

STORMWATER DRAINAGE TECHNICAL REPORT

Cousin's Subs

Project Location:

405 S Perry Rd, Plainfield, IN 46168

Prepared for:

Evo Development, Inc

5375 N 118th Ct, Milwaukee, WI 53225

Date:

May 4, 2023

TERRA Project #2212005



CONSULTING ENGINEERS & LAND SURVEYORS

CIVIL / SITE ENGINEERING
LAND SURVEYING
GEOTECHNICAL ENGINEERING
ENVIRONMENTAL CONSULTING
BROWNFIELDS REDEVELOPMENT
CONSTRUCTION MATERIALS TESTING (CMT) / INSPECTION

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Project Description

The project site is also known as Lot 7, Plainfield Commons IV, Phase II and contains 1.33 Ac. The site address is 405 S Perry Rd, Plainfield, IN 46168, Sec 30, T15N, R02E in Guilford Twp of Hendricks County. The GPS coordinates are 39°42'44.784" N latitude and 86°21'14.616" W longitude. The proposed use is a restaurant with drive-thru. See Appendix A.

Site History

The site was included in the Metropolis/Plainfield Commons Master Drainage design by The Schneider Corporation (June 6, 2007) for Premier Properties USA, Inc. provided in Appendix B. The drainage intent is for the site to discharge to the existing 48" storm sewer on the east side of Perry Rd and be conveyed to an open channel (George's Creek) on the southwest side of Perry Rd and Futura Park Way. George's Creek reaches a regional dry detention pond (revised "Cigar" pond) south of Stout Heritage Parkway. The regional detention pond has a dry forebay which captures oils, silts and debris from upstream flow.

Adjacent land uses include:

North: commercial; this use shares an existing driveway to Pine Crest Drive.

East: residential

South: future commercial

West: commercial

Existing Conditions

The site currently mowed field, relatively flat, with no apparent drainage features. It is Zone X on FEMA FIRM panel 18063C0278D eff 9/25/2009.

Soil Conditions

The USDA web soil survey shows the area to be Urban land (disturbed) Brookston and Crosby silt loam soils. These are categorized in Hydrologic Soil Groups (HSG) B/D and C, respectively.

TERRA Site Development performed five (5) soil borings on site (see Appendix C).

Phase 1 ESA

TERRA Site Development performed a Phase 1 Environmental Site Assessment on the site and concluded that no recognized environmental condition was discovered. The ESA without its appendix is provided in Appendix D of this report.

Proposed Conditions

The proposed restaurant use will share the existing driveway with the commercial use to the north and have a new entrance off Pine Crest Dr. It is 50% pervious and 50% impervious, with the following developed conditions for HSG D.

Table 1 – Weighted Curve Number (CN)

Description	CN	Area (ac)
Good condition (grass >75%)	80	0.664
Paved parking lots, roofs, driveways	98	0.668
	89	1.332

Storm Sewer

The proposed restaurant will have a drive thru on the north side and parking on the south side. Inlets are proposed in the parking and lawn areas to collect runoff from impervious areas and direct it to an existing 18" stub at Perry Rd. At that point it connects to an existing 48" RCP and follows the drainage path described above.

We used the Hydraflow software, 10 yr storm event from NOAA Atlas 14 to size the storm sewer system. See Appendix E for Developed Conditions Plan and Appendix F for HGL calculations.

There are two basins which are not captured by on site storm sewer, but indirectly reach the same system and are directed to the existing trunk line along Perry Rd. These are mostly pervious areas around the perimeter of the site, labeled IND1 and IND2 on the Developed Conditions Plan.

Table 2 – Storm Sewer Design Characteristics

Inlet	Area (ac)	Rational C factor
600	0.18	0.26
601	0.12	0.90
602	0.20	0.58
603	0.34	0.47
604	0.06	0.78
605	0.08	0.80
IND1	0.04	0.20
IND2	0.32	0.26

Water Quality

For stormwater quality, we propose a R-24 BMP Snout in inlet 600, prior to discharge to the existing storm sewer in Perry Rd. See Operation & Maintenance Manual in separate document.

Appendix

- A. Site Location Map
- B. Master Drainage Plan
- C. Soil Boring Report
- D. Phase 1 ESA (abridged)
- E. Developed Conditions Plan
- F. HGL Calculations

APPENDIX A
SITE LOCATION MAP

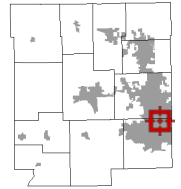


BeaconTM

Hendricks County, IN



Overview



Legend

- Parcels
- Road Centerlines

Parcel ID	32-09-30-227-002.000-012	Alternate ID	21-1-30-52E 227-002	Owner Address	SILA PERRY LLC
Sec/Twp/Rng	0030-0015-2E	Class	COMMERCIAL VACANT LAND		706 PRO MED LANE Ste # 260
Property Address	405 S PERRY RD	Acreage	1.33		CARMEL, IN 46032
	Plainfield				
District	Town Of Plainfield				
Brief Tax Description	LOT 7 PLAINFIELD COMMONS IV PH II				
	1.33 AC				
	CAME FROM 21-1-30-52E 400-012				
	(Note: Not to be used on legal documents)				

Date created: 1/26/2023

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APPENDIX B
MASTER DRAINAGE PLAN

DRAINAGE CALCULATIONS

METROPOLIS / PLAINFIELD COMMONS MASTER DRAINAGE PLAINFIELD, INDIANA

DEVELOPER:

**Premier Properties USA, Inc.
5252 East 82nd Street, Suite 300
Indianapolis, IN 46250
(317) 558-9900**

DESIGNER:



**THE SCHNEIDER CORPORATION
5250 East U.S. 36, Building 1000
Avon, IN 46123
317-745-9926
317-745-9973 Fax**



JUNE 6, 2007

Gary E. Murray

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A. SITE NARRATIVE

A.1 - Site location:

409+/- acres of land on the south side of U.S. Highway 40 along the east and west sides of Perry Road; Plainfield, Indiana; a part of Guilford Township in Hendricks County, Indiana; Section 30-T15N-R2E.

A.2 - Proposed Use:

The subject site will consist of multiple commercial developments including an outdoor shopping mall, offices, department stores, "B" shops, and restaurants.

A.3 - Existing Conditions:

A.3a - Ground Surface & Terrain:

The high elevation of the site is at the northeast end. The ground slopes from northeast to southwest, and in an undeveloped state consists of mainly row crops and some areas of tall weeds and grass. There is a ditch that drains from the east side of the site to the southwest corner of the site, and discharges into George Creek at the southwest corner of the site.

A.3b - Drainage:

On-site:

Storm water runoff that accumulates on-site sheet flows to the ditch, then discharges to George Creek at the southwest corner of the site.

Off-site:

Off-site storm water from the north and east flows into the onsite ditch and discharges at the southwest corner of the site.

A.3c - Soils:

Soils maps from the United States Department of Agriculture, Soil Conservation Service, identify Brookston and Crosby soils on the subject site. Brookston soils are part of hydrologic Group B and D, while Crosby is part of hydrologic Group C (see Soils Map on Pg. 9).

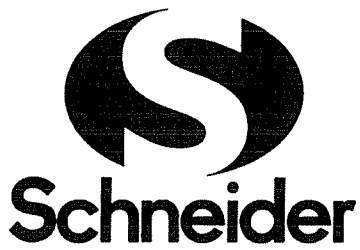
A.4 - Adjacent Land Uses:

North:	Commercial / Retail
South:	Industrial Warehouse
East:	Agricultural Field
West:	Residential / Multi-Family

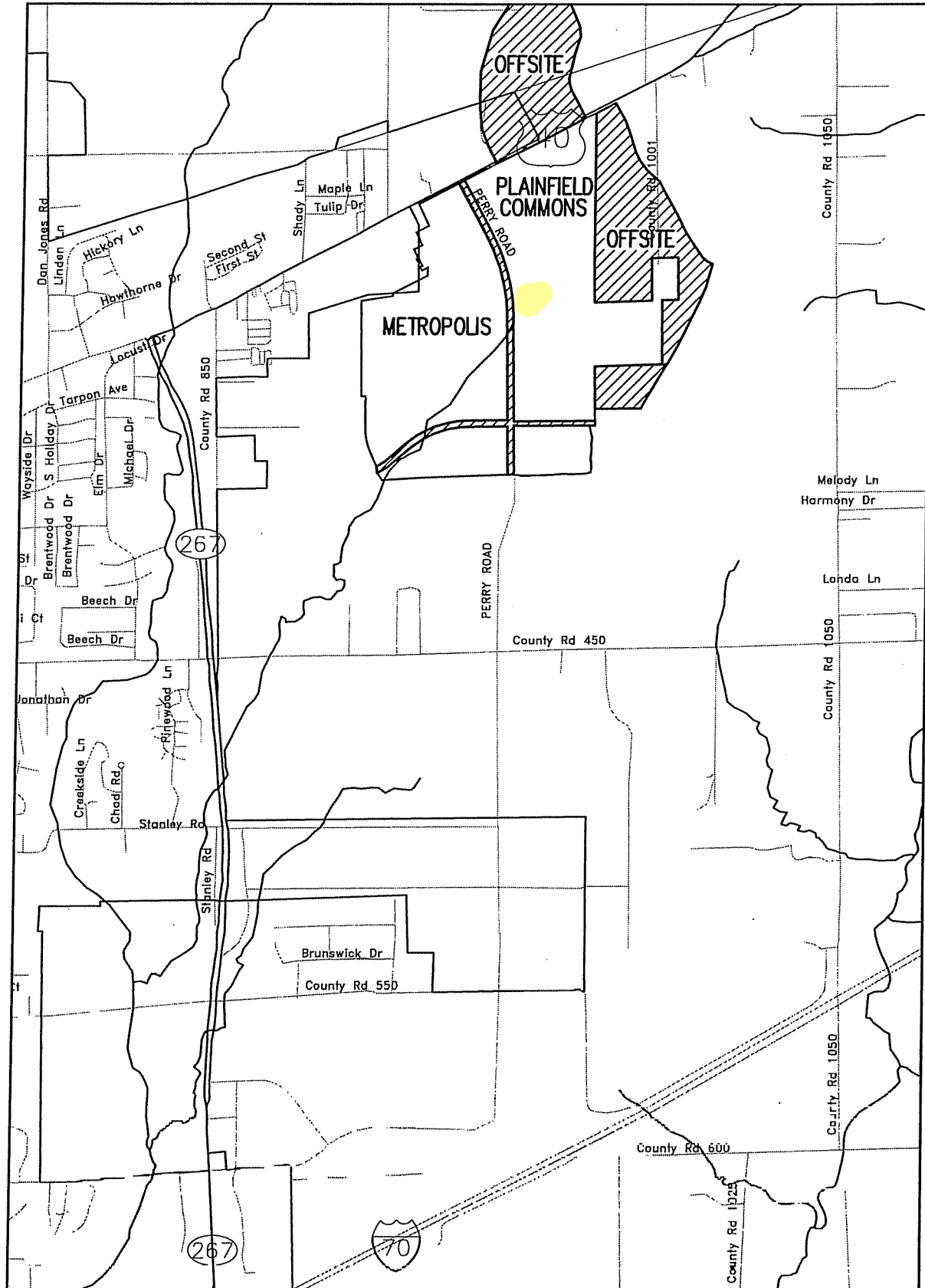
A.5 – Detention requirements

According to the Town of Plainfield drainage ordinance NO. 17-97, Section 4; the release rate of storm water runoff for a new development during a 100-year storm event should not exceed the release rate of a 10-year storm event that would occur before development.

B. SITE MAPS



The Schneider Corp.
5250 East U.S. 36
Building 1000
Avon, Indiana
46123
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317-745-9973 FAX



B.1 AREA MAP

ASSUMED NORTH
SCALE: N.T.S.

C. DRAINAGE DESIGN

C.1 - Developed Drainage Summary:

Storm water from Metropolis, Plainfield Commons, and future on-site developments (409 +/- acres) will be collected in storm structures and conveyed through a system of underground pipes to multiple inter-connected detention ponds. All of the storm water eventually reaches a regional dry detention pond (revised "Cigar" pond) located at the southwest corner of the site. The regional pond discharges into the existing ditch that flows to George Creek. Offsite Storm water from Wal-mart, Dermody, 84+/- acres from the north, 100+/- acres from the east, Metropolis Parkway and Perry Road, drains into the Metropolis and Plainfield Commons projects and flows through the regional detention pond. The regional detention pond also contains a dry forebay to help capture oils, silts and debris from Metropolis and Plainfield Commons. The forebay was designed to treat the "first flush" from a storm event. The following is a summary of results.

Summary Table

Pre-Developed (on-site) based on 10-year peak storm event	
Basins	Release Rate (allowable)
PRE-101	209.05 CFS

Developed (on-site) based on 100-year peak storm event			
Node	Release Rate	Max. Stage	Top of Bank
CIGAR PND	206.28 CFS	756.82	758.50
CIG PIPE BNDY	206.83 CFS		

Pre-Developed (entire watershed) based on 100-year peak storm event	
Basins	Release Rate
PRE-101	496.19 CFS

Developed (on-site & off-site) based on 100-year peak storm event			
Node	Release Rate	Max. Stage	Top of Bank
CIGAR PND	373.65 CFS	757.20	758.50
CIG PIPE BNDY	374.54 CFS		

Developed (forebay) based on "first flush" storm event			
Node	Release Rate	Max. Stage	Weir Bank
CIGAR PND	47.47 CFS	755.35	755.50

C.2 - Drainage Calculation Method:

The runoff Curve Number (CN) and Time of Concentration (Tc) for the basins in this report have been calculated using TR-55 version 2.10.

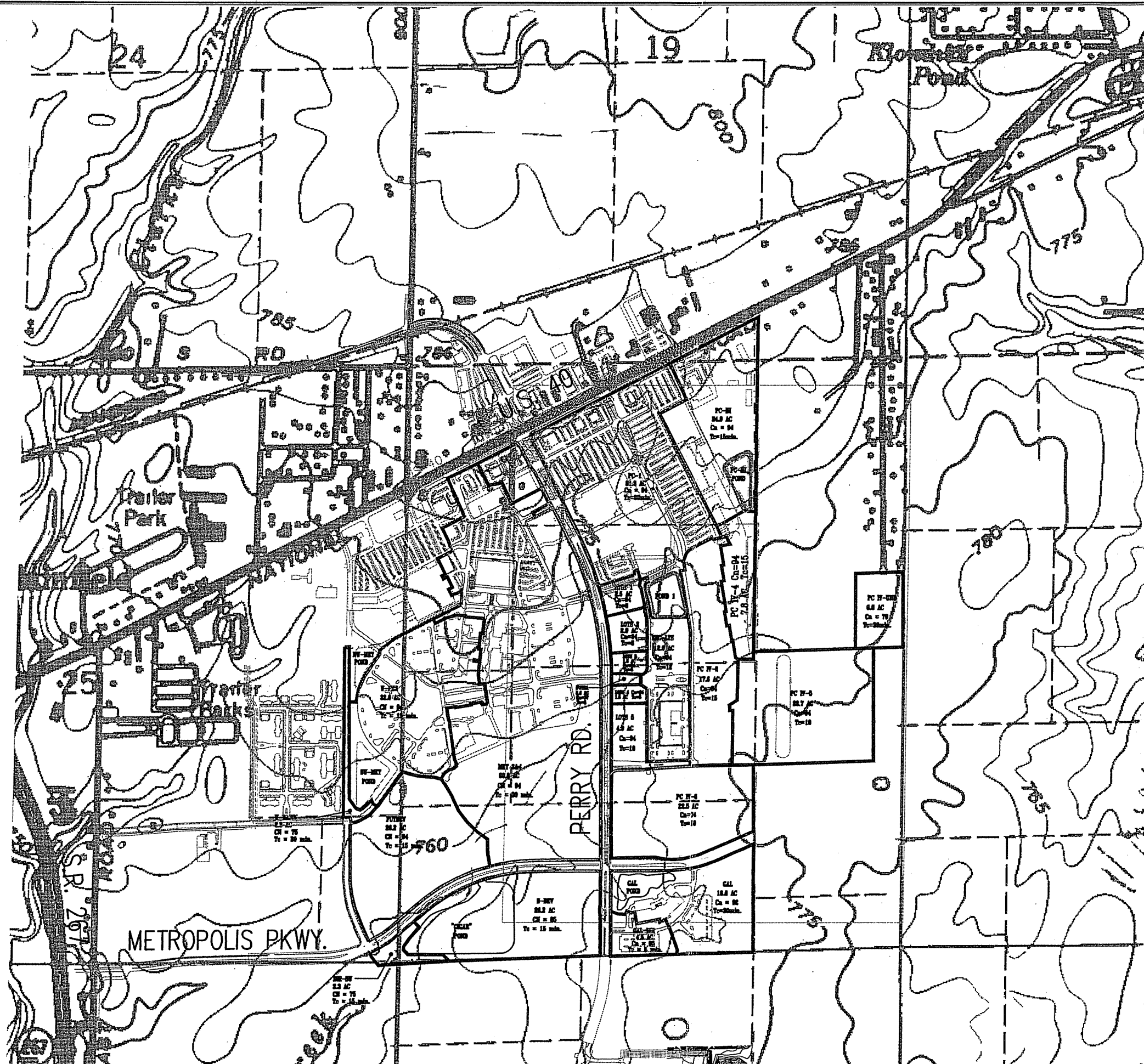
The detention calculations for this report were achieved using ICPR version 3.02.

C.3 - Pre-developed Drainage Calculations:

C.3a - Pre-developed Basin Maps:

C.4 – Developed Drainage Calculations:

C.4a - Developed Basin Map:



ASSUMED NORTH
SCALE: N.T.S.

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**METROPOLIS & PLAINFIELD
COMMONS DRAINAGE**
PLAINFIELD, INDIANA
PREMIER PROPERTIES
5252 E. 82nd Street, Suite 300 - Indianapolis, IN 46250

DATE:	PROJECT NO.:
10/19/09	1019.094
DRAWN BY:	CHECKED BY:
WCZ	
SHEET TITLE:	
DEVELOPED DRAINAGE BASINS (ON-SITE)	
DRAWING FILE:	
SHEET NO.:	
DR-2	

C.4b - Developed TR-55 Data (CN & Tc):

Node Results (Offsite NOT included) 100-year storm event

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Inflow hrs cfs	Max Time Outflow hrs	Max Outflow cfs
bndy-forbay	BASE	100Y-01HR	0.00	750.000	750.000	0.0000	3	0.00	0.00	0.000
bndy-forbay	BASE	100Y-02HR	0.00	750.000	750.000	0.0000	3	0.00	0.00	0.000
bndy-forbay	BASE	100Y-03HR	0.00	750.000	750.000	0.0000	3	0.00	0.00	0.000
bndy-forbay	BASE	100Y-06HR	0.00	750.000	750.000	0.0000	3	0.00	0.00	0.000
bndy-forbay	BASE	100Y-12HR	0.00	750.000	750.000	0.0000	3	0.00	0.00	0.000
bndy-forbay	BASE	100Y-24HR	0.00	750.000	750.000	0.0000	3	0.00	0.00	0.000
CIG PIPE BNDY	BASE	100Y-01HR	0.00	749.000	749.000	0.0000	7	2.23	0.00	0.000
CIG PIPE BNDY	BASE	100Y-02HR	0.00	749.000	749.000	0.0000	7	2.81	0.00	0.000
CIG PIPE BNDY	BASE	100Y-03HR	0.00	749.000	749.000	0.0000	7	3.42	0.00	0.000
CIG PIPE BNDY	BASE	100Y-06HR	0.00	749.000	749.000	0.0000	7	6.00	0.00	0.000
CIG PIPE BNDY	BASE	100Y-12HR	0.00	749.000	749.000	0.0000	7	7.92	0.00	0.000
CIG PIPE BNDY	BASE	100Y-24HR	0.00	749.000	749.000	0.0000	7	12.20	0.00	0.000
CIGAR PND	BASE	100Y-01HR	2.23	754.687	757.500	0.0010	410671	0.67	2.23	159.797
CIGAR PND	BASE	100Y-02HR	2.81	755.857	757.500	0.0008	438497	1.03	2.81	186.824
CIGAR PND	BASE	100Y-03HR	3.44	756.459	757.500	0.0011	450247	1.47	3.44	199.293
CIGAR PND	BASE	100Y-06HR	6.07	756.815	757.500	0.0021	456435	2.75	6.07	206.284
CIGAR PND	BASE	100Y-12HR	7.93	756.306	757.500	0.0015	447584	5.42	7.93	196.208
CIGAR PND	BASE	100Y-24HR	12.26	755.540	757.500	0.0008	430182	7.28	12.26	179.916
d.s. OFF-NE	BASE	100Y-01HR	0.56	764.982	768.000	0.0391	634	0.41	0.58	63.541
d.s. OFF-NE	BASE	100Y-02HR	1.86	764.726	768.000	0.0384	650	0.53	0.55	60.257
d.s. OFF-NE	BASE	100Y-03HR	2.45	764.549	768.000	0.0380	658	0.74	0.76	60.420
d.s. OFF-NE	BASE	100Y-06HR	3.16	764.262	768.000	0.0291	669	1.65	1.65	62.091
d.s. OFF-NE	BASE	100Y-12HR	3.69	763.744	768.000	0.0346	493	3.68	3.69	61.905
d.s. OFF-NE	BASE	100Y-24HR	7.31	763.145	768.000	0.0034	683	7.25	7.25	23.147
D.S. PND1 MH	BASE	100Y-01HR	1.04	769.245	774.500	0.0798	147	1.23	1.78	78.787
D.S. PND1 MH	BASE	100Y-02HR	1.60	769.067	774.500	0.0648	147	0.87	2.51	78.539
D.S. PND1 MH	BASE	100Y-03HR	1.80	768.751	774.500	0.0654	147	1.17	2.90	77.596
D.S. PND1 MH	BASE	100Y-06HR	2.53	766.568	774.500	-0.0079	705	2.49	2.50	64.098
D.S. PND1 MH	BASE	100Y-12HR	3.90	766.027	774.500	0.0070	781	3.93	3.95	52.584
D.S. PND1 MH	BASE	100Y-24HR	7.37	765.843	774.500	0.0020	783	7.36	7.36	24.719
d.s.twin ellip	BASE	100Y-01HR	0.63	761.958	764.130	0.0066	11074	0.57	0.63	207.066
d.s.twin ellip	BASE	100Y-02HR	0.99	761.683	764.130	0.0066	11393	0.94	1.00	191.496
d.s.twin ellip	BASE	100Y-03HR	1.46	761.603	764.130	0.0066	11563	1.64	1.46	186.623
d.s.twin ellip	BASE	100Y-06HR	2.26	761.554	764.130	0.0066	11796	2.89	2.17	180.836
d.s.twin ellip	BASE	100Y-12HR	3.77	761.477	764.130	0.0066	11975	5.42	3.78	171.729
d.s.twin ellip	BASE	100Y-24HR	7.31	761.327	764.130	0.0066	12072	7.27	7.31	89.683
ds-culvert	BASE	100Y-01HR	0.73	757.441	757.500	0.0039	21903	0.71	0.73	472.743
ds-culvert	BASE	100Y-02HR	1.08	757.291	757.500	0.0039	21380	1.07	1.08	416.234
ds-culvert	BASE	100Y-03HR	1.49	757.139	757.500	0.0035	20850	1.47	1.49	361.966
ds-culvert	BASE	100Y-06HR	6.04	756.894	757.500	0.0031	19764	2.89	2.78	278.735
ds-culvert	BASE	100Y-12HR	3.77	756.601	757.500	0.0039	18106	6.92	3.77	194.556
ds-culvert	BASE	100Y-24HR	7.28	756.403	757.500	0.0040	16985	7.78	7.28	143.231
ds-culvert-fb	BASE	100Y-01HR	0.00	752.820	757.500	0.0000	436	0.00	0.00	0.000

