
**STRUCTURE GEOTECHNICAL REPORT
MAIN STREET OVER I & M CREEK UNNAMED TRIBUTARY
CULVERT 15 AT STATION 155+31.67
PR SN 016-1403, SECTION 2020-142-C&DR
LEMONT, COOK COUNTY, ILLINOIS**

**For
Mott MacDonald
10 South LaSalle Street, Suite 2520
Chicago, IL 60603**

**Submitted by
Wang Engineering, Inc.
1145 North Main Street
Lombard, IL 60148**

**Original Report: December 27, 2021
Revised Report: May 11, 2022**

Technical Report Documentation Page

1. Title and Subtitle Structure Geotechnical Report, Culvert at Station 155+31.67 Main Street from Wheeler Road to Illinois 83 (Archer Avenue)		2. Original Date: December 27, 2021 Revised Date: May 11, 2022			
4. Route / Section / County/ District/ Region FAU3585/ 2020-142-C &DR/ Cook/ 1/ 1		3. Report Type ☒ SGR ☐ RGR ☐ Draft ☒ Final ☐ Revised			
6. PTB / Item No. 196/006		7. Existing Structure Number(s) 016-1403			
8. Proposed Structure Number(s) 016-1403		5. IDOT Job / Contract D-91-449-20/ 62L30			
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%; vertical-align: top;"> 9. Prepared by Wang Engineering, Inc. 1145 N Main Street Lombard, IL 60148 </td> <td style="width: 33%; vertical-align: top;"> Contributor(s) Author: Ramesh KC, PE QA/QC: Corina T. Farez, PG, PE PM: Met Seyhun, PE </td> <td style="width: 33%; vertical-align: top;"> Contact (630) 953-9928 ext. 1018 mseyhun@wangeng.com </td> </tr> </table>			9. Prepared by Wang Engineering, Inc. 1145 N Main Street Lombard, IL 60148	Contributor(s) Author: Ramesh KC, PE QA/QC: Corina T. Farez, PG, PE PM: Met Seyhun, PE	Contact (630) 953-9928 ext. 1018 mseyhun@wangeng.com
9. Prepared by Wang Engineering, Inc. 1145 N Main Street Lombard, IL 60148	Contributor(s) Author: Ramesh KC, PE QA/QC: Corina T. Farez, PG, PE PM: Met Seyhun, PE	Contact (630) 953-9928 ext. 1018 mseyhun@wangeng.com			
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%; vertical-align: top;"> 10. Prepared for Mott MacDonald 10 S. LaSalle Street, Suite 2520 Chicago, IL, 60603 </td> <td style="width: 33%; vertical-align: top;"> Design Engineer Kevin Bollinger, P.E. </td> <td style="width: 33%; vertical-align: top;"> Contact (312) 894-5368 kevin.bollinger@mottmac.com </td> </tr> </table>			10. Prepared for Mott MacDonald 10 S. LaSalle Street, Suite 2520 Chicago, IL, 60603	Design Engineer Kevin Bollinger, P.E.	Contact (312) 894-5368 kevin.bollinger@mottmac.com
10. Prepared for Mott MacDonald 10 S. LaSalle Street, Suite 2520 Chicago, IL, 60603	Design Engineer Kevin Bollinger, P.E.	Contact (312) 894-5368 kevin.bollinger@mottmac.com			
11. Abstract The existing single cell three sided culvert with 16.3-foot wide and 5.4-high opening that carries Main Street over I&M Creek Unnamed Tributary will be replaced. The proposed culvert will be precast or cast-in-place double-cell box culvert with an interior opening of 8-foot wide and 4-foot high. The culvert will have a length of 54 feet, a total width of 18.6 feet, and up to 4.3 feet of embankment fill on the top. Beneath the pavement and topsoil surface, boring encountered 2.4 to 15 feet of medium stiff to very stiff silty loam to silty clay loam followed by loose to medium dense silt, silty loam to sandy loam. Groundwater was encountered while drilling at elevations of 598.8 and 604.7 feet (8 and 23 feet bgs) and was measured in open boreholes at elevations of 596.8 and 602.7 feet (10 and 25 feet bgs) upon completion of drilling. Groundwater was observed 7.6 feet below the bottom of proposed footing. We do not anticipate groundwater during excavation; however, depending upon prevailing climate conditions and the time of the year the culvert construction taken place, control runoff and maintenance of existing flows may require temporary water diversion and control. Based on the subsurface investigation, average bottom of culvert elevation is 612.3 feet. The new culvert is anticipated to rest on the medium stiff silty clay loam or loose silty loam which could experience settlement of 1.6 inches. Wang recommend removing 12 inches or up to 611 feet elevation and replace with IDOT CA-6 or District one "Aggregate Subgrade Improvement" material. For the replacement of culvert and to maintain the traffic along Main Street, temporary sheet piling can be design using IDOT Design guide 3.3.13 (IDOT 2012). Wang recommends that the impact of the proposed culvert on the existing utilities including gas line, sanitary sewer, and water main be undertaken for safety and construction reasons.					
12. Path to archived file N:_WANGLegacy\SHARED\Netprojects\2690201\Reports\Culvert_15_SGR\V03\RPT_Wang_RKC-MWS_2690201MainStreetCulvert15FinalV01_20220511.doc					

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**STRUCTURE GEOTECHNICAL REPORT
MAIN STREET OVER I & M CREEK UNNAMED TRIBUTARY
CULVERT 15 AT STATION 155+31.67
PR SN 016-XXXX, SECTION 2020-143-C&DR
LEMONT, COOK COUNTY, ILLINOIS
FOR
MOTT MACDONALD**

1.0 INTRODUCTION

This report presents the results of our subsurface investigation, laboratory testing, geotechnical evaluations, and recommendations to support the design and construction of replacement of culvert over I & M Creek Unnamed Tributary at Station 155+31.67 in the Village of Lemont, Cook County, Illinois. On the USGS *Quadrangle 7.5 Minute Series* map, the project site is generally located at SE $\frac{1}{4}$ of Section 14, Township 37N, Range 11E of the Third Principal Meridian. A *Site Location Map* is presented as Exhibit 1.

