Questions & Answers - 3

Project	25-049 - Tinley Creek Bank Stabilization, Construction
Buying Organization	Village of Orland Park

No	Question/Answer	Question Date
Q3	**Question: Soil Disposal** Can you please confirm whether it is the owner's intent for contractors to base their bids on the assumption that all material will be accepted at a CCDD facility? Additionally, if any material is rejected or testing indicates that landfill disposal is necessary, will those additional costs be addressed through a change order? **Answer:** 1. Yes, it is the intent to base bids on all material being accepted at a CCDD facility. 2. Yes, any changes outside of the project scope will be addressed via change orders.	10/14/2025
Q4	**Question: Geotechnical Report** Please provide the geotechnical reports referenced on sheet S-101. **Answer:** The "2012 Geotechnical Report" for sheet pile wall will be published as Exhibit I under Addendum #7. An updated geotechnical report will be provided at a later date.	10/14/2025
Q5	**Question: Sheet Piling** Can the designer please provide minimum section modulus and moment of inertia criteria for steel sheet pile? Can the steel sheet pile cap (Detail 1 on S-202) be welded in lieu of a bolted connection? Please specific if any components of the sheet pile wall (wale, steel cap, hardware, sheeting, tie rods) need or be epoxy coated or galvanized. Please confirm all holes in wale, sheeting, and cap can be torch cut in the field. Please confirm toe rods can be coupled between Deadman anchors and sheeting wall. **Answer:** 1. Due to the presence of the proposed deadmen anchors, the sheet pile size can be reduced. The proposed sheet pile section is a PZ22 or approved equal. This corresponds to a sheet pile section modulus of 34.8 in 3 per pile or 9 in 3 per foot of wall. The "Steel Sheet Piling Sections" document will be published as Exhibit J under Addendum #7. 2. Yes. The contractor would need to provide an alternate welding detail for review and approval. 3. Yes, galvanizing and epoxy coating should be included due to proximity of parking lot and likely exposure to deicing salts. As well as the proximity to the creek. 4. Confirmed. Inspection of all holes shall be performed to ensure that integrity of sheet pile/wale is maintained and bearing plates/washers shall be provided. 5. Confirmed. Proposed couplers should be submitted for approval.	10/14/2025

No	Question/Answer	Question Date
Q7	**Question: materials & subs** Looking for a spec for the following: construction fencing? perm erosion barrier? PZ 38 section modulus- for sizing? Species & quantities for the trees and shrubs?- only the total is listed maint & monitor expectations? Regarding the MWRD must/shall requirements- what agencies do the companies need to be certified by? Do we need to turn in with bid? and how will we know that they are approved prior to the project starting? Item 19- seeding- use page L601 or C503? Item 29- supplemental stone? specs? **Answer:** 1. See page 13 of the Special Provisions under "Temporary Fence". Follows IDOT Standard Specs - Section 201. 2. IDOT Standard Specifications for Road and Bridge Construction - Section 280 - PERIMETER EROSION BARRIER 3. Due to the presence of the proposed deadmen anchors, the sheet pile size can be reduced. The proposed sheet pile section is a PZ22 or approved equal. This corresponds to a sheet pile section modulus of 34.8 in 3 per pile or 9 in 3 per foot of wall. The "Steel Sheet Piling Sections" document will be published as Exhibit J under Addendum #7. 4. Based on the Summary of Quantities sheet, the bid should include provisions for 1,000 trees and 250 shrubs. 5. thru 7. Certification by Cook County. Yes, turn in with the bid submittal. The Village will inform the selected contractor. 8. Use seed mixes on L601. 9. See page 37 of the Special Provisions.	10/14/2025
Q8	**Question: Gabion Wall Transition** Detail on C-504 shows RR-4 rock transition that is incidental. It his only at the beginning or ending of the gabion wall? The cross sections don't show the extra RR-4 in them. **Answer:** The rock transition will be at the beginning and end of each gabion section per detail on C504.	10/15/2025
Q10	**Question: Construction Access Points, Utility crossings** There are several construction access points shown. Some of those locations show utilities. Do we have to have protections pads over the lines, or will we be able to run loaded semis over them? If we have to have construction access pads, will you make an allowance as this will be difficult to determine the cost at bid time? **Answer:** We are coordinating with Nicor to get an answer to this question for exact requirements they may have and will be sent in a future addendum or shared with the selected contractor.	10/15/2025
Q12	**Question: Dirt disposal** Has testing been done for CCDD acceptance? Are we to figure the dirt haul off as nonspecial waste? Hauling off to a nonspecial waste landfill subtitle D is considerable more expensive then a CCDD facility. **Answer:** It is the intent to base bids on all material being accepted at a CCDD facility.	10/15/2025

No	Question/Answer	Question Date
Q13	**Question: Tree Removal** Are we only allowed to remove trees from October to March 15th? Has there been a bat study to verify if there are bats or not, so that we can remove the trees as we go? If we have to remove the trees before March 15th, will we be able to walk down the middle of the creek with track equipment to remove the trees? **Answer:** Trees should be removed between November 1st and March 31st. If clearing is desired outside of that window, the contractor will be responsible a bat habitat assessment and further consultation with IDNR may be necessary.	10/15/2025
Q16	**Question: Sheet pile wall** There is a sheet pile wall, station 10+79.84 to 11+36.94, that is adjacent to an apartment building and there are homes near by. Can we change this driven sheet pile wall to a post and panel wall, where we aren't driving sheeting or posts? The deadmen appear to be going into the existing parking lot. Will we have to remove and replace the parking lot? What is the thickness of the asphalt? **Answer:** Agreed, existing asphalt will need to be replaced where deadmen will be installed. Please use an allowance in the bid response.	10/15/2025
Q17	**Question: Creek Flow rate** What is the creek flow rate after a 1" rain event? **Answer:** USGS Rain Gage (05536500) located downstream of this project on Tinley Creek can be used to approximate the expected flows within the creek after various rainfall events.	10/15/2025
Q18	**Question: Sheet Piling** Can you provide me with a data sheet for the PZ38 sheeting? This is not a size we have seen or that our suppliers can produce. From a quick glance it looks like our suppliers only make PZ35 and PZ40. More importantly we would need the minimum required section modulus of the sheet piling. This way maybe we can supply an alternate sheet size that meets the requirements of the PZ38. **Answer:** Due to the presence of the proposed deadmen anchors, the sheet pile size can be reduced. The proposed sheet pile section is a PZ22 or approved equal. This corresponds to a sheet pile section modulus of 34.8 in 3 per pile or 9 in 3 per foot of wall. The "Steel Sheet Piling Sections" document will be published as Exhibit J under Addendum #7.	10/16/2025

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ADDENDUM #5 - PROJECT CLARIFICATIONS
ITB #25-049 - Tinley Creek Streambank Stabilization, Construction

Follow-up clarifications provided for Pre-Proposal Meeting

Non-mandatory Pre-Proposal Meeting was held on Tuesday, October 14th, 2025
at the Village Hall Board Room

Clarification #1: MWRD's Specific MBE participation goals are detailed in the Intergovernmental Agreement (IGA) between the Village and MWRD, please refer to *Exhibit C – MWRD IGA; Exhibit 6 – M/W/SBE Utilization Pla*.

Clarification #2: Contractor to pothole to verify depth of existing gas pipe prior to start of construction. The Village is coordinating with Nicor Gas to get an answer for the exact requirements they may have.

Clarification #3: Contractor is responsible for CCDD testing. For bidding purposes, the contractor should assume spoils will be able to be hauled to a CCDD facility.

Clarification #4: A tree survey was completed, but a complete bat habitat assessment was not completed for the project limits. Trees should be removed between November 1, 2025 and March 31, 2026. If clearing is desired outside of that window, the contractor will be responsible for a bat habitat assessment and further consultation with IDNR may be necessary. Contractor will be able to work on the tree removals as soon as the contract is executed, which is expected in December 2025 or January 2026.

Clarification #5: There is a USGS Rain Gage (05536500) located downstream of this project on Tinley Creek that can be used to approximate the expected flows within the creek after various rainfall events. The base flood elevation varies across the project corridor from 694.1+/- at the south end of the project to 672.4+/- at 151st Street. These elevations are for a 100-year event and are primarily outside the banks for the channel.

The USGS gage suggests that the base flow in the channel is generally less than 2 cfs, but can spike quickly after rain events.

Clarification #6: Work can be done within the creek as long as the flow/hydrology is not disturbed or managed through mechanical methods.

Clarification #7: Yes, a lump sum contract is acceptable. A "Unit Price Sheet", which is a required bid submission document, will be published as Exhibit K under Addendum #7. The Village is requesting unit pricing for each of the items listed on the sheet. These prices will be used to adjust upwards or downwards for changes to stabilization measures required during construction.

Clarification #8: ComED redesign is in progress. Relocation is expected to be completed near the end of 2025. Coordination has been made with all other dry utilities. Contacts are listed in the Special Provisions.

Clarification #9: Earth excavation and disposal are included with the other line items and are defined in the Special Provisions. The contractor is responsible for CCDD testing. For bidding purposes, the contractor should assume spoils will be able to be hauled to a CCDD facility.

Clarification #10: The contractor is responsible for CCDD testing. The number of tests will likely be determined by the requirements of the facility that is receiving the spoils.

Clarification #11: The Village expects substantial completion by December 2026, with 2027 being open for minor restoration.

June, 2012
SO 126076

GEOTECHNICAL REPORT

TINLEY CREEK
STREAMBANK STABILIZATION

PROPOSED RETAINING WALLS
FOR
REACHES TICR 7 AND TICR 8

ORLAND PARK, IL

Prepared for:

Metropolitan Water Reclamation District
of
Greater Chicago

FOR DESIGN PURPOSES ONLY

Prepared by

Baker

Michael Baker Jr., Inc.
Beaver, Pennsylvania

Geotechnical Report
Tinley Creek Streambank Stabilization
Proposed Retaining Walls

TABLE OF CONTENTS

Geotechnical Report
Tinley Creek Streambank Stabilization
Proposed Retaining Walls

TABLE OF CONTENTS

1.0 Introduction

1.1 Geotechnical Objectives

This report contains the results of the geotechnical investigation and geotechnical analyses performed by Michael Baker Jr., Inc. (Baker), under contract to Metropolitan Water Reclamation District (MWRD), for the Tinley Creek Streambank Stabilization proposed retaining walls. Baker's geotechnical analysis includes a sheet pile wall analysis, soil strength parameters and excavation recommendations for the proposed retaining walls.

1.2 Project Location and Background Information

The project is located in Orland Park, Cook County, Illinois. The District Watershed Plan (DWP) for Tinley Creek, Sections TICR-7 and TICR-8, is to install steel sheet piling to alleviate streambank erosion and flooding.

1.3 Physiographic Setting

The project site is located in the Wheaton Morainal Country subsection of the Great Lake Physiographic Section. The Great Lake Section is a further physiographic subdivision of the Central Lowland Province, of the Interior Plains, of the United States. The Chicago residential area of Orland Park, Illinois, in which the project site resides, is characterized by nearly flat to low relief ground terrain, ranging in elevation from approximately 675 to 700 feet. Lake Michigan (elev. 577.5 feet) is located approximately 17 miles to the east-northeast of the project site.

1.4 Geologic Setting

Geological mapping of Cook County, Illinois indicates the glacial soil deposits beneath the project site to be 100 to 125 feet in thickness overlaying bedrock. The elevation of the top of bedrock beneath the soil deposits may be inferred at an approximate elevation range of 550 to 600 feet. Bedrock beneath the soils deposits in the project vicinity is reported as Silurian-aged, pure to silty, dolomite, that is locally cherty. The bedrock is reported as mildly deformed with beds dipping at approximately 10 feet per mile towards the east-southeast. The Silurian-aged dolomite bedrock also contains groundwater in solution channels and fractures and is reported to be hydrologically connected with the overlaying soil deposits.

1.5 Site Soils

The project site is underlain entirely by soils deposited as a result of the advance and retreat of continental glaciers during the Pleistocene Epoch of the Quaternary Period. The Lake Michigan Lobe of the Wisconsin Glacier advanced and retreated over the region from the Lake Michigan Basin to the northeast during the Pleistocene Epoch. These glacial advance/retreat episodes deposited glacial till (unsorted fine to coarse sediment) on top of the bedrock beneath the project site. After the Wisconsin Glacier retreated to the northeast approximately 13,000 years before present, pro-glacial Lake Chicago formed in the Lake Michigan Basin and extended over the project site. Fine lacustrine sediments from pro-glacial Lake Chicago were laid down on top of the previously deposited glacial till at the project site in addition to granular near-shore bar and beach deposits of limited extent. Pro-glacial Lake Chicago subsequently receded to form modern-day Lake Michigan.

2.0 Subsurface Investigation

Wang Engineering performed test borings in March and May, 2012, under subcontract to Baker. Test boring logs describing the subsurface conditions encountered are presented in Appendix A.

Seven test borings, SB-07-09, and SB-11-14, were drilled for Section TICR-7.

Six test borings, SB-01 to SB-06, were drilled for Section TICR-8.

The test borings were advanced using 3.25-inch, ID, hollow stem augers with standard penetration tests (SPT) taken at 2.5 foot intervals; 1.5-inch, OD, hydraulic push, Geoprobe sampling; and hand augering.

2.1 Section TICR-7

Test borings SB-07-09, and SB-11-14, were drilled for Section TICR-7 retaining walls.

Test borings SB-08, 09, and 14, were drilled in the southern portion of the Section. These borings are located between Camelia Avenue to the south, Hollywood Drive to the east, and Tee Brook Drive to the north and west.

Test borings SB-07 was drilled in the central portion of the Section where Tee Brook Drive crosses Tinley Creek. It was drilled on the west side of Tinley Creek.

Test borings SB-11 to SB-14 were drilled in the northern portion of the Section. These borings are located west and northwest of Hollywood Drive and east of Quail Hollow Drive.

The test borings drilled for the southern portion of Section TICR-7, SB-08, 09, and 14, encountered topsoil underlain by lean clay (CL). All of the borings encountered a buried topsoil layer. In test borings SB-08 and SB-09, the layer was encountered between depths of 8 feet and 10 feet. Test boring SB-14 encountered the layer between depths of 10.5 feet and 12.5 feet. Test boring SB-09 also encountered a fine sand and silt (SP) layer at the bottom of the boring between depths of 14 feet and 18 feet. The test borings were terminated at depths of 15 feet, in SB-8; 18 feet in SB-09; and 20 feet in SB-14. Ground water was only encountered in test boring SB-09 at a depth of 14 feet, during drilling and upon completion of drilling.

The test borings drilled for the northern portion of Section TICR-7, SB-11 to SB-13, encountered topsoil (except SB11) underlain by lean clay (CL), lean clay with sand (CL), and fat clay (CH). The soils are softer in the northern portion of the Section. Test boring SB-12 encountered buried topsoil between depths of 4 feet and 7 feet. The test borings were terminated at depths of 18 feet, in SB-11; 20 feet in SB-12; and 18 feet in SB-13. Ground water was encountered in test boring SB-11 at depths of 4 feet, during drilling, and 5 feet upon completion of drilling; in test boring SB-13 at a depth of 8 feet during drilling and upon completion of drilling. Test boring SB-12 did not encounter ground water.

Test boring SB-07 was drilled in the central portion of Section TICR-7. The boring encountered lean clay (CL). A fat clay (CH) layer was encountered between depths of 13 feet and 18 feet. The boring was terminated at a depth of 20 feet. No ground water was encountered in the boring.

2.2 Section TICR-8

Test borings SB-01 to SB-06 were drilled for Section TICR-8.

Test borings SB-01 and SB-02 were drilled in the southern portion of Section TICR-8. The borings are located on the west side of Tinley Creek and between Orlan Brook Drive to the west and 86th Avenue to the east.

Test borings SB-03 and SB-04 were drilled in the central portion of Section TICR-8. The borings are located on the east side of Tinley Creek and west of 86th Avenue, near the intersection of Biltmore Drive.

Test borings SB-05 and SB-06 were drilled in the northern portion of Section TICR-8. The borings are located on the east side of Tinley Creek and west of 86th Avenue, between Biltmore Drive and West 157th Street.

Test borings SB-01 and SB-02 encountered 3-inches and 12-inches of topsoil, respectively. Underlying the topsoil, the borings encountered lean clay (CL). Both borings encountered a buried topsoil layer. In SB-01 it was encountered between depths of 2 feet and 4 feet and in SB-02 between 3 feet and 5 feet. Test boring SB-01 also encountered a sand (SW) layer between depths of 14 feet and 16 feet. Both borings were terminated at a depth of 17.5 feet. Ground water was encountered in test boring SB-01 at a depth of 16 feet, during drilling, and was measured at 12.5 feet at the completion of drilling. Ground water was not encountered in test boring SB-02.

Test borings SB-03 and SB-04 encountered 4-inches and 8-inches of topsoil, respectively. Underlying the topsoil, the borings encountered lean clay (CL). Test boring SB-03 also encountered crushed stone fill between depths of 0.3 feet and 0.8 feet. Both borings were terminated at a depth of 17.5 feet. No ground water was encountered in the borings.

Test borings SB-05 encountered 4-inches of topsoil, whereas, test boring SB-06 was drilled through asphalt pavement and subbase to a total depth of 1.3 feet. Underlying the topsoil and pavement, the borings encountered lean clay (CL). Test boring SB-05 also encountered a silt with gravel (ML) layer, at the bottom of the boring, between depths of 16 feet and 20 feet. Test boring SB-06 encountered a silt with sand layer between depths of 8 feet and 10.5 feet. Test boring SB-05 was terminated at a depth of 20 feet and test boring SB-06 was terminated at a depth of 17.5 feet. No ground water was encountered in either boring.

The soils in TICR-8 are generally stiffer than those in TICR-7.

3.0 Laboratory Testing

Wang Engineering performed laboratory testing under subcontract to Baker. Thirteen classifications, three atterberg limit only tests, and three soil corrosivity tests were performed for the Tinley Creek Streambank Restoration project.

See Appendix B for the results of the laboratory tests.

3.1 Section TICR-7

Six classifications and two atterberg limit only tests were performed for this Section. Table 3.1.1 summarizes the results of the laboratory tests for this Section. Two soil corrosivity tests were also performed for the Section and the results are presented in Table 3.1.2 below.

Table 3.1.1 – TICR-7 Soil Laboratory Test Results

Boring No.	Sample No.	Sample Depth (ft.)	Classification (USCS)	Group Name (USCS)	Liquid Limit (%)	Plasticity Index (%)
SB-08	S-6	10-12	CL	Lean Clay w/ Sand	36	21
SB-08	S-7	12-14	CL	Sandy Lean Clay	28	15
SB-09	S-8	14-16	ML	Sandy Silt	NP	NP
SB-11	S-2	2-4	CL	Lean Clay w/ Sand	48	25
SB-12	S-5	8-10	CL	Sandy Lean Clay	38	19
SB-12	S-6	10-12	NT	NT	49	29
SB-13	S-2	2-4	CH	Fat Clay	54	27
SB-14	S-5	11-12.5	NT	NT	48	20

Notes: NP = non-plastic; NT = not tested.

Table 3.1.2 – TICR-7 Soil Corrosivity Test Results

Boring No.	Sample No.	Sample Depth (ft.)	Chloride (mg/Kg)	ORP (mV)	Resistivity (uohms)	pH	Sulfide (mg/Kg)
SB-08	S-3	4-6	ND	172.1	0.0508	8.19	ND
SB-13	S-4	6-8	ND	131.6	0.0673	7.55	ND

Notes: ND = non-detect

3.2 Section TICR-8

Seven classifications and one atterberg limit only test were performed for this Section. Table 3.2.1 summarizes the results of the laboratory tests for this Section. One soil corrosivity test was also performed for the Section and the results are presented in Table 3.2.2 below.

Table 3.2.1 – TICR-8 Soil Laboratory Test Results

Boring No.	Sample No.	Sample Depth (ft.)	Classification (USCS)	Group Name (USCS)	Liquid Limit (%)	Plasticity Index (%)
SB-01	S-4	6-8	NT	NT	45	25
SB-01	S-7	13.5-15	SM	Silty Sand	NP	NP
SB-02	S-5	11-12.5	CL	Lean Clay	40	23
SB-03	S-2	3.5-5	CL	Lean Clay w/ Sand	43	26
SB-04	S-5	11-12.5	CL	Sandy Lean Clay	26	9
SB-05	S-2	3.5-5	CL	Lean Clay w/ Sand	44	24
SB-05	S-6	13.5-15	ML	Silt w/ Sand	NP	NP
SB-06	S-4	8.5-10	CL	Sandy Lean Clay	25	9

Notes: NP = non-plastic; NT = not tested.

Table 3.2.2 – TICR-8 Soil Corrosivity Test Results

Boring No.	Sample No.	Sample Depth (ft.)	Chloride (mg/Kg)	ORP (mV)	Resistivity (uohms)	pH	Sulfide (mg/Kg)
SB-04	S-3	6-7.5	ND	276	0.0224	8.53	ND

Notes: ND = non-detect

4.0 Geotechnical Analysis

The information from the test borings was used to determine the steel sheet pile tip depths for the two Sections. The software used for the analysis is CWALSHT, from the U.S. Army COE.

The soil parameters used in this analysis are as follows.

Table 4.0.1 – Soil Parameters Used For Analysis

Soil Type	Saturated Unit Wt. (pcf)	Moist Unit Weight (pcf)	Cohesion (psf)	Angle of Internal Friction, phi (degrees)
Stiff Clay	120	115	270	28
Soft Clay	95	90	230	19

See Appendix C for the calculations, which include scaled deflection, bending moment, and shear profile curves.