Node Results (Offsite NOT included) 100-year storm event

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
ds-culvert-fb	BASE	100Y-02HR	0.00	752.820	757.500	0.0000	436	0.00	0.000	0.00	0.000
ds-culvert-fb	BASE	100Y-03HR	0.00	752.820	757.500	0.0000	436	0.00	0.000	0.00	0.000
ds-culvert-fb	BASE	100Y-06HR	0.00	752.820	757.500	0.0000	436	0.00	0.000	0.00	0.000
ds-culvert-fb	BASE	100Y-12HR	0.00	752.820	757.500	0.0000	436	0.00	0.000	0.00	0.000
ds-culvert-fb	BASE	100Y-24HR	0.00	752.820	757.500	0.0000	436	0.00	0.000	0.00	0.000
E. PERRY MH-1	BASE	100Y-01HR	1.02	762.850	768.000	-0.0123	170	1.11	57.268	1.11	57.376
E. PERRY MH-1	BASE	100Y-02HR	1.64	762.884	768.000	-0.0102	170	2.10	56.246	2.10	56.347
E. PERRY MH-1	BASE	100Y-03HR	2.41	762.667	768.000	-0.0114	170	2.51	55.119	2.51	55.145
E. PERRY MH-1	BASE	100Y-06HR	3.01	762.422	768.000	-0.0082	170	3.11	54.281	3.11	54.295
E. PERRY MH-1	BASE	100Y-12HR	5.43	761.850	768.000	0.0079	170	5.50	51.203	5.50	51.207
E. PERRY MH-1	BASE	100Y-24HR	8.55	760.106	768.000	-0.0087	170	11.04	40.023	8.53	39.054
E. PERRY MH-2	BASE	100Y-01HR	0.54	761.314	766.160	0.0060	198	0.50	68.000	0.51	67.446
E. PERRY MH-2	BASE	100Y-02HR	1.63	761.294	766.160	0.0058	189	1.62	66.751	1.62	66.732
E. PERRY MH-2	BASE	100Y-03HR	2.41	761.095	766.160	0.0057	202	1.44	66.373	2.40	65.662
E. PERRY MH-2	BASE	100Y-06HR	3.00	760.906	766.160	0.0050	236	3.00	64.404	3.00	64.383
E. PERRY MH-2	BASE	100Y-12HR	5.42	760.483	766.160	0.0045	279	5.42	60.131	5.42	60.124
E. PERRY MH-2	BASE	100Y-24HR	8.56	759.414	766.160	0.0043	347	8.55	45.970	8.56	45.970
E. PERRY MH-3	BASE	100Y-01HR	0.55	758.858	767.950	0.0024	2261	0.51	67.446	0.55	66.932
E. PERRY MH-3	BASE	100Y-02HR	1.63	758.850	767.950	0.0030	2264	1.62	66.732	1.64	66.709
E. PERRY MH-3	BASE	100Y-03HR	2.42	758.810	767.950	0.0030	2314	2.40	65.662	2.42	65.657
E. PERRY MH-3	BASE	100Y-06HR	3.01	758.762	767.950	-0.0029	2429	3.00	64.383	3.01	64.348
E. PERRY MH-3	BASE	100Y-12HR	5.43	758.609	767.950	0.0010	2597	5.42	60.124	5.43	60.110
E. PERRY MH-3	BASE	100Y-24HR	8.57	758.100	767.950	0.0006	2871	8.56	45.970	8.57	45.970
forbay	BASE	100Y-01HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
forbay	BASE	100Y-02HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
forbay	BASE	100Y-03HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
forbay	BASE	100Y-06HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
forbay	BASE	100Y-12HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
forbay	BASE	100Y-24HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
GAL POND	BASE	100Y-01HR	1.32	765.859	768.000	0.0003	98829	0.62	59.779	1.32	6.285
GAL POND	BASE	100Y-02HR	2.24	766.119	768.000	0.0002	102018	0.98	45.818	2.24	7.113
GAL POND	BASE	100Y-03HR	3.15	766.194	768.000	0.0003	102915	1.37	35.694	3.15	7.334
GAL POND	BASE	100Y-06HR	5.43	766.142	768.000	0.0005	102289	2.00	22.324	5.43	7.180
GAL POND	BASE	100Y-12HR	6.91	765.942	768.000	0.0004	99863	3.67	13.837	6.91	6.561
GAL POND	BASE	100Y-24HR	12.14	765.741	768.000	0.0003	97363	7.25	8.408	12.14	5.870
MET-NW-pond	BASE	100Y-01HR	0.00	768.100	772.500	0.0000	40094	0.00	0.000	0.00	0.000
MET-NW-pond	BASE	100Y-02HR	0.00	768.100	772.500	0.0000	40094	0.00	0.000	0.00	0.000
MET-NW-pond	BASE	100Y-03HR	0.00	768.100	772.500	0.0000	40094	0.00	0.000	0.00	0.000
MET-NW-pond	BASE	100Y-06HR	0.00	768.100	772.500	0.0000	40094	0.00	0.000	0.00	0.000
MET-NW-pond	BASE	100Y-12HR	0.00	768.100	772.500	0.0000	40094	0.00	0.000	0.00	0.000
MET-NW-pond	BASE	100Y-24HR	0.00	768.100	772.500	0.0000	40094	0.00	0.000	0.00	0.000
MET-SW-pond	BASE	100Y-01HR	1.26	762.248	765.000	0.0006	109254	0.53	121.951	1.26	9.793
MET-SW-pond	BASE	100Y-02HR	2.18	762.650	765.000	0.0004	111178	0.90	85.300	2.18	11.339

Node Results (Offsite NOT included) 100-year storm event

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
MET-SW-pond	BASE	100Y-03HR	3.14	762.780	765.000	0.0006	111802	1.10	66.023	3.14	11.801
MET-SW-pond	BASE	100Y-06HR	5.53	762.715	765.000	0.0008	111489	1.92	41.404	5.53	11.571
MET-SW-pond	BASE	100Y-12HR	7.43	762.377	765.000	0.0006	109871	3.58	25.038	7.43	10.313
MET-SW-pond	BASE	100Y-24HR	12.18	762.087	765.000	0.0003	108484	7.17	14.950	12.18	9.127
MH-WAL	BASE	100Y-01HR	0.00	768.100	772.000	0.0000	157	0.00	0.000	0.00	0.000
MH-WAL	BASE	100Y-02HR	0.00	768.100	772.000	0.0000	157	0.00	0.000	0.00	0.000
MH-WAL	BASE	100Y-03HR	0.00	768.100	772.000	0.0000	157	0.00	0.000	0.00	0.000
MH-WAL	BASE	100Y-06HR	0.00	768.100	772.000	0.0000	157	0.00	0.000	0.00	0.000
MH-WAL	BASE	100Y-12HR	0.00	768.100	772.000	0.0000	157	0.00	0.000	0.00	0.000
MH-WAL	BASE	100Y-24HR	0.00	768.100	772.000	0.0000	157	0.00	0.000	0.00	0.000
NW-BNDY	BASE	100Y-01HR	0.00	768.100	768.100	0.0000	15	0.00	0.000	0.00	0.000
NW-BNDY	BASE	100Y-02HR	0.00	768.100	768.100	0.0000	15	0.00	0.000	0.00	0.000
NW-BNDY	BASE	100Y-03HR	0.00	768.100	768.100	0.0000	15	0.00	0.000	0.00	0.000
NW-BNDY	BASE	100Y-06HR	0.00	768.100	768.100	0.0000	15	0.00	0.000	0.00	0.000
NW-BNDY	BASE	100Y-12HR	0.00	768.100	768.100	0.0000	15	0.00	0.000	0.00	0.000
NW-BNDY	BASE	100Y-24HR	0.00	768.100	768.100	0.0000	15	0.00	0.000	0.00	0.000
OFF-NE	BASE	100Y-01HR	0.57	765.005	768.000	0.0756	137	0.87	9.496	1.49	13.635
OFF-NE	BASE	100Y-02HR	1.85	764.751	768.000	0.0813	139	1.20	8.674	2.37	15.024
OFF-NE	BASE	100Y-03HR	2.45	764.568	768.000	0.0708	139	1.60	7.651	3.25	12.654
OFF-NE	BASE	100Y-06HR	3.16	764.282	768.000	0.0418	140	2.83	5.274	4.07	8.209
OFF-NE	BASE	100Y-12HR	3.69	763.755	768.000	0.0440	140	5.50	3.337	6.45	7.400
OFF-NE	BASE	100Y-24HR	7.31	763.160	768.000	0.0058	140	10.83	2.091	10.84	2.092
OUT1 MH	BASE	100Y-01HR	1.00	767.938	771.500	0.0207	178	1.78	78.787	1.80	75.622
OUT1 MH	BASE	100Y-02HR	1.60	767.791	771.500	-0.0184	178	2.51	78.539	2.53	75.702
OUT1 MH	BASE	100Y-03HR	1.55	767.540	771.500	-0.0314	178	2.90	78.902	2.94	74.295
OUT1 MH	BASE	100Y-06HR	2.53	766.014	771.500	0.0066	1095	2.50	67.023	2.53	67.015
OUT1 MH	BASE	100Y-12HR	3.95	765.114	771.500	0.0060	1376	3.98	54.371	3.95	45.868
OUT1 MH	BASE	100Y-24HR	7.37	764.867	771.500	-0.0013	1397	7.36	25.789	7.35	25.785
OUT2 MH	BASE	100Y-01HR	0.86	766.306	769.040	0.0324	175	0.91	77.428	1.90	88.557
OUT2 MH	BASE	100Y-02HR	1.04	766.173	769.040	0.0346	175	0.86	77.069	0.73	89.256
OUT2 MH	BASE	100Y-03HR	1.53	766.049	769.040	0.0359	175	1.16	76.790	0.97	89.299
OUT2 MH	BASE	100Y-06HR	2.54	765.099	769.040	-0.0198	850	2.52	70.408	1.77	91.256
OUT2 MH	BASE	100Y-12HR	3.98	764.600	769.040	0.0064	1226	3.95	47.941	3.98	44.003
OUT2 MH	BASE	100Y-24HR	7.29	763.854	769.040	0.0012	1333	7.27	27.065	7.28	27.058
OUT3 MH	BASE	100Y-01HR	0.60	764.521	767.000	-0.0262	296	0.48	94.393	0.56	80.119
OUT3 MH	BASE	100Y-02HR	1.02	764.462	767.000	-0.0249	312	0.73	93.402	0.86	80.458
OUT3 MH	BASE	100Y-03HR	1.16	764.428	767.000	-0.0248	318	0.97	92.481	1.16	80.042
OUT3 MH	BASE	100Y-06HR	2.54	764.156	767.000	0.0215	420	1.77	93.257	2.55	72.159
OUT3 MH	BASE	100Y-12HR	4.01	762.941	767.000	0.0029	1336	3.98	45.077	3.99	44.591
OUT3 MH	BASE	100Y-24HR	7.29	762.301	767.000	0.0029	1397	7.27	27.717	7.29	27.713
PC-IV-6	BASE	100Y-01HR	1.03	764.373	770.000	0.0128	1356	0.45	78.786	1.11	57.268
PC-IV-6	BASE	100Y-02HR	1.71	764.405	770.000	-0.0088	1323	0.73	64.965	2.10	56.246
PC-IV-6	BASE	100Y-03HR	2.16	764.162	770.000	0.0099	1358	1.05	74.804	2.51	55.119

Node Results (Offsite NOT included) 100-year storm event

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
PC-IV-6	BASE	100Y-06HR	3.08	763.871	770.000	0.0103	1409	1.96	76.260	3.11	54.281
PC-IV-6	BASE	100Y-12HR	5.46	763.152	770.000	0.0103	1452	3.73	75.596	5.50	51.203
PC-IV-6	BASE	100Y-24HR	8.55	760.827	770.000	0.0039	4132	7.25	39.586	11.04	40.023
PC1V-3MH	BASE	100Y-01HR	0.56	765.078	772.000	0.0157	1165	1.30	45.833	1.30	47.274
PC1V-3MH	BASE	100Y-02HR	1.81	764.588	772.000	0.0157	1624	2.27	48.151	2.24	48.445
PC1V-3MH	BASE	100Y-03HR	2.43	764.412	772.000	0.0157	1737	3.22	41.422	3.23	41.892
PC1V-3MH	BASE	100Y-06HR	3.12	764.137	772.000	0.0157	1878	3.51	34.453	3.50	35.077
PC1V-3MH	BASE	100Y-12HR	5.51	763.582	772.000	0.0157	2054	3.69	27.718	6.26	26.194
PC1V-3MH	BASE	100Y-24HR	7.31	763.046	772.000	0.0157	2118	11.09	16.226	11.08	16.305
PCIII	BASE	100Y-01HR	0.34	769.992	772.000	0.0221	3492	0.53	52.226	0.34	74.046
PCIII	BASE	100Y-02HR	0.53	770.049	772.000	0.0221	3618	0.90	43.292	0.53	74.369
PCIII	BASE	100Y-03HR	0.74	770.099	772.000	0.0221	3726	1.10	38.593	0.74	74.647
PCIII	BASE	100Y-06HR	1.63	770.133	772.000	0.0221	3850	1.92	32.592	1.63	74.074
PCIII	BASE	100Y-12HR	3.68	769.987	772.000	0.0221	3483	3.58	28.603	3.68	74.029
PCIII	BASE	100Y-24HR	7.20	769.385	772.000	0.0221	2294	7.17	21.277	7.19	21.263
PCIV-1MH	BASE	100Y-01HR	0.55	765.029	769.000	0.0170	249	0.57	90.851	0.60	91.048
PCIV-1MH	BASE	100Y-02HR	0.94	764.283	769.000	0.0170	1021	1.70	78.442	1.70	78.371
PCIV-1MH	BASE	100Y-03HR	2.17	764.095	769.000	0.0170	1163	2.18	73.740	2.18	73.698
PCIV-1MH	BASE	100Y-06HR	3.08	763.876	769.000	0.0170	1298	3.08	68.155	3.08	68.106
PCIV-1MH	BASE	100Y-12HR	5.45	763.354	769.000	0.0170	1507	5.46	54.033	5.49	54.023
PCIV-1MH	BASE	100Y-24HR	7.27	762.864	769.000	0.0170	1611	7.25	40.894	7.27	40.878
PCIV-2MH	BASE	100Y-01HR	0.55	765.118	772.000	0.0169	538	1.15	61.339	1.15	60.791
PCIV-2MH	BASE	100Y-02HR	1.75	764.523	772.000	0.0169	1226	1.96	62.237	2.12	61.399
PCIV-2MH	BASE	100Y-03HR	2.43	764.343	772.000	0.0169	1334	2.53	58.768	2.56	57.606
PCIV-2MH	BASE	100Y-06HR	3.09	764.089	772.000	0.0169	1455	3.26	53.053	3.24	51.948
PCIV-2MH	BASE	100Y-12HR	5.50	763.539	772.000	0.0169	1628	5.59	41.269	5.59	40.343
PCIV-2MH	BASE	100Y-24HR	7.29	763.017	772.000	0.0169	1705	8.50	29.458	8.50	29.472
PCIV-4MH	BASE	100Y-01HR	0.56	764.935	775.000	0.0145	1982	1.29	54.868	1.30	39.833
PCIV-4MH	BASE	100Y-02HR	1.87	764.699	775.000	0.0145	2172	2.22	57.018	2.27	42.151
PCIV-4MH	BASE	100Y-03HR	2.45	764.521	775.000	0.0145	2263	3.11	48.869	3.22	35.422
PCIV-4MH	BASE	100Y-06HR	3.18	764.229	775.000	0.0145	2378	3.52	38.156	3.51	28.453
PCIV-4MH	BASE	100Y-12HR	5.54	763.666	775.000	0.0145	2498	3.68	30.026	3.69	21.718
PCIV-4MH	BASE	100Y-24HR	7.32	763.107	775.000	0.0145	2500	8.73	10.177	11.09	10.226
POND 1	BASE	100Y-01HR	1.11	770.616	773.000	-0.0010	98279	0.58	188.075	1.23	74.869
POND 1	BASE	100Y-02HR	1.58	770.359	773.000	-0.0008	96717	0.97	140.904	0.87	74.439
POND 1	BASE	100Y-03HR	1.83	770.021	773.000	0.0008	94655	1.20	109.318	1.17	73.728
POND 1	BASE	100Y-06HR	2.49	769.074	773.000	0.0009	89281	1.92	68.744	2.49	64.107
POND 1	BASE	100Y-12HR	3.93	768.779	773.000	0.0006	87611	3.67	42.158	3.93	39.605
POND 1	BASE	100Y-24HR	7.36	768.569	773.000	0.0003	86422	7.17	25.276	7.36	24.720
POND 2	BASE	100Y-01HR	1.12	764.566	767.000	0.0010	132578	0.48	118.084	1.40	56.981
POND 2	BASE	100Y-02HR	1.87	764.693	767.000	-0.0008	133032	0.73	78.663	2.34	58.978
POND 2	BASE	100Y-03HR	2.45	764.514	767.000	0.0010	132387	0.98	60.879	3.43	51.772
POND 2	BASE	100Y-06HR	3.21	764.215	767.000	0.0013	131252	1.83	38.106	6.83	37.975

Node Results (Offsite NOT included) 100-year storm event

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
POND 2	BASE	100Y-12HR	5.60	763.619	767.000	0.0008	127978	3.58	22.597	6.58	29.538
POND 2	BASE	100Y-24HR	8.48	763.014	767.000	0.0004	124847	7.17	13.432	14.98	20.823
u.s. culvert	BASE	100Y-01HR	0.73	757.484	758.120	-0.0049	9503	0.68	467.592	0.71	466.987
u.s. culvert	BASE	100Y-02HR	1.08	757.325	758.120	-0.0050	10070	1.07	411.014	1.07	410.693
u.s. culvert	BASE	100Y-03HR	1.48	757.167	758.120	-0.0050	10526	1.47	365.675	1.47	360.079
u.s. culvert	BASE	100Y-06HR	2.77	756.905	758.120	-0.0051	11126	2.17	296.249	2.89	281.120
u.s. culvert	BASE	100Y-12HR	3.77	756.611	758.120	-0.0050	11630	3.75	245.361	6.92	223.938
u.s. culvert	BASE	100Y-24HR	7.31	756.411	758.120	-0.0050	11887	7.29	136.873	7.78	224.492
u.s.twin ellip	BASE	100Y-01HR	0.57	763.024	764.130	0.0148	1795	0.56	208.076	0.57	205.829
u.s.twin ellip	BASE	100Y-02HR	0.94	762.799	764.130	0.0148	1961	0.86	187.575	0.94	186.032
u.s.twin ellip	BASE	100Y-03HR	1.16	762.682	764.130	0.0148	2021	1.16	173.418	1.64	173.393
u.s.twin ellip	BASE	100Y-06HR	2.77	762.526	764.130	0.0148	2075	2.78	156.543	2.89	159.491
u.s.twin ellip	BASE	100Y-12HR	5.42	762.097	764.130	0.0148	2318	5.42	112.297	5.42	112.257
u.s.twin ellip	BASE	100Y-24HR	7.28	761.796	764.130	0.0148	2359	7.26	83.776	7.27	83.761
W-futura	BASE	100Y-01HR	0.54	764.319	766.000	0.0192	253	0.53	104.042	0.54	104.005
W-futura	BASE	100Y-02HR	0.94	763.831	766.000	0.0192	682	0.93	88.478	0.93	88.467
W-futura	BASE	100Y-03HR	2.15	763.625	766.000	0.0192	788	2.14	81.556	2.15	81.510
W-futura	BASE	100Y-06HR	3.03	763.449	766.000	0.0192	861	3.05	75.749	3.05	75.711
W-futura	BASE	100Y-12HR	5.43	763.004	766.000	0.0192	984	5.42	61.397	5.43	61.356
W-futura	BASE	100Y-24HR	7.27	762.581	766.000	0.0192	1049	7.25	47.828	7.26	47.824

Node Results (Offsite Included) 100-year storm event

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
bndy-forbay	BASE	100Y-01HR	0.00	750.000	750.000	0.0000	3	0.00	0.000	0.00	0.000
bndy-forbay	BASE	100Y-02HR	0.00	750.000	750.000	0.0000	3	0.00	0.000	0.00	0.000
bndy-forbay	BASE	100Y-03HR	0.00	750.000	750.000	0.0000	3	0.00	0.000	0.00	0.000
bndy-forbay	BASE	100Y-06HR	0.00	750.000	750.000	0.0000	3	0.00	0.000	0.00	0.000
bndy-forbay	BASE	100Y-12HR	0.00	750.000	750.000	0.0000	3	0.00	0.000	0.00	0.000
bndy-forbay	BASE	100Y-24HR	0.00	750.000	750.000	0.0000	3	0.00	0.000	0.00	0.000
CIG PIPE BNDY	BASE	100Y-01HR	0.00	749.000	749.000	0.0000	7	3.11	187.268	0.00	0.000
CIG PIPE BNDY	BASE	100Y-02HR	0.00	749.000	749.000	0.0000	7	3.45	254.902	0.00	0.000
CIG PIPE BNDY	BASE	100Y-03HR	0.00	749.000	749.000	0.0000	7	3.20	348.161	0.00	0.000
CIG PIPE BNDY	BASE	100Y-06HR	0.00	749.000	749.000	0.0000	7	4.86	374.541	0.00	0.000
CIG PIPE BNDY	BASE	100Y-12HR	0.00	749.000	749.000	0.0000	7	6.45	338.557	0.00	0.000
CIG PIPE BNDY	BASE	100Y-24HR	0.00	749.000	749.000	0.0000	7	11.50	265.669	0.00	0.000
CIGAR PND	BASE	100Y-01HR	3.11	755.877	757.500	0.0012	439044	0.61	793.077	3.11	187.268
CIGAR PND	BASE	100Y-02HR	3.45	756.972	757.500	0.0009	459166	1.01	693.976	3.45	254.902
CIGAR PND	BASE	100Y-03HR	3.20	757.153	757.500	0.0011	462309	1.67	626.919	3.20	347.791
CIGAR PND	BASE	100Y-06HR	4.87	757.195	757.500	0.0023	463020	2.72	534.455	4.87	373.653
CIGAR PND	BASE	100Y-12HR	6.45	757.136	757.500	0.0017	462021	5.42	376.801	6.45	337.888
CIGAR PND	BASE	100Y-24HR	11.50	756.995	757.500	0.0009	459588	10.84	276.384	11.50	265.080
d.s. OFF-NE	BASE	100Y-01HR	1.21	765.442	768.000	0.0550	594	1.40	193.603	1.39	106.396
d.s. OFF-NE	BASE	100Y-02HR	2.14	767.693	768.000	-1.0000	360	2.14	1228.230	2.14	381.136
d.s. OFF-NE	BASE	100Y-03HR	2.75	767.733	768.000	-1.0000	356	3.25	1348.351	2.75	382.612
d.s. OFF-NE	BASE	100Y-06HR	4.12	766.243	768.000	0.3187	462	4.39	475.464	4.12	170.147
d.s. OFF-NE	BASE	100Y-12HR	6.20	765.282	768.000	0.0380	609	5.79	108.496	6.09	82.475
d.s. OFF-NE	BASE	100Y-24HR	10.89	763.977	768.000	0.0034	699	10.84	50.494	10.84	50.483
D.S. PND1 MH	BASE	100Y-01HR	1.29	769.835	774.500	0.0652	147	1.32	78.331	2.86	78.870
D.S. PND1 MH	BASE	100Y-02HR	2.29	770.604	774.500	0.0712	147	2.31	82.457	2.31	82.459
D.S. PND1 MH	BASE	100Y-03HR	3.02	770.755	774.500	0.0676	147	3.22	82.717	3.22	82.733
D.S. PND1 MH	BASE	100Y-06HR	4.44	769.802	774.500	0.0573	147	5.00	75.802	6.85	79.007
D.S. PND1 MH	BASE	100Y-12HR	6.01	768.219	774.500	0.0470	147	4.88	72.266	7.08	77.868
D.S. PND1 MH	BASE	100Y-24HR	11.93	766.031	774.500	-0.0077	776	10.88	48.712	10.90	54.322
d.s.twin ellip	BASE	100Y-01HR	0.59	762.401	764.130	0.0066	10468	0.56	238.293	0.60	231.349
d.s.twin ellip	BASE	100Y-02HR	1.00	762.024	764.130	0.0066	11068	0.95	211.237	1.01	210.591
d.s.twin ellip	BASE	100Y-03HR	2.50	762.020	764.130	0.0066	11414	2.44	206.478	2.51	205.992
d.s.twin ellip	BASE	100Y-06HR	3.60	761.828	764.130	0.0066	11631	4.12	195.284	3.84	195.364
d.s.twin ellip	BASE	100Y-12HR	8.06	761.632	764.130	0.0066	11579	6.00	181.064	8.06	190.616
d.s.twin ellip	BASE	100Y-24HR	12.14	761.630	764.130	0.0066	11627	10.83	130.723	12.14	190.416
ds-culvert	BASE	100Y-01HR	0.71	757.490	757.500	0.0036	22072	0.69	492.077	0.71	491.607
ds-culvert	BASE	100Y-02HR	1.08	757.343	757.500	0.0031	21560	1.07	435.834	1.08	435.380
ds-culvert	BASE	100Y-03HR	3.16	757.307	757.500	0.0031	21435	1.51	382.492	1.53	382.468
ds-culvert	BASE	100Y-06HR	4.85	757.343	757.500	0.0031	21561	2.84	303.670	2.87	303.615
ds-culvert	BASE	100Y-12HR	6.37	757.274	757.500	0.0031	21319	6.45	252.384	5.42	249.539
ds-culvert	BASE	100Y-24HR	11.34	757.097	757.500	-0.0040	20704	15.17	240.419	10.85	175.881