The purpose of this investigation was to characterize the site soil and groundwater conditions, perform geotechnical analyses, and provide recommendations for the design and construction of the proposed culvert replacement.

1.1 Proposed Structure

Based on *General Plan and Elevation Sheets(GPE)* (Appendix-C) dated December 22, 2021 provided by Mott MacDonald (Mott), Wang Engineering, Inc. (Wang) understands the existing single cell culvert will be removed and replaced with a precast or cast-in-place double-cell box culvert with an interior opening of 8-foot wide and 4-foot high. The culvert has a proposed invert elevation of 613.57 feet at the upstream and 612.81 feet at downstream ends.

The culvert will have a length of 54 feet and total width of 18.6 feet with up to 4.3 feet of embankment fill on the top. Culvert wingwalls type is yet to be determined. The culvert replacement will be done on staged construction to maintain traffic at Main Street.

The types of wingwalls at upstream and downstream ends have not been determined at the time of report preparation.

1.2 Existing Structure and Land Use

The existing structure was constructed circa 1900. The structure consists of a single cell 16.3-foot wide and 5.4-foot high three sided culvert. The existing overtop elevation is 619.4 at Sta. 150+50 and proposed overtop elevation is 622.06 at Sta. 155+31.67. The existing structure will be completely removed. The surrounding land of the culvert is generally wooded area.

2.0 METHODS OF INVESTIGATION

The following sections outline the field and laboratory investigations performed by Wang.

2.1 Field Investigation

The field investigation consisted of three structure borings, designated as CUL-15-01 through CUL-15-03 drilled along the north right-of-way shoulder and in both eastbound and westbound lanes of Main Street. The borings were performed by Wang from October 5 to 13, 2021. The as-drilled northings and eastings were obtained with a mapping-grade GPS unit. Elevations, stations, and offsets were provided by Mott. As-drilled boring locations are presented in the *Boring Logs* (Appendix A) and the as-completed boring locations are shown in the *Boring Location Plan* (Exhibit 2).

A Truck-mounted drilling rig, equipped with hollow stem augers, was used to advance and maintain open boreholes for borings CUL-15-02 and CUL-15-03. Soil sampling was performed according to AASHTO T206, *"Penetration Test and Split Barrel Sampling of Soils."* The soil was sampled at 2.5-foot intervals to the boring termination depths. Rig access was limited to the north of the culvert, a jackhammer driven Geoprobe sampler was used to continuously sample soils at Boring CLU-15-01. Soil samples collected from each sampling interval were placed in sealed jars and transported to the laboratory for further examination and laboratory testing. Additionally, a bulk sample was collected at Boring CUL-15-01 for further hydraulic analysis.

Field boring logs, prepared and maintained by Wang geologists, include lithological descriptions, visual-manual soil (IDH Textural) classifications, results of Rimac and pocket penetrometer unconfined compressive strength tests, and results of Standard Penetration Tests (SPT) recorded as blows per 6 inches of penetration.

Groundwater levels were measured while drilling and at completion of each boring. Each borehole was backfilled upon completion with soil cuttings and/or bentonite chips. The pavement surface was restored as close as possible to its original condition.

2.2 Laboratory Testing

The soil samples were tested in the laboratory for moisture content (AASHTO T265). Atterberg limits (AASHTO T89 and T90) and particle size analyses (AASHTO T88) were performed on selected samples. Tested samples were classified according to the IDH classification system. Field visual descriptions of the soil samples were verified in the laboratory. Laboratory test results are shown in the *Boring Logs* (Appendix A) and in the *Laboratory Test Results* (Appendix B). Additionally, a bulk sample was collected for scour analysis.

3.0 INVESTIGATION RESULTS

Detailed descriptions of the soil conditions encountered during the subsurface investigation are presented in the attached *Boring Logs* (Appendix A) and in the *Soil Profile* (Exhibit 3). Please note that strata contact lines represent approximate boundaries between soil types. The actual transition between soil types in the field may be gradual in horizontal and vertical directions.

3.1 Lithological Profile

Boring CUL-15-01, drilled at the downstream of culvert encountered 4 inches of clay loam topsoil. Borings CUL-15-02 and CUL-15-03, drilled along Main Street, encountered 8 inches of asphalt over 8 inches of concrete pavement underlain by 4 to 10 inches of gray sandy gravel aggregate base. In descending order, the general lithologic succession encountered beneath the surface includes: 1) medium stiff to very stiff silty clay loam and clay loam; 2) medium dense to dense silt to silty loam; and 3) loose to medium dense sand to sandy loam.

1) Medium stiff to very stiff silty clay loam and clay loam

Beneath the pavement and topsoil, at elevations of 611.2 and 620.5 feet, the borings encountered 2.4 to 15 feet of medium stiff to very stiff, brown to gray silty clay loam and clay loam interbedded with medium dense, damp silty loam. The unit has Q_u values range between 0.5 to 2.5 tsf and moisture content values range between 13 to 26%. The interbedded 9-foot thick medium dense silty loam layer has N values of 12 to 25 blows per foot and moisture content values range between 13 to 15%. At an elevation of 612.4 feet, a 1.2-foot thick, brown and gray, damp sandy gravel was

encountered above the clay loam.

2) *Medium dense to dense silt to silty loam*

At elevations of 605.5 and 608.8 feet, the borings encountered 6.5 to 10 feet of medium dense to dense, gray, dry to moist silt to silty loam. The unit has N values range from 18 to 34 blows per foot, Qu values range between 1.5 to 3.0 tsf and moisture content values range between 8 to 15%. Laboratory test results on this layer show Liquid Limit (LL) value of 18% and Plastic Limit (PL) value of 14%. Liquid Limit (LL) and Plastic Limit (PL) Test done on a sample from this layer shows LL value of 18% and PL value of 14%.

3) *Loose to medium dense sand to sandy loam*

At elevations of 598.8 and 599.0 feet, the borings encountered loose to medium dense, brown, saturated, fine sand to sandy loam extending to boring termination depths. The sand to sandy loam has N values range from 9 to 28 blows per foot and moisture content values range between 23 to 29%.