4.1 Section TICR-7

Test borings SB-07, 11, and 14 were used to analyze the steel sheet pile tip depths. The unsupported height of the steel sheet pile (SSP), on the creek side, is nine (9) feet in the analysis. Table 4.1.1 summarizes the findings.

Table 4.1.1 – Steel Sheet Pile Tip Depths

Boring No.	SSP Tip Depth (ft.) *	Maximum Bending Moment (ft.-K)	Scaled Deflection (pci)	Pile Moment of Inertia Req'd. ($in.^4$)	Req'd. Pile Section
SB-07	22	12.53	$3.1343x10^9$	54.04	AZ13/PZ22
SB-11	28 **	19.0	$7.4999x10^9$	129.31	AZ13/PZ27
SB-14	21	11.85	$2.3754x10^9$	40.96	AZ13/PZ22

Notes: * = From top of pile. ** = Recommended for SB-12 and SB-13 areas. AZ = Arbed Pile. PZ = U.S. Steel Pile.

Deflection at the top of the pile is 1.8 inches, based on the above highest scaled deflection value and the pile sections selected.

4.2 Section TICR-8

Test borings SB-02, 03, 04 and 06 were used to analyze the steel sheet pile tip depths. The unsupported height of the steel sheet pile (SSP), on the creek side, is nine (9) feet, in the analysis. Table 4.2.1 summarizes the findings.

Table 4.2.1 – Steel Sheet Pile Tip Depths

Boring No.	SSP Tip Depth (ft.) *	Maximum Bending Moment (ft.-K)	Scaled Deflection (pci)	Pile Moment of Inertia Req'd. ($in.^4$)	Req'd. Pile Section
SB-02	21	11.85	$2.3754x10^9$	40.96	AZ13/PZ22
SB-03	21	11.85	$2.3754x10^9$	40.96	AZ13/PZ27
SB-04	22	11.85	$2.4673x10^9$	42.54	AZ13/PZ22
SB-06	22	13.03	$2.7887x10^9$	48.08	AZ13/PZ22

Notes: * = From top of pile. AZ = Arbed Pile, PZ = U.S. Steel Pile

Deflection at the top of the pile is 0.7 inches, based on the above highest scaled deflection value and the pile sections selected.

5.0 Recommendations

All of the SSP tip depths are 21 to 22 feet, except for the soil profile of boring SB-11 which had softer soils. Because the soil profiles of SB-12 and SB-13 are similar to SB-11, the SSP tip depth for the walls from SB-11 to SB-13 are recommended at 28 feet from the top of the pile.

The SSP can be placed immediately before the existing retaining structures (wood cribbing, etc.) or immediately behind the structures depending on the stream cross section needed. Driving the SSP behind the existing walls will require removal of known obstacles, such as perpendicular wood crib members, concrete block and nests of bricks, tree roots, and rock fill. Any utilities should be disconnected and relocated. Driving the SSP with a vibratory hammer should achieve full tip elevation, although the stiffer clays in TICR-8 (SB-1 to SB-6) may take longer to drive. A predriving survey of adjacent buildings should be performed. The adjacent buildings should also be monitored for vibration amplitude and frequency during driving. This monitoring should be done by a licensed P.E.

The site soils are not corrosive to steel but corrosion in the flood zone due to fluctuating stream levels will occur and should be considered in the wall design.

To minimize corrosion damage, the following measures should be considered.

- Coat the exposed piling with coal tar epoxy,
- Use A-690 steel,
- Select a SSP section of 0.075 inches thicker than needed,

The SSP wall should be topped off with a concrete cap.

6.0 Limitations

The considerations presented in this report are based on the results of the borings, laboratory testing results, prior investigations, and anticipated development and construction requirements known to Michael Baker Jr., Inc. (Baker) at the time this report was prepared. It should be noted that the considerations presented in this report may be invalid if the anticipated development and construction requirements change. It should also be noted that soil and groundwater conditions between the performed boring locations may differ from those conditions reported at those specific boring locations and that any soil and groundwater conditions may change over time.

Baker has relied on certain information provided by MWRD and other parties who are referenced in this report. This information was assumed to be accurate and complete unless information to the contrary arose during the course of preparation of this report. Referenced prior reports may include statements or opinions of the original authors as to the satisfactory completion of work. These statements or opinions are those of the original report authors. Baker neither warrants nor certifies the accuracy or completeness of these statements or opinions. Baker notes that design standards, guidelines, and regulations are periodically reviewed and updated by various regulatory agencies and may have changed since the respective dates of the referenced prior reports.

Baker's professional services have been performed, findings obtained, and considerations presented in accordance with generally accepted geotechnical engineering principles and practices. No other warranty, expressed or implied, is made as to the considerations presented in this report. Baker is not responsible for the conclusions, opinions, and recommendations made by others based upon the considerations included herein.

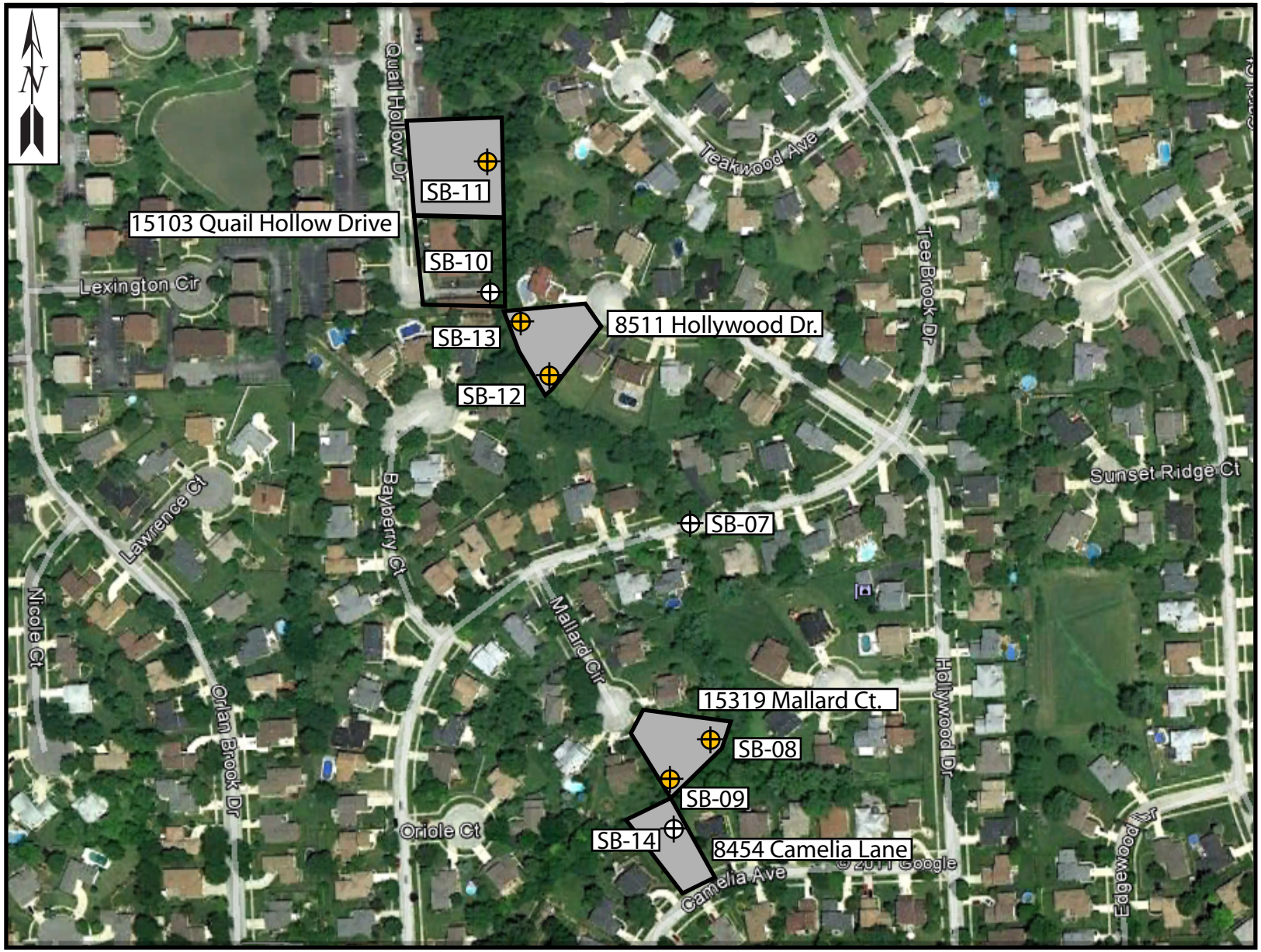
7.0 References

Surficial Geology of the Tinley Park Quadrangle, Map No. 18 – Tinley Park, by Bretz, J. Harlen, State Geological Survey Division, 1930-32.

Geologic Atlas of Cook County for Planning Purposes, by Leetaru, H.E. et al., Illinois State Geological Survey, Champaign, Illinois, July 27, 2004.

Physiographic Divisions of Illinois, Illinois State Geological Survey, 1993.

EXHIBITS



0 300 FT

Proposed Truck/ATV Mounted Rig Boring

Proposed Hand Auger Boring

Right of Entry Approved

SOIL BORING LOCATION MAP: TINLEY CREEK 7 IMPROVEMENTS, ORLAND PARK, ILLINOIS

SCALE: see scale bar	EXHIBIT 1	DRAWN BY: N. DAVIS CHECKED BY:

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1145 N. Main Street
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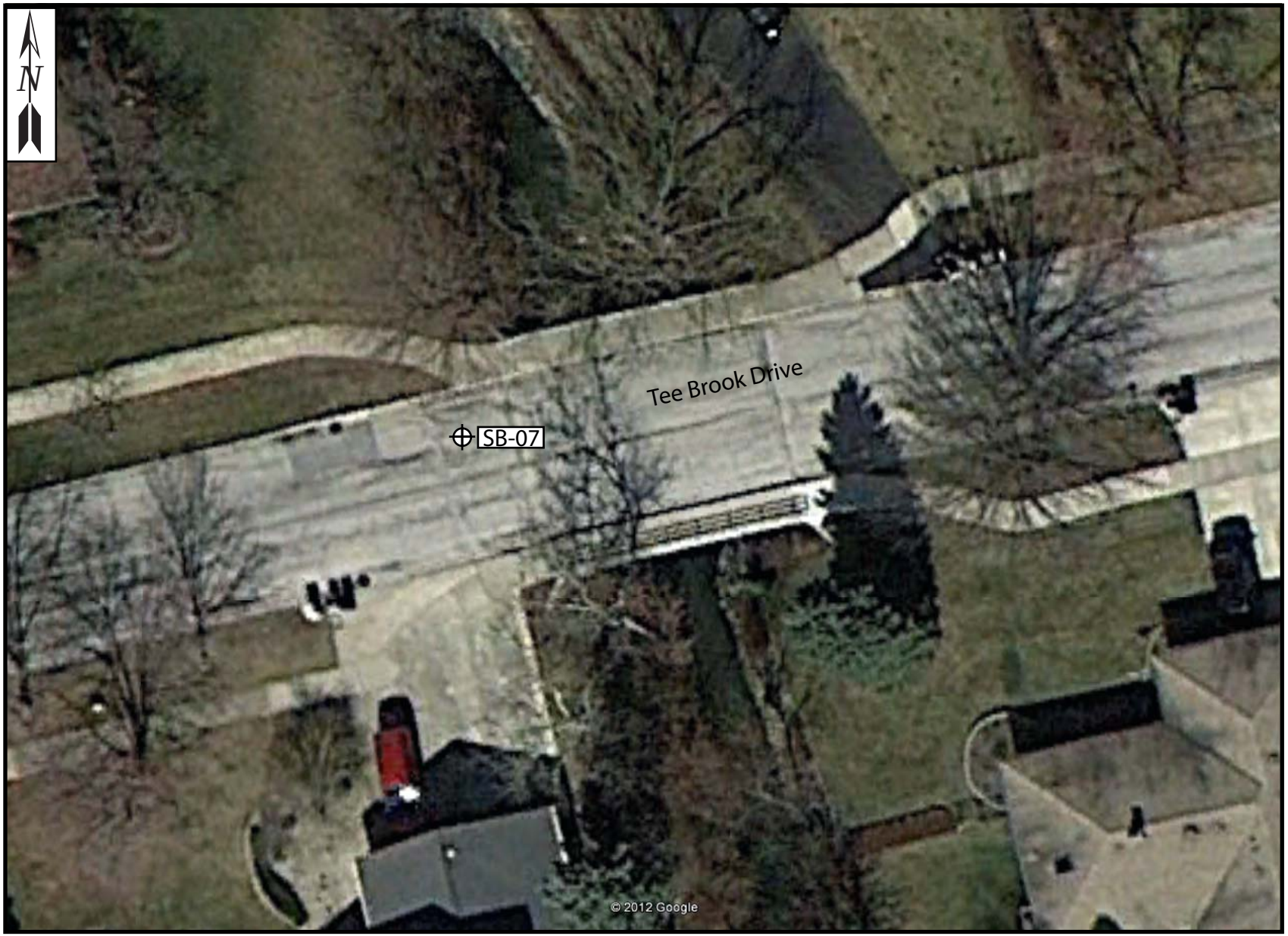
FOR MICHAEL BAKER JR., INC. 707-15-02



0 50 FT

⊕ Proposed Truck Mounted Rig Boring

SOIL BORING LOCATION MAP: TINLEY CREEK 7 IMPROVEMENTS, ORLAND PARK, ILLINOIS

SCALE: see scale bar	EXHIBIT 1	DRAWN BY: N. DAVIS CHECKED BY:

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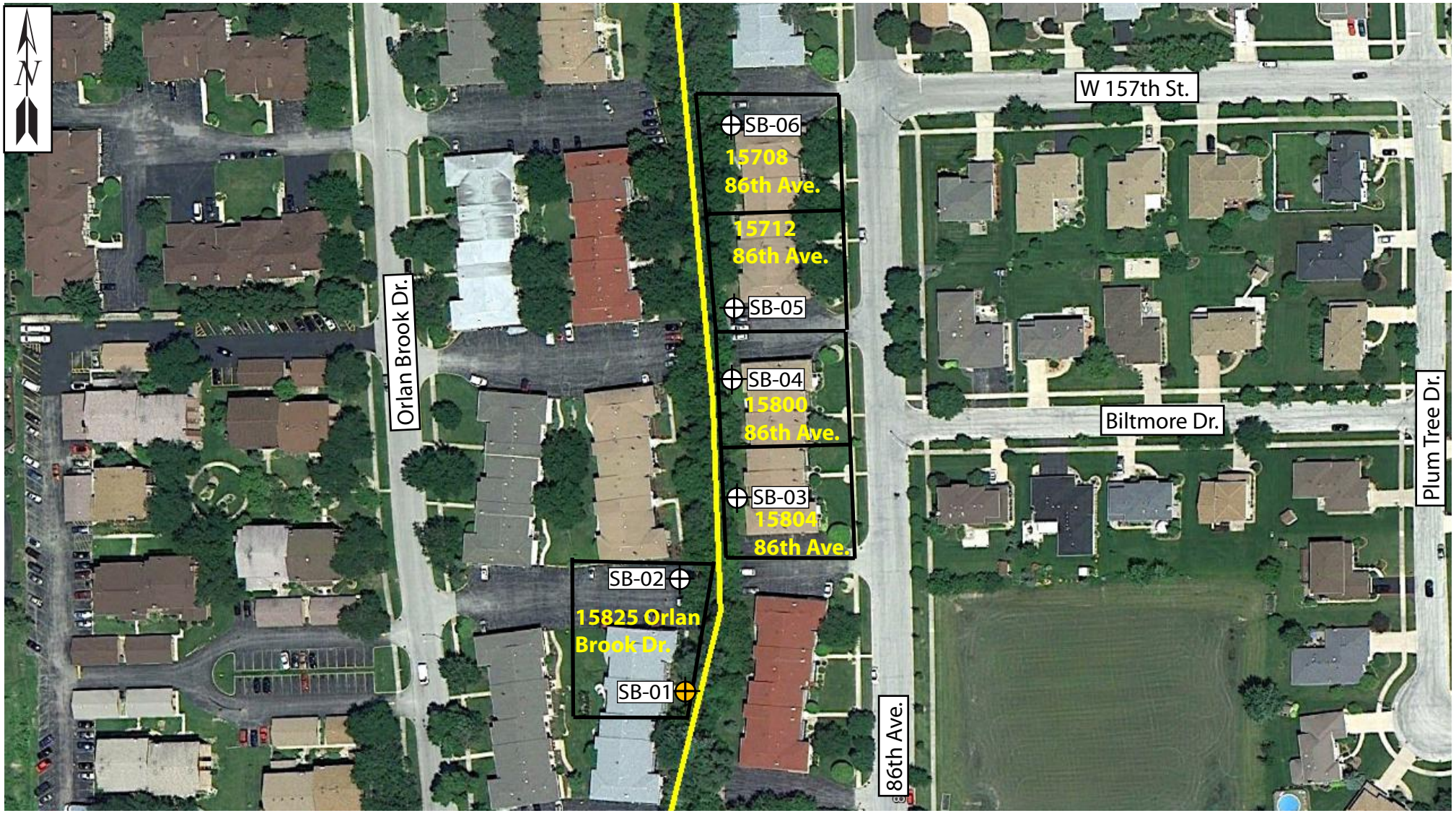
FOR MICHAEL BAKER JR., INC. 707-15-02



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Proposed Truck Mounted Rig Boring

Proposed Hand Auger Boring

SOIL BORING LOCATION MAP: TINLEY CREEK 8 IMPROVEMENTS, ORLAND PARK, ILLINOIS

SCALE: see scale bar	EXHIBIT 1	DRAWN BY: N. DAVIS CHECKED BY:

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www.wangeng.com

FOR MICHAEL BAKER JR., INC.

707-15-02

APPENDIX A - Boring Logs

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BORING LOG SB-01

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		3-inch thick, dark brown LEAN CLAY --TOPSOIL--			1	PUSH	0.49 B	28
		Soft, brown and gray LEAN CLAY (CL) --FILL--			2	PUSH	0.98 B	32
		Medium stiff, dark brown LEAN CLAY, trace organic matter (CL) --BURIED TOPSOIL--	5		3	PUSH	1.64 B	22
		Stiff to very stiff, brown to gray LEAN CLAY (CL)			4	PUSH	3.36 B	21
					5	PUSH	3.69 B	19
			10		6	3 5 7	3.69 B	17
		Medium dense WELL GRADED SAND (SW)	15		7	3 5 5	NP	16
		Stiff, gray LEAN CLAY (CL)			8	4 5 7	1.48 B	14
		Boring terminated at 17.50 ft						
			20					
			25					

GENERAL NOTES

Begin Drilling: **03-22-2012** Complete Drilling: **03-22-2012**
Drilling Contractor: **WTS** Drill Rig: **Hand/TMR**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **Geoprobe to 10' and 3.25" IDA HSA 10 to 17.5';**
Boring backfilled upon completion

WATER LEVEL DATA

While Drilling: **16.00 ft**
At Completion of Drilling: **12.50 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 SB-02

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		12-inch thick, dark brown LEAN CLAY						
		--TOPSOIL--						
		Stiff, brown and gray LEAN CLAY (CL), with rock fragments			1	4 7 7	1.00 P	31
		--FILL--						
		Stiff, dark brown LEAN CLAY, trace organic matter (CL)			2	4 5 5	1.50 P	20
		--BURIED TOPSOIL--	5					
		Stiff, brown and gray LEAN CLAY (CL)			3	2 2 3	1.64 B	27
		Soft, brown and gray LEAN CLAY (CL)			4	2 2 2	0.25 P	35
			10					
		Stiff to hard, gray LEAN CLAY (CL)			5	4 6 10	4.51 B	19
					6	4 5 6	2.05 B	16
			15					
					7	3 4 5	1.80 B	13
		Boring terminated at 17.50 ft						
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling: **03-22-2012** Complete Drilling: **03-22-2012**
Drilling Contractor: **WTS** Drill Rig: **B-57 TMR**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **3.25" IDA HSA; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
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 SB-03

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		4-inch thick, dark brown LEAN CLAY						
		--TOPSOIL--						
		6-inch thick CRUSHED STONE						
		Very stiff, brown and gray LEAN CLAY (CL)						
		--FILL--			1	2 3 5	2.87 B	21
			5		2	2 3 4	2.79 B	17
		Medium stiff to very stiff, brown and gray LEAN CLAY (CL)			3	3 4 4	3.28 B	22
			10		4	2 2 3	0.90 B	24
					5	3 3 4	1.31 B	15
			15		6	3 3 4	1.39 B	18
					7	3 5 5	1.23 B	14
		Boring terminated at 17.50 ft						
			20					
			25					

GENERAL NOTES

Begin Drilling: **03-23-2012** Complete Drilling: **03-23-2012**
Drilling Contractor: **WTS** Drill Rig: **B-57 TMR**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **3.25" IDA HSA; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG SB-04

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		8-inch thick, brown LEAN CLAY --TOPSOIL--						
		Stiff to very stiff, brown and gray LEAN CLAY (CL) --FILL--			1	2 3 3	3.36 B	19
			5		2	3 3 3	1.64 B	14
		Stiff to hard, brown and gray LEAN CLAY (CL)			3	3 3 4	1.31 B	17
			10		4	4 6 6	3.12 B	15
					5	3 7 10	2.87 S	16
			15		6	10 8 15	4.00 P	14
					7	6 5 7	1.89 B	11
		Boring terminated at 17.50 ft						
			20					
			25					

GENERAL NOTES

Begin Drilling: **03-23-2012** Complete Drilling: **03-23-2012**
Drilling Contractor: **WTS** Drill Rig: **B-57 TMR**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **3.25" IDA HSA; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG SB-05