Node Results (Offsite Included) 100-year storm event

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
ds-culvert-fb	BASE	100Y-01HR	0.00	752.820	757.500	0.0000	436	0.00	0.000	0.00	0.000
ds-culvert-fb	BASE	100Y-02HR	0.00	752.820	757.500	0.0000	436	0.00	0.000	0.00	0.000
ds-culvert-fb	BASE	100Y-03HR	0.00	752.820	757.500	0.0000	436	0.00	0.000	0.00	0.000
ds-culvert-fb	BASE	100Y-06HR	0.00	752.820	757.500	0.0000	436	0.00	0.000	0.00	0.000
ds-culvert-fb	BASE	100Y-12HR	0.00	752.820	757.500	0.0000	436	0.00	0.000	0.00	0.000
ds-culvert-fb	BASE	100Y-24HR	0.00	752.820	757.500	0.0000	436	0.00	0.000	0.00	0.000
E. PERRY MH-1	BASE	100Y-01HR	0.55	765.259	768.000	0.0112	3476	1.32	58.205	1.32	58.287
E. PERRY MH-1	BASE	100Y-02HR	2.02	764.288	768.000	0.0061	170	2.65	60.280	2.37	60.009
E. PERRY MH-1	BASE	100Y-03HR	2.75	764.353	768.000	-0.0071	170	3.26	60.457	3.25	60.553
E. PERRY MH-1	BASE	100Y-06HR	4.75	763.994	768.000	-0.0141	170	6.21	57.376	6.21	57.479
E. PERRY MH-1	BASE	100Y-12HR	6.01	763.441	768.000	-0.0114	170	6.30	54.883	6.30	54.895
E. PERRY MH-1	BASE	100Y-24HR	10.83	762.072	768.000	-0.0108	170	11.05	50.789	12.17	50.813
E. PERRY MH-2	BASE	100Y-01HR	0.52	764.393	766.160	0.0077	197	1.32	64.572	1.30	64.682
E. PERRY MH-2	BASE	100Y-02HR	1.83	762.614	766.160	0.0067	189	2.29	67.113	2.37	67.280
E. PERRY MH-2	BASE	100Y-03HR	2.44	762.648	766.160	0.0074	189	3.25	67.869	3.22	68.009
E. PERRY MH-2	BASE	100Y-06HR	4.75	762.334	766.160	0.0071	189	4.75	65.739	4.75	65.736
E. PERRY MH-2	BASE	100Y-12HR	6.00	761.950	766.160	0.0070	190	6.35	63.157	6.33	63.169
E. PERRY MH-2	BASE	100Y-24HR	10.79	760.740	766.160	0.0057	190	11.07	58.123	11.07	58.132
E. PERRY MH-3	BASE	100Y-01HR	0.51	762.141	767.950	0.0210	753	0.45	173.002	0.51	172.605
E. PERRY MH-3	BASE	100Y-02HR	0.92	760.603	767.950	-0.0215	807	0.77	128.434	1.39	167.043
E. PERRY MH-3	BASE	100Y-03HR	1.46	760.083	767.950	-0.0218	1311	1.38	110.762	1.67	167.030
E. PERRY MH-3	BASE	100Y-06HR	2.52	759.529	767.950	-0.0201	1930	2.75	94.016	2.63	163.600
E. PERRY MH-3	BASE	100Y-12HR	5.42	759.217	767.950	0.0021	2116	5.42	80.216	5.42	80.156
E. PERRY MH-3	BASE	100Y-24HR	10.76	758.863	767.950	0.0008	2261	10.75	69.142	10.75	69.135
forbay	BASE	100Y-01HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
forbay	BASE	100Y-02HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
forbay	BASE	100Y-03HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
forbay	BASE	100Y-06HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
forbay	BASE	100Y-12HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
forbay	BASE	100Y-24HR	0.00	750.300	755.500	-0.3000	116	0.00	0.000	0.00	0.000
GAL POND	BASE	100Y-01HR	1.32	765.859	768.000	0.0003	98829	0.62	59.779	1.32	6.285
GAL POND	BASE	100Y-02HR	2.24	766.119	768.000	0.0002	102018	0.98	45.818	2.24	7.113
GAL POND	BASE	100Y-03HR	3.15	766.194	768.000	0.0002	102915	1.37	35.694	3.15	7.334
GAL POND	BASE	100Y-06HR	5.43	766.142	768.000	0.0004	102289	2.00	22.324	5.43	7.180
GAL POND	BASE	100Y-12HR	6.91	765.942	768.000	0.0004	99863	3.67	13.838	6.91	6.561
GAL POND	BASE	100Y-24HR	12.14	765.741	768.000	0.0002	97363	7.25	8.408	12.14	5.870
MET-NW-pond	BASE	100Y-01HR	1.11	771.895	772.500	0.0012	60090	0.48	114.381	1.09	19.375
MET-NW-pond	BASE	100Y-02HR	2.03	772.130	772.500	0.0009	61567	0.73	76.196	1.90	19.651
MET-NW-pond	BASE	100Y-03HR	2.59	772.042	772.500	0.0011	61185	0.98	58.970	2.50	19.394
MET-NW-pond	BASE	100Y-06HR	3.34	771.670	772.500	0.0016	58131	1.83	36.911	2.53	18.849
MET-NW-pond	BASE	100Y-12HR	5.44	771.222	772.500	0.0011	54268	3.58	21.889	5.06	18.697
MET-NW-pond	BASE	100Y-24HR	10.92	770.848	772.500	0.0005	51848	7.17	13.010	10.91	10.270

Node Results (Offsite Included) 100-year storm event

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
MET-SW-pond	BASE	100Y-01HR	1.46	762.442	765.000	0.0006	110185	0.57	122.221	1.46	10.568
MET-SW-pond	BASE	100Y-02HR	2.31	762.996	765.000	0.0004	112836	1.05	90.271	2.31	12.522
MET-SW-pond	BASE	100Y-03HR	3.25	763.273	765.000	0.0005	114041	1.42	73.554	3.25	13.380
MET-SW-pond	BASE	100Y-06HR	5.65	763.440	765.000	0.0008	114970	2.53	47.867	5.65	13.868
MET-SW-pond	BASE	100Y-12HR	8.53	762.847	765.000	0.0006	112339	5.06	31.828	8.53	12.026
MET-SW-pond	BASE	100Y-24HR	12.26	762.298	765.000	0.0003	109711	7.25	15.330	12.26	9.998
MH-WAL	BASE	100Y-01HR	1.11	769.907	772.000	0.0012	179	1.11	9.831	1.12	9.831
MH-WAL	BASE	100Y-02HR	2.03	769.964	772.000	0.0010	176	2.03	10.262	2.03	10.262
MH-WAL	BASE	100Y-03HR	2.60	769.943	772.000	0.0011	177	2.59	10.102	2.60	10.102
MH-WAL	BASE	100Y-06HR	3.35	769.852	772.000	0.0013	181	3.34	9.403	3.35	9.402
MH-WAL	BASE	100Y-12HR	5.45	769.742	772.000	0.0009	185	5.44	8.536	5.45	8.536
MH-WAL	BASE	100Y-24HR	10.92	769.678	772.000	0.0005	186	10.91	8.025	10.92	8.025
NW-BNDY	BASE	100Y-01HR	0.00	768.100	768.100	0.0000	15	1.12	9.831	0.00	0.000
NW-BNDY	BASE	100Y-02HR	0.00	768.100	768.100	0.0000	15	2.03	10.262	0.00	0.000
NW-BNDY	BASE	100Y-03HR	0.00	768.100	768.100	0.0000	15	2.60	10.102	0.00	0.000
NW-BNDY	BASE	100Y-06HR	0.00	768.100	768.100	0.0000	15	3.35	9.402	0.00	0.000
NW-BNDY	BASE	100Y-12HR	0.00	768.100	768.100	0.0000	15	5.45	8.536	0.00	0.000
NW-BNDY	BASE	100Y-24HR	0.00	768.100	768.100	0.0000	15	10.92	8.025	0.00	0.000
OFF-NE	BASE	100Y-01HR	1.29	765.873	768.000	-0.1490	133	1.52	64.418	1.29	135.088
OFF-NE	BASE	100Y-02HR	2.00	768.068	768.000	-1.0000	790	2.17	83.267	2.14	1206.015
OFF-NE	BASE	100Y-03HR	3.25	767.988	768.000	-1.0000	114	2.60	79.310	3.25	1326.136
OFF-NE	BASE	100Y-06HR	5.05	766.544	768.000	-0.9018	121	3.50	66.149	4.39	453.252
OFF-NE	BASE	100Y-12HR	6.16	765.646	768.000	0.0220	134	6.08	48.458	6.06	48.893
OFF-NE	BASE	100Y-24HR	10.91	764.249	768.000	0.0058	140	11.00	31.577	11.00	31.581
OUT1 MH	BASE	100Y-01HR	1.03	768.404	771.500	0.0225	178	2.86	78.870	1.31	78.357
OUT1 MH	BASE	100Y-02HR	2.03	768.916	771.500	-0.0209	178	2.31	82.469	2.30	82.473
OUT1 MH	BASE	100Y-03HR	3.01	769.041	771.500	-0.0268	178	3.19	82.799	3.19	82.819
OUT1 MH	BASE	100Y-06HR	4.40	768.297	771.500	-0.0349	178	6.85	79.007	4.45	77.005
OUT1 MH	BASE	100Y-12HR	6.00	767.016	771.500	-0.0351	178	7.08	78.715	7.13	74.553
OUT1 MH	BASE	100Y-24HR	8.21	765.445	771.500	0.0062	1335	8.41	55.365	8.21	57.061
OUT2 MH	BASE	100Y-01HR	0.56	766.708	769.040	0.0247	175	0.95	81.489	2.99	88.544
OUT2 MH	BASE	100Y-02HR	2.02	766.914	769.040	0.0277	175	2.02	84.062	0.69	89.579
OUT2 MH	BASE	100Y-03HR	3.00	766.963	769.040	0.0286	175	3.00	84.687	0.92	89.995
OUT2 MH	BASE	100Y-06HR	4.26	766.471	769.040	0.0347	175	4.25	79.571	1.66	91.510
OUT2 MH	BASE	100Y-12HR	6.00	765.759	769.040	0.0385	175	4.86	76.422	3.42	91.067
OUT2 MH	BASE	100Y-24HR	8.21	764.890	769.040	-0.0191	1122	8.21	59.210	8.21	91.466
OUT3 MH	BASE	100Y-01HR	0.56	764.855	767.000	-0.0246	270	0.44	94.155	0.56	84.527
OUT3 MH	BASE	100Y-02HR	2.01	764.777	767.000	-0.0233	298	0.69	93.762	2.01	85.104
OUT3 MH	BASE	100Y-03HR	3.00	764.789	767.000	-0.0230	300	0.92	93.322	3.00	85.479
OUT3 MH	BASE	100Y-06HR	4.25	764.552	767.000	-0.0249	306	1.66	93.468	4.25	80.349
OUT3 MH	BASE	100Y-12HR	4.86	764.393	767.000	-0.0248	320	3.42	92.241	4.86	79.111
OUT3 MH	BASE	100Y-24HR	8.21	763.315	767.000	0.0206	1260	8.21	92.102	8.21	55.299

Node Results (Offsite Included) 100-year storm event

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
PC-IV-6	BASE	100Y-01HR	0.56	765.650	770.000	0.0165	1440	0.39	59.498	1.35	58.134
PC-IV-6	BASE	100Y-02HR	2.04	765.756	770.000	-0.0089	367	2.65	63.628	2.65	60.280
PC-IV-6	BASE	100Y-03HR	3.02	765.931	770.000	-0.0089	367	3.66	63.465	3.30	60.378
PC-IV-6	BASE	100Y-06HR	4.75	765.484	770.000	0.0101	448	1.79	64.850	6.26	57.263
PC-IV-6	BASE	100Y-12HR	6.06	764.766	770.000	0.0107	1165	3.44	72.044	6.78	53.592
PC-IV-6	BASE	100Y-24HR	10.84	763.280	770.000	0.0093	1444	7.03	74.101	12.19	49.935
PC1V-3MH	BASE	100Y-01HR	0.56	765.205	772.000	0.0157	957	1.39	64.681	1.39	65.943
PC1V-3MH	BASE	100Y-02HR	2.02	765.934	772.000	0.1112	214	2.37	112.052	2.38	93.066
PC1V-3MH	BASE	100Y-03HR	2.73	766.018	772.000	0.0917	214	3.46	113.210	3.40	92.703
PC1V-3MH	BASE	100Y-06HR	4.66	765.498	772.000	-0.0505	214	5.01	83.537	5.04	73.691
PC1V-3MH	BASE	100Y-12HR	6.13	764.937	772.000	0.0157	1303	6.35	57.454	6.42	57.906
PC1V-3MH	BASE	100Y-24HR	10.88	763.733	772.000	0.0157	2016	11.10	32.536	11.09	32.584
PCIII	BASE	100Y-01HR	0.34	769.977	772.000	0.0221	3459	0.53	52.226	0.34	73.969
PCIII	BASE	100Y-02HR	0.53	770.041	772.000	0.0221	3600	0.90	43.292	0.53	74.323
PCIII	BASE	100Y-03HR	0.74	770.092	772.000	0.0221	3710	1.10	38.593	0.74	74.608
PCIII	BASE	100Y-06HR	1.54	770.080	772.000	0.0221	3735	1.92	32.592	1.54	73.778
PCIII	BASE	100Y-12HR	3.21	769.861	772.000	0.0221	3257	3.58	28.603	3.21	72.514
PCIII	BASE	100Y-24HR	7.20	769.385	772.000	0.0221	2294	7.17	21.277	7.19	21.263
PCIV-1MH	BASE	100Y-01HR	0.54	765.133	769.000	0.0170	190	0.58	94.224	0.60	90.974
PCIV-1MH	BASE	100Y-02HR	2.00	765.056	769.000	0.0170	190	1.98	97.365	2.08	95.145
PCIV-1MH	BASE	100Y-03HR	2.50	765.070	769.000	0.0170	190	2.71	96.863	3.05	95.044
PCIV-1MH	BASE	100Y-06HR	4.66	764.793	769.000	0.0170	428	4.18	94.175	4.11	91.106
PCIV-1MH	BASE	100Y-12HR	6.08	764.429	769.000	0.0170	805	6.08	82.177	6.08	82.154
PCIV-1MH	BASE	100Y-24HR	10.85	763.419	769.000	0.0170	1486	10.83	55.566	10.85	55.553
PCIV-2MH	BASE	100Y-01HR	0.56	765.246	772.000	0.0169	243	1.21	75.374	1.18	73.638
PCIV-2MH	BASE	100Y-02HR	2.00	765.612	772.000	0.0317	193	2.25	99.979	2.22	87.242
PCIV-2MH	BASE	100Y-03HR	2.73	765.640	772.000	-0.0216	193	3.40	99.198	3.31	89.728
PCIV-2MH	BASE	100Y-06HR	4.66	765.268	772.000	0.0169	260	5.04	87.175	5.03	82.167
PCIV-2MH	BASE	100Y-12HR	6.09	764.779	772.000	0.0169	1033	6.27	71.068	6.26	70.360
PCIV-2MH	BASE	100Y-24HR	10.86	763.651	772.000	0.0169	1602	10.92	44.916	10.94	44.941
PCIV-4MH	BASE	100Y-01HR	1.18	765.329	775.000	0.0145	1702	1.39	79.219	1.39	58.681
PCIV-4MH	BASE	100Y-02HR	2.15	766.483	775.000	-0.2559	317	2.14	441.182	2.37	106.052
PCIV-4MH	BASE	100Y-03HR	3.26	766.657	775.000	0.3327	233	3.27	471.617	3.46	107.210
PCIV-4MH	BASE	100Y-06HR	4.55	766.042	775.000	0.0928	649	4.19	204.301	5.01	77.537
PCIV-4MH	BASE	100Y-12HR	6.21	765.212	775.000	0.0145	1819	6.44	61.072	6.35	51.454
PCIV-4MH	BASE	100Y-24HR	10.91	763.908	775.000	0.0145	2466	11.10	26.477	11.10	26.536
POND 1	BASE	100Y-01HR	1.29	771.465	773.000	-0.0009	103457	0.58	204.203	1.32	78.331
POND 1	BASE	100Y-02HR	2.30	772.411	773.000	-0.0009	109226	1.02	161.806	2.31	82.457
POND 1	BASE	100Y-03HR	3.13	772.517	773.000	-0.0009	109874	1.52	138.590	3.22	82.717
POND 1	BASE	100Y-06HR	4.44	771.326	773.000	0.0009	102612	3.00	110.947	5.00	75.802
POND 1	BASE	100Y-12HR	6.18	769.512	773.000	0.0006	91760	5.42	77.942	4.88	72.266
POND 1	BASE	100Y-24HR	10.88	768.894	773.000	0.0003	88264	10.83	48.925	10.88	48.712

Node Results (Offsite Included) 100-year storm event

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
POND 2	BASE	100Y-01HR	1.21	765.285	767.000	0.0012	136162	0.50	120.215	3.71	45.949
POND 2	BASE	100Y-02HR	2.16	766.260	767.000	0.0008	140997	0.77	80.412	2.20	148.749
POND 2	BASE	100Y-03HR	3.11	766.559	767.000	0.0008	142088	1.00	62.415	3.27	174.607
POND 2	BASE	100Y-06HR	4.57	765.973	767.000	0.0013	139949	1.83	39.678	5.14	96.173
POND 2	BASE	100Y-12HR	6.23	765.186	767.000	0.0009	135445	3.58	23.888	7.51	30.725
POND 2	BASE	100Y-24HR	10.96	763.829	767.000	0.0004	129326	7.17	14.356	7.03	31.269
u.s. culvert	BASE	100Y-01HR	0.71	757.536	758.120	-0.0046	9187	0.67	487.399	0.69	486.077
u.s. culvert	BASE	100Y-02HR	1.08	757.380	758.120	-0.0049	9819	1.07	430.138	1.07	429.834
u.s. culvert	BASE	100Y-03HR	3.16	757.318	758.120	-0.0053	10063	1.47	376.648	1.51	376.492
u.s. culvert	BASE	100Y-06HR	4.85	757.353	758.120	-0.0053	9967	2.83	297.780	2.84	297.670
u.s. culvert	BASE	100Y-12HR	6.37	757.283	758.120	-0.0050	10202	3.75	247.915	6.45	246.384
u.s. culvert	BASE	100Y-24HR	11.34	757.103	758.120	0.0054	10682	10.91	230.393	15.17	234.419
u.s.twin ellip	BASE	100Y-01HR	0.56	763.263	764.130	0.0148	1631	0.54	232.558	0.56	232.293
u.s.twin ellip	BASE	100Y-02HR	1.66	762.997	764.130	0.0148	1810	0.95	205.328	0.95	205.237
u.s.twin ellip	BASE	100Y-03HR	2.48	762.998	764.130	0.0148	1807	2.44	200.584	2.44	200.478
u.s.twin ellip	BASE	100Y-06HR	4.25	762.873	764.130	0.0148	1902	4.25	189.386	4.12	189.284
u.s.twin ellip	BASE	100Y-12HR	6.01	762.722	764.130	0.0148	1990	6.00	175.084	6.00	175.064
u.s.twin ellip	BASE	100Y-24HR	10.84	762.222	764.130	0.0148	2279	10.83	125.720	10.83	124.723
W-futura	BASE	100Y-01HR	0.54	764.368	766.000	0.0192	245	0.54	103.952	0.52	104.179
W-futura	BASE	100Y-02HR	2.00	764.274	766.000	0.0192	253	2.02	101.834	2.00	101.528
W-futura	BASE	100Y-03HR	2.49	764.280	766.000	0.0192	253	2.50	102.188	2.49	101.701
W-futura	BASE	100Y-06HR	4.67	764.117	766.000	0.0192	466	4.11	98.227	4.67	97.958
W-futura	BASE	100Y-12HR	6.05	763.843	766.000	0.0192	640	6.05	89.087	6.06	89.056
W-futura	BASE	100Y-24HR	10.84	763.053	766.000	0.0192	973	10.83	62.368	10.84	62.367

APPENDIX C
SOIL BORING REPORT



DEVELOPMENT & ENGINEERING CONSULTANTS

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GEOTECHNICAL ENGINEERING REPORT COUSINS SUBS - PLAINFIELD

405 S. Perry Road
Plainfield, Indiana

Prepared for:

Evo Development, Inc.
5375 N. 118th Ct
Milwaukee, WI 53225

**GEOTECHNICAL
ENGINEERING
REPORT**

**March 24, 2023
TERRA # 2212005**

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March 24, 2023

Mr. John Holborow
Evo Development, Inc.
5375 N. 118th Ct
Milwaukee, WI 53225

RE: Geotechnical Engineering Study
Cousins Subs - Plainfield
405 S Perry Road
Plainfield, Indiana

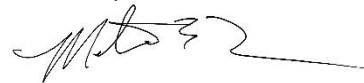
Dear Mr. Holborow,

Enclosed is TERRA Site Development's (TERRA's) Geotechnical engineering investigation report for the above referenced project. This report presents the results of TERRA's field and laboratory testing program, an engineering interpretation of this data with respect to the available project characteristics, and recommendations to aid in the design and construction of the foundations and other earthwork related phases of this project.