3.2 Groundwater Conditions

Groundwater was encountered while drilling at elevations of 598.8 and 604.7 feet (8 and 23 feet bgs) and was measured in open boreholes at elevations of 596.8 and 602.7 feet (10 and 25 feet bgs) upon completion of drilling. Based on seasonal fluctuation, we estimate the long-term groundwater elevation could be as high as 609 feet or on top of silt to silty loam layer.

4.0 ANALYSES AND RECOMMENDATIONS

In the following sections, we present the results of our analyses and recommendations for the proposed culvert and wingwalls.

4.1 Culvert Foundations

The new culvert footprint along length and width will be larger than existing three sided culvert. The concern would be the differential settlement between the existing culvert footprint and the new precast section bearing upon virgin soils. Wang recommends settlement collars for possible differential settlement.

Settlement analyses was performed for the new culvert based on the boring information, and the

estimated culvert and roadway fill pressures applied to the full width of the culvert at an average proposed foundation bearing elevation of 612.3 feet elevation. Borings revealed up to 3.2-foot thick medium stiff to very stiff silty clay loam or loose to medium dense silty loam layer followed by medium dense silty loam to sand layer below the culvert bottom.

We estimate the foundation soils will experience a total settlement of 1.6 inches. Extended part of the new culvert will sit on virgin soil. Differential settlement is possible, therefore, prior to culvert barrel construction, we recommend removing 12 inches or to an elevation of about 611 feet of unsuitable medium stiff silty clay loam or loose silty loam. The total settlement after treatment will be about 1 inch or less and differential settlement 3/4 inch or less. The replacement material could be IDOT CA-6 or IDOT District One “*Aggregate Subgrade Improvement*” materials. Any culvert bedding material should be taken into account. The removal and replacement material should extend a minimum of two foot beyond the edge of the box. The actual extent of the removal shall be determined in the field by a geotechnical soil inspector at the time of construction. It should be noted that groundwater table can be as high as 609 feet, thus water control will be needed during construction. Based on our analysis both precast or cast-in-place culverts are feasible at this site.

4.2 Wingwalls

Based on General Plan and Elevation and information provided by Mott, the wingwall types at upstream and downstream ends have not been determined yet. It should be noted that if the proposed wingwalls are less than 16 feet in length, a horizontal cantilever wingwall type could be considered (IDOT 2017). For wingwalls longer between 14 feet and up to 30 feet, two-way L-type cantilever wingwalls could be used. The horizontal cantilever and L-type wingwalls are supported by the culvert box rather than the foundation soils. Horizontal cantilever wingwalls should be designed based on the guidelines provided in Section 4.2 of the IDOT *Culvert Manual* (2017).

Other wingwall type could be cast-in-place T-type walls, the footings should be established at a depth such that they would be at least 4 feet below culvert barrel invert elevation.

4.3 Global Stability

Since the horizontal cantilever walls are expected to be preferred wingwall type, we do not anticipate global instability concerns for wingwalls. For the T-type wall, global stability analysis will be performed when cross-section drawing becomes available.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 Site Preparation

The existing vegetation, surface topsoil, pavement, and debris should be cleared and stripped where the foundations will be placed.

5.2 Excavation, Dewatering, and Utilities

Excavations should be performed in accordance with local, state, and federal regulations. The potential effect of ground movements upon nearby roadways and utilities should be considered during design and at the time of construction. Therefore, Wang recommends that the impact of the proposed culvert on the existing utilities including gas, water, and sanitary sewer at the north end should be undertaken for safety and construction reasons. Temporary sheet piling is feasible using IDOT Design Guide 3.3.1.13 (IDOT 2012). Temporary sheet piles can be used for any excavation that cannot be sloped 1:2.5 (V:H).

The groundwater was observed at elevations 604.7 feet which is 7.6 feet below the proposed culvert base slab. Depending upon prevailing climate conditions and the time of the year when wingwalls construction taken place, control runoff and maintenance of existing flows may require temporary water diversion and control. Any water that accumulates in open excavations by seepage or runoff should be immediately removed.

Unstable or unsuitable materials exposed during excavation should be removed and replaced with compacted structural fill as described in Section 4.1. Geotechnical and field engineer may extend or reduce the limits of excavation based on soil condition encountered during construction. The following note should be included:

The limits and quantities of removal and replacement shown are based on the boring data and may be modified by the District Geotechnical and Field Engineers for variable subsurface conditions encountered in the field.

In cases where replacement below the box culvert extension where dewatering and compaction is not possible, Rockfill shall be used and the following note should be added:

The Rockfill shall be capped with 6 inches of CA7 and satisfy the Standard Specifications unless

otherwise indicated in the Special Provisions. The cost of the capping material shall be included in the pay item for Rockfill.

5.3 Filling and Backfilling

Fill used as embankment material and for replacement of any unstable or unsuitable soils encountered during construction should be pre-approved by the Engineer. The material used to backfill around and to a level at least 1 foot over the top of the culvert box, should be porous granular material conforming to the requirements specified in the IDOT 2022 Standard Specifications (IDOT 2022). The fill material should be free of organic matter and debris. Engineered fill should be placed in lifts and compacted according to Section 205, Embankment (IDOT 2022).

5.4 Earthwork Operations

The required earthwork can be accomplished with conventional construction equipment. Moisture and traffic will cause deterioration of exposed subgrade soils. Precautions should be taken by the Contractor to prevent water erosion of the exposed subgrade. A compacted subgrade will minimize water runoff erosion.

Earth moving operations should be scheduled to not coincide with excessive cold or wet weather (early spring, late fall or winter). Any soil allowed to freeze or soften due to the standing water should be removed. Wet weather can cause problems with subgrade compaction.

It is recommended that an experienced geotechnical engineer be retained to inspect the exposed subgrade, monitor earthwork operations, and provide material inspection services during the construction phase of this project.

6.0 QUALIFICATIONS

The analysis and recommendations submitted in this report are based upon the data obtained from the borings drilled at the locations shown on the boring logs and in Exhibit 2. This report does not reflect any variations that may occur between the borings or elsewhere on the site, variations whose nature and extent may not become evident until the course of construction. If changes are planned to the proposed improvements as described in this report, we should be timely informed so that our recommendations can be adjusted accordingly.