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		4-inch thick, brown LEAN CLAY --TOPSOIL--						
		Very stiff, brown LEAN CLAY (CL) --FILL--			1	2 4 3	2.62 B	19
		Stiff to hard, brown and gray LEAN CLAY (CL)			2	2 3 3	1.80 B	21
			5		3	2 3 3	1.50 P	15
					4	4 5 8	4.26 B	15
			10		5	3 6 7	5.82 B	12
					6	3 7 7	4.67 B	12
			15					
		Medium dense, gray SILT (ML), with gravel			7	7 12 16	NR	
					8	6 7 9	NP	10
			20					
		Boring terminated at 20.00 ft						
			25					

GENERAL NOTES

Begin Drilling: **03-23-2012** Complete Drilling: **03-23-2012**
Drilling Contractor: **WTS** Drill Rig: **B-57 TMR**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **3.25" IDA HSA; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG SB-06

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		6-inch thick ASPHALT --PAVEMENT--						
		10-inch thick CRUSHED STONE --BASE COURSE--						
		Very stiff, brown and gray LEAN CLAY (CL) --FILL--			1	2 3 4	2.36 B	19
					2	3 3 5	2.05 B	19
		Very stiff, brown and gray LEAN CLAY (CL)	5		3	3 4 7	2.38 B	13
		Medium dense, brown and gray SILT WITH SAND (ML)			4	4 8 7	NP	15
		Stiff to very stiff, gray LEAN CLAY (CL)	10		5	3 4 5	2.30 B	11
					6	2 3 5	1.64 B	12
			15		7	3 4 8	2.05 B	18
		Boring terminated at 17.50 ft						
			20					
			25					

GENERAL NOTES

Begin Drilling: **03-23-2012** Complete Drilling: **03-23-2012**
Drilling Contractor: **WTS** Drill Rig: **B-57 TMR**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **3.25" IDA HSA; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG SB-07

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **TICR 7 and 8**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		6-inch thick ASPHALT --PAVEMENT--						
		15-inch thick CRUSHED STONE --BASE COURSE--			1	4 2 3	2.50 P	25
		Very stiff, brown and gray LEAN CLAY (CL) --FILL--						
		Stiff to hard, brown and gray LEAN CLAY (CL)	5		2	2 3 4	1.00 P	31
					3	2 3 3	1.15 B	31
			10		4	3 4 5	4.18 B	24
					5	3 4 5	3.85 B	25
		Soft to medium stiff, gray FAT CLAY (CH)	15		6	2 3 3	0.82 B	30
					7	0 0 1	0.41 B	34
		Very stiff, gray LEAN CLAY, trace gravel (CL)	20		8	3 4 7	2.62 B	19
		Boring terminated at 20.00 ft	25					

GENERAL NOTES

Begin Drilling: **05-04-2012** Complete Drilling: **05-04-2012**
Drilling Contractor: **WTS** Drill Rig: **B-57 TMR**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **3.25" IDA HSA; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG SB-08

WEI Job No.: 707-17-02

Client **Michael Baker Jr, Inc.**
Project **Streambed Stabilization Project**
Location **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		5-inch thick, black LEAN CLAY --TOPSOIL--			1	PUSH	0.74 B	21
		Medium stiff to stiff, brown LEAN CLAY (CL) --FILL--			2	PUSH	0.74 B	28
			5		3	PUSH	1.72 B	22
					4	PUSH	0.82 B	28
		Stiff, black LEAN CLAY, trace organic matter (CL) --BURIED TOPSOIL--			5	PUSH	1.97 B	30
			10					
		Medium stiff, brown and gray LEAN CLAY (CL)			6	PUSH	0.74 B	23
		Soft, gray LEAN CLAY with SAND (CLS)			7	PUSH	0.41 B	20
		Stiff, brown and gray LEAN CLAY (CL) --Sampler refusal on cobble at 15'--	15		8	PUSH	1.31 B	24
		Boring terminated at 15.00 ft						
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **03-16-2012** Complete Drilling **03-16-2012**
Drilling Contractor **WTS** Drill Rig **Hand Auger**
Driller **R & N** Logger **F. Bozga** Checked by **N. Davis**
Drilling Method **1.50" IDA Geoprobe; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG SB-09

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		12-inch thick, black LEAN CLAY (CL) --TOPSOIL--			1	PUSH	1.00 P	25
		Medium stiff to stiff, brown and gray LEAN CLAY (CL) --FILL--			2	PUSH	0.49 B	26
			5		3	PUSH	0.82 B	27
					4	PUSH	0.74 B	29
		Medium stiff, black LEAN CLAY (CL) --BURIED TOPSOIL--			5	PUSH	0.50 P	35
			10					
		Medium stiff to very stiff, brown and gray LEAN CLAY (CL)			6	PUSH	2.00 P	22
					7	PUSH	0.90 B	31
		Brown and gray POORLY GRADED FINE SAND with SILT (SP-SM) --WET--	15		8	PUSH	NP	24
					9	PUSH	NP	28
		Boring terminated at 18.00 ft						
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling: **03-19-2012** Complete Drilling: **03-19-2012**
Drilling Contractor: **WTS** Drill Rig: **Hand Auger**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **1.50" IDA Geoprobe; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **14.00 ft**
At Completion of Drilling: **14.00 ft**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG SB-11

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Soft to medium stiff, dark brown ORGANIC LEAN CLAY with roots (OL)			1	PUSH	0.25 B	31
					2	PUSH	0.74 B	36
		Stiff, brown and gray LEAN CLAY (CL)	5		3	PUSH	1.23 B	29
					4	PUSH	1.15 B	28
		Soft, gray FAT CLAY (CH)			5	PUSH	0.49 B	30
			10		6	PUSH	0.41 B	31
					7	PUSH	0.33 B	33
			15		8	PUSH	0.25 B	34
					9	PUSH	0.25 B	36
		Boring terminated at 18.00 ft						
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling: **03-15-2012** Complete Drilling: **03-15-2012**
Drilling Contractor: **WTS** Drill Rig: **Hand Auger**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **1.50" IDA Geoprobe; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **4.00 ft**
At Completion of Drilling ▼ **5.00 ft**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG SB-12

WEI Job No.: 707-17-02

Client **Michael Baker Jr, Inc.**
Project **Streambed Stabilization Project**
Location **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		18-inch thick, black LEAN CLAY --TOPSOIL--			1	PUSH	0.74 B	26
		Stiff, brown LEAN CLAY (CL) --FILL--			2	PUSH	1.23 B	28
		Soft, black LEAN CLAY (CL) --BURIED TOPSOIL--	5		3	PUSH	0.25 B	98
					4	PUSH	0.35 B	38
		Stiff, black to brown LEAN CLAY WITH SAND (CLS)			5	PUSH	1.56 B	23
			10		6	PUSH	1.07 B	30
		Stiff, brown and gray LEAN CLAY (CL)			7	PUSH		
		Very soft to medium stiff, gray FAT CLAY (CH)	15		8	PUSH	0.90 B	27
					9	PUSH	0.25 B	31
					10	PUSH	0.08 B	34
			20					
		Boring terminated at 20.00 ft						
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **03-16-2012** Complete Drilling **03-16-2012**
Drilling Contractor **WTS** Drill Rig **Hand Auger**
Driller **R & N** Logger **F. Bozga** Checked by **N. Davis**
Drilling Method **1.50" IDA Geoprobe; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG SB-13

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		3-inch thick, brown LEAN CLAY --TOPSOIL--			1	PUSH	0.49 B	34
		Medium stiff, brown and gray LEAN CLAY (CL) --FILL--			2	PUSH	0.41 B	46
		Soft to stiff, brown and gray to gray LEAN CLAY (CL)	5		3	PUSH	1.00 P	23
					4	PUSH	1.31 B	23
			10		5	PUSH	0.90 B	32
					6	PUSH	1.07 B	30
					7	PUSH	1.15 B	30
		Soft to medium stiff, gray FAT CLAY (CH)	15		8	PUSH	0.41 B	32
					9	PUSH	0.25 P	38
		Boring terminated at 18.00 ft	20					
			25					

GENERAL NOTES

Begin Drilling: **03-15-2012** Complete Drilling: **03-15-2012**
Drilling Contractor: **WTS** Drill Rig: **Hand Auger**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **1.50" IDA Geoprobe; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **8.00 ft**
At Completion of Drilling: **8.00 ft**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG SB-14

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		12-inch thick, dark brown LEAN CLAY						
		--TOPSOIL--						
		Stiff, brown and gray LEAN CLAY (CL)			1	2 2 2	1.50 P	26
		--FILL--						
			5		2	2 3 3	1.56 B	25
					3	2 2 4	1.25 P	29
			10		4	2 3 3	1.15 B	26
		Stiff, dark brown LEAN CLAY (CL)			5	2 4 5	1.50 P	31
		--BURIED TOPSOIL--						
		Stiff to very stiff, brown and gray LEAN CLAY (CL)			6	2 4 5	2.13 B	20
			15		7	4 5 7	1.72 B	17
					8	4 6 10	3.85 B	12
			20					
		Boring terminated at 20.00 ft						
			25					

GENERAL NOTES

Begin Drilling: **03-19-2012** Complete Drilling: **03-19-2012**
Drilling Contractor: **WTS** Drill Rig: **B-57 TMR**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **3.25" IDA HSA; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
Time After Drilling: **NA**
Depth to Water: **NA**

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

WANGENGINC 7071702.GPJ WANGENG.GDT 4/2/12

APPENDIX B - Laboratory Testing Results

Wang Engineering

Wang Engineering Laboratory Test Results

Project: TICR 7 and 8
Client: Michael Baker Jr.
WEI Job No.: 707-17-02

Prepared by: M. de los Reyes
Checked by: M. Snider
Date: 4/24/2012

Sample ID	USCS Soil Classification	Atterberg Limits D4318			Particle Size Analysis D422			
		LL %	PL %	PI %	Gravel %	Sand %	Silt %	Clay %
SB-01 No. 4	--	45	19	25	NR	NR	NR	NR
SB-01 No. 7	Silty Sand (SM)	NP	NP	NP	6.2	66.1	17.7	10.1
SB-02 No. 5	Lean Clay (CL)	40	17	23	0.3	10.3	31.6	57.8
SB-03 No. 2	Lean Clay with Sand (CL)	43	17	26	3.2	18.1	29.6	49.1
SB-04 No. 5	Sandy Lean Clay (CL)	26	17	9	1.9	29.1	42.4	26.6
SB-05 No. 2	Lean Clay with Sand (CL)	44	20	24	0.2	25.4	32.7	41.8
SB-05 No. 6	Silt with Sand (ML)	NP	NP	NP	0.9	20.4	46.8	31.9
SB-06 No. 4	Sandy Lean Clay (CL)	25	16	9	1.8	28.4	43.1	26.7
SB-08 No. 6	Lean Clay with Sand (CL)	36	15	21	0.0	24.0	36.3	39.7
SB-08 No. 7	Sandy Lean Clay (CL)	28	13	15	0.9	40.8	32.3	26.0
SB-09 No. 8	Sandy Silt (ML)	NP	NP	NP	0.0	44.8	34.8	20.4
SB-11 No. 2	Lean Clay with Sand (CL)	48	23	25	0.0	21.2	43.6	35.2
SB-12 No. 5	Sandy Lean Clay (CL)	38	19	19	0.2	30.3	33.6	35.8
SB-12 No. 6	--	49	20	29	NR	NR	NR	NR
SB-13 No. 2	Fat Clay (CH)	54	27	27	0.0	3.7	48.1	48.1
SB-14 No. 5	--	48	28	20	NR	NR	NR	NR

Notes: NP= Non-Plastic
NR= Not Requested

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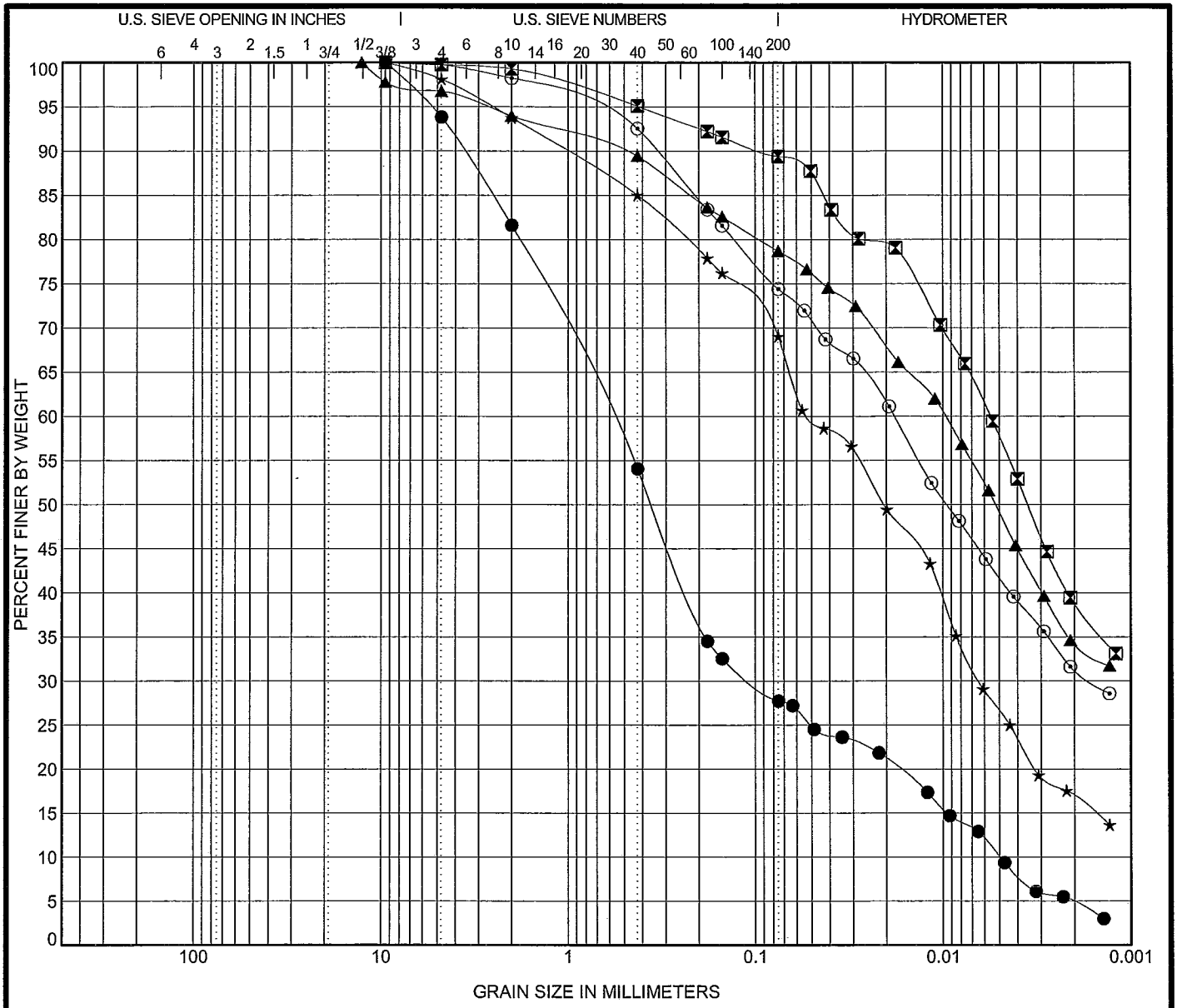

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		USCS Classification	LL	PL	PI	Cc	Cu
●	SB-01#7	13.5 ft	SILTY SAND(SM)	NP	NP	NP	3.65	119.13
⊠	SB-02#5	11.0 ft	LEAN CLAY(CL)	40	17	23		
▲	SB-03#2	3.5 ft	LEAN CLAY with SAND(CL)	43	17	26		
★	SB-04#5	11.0 ft	SANDY LEAN CLAY(CL)	26	17	9		
⊙	SB-05#2	3.5 ft	LEAN CLAY with SAND(CL)	44	20	24		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	SB-01#7	13.5 ft	9.5	0.593	0.104	0.005	6.2	66.1	17.7	10.1
⊠	SB-02#5	11.0 ft	9.5	0.006			0.3	10.3	31.6	57.8
▲	SB-03#2	3.5 ft	12.7	0.01			3.2	18.1	29.6	49.1
★	SB-04#5	11.0 ft	9.5	0.051	0.006		1.9	29.1	42.4	26.6
⊙	SB-05#2	3.5 ft	9.5	0.018	0.002		0.2	25.4	32.7	41.8

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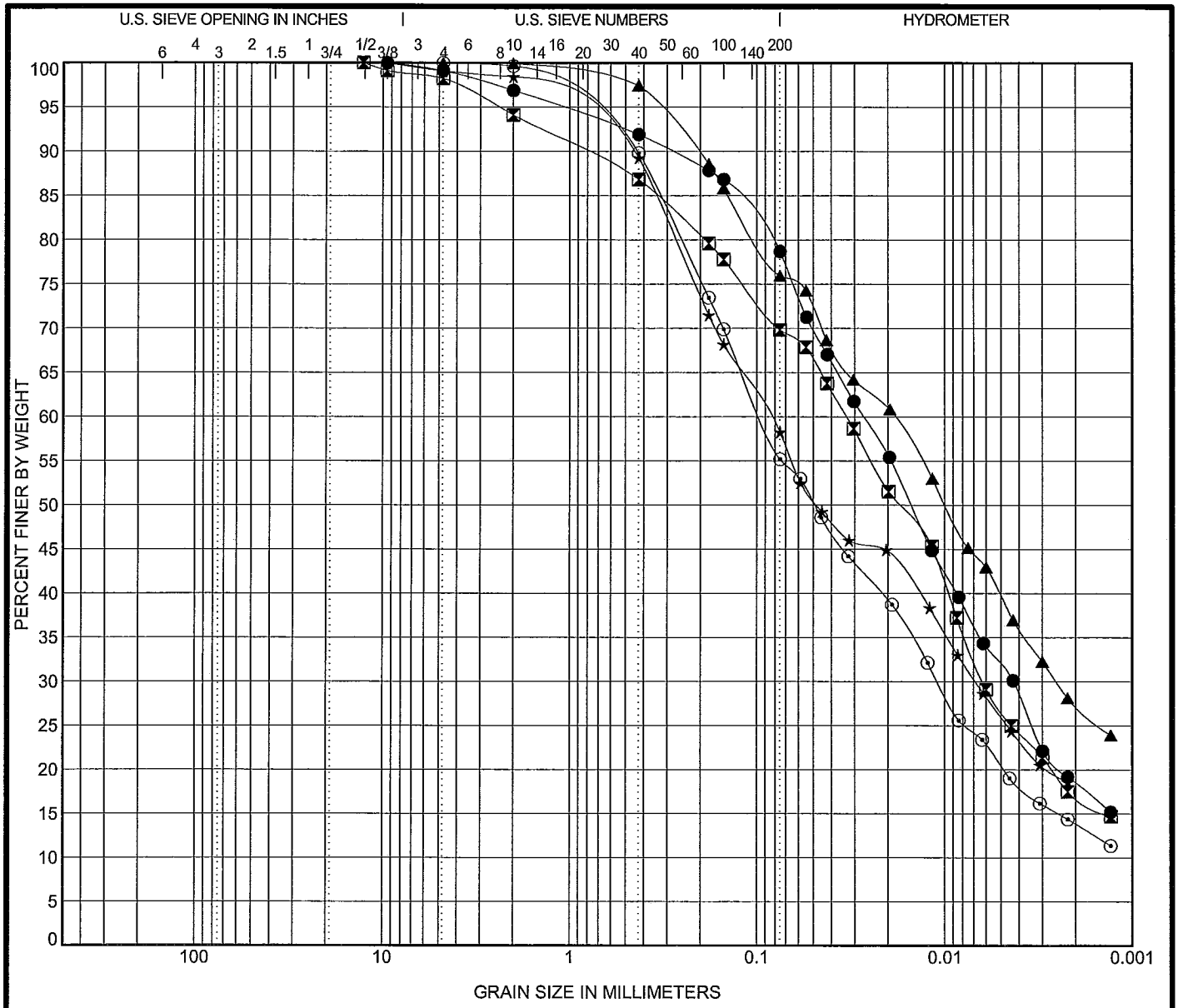
GRAIN SIZE DISTRIBUTION

Project: TICR 7 and 8

Location: Orland Park, IL

Number: 707-17-02

WEI GRAIN SIZE USCS 7071702.GPJ US_LAB.GDT 4/25/12



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		USCS Classification	LL	PL	PI	Cc	Cu
●	SB-05#6	13.5 ft	SILT with SAND(ML)	NP	NP	NP		
⊠	SB-06#4	8.5 ft	SANDY LEAN CLAY(CL)	25	16	9		
▲	SB-08#6	10.0 ft	LEAN CLAY with SAND(CL)	36	15	21		
★	SB-08#7	12.0 ft	SANDY LEAN CLAY(CL)	28	13	15		
⊙	SB-09#8	14.0 ft	SANDY SILT(ML)	NP	NP	NP		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	SB-05#6	13.5 ft	9.5	0.027	0.004		0.9	20.4	46.8	31.9
⊠	SB-06#4	8.5 ft	12.7	0.033	0.006		1.8	28.4	43.1	26.7
▲	SB-08#6	10.0 ft	4.75	0.018	0.003		0.0	24.0	36.3	39.7
★	SB-08#7	12.0 ft	9.5	0.085	0.007		0.9	40.8	32.3	26.0
⊙	SB-09#8	14.0 ft	4.75	0.094	0.011		0.0	44.8	34.8	20.4