We recommend that TERRA be retained to provide construction observation services during the earthwork and foundation construction phases of the project. This will allow us to verify that the construction proceeds in compliance with the design concepts, specifications and recommendations. Also, this will allow design changes to be made in the event that subsurface conditions differ from those anticipated.

TERRA appreciates having the opportunity to perform this Geotechnical Engineering Report Evo Development, Inc. If you have any questions regarding this report, or if we may be of any additional assistance regarding any geotechnical aspect of the project, please do not hesitate to contact our office.

Sincerely,



Michael B. Reeve, P.E.
Senior Project Engineer



Mark Behrens
Director - Geotechnical Engineering



EXECUTIVE SUMMARY

TERRA Site Development (TERRA) has performed a geotechnical engineering study of the site for the proposed Cousins Subs, located at 405 South Perry Road at Plainfield (Hendricks County), Indiana. Refer to Figure No.1, Site Vicinity Map in the Appendix of the study. The 1 story Cousins Subs building will include driveways and a parking lot on site. Only a conceptual layout of the proposed Cousins Subs was made available during the preparation of this study. The following summary highlights the findings of TERRA's geotechnical investigation. Please refer to the body of this study for more specific conclusions and recommendations.

- The topography of the area of the site where the new proposed Cousins Subs is to be constructed is relatively flat and is currently a rough graded commercial outlot. Four (4) soil borings were drilled to a depth of fifteen (15) feet within the proposed building area and five (5) test borings were drilled to a depth of five (5) feet within the proposed driveway and parking areas. Refer to Figure No. 2, Soil Boring Location Plan in the Appendix of the study. The soil borings revealed the following generalized subsurface profile. Please refer to Section 4.0, *Subsurface Conditions*, for more specific information regarding the subsurface profile.
 - The depth of potential topsoil, surface vegetation, and root fibers at the test boring locations was generally found to range from approximately 2 to 4 inches below the existing grade.
 - Beneath the surface topsoil, surface vegetation and root fibers, test borings typically encountered varying consistencies of dark brown, moist, medium stiff-to-very stiff, silty/sandy CLAY with traces of fine gravel (potential FILL) to depths ranging to approximately 2.5 to 3.0 feet below the existing grade. Beneath shallow cohesive potential FILL soils, test boring typically encountered a cohesive brown, moist, stiff-to-very stiff, sandy CLAY with a trace of fine gravel layer at a depth ranging from about 8.5 to 12.0 feet below the existing grade. Beneath the shallow cohesive layer, test borings generally encountered varying thicknesses and consistencies of brown/ gray, very stiff-to-hard, sandy SILT with traces of fine gravel (glacial TILL) ranging from depths of about 8.5 to 12.5 feet to the termination depth of the borings.
 - At the time of this investigation, free groundwater was noted on the drilling tools in soil borings ranging from about 9.5 to 12.0 feet below the existing ground surface. Groundwater measurements performed upon completion of drilling operations encountered groundwater ranging from about 8.0 to 11.5 feet. Please note that relatively short-term ground water level readings are not necessarily a reliable indication of the ground water level.
- Based on the analysis of the soils samples and results of the lab testing, the proposed structure can be supported on shallow/extended spread foundations provided any un-compacted fill, topsoil and any soft and/or loose natural soils including larger pieces of construction rubble are identified, removed and replaced with well-compacted structural fill. Foundations can be designed for a maximum net allowable bearing pressure of **2,500 psf** for the design of the shallow wall spread foundations and **3,000 psf** for isolated column foundations. The base of the foundation excavations should be inspected as outlined in Section 6.0, *Construction Considerations* of this study and any soft and/or loose natural soils shall be removed and replaced with well compacted engineered fill so that the foundations will bear on suitable material. The foundations should bear at a depth of at least 30 inches below the finished exterior grades. Please refer to Section 5.0, *Engineering Recommendations*, for more specific information regarding the foundation design recommendations.

- Shallow cohesive silty soils are generally considered to be sensitive to heavy construction traffic during periods of wet weather conditions. In other words, the subgrade soils at this site have the potential to become unstable when simultaneously exposed to wet weather and construction traffic.
- Hydrated lime/kiln dust stabilization is typically only used for cohesive subgrade soils that have excessive moisture content, or if construction is performed during the wetter periods of the year. Laboratory testing appears to indicate the soils classified as silty/sandy CLAY soils are generally suitable for stabilization through the addition of hydrated lime, if required. If construction is planned for the spring, fall or winter months, reducing the moisture content may be difficult, if not impossible, to achieve. A contingency for subgrade stabilization such as lime/cement treatment and/or Geogrid is recommended to be included as an alternate bid item in the bid documents. Please refer to Section 6.0, *Construction Considerations*, for more specific information regarding construction practices.
- Structural fill should be placed and compacted in accordance with the recommendations of Section 6.3, *Structural Fill* and Section 6.4, *Fill Placement Control*. All structural fill supporting foundations and floor slab should be compacted to at least 95 percent of the soil's maximum Modified Proctor dry density (ASTM D-1557).

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Log of Test Boring – General Notes
Unified Soil Classification System
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Appendix B: Qualifications of this Geotechnical Engineering Study

1.0 INTRODUCTION

1.1 Purpose and Scope

The purpose of this study was to determine the general near surface and subsurface conditions within the project area and to develop the geotechnical engineering recommendations necessary for the construction of a proposed Cousins Subs in the Town of Plainfield, (Hendricks County), Indiana. Refer to Figure 1 in Appendix A for a site vicinity map.

Four (4) soil borings were drilled to a depth of fifteen (15) feet within the proposed building area and five (5) borings were drilled within the proposed parking areas to a depth of five (5) feet each. A conceptual site layout of the proposed Cousins Subs was made available during the preparation of this study.

Laboratory testing was conducted on soil samples collected from the test borings. This study contains the results of TERRA's findings, an engineering interpretation of these results with respect to the available project characteristics and recommendations to aid in design and construction of the proposed facility. The investigation was carried out in general accordance with TERRA's proposal.

2.0 PROJECT CHARACTERISTICS

2.1 Site Description

The topography of the area of the site where the new proposed Cousins Subs is to be constructed is relatively flat and is currently a rough graded commercial outlot.

2.2 Proposed Construction

TERRA's understanding is that the outlot will include a proposed Cousins Subs with adjoining parking and driveways. The structures will be built with wood and/or steel-stud framing and a masonry/brick facade on a concrete slab on grade. For the purpose of this study, we have assumed the following loads:

- Maximum continuous wall loads of 3.0 to 5.0 kip per lineal foot.
- Maximum column loads for were assumed to be up to 150 kips.
- The maximum floor loads are assumed to be 150 psf or less.

3.0 INVESTIGATIONAL PROCEDURES

3.1 Field Work

Four (4) soil borings were drilled to a depth of fifteen (15) feet within the proposed building area and five (5) borings were drilled within the proposed access drives and parking areas were drilled to a depth of five (5) feet each. All depths are given as feet below existing grade. Please refer to Figure No. 2, Soil Boring Location Plan in Appendix A for approximate soil boring locations.

The borings were advanced using 3.25-inches O.D. hollow-stem augers. Samples were recovered in the undisturbed material below the bottom of the augers using the standard drive sample technique in accordance with ASTM D 1586-74. A 2-inch O.D. by 1-3/8-inch I.D. split-spoon sampler was driven a total of 18 inches with the number of blows of a 140-pound hammer falling 30 inches recorded for each 6 inches of penetration. The sum of blows for the middle 12 inches of penetration (or the last two reported on boring logs) is the Standard Penetration Test result commonly referred to as the N-value (or blow-count).

Split-spoon samples were recovered at 2.5-foot intervals, beginning at an approximate depth of 1-foot below the existing grades, extending to a depth of 10 feet and sampled at 5-foot intervals thereafter to the termination depth of the boring. Water levels were monitored at each boring location during drilling and upon completion of the boring.

3.2 Laboratory Testing

Upon completion of the boring program, all samples recovered were returned to *TERRA's* soils and materials testing laboratory where they were visually examined and placed in groups of like materials. A laboratory log of each boring was prepared based on the driller's field log, laboratory test results, and visual classification. Test boring logs are included in Appendix A of this study. Indicated on each log is the primary strata encountered, the depth of each stratum change, the depth of sample, Standard Penetration Test results, groundwater conditions and selected laboratory test data. The laboratory logs were prepared for each boring giving the appropriate sample data and the textural description and classification.

Representative soil samples recovered in the borings were selected for testing in the laboratory to evaluate their physical properties and engineering characteristics. The results of all field and laboratory tests are summarized on the boring logs. The appropriate laboratory analysis performed on selected samples is as follows:

- Natural moisture content of cohesive soil samples
- Estimation of the unconfined compressive strength (Q_p) of cohesive soil samples using a calibrated hand penetrometer.

4.0 SUBSURFACE CONDITIONS

4.1 Subsurface Soil Conditions

TERRA's interpretation of the subsurface conditions is based on a review of available published literature and the nine (9) soil borings, drilled at the approximate locations shown on Figure No. 2, Soil Boring Location Plan in Appendix A. The following is a generalized discussion of the findings for the borings drilled for this study. For more specific information, please refer to Figure No. 2, Soil Boring Location Plan and test boring logs presented in Appendix A.

The soil borings revealed a surface layer of material that was a blend of silts, sands, clays, and surface vegetation with varying amounts of organic materials, commonly referred to as "topsoil. The depth of potential topsoil, surface vegetation, and root fibers at the test boring locations was found to range from approximately 2 to 4 inches below the existing grade.

Beneath the surface topsoil, surface vegetation and root fibers, test borings typically encountered varying consistencies of dark brown, moist, medium stiff-to-very stiff, silty/sandy CLAY with traces of fine gravel (potential FILL) to depths ranging to approximately 2.5 to 3.0 feet below the existing grade. An estimate of the unconfined compressive strengths (Qp) of the silty CLAY soils, based on a calibrated hand penetrometer, typically ranged from 1.0 to 4.0 tsf indicating a consistency of stiff-to-hard soil conditions within the zone of potential shallow foundation bearing. Natural moisture content tests performed on the selected cohesive soil samples ranged from approximately 4.4 to 18.8 percent. The majority of the shallow subgrade soils encountered at the site are anticipated to be above the optimum moisture content for structural fill compaction. As a result, considerable drying of the subgrade soils should be anticipated during construction.

Beneath shallow cohesive potential FILL soils, test boring typically encountered a cohesive brown, moist, stiff-to-very stiff, sandy CLAY with a trace of fine gravel layer at a depth ranging from about 8.5 to 12.0 feet below the existing grade. Beneath the shallow cohesive layer, test borings generally encountered varying thicknesses and consistencies of brown/ gray, very stiff-to-hard, sandy SILT with traces of fine gravel (glacial TILL) ranging from depths of about 8.5 to 12.5 feet to the termination depth of the borings.

Please refer to the soil boring logs in the Appendix for more specific description for subgrade conditions. The depths were measured from the existing grade and should be assumed to be approximate.

4.2 Groundwater Conditions

The term groundwater, for the purpose of this study, pertains to any water that percolates through the naturally occurring materials found on site. This includes any overland flow that permeates through a given depth of soil, perched water, and water that occurs below the "water table", a zone that remains saturated and water-bearing year-round.

At the time of this investigation, free groundwater was noted on the drilling tools in soil borings ranging from about 9.5 to 12.0 feet below the existing ground surface. Groundwater measurements performed upon completion of drilling operations encountered groundwater ranging from about 8.0 to 11.5 feet. Note that shallow groundwater in Central Indiana glacial till deposits is typically contained or "perched" within discontinuous sand seams or lenses within the cohesive soils and relatively short-term groundwater readings are not necessarily a reliable indication of the groundwater level.

Boring No.	Approximate depth* of water observed on tools (ft)	Approximate depth* of water observed upon completion of drilling (ft)
BB-1	Dry	8.0
BB-2	10.0	10.0
BB-3	9.5	9.0
BB-4	12.0	11.5
PB-1	Dry	Dry
PB-2	Dry	Dry
PB-3	Dry	Dry
PB-4	Dry	Dry
PB-5	Dry	Dry
* Approximate depth of groundwater was measured from the existing ground surface.		

Note that relatively short-term groundwater level readings are not necessarily a reliable indication of the groundwater level. Fluctuations in the groundwater level should be expected to occur due to variations in rainfall and other environmental or physical factors at the time measurements are made. The true static groundwater level can only be determined through observations made in cased holes over a long period, the installation of which was beyond the scope of this investigation.

5.0 ENGINEERING RECOMMENDATIONS

5.1 Basis

TERRA's recommendations are based on data presented in this study, which includes nine (9) soil borings at widely spaced locations and existing topographic survey information. Subsurface variations not indicated by a dispersive exploratory boring program can exist on any site. If such variations or unexpected conditions are encountered during construction, or if the project information is incorrect or changed, we should be informed immediately since the validity of TERRA's recommendations may be affected. Refer to Appendix B for additional qualifications of this geotechnical engineering study and construction contract considerations.

While the subsurface conditions noted in the soil borings performed on site are relatively uniform, the possibility exists that these conditions may vary significantly. The borings were generally positioned in areas that could be conveniently accessed by the drilling equipment. Consequently, the subsurface conditions encountered at the boring locations may not be representative of the subsurface conditions throughout the footprint of the new structure. For this reason, please recognize that some unsatisfactory soil conditions may exist limiting the application of the following recommendations.

5.2 Foundations

In TERRA's opinion, the proposed Cousins Subs can be supported on a spread foundation system provided any existing un-compacted fill, topsoil and any soft and/or loose natural soils are identified, removed and replaced with well compacted structural fill.

Foundations should bear on the natural, medium stiff to hard cohesive soils, or on structural fill overlying the same. The foundations can be designed to a maximum net allowable bearing pressure of **2,500 psf** for the design of the shallow continuous wall foundations and **3,000 psf** for isolated column spread foundations. Inspection of the base of the foundation excavations is very important as outlined in Section 6.2, *Foundation Excavations* of this study and that any soft and/or loose natural soil and other unsuitable materials are removed and replaced with well compacted engineered fill and that the foundations will bear on suitable material.

TERRA's above recommendations are only valid if the foundations are constructed in compliance with the recommendations for site preparation, fill placement, and inspection that are discussed in Section 6.0, *Construction Considerations*.

In using net pressure, the weight of the foundation and backfill over the foundation need not be considered; hence, only loads applied at or above the finished grade need to be used for dimensioning the foundations. Each new foundation should be positioned so the foundation does not induce significant pressure on adjacent foundations; otherwise, the stress overlap must be considered in the design. All other shallow exterior foundations and foundations in unheated areas should be located at a depth of at least **30 inches** below final exterior grade for frost protection. However, interior foundations, if any, within heated areas can bear at nominal depths below the finished floor.

We estimate the total foundation settlement should not exceed approximately one (1.0) inch and differential settlement should not exceed one-half (0.5) inch assuming the above recommendations are followed at a minimum and organic soils are removed. Careful field control during construction should reduce the actual settlement that occurs.

All foundations should be located such that the lateral distance between foundations is equal to or greater than the difference in the bearing elevations between foundations. If this distance cannot be achieved, the lower foundation must be designed for the additional load that is imparted on the lower foundation by the higher foundation. If this condition occurs near a below-grade wall, the wall must also be designed for the increase in lateral earth pressure due to the upper foundation.

5.3 Seismic Considerations

Based on the results of the test borings, conditions described herein, and in accordance with section 1615.1.1 of the 2006 International Building Code (IBC), the soil site classification is based on the soil profile in the top 100 feet. Although site specific information to this depth is not available, based on the subsurface conditions observed during TERRA's geotechnical exploration we recommend that the soil profile at the site be classified as a Site Class D, which is described as Stiff Soil Profile.

5.4 Slabs-on-Grade

Floor slabs can be supported on firm existing soils or on new compacted structural fill provided that the slab subgrade is prepared and inspected as outlined in Section 6.1 *Site Preparation* of this study.

All floor slabs are recommended to be designed as "floating", that is, fully ground supported and not structurally connected to walls or foundations. This is to minimize the possibility of cracking and the displacement of the floor slab because of differential movements between the slab and the foundation. Although the movements are estimated to be within the tolerable limits for structural safety, such movements could be detrimental to the slabs if they were rigidly connected to the foundations. An appropriate flexible and waterproof sealant should be used at the floor slab and wall interface.

The building floor slabs should be supported on a minimum 6-inch thick, compacted granular base course, bearing on a suitably prepared subgrade (see Section 6.0, *Construction Considerations*, for more information). The granular base course is expected to help distribute loads and equalize moisture conditions beneath the slab. All slabs should be designed to be liberally jointed and designed with the appropriate reinforcement for the anticipated loading conditions. If the recommended 6-inch thick, compacted granular layer for the floor slab is selected then a modulus of subgrade reaction value of 150 pci may be used for slab design purposes.

A vapor barrier shall be provided under the concrete floor to prevent floor dampness and adequate mesh reinforcement shall be placed in the concrete to compensate for temperature differentials and design loads over the depth of the slab. All slabs should be designed to be liberally jointed and designed with the appropriate reinforcement for the anticipated loading conditions.

5.5 Pavements

The near surface soils at this site may become loose or soft when exposed to prolonged wet periods. The contractor will need to exercise extreme care during the grading and fill placement activities in order to achieve the necessary subgrade soil support for the pavement system. (See Section 6.0, *Construction Considerations*, for specific construction recommendations.) The subgrade soil for the pavement section will need to be firm and dry. Providing for good base drainage is important.

TERRA also recommends a subgrade drainage system be incorporated to remove water collected in the granular base course below pavements. If pavement perimeter stormwater inlets are planned we recommend a subgrade drainage system that is tied into the perimeter stormwater inlets, if possible. Furthermore, all stormwater inlets within the pavement sections should include a subgrade drainage system, which is connected to the storm sewer inlet. The drains should extend out from the inlet in orthogonal directions, a minimum distance equal to approximately one-half ($\frac{1}{2}$) the length to the perimeter of each drainage basin.

Our recommendations are based on the assumption the paved areas will be constructed on proof-rolled subgrade soils. Serviceable pavements can be achieved by different combinations of material and depths, varied to provide roughly equivalent strengths. In addition, local practice for pavement construction should be reviewed for other blends, or combinations of materials that have been found

satisfactory, and for applicable minimum standards. Based upon our experience, we have found that proper construction techniques, quality of drainage, pavement maintenance, and actual traffic loads are the major factors in determining pavement life and performance.

Based upon the near surface soils, we recommend using a CBR value of five (5) for pavement design purposes. The following typical pavement design sections have been developed from the results of our soil exploration and utilizing the applicable quality control standards of the Indiana Department of Transportation (INDOT), the American Association of State Highway Transportation Officials (AASHTO) and the American Concrete Institute (ACI).

5.5.1 Flexible Pavement Design Sections

Flexible Pavement Design for parking bays only

1.5 inches	HMA (9.5 mm) Surface Course overlay per INDOT Section 400
2.5 inches	HMA (19.0 mm) Intermediate Course per INDOT Section 400
6.0 inches	INDOT #53 Crushed Limestone Aggregate Base (INDOT Section 904)
Subgrade	Localized areas may need additional stabilization - well-compacted natural subgrade that passes a proof-roll, or new compacted structural fill and/or Geogrid.

Flexible Pavement Design for access drives and driving lanes of parking lot

1.5 inches	HMA (9.5 mm) Surface Course overlay per INDOT Section 400
3.0 inches	HMA (19.0 mm) Intermediate Course per INDOT Section 400
8.0 inches	INDOT #53 Crushed Limestone Aggregate Base (INDOT Section 904)
Subgrade	Localized areas may need additional stabilization - well-compacted natural subgrade that passes a proof-roll, or new compacted structural fill and/or Geogrid.

5.5.2 Rigid Pavement Areas

Although the ACI guidelines do not require the use of an aggregate subbase material for design, we recommend that a drainage aggregate subbase course approved by the Indiana Department of Transportation be included to provide a more uniform support surface and to improve drainage conditions beneath the pavement. The concrete materials should conform to Indiana Department of Transportation Standard Specifications for Road Construction. The concrete mix should have a minimum compressive strength of 4,000 psi or a minimum tensile strength of 600 psi at 28 days and the pavement section's joint pattern should not exceed 12 feet by 12 feet. TERRA recommends including synthetic fiber reinforcing for temperature reinforcing.

Std Duty Rigid Pavement for parking bays only

5.0 inches	Portland Cement Concrete
6.0 inches	INDOT #8 Crushed Limestone Aggregate base per INDOT Section 904
Subgrade	Localized areas may need additional stabilization - well-compacted natural subgrade that passes a proof-roll, or new compacted structural fill and/or Geogrid.

Heavy Duty Rigid Pavement for access drives and driving lanes of parking lot

6.0 inches	Portland Cement Concrete
6.0 inches	INDOT #8 Crushed Limestone Aggregate base per INDOT Section 904
Subgrade	Localized areas may need additional stabilization - well-compacted natural subgrade that passes a proof-roll, or new compacted structural fill and/or Geogrid.

5.5.3 Trash Receptacles

Due to the high concentrated loads on the front axle of a garbage truck during the emptying of the dumpster, TERRA recommends a "Heavy-Duty Rigid Pavement Section" be constructed beneath and in front of the dumpster to an extent which will intercept and distribute concentrated wheel loads.

6.0 CONSTRUCTION CONSIDERATIONS

6.1 Site Preparation

All areas that will support foundations, floors, pavements or newly placed engineered fill must be properly prepared. All loose surface soil or "topsoil" and other unsuitable materials must be removed. Unsuitable materials include undocumented old fill, frozen soil, relatively soft material, relatively wet soils, deleterious material (i.e., rubble, debris, asphalt pavement, buried foundations etc. from previous construction), or soils near the surface that exhibit a high organic content. Any soil with an organic content in excess of 4 percent must be removed and replaced with well compacted engineered fill where necessary.

If unsuitable materials are encountered, TERRA's geotechnical engineer should be contacted immediately to assess and possibly modify recommendations provided in this geotechnical study. The assessment may include additional test pits to determine the extent of unsuitable material that may not have been encountered during the soil boring program. In all cases, the earthwork operations should be performed in a manner consistent with good erosion and sedimentation control practices.

6.1.1 Stripping

Stripping of topsoil, vegetation and roots will be required. The soil borings indicate that a stripping depth of approximately 2 to 4 inches should be expected. Additional stripping and/or scarification and re-compaction may be required during construction to achieve suitable subgrade support. In TERRA's opinion, the best practice to achieve a stable subgrade would be to compact the exposed cohesive subgrade soils with a sheep's-foot roller compactor and sandy soils with a smooth drum compactor prior to the placement of new engineered fill.

6.1.2 Subgrade Preparation and Proof-rolling

The subgrade soils encountered at shallow depths within the proposed project area are predominantly cohesive silty/sandy CLAYS. The silty/sandy CLAY soils encountered at this site are highly sensitive to construction traffic. We recommend heavy construction equipment (i.e., dump trucks, scrapers, etc.) be routed away from these and other building areas. The contractor must exercise discretion when selecting

equipment sizes and also make a concerted effort to control construction traffic and surface water while the subgrade soils are exposed. If such problems do arise, the operations in the affected area must be halted and TERRA's geotechnical engineer contacted to evaluate the condition.

Prior to construction or the placement of new engineered fill, the TERRA project geotechnical engineer or his representative should evaluate the exposed subgrade. The evaluation should include proof-rolling of the subgrade. If unsuitable materials are encountered, an appropriate remedial measure would be removal of the unsuitable materials, and replacement in accordance with this Section 6.0, *Construction Considerations*.