It has been a pleasure to assist Mott MacDonald and the Illinois Department of Transportation on this project. Please call if there are any questions, or if we can be of further service.

Respectfully Submitted,

WANG ENGINEERING, INC.

Metin W. Seyhun, P.E.
Project Manager

Ramesh KC, P.E.
Project Geotechnical Engineer

Corina T. Farez, P.E., P.G.
QA/QC Reviewer

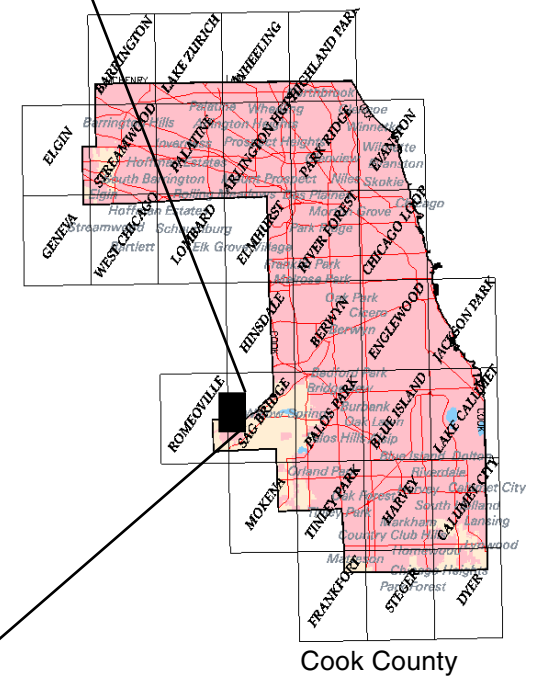
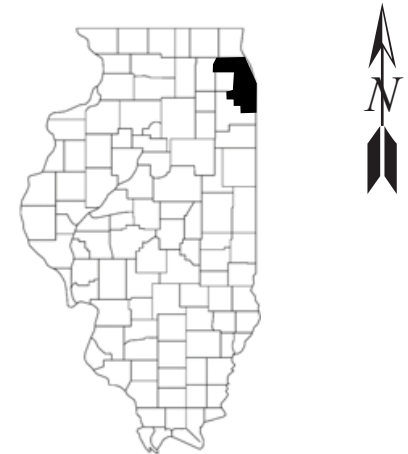
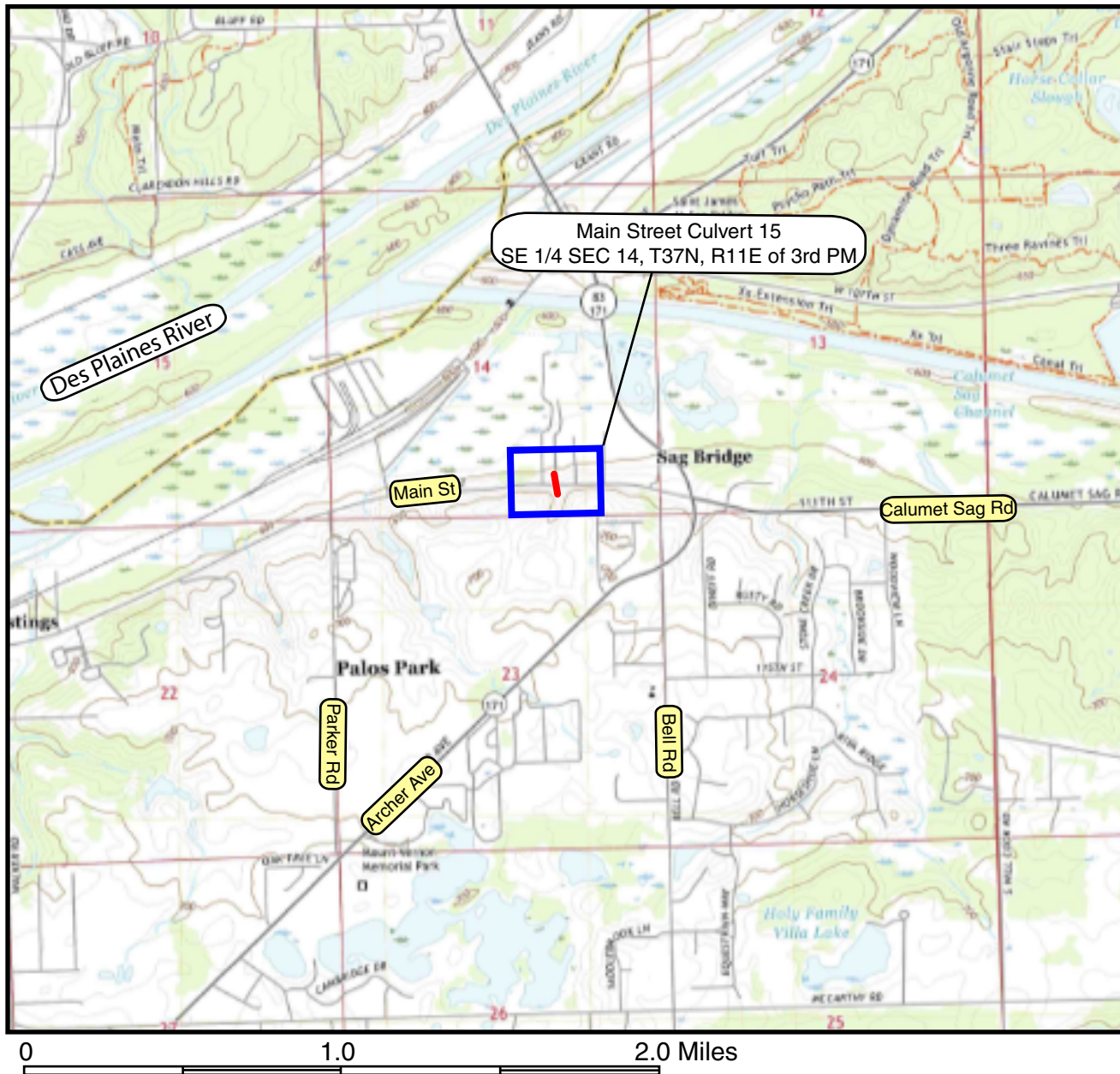
REFERENCES

AASHTO (2020) *LRFD Bridge Design Specifications, 9th Edition*. Washington DC.