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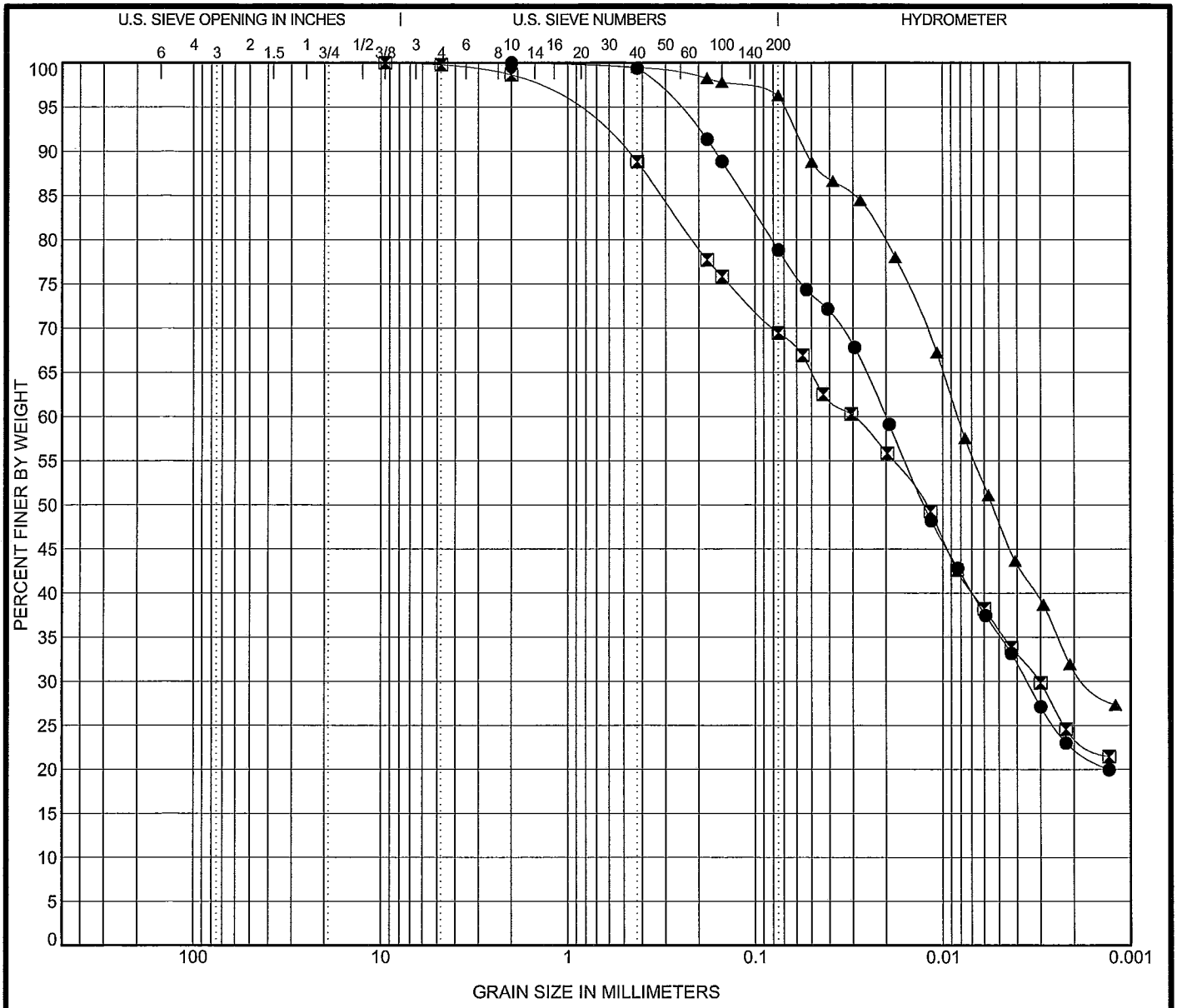
Location: Orland Park, IL

Number: 707-17-02



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		USCS Classification	LL	PL	PI	Cc	Cu
●	SB-11#2	2.0 ft	LEAN CLAY with SAND(CL)	48	23	25		
⊠	SB-12#5	8.0 ft	SANDY LEAN CLAY(CL)	38	19	19		
▲	SB-13#2	2.0 ft	FAT CLAY(CH)	54	27	27		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	SB-11#2	2.0 ft	2	0.02	0.004		0.0	21.2	43.6	35.2
⊠	SB-12#5	8.0 ft	9.5	0.03	0.003		0.2	30.3	33.6	35.8
▲	SB-13#2	2.0 ft	2	0.008	0.002		0.0	3.7	48.1	48.1

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GRAIN SIZE DISTRIBUTION

Project: TICR 7 and 8

Location: Orland Park, IL

Number: 707-17-02

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

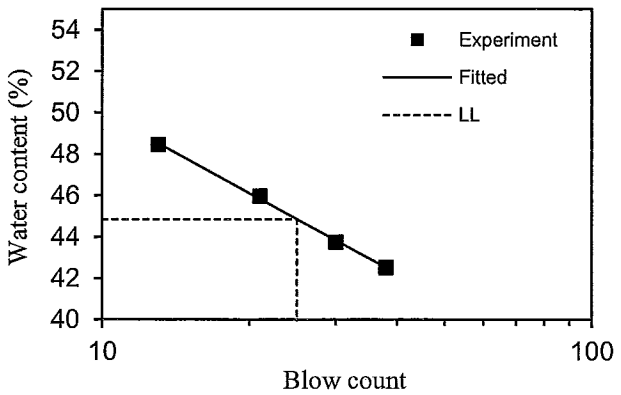
Analyst name: K. Mohammed
Test date: April 24, 2012
Soil Sample ID: SB-01 No.4 (6.0-8.0 ft)
Sample description: Brown & Gray Lean Clay
% retained on #40 sieve: 3%

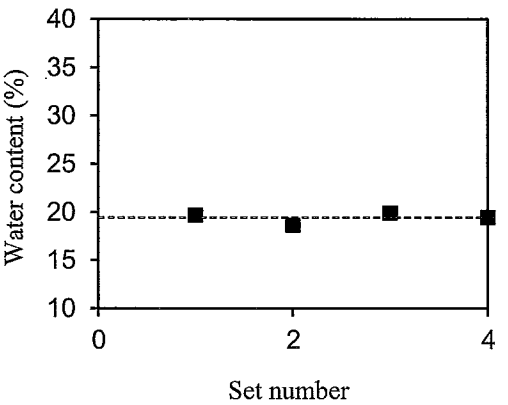
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.24*	*23.24*	*19.66*	*38*	42.52	42.51
2	*11.17*	*25.40*	*21.07*	*30*	43.74	43.83
3	*11.10*	*23.39*	*19.52*	*21*	45.96	45.83
4	*11.30*	*23.31*	*19.39*	*13*	48.45	48.51

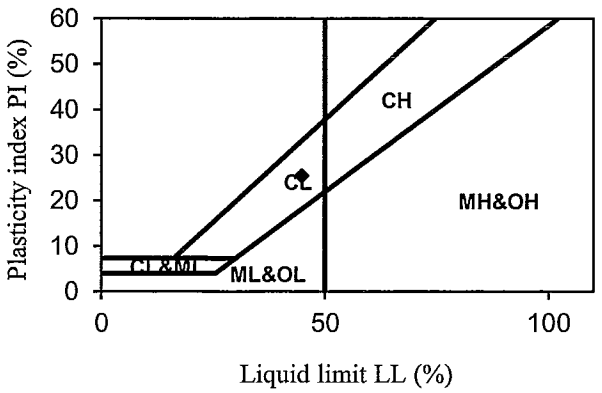
Liquid limit (%) = 44.85
Slope of flow line = 0.123

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.07*	*21.65*	*19.91*	19.68
2	*11.14*	*22.15*	*20.42*	18.64
3	*11.09*	*21.51*	*19.78*	19.91
4	*11.05*	*20.51*	*18.97*	19.44

Plastic limit (%) = 19.42







Liquid limit (%) = *45*
Plastic limit (%) = *19*
Plasticity index (%) = *25*

Prepared by: M.d lor Rmys Date: 4/25/12

Checked by: [signature] Date: 4/26/12

s:\netprojects\7071702\lab data\lws_wang_mdlr_7071702atterbergsb-01(6.0-8.0ft)_20120425.xls

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

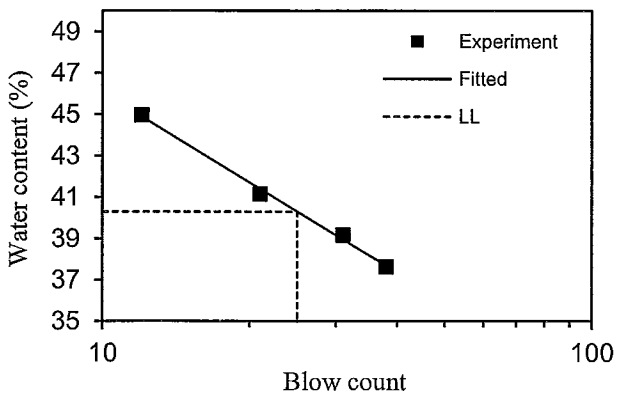
Analyst name: C. Iordache
Test date: April 23, 2012
Soil Sample ID: SB-02 No.5 (11.0-12.5 ft)
Sample description: Gray Lean Clay
% retained on #40 sieve: 5%

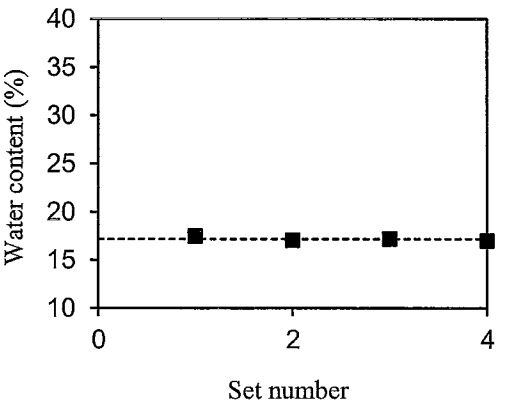
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.18*	*21.13*	*18.41*	*38*	37.62	37.68
2	*11.05*	*25.55*	*21.47*	*31*	39.16	38.95
3	*11.19*	*24.67*	*20.74*	*21*	41.15	41.39
4	*11.28*	*23.53*	*19.73*	*12*	44.97	44.89

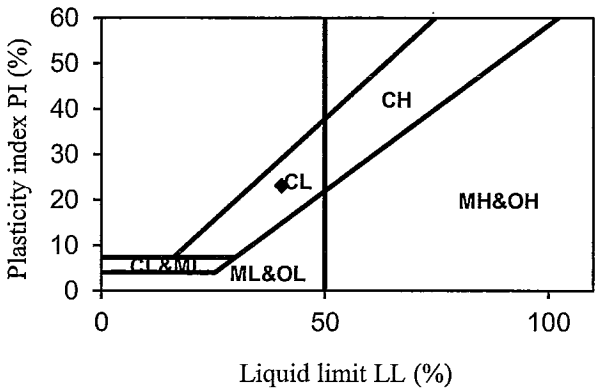
Liquid limit (%) = 40.30
Slope of flow line = 0.151

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.36*	*22.38*	*20.74*	17.48
2	*11.23*	*20.84*	*19.44*	17.05
3	*11.07*	*19.59*	*18.34*	17.19
4	*11.39*	*19.58*	*18.39*	17.00

Plastic limit (%) = 17.18







Liquid limit (%) = *40*
Plastic limit (%) = *17*
Plasticity index (%) = *23*

Prepared by: M. Cuadros Reyes Date: 4/26/12

Checked by: [signature] Date: 4/26/12

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

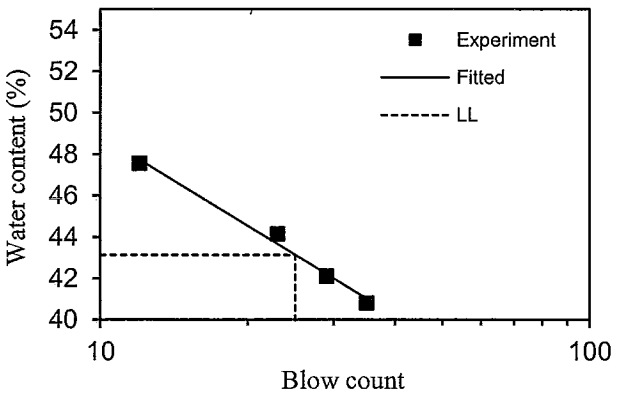
Analyst name: C. Iordache
Test date: April 23, 2012
Soil Sample ID: SB-03 No.2 (3.5-5.0 ft)
Sample description: Brown Lean Clay with Sand
% retained on #40 sieve: 11%

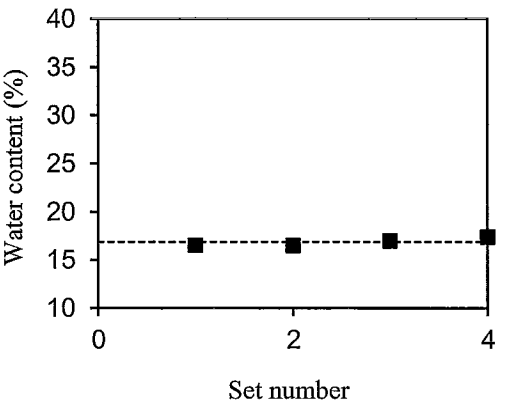
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.14*	*20.25*	*17.61*	*35*	40.80	41.02
2	*11.16*	*23.31*	*19.71*	*29*	42.11	42.20
3	*11.43*	*22.86*	*19.36*	*23*	44.14	43.65
4	*11.15*	*22.63*	*18.93*	*12*	47.56	47.73

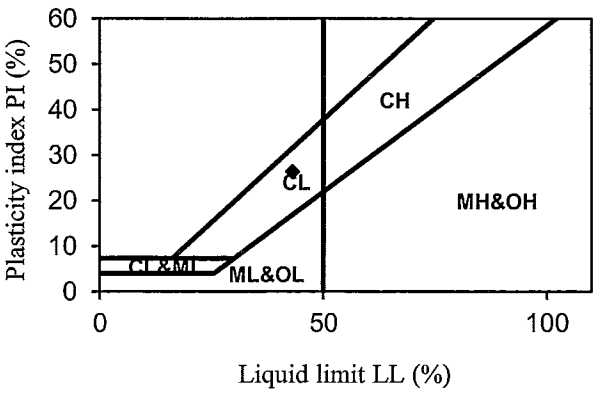
Liquid limit (%) = 43.13
Slope of flow line = 0.142

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.20*	*17.55*	*16.65*	16.51
2	*11.07*	*16.93*	*16.10*	16.50
3	*11.16*	*17.01*	*16.16*	17.00
4	*11.07*	*19.64*	*18.37*	17.40

Plastic limit (%) = 16.85







Liquid limit (%) = *43*
Plastic limit (%) = *17*
Plasticity index (%) = *26*

Prepared by: M. de los Reyes Date: 4/25/12

Checked by: [signature] Date: 4/26/12

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

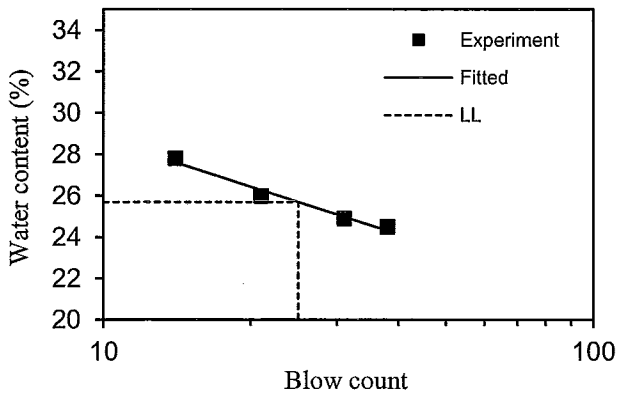
Analyst name: C. Iordache
Test date: April 23, 2012
Soil Sample ID: SB-04 No.5 (11.0-12.5 ft)
Sample description: Brown Sandy Lean Clay
% retained on #40 sieve: 15%

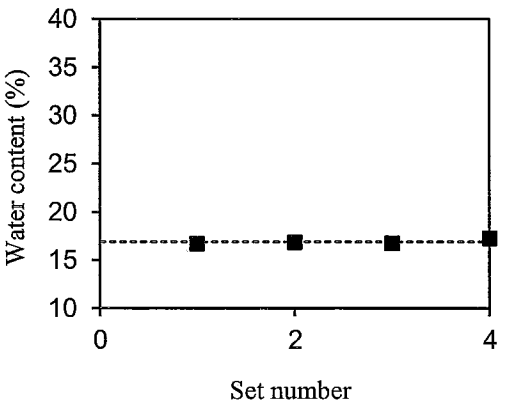
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.12*	*21.54*	*19.49*	*38*	24.49	24.30
2	*11.32*	*22.86*	*20.56*	*31*	24.89	24.98
3	*11.00*	*22.64*	*20.24*	*21*	25.97	26.27
4	*11.26*	*22.43*	*20.00*	*14*	27.80	27.61

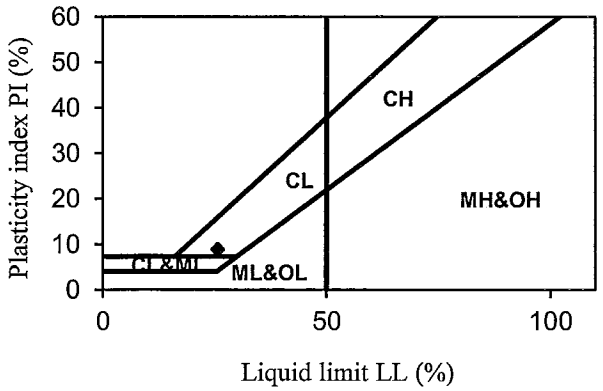
Liquid limit (%) = 25.69
Slope of flow line = 0.127

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.16*	*19.48*	*18.29*	16.69
2	*11.04*	*18.87*	*17.74*	16.87
3	*11.22*	*19.23*	*18.08*	16.76
4	*11.26*	*19.83*	*18.57*	17.24

Plastic limit (%) = 16.89







Liquid limit (%) = *26*
Plastic limit (%) = *17*
Plasticity index (%) = *9*

Prepared by: M. de los Reyes Date: 4/25/12

Checked by: [signature] Date: 4/26/12

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

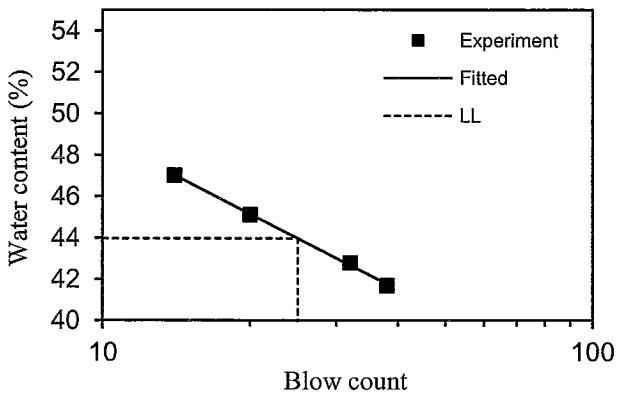
Analyst name: C. Iordache
Test date: April 23, 2012
Soil Sample ID: SB-05 No.2 (3.5-5.0 ft)
Sample description: Brown Lean Clay with Sand
% retained on #40 sieve: 7%

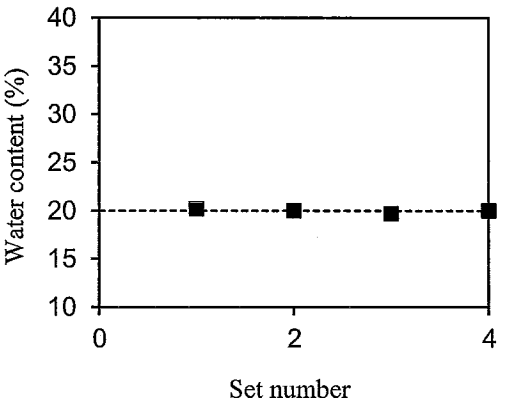
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.10*	*21.91*	*18.73*	*38*	41.68	41.76
2	*11.21*	*21.99*	*18.76*	*32*	42.78	42.67
3	*11.25*	*22.83*	*19.23*	*20*	45.11	45.14
4	*11.24*	*22.84*	*19.13*	*14*	47.02	47.02

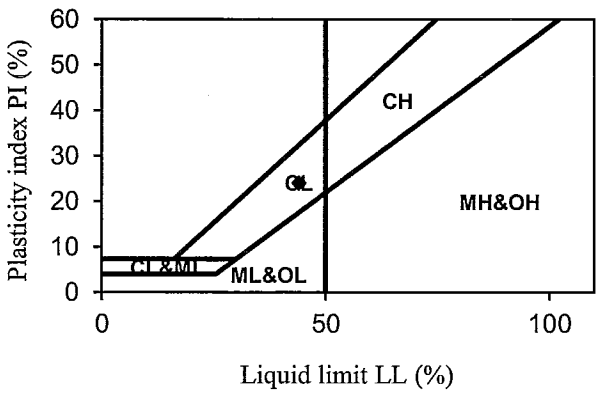
Liquid limit (%) = 43.97
Slope of flow line = 0.119

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.16*	*15.62*	*14.87*	20.22
2	*11.11*	*15.43*	*14.71*	20.00
3	*11.20*	*16.73*	*15.82*	19.70
4	*10.96*	*15.28*	*14.56*	20.00

Plastic limit (%) = 19.98







Liquid limit (%) = *44*
Plastic limit (%) = *20*
Plasticity index (%) = *24*

Prepared by: Mdr Ios Ruyer Date: 4/25/12

Checked by: LL Date: 4/26/12

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

[redacted]