Proof-rolling should consist of repeated and overlapping passes of a loaded, pneumatic-tired vehicle such as a tandem-axle dump-truck or scraper. TERRA's geotechnical engineer or his representative should observe the proof-rolling operations, and the proof-rolling vehicle should be loaded as directed by the engineer or his representative.

Any area judged by the engineer to be unstable (i.e., rutting, pumping, or deflecting) during the proof-rolling should be aerated to reduce the moisture content and re-compacted. Aeration may entail using a chisel plow to depths of at least 12 inches below grade and disking the material with a disc plow. This procedure is weather-dependent and may need to be repeated several times to achieve the optimum moisture content and to achieve the required compaction of the in-place material. However, if construction takes place during the fall, winter or early spring, reducing the moisture content may be difficult, if not impossible, to achieve.

If the subgrade soils cannot be suitably dried because of weather conditions or scheduling, TERRA's geotechnical engineer should be contacted for recommendations. Recommendations could include stabilizing the subgrade by:

- 1) Using hydrated lime/cement
- 2) Undercutting soft areas and replacing with coarse aggregate
- 3) Using a combination of additional aggregate with Geogrid.

If deemed necessary, the geotechnical engineer may also specify a perforated subsurface drainage system to improve drainage.

Please note that the subgrade and each layer of structural fill should be proof-rolled upon completion of compaction testing in accordance to Section 6.4, *Fill Placement Control*. The proof-roll is only valid if new structural fill is placed above the proof-rolled section on the day of testing. If rain/inclement weather conditions are encountered after the proof-roll, then the section would need to be re-tested prior to proceeding with structural fill placement. Construction traffic should be routed away from all proof-rolled areas.

6.2 Foundation Excavations

The foundation excavations should proceed downward until the proposed foundation bearing elevation is reached. Thereafter, TERRA's geotechnical engineer or his representative should inspect the exposed soil subgrade to confirm that soils of adequate strength have been reached. This inspection of the subgrade soils should include probing with a Dynamic Cone Penetrometer (DCP), or similar testing device to a minimum depth of at least three (3) feet below the foundation. Some undercutting or extended foundations may be necessary in areas that encountered soft/loose or unsuitable soils.

The DCP testing should be performed at a minimum of 20-foot intervals along wall spread foundation excavations and at each isolated column foundation excavation. Any localized soft soil zones encountered at the bearing elevations should be further excavated to adequate support soils, and the cavity backfilled with structural fill as defined below, or the footing can be poured at the excavated depth. The necessary depth of undercutting and/or excavation will be established during the actual inspection. TERRA's opinion is that construction traffic on the exposed surface of the bearing soils will potentially cause some disturbance of the subgrade and consequently loss of bearing capacity. However, we feel the degree of disturbance can be minimized by proper protection of the exposed surface.

If necessary to support spread footings on structural fill, the fill pad must extend laterally a minimum distance beyond the edge of the footing. The minimum structural pad width would correspond with a point at which an imaginary line extending downward from the outside edge of the footing at a 1H: 2V slope intersects the surface of the natural soils. For example, if the depth to the bottom of the excavation is 4 feet below the bottom of the foundation, the excavation would need to extend laterally beyond the edge of the footing at least 2 feet. Please refer to the *Undercut Diagram* below (Figure A), for more details. *If lean concrete is chosen as a structural fill material, the excavation would need to be only as wide as the proposed foundation member.*

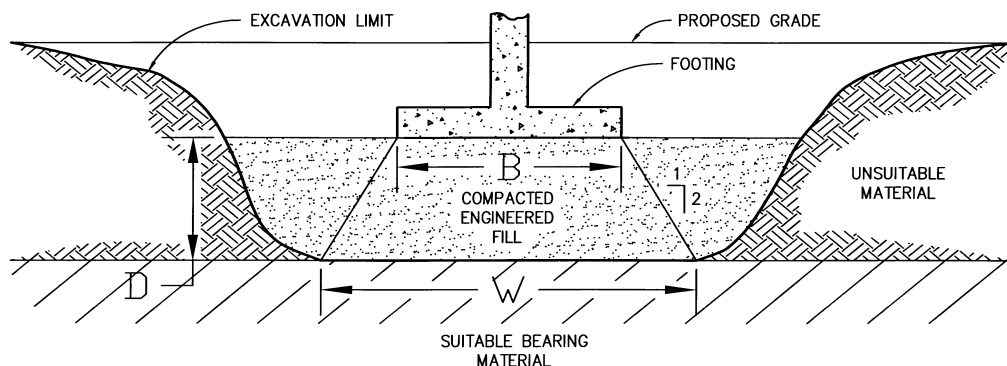


Figure A: Foundation Under-cut Diagram

Excavation slopes should be maintained within OSHA requirements. In addition, we recommend any surcharge fill or heavy equipment be kept at least 5 feet away from the edge of the excavation. In addition, excavations occurring near existing in-use foundations should be performed carefully making a conscious effort not to undermine the support of the in-use foundations. If necessary to excavate soils adjacent to, and below the bearing elevation of any in-use foundations, *TERRA* should be contacted to make further recommendations regarding these excavations.

6.3 Structural Fill

Structural fill, defined as any fill which will support structural loads, should be clean and well graded from coarse to fine. The fill should be free of organic material, debris, deleterious materials and frozen soils. In order to minimize the potential formation of sumps in the subgrade, *TERRA* recommends any fill used to repair undercut areas, exhibit properties similar to the surrounding materials. In addition, the material should exhibit a maximum dry density ($\gamma_{D\text{ MAX}}$) of at least 105 pcf and have a liquid limit less than 50 and a plasticity index of less than 25.

Sands which have less than 15% fines passing a #200 sieve will be acceptable provided the moisture content is controlled to insure the material can be compacted to the required density. Furthermore, samples of the proposed fill materials should be tested prior to initiating the earthwork and backfilling operations to determine the classification, the natural and optimum moisture contents and maximum dry density and overall suitability as a structural fill.

6.4 Fill Placement Control

All engineered fill supporting footings, floor slabs and pavement should be compacted to at least 95 percent of the soils maximum Modified Proctor dry density (ASTM D-1557) value, provided they are designed as outlined in Section 5.0, *Engineering Recommendations*. This minimum compaction requirement may be decreased to 85 percent of the maximum Modified Proctor dry density for subgrade soils within landscaped areas.

To achieve the recommended compaction of structural fill, we suggest the fill be placed and compacted in layers not exceeding (8) inches in loose thickness and at a moisture content within 2 percent of the soil's optimum moisture content. Furthermore, each compacted layer should be proof-rolled upon completion of compaction testing to verify that compaction was achieved. Based on visual observation and laboratory testing of the clayey soils encountered by *TERRA*'s borings, some drying of these soils will most likely be required to achieve the proper moisture content range for compaction.

6.5 Groundwater Concerns

At the time of this investigation, the borings encountered dry conditions during and upon completion of drilling. Note that shallow ground water in Central Indiana glacial till deposits is typically contained or "perched" within discontinuous sand seams or lenses within the cohesive soils and that relatively short-term ground water level readings are not necessarily a reliable indication of the ground water level. Fluctuations in the groundwater level should be expected to occur due to variations in rainfall and other environmental or physical factors at the time measurements are made. The true static groundwater level

can only be determined through observations made in cased holes over a long period of time, the installation of which was beyond the scope of this investigation. As a result, localized perched groundwater may be as shallow as 6.5 feet below the existing grade across the site during wet seasons.

Conventional methods of dewatering such as gravity drainage and/or pumping from sumps should be capable of controlling groundwater, during the drier periods of the year, if encountered. If significant seepage is encountered during the wetter periods of the year, then more aggressive de-watering techniques should be applied. If granular materials are encountered at the base of the excavation, pumping directly from the base will not be possible without causing deterioration at the base of the excavation. In this case, pumping from a sump adjacent to the excavation or using wells or well points will be necessary. The best method and dewatering system will need to be determined at the time of construction. Caution should be exercised during the wetter periods of the year for deep excavations (i.e., utility excavations) in non-cohesive sandy soils encountered beneath the shallow cohesive soils for slope instability.

7.0 GENERAL COMMENTS

TERRA should be retained to review the final design plans and specifications, so comments can be made regarding interpretation and implementation of TERRA's geotechnical recommendations in the design and specifications. TERRA should also be retained to provide observation and construction material testing (CMT) services during grading, excavation, foundation construction and other earthwork related construction phases of the project.

The analysis and recommendations presented in this study were developed from the information and data obtained from the test borings, which depict subsurface conditions only at specific locations. Subsurface conditions at other locations may differ from those occurring at the specific drill sites. This study does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of variations between borings may only become evident during the course of construction. If variations become evident, we should be notified immediately because re-evaluation of the recommendations of this study may be necessary and further evaluation and supplemental recommendations can be provided.

The scope of TERRA's services did not include either specifically or by implication any environmental or biological (e.g., mold, fungi, and bacteria) assessment of the site, or investigation for the presence of wetlands, or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this study or on the test boring logs regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of TERRA's client. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

TERRA's professional services and this study has been prepared for the exclusive use of TERRA's client for specific application to the project discussed in accordance with generally accepted geotechnical engineering practices. No warranties, either expressed or implied, are intended or made. TERRA is not

responsible for the independent conclusions, opinions, or recommendations made by others based on the field and laboratory data presented in this study. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in the study are planned, the conclusions and recommendations contained in the study shall not be considered valid unless TERRA reviews the changes and either verifies or modifies the conclusions of this study in writing.

APPENDIX A

Figure No. 1: Site Vicinity Map

Figure No. 2: Soil Boring Location Plan

Log of Test Boring – General Notes

Unified Soil Classification System

Soil Boring Logs

Laboratory Test Results



Not To Scale



CONSULTING ENGINEERS
&
LAND SURVEYORS

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FIGURE No. 1
SITE VICINITY MAP

COUSIN SUBS
405 South Perry Road
Plainfield, Indiana

TERRA Project #: 2212005

LOG OF TEST BORING GENERAL NOTES

Typical Order of Soil Descriptions:

Color, Moisture, Soil Density/Consistency, Secondary Soil Type, PRIMARY SOIL TYPE, Descriptive Terms

Non-Cohesive Soils:

(Silt, Sand, Gravel and Combinations)

Term	Relative Density	"N" Value
Very Loose		5 blows/ft (blows/ft)
Loose		6 to 10 blows/ft.
Medium Dense		11 to 30 blows/ft.
Dense		31 to 50 blows/ft.
Very Dense		51 blows/ft. or more

Relative Proportions

Descriptive Term	Permit
Trace	1-10
Little	11-20
Some	21-35
And	46-50

Particle Size Identification

Boulders		8 inch diameter or more
Cobbles		3 to 8 inch diameter
Gravel		Coarse: 1 to 3 inch Medium: ½ to 1 inch Fine: ¼ to ½ inch
Sand		Coarse: 6mm to ¼ inch (dia. of pencil lead) Fine: 0.05mm to 0.2mm (dia. of human hair)
Fines		Silt: 0.06 to 0.002mm (cannot see particle)

Cohesive Soils

(Clay, Silt and Combinations)
Particle Size less than 0.06 mm

Consistency	"N" value (blows/ft)	Unconfined Compressive Strength (tons/sq. ft.)
Very soft	0-3	Less than 0.25
Soft	4-5	Less than 0.5
Medium Stiff	6-10	0.5-1.0
Stiff	11-15	1.0-2.0
Very Stiff	16-30	2.0-4.0
Hard	31+	Over 4.0

Plasticity	
Term	Plastic Index (PI)
None to Slight	0-4
Slight	5-7
Medium	8-22
High/Very High	22+

Relative Portions	
trace	1-10%
Little	11-20%
Some	21-35%
And	26-50%

SYMBOLS

Drilling and Sampling

AS	Auger sample
BS	Bag Sample
C	Casing: Size 64 mm, NW; 100 mm,
COA	HW
CS	Continuous Sampling
CW	Clear Water
DC	Driven Casing
DM	Drilling Mud
FA	Flight Auger
FT	Fish Tail
HA	Hand Auger
HSA	Hollow Stem Auger
NR	Hollow Stem Auger
PMT	No Recovery
PT	Borehole Pressure meter Test
PTS	75 mm OD Piston Tube Sample
RB	Peat Sample
RC	Rock Bit
REC	Rock Coring
RQD	Recovery
RS	Rock Quality Designation
S	Rock Sounding
SS	Soil Sounding
2ST	50 mm OD Split-Barrel Sample
3ST	50 mm OD Thin-Walled Tube Sample
VS	75 mm OD Thin-Walled Tube Sample
WPT	Vane Shear Test
	Water Pressure Test

Laboratory Tests

Qp	Penetrometer Reading, kPa
Qu	Unconfined Strength, KpA
W	Moisture Content, %
LL	Liquid Limit, %
PL	Plastic Limit, %
PI	Plasticity Index
SL	Shrinkage Limit, %
LIO	Loss on Ignition, %
	Dry Unit Weight, kg/m3
pH	Measure of Soil Alkalinity/Acidity

Other Notes

Classification – on logs is made by visual inspection.

Standard Penetration Test – Driving a 2.0" O.D., 1 3/8" I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary for TERRA's drillers to drive the spoon a few inches to seat into undisturbed soil, then perform the test. Upon seating the spoon, the number of hammer blows for each 6 inches of penetration are recorded on the drill log (Example – 6/8/9). The Standard Penetration Test results (N-value) can be obtained by adding the last two figures (i.e. 8+9 = 17 blows/ft.) (Compliant with ASTM D-1586)

Strata Changes – In the column "Soil Descriptions" on the drill log the horizontal lines represent strata changes. A solid line (____) represents an actually observed change, a dashed line (----) represents an estimated change.

Ground Water – Observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water levels indicated on the logs.

Groundwater Symbols:



Observed groundwater elevation, encountered during drilling



observed groundwater elevation several hours upon completion of boring

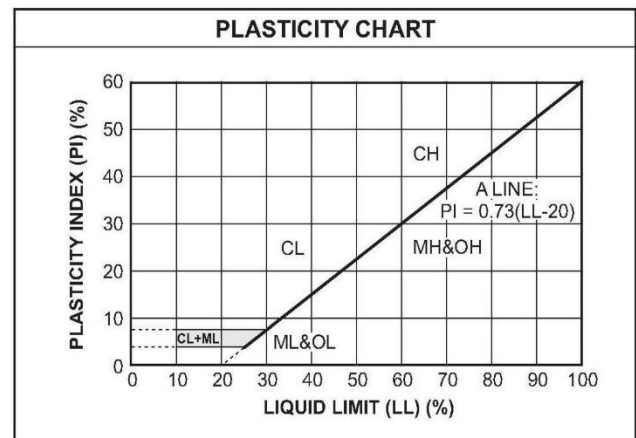
UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART		
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	
	 GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	 GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	
	 GM	Silty gravels, gravel-sand-silt mixtures
	 GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	
	 SW	Well-graded sands, gravelly sands, little or no fines
	 SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
	 SM	Silty sands, sand-silt mixtures
	 SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
SILTS AND CLAYS Liquid limit less than 50%	 ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
	 CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	 OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater	 MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	 CH	Inorganic clays of high plasticity, fat clays
	 OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	 PT	Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA		
GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent GW, GP, SW, SP
More than 12 percent GM, GC, SM, SC
5 to 12 percent Borderline cases requiring dual symbols



ASTM Designation D-2487

TERRA
SITE DEVELOPMENT
LOG OF BORING
No. BB-1

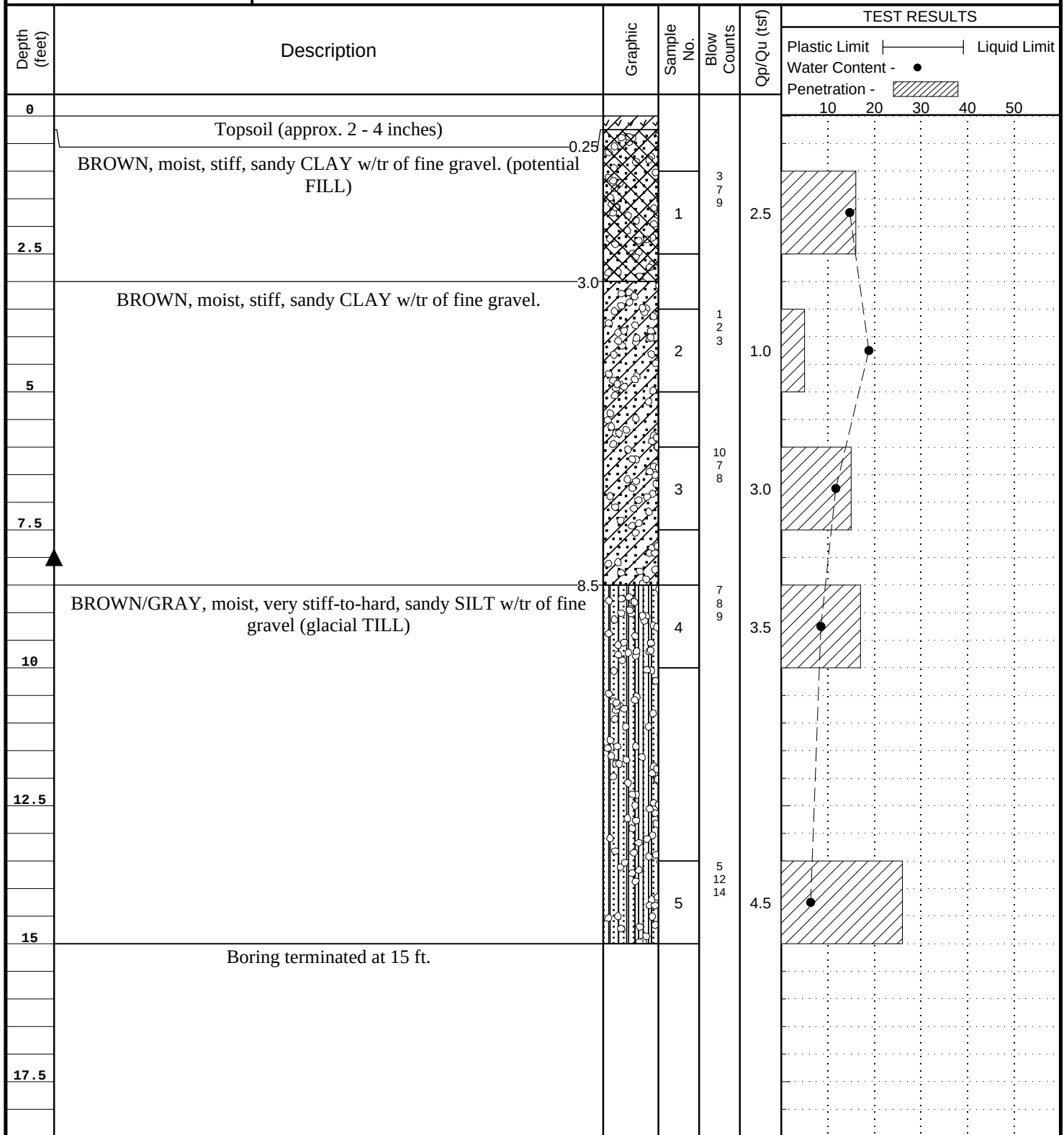
PROJECT: Cousins Subs Plainfield
CLIENT: Evo Development, Inc.
PROJECT LOCATION: 405 S. Perry Rd. Plainfield, IN
DRILLER: TERRA
DRILLING METHOD: ASTM D-1586 (ID SS - 1.4")
GROUNDWATER > ON RODS: $\frac{\pi}{8}$ Dry **AT COMPLETION:** ▲ 8.0 **AFTER 24 HOURS:** $\frac{\pi}{8}$
ELEVATION: **CAVE DEPTH:** C

PROJECT NO.: 2212005

DATE: 01/25/23

LOGGED BY: BOD

This information pertains only to this boring and should not be interpreted as being indicative of the site.

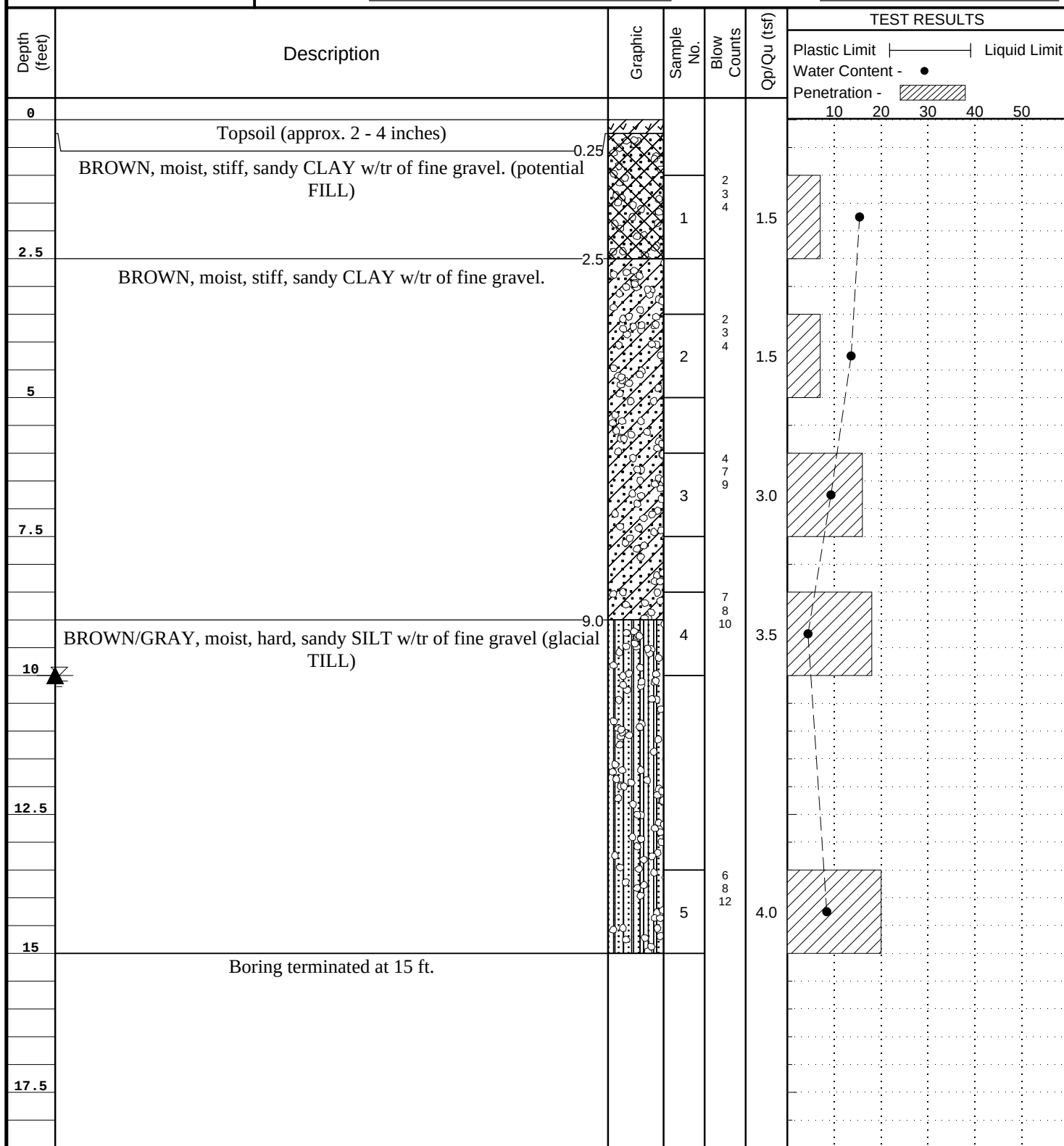


LOG OF BORING
No. BB-2

PROJECT: Cousins Subs Plainfield
CLIENT: Evo Development, Inc.
PROJECT LOCATION: 405 S. Perry Rd. Plainfield, IN
DRILLER: TERRA
DRILLING METHOD: ASTM D-1586 (ID SS - 1.4")
GROUNDWATER> ON RODS: ∇ 10.0 **AT COMPLETION:** $\blacktriangle$ 10.0 **AFTER 24 HOURS:** ∇
ELEVATION: _____ **CAVE DEPTH:** C _____

PROJECT NO.: 2212005
DATE: 01/25/23
LOGGED BY: BOD

This information pertains only to this boring and should not be interpreted as being indicative of the site.