IDOT (2017) *Culvert Manual*. Illinois Department of Transportation.

IDOT (2022) *Standard Specifications for Road and Bridge Construction*. Illinois Department of Transportation.

EXHIBITS



SITE LOCATION MAP: MAIN STREET OVER I&M UNNAMED TRIBUTARY,
CULVERT 15 AT STA. 155+31.67, COOK COUNTY, ILLINOIS

SCALE: GRAPHICAL

EXHIBIT 1

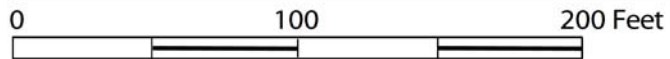
DRAWN BY: J. Bensen
CHECKED BY: M. Seyhun



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FOR MOTT MCDONALD

269-02-01



Legend

- Boring Location

BORING LOCATION PLAN: MAIN STREET OVER I&M UNNAMED TRIBUTARY,
CULVERT 15 AT STA. 155+31.67, COOK COUNTY, ILLINOIS

SCALE: GRAPHICAL

EXHIBIT 2

DRAWN BY: J. Bensen
CHECKED BY: M. Seyhun

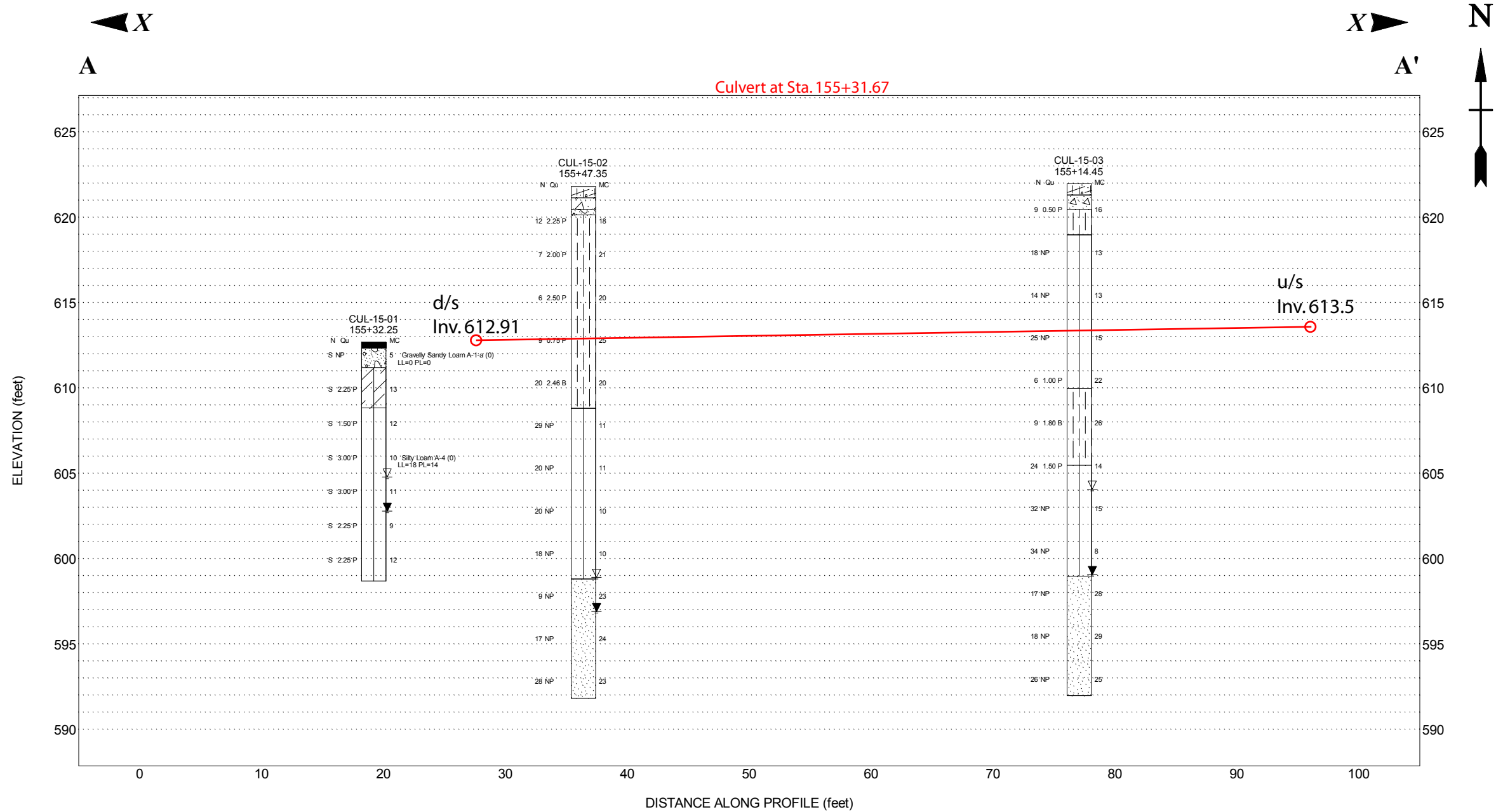


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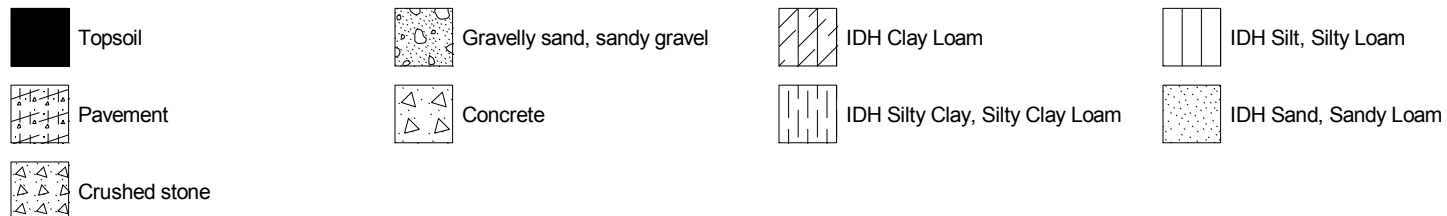
FOR MOTT MCDONALD