A[redacted]ASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

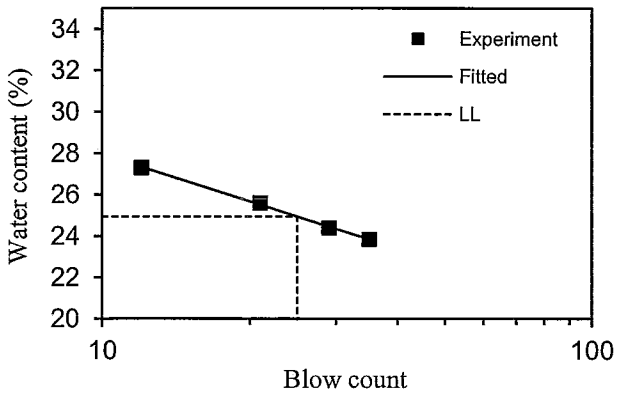
Analyst name: C. Iordache
Test date: April 24, 2012
Soil Sample ID: SB-06 No.4 (8.5-10.0 ft)
Sample description: Brown Sandy Lean Clay
% retained on #40 sieve: 12%

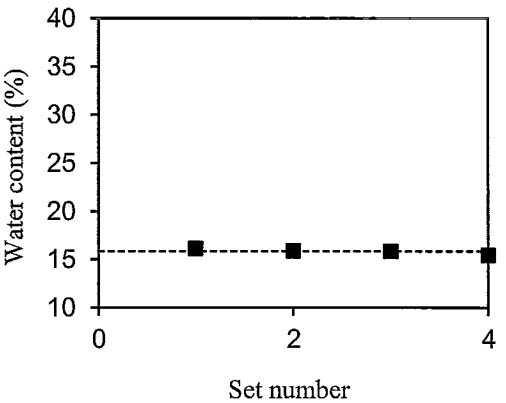
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.38*	*22.45*	*20.32*	*35*	23.83	23.83
2	*11.03*	*22.35*	*20.13*	*29*	24.40	24.45
3	*11.12*	*22.11*	*19.87*	*21*	25.60	25.50
4	*11.12*	*21.10*	*18.96*	*12*	27.30	27.33

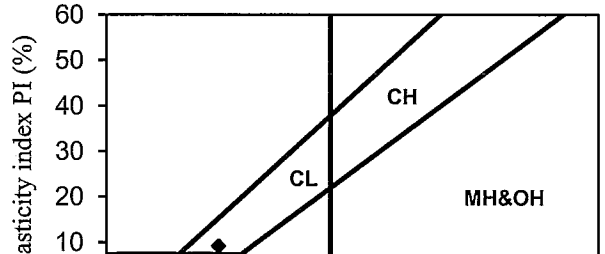
Liquid limit (%) = 24.93
Slope of flow line = 0.128

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.20*	*19.84*	*18.64*	16.13
2	*11.11*	*16.80*	*16.02*	15.89
3	*11.11*	*17.83*	*16.91*	15.86
4	*11.14*	*17.56*	*16.70*	15.47

Plastic limit (%) = 15.84







Liquid limit (%) = *25*
Plastic limit (%) = *16*
Plasticity index (%) = *9*

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

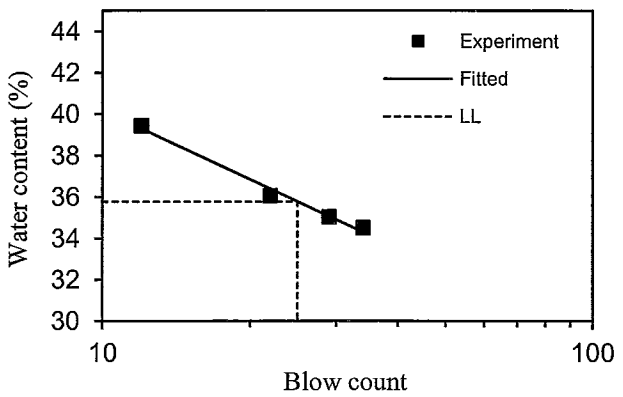
Analyst name: M. de los Reyes
Test date: April 23, 2012
Soil Sample ID: SB-08 No.6 (10.0-12.0 ft)
Sample description: Gray Lean Clay with Sand
% retained on #40 sieve: 2%

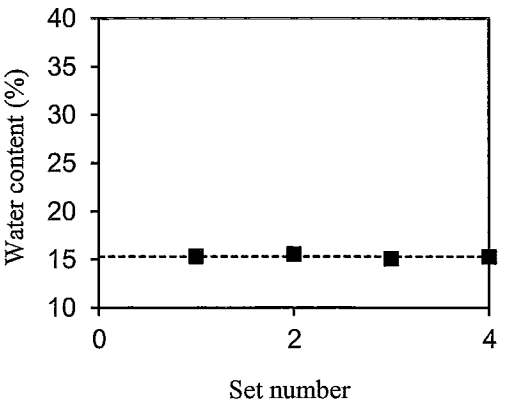
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.37*	*23.57*	*20.44*	*34*	34.51	34.30
2	*11.23*	*23.41*	*20.25*	*29*	35.03	35.06
3	*11.32*	*23.47*	*20.25*	*22*	36.06	36.39
4	*11.05*	*22.40*	*19.19*	*12*	39.43	39.29

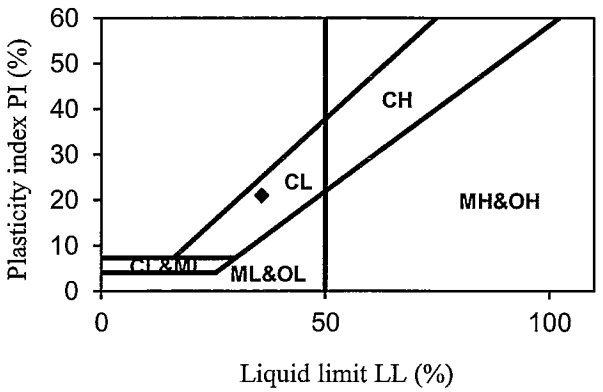
Liquid limit (%) = 35.77
Slope of flow line = 0.130

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.08*	*18.00*	*17.08*	15.33
2	*10.97*	*15.43*	*14.83*	15.54
3	*11.18*	*17.20*	*16.41*	15.11
4	*11.22*	*18.01*	*17.11*	15.28

Plastic limit (%) = 15.32







Liquid limit (%) = *36*
Plastic limit (%) = *15*
Plasticity index (%) = *21*

Prepared by: M. de los Reyes Date: 4/25/12

Checked by: [signature] Date: 4/26/12

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

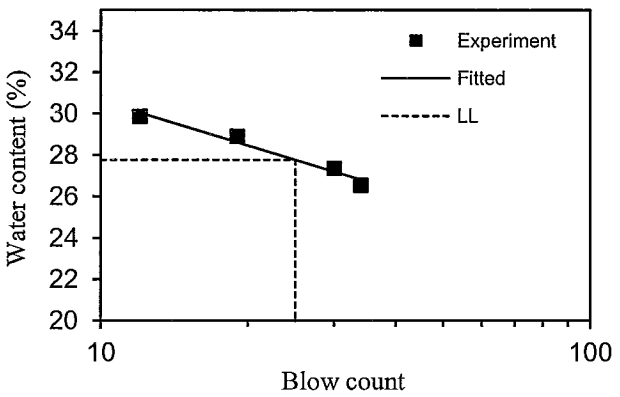
Analyst name: C. Iordache
Test date: April 24, 2012
Soil Sample ID: SB-08 No.7 (12.0-14.0 ft)
Sample description: Brown Sandy Lean Clay
% retained on #40 sieve: 11%

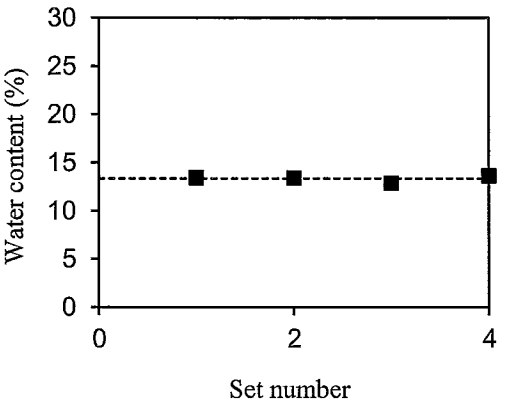
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.12*	*22.42*	*20.05*	*34*	26.54	26.81
2	*11.01*	*20.74*	*18.65*	*30*	27.36	27.20
3	*11.09*	*22.55*	*19.98*	*19*	28.91	28.62
4	*11.16*	*22.25*	*19.70*	*12*	29.86	30.04

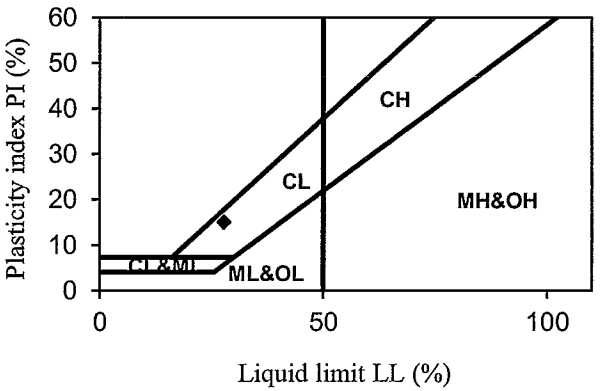
Liquid limit (%) = 27.76
Slope of flow line = 0.110

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.19*	*17.61*	*16.85*	13.43
2	*11.17*	*18.53*	*17.66*	13.41
3	*11.03*	*17.18*	*16.48*	12.84
4	*11.39*	*17.73*	*16.97*	13.62

Plastic limit (%) = 13.32







Liquid limit (%) = *28*
Plastic limit (%) = *13*
Plasticity index (%) = *15*

Prepared by: M. de los Reyes Date: 4/25/12

Checked by: [signature] Date: 4/26/12

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

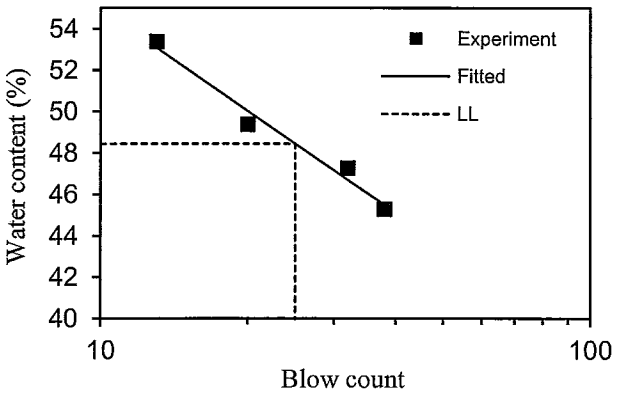
Analyst name: C. Iordache
Test date: April 23, 2012
Soil Sample ID: SB-11 No.2 (2.0-4.0 ft)
Sample description: Black Lean Clay with Sand
% retained on #40 sieve: 1%

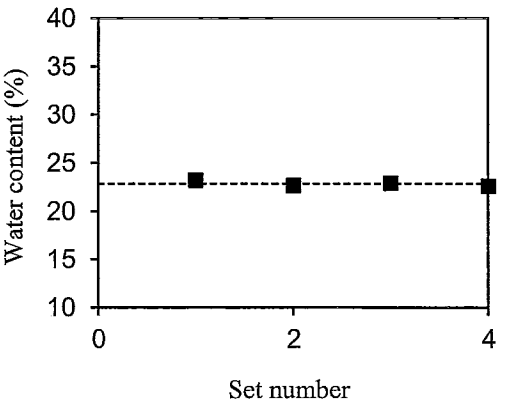
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.31*	*23.31*	*19.57*	*38*	45.28	45.49
2	*11.27*	*20.71*	*17.68*	*32*	47.27	46.71
3	*11.14*	*22.00*	*18.41*	*20*	49.38	50.03
4	*11.15*	*21.87*	*18.14*	*13*	53.36	53.07

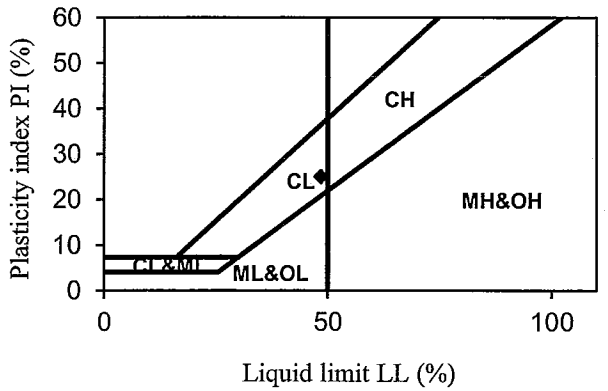
Liquid limit (%) = 48.45
Slope of flow line = 0.143

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.28*	*18.29*	*16.97*	23.20
2	*11.51*	*17.30*	*16.23*	22.67
3	*11.19*	*19.24*	*17.74*	22.90
4	*10.98*	*18.41*	*17.04*	22.61

Plastic limit (%) = 22.84







Liquid limit (%) = *48*
Plastic limit (%) = *23*
Plasticity index (%) = *25*

Prepared by: M. de los Reyes Date: 4/25/12

Checked by: [illegible] Date: 4/26/12

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

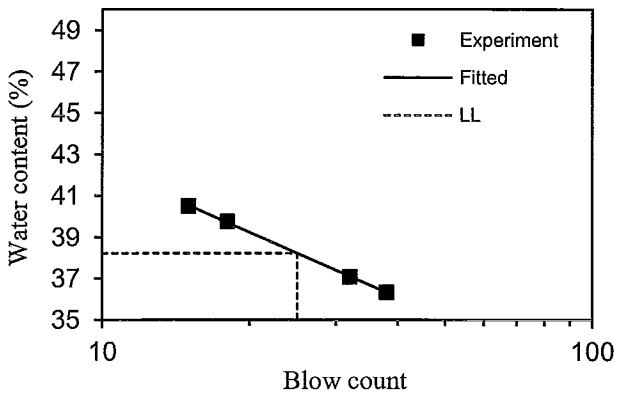
Analyst name: C. Iordache
Test date: April 23, 2012
Soil Sample ID: SB-12 No.5 (8.0-10.0 ft)
Sample description: Gray Sandy Lean Clay
% retained on #40 sieve: 11%

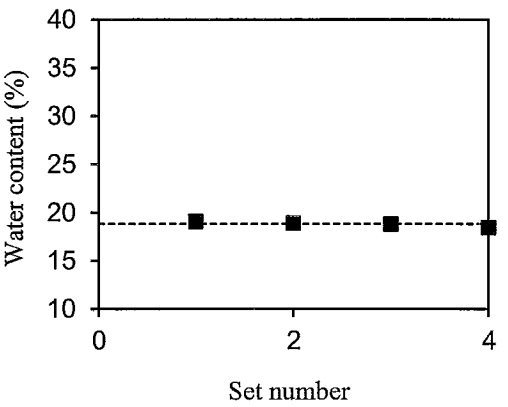
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.20*	*22.42*	*19.43*	*38*	36.33	36.32
2	*11.05*	*21.66*	*18.79*	*32*	37.08	37.10
3	*11.11*	*22.78*	*19.46*	*18*	39.76	39.71
4	*11.12*	*22.81*	*19.44*	*15*	40.50	40.54

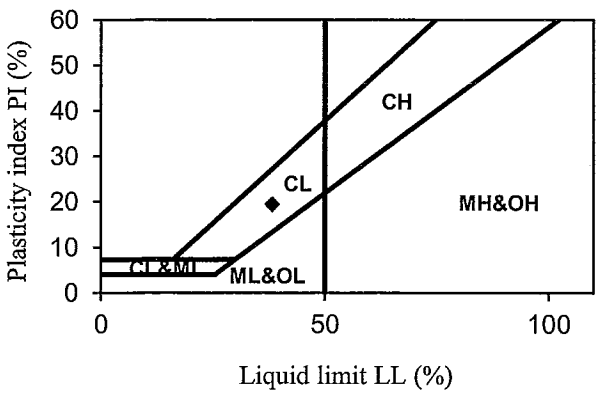
Liquid limit (%) = 38.22
Slope of flow line = 0.118

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.56*	*17.43*	*16.49*	19.07
2	*11.13*	*18.17*	*17.05*	18.92
3	*11.12*	*16.74*	*15.85*	18.82
4	*11.64*	*17.61*	*16.68*	18.45

Plastic limit (%) = 18.81







Liquid limit (%) = *38*
Plastic limit (%) = *19*
Plasticity index (%) = *19*

Prepared by: M. de los Reyes Date: 4/25/12

Checked by: M. Li Date: 4/26/12

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

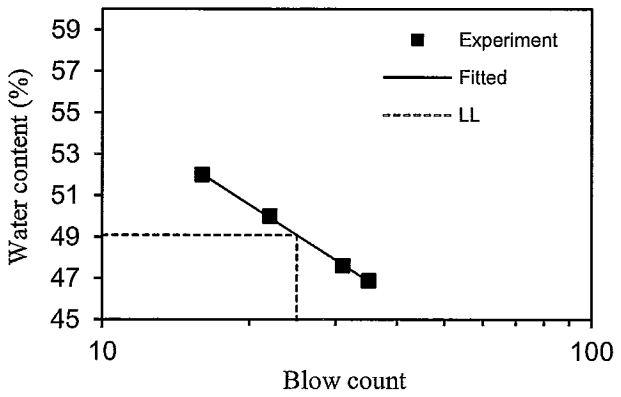
Analyst name: C. Iordache
Test date: April 24, 2012
Soil Sample ID: SB-12 No.6 (10.0-12.0 ft)
Sample description: Brown & Gray Lean Clay
% retained on #40 sieve: 8%

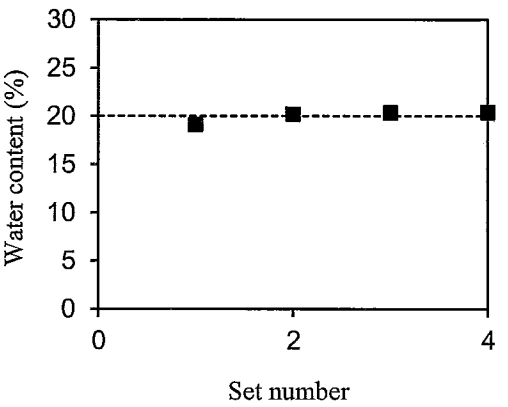
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.16*	*22.69*	*19.01*	*35*	46.88	46.86
2	*11.12*	*21.32*	*18.03*	*31*	47.61	47.66
3	*11.50*	*23.89*	*19.76*	*22*	50.00	49.93
4	*11.19*	*22.62*	*18.71*	*16*	51.99	52.03

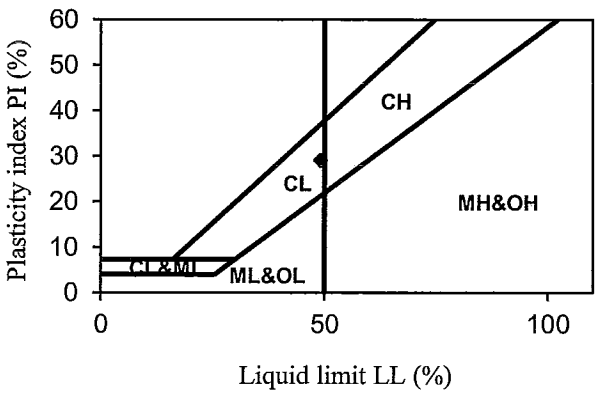
Liquid limit (%) = 49.08
Slope of flow line = 0.134

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.16*	*17.45*	*16.44*	19.13
2	*11.42*	*17.43*	*16.42*	20.20
3	*11.26*	*17.64*	*16.56*	20.38
4	*11.36*	*18.33*	*17.15*	20.38

Plastic limit (%) = 20.02







Liquid limit (%) = *49*
Plastic limit (%) = *20*
Plasticity index (%) = *29*

Prepared by: M. de los Reyes Date: 4/25/12

Checked by: [signature] Date: 4/26/12

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

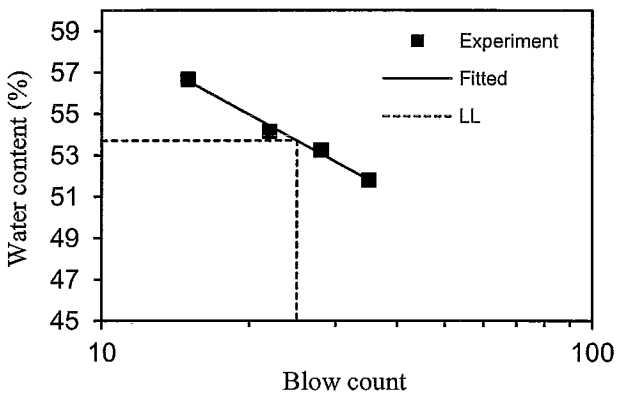
Analyst name: C. Iordache
Test date: April 24, 2012
Soil Sample ID: SB-13 No.2 (2.0-4.0 ft)
Sample description: Gray Fat Clay
% retained on #40 sieve: 1%

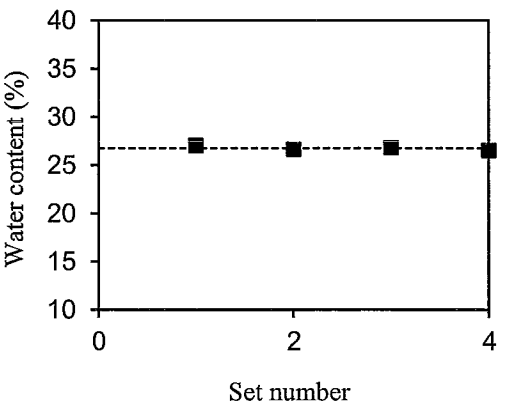
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.23*	*22.66*	*18.76*	*35*	51.79	51.81
2	*11.15*	*23.41*	*19.15*	*28*	53.25	53.06
3	*11.26*	*23.70*	*19.33*	*22*	54.15	54.42
4	*11.39*	*24.19*	*19.56*	*15*	56.67	56.57