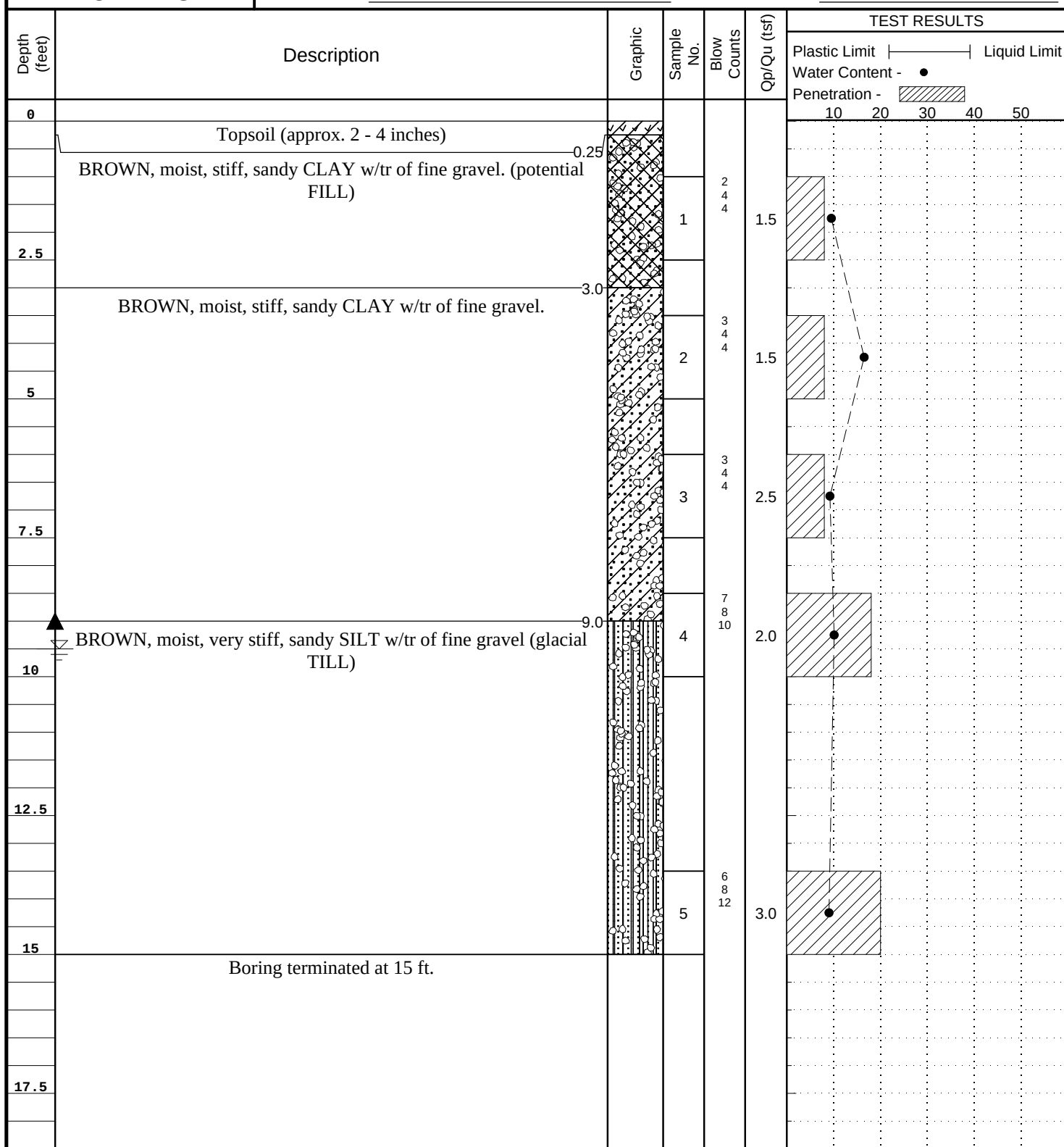


LOG OF BORING
No. BB-3

PROJECT: Cousins Subs Plainfield
CLIENT: Evo Development, Inc.
PROJECT LOCATION: 405 S. Perry Rd. Plainfield, IN
DRILLER: TERRA
DRILLING METHOD: ASTM D-1586 (ID SS - 1.4")
GROUNDWATER> ON RODS: ∇ 9.5 **AT COMPLETION:** $\blacktriangle$ 9.0 **AFTER 24 HOURS:** ∇
ELEVATION: _____ **CAVE DEPTH:** C _____

PROJECT NO.: 2212005
DATE: 02/05/23
LOGGED BY: BOD

This information pertains only to this boring and should not be interpreted as being indicative of the site.

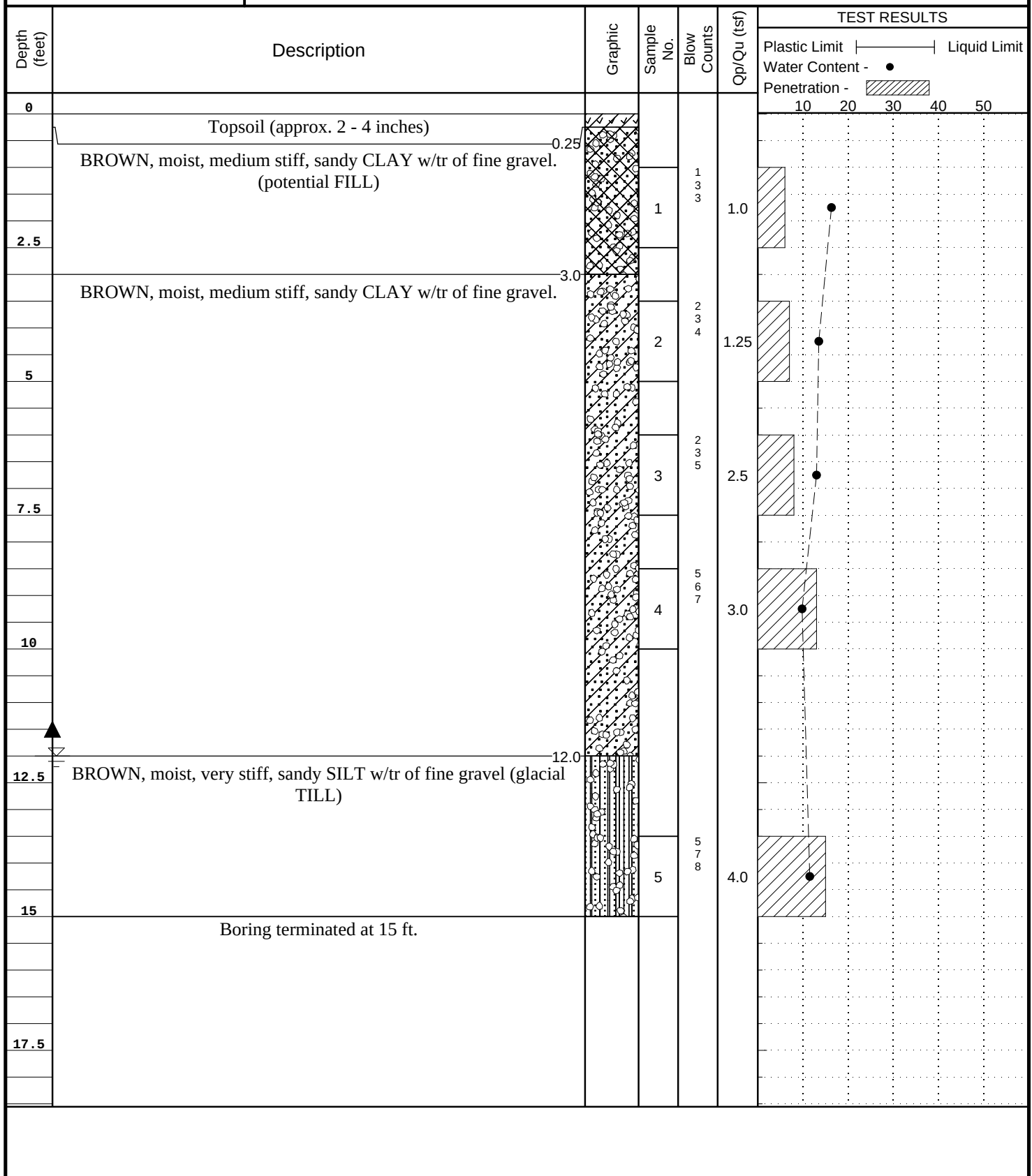


LOG OF BORING
No. BB-4

PROJECT: Cousins Subs Plainfield
CLIENT: Evo Development, Inc.
PROJECT LOCATION: 405 S. Perry Rd. Plainfield, IN
DRILLER: TERRA
DRILLING METHOD: ASTM D-1586 (ID SS - 1.4")
GROUNDWATER> ON RODS: ∇ 12.0 **AT COMPLETION:** $\blacktriangle$ 11.5 **AFTER 24 HOURS:** ∇
ELEVATION: _____ **CAVE DEPTH:** C _____

PROJECT NO.: 2212005
DATE: 02/05/23
LOGGED BY: BOD

This information pertains only to this boring and should not be interpreted as being indicative of the site.

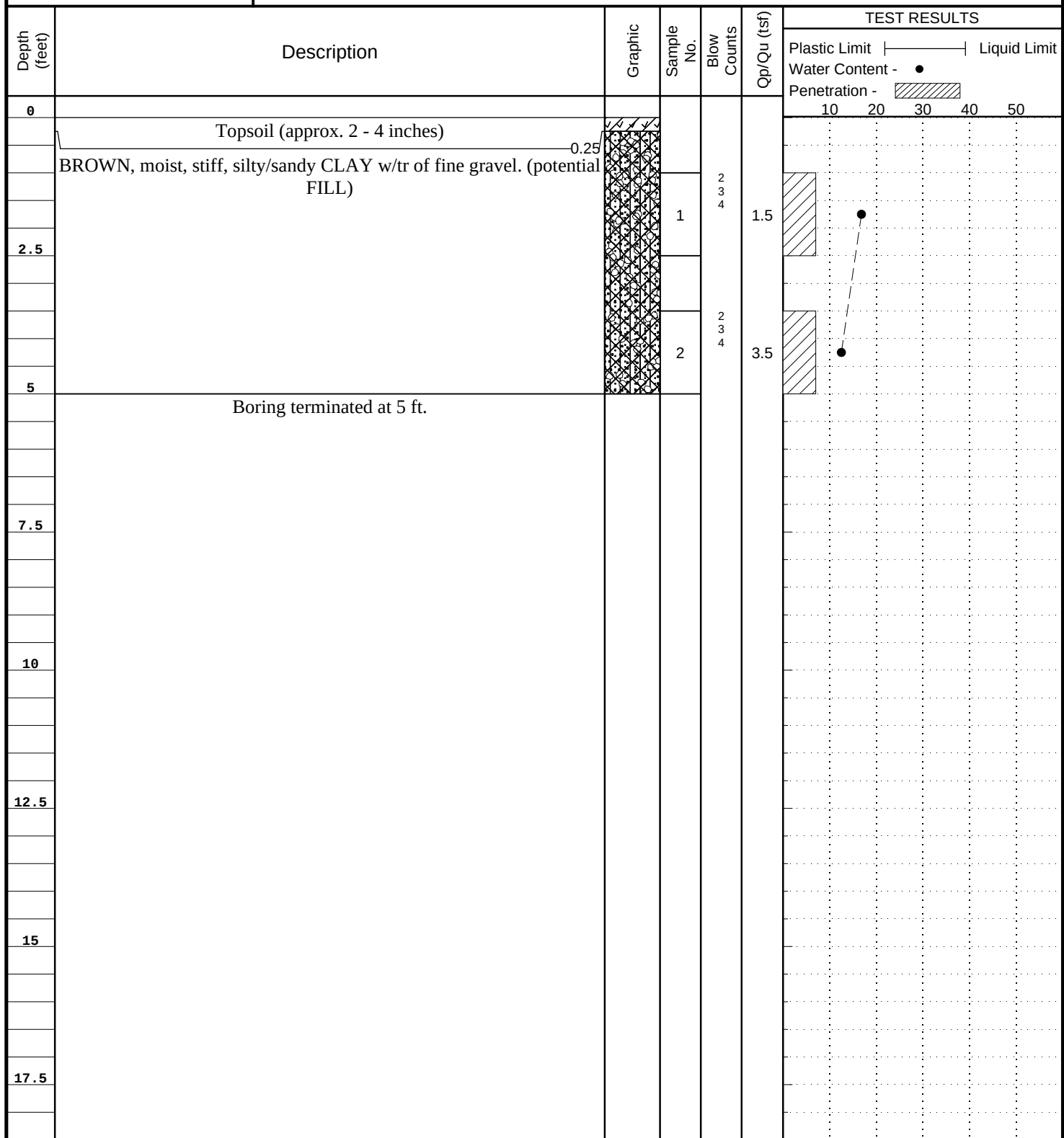


LOG OF BORING
No. PB-1

PROJECT: Cousins Subs Plainfield
CLIENT: Evo Development, Inc.
PROJECT LOCATION: 405 S. Perry Rd. Plainfield, IN
DRILLER: TERRA
DRILLING METHOD: ASTM D-1586 (ID SS - 1.4")
GROUNDWATER> ON RODS: $\frac{\pi}{8}$ Dry **AT COMPLETION:** $\blacktriangle$ Dry **AFTER 24 HOURS:** $\frac{\pi}{8}$
ELEVATION: _____ **CAVE DEPTH:** C _____

PROJECT NO.: 2212005
DATE: 01/20/23
LOGGED BY: BOD

This information pertains only to this boring and should not be interpreted as being indicative of the site.

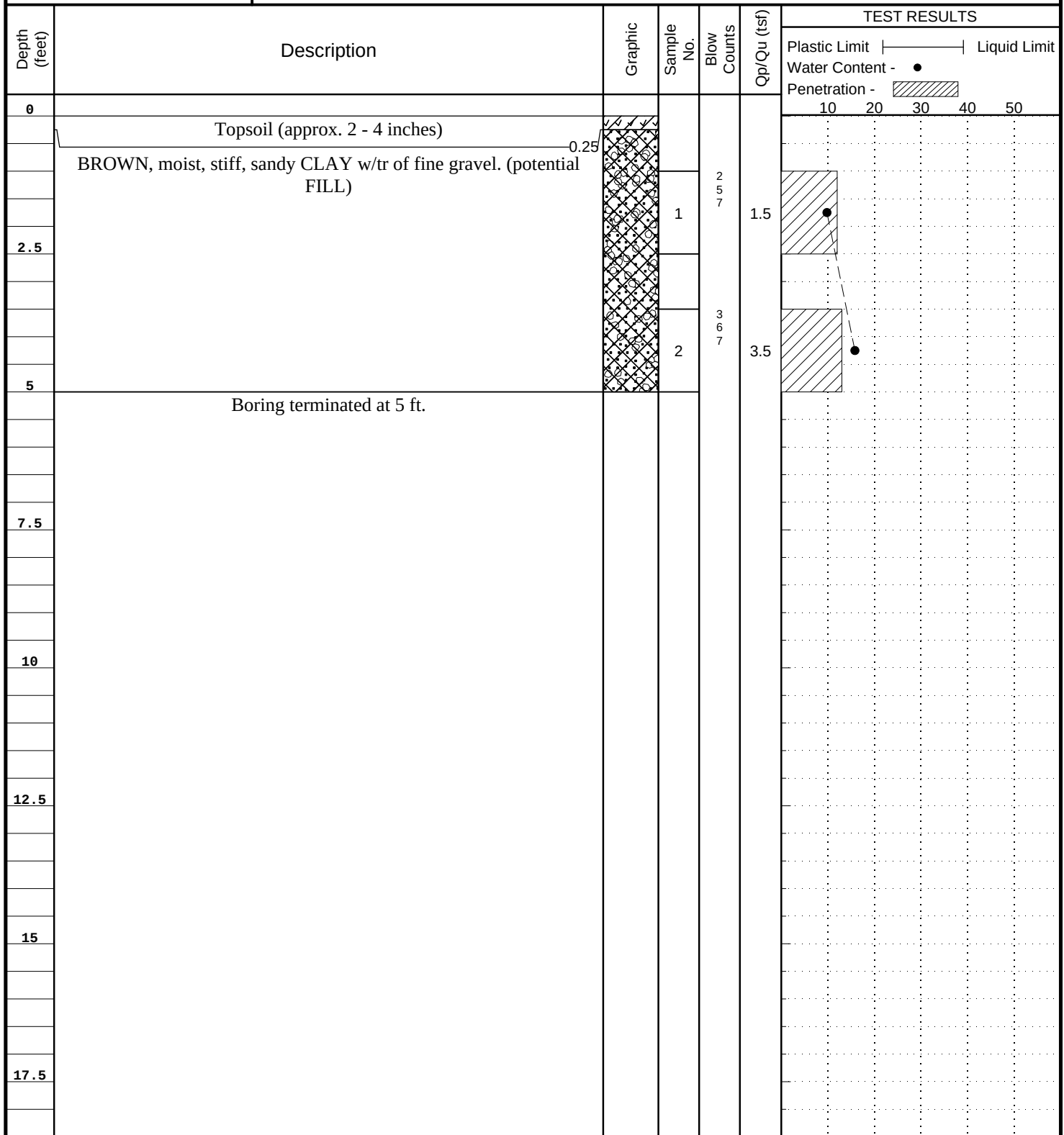


LOG OF BORING
No. PB-2

PROJECT: Cousins Subs Plainfield
CLIENT: Evo Development, Inc.
PROJECT LOCATION: 405 S. Perry Rd. Plainfield, IN
DRILLER: TERRA
DRILLING METHOD: ASTM D-1586 (ID SS - 1.4")
GROUNDWATER> ON RODS: $\frac{\pi}{8}$ Dry **AT COMPLETION:** ▲ Dry **AFTER 24 HOURS:** $\frac{\pi}{8}$
ELEVATION: _____ **CAVE DEPTH:** C _____

PROJECT NO.: 2212005
DATE: 01/20/23
LOGGED BY: BOD

This information pertains only to this boring and should not be interpreted as being indicative of the site.

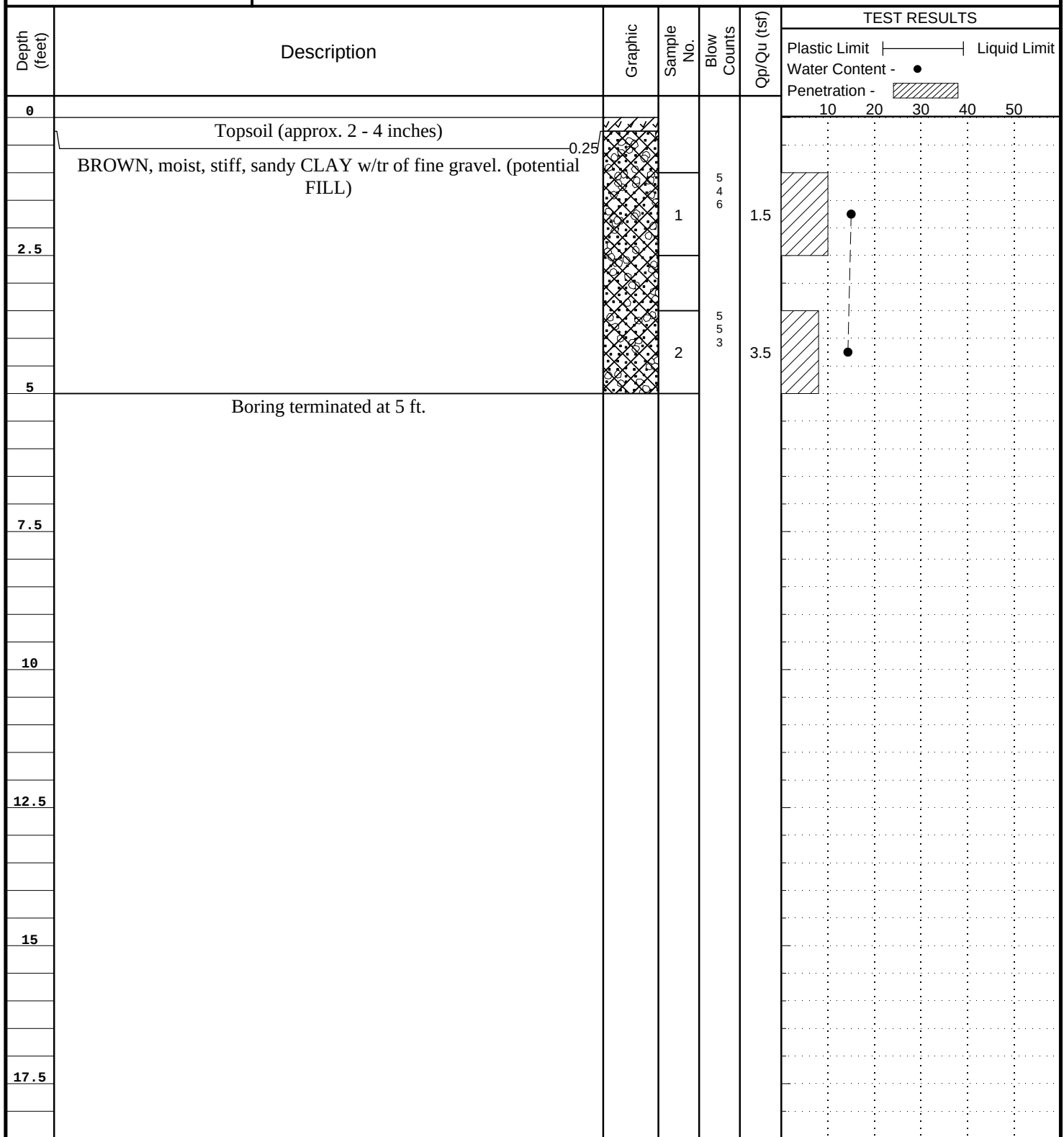


LOG OF BORING
No. PB-3

PROJECT: Cousins Subs Plainfield
CLIENT: Evo Development, Inc.
PROJECT LOCATION: 405 S. Perry Rd. Plainfield, IN
DRILLER: TERRA
DRILLING METHOD: ASTM D-1586 (ID SS - 1.4")
GROUNDWATER> ON RODS: $\frac{\varnothing}{\varnothing}$ Dry **AT COMPLETION:** $\blacktriangle$ Dry **AFTER 24 HOURS:** $\frac{\varnothing}{\varnothing}$
ELEVATION: _____ **CAVE DEPTH:** C _____

PROJECT NO.: 2212005
DATE: 01/23/23
LOGGED BY: BOD

This information pertains only to this boring and should not be interpreted as being indicative of the site.