269-02-01

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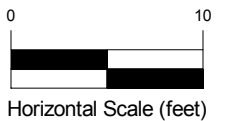
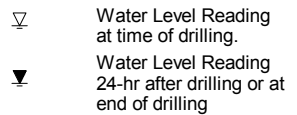
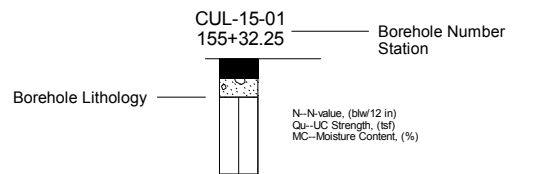


Lithology Graphics



Site Map Scale 1 inch equals 35 feet

Explanation:



Vertical Exaggeration: 1.5x

Wang Engineering, Inc.
1145 N Main Street
Lombard, IL 60148

Subsurface Data Profile
Culvert at Sta. 155+31.67



Main Street Lemont from Wheeler RD
to IL 83
Cook County, IL

JOB NUMBER	PLATE NUMBER
269-02-01	EXHIBIT 3

APPENDIX A

LEGEND FOR BORING LOG

Relative Density of Non-Cohesive Soils	
N-Blows/ 12 inches	Relative Density Term
0-3	Very Loose
4-9	Loose
10-29	Medium Dense
30-49	Dense
50-80+	Very Dense

Consistency of Cohesive Soils	
Unconfined Compressive Strength Q_u , tsf	Consistency Term
<0.25	Very Soft
0.25-0.49	Soft
0.50-0.99	Medium Stiff
1.00-1.99	Stiff
2.00-3.99	Very Stiff
>4.00	Hard

Rock Quality Designation (RQD)	
0-25%	Very Poor
25-50%	Poor
50-75%	Fair
75-90%	Good
90-100%	Excellent

SS = Split Spoon
 ST = Shelby Tube
 SPT = Standard Penetration Test
 Q_u = Unconfined Compressive Strength
 NP = Non Plastic
 P = Pocket Penetrometer
 S = Shear failure of sample, Rimac test
 B = Bulge failure of sample, Rimac test
 SSA = Solid Stem Augers,
 HSA = Hollow Stem Augers,

Proportional Terms		
Trace	1-9	Percent of Dry Weight
Little	10-19	
Some	20-34	
And	35-50	
Gradation Terminology		
Boulders	>200mm	
Cobbles	200mm to 75mm	
Gravel	75mm to 2mm	
Sand	2-0mm to 0.074mm	
Silt	0.074mm to 0.002mm	
Clay	<0.002mm	

Relative Moisture Conditions	
Term	Description
Dry	Dusty, No visible moisture
Damp	Cohesives hard to mold; Granulars do not flow easily
Moist	Cohesives can be molded; Granulars start to stick together
Wet	Cohesives can be very easily molded and sticky; Granulars stick together easily
Saturated	Only granular soils; Water drains freely from sample

Relative Drilling Resistance (RDR)	
1	No Chatter - Very Easy Drilling
2	No Chatter - Easy Drilling
3	Some Chatter - Moderate Advancement
4	Frequent Chatter - Slow Advancement
5	Constant Chatter - Very Slow Advancement

Sample Type Symbols



Split Spoon



Rock Core



In-situ Vane Shear Test



No Recovery



Shelby Tube



Geoprobe



Auger Cuttings

SPT = Standard Penetration Test
 N Value is the sum of the second
 and the third numbers



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BORING LOG CUL-15-01

WEI Job No.: 269-02-01

Client **Mott MacDonald**
Project **Main Street Lemont from Wheeler RD to IL 83**
Location **Cook County, IL**

Datum: NAVD 88
Elevation: 612.68 ft
North: 1829322.20 ft
East: 1092009.37 ft
Station: 155+32.25
Offset: 22.89' LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	612.44	1/2-inch thick, very soft (<0.25P), black CLAY LOAM; damp			1	PUSH	NP	5									
	611.2	--TOPSOIL-- Brown and gray SANDY GRAVEL; damp			2	PUSH	2.25 P	13									
	608.8	Very stiff, brown CLAY LOAM, some gravel; damp			3	PUSH	1.50 P	12									
		Stiff to very stiff, brown to gray SILTY LOAM, little to some gravel; damp to moist	5		4	PUSH	3.00 P	10									
		--L _L (%)=18, P _L (%)=14-- --%Gravel=11.7-- --%Sand=22.8-- --%Silt=58.5-- --%Clay=7.1-- --A-4 (0)--			5	PUSH	3.00 P	11									
			10		6	PUSH	2.25 P	9									
					7	PUSH	2.25 P	12									
	598.7	Boring terminated at 14.00 ft	15														
			20														

GENERAL NOTES

Begin Drilling **10-11-2021** Complete Drilling **10-11-2021**
Drilling Contractor **Wang Testing Services** Drill Rig **Geoprobe HA**
Driller **R&A** Logger **M. Sadowski** Checked by **C. Marin**
Drilling Method **1" ID HSA; boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ∇ **8.00 ft**
At Completion of Drilling $\blacktriangledown$ **10.00 ft**
Time After Drilling **NA**
Depth to Water ∇ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.