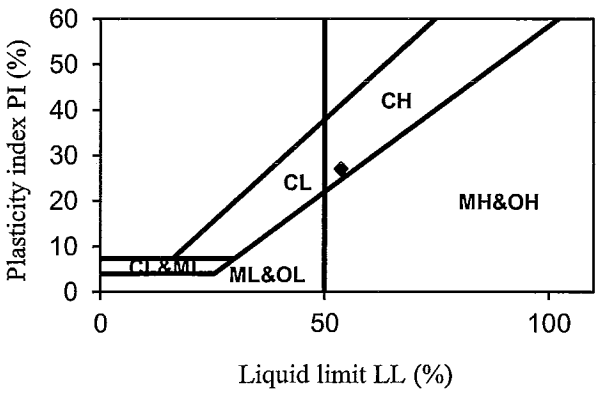
Liquid limit (%) = 53.70
Slope of flow line = 0.104

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.36*	*21.18*	*19.09*	27.04
2	*11.32*	*20.64*	*18.68*	26.63
3	*11.14*	*20.98*	*18.90*	26.80
4	*11.18*	*20.44*	*18.50*	26.50

Plastic limit (%) = 26.74







Liquid limit (%) = *54*
Plastic limit (%) = *27*
Plasticity index (%) = *27*

Prepared by: M. de los Reyes Date: 4/25/12

Checked by: [signature] Date: 4/26/12

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LIQUID LIMIT, PLASTIC LIMIT, and PLASTICITY INDEX of SOILS

AASHTO T 89, T 90 / ASTM D 4318

Client: Michael Baker Jr, Inc.
Project: TICR 7 and 8
WEI Job No: 707-17-02
Prep Method: air dried

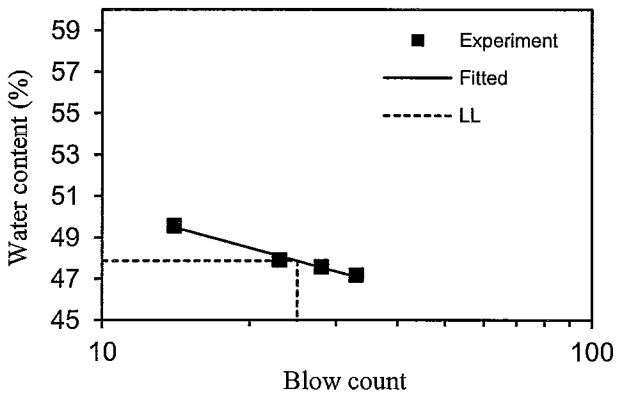
Analyst name: M. de los Reyes
Test date: April 23, 2012
Soil Sample ID: SB-14 No.5 (11.0-12.5 ft)
Sample description: Black Lean Clay with Sand
% retained on #40 sieve: 4%

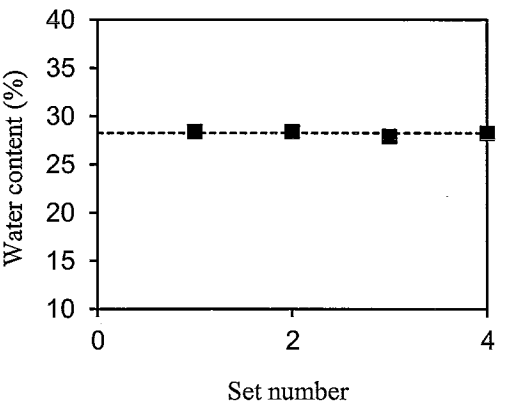
Set #	Tare mass (g) Wc	Tare with wet soil (g) Ww	Tare with dry soil (g) Wd	Blow count N	Water content (%) w	Water content fitted (%)
1	*11.19*	*20.05*	*17.21*	*33*	47.18	47.09
2	*11.19*	*22.14*	*18.61*	*28*	47.57	47.55
3	*11.37*	*21.59*	*18.28*	*23*	47.90	48.10
4	*11.07*	*21.27*	*17.89*	*14*	49.56	49.48

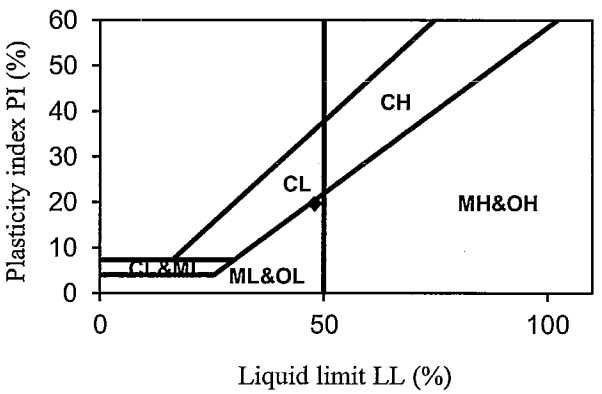
Liquid limit (%) = 47.86
Slope of flow line = 0.058

Set #	Tare mass (g) Mc	Tare with wet soil (g) Mw	Tare with dry soil (g) Md	Water content (%) w
1	*11.05*	*18.10*	*16.54*	28.42
2	*11.17*	*20.80*	*18.67*	28.40
3	*11.09*	*20.62*	*18.54*	27.92
4	*11.10*	*20.32*	*18.29*	28.23

Plastic limit (%) = 28.24







Liquid limit (%) = *48*
Plastic limit (%) = *28*
Plasticity index (%) = *20*

Prepared by: M. de los Reyes Date: 4/25/12
Checked by: [signature] Date: 4/26/12

s:\netprojects\7071702\lab data\lws_wang_mdlr_7071702atterbergsb-14(11.0-12.5ft)_20120424.xls

AASHTO R18

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
3310 Win Street
Cuyahoga Falls, Ohio 44223
800-278-0140

Analysis Request

For Summit Environmenta

Order ID: 1209054
Page 1 of 1
SEI No.
COC

Client Name: Wang Engineering	Project Identification: Streambed Stabilization Project
Client Address: 1145 N. Main street Lombard, IL 60148	Project Address: Tinley Creek
Client Phone: 630-953-9928	Report To: Mayra de los Reyes mdelosreyes@wangeng.com
Client Fax No.: 630-953-9938 ☐ √ to Receive Results by Fax	PO Number: 707-17-02
Contact Person: Mayra de los Reyes	Quote Number:
Sampled By:	☐ √ if Ohio VAP Samples

#	Sample Identification	Date Collected	Time Collected	Grab	Composite	Matrix: S=Solid, L=Liquid, O=Oil SL=Sludge, A=Air	Preservative	Number of Containers	Analytical Parameters and Methods: Sulfide Determination	Chloride Determination	PH (D4972)	Resistivity (G187)	Oxidation-Reduction Potential (G200)			
	SB-13 #4 (6-8 ft)					S			✓	✓	✓	✓	✓			
	SB-08 #3 (4-6 ft)					S			✓	✓	✓	✓	✓			
	SB-04 #3 (6-7.5 ft)					S			✓	✓	✓	✓	✓			

1209054-01-03

Relinquished by:	Date	Time	Received by:	Date	Time
M. de los Reyes	4/17/12				

Received in Lab by:	Date	Time
Sara	4.20.12	10:00

Rush Requested: _____ Day(s)
Must be approved by Lab Manager

Notes / Comments:
* Please e-mail me as to when I can receive results

Summit Environmental Tec
Cooler Recei

Order ID: 1209054 **COOLER**

Client: Wang Engineering Order ID:

Log in Initials:

Date Received: 4.20.12 Time Received: 10:00 Date opened:

Number of Coolers/Boxes: 1 N/A Unpacked by: Sara

Shipper: ~~FED EX~~ UPS DHL Airborne US Postal Walk-in Pickup Other:

Packaging: Peanuts Bubble Wrap Paper Foam (None) Other:

Tape on cooler/box:	(Y)	N	N/A
Custody Seals intact	Y	N	(N/A)
C-O-C in plastic	(Y)	N	N/A
Coolant: Ice___ Melted Ice ____Blue ice ___ Water ___ (None) ___	Sample Temperature 15.1 °C		
C-O-C filled out properly	(Y)	N	N/A
Samples in separate bags	(Y)	N	N/A
Sample containers intact	(Y)	N	N/A

*If no, list broken sample(s):

Sample label(s) complete (ID, date, etc.)	(Y)	N	N/A
Label(s) agree with C-O-C	(Y)	N	N/A
Correct containers used	(Y)	N	N/A
Sufficient sample received	(Y)	N	N/A
Samples at correct pH? (list below)	Y	N	~~NA~~
Bubbles absent from 40 mL vials**	Y	N	(N/A)

** Samples with bubbles less than the size of a pea are acceptable.

Client contact: Date/Time:

Comments:

Sample ID	pH	Sample ID	pH

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

LABORATORY REPORT

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

Order Number
1209054

Project Number
Streambed Stabilization Project

Issued
Wednesday, May 02, 2012

Total Number of Pages
5 (excluding C.O.C. and cooler receipt form)

Approved By : RL Libra
QA Manager

NELAC Accreditation #E87688

Sample Summary

Client: Wang Engineering
Order Number: 1209054

Laboratory ID	Client ID	Matrix	Sampling Date
1209054-01	SB-13 #4 (6-8FT)	Solid	4/17/2012
1209054-02	SB-08 #3 (4-6FT)	Solid	4/17/2012
1209054-03	SB-04 #3 (6-7.5FT)	Solid	4/17/2012

Report Narrative

Client: Wang Engineering
Order Number: 1209054

Solid sample results are reported on a wet weight basis except as noted.
No problems were encountered during analysis of this order number, except as noted.

Data Qualifiers:
B = Analyte found in the method blank
J = Estimated concentration of analyte between MDL (LOD) and Reporting Limit (LOQ)
C = Analyte has been confirmed by another instrument or method
E = Analyte exceeds the upper limit of the calibration curve.
D = Sample or extract was analyzed at a higher dilution
X = User defined data qualifier.
S = Surrogate out of control limits
U = Undetected
a = Not Accredited by NELAC

ND = Non Detected at LOQ
DF = Dilution Factor

Limit Of Quantitation (LOQ) = Laboratory Reporting Limit (not adjusted for dilution factor)
Limit Of Detection (LOD) = Laboratory Detection Limit

Matrices:
A = Air
C = Cream
DW = Drinking Water
L = Liquid
O = Oil
SL = Sludge
SO = Soil
S = Solid
T = Tablet
TC = TCLP Extract
WW = Waste Water
W = Wipe

Estimated uncertainty values are available upon request.

The test results meet the requirements of the NELAC standard, except where noted. The information contained in this analytical report is the sole property of Summit Environmental Technologies, Inc. and that of the client. It cannot be reproduced in any form without the consent of Summit Environmental Technologies, Inc. or the client for which this report was issued. The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

May 02, 2012
Client: Wang Engineering
Address: 1145 N. Main Street
Lombard, IL 60148
Received: 4/20/2012
Project #: Streambed Stabilization Project

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	LOQ	Run	Analyst
SB-13 #4 (6-8FT)	1209054-01	17-Apr-12	Chloride	ND	mg/Kg	S	9056	1	100	25-Apr-12	KMG
SB-13 #4 (6-8FT)	1209054-01	17-Apr-12	ORP	131.6	mV	S	ASTM G200	1	1	01-May-12	CXS
SB-13 #4 (6-8FT)	1209054-01	17-Apr-12	pH	7.55@19.4 C	s.u.	S	SW-846 9045 A	1	0.01	23-Apr-12	JRK
SB-13 #4 (6-8FT)	1209054-01	17-Apr-12	Resistivity	0.0673 uohms		S	120.1	1	0.0001	23-Apr-12	ERE
SB-13 #4 (6-8FT)	1209054-01	17-Apr-12	Sulfide, Distillation	ND	mg/Kg	S	SW-846 9030 A mod.	1	25	24-Apr-12	TIR
SB-08 #3 (4-6FT)	1209054-02	17-Apr-12	Chloride	ND	mg/Kg	S	9056	1	100	25-Apr-12	KMG
SB-08 #3 (4-6FT)	1209054-02	17-Apr-12	ORP	172.1	mV	S	ASTM G200	1	1	01-May-12	CXS
SB-08 #3 (4-6FT)	1209054-02	17-Apr-12	pH	8.19@19.1 C	s.u.	S	SW-846 9045 A	1	0.01	23-Apr-12	JRK
SB-08 #3 (4-6FT)	1209054-02	17-Apr-12	Resistivity	0.0508 uohms		S	120.1	1	0.0001	23-Apr-12	ERE
SB-08 #3 (4-6FT)	1209054-02	17-Apr-12	Sulfide, Distillation	ND	mg/Kg	S	SW-846 9030 A mod.	1	25	24-Apr-12	TIR

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

May 02, 2012
Client: Wang Engineering
Address: 1145 N. Main Street
Lombard, IL 60148
Received: 4/20/2012
Project #: Streambed Stabilization Project

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	LOQ	Run	Analyst
SB-04 #3 (6-7.5FT)	1209054-03	17-Apr-12	Chloride	ND	mg/Kg	S	9056	1	100	25-Apr-12	KMG
SB-04 #3 (6-7.5FT)	1209054-03	17-Apr-12	ORP	276.0	mV	S	ASTM G200	1	1	01-May-12	CXS
SB-04 #3 (6-7.5FT)	1209054-03	17-Apr-12	pH	8.53@18.8 C	s.u.	S	SW-846 9045 A	1	0.01	23-Apr-12	JRK
SB-04 #3 (6-7.5FT)	1209054-03	17-Apr-12	Resistivity	0.0224 uohms		S	120.1	1	0.0001	23-Apr-12	ERE
SB-04 #3 (6-7.5FT)	1209054-03	17-Apr-12	Sulfide, Distillation	ND	mg/Kg	S	SW-846 9030 A mod.	1	25	24-Apr-12	TIR

APPENDIX C - Calculations

S.O. No. _____

Subject: TINLEY CREEK - DETERMINATION OF REQ'D PILE MOMENT OF INERTIA Sheet No. 1 of 4

Drawing No. _____

Computed by REC Checked By DNO Date 6/21/12

Baker

FROM CWAISHT OUTPUT -

$$\frac{\text{SCALED DEFLECTION}}{E_S \quad I} = \Delta \text{ (DEFLECTION)} \quad (\text{MAX. ASSUMED} = 2'')$$

$$I = \frac{\text{SCALED DEFLECTION}}{E_S \ \Delta}$$

$$E_S = 29{,}000{,}000 \text{ PSI} = 29 \times 10^6 \text{ PSI}$$

$$I = \frac{\text{SCALED DEFLECTION}}{29 \times 10^6 \text{ PSI} \times 2''}$$

$$I = \frac{\text{SCALED DEFLECTION}}{58 \times 10^6 \text{ PSI}}$$

ASSUMING USE OF AZ13 SHEET PILE THE MAXIMUM DEFLECTIONS FOR TC-7 AND TC-8 WOULD BE:

$I_{AZ13} = 144.3 \text{ in}^4/\text{FT}$

TC-7

$$\Delta_{MAX} = \frac{7.4999 \times 10^9 \text{ lb-in}^3}{29 \times 10^6 \text{ PSI} \ (144.3 \text{ in}^4)} = 1.79 \text{ in}$$

TC-8

$$\Delta_{MAX} = \frac{2.7887 \times 10^9 \text{ lb-in}^3}{29 \times 10^6 \text{ PSI} \ (144.3 \text{ in}^4)} = 0.67 \text{ in}$$

S.O. No. _____

Subject: TINLEY CREEK - SUMMARY OF ESTIMATED SHEET PILE TIP ELEVATIONS Sheet No. 2 of 4

Drawing No. _____

Computed by REC Checked By JAD Date 6/21/12

LOCATION	BORING #	EST. PILE TIP DEPTH	MAX BENDING MOMENT/FT	SCALED DEFLECTION lb-in³	PILE MOMENT OF INERTIA in⁴ REQ'D/FT	REQ'D PILE SECTION
TC-7	SB-07	22'	12.53'K	3.1343×10^9	54.04	AZ 13 PZ 22
	SB-11	28'	19.0'K	7.4999×10^9	129.31	AZ 13 / PZ 27
	SB-14	21'	11.85'K	2.3754×10^9	40.96	AZ 13 / PZ 22
TC 8						
	SB-02	21'	11.85'K	2.3754×10^9	40.96	AZ 13 / PZ 22
	SB-03	21'	11.85'K	2.3754×10^9	40.96	AZ 13 / PZ 22
	SB-04	22'	11.85'K	2.4673×10^9	42.54	AZ 13 / PZ 22
	SB-06	22'	13.03'K	2.7887×10^9	48.08	AZ 13 / PZ 22

* ARBED PILES

REFERENCE: "SOIL MECHANICS IN FOUNDATION ENGINEERING" Z. WILUN AND K. STARZEWSKI VOLUME 1

3/4

S.I. UNITS ↓ 155

MECHANICAL PROPERTIES OF SOILS

KILONEWTON/METRE²

kPa

Table 5.7. Typical values of strength parameters ϕ and c in kN/m³
(after Polish Code PN-59/B-03020, 1959)

		Type of soil		Density index of cohesionless soils			
			I_D =	DENSE 1.0 – 0.67	M. DENSE 0.67 – 0.33	LOOSE 0.33 – 0	0
cohesionless	inorganic	gravels, tills, hoggins, etc.	ϕ'	45°–40°	40°–37°	37°–35°	
		sands: coarse and medium	ϕ'	40°–38°	38°–35°	35°–32°	
		sands: fine and silty	ϕ'	37°–35°	35°–32°	32°–28°	
	organic	sands, organic	ϕ'	30°–25°	25°–22°	22°–18°	
				Consistency of cohesive soils			
				hard or very stiff 1.5+	stiff 1.5–0.8	firm 0.8–0.4	soft to very soft 0.4–0.2
			$w = w_s$ I_c =	1.0	0.75	0.50	0.0
cohesive	inorganic	slightly clayey sands, sandy silts, silts J < 10%	ϕ' c' ϕ_u	28°–24° 40°–30 25°–20°	24°–22° 30–20 20°–16°	22°–19° 20–15 16°–10°	19°–5° 15–2 10°–7°
		clayey sands, clayey sandy silts, clayey silts, J = 10–20%	ϕ' c' ϕ_u	26°–22° 50–40 20°–16°	22°–19° 40–30 16°–12°	19°–15° 30–20 12°–7°	15°–12° 20–3 7°–5°
		sand–clays, sand–silt–clays, silt–clays J = 20–30%	ϕ' c' ϕ_u	23°–20° 60–50 15°–12°	20°–17° 50–40 12°–9°	17°–12° 40–30 9°–5°	12°–8° 30–5 5°–2°
		sandy clays, clays, silty clays J > 30%	ϕ' c' ϕ_u	19°–17° 80–60 10°–8°	17°–14° 60–50 8°–5°	14°–5° 50–40 5°–2°	10°–5° 40–10 2°–0°
	organic	organic silts, peats, etc.		all strength parameters to be determined from laboratory tests			

• For approximate conversion from kN/m³ to lbf/ft³ multiply by 21 and to kgf/cm² by 0·01.
For computation of safe bearing capacity undrained cohesive resistance c_u can be taken as equal to c' – this assumption is on the safe side.

I_c = CONSISTENCY INDEX = $\frac{w_L - w_{natural}}{w_L - w_P}$

J = CLAY FRACTION

* C' & ϕ' = EFFECTIVE STRESS PARAMETERS

C_u & ϕ_u = TOTAL STRESS PARAMETERS

W_s = SHRINKAGE LIMIT

W = NATURAL WATER CONTENT

I_D = DENSITY INDEX

3/35

TABLE 1
Typical Properties of Compacted Soils

Group Symbol	Soil Type	Range of Maximum Dry Unit Weight, pcf	Range of Optimum Moisture, Percent	Typical Value of Compression		Typical Strength Characteristics				Typical Coefficient of Permeability ft./min.	Range of CBR Values	Range of Subgrade Modulus k lbs/cu in.
				At 1.4 tsf (20 psi)	At 3.6 tsf (50 psi)	Cohesion (as compacted) psf	Cohesion (saturated) psf	∅ (Effective Stress Envelope Degrees)	Tan ∅			
				Percent of Original Height								
GW	Well graded clean gravels, gravel-sand mixtures.	125 - 135	11 - 8	0.3	0.6	0	0	>38	>0.79	5×10^{-2}	40 - 80	300 - 500
GP	Poorly graded clean gravels, gravel-sand mix	115 - 125	14 - 11	0.4	0.9	0	0	>37	>0.74	10^{-1}	30 - 60	250 - 400
GM	Silty gravels, poorly graded gravel-sand-silt.	120 - 135	12 - 8	0.5	1.1	.....	.....	>34	>0.67	$>10^{-6}$	20 - 60	100 - 400
GC	Clayey gravels, poorly graded gravel-sand-clay.	115 - 130	14 - 9	0.7	1.6	.....	.....	>31	>0.60	$>10^{-7}$	20 - 40	100 - 300
SW	Well graded clean sands, gravelly sands.	110 - 130	16 - 9	0.6	1.2	0	0	38	0.79	$>10^{-3}$	20 - 40	200 - 300
SP	Poorly graded clean sands, sand-gravel mix.	100 - 120	21 - 12	0.8	1.4	0	0	37	0.74	$>10^{-3}$	10 - 40	200 - 300
SM	Silty sands, poorly graded sand-silt mix.	110 - 125	16 - 11	0.8	1.6	1050	420	34	0.67	$5 \times >10^{-5}$	10 - 40	100 - 300
SM-SC	Sand-silt clay mix with slightly plastic fines.	110 - 130	15 - 11	0.8	1.4	1050	300	33	0.66	$2 \times >10^{-6}$	5 - 30	100 - 300
SC	Clayey sands, poorly graded sand-clay-mix.	105 - 125	19 - 11	1.1	2.2	1550	230	31	0.60	$5 \times >10^{-7}$	5 - 20	100 - 300
ML	Inorganic silts and clayey silts.	95 - 120	24 - 12	0.9	1.7	1400	190	32	0.62	$>10^{-5}$	15 or less	100 - 200
ML-CL	Mixture of inorganic silt and clay.	100 - 120	22 - 12	1.0	2.2	1350	460	32	0.62	$5 \times >10^{-7}$	.....	
CL	Inorganic clays of low to medium plasticity.	95 - 120	24 - 12	1.3	2.5	1800	270	28	0.54	$>10^{-7}$	15 or less	50 - 200
OL	Organic silts and silt-clays, low plasticity.	80 - 100	33 - 21	.....	.....	.....	.....	.....	.....	.....	5 or less	50 - 100
MH	Inorganic clayey silts, elastic silts.	70 - 95	40 - 24	2.0	3.8	1500	420	25	0.47	$5 \times >10^{-7}$	10 or less	50 - 100
CH	Inorganic clays of high plasticity	75 - 105	36 - 19	2.6	3.9	2150	230	19	0.35	$>10^{-7}$	15 or less	50 - 150
OH	Organic clays and silty clays	65 - 100	45 - 21	.....	.....	.....	.....	.....	.....	.....	5 or less	25 - 100

Notes:

1. All properties are for condition of "Standard Proctor" maximum density, except values of k and CBR which are for "modified Proctor" maximum density.
2. Typical stength characteristics are for effective strength envelopes and are obtained from USBR data.
3. Compression values are for vertical loading with complete lateral confinement.
4. (>) indicates that typical property is greater than the value shown.
   (..) indicates insufficient data available for an estimate.