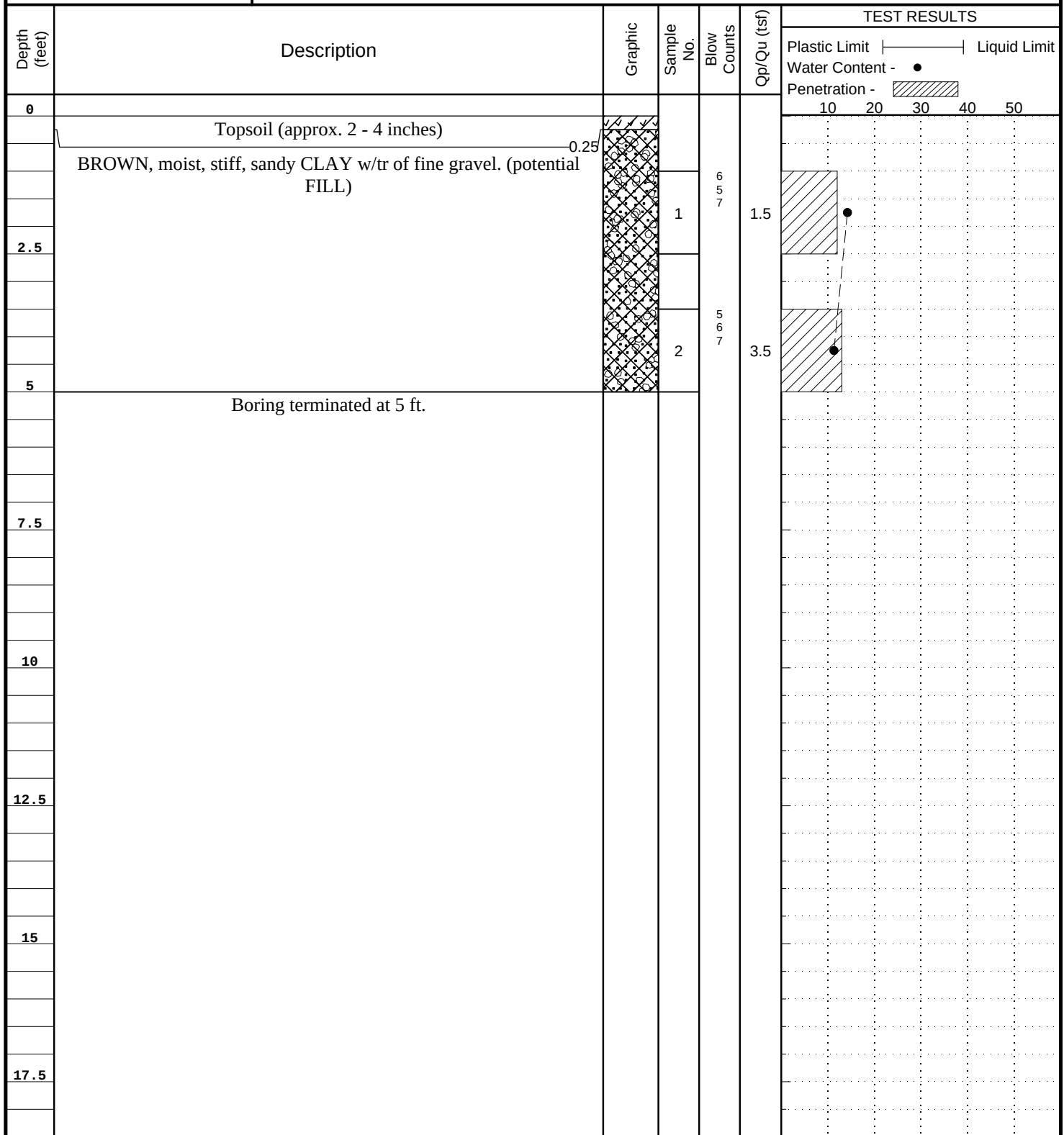


LOG OF BORING
No. PB-4

PROJECT: Cousins Subs Plainfield
CLIENT: Evo Development, Inc.
PROJECT LOCATION: 405 S. Perry Rd. Plainfield, IN
DRILLER: TERRA
DRILLING METHOD: ASTM D-1586 (ID SS - 1.4")
GROUNDWATER> ON RODS: $\frac{\pi}{8}$ Dry **AT COMPLETION:** $\blacktriangle$ Dry **AFTER 24 HOURS:** $\frac{\pi}{8}$
ELEVATION: _____ **CAVE DEPTH:** C _____

PROJECT NO.: 2212005
DATE: 01/23/23
LOGGED BY: BOD

This information pertains only to this boring and should not be interpreted as being indicative of the site.

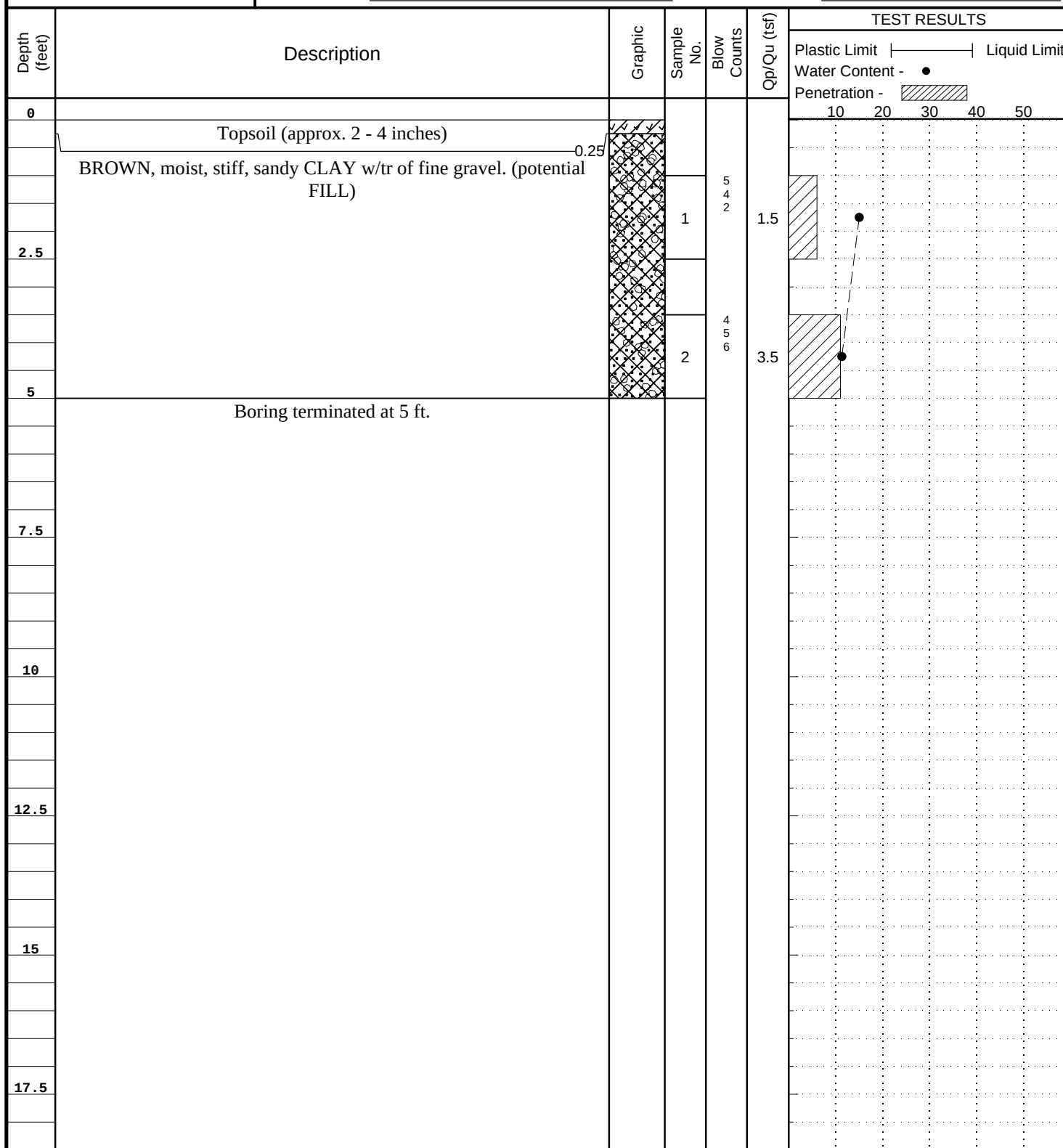


LOG OF BORING
No. PB-5

PROJECT: Cousins Subs Plainfield
CLIENT: Evo Development, Inc.
PROJECT LOCATION: 405 S. Perry Rd. Plainfield, IN
DRILLER: TERRA
DRILLING METHOD: ASTM D-1586 (ID SS - 1.4")
GROUNDWATER> ON RODS: $\frac{\pi}{8}$ Dry **AT COMPLETION:** $\blacktriangle$ Dry **AFTER 24 HOURS:** $\frac{\pi}{8}$
ELEVATION: _____ **CAVE DEPTH:** C _____

PROJECT NO.: 2212005
DATE: 01/23/23
LOGGED BY: BOD

This information pertains only to this boring and should not be interpreted as being indicative of the site.





Project: Cousins Subs - Plainfield, IN
Location: 405 S. Perry Road, Plainfield, IN
Client: Evo Development, Inc.
TERRA Project No.: 2212005

Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)	Organic Content (%)	Atterberg Limits		
					LL	PL	PI
BB-1	1	1.0 - 2.5	14.7				
BB-1	2	3.5 - 5.0	18.8				
BB-1	3	6.0 - 7.5	11.7				
BB-1	4	8.5 - 10.0	8.5				
BB-1	5	13.5 - 15.0	6.3				
BB-2	1	1.0 - 2.5	15.4				
BB-2	2	3.5 - 5.0	13.6				
BB-2	3	6.0 - 7.5	9.3				
BB-2	4	8.5 - 10.0	4.4				
BB-2	5	13.5 - 15.0	8.4				
BB-3	1	1.0 - 2.5	9.5				
BB-3	2	3.5 - 5.0	16.5				
BB-3	3	6.0 - 7.5	9.2				
BB-3	4	8.5 - 10.0	10.1				
BB-3	5	13.5 - 15.0	9.0				
BB-4	1	1.0 - 2.5	16.3				
BB-4	2	3.5 - 5.0	13.5				
BB-4	3	6.0 - 7.5	13.0				
BB-4	4	8.5 - 10.0	9.8				
BB-4	5	13.5 - 15.0	11.5				
PB-1	1	1.0 - 2.5	16.8				
PB-1	2	3.5 - 5.0	12.5				
PB-2	1	1.0 - 2.5	9.8				
PB-2	2	3.5 - 5.0	15.8				
PB-3	1	1.0 - 2.5	15.0				
PB-3	2	3.5 - 5.0	14.3				
PB-4	1	1.0 - 2.5	14.2				
PB-4	2	3.5 - 5.0	11.3				
PB-5	1	1.0 - 2.5	15.0				
PB-5	2	3.5 - 5.0	11.3				

APPENDIX B

Qualifications of this Geotechnical Engineering Study

GENERAL QUALIFICATIONS of TERRA Site Development, Inc. Report

This report has been prepared at the request of our client for their use on this project. The work, including the field work, laboratory testing, and engineering analysis, was performed in accordance with generally accepted soil and foundation engineering practices. This warranty is in lieu of all other warranties either expressed or implied.

This report may not contain sufficient information for purposes of other parties or other uses. Should there be any sufficient differences in structural arrangement, loading or location of the structure, our analysis should be reviewed.

The analysis, conclusions, and recommendations contained in our report are based on site conditions as they existed at the time of our exploration and further assume that the borings are representative of the subsurface conditions throughout the site.

If during construction, different subsurface conditions from those encountered during our explorations are observed or appear to be present beneath excavations, we must be advised promptly so that we can review these conditions and reconsider our recommendations where necessary.

If there is a substantial lapse of time between the submission of our report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, we urge that our report be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

We urge that we be retained to review those portions of the plans and specifications that pertain to earthwork and foundations to determine whether they are consistent with our recommendations. In addition, we are available to observe construction, particularly the compaction of structural backfill and preparation of the foundations, and such other field observations as may be necessary.

In order to fairly consider changed or unexpected conditions that might arise during construction, we recommend the following verbiage (Standard Clause for Unanticipated Subsurface Conditions) be included in the project contract.

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

"The owner has had a subsurface exploration performed by a soils consultant, the results of which are contained in the consultant's report. The consultant's report represents their conclusions on the subsurface conditions based on their interpretations of the data obtained in the exploration. The contractor acknowledges that they have reviewed the consultant's report and any addenda thereto, and that their bid for earthwork operations is based on the subsurface conditions as described in that report. It is recognized that a subsurface exploration may not disclose all conditions as they exist and further, conditions may change, particularly groundwater conditions, between the time of a subsurface exploration and the time of earthwork operations. In recognition of these facts, this clause is entered in the contract to provide a means of equitable additional compensation for the contractor if adverse unanticipated conditions are encountered and to provide a means of rebate to the owner if the conditions are more favorable than anticipated.

At any time during construction operations that the contractor encounters conditions that are different than those anticipated by the soils consultant's report, they shall immediately (within 24 hours) bring this fact to the owner's attention. If the owner's representative on the construction site observes subsurface conditions which are different than those anticipated by the consultant's report, they shall immediately (within 24 hours) bring this fact to the contractor's attention. Once a fact of unanticipated conditions has been brought to the attention of either the owner or the contractor, and the consultant has concurred, immediate negotiations will be undertaken between the owner and the contractor, to arrive at a change in contract price for additional work or reduction in work because of the unanticipated conditions. The contractor agrees that the following unit prices would apply for additional or reduced work under the contract. For changed conditions for which unit prices are not provided, the additional work shall be paid for on a time and materials basis."

Another example of a changed conditions clause can be found in paper No. 4035 by Robert F. Borg, published in ASCE Construction Division Journal, No. CO2, September 1964, page 37.

APPENDIX D
PHASE 1 ESA (ABBRIDGED)



DEVELOPMENT & ENGINEERING CONSULTANTS

www.TERRAsitedev.com

PHASE I ENVIRONMENTAL ASSESSMENT COUSIN'S SUBS - PLAINFIELD

405 S Perry Road
Plainfield, Indiana

Prepared for:

Evo Development, Inc.
W293N3808 Round Hill Circle
Pewaukee, Wisconsin 53072

**PHASE I
ESA
REPORT**

**March 10th, 2023
TERRA # 2212005**

e | contact@TERRAsitedev.com

p | 317.399.1216 **f** | 317.399.1216

w | [http:// www.TERRAsitedev.com](http://www.TERRAsitedev.com)



March 10th, 2023

John Holborow
Evo Development, Inc.
W293N3808 Round Hill Circle
Pewaukee, Wisconsin 53072

**RE: Final Report of Phase I Environmental Site Assessment
Cousin's Subs - Plainfield**
405 S Perry Road
Plainfield, Indiana
TERRA Project No. 2212005

Dear Mr. John Holborow:

Enclosed is TERRA Site Development's (TERRA's) Phase I Environmental Site Assessment (ESA) final report for the above referenced project. This report was completed in general accordance with TERRA's proposal the scope and limitations of the American Society for Testing and Materials (ASTM) Standard Practice E1527-21. The attached report provides a summary of the environmental conditions encountered and relevant information obtained during the ESA and presents our conclusions relative to the site.

Thank you again for this work engagement. If you have any questions or comments regarding our findings, please do not hesitate to contact our office.

Sincerely,
TERRA Site Development, Inc.

A handwritten signature in black ink, appearing to read 'Mark Behrens'.

Mark Behrens
Principal – Engineering & Environmental Services

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Executive Summary

TERRA Site Development (TERRA) was retained by Evo Development Inc. to conduct a Phase I Environmental Site Assessment (ESA) of proposed undeveloped 1.33-acre commercial outlot located southeast of the Perry Road and Center City Way in Plainfield, Hendricks County, Indiana (the "Property"). The protocol used for this assessment is in general conformance with the American Society for Testing and Materials (ASTM) E 1527-21, "*Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*" and the standards and practices set forth in 40 CFR Part 312.

On January 5, 2023, Mr. Mark Behrens / Mr. Cole Oland, representing TERRA, conducted Property reconnaissance to assess the possible presence of petroleum products and hazardous substances at the Property. A photographic log of the Property reconnaissance is included in Appendix 14.2. TERRA's investigation also included review of historic aerial photos and city directories, reconnaissance of adjacent sites, interviews with available present and past owners, operators, and occupants of the Site, as well as State and Local government personnel (i.e., local health and fire departments), and review of available Local, State, and Federal regulatory records regarding the presence of petroleum products and/or hazardous materials at the Property and/or adjacent properties.

The Study Site consists of a single lot. The lot is relatively flat and is currently an undeveloped "rough graded" commercial outlot. The project site is currently a mowed grass property. According to Property Manager, Mr. Jeffery M. Reasner, who has been affiliated to the property for about 3 year believes that the property has historically been vacant and never been developed in the past. Mr. Reasner indicated he is not aware of current zoning laws (AUL) associated with the Property. The questionnaires are provided in Appendix 14.5.

Based on the information collected and reviewed during this assessment, no recognized environmental condition such as evidence of past, existing, or a material threat of future releases to the environment of a hazardous substance or petroleum product associated with the study site was discovered.

1.0 Introduction

1.1 Purpose

The purpose of this Phase I ESA study was to identify any recognized environmental conditions associated with the Property in accordance with the procedures detailed in the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessments (ASTM E-1527-21). This Phase I was also completed to satisfy All Appropriate Inquiry (AAI) to qualify for any and all applicable state and federal landowner liability protections under CERCLA. This study was authorized by Evo Development Inc., For the purposes of this study, Evo Development Inc., is considered the User.

RECs are defined in ASTM E1527-21 as the “presence or likely presence of any *hazardous substances* or *petroleum products* in, on, or at a property: (1) due to any *release* to the *environment*; (2) under conditions indicative of a *release* to the *environment*; or (3) under conditions that pose a *material threat* of a future *release* to the *environment*.”

The definition of a *release* under CERCLA includes contamination that is the direct result of a *release* into the environment from a non-natural source that migrates into a building or structure. For the purposes of the ASTM E1527-21 practice, *migrate* and *migration* refers to the movement of *hazardous substances* or *petroleum products* in any form, including, for example, solid and liquid at the surface or subsurface, and vapor in the subsurface.

A REC resulting from a past *release* of *hazardous substances* or *petroleum products* that has been addressed to the satisfaction of the applicable regulatory authority, with *hazardous substances* or *petroleum products* allowed to remain in place subject to the implementation of required controls (e.g., property restrictions, *activity and use limitations (AULs)*, *institutional controls*, or *engineering controls*) is defined as a *controlled REC (CREC)*. A CREC shall be identified as a REC in the conclusions section of this report; however, the identification of a condition as a CREC does not imply that the environmental professional conducting the Phase I ESA has evaluated or confirmed the adequacy, implementation, or continued effectiveness of the required control that has been, or is intended to be, implemented.

A CREC differs from a *historical REC (HREC)* in that a HREC refers to a past *release* of *hazardous substances* or *petroleum products* that has occurred in connection with the site and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the site to any required controls.

RECs include *hazardous substances* or *petroleum products* even under conditions in compliance with laws, but do not include “*de minimis* conditions that generally do not present a material risk of harm to public health or the *environment* and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.” Conditions determined to be *de minimis* are not RECs.

1.2 Significant Assumptions

This environmental study, including its findings and recommendations, was completed using outside information contained within pertinent publications and databases either publicly available or available for a fee, and information obtained through personal interviews. TERRA assumes that information contained within these publications and databases is complete and accurate, and that information obtained from interviewees reflects their good faith attempts to truthfully and accurately respond to TERRA's inquiries. However, TERRA cannot and does not warrant or guarantee that the information provided by these other sources is accurate or complete.

1.3 Limitations and Exceptions

This environmental study has an inherent limitation in that its conclusions must be drawn based on limited data sources. Within the scope of an investigation such as this study, the potential for unintentional omission of data exists. The Phase I Environmental Site Assessment records the findings of a visual site inspection, interviews, and information contained within pertinent publications and databases. The scope of our services did not include any sampling for the presence of hazardous materials in the environmental media within or beyond the Study Site.

Our professional services have been performed and our findings obtained in accordance with generally accepted environmental engineering principles and practices. TERRA is not responsible for the independent conclusions, opinions, or recommendations made by others based on the information presented in this report. The investigation summary contains all of the data gaps and limitations inherent in these methodologies that are referred to in ASTM E 1527-21.

1.4 Special Terms and Conditions

No special terms and conditions are noted. Authorization to perform this work was given by a directive from Mr. John Holborow of Evo Development Inc. The conclusions and findings set forth in this report are strictly limited in time and scope to the date of the evaluations. The conclusions presented in the report are based solely on the services described therein, and not on scientific tasks or procedures beyond the scope of agreed-upon services or the time and budgeting restraints imposed by the User. No subsurface exploratory drilling or sampling was done under the scope of this work. Unless specifically stated otherwise in the report, no chemical analyses have been performed during the course of this ESA.

Some of the information provided in this report is based upon personal interviews and research of available documents, records, and maps held by the appropriate government and private agencies. This is subject to the limitations of historical documentation, availability, and accuracy of pertinent records and the personal recollections of those persons contacted.

The content and conclusions provided by TERRA in this report are based solely on the information collected during our investigation and activities at the Property, our present understanding of the Property conditions, and our professional judgment in light of such information at the time this report was prepared. Part of the findings in this investigation is based on data provided by others. This report presents TERRA's professional opinion, and no warranty, expressed or implied, is made. Evo Development Inc., have the right to reproduce in full and provide copies of this report to interested parties, including their agents and existing/potential lenders.

1.5 User Reliance

This Phase I ESA report has been prepared for the exclusive use of the User. The reliance on the information presented in this report, in part or in whole, by any other parties is prohibited without written authorization by TERRA Site Development, Inc. and the User.

This report is solely for the use of Evo Development Inc., and any reliance of this report by third parties shall be at such party's sole risk and may not contain sufficient information for purposes of other parties for other uses. This report shall only be presented in full and may not be used to support any other objectives than those set out in the report, except where written approval with consent is provided by Evo Development Inc. and TERRA.

2.0 Site Description

2.1 Location and Legal Description

The study site is located in Guilford Township Hendricks County in Plainfield, Indiana, and is situated on a single lot southeast of Perry Road and City Center Way in Plainfield, Indiana.

No legal description is available at this time. An ALTA Survey is being prepared but has not been completed.

2.2 Site and Vicinity General Characteristics

The study site consists of one parcels and is platted for commercial development. The topography of the site where the new proposed developed is to be constructed is relatively flat. The property is bordered by a "Tire Discounters" to the north, a retention/drainage pond across Pine Crest Drive the east, an undeveloped grass lot similar to The property to the south, and a mall, "The Shops at Perry Crossing" across Perry Road to the West.

2.3 Current Use of the Property

The Property is an undeveloped (rough graded) commercial outlot with an existing detention pond the northeast of the study site, and another detention pond under construction to the east of the Study Site.

2.4 Descriptions of Structures, Roads, and Other Site Improvements

The Study Site consisting of undeveloped, vacant land. At the time of the site visit (01/05/2023) there are two 20-ft shipping containers on the northeast corner of the property.

2.5 Current Uses of the Adjoining Properties

The properties directly north of the Study Site include a Red Robin Gourmet Burgers and Brews and a Tire Discounters, to the east is a detention pond under construction, to property to the south in another undeveloped grass outlot, and to the west is a mall, "The Shops at Perry Crossing".

3.0 User Provided Information

3.1 Environmental Liens or Activity and Use Limitations

The State of Indiana's environmental regulatory agency, the Indiana Department of Environmental Management (IDEM), does not currently implement a comprehensive or centralized record-keeping system to document the existence of an environmental lien or Activity and Use Limitation ("AUL") that may exist pursuant to activity taken within all the agency's departments. A record listing of AULs does exist for projects participating in Indiana's Voluntary Remediation Program and the state Brownfields Program. While this database was reviewed as part of TERRA's record search, it is important to note that it is customary IDEM practice to require the recording of an environmental lien or AUL with the Recorder of the county where the affected site is located. Therefore, local land title records are the most accurate source of information regarding the existence of any lien or AUL, if present. Neither title history information, nor knowledge of any environmental lien or AUL for the Study Site was communicated to TERRA by the User, nor was any other evidence of an environmental lien or AUL noted by TERRA during the course of this study.