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BORING LOG CUL-15-02

WEI Job No.: 269-02-01

Client **Mott MacDonald**
Project **Main Street Lemont from Wheeler RD to IL 83**
Location **Cook County, IL**

Datum: NAVD 88
Elevation: 621.81 ft
North: 1829313.89 ft
East: 1092024.43 ft
Station: 155+47.35
Offset: 14.62' LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	621.2	8-inch thick ASPHALT --PAVEMENT--															
	620.5	8-inch thick CONCRETE --PAVEMENT--															
	620.2	4-inch thick, gray SANDY GRAVEL; dry --BASE COURSE--			1	3 7 5	2.25 P	18						9	8 8 10	NP	10
		Medium stiff to very stiff, brown SILTY CLAY LOAM; damp --RDR 2--	5		2	4 3 4	2.00 P	21		598.8	Loose to medium dense, brown, fine SAND; saturated --RDR 2--	25		10	3 4 5	NP	23
					3	3 3 3	2.50 P	20						11	4 7 10	NP	24
			10		4	7 5 4	0.75 P	25		591.8		30		12	5 11 17	NP	23
					5	3 8 12	2.46 B	20			Boring terminated at 30.00 ft						
	608.8	--1-inch thick, fine sand seam; wet--			6	7 13 16	NP	11									
		Medium dense, gray SILTY LOAM, trace to some gravel; damp --RDR 2--	15		7	7 9 11	NP	11									
					8	9 10 10	NP	10									
			20									40					

GENERAL NOTES

Begin Drilling **10-13-2021** Complete Drilling **10-13-2021**
Drilling Contractor **Wang Testing Services** Drill Rig **20CME55T[81%]**
Driller **R&A** Logger **M. Sadowski** Checked by **C. Marin**
Drilling Method **3.25" ID HSA; boring backfilled upon completion**

WATER LEVEL DATA

While Drilling **23.00 ft**
At Completion of Drilling **25.00 ft**
Time After Drilling **NA**
Depth to Water **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.



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1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
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BORING LOG CUL-15-03

WEI Job No.: 269-02-01

Client **Mott MacDonald**
Project **Main Street Lemont from Wheeler RD to IL 83**
Location **Cook County, IL**

Datum: NAVD 88
Elevation: 621.97 ft
North: 1829293.33 ft
East: 1091991.47 ft
Station: 155+14.45
Offset: 6.04' RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	621.3	8-inch thick ASPHALT --PAVEMENT--									--frequent rig chatter, 20.0 to 21.0 feet-- --possible cobbles--						
	620.5	Gray CRUSHED STONE --AGGREGATE BASE--															
	619.0	Medium stiff, brown SILTY CLAY LOAM, trace gravel; damp --RDR 2--			1	4 5 4	0.50 P	16						9	12 18 16	NP	8
		Medium dense, brown to gray SILTY LOAM, trace gravel; damp --RDR 2 to 3--	5		2	5 6 12	NP	13		599.0	Medium dense, brown, fine SAND to SANDY LOAM; saturated --RDR 2--	25		10	5 7 10	NP	28
					3	4 8 6	NP	13						11	4 7 11	NP	29
			10		4	3 6 19	NP	15						12	5 11 15	NP	25
	610.0	Stiff, gray SILTY CLAY --RDR 2--			5	7 3 3	1.00 P	22		592.0	Boring terminated at 30.00 ft	30					
		--silt seams and 1-in silt layer; moist--	15		6	3 4 5	1.80 B	26									
	605.5	Medium dense to dense, gray SILT to SILTY LOAM, trace gravel; dry --RDR 2--			7	4 11 13	1.50 P	14									
		--RDR 4--	20		8	7 12 20	NP	15									

GENERAL NOTES

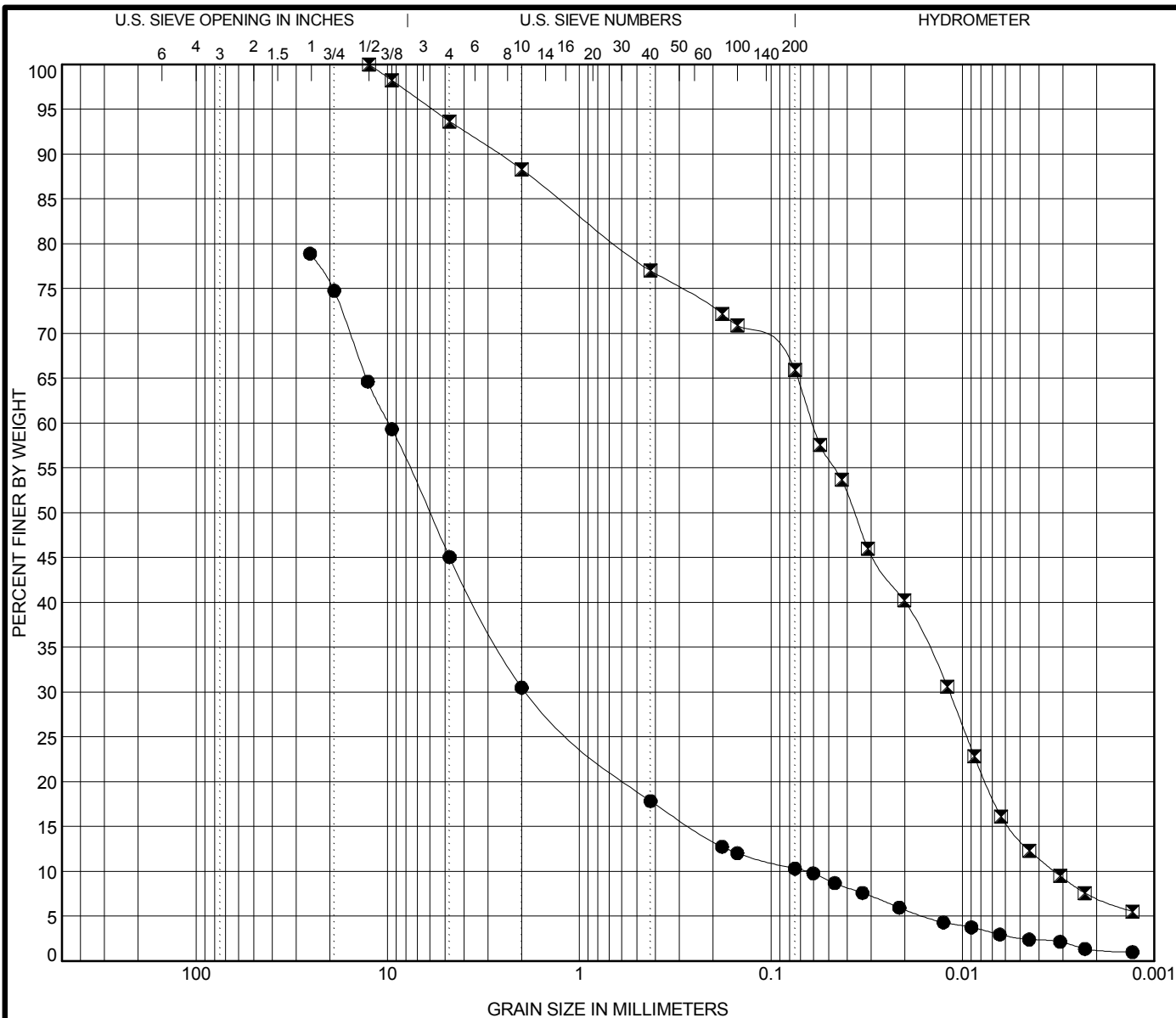
Begin Drilling **10-05-2021** Complete Drilling **10-05-2021**
Drilling Contractor **Wang Testing Services** Drill Rig **20CME55T[81%]**
Driller **R&H** Logger **F. Bozga** Checked by **C. Marin**
Drilling Method **3.25" ID HSA; boring backfilled upon completion**