S.O. No. _____

Subject: TINLEY CREEK - RETAINING WALLS @ CENTRAL PARK AND SPRINGFIELD AVES. Sheet No. 1 of 11

RESULTS SUMMARY Drawing No. _____

Computed by REC Checked By JAD Date 6/21/12

Baker

TINLEY CREEK

@ SB-07

PILE TIP DEPTH - 23' BELOW TOP OF PILE (BORING ELEV.)

MAX. BENDING MOMENT = 12.53'K

γ_m = 115 PCF γ_{SAT} = 120 PCF $\phi = 28^\circ$ $K_a = 0.361$

C = 270 PSF

@ SB-14

PILE TIP DEPTH - 21' Below Top of Pile (BORING ELEV)

MAX BENDING MOMENT - 11.85'K

γ_m = 115 PCF γ_{SAT} = 120PCF $\phi = 28^\circ$ $K_a = 0.361$

CENTRAL PARK AVE

UPSTREAM END (B-01) B.O.F. - 615'

NOMINAL BEARING RESISTANCE - 23.47 KSF

EXCAVATION PARAMETERS - $\phi = 34^\circ$ C = ϕ $K_a = 0.283$

γ_m = 110 PCF γ_s = 115 PCF COEFF SLIDING FRICTION = 0.675

DOWNSTREAM END - (B-02)

NOMINAL BEARING RESISTANCE - 28.8 KSF BOF - 613'

EXCAVATION PARAMETERS $\phi = 34^\circ$ C = 0 $K_a = 0.283$

γ_m = 110 PCF, γ_s = 115 PCF COEFF OF SLIDING FRICTION 0.675

SPRINGFIELD AVE - (B-03)

NOMINAL BEARING RESISTANCE - 18.2 KSF BOF - 626'

EXCAVATION PARAMETERS - $\phi = 28^\circ$ C = 0 $K_a = 0.361$

γ_m = 110 PCF γ_s = 115 PCF COEFF SLIDING FRICTION = 0.532

S.O. No. _____

Subject: TINLEY CREEK SB07

LATERAL EARTH PRESSURE Sheet No. 2 of 11

Drawing No. _____

Computed by REC Checked By JAD Date 6/21/12

AASHTO 3.11.5.7.2

LATERAL EARTH PRESSURE - BASED ON COHESIVE SOILS SHOULD BE DETERMINED IN ACCORDANCE WITH AASHTO

EQ. 3.11.5.7.1, (EQ. 3.11.5.7.1-1) $P_a = K_a \gamma' H$

$K_a = \tan^2 (45° - \phi_s/2)$ FOR LEVEL BACKFILL

ϕ_s = DRAINED FRICTION ANGLE = 28° FOR CL. (EL 100-87) AND BELOW 82'

19° FOR CH (EL 87-82)

∴ USE K_a = 0.361 (100'-87' AND BELOW 82')

K_a = 0.509 (87'-82')

γ_m = 115 PCF (100'-87') AND BELOW 82'

γ_{SAT} = 120 PCF " " "

γ_m = 105 PCF (87'-82')

γ_{SAT} = 110 PCF "

EST. PILE TIP ELEV. = 77' (23' BELOW TOP OF PILE)

MAX. BENDING MOMENT = 12.53'K

NOTE: q_u VALUES IN SB-14 ARE HIGH ENOUGH TO ENABLE CLAY TO STAND VERTICALLY. HOWEVER, STREAM ACTION AND WEATHERING WILL SOFTEN CLAY AND A LOWER STRENGTH WAS USED.

S.O. No. _____

Subject: _____

Sheet No. 3 of 11

Drawing No. _____

Computed by RLC Checked By JD Date 6/21/12

Baker

TC7-07

@ Boring SB-07

0 - 13'

CL

$\bar{N}$ = 7.2

q_u = 5 KSF

γ_m = 110 γ_{sat} = 115

ϕ = 28 14

C = 270 PSF 200 PSF

13'

CH

$\bar{N}$ = 3.5

q_u = 1.24 KSF

γ_m = 105 γ_{sat} 110

ϕ = 19° 8

C = 230 400 PSF

18'

CL

20

$\bar{N}$ = 11

q_u = 5.24 KSF

γ_m = 115 γ_{sat} = 120

ϕ = 28 15

C = 270 1100

* STRENGTH

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-JUNE-2012 TIME: 13:08:26

4/11

****
* INPUT DATA *
****

I.--HEADING
'TINLEY CREEK - SB-07

II.--CONTROL
CANTILEVER WALL DESIGN
FACTOR OF SAFETY FOR ACTIVE PRESSURES = 1.00
FACTOR OF SAFETY FOR PASSIVE PRESSURES = 1.50

III.--WALL DATA
ELEVATION AT TOP OF WALL = 100.00 FT.

IV.--SURFACE POINT DATA

IV.A.--RIGHTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
0.00	100.00
100.00	100.00

IV.B.--LEFTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
0.00	91.00
15.00	91.00
16.00	100.00

V.--SOIL LAYER DATA

V.A.--RIGHTSIDE
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURE = 1.00
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURE = 1.50

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
120.00	110.00	28.00	270.00	0.00	0.00	87.00	0.00	DEF	DEF
110.00	105.00	19.00	230.00	0.00	0.00	82.00	0.00	DEF	DEF
120.00	115.00	28.00	270.00	0.00	0.00			DEF	DEF

V.B.--LEFTSIDE
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURE = 1.00
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURE = 1.50

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
115.00	110.00	28.00	270.00	0.00	0.00	87.00	0.00	DEF	DEF
110.00	105.00	19.00	230.00	0.00	0.00	82.00	0.00	DEF	DEF
115.00	110.00	28.00	270.00	0.00	0.00			DEF	DEF

VI.--WATER DATA
UNIT WEIGHT = 62.40 (PCF)
RIGHTSIDE ELEVATION = 99.00 (FT)
LEFTSIDE ELEVATION = 92.00 (FT)
NO SEEPAGE

VII.--VERTICAL SURCHARGE LOADS
NONE

VIII.--HORIZONTAL LOADS
NONE

8/35

5/11

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-JUNE-2012 TIME: 13:08:30

****
* SOIL PRESSURES FOR *
* CANTILEVER WALL DESIGN *
****

I.--HEADING
'TINLEY CREEK - SB-07

II.--SOIL PRESSURES

RIGHTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

				<------NET------>			
	NET	<---LEFTSIDE--->		(SOIL + WATER)		<--RIGHTSIDE--->	
ELEV.	WATER	PASSIVE	ACTIVE	ACTIVE	PASSIVE	ACTIVE	PASSIVE
(FT)	(PSF)	(PSF)	(PSF)	(PSF)	(PSF)	(PSF)	(PSF)
100.0	0.0	0.0	0.0	0.0	509.6	0.0	509.6
99.0	0.0	0.0	0.0	0.0	703.7	0.0	703.7
98.0	62.4	0.0	0.0	62.4	907.8	0.0	845.4
97.0	124.8	0.0	0.0	124.8	1085.6	0.0	960.8
96.0	187.2	0.0	0.0	187.2	1263.4	0.0	1076.2
95.0	249.6	0.0	0.0	249.6	1441.2	0.0	1191.6
94.0	312.0	0.0	0.0	312.0	1619.0	0.0	1307.0
93.0	374.4	0.0	0.0	374.4	1796.8	0.0	1422.4
92.0	436.8	0.0	0.0	436.8	1974.6	0.0	1537.8
91.0+	436.8	0.0	0.0	436.8	2090.0	0.0	1653.2
91.0-	436.8	509.6	0.0	-72.8	2090.0	0.0	1653.2
90.0	436.8	615.0	0.0	-178.2	2205.4	0.0	1768.6
89.0	436.8	720.4	0.0	-283.6	2320.8	0.0	1884.0
88.0	436.8	825.7	0.0	-388.9	2436.2	0.0	1999.4
87.0	436.8	818.9	0.0	-382.1	2312.4	0.0	1875.6
86.0	436.8	796.2	0.0	-359.4	2168.6	0.0	1731.8
85.0	436.8	869.2	0.0	-432.4	2243.9	0.0	1807.1
84.0	436.8	942.9	0.0	-506.1	2319.2	0.0	1882.4
83.0	436.8	1018.0	0.0	-581.2	2393.0	0.0	1956.2
82.0	436.8	1259.5	0.0	-822.7	2759.1	0.0	2322.3
81.0	436.8	1516.2	0.0	-1079.4	3145.3	0.0	2708.5
80.0	436.8	1647.8	0.0	-1211.0	3259.3	0.0	2822.5
79.0	436.8	1826.7	0.0	-1389.9	3374.7	0.0	2937.9
78.0	436.8	2215.2	0.0	-1778.4	3490.1	0.0	3053.3
77.0	436.8	2561.4	0.0	-2124.6	3605.5	0.0	3168.7
76.0	436.8	2448.9	0.0	-2012.1	3720.9	0.0	3284.1
75.0	436.8	2751.0	0.0	-2314.2	3836.3	0.0	3399.5
74.0	436.8	3499.0	0.0	-3062.2	3951.7	0.0	3514.9
73.0	436.8	4137.1	0.0	-3700.3	4067.1	0.0	3630.3
72.0	436.8	4993.5	0.0	-4429.0	4182.5	127.8	3745.7
71.0	436.8	4463.0	0.0	-3753.5	4297.9	272.7	3861.1
70.0	436.8	5377.9	0.0	-4640.8	4413.3	300.3	3976.5
69.0	436.8	5661.4	0.0	-4903.6	4528.7	321.1	4091.9
68.0	436.8	7068.6	0.0	-6289.9	4644.1	341.9	4207.3
67.0	436.8	12054.2	0.0	-11254.7	4759.5	362.7	4322.7
66.0	436.8	9761.5	0.0	-8941.2	4874.9	383.4	4438.1
65.0	436.8	5633.4	0.0	-4792.3	4990.3	404.2	4553.5
64.0	436.8	14523.5	0.0	-13661.7	5105.7	425.0	4668.9
63.0	436.8	15253.8	0.0	-14371.2	5221.1	445.8	4784.3

9/35

62.0	436.8	1500.4	484.8	-597.0	4851.7	466.6	4899.7
61.0	436.8	1553.0	749.8	-628.8	4702.1	487.4	5015.1
60.0	436.8	5776.9	539.2	-4831.9	5028.1	508.2	5130.5

6/11

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-JUNE-2012 TIME: 13:08:50

****
* SUMMARY OF RESULTS FOR *
* CANTILEVER WALL DESIGN *
****

I.--HEADING
'TINLEY CREEK - SB-07

II.--SUMMARY

RIGHTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

WALL BOTTOM ELEV. (FT) : 77.79
PENETRATION (FT) : 13.21

MAX. BEND. MOMENT (LB-FT) : 1.2531E+04
AT ELEVATION (FT) : 84.73

MAX. SCALED DEFL. (LB-IN^3): 3.1343E+09
AT ELEVATION (FT) : 100.00

NOTE: DIVIDE SCALED DEFLECTION MODULUS OF
ELLASTICITY IN PSI TIMES PILE MOMENT
OF INERTIA IN IN^4 TO OBTAIN DEFLECTION
IN INCHES.

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHOREDOR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-JUNE-2012 TIME: 13:08:50

****
* COMPLETE OF RESULTS FOR *
* CANTILEVER WALL DESIGN *
****

I.--HEADING
'TINLEY CREEK - SB-07

II.--RESULTS

ELEVATION (FT)	BENDING MOMENT (LB-FT)	SHEAR (LB)	SCALED DEFLECTION (LB-IN^3)	NET PRESSURE (PSF)
100.00	0.0000E+00	0.	3.1343E+09	0.00
99.00	6.1118E-10	0.	2.9145E+09	0.00
98.00	1.0400E+01	31.	2.6948E+09	62.40
97.00	8.3200E+01	125.	2.4751E+09	124.80
96.00	2.8080E+02	281.	2.2555E+09	187.20

10/35

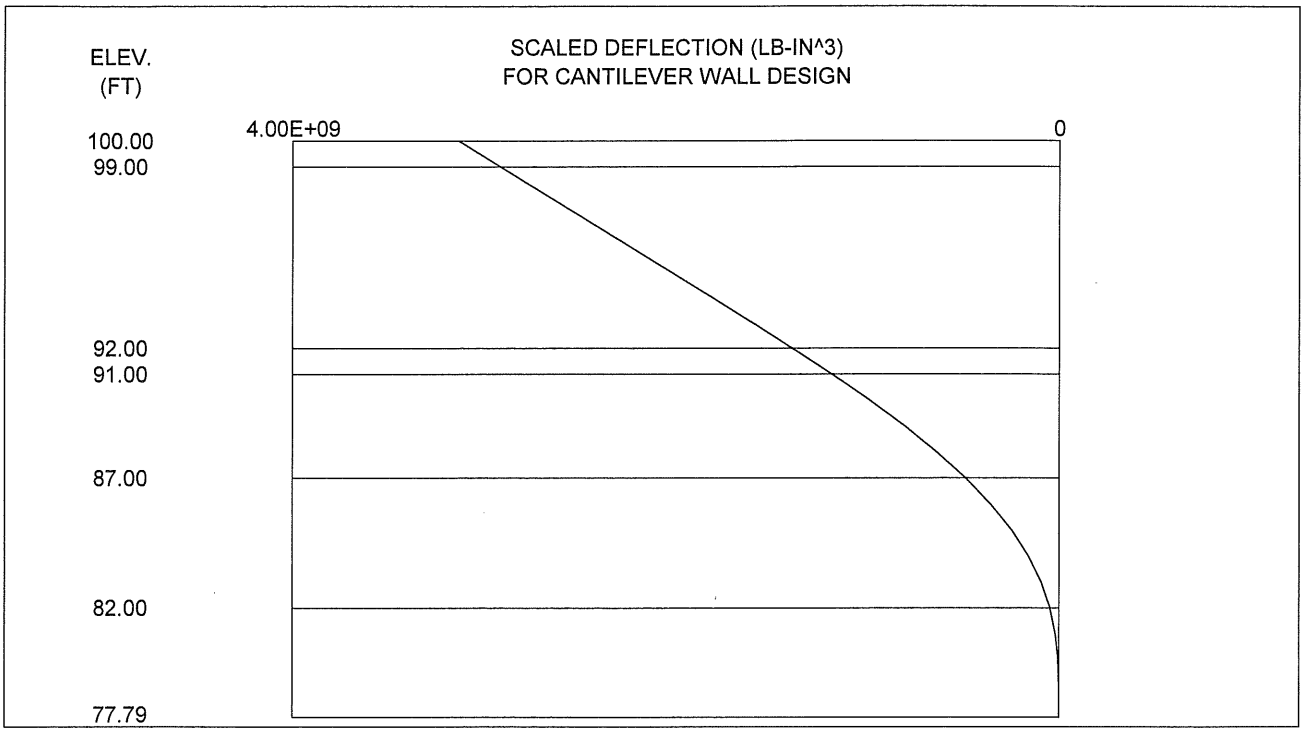
95.00	6.6560E+02	499.	2.0365E+09	249.60
94.00	1.3000E+03	780.	1.8187E+09	312.00
93.00	2.2464E+03	1123.	1.6031E+09	374.40
92.00	3.5672E+03	1529.	1.3915E+09	436.80
91.00+	5.3144E+03	1966.	1.1861E+09	436.80
91.00-	5.3144E+03	1966.	1.1861E+09	-72.76
90.00	7.2261E+03	1840.	9.8990E+08	-178.17
89.00	8.9595E+03	1609.	8.0617E+08	-283.56
88.00	1.0409E+04	1273.	6.3788E+08	-388.94
87.00	1.1489E+04	887.	4.8753E+08	-382.11
86.00	1.2189E+04	517.	3.5698E+08	-359.37
85.00	1.2514E+04	121.	2.4743E+08	-432.37
84.00	1.2407E+04	-348.	1.5945E+08	-506.13
83.00	1.1793E+04	-892.	9.2835E+07	-581.21
82.00	1.0570E+04	-1594.	4.6511E+07	-822.68
81.00	8.5218E+03	-2545.	1.8333E+07	-1079.37
80.46	6.9718E+03	-3152.	9.4128E+06	-1151.09
80.00	5.4447E+03	-3495.	4.7274E+06	-354.80
79.00	2.0635E+03	-2976.	4.8073E+05	1394.17
78.00	7.6463E+01	-707.	5.0375E+02	3143.13
77.79	0.0000E+00	0.	0.0000E+00	3514.57

NOTE: DIVIDE SCALED DEFLECTION MODULUS OF ELLASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN^4 TO OBTAIN DEFLECTION IN INCHES.

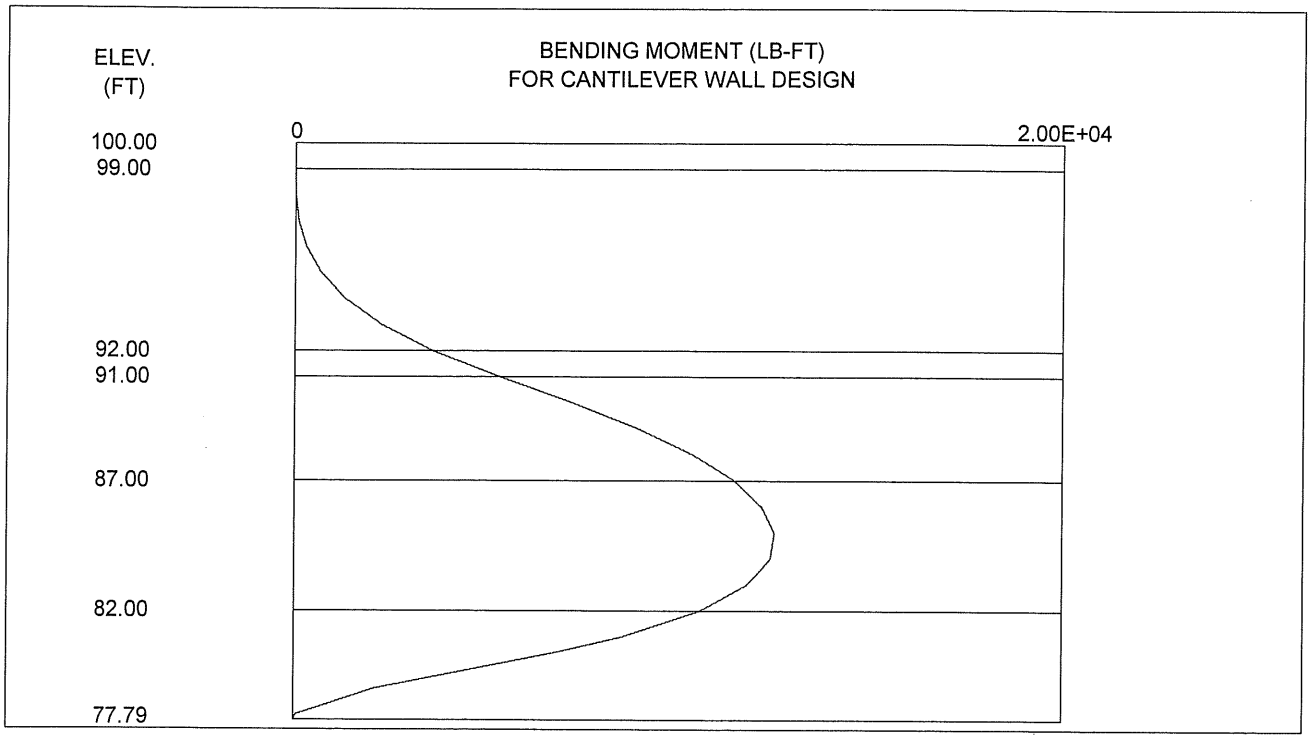
III.--WATER AND SOIL PRESSURES

		<----------SOIL PRESSURES---------->			
	WATER	<----LEFTSIDE----->		<---RIGHTSIDE---->	
ELEVATION (FT)	PRESSURE (PSF)	PASSIVE (PSF)	ACTIVE (PSF)	ACTIVE (PSF)	PASSIVE (PSF)
100.00	0.	0.	0.	0.	510.
99.00	0.	0.	0.	0.	704.
98.00	62.	0.	0.	0.	845.
97.00	125.	0.	0.	0.	961.
96.00	187.	0.	0.	0.	1076.
95.00	250.	0.	0.	0.	1192.
94.00	312.	0.	0.	0.	1307.
93.00	374.	0.	0.	0.	1422.
92.00	437.	0.	0.	0.	1538.
91.00+	437.	0.	0.	0.	1653.
91.00-	437.	510.	0.	0.	1653.
90.00	437.	615.	0.	0.	1769.
89.00	437.	720.	0.	0.	1884.
88.00	437.	826.	0.	0.	1999.
87.00	437.	819.	0.	0.	1876.
86.00	437.	796.	0.	0.	1732.
85.00	437.	869.	0.	0.	1807.
84.00	437.	943.	0.	0.	1882.
83.00	437.	1018.	0.	0.	1956.
82.00	437.	1259.	0.	0.	2322.
81.00	437.	1516.	0.	0.	2709.
80.46	437.	1588.	0.	0.	2771.
80.00	437.	1648.	0.	0.	2822.
79.00	437.	1827.	0.	0.	2938.
78.00	437.	2215.	0.	0.	3053.
77.79	437.	2561.	0.	0.	3169.
76.00	437.	2449.	0.	0.	3284.