3.2 Specialized Knowledge

Mr. Jeffery M. Reasner, the current manager of the property responded to a questionnaire dated January 13, 2023. Mr. Reasner indicated he has been affiliated to the property for about 3 years and believes that the property has never been developed before and was historically a vacant lot. Mr. Reasner indicated he is not aware of current zoning laws (AUL) associated with the Property. John Holborow is the representative of Evo Development, Inc. representing the new owner of the study site and indicated he had no specialized knowledge of the Site other than the land has been vacant. The questionnaire is provided in Appendix 14.5.

3.3 Commonly Known or Reasonably Ascertainable Information

Commonly known or reasonably ascertainable information within the local community about the Study Site that is material to recognized environmental conditions was communicated to TERRA by Mr. Reasner and Evo Development Inc. This information is discussed in the Executive Summary and Conclusions sections of this report.

3.4 Valuation Reduction for Environmental Issues

No information related to a reduced property valuation as a result of environmental issues was communicated to TERRA by the Study User.

3.5 Owner, Property Manager, and Occupant Information

The Study site is currently unoccupied, with no structures on it. Mr. Jeffery M. Reasner is the current property manager and responded to a questionnaire dated January 13, 2023 indicating he has been affiliated with the property for about 3 years and believes that the property has never been developed before and was historically a vacant lot. Mr. Reasner indicated he is not aware of current zoning laws (AUL) associated with the Property. Mr. Reasner is also not aware of any environmental concern to the Property. The questionnaires are provided in Appendix 14.5.

3.6 Reason for Performing Phase I

TERRA has completed its analysis of the Study Site with the understanding that this study was contracted by Evo Development Inc. as the User as part of their desire to gain an understanding of potential environmental conditions at the Study Site that could impact the planned residential development of the property. TERRA was instructed by Evo Development Inc., as the User, to

complete the study in accordance with ASTM E-1527-21, and the study should consist of all appropriate inquiry (AAI) into the previous uses of the Study Site consistent with good commercial and customary professional practice.

3.7 Other Information

TERRA was provided the following information by the Study User:

- A copy of a partial development plan and a conceptual architectural plan showing the Property boundaries was provided by Evo Development Inc.

4.0 Records Review

4.1 Standard Environmental Record Sources

Database information, maintained by various federal and state regulatory agencies, was reviewed to determine the regulatory history of the Study Site and surrounding areas. Environmental Risk Information Services (ERIS) was retained to perform a computerized database search of the Study Site using the search radii specified in the current ASTM guidance. Information from each of the sources was reviewed to determine if the Study Site, or facilities within the appropriate ASTM search radii of the Study Site, are listed on environmental databases and if the Study Site or any of the other facilities have been the subject of reported environmental violations. A summary of the information obtained from the ERIS search that highlights the findings from key databases is presented in tabular format, below. The ERIS report, including other additional database findings, is provided in its entirety in Appendix 14.4.

Summary of Regulatory Records Review of Study Site and Surrounding Properties

DATABASE	SEARCH RADIUS	SITES LOCATED
Department of Energy Formerly Utilized Sites Remedial Action Program (DOE FUSRAP)	1.00 mile	0
Federal National Priorities List (NPL), or "Superfund", Sites List	1.00 mile	0
Federal Proposed NPL Sites List	1.00 mile	0
Federal NPL Lien Sites List	Target	0
Federal Delisted NPL Sites List	0.50 mile	0
Federal CERCLIS Sites List	0.50 mile	0
Federal CERCLIS - No Further Remedial Action Planned List (NFRAP) Sites List	0.50 mile	0
Federal RCRA - Corrective Action Facilities List (CORRACTS)	1.00 mile	0
Federal RCRA - non-CORRACTS TSD Facilities List	0.50 mile	0
Federal RCRA - Large Quantity Generator (LQG) Sites List	0.25 mile	0
Federal RCRA - Small Quantity Generator (SQG) Sites List	0.25 mile	1
Federal Engineering Control Sites List	0.50 mile	0
Federal Institutional Control Sites List	0.50 mile	0
Federal ERNS Sites List	Target	0

State and Tribal CERCLIS Equivalent Sites List	1.00 mile	0
State and Tribal Landfill and/or Solid Waste Disposal Sites Lists	0.50 mile	0
State and Tribal Leaking Underground Storage Tanks (LUST) Sites Lists	0.50 mile	0
State and Tribal Registered Underground Storage Tanks (UST) Sites Lists	0.25 mile	0
State and Tribal Voluntary Cleanup (VCP) Sites Lists	0.50 mile	0
State and Tribal Brownfield Sites Lists	0.50 mile	0
State (IN) Spill Incident Sites List	0.125 mile	0
Federal Toxic Chemical Release Inventory System (TRIS) Sites List	Target	0
Federal Toxic Substances Control Act (TSCA) Sites List	0.125 mile	0
Federal FIFRA Section Seven Tracking System (SSTS) Sites List	0.25 mile	0
Federal PCB Activity Database System (PADS) Sites List	0.50 mile	0

The Study Site was not identified in any of the environmental databases searched for this ESA. As show in the above summary table, surrounding properties located within various ASTM-specified search radii of the study site were identified in searched databases.

Sites identified within 1/2 mile of the study site in the searched databases are as follows:

SURROUNDING PROPERTIES WITHIN 1/4 to 1/2 MILE - DATABASE IDENTIFICATION(S)

1. Hazardous Waste Sites

Hazardous waste site documents are held in a state database and can be pulled from a Virtual Filing Cabinet (VFC):

a. NAME: Ricker Oil 41

ADDRESS: 2628 E Main Street, Plainfield, Indiana 46168

Location: 0.40 miles from study site (NW)

Reported Status: UST violation reported 04/24/2019, return to compliance as of 06/07/2019

Based on the information obtained and reviewed from the regulatory records search, unless otherwise noted the surrounding properties identified within 1/8 mile of the study site are unlikely to pose an environmental threat to the study site based on one or more factors associated with each of those properties, including but not limited to their: distance from the study site; absence of high priority reported releases; and geologic/hydrogeologic features limiting contaminant transport. Additional surrounding properties located beyond 1/8 mile of the study site, also do not pose an environmental threat to the study site based on TERRA's evaluation.

4.2 Additional Environmental Record Sources

No additional environmental records were provided to TERRA by the Study User for review.

4.3 Physical Setting Sources

A United States Geological Survey (USGS) 7.5 Minute topographical map dated 2019 was obtained and reviewed for the Study Site. This map indicates that the site constructed is rolling terrain with a difference of less than 10 feet across the Study Site. A copy of the topographical map referenced is

included in Appendix 14.3.

The Study Site is located in an area with soils identified by the U.S. Soil Conservation Service ("SCS") primarily consisting of Urban Land-Brookston Complex and Urban Land-Crosby Silt Loam Complex in the NE corner of the property. The Urban Land-Brookston Complex is composed of 60% urban land and 40% Brookston soils. The Urban Land-Crosby Complex consists of 60% Urban Land, 35% Crosby, and 5% treaty soils. The Urban Land soils consist of miscellaneous soil types. The Brookston series soils are found in depressions on till plains and the natural drainage is poor; the Crosby series soils are found on till plains and the natural drainage is somewhat poor.

Wetlands are surface areas that are inundated or saturated with water under normal circumstances. Wetlands support a prevalence of hydrophilic vegetation adapted for life in saturated soil conditions and will generally be found in floodplains, along drainage ways, areas of topographic depression, or around the periphery of lakes. The U.S. Fish and Wildlife Service's National Wetlands Inventory Mapping website indicates no designated wetland on the Study Site. Irrespective of map identification, confirmation of wetlands is beyond the scope of this Phase I ESA. An illustration is included in Appendix 14.3 that depicts output from the National Wetlands Inventory Mapping website relative to the Study Site and property in the vicinity of the site.

A copy of the most recent available Flood Insurance Rate Map (FIRM) providing coverage for the Study Site was also reviewed by TERRA and has been included in Appendix 14.3. The applicable FIRM shows the Study Site is outside any flood zone.

4.4 Historical Use Information for the Property

In addition to the USGS topographical map referenced above, historical aerial photographs providing coverage of the Study Site were also reviewed for the years 1939, 1946, 1948, 1958, 1966, 1969, 1977, 1984, 1992, 1998, 2003, 2004, 2005, 2006, 2007, 2008, 2010, 2012, 2014, 2016, 2018 and 2020 as part of the study. Copies of these photographs are provided in Appendix 14.4.

All photos reviewed show the Study Site as an undeveloped, vacant land throughout its history. No structures or other improvements were visible in any of the photos. The 2003 aerial shows the construction of Perry Road on the west property boundary. The 2006 aerial shows the construction of City Center Way and northeastern detention pond.

The largest and most complete collection of fire insurance maps commercially available was also queried as a part of this study in an effort to aid in identifying past uses of the Study Site. Fire insurance maps were not available for this site. Copies of the fire insurance map search results are included in Appendix 14.4 of this report.

4.5 Historical Use Information for the Adjoining Properties

An analysis of the aerial photographs described above was also performed for the properties adjoining the Study Site. The 2005 aerial shows the construction of "The Shops at Perry Crossing" across Perry Road to the west of the property, the 2006 aerial shows the construction of City Center Way and the construction of the NE detention pond, the 2014 aerial shows new commercial development to the SE and the 2020 aerial details the construction of the Tire Discounters immediately adjacent to the property's north boundary.

TERRA also contracted ERIS to conduct a City Street Directory review for the Study Site address and surrounding property addresses. The review spanned the years 1960 – 2022. All addresses reviewed along Perry Rd. and Pinecrest Dr. posed no REC to the Study Site. The complete directory review is provided in Appendix 14.4.

5.0 Site Reconnaissance

5.1 Methodology and Limiting Conditions

A site reconnaissance visit was conducted on January 5, 2023, Mr. Mark Behrens / Mr. Cole Oland of TERRA. TERRA was unaccompanied during the site visit. Weather conditions at the time of the visit included light cloud cover with a temperature of approximately 35 degrees F. Access to the Study Site was unencumbered, allowing TERRA to complete a visual observation from the surrounding public thoroughfares, and to also physically inspect the property on foot. The purpose of the inspection was to gather information regarding the environmental conditions at the Study Site and surrounding area. Photographic documentation of the site conditions at the time of the site inspections is included in Appendix 14.2.

5.2 General Site Setting

At the time of the inspection, the Study Site consisted of open field (mowed grass area) with two 20-ft shipping containers in the northeast corner. The Study site was relatively flat with no discernable elevation difference by eye.

5.3 Exterior Observations

Waterways: Phillips Ditch is located about 0.5 mile to the southwest of the Study site.

Topography & Drainage: The topography of the site constructed rough graded terrain with no discernable difference in elevation. Storm water drainage at the site occurs through natural infiltration in open grassy areas or is collected from impervious surfaces and allowed to convey to the detention pond located to the adjoining property to the northeast of the Study Site.

Groundwater: Information on the groundwater flow direction at the Study Site was not available at the time of the site inspection. In general, shallow groundwater could be expected to be influenced in a northeasterly direction to the existing detention pond northeast of the study site plus deeper groundwater could traverse in a west to southwesterly direction towards Clark's Creek.

PCB Containing Equipment and Materials: Historically, polychlorinated biphenyls (PCBs) were commonly used as thermal insulating additives in electrical transformers and hydraulic equipment in the United States. No electrical transformers are present at the Study Site.

Asbestos Containing Materials: Exposure to asbestos containing materials (ACMs) represents a significant health threat when the material has the potential to emit fibers into the atmosphere where they can be inhaled into the respiratory system. The United States Environmental Protection Agency (EPA) promulgated a three-stage ban in 1975 effectively eliminating the future use of ACMs in building construction. While asbestos containing materials (ACMs) were not suspected by TERRA

during its site inspection, no structure was observed on the property. Therefore, ACMs is not required for this Phase I ESA study.

Underground Storage Tanks (USTs): No evidence of USTs was observed.

Aboveground Storage Tanks (ASTs): No evidence of ASTs was observed.

Solid Waste Management: Solid waste is not actively generated at the Study Site.

Chemical and Raw Materials Usage: No evidence of chemical or raw material usage was observed.

Utilities: City of Plainfield City water + sewer, gas and electric are currently on the property.

5.4 Interior Observations

There are no interior construction materials present on site.

5.5 Vapor Encroachment

ASTM E1527-21 indicates that a REC at a site can be caused by the release of vapors from contaminated soil or groundwater on or near the site. TERRA reviewed the ERIS database information described above, as well as physical setting information, historical information, and findings from the site inspection described above to identify potential vapor encroachment conditions at the site.

TERRA initially reviewed these data sources for known or suspected contaminated sites in an area of concern of 0.33 mile (0.1 mile for petroleum hydrocarbons) from the subject site in any direction or within 1 mile of the Subject Site in the anticipated up-gradient direction. If known or suspected contaminated sites were identified, TERRA reviewed available data to evaluate the potential for contaminants to migrate to within a critical distance of the Subject site (100 feet for non-petroleum related volatile contaminants and 33 feet for petroleum hydrocarbons in ASTM International E2600-10 Standard). No vapor encroachment condition is present at the Study Site at the time of this report.

6.0 Interviews

6.1 Interview with Owner/Owners Representative

Mr. Jeffery M. Reasner, the current manager of the Study site, was interviewed via a questionnaire. Mr. Reasner responded to a questionnaire dated January 13, 2023. He has been affiliated with the Property for around 3 years and indicated that the Study site has historically been vacant to the best of his knowledge has never been developed. Mr. Reasner indicated he is not aware of current zoning laws associated with the Property. Mr. Reasner is also not aware of any environmental concern to the Property. The questionnaires are provided in Appendix 14.5.

6.2 Interview with Occupants

There are no occupants of the study site.

6.3 Interview with Local Government Officials

TERRA contacted the Hendricks County Health Department to inquire about the environmental conditions, complaints, violations, or enforcement actions at the study site. We did not receive a response back.

TERRA contacted the City of Plainfield and Hendricks County Fire Departments to inquire about any hazardous material events or other emergency response events at the Study Site. According to both fire departments they did not respond to our query.

6.4 Interview with Prior Owners

TERRA's attempts to ascertain contact information for prior owners were unsuccessful; therefore interviews with prior owners were not conducted.

7.0 Data Gaps

No data gaps of any consequence to the identification of site environmental conditions are noted.

8.0 Conclusions

TERRA has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-21 for the 405 S Perry Road in Plainfield, Indiana. Based on the information collected and reviewed during this assessment, no evidence of recognized environmental conditions such as evidence of past, existing, or a material threat of future releases to the environment of a hazardous substance or petroleum product associated with the Study Site.

Based on the information collected and reviewed during this assessment, no recognized environmental condition such as evidence of past, existing, or a material threat of future releases to the environment of a hazardous substance or petroleum product associated with the study site was discovered.

9.0 Deviations

No deviations from the ASTM Standard Practice E1527-21 are noted.

10.0 Additional Services

No additional services were requested as part of the Phase I ESA.

11.0 References

Environmental Risk Information Services (ERIS):

Radius Report, Aerial Photographs, City Directory, Fire Insurance Maps

Indiana Map Viewer:

Study Site Photos and Characteristics Data

Indiana Historical Aerial Photo Index

Study Site Historic Aerial Photos

Federal Insurance Agency:

Flood Hazard Boundary Map

Indiana Department of Environmental Management:

Study Site Virtual File Contents

United States Department of Agriculture:

Whitley County Soils Survey

United States Department of the Interior Fish and Wildlife Service:

National Wetlands Inventory Maps

United States Geological Survey:

Topographic Quadrangle Maps

Other Files:

Plainfield, Indiana GIS

Interviews:

Hendricks County Health

Plainfield Fire Department

Study User Representative (Jeffery Reasner)

Hendricks County Fire Department

12.0 Signature(s) of Environmental Professional

I declare that to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in ASTM E1527-21, and I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject properties. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.



Mark Behrens
Principal – Geotechnical & Environmental Services
TERRA Site Development, Inc.

I declare that to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in ASTM E1527-21, and I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject properties. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.



Cole Oland
Project Engineer – Geotechnical and Environmental Services
TERRA Site Development, Inc.

13.0 Qualifications of Environmental Professional

EXPERIENCE SUMMARY

Mark Behrens is a principal of TERRA Site Development, Inc. (TERRA) and serves as Director of Geotechnical Services. He has over 20 years of experience in the area of geotechnical engineering, environmental science and brownfield redevelopment services. He has extensive experience in performing ASTM-compliant environmental due diligence investigations, as well as regulatory closures for public and private sector clients at sites across Indiana. Mark has considerable subsurface geological exploration and sampling, geotechnical engineering, soils laboratory testing, hazardous waste assessment and disposal, and other environmental regulatory compliance management experience for a wide variety of properties from residential, commercial and industrial sites. Mark has been involved on several brownfield redevelopment projects including

for multiple years in a senior project management role on the design team for redeveloping a landfill closure into a public park.

EDUCATION

B.S. in Engineering, Arkansas State University, 1996.

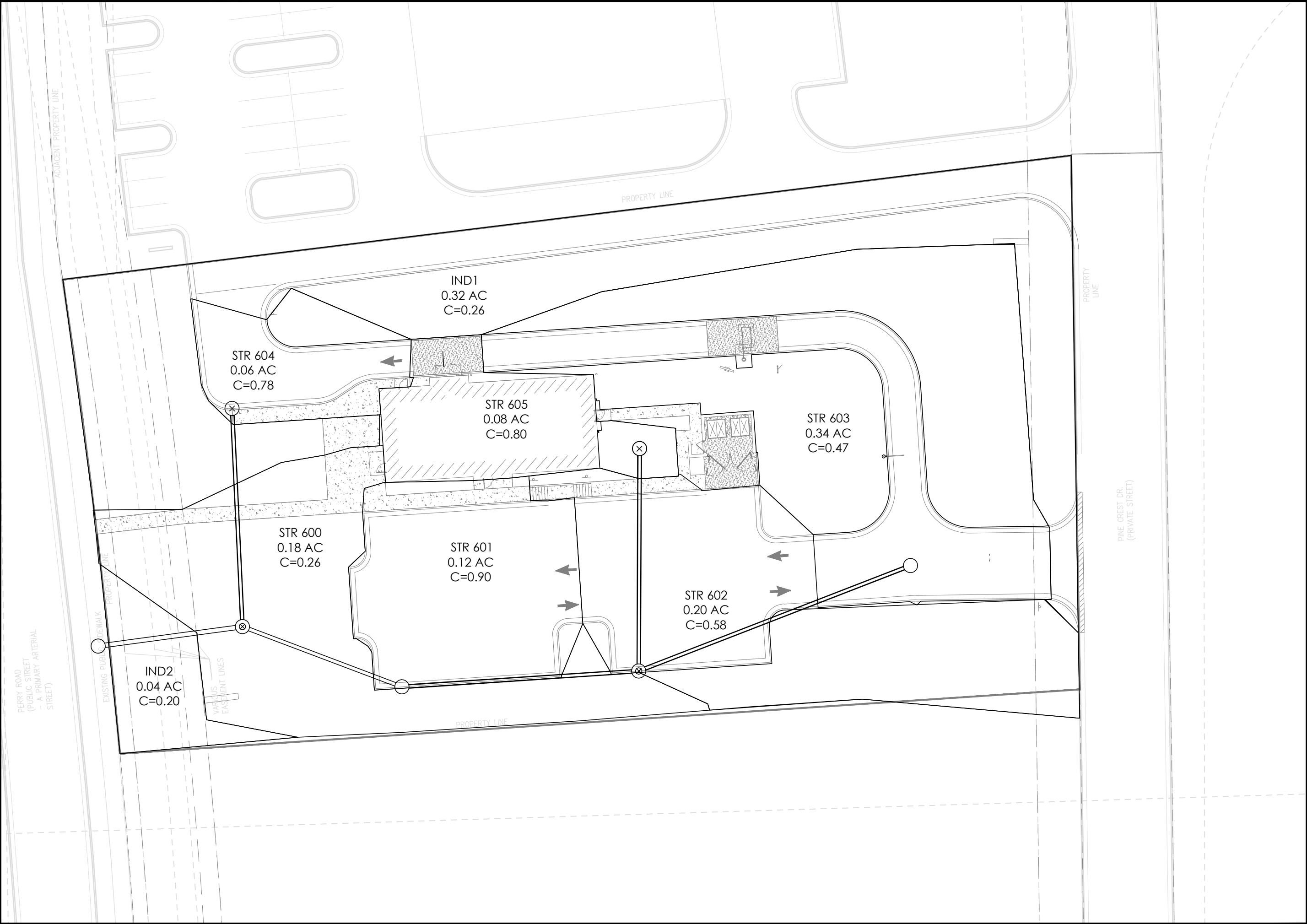
Cole Oland is a project engineer of TERRA Site Development, Inc. (TERRA). He graduated from the Purdue University in the Spring of 2022 and has been involved in several Environmental Remediation projects as well as geotechnical studies. He has been trained in completing ASTM-compliant environmental due diligence investigations.

EDUCATION

B.S. in Civil Engineering, Purdue University, 2022.

APPENDIX E
DEVELOPED CONDITIONS PLAN

P:\2022\2212005_Cousins Subs_Plainfield_Evo Dev\05 Civil\CAD\01-Design Base\T2212005_DR.dwg Thursday, May 4, 2023 11:03:22 AM



COUSINS SUBS - PLAINFIELD

405 S PERRY RD, PLAINFIELD, IN 46168
GUILFORD TWP, HENDRICKS COUNTY, IN E₃, S30, T15N, R2E

EVO DEVELOPMENT
537 N 118TH CT, MILWAUKEE, WI 53225

DEVELOPED CONDITIONS PLAN

DATE: 05/04/23	CHECK: GD
PROJECT NO. 2212005	DRAWN: KLS
SHEET NO. 1	

TERRA

SITE DEVELOPMENT

16102 Spring Mill Road Westfield, Indiana 46074
P: 317.399.1216 F: 317.399.1216
www.TERRAsitedev.com

CIVIL ENGINEERS
LAND SURVEYORS
DEVELOPMENT CONSULTANTS
GEOTECHNICAL
ENVIRONMENTAL
CONSTRUCTION STAKING
CONSTRUCTION MAT. TESTING

APPENDIX F

HGL CALCULATIONS

Line No.	Inlet ID	Invert Dn (ft)	Invert Up (ft)	HGL Dn (ft)	HGL Up (ft)	Line Size (in)	Line Slope (%)	Line Length (ft)	Drng Area (ac)	Runoff Coeff (C)	Vel Ave (ft/s)	Flow Rate (cfs)	Capac Full (cfs)		
1	600	760.97	761.22	761.72	761.93 j	18	0.50	50.000	0.18	0.26	4.05	3.46	7.43		
2	601	762.97	763.76	763.51	764.45	15	1.36	58.207	0.12	0.90	4.98	2.91	7.53		
3	602	764.01	764.42	764.76	765.16	12	0.50	81.000	0.20	0.58	3.63	2.28	2.52		
4	603	764.42	764.91	765.47	765.58	12	0.50	99.546	0.34	0.47	1.82	1.18	2.52		
5	604	763.22	764.59	763.40	764.84	12	1.84	74.540	0.06	0.78	2.97	0.35	4.83		
6	605	764.42	765.80	765.47	766.08 j	12	1.82	75.912	0.08	0.80	1.59	0.48	4.80		