WATER LEVEL DATA

While Drilling **18.00 ft**
At Completion of Drilling **23.00 ft**
Time After Drilling **NA**
Depth to Water **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

APPENDIX B



COBBLES	GRAVEL	SAND		SILT AND CLAY
		coarse	fine	

Specimen Identification			IDH Classification					LL	PL	PI	Cc	Cu
●	CUL-15-01#1	0.0 ft	Gravelly Sandy Loam					NP	NP	NP	5.47	150.37
☒	CUL-15-01#4	6.0 ft	Silty Loam					18	14	4	0.68	18.26
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	CUL-15-01#1	0.0 ft	25.4	9.859	1.881	0.066	69.5	20.2	9.0	1.3		
☒	CUL-15-01#4	6.0 ft	12.5	0.061	0.012	0.003	11.7	22.8	58.5	7.1		



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GRAIN SIZE DISTRIBUTION

Project: Main Street Lemont from Wheeler RD to IL 83

Location: Cook County, IL

Number: 269-02-01



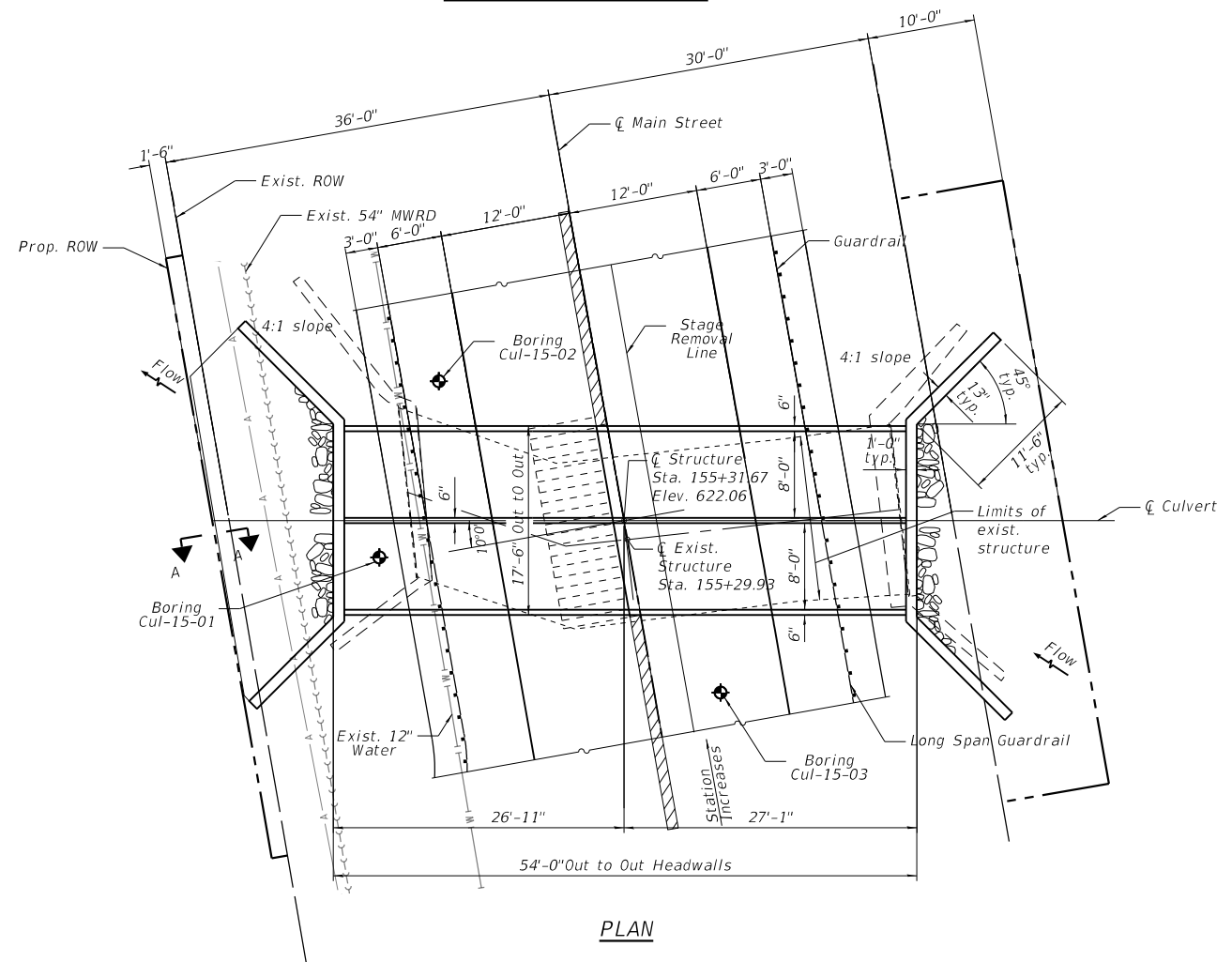
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Number: 269-02-01

APPENDIX C

No salvage



10-Year Velocity through Existing Structure = 6 ft/s
10-Year Velocity through Proposed Structure = 7 ft/s

MODEL: Default
FILE NAME: new\mofft-riso-new hantenv.com\mofft-riso\new-20\Documents\507103006-IPDT-Emont-Main_SireethCAD_Sheers\110144070-shs-detail-C_d\env15.dwg