'TINLEY CREEK - SB-07

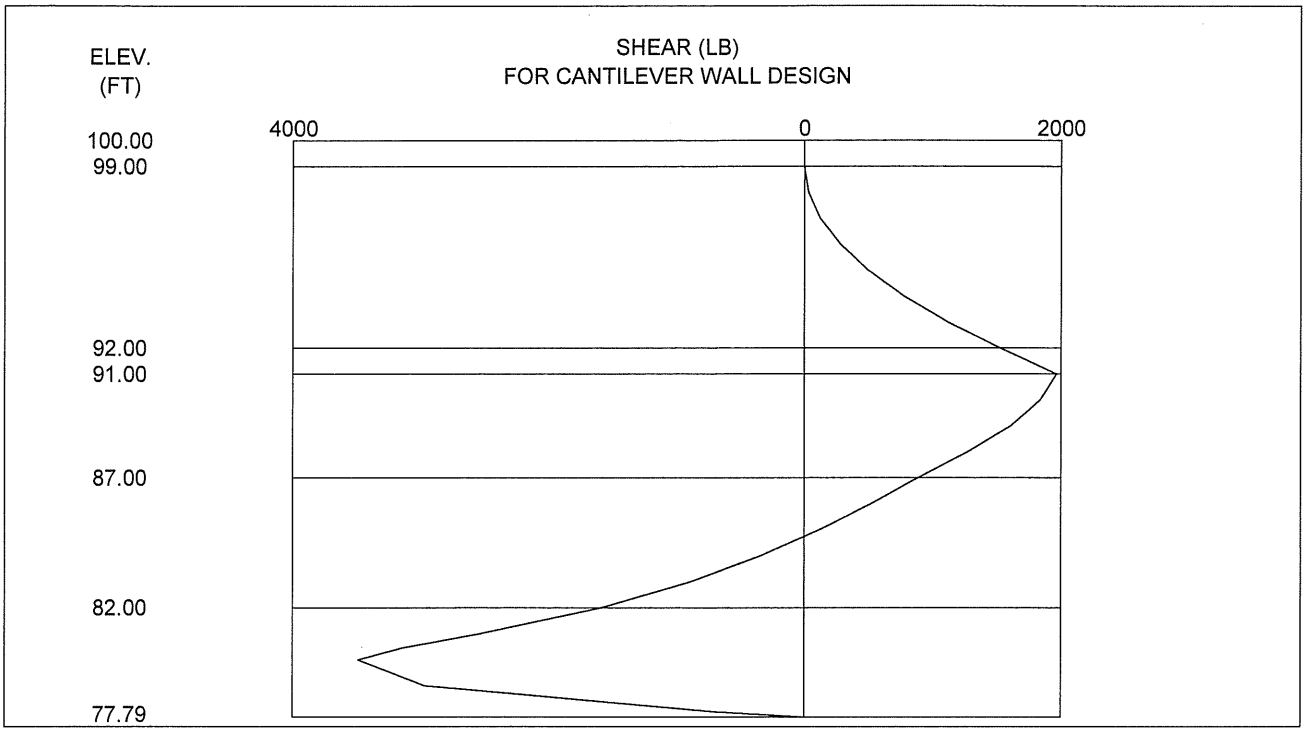


'TINLEY CREEK - SB-07



10/11

'TINLEY CREEK - SB-07



Wang Engineering

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1145 N Main Street
Lombard, IL
Telephone: 630 953-9928
Fax: 630 953-9938

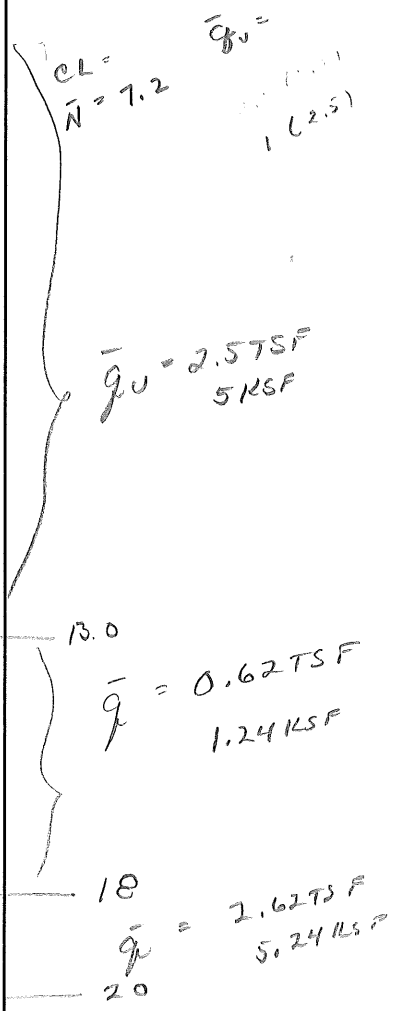
BORING LOG SB-07

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **TICR 7 and 8**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		6-inch thick ASPHALT --PAVEMENT--						
		15-inch thick CRUSHED STONE --BASE COURSE--			1	4 2 3	2.50 P	25
		Very stiff, brown and gray LEAN CLAY (CL) --FILL--						
		Stiff to hard, brown and gray LEAN CLAY (CL)	5		2	2 3 4	1.00 P	31
					3	2 3 3	1.15 B	31
			10		4	3 4 5	4.18 B	24
					5	3 4 5	3.85 B	25
		Soft to medium stiff, gray FAT CLAY (CH)	15		6	2 3 3	0.82 B	30
					7	0 0 1	0.41 B	34
		Very stiff, gray LEAN CLAY, trace gravel (CL)	20		8	3 4 7	2.62 B	19
		Boring terminated at 20.00 ft	25					



GENERAL NOTES

Begin Drilling: **05-04-2012** Complete Drilling: **05-04-2012**
Drilling Contractor: **WTS** Drill Rig: **B-57 TMR**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **3.25" IDA HSA; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
Time After Drilling: **NA**
Depth to Water: **NA**

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

WANGENGINC 7071702.GPJ WANGENG.GDT 5/9/12

S.O. No. _____

Subject: TINLEY CREEK - CWAISNT INPUT

@ BORING SB-11 Sheet No. 1 of 10

Drawing No. _____

Computed by REC Checked By JAO Date 6/21/12

Baker

TOP OF BANK/PILE ELEV. 100'

OL 19 γ_m = 90 PCF
230 γ_s = 95 PCF ____ 96'

CL ϕ = 28 γ_m = 115 PCF
C = 270 γ_s = 120 PCF ____ 92'

CH ϕ = 19 γ_m = 90 PCF
C = 230 γ_s = 95 PCF

WATER ELEVATION.

Pile Tip Elev. - 72.03 SAY 72' (28' BELOW TOP OF BANK/PILE)

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 21-JUNE-2012 TIME: 11:18:21

****
* INPUT DATA *
****

I.--HEADING
'TINLEY CREEK - SB-11

II.--CONTROL
CANTILEVER WALL DESIGN
FACTOR OF SAFETY FOR ACTIVE PRESSURES = 1.00
FACTOR OF SAFETY FOR PASSIVE PRESSURES = 1.50

III.--WALL DATA
ELEVATION AT TOP OF WALL = 100.00 FT.

IV.--SURFACE POINT DATA

IV.A.--RIGHTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
0.00	100.00
100.00	100.00

IV.B.--LEFTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
0.00	91.00
15.00	91.00
16.00	100.00

V.--SOIL LAYER DATA

V.A.--RIGHTSIDE
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURE = 1.00
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURE = 1.50

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
95.00	90.00	19.00	230.00	0.00	0.00	96.00	0.00	DEF	DEF
120.00	115.00	28.00	270.00	0.00	0.00	92.00	0.00	DEF	DEF
95.00	90.00	19.00	230.00	0.00	0.00			DEF	DEF

V.B.--LEFTSIDE
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURE = 1.00
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURE = 1.50

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
95.00	90.00	19.00	230.00	0.00	0.00			DEF	DEF

VI.--WATER DATA
UNIT WEIGHT = 62.40 (PCF)
RIGHTSIDE ELEVATION = 99.00 (FT)
LEFTSIDE ELEVATION = 92.00 (FT)
NO SEEPAGE

VII.--VERTICAL SURCHARGE LOADS
NONE

VIII.--HORIZONTAL LOADS
NONE

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 21-JUNE-2012 TIME: 11:18:28

****
* SOIL PRESSURES FOR *
* CANTILEVER WALL DESIGN *
****

I.--HEADING
'TINLEY CREEK - SB-11

II.--SOIL PRESSURES

RIGHTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

				<------NET------>			
	NET	<---LEFTSIDE--->		(SOIL + WATER)		<--RIGHTSIDE--->	
ELEV.	WATER	PASSIVE	ACTIVE	ACTIVE	PASSIVE	ACTIVE	PASSIVE
(FT)	(PSF)	(PSF)	(PSF)	(PSF)	(PSF)	(PSF)	(PSF)
100.0	0.0	0.0	0.0	0.0	385.0	0.0	385.0
99.0	0.0	0.0	0.0	0.0	504.4	0.0	504.4
98.0	62.4	0.0	0.0	62.4	640.8	0.0	578.4
97.0	124.8	0.0	0.0	124.8	754.6	0.0	629.8
96.0	187.2	0.0	0.0	187.2	989.2	0.0	802.0
95.0	249.6	0.0	0.0	249.6	1254.5	0.0	1004.9
94.0	312.0	0.0	0.0	312.0	1430.9	0.0	1118.9
93.0	374.4	0.0	0.0	374.4	1608.9	0.0	1234.5
92.0	436.8	0.0	0.0	436.8	1618.5	0.0	1181.7
91.0+	436.8	0.0	0.0	436.8	1533.7	0.0	1096.9
91.0-	436.8	385.0	0.0	51.8	1533.7	0.0	1096.9
90.0	436.8	436.5	0.0	0.3	1585.1	0.0	1148.3
90.0	436.8	436.8	0.0	0.0	1585.4	0.0	1148.6
89.0	436.8	487.9	0.0	-51.1	1636.5	0.0	1199.7
88.0	436.8	539.3	0.0	-102.5	1688.0	0.0	1251.2
87.0	436.8	590.7	0.0	-153.9	1739.4	0.0	1302.6
86.0	436.8	642.1	0.0	-205.3	1790.8	0.0	1354.0
85.0	436.8	693.5	0.0	-256.7	1842.2	0.0	1405.4
84.0	436.8	744.9	0.0	-308.1	1893.7	0.0	1456.9
83.0	436.8	796.3	0.0	-359.5	1945.1	0.0	1508.3
82.0	436.8	847.7	0.0	-410.9	1996.5	0.0	1559.7
81.0	436.8	899.1	0.0	-462.3	2048.0	0.0	1611.2
80.0	436.8	950.4	0.0	-513.6	2099.4	0.0	1662.6
79.0	436.8	1017.1	0.0	-580.3	2150.8	0.0	1714.0
78.0	436.8	1174.7	0.0	-737.9	2202.2	0.0	1765.4
77.0	436.8	1322.0	0.0	-885.2	2253.7	0.0	1816.9
76.0	436.8	1287.0	0.0	-850.2	2305.1	0.0	1868.3
75.0	436.8	1404.2	0.0	-967.4	2356.5	0.0	1919.7
74.0	436.8	1685.7	0.0	-1248.9	2407.9	0.0	1971.1
73.0	436.8	1905.4	0.0	-1468.6	2459.4	0.0	2022.6
72.0	436.8	2176.4	0.0	-1739.6	2510.8	0.0	2074.0
71.0	436.8	1983.2	0.0	-1546.4	2561.9	0.0	2125.1
70.0	436.8	2237.5	0.0	-1800.7	2612.5	0.0	2175.7
69.0	436.8	2329.2	0.0	-1864.9	2663.3	27.5	2226.5
68.0	436.8	2666.6	0.0	-2056.9	2714.7	172.9	2277.9
67.0	436.8	3882.0	0.0	-3146.0	2766.1	299.2	2329.3
66.0	436.8	3235.2	0.0	-2482.6	2817.5	315.8	2380.7
65.0	436.8	2248.0	0.0	-1478.8	2868.9	332.4	2432.1
64.0	436.8	4022.5	0.0	-3236.7	2920.3	349.0	2483.5
63.0	436.8	4172.0	0.0	-3369.7	2971.7	365.6	2534.9
62.0	436.8	5173.7	0.0	-4354.8	3023.1	382.1	2586.3

61.0	436.8	5362.7	0.0	-4527.2	3074.4	398.7	2637.6
60.0	436.8	2992.0	0.0	-2139.9	3125.8	415.3	2689.0

4/10

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 21-JUNE-2012 TIME: 11:18:30

****
* SUMMARY OF RESULTS FOR *
* CANTILEVER WALL DESIGN *
****

I.--HEADING
'TINLEY CREEK - SB-11

II.--SUMMARY

RIGHTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

WALL BOTTOM ELEV. (FT) : 72.03
PENETRATION (FT) : 18.97

MAX. BEND. MOMENT (LB-FT) : 1.8998E+04
AT ELEVATION (FT) : 81.19

MAX. SCALED DEFL. (LB-IN^3): 7.4999E+09
AT ELEVATION (FT) : 100.00

NOTE: DIVIDE SCALED DEFLECTION MODULUS OF
ELLASTICITY IN PSI TIMES PILE MOMENT
OF INERTIA IN IN^4 TO OBTAIN DEFLECTION
IN INCHES.

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHOREDOR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 21-JUNE-2012 TIME: 11:18:30

****
* COMPLETE OF RESULTS FOR *
* CANTILEVER WALL DESIGN *
****

I.--HEADING
'TINLEY CREEK - SB-11

II.--RESULTS

ELEVATION (FT)	BENDING MOMENT (LB-FT)	SHEAR (LB)	SCALED DEFLECTION (LB-IN^3)	NET PRESSURE (PSF)
100.00	0.0000E+00	0.	7.4999E+09	0.00
99.00	2.0955E-09	0.	7.0690E+09	0.00
98.00	1.0400E+01	31.	6.6381E+09	62.40
97.00	8.3200E+01	125.	6.2072E+09	124.80
96.00	2.8080E+02	281.	5.7765E+09	187.20
95.00	6.6560E+02	499.	5.3463E+09	249.60

19/35

94.00	1.3000E+03	780.	4.9173E+09	312.00
93.00	2.2464E+03	1123.	4.4906E+09	374.40
92.00	3.5672E+03	1529.	4.0678E+09	436.80
91.00+	5.3144E+03	1966.	3.6512E+09	436.80
91.00-	5.3144E+03	1966.	3.6512E+09	51.76
90.00	7.2973E+03	1992.	3.2439E+09	0.30
89.99	7.3090E+03	1992.	3.2415E+09	0.00
89.00	9.2805E+03	1966.	2.8491E+09	-51.09
88.00	1.1213E+04	1889.	2.4704E+09	-102.49
87.00	1.3042E+04	1761.	2.1111E+09	-153.88
86.00	1.4718E+04	1582.	1.7743E+09	-205.28
85.00	1.6188E+04	1351.	1.4628E+09	-256.67
84.00	1.7402E+04	1068.	1.1793E+09	-308.07
83.00	1.8308E+04	735.	9.2588E+08	-359.46
82.00	1.8854E+04	349.	7.0400E+08	-410.86
81.00	1.8990E+04	-87.	5.1464E+08	-462.25
80.00	1.8663E+04	-575.	3.5803E+08	-513.65
79.00	1.7820E+04	-1122.	2.3360E+08	-580.26
78.00	1.6381E+04	-1781.	1.3987E+08	-737.90
77.00	1.4207E+04	-2593.	7.4342E+07	-885.16
76.10	1.1527E+04	-3373.	3.6461E+07	-853.82
76.00	1.1177E+04	-3456.	3.3240E+07	-769.43
75.00	7.4741E+03	-3813.	1.1348E+07	55.90
74.00	3.8266E+03	-3344.	2.3802E+06	881.22
73.00	1.0603E+03	-2051.	1.5112E+05	1706.55
72.03	0.0000E+00	0.	0.0000E+00	2509.39

NOTE: DIVIDE SCALED DEFLECTION MODULUS OF ELLASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN^4 TO OBTAIN DEFLECTION IN INCHES.

III.--WATER AND SOIL PRESSURES

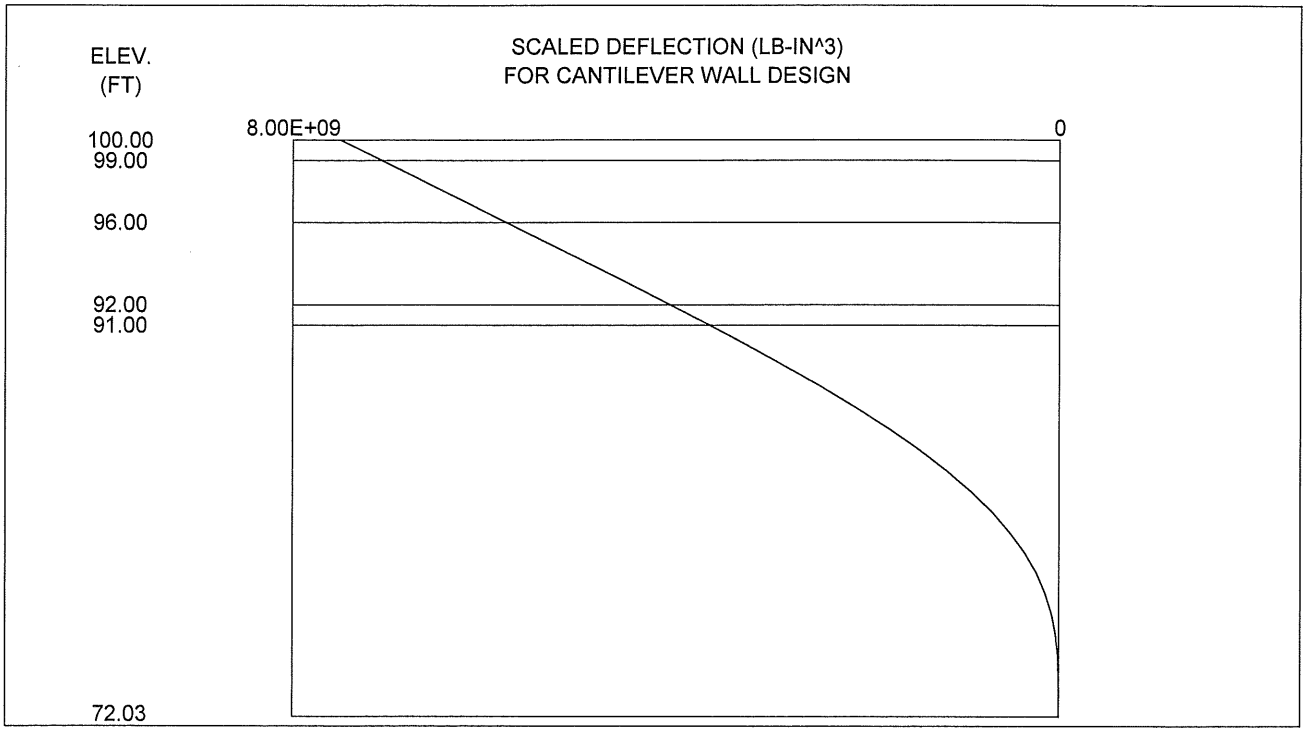
		<----------SOIL PRESSURES---------->			
	WATER	<----LEFTSIDE----->		<---RIGHTSIDE---->	
ELEVATION (FT)	PRESSURE (PSF)	PASSIVE (PSF)	ACTIVE (PSF)	ACTIVE (PSF)	PASSIVE (PSF)
100.00	0.	0.	0.	0.	385.
99.00	0.	0.	0.	0.	504.
98.00	62.	0.	0.	0.	578.
97.00	125.	0.	0.	0.	630.
96.00	187.	0.	0.	0.	802.
95.00	250.	0.	0.	0.	1005.
94.00	312.	0.	0.	0.	1119.
93.00	374.	0.	0.	0.	1234.
92.00	437.	0.	0.	0.	1182.
91.00+	437.	0.	0.	0.	1097.
91.00-	437.	385.	0.	0.	1097.
90.00	437.	436.	0.	0.	1148.
89.99	437.	437.	0.	0.	1149.
89.00	437.	488.	0.	0.	1200.
88.00	437.	539.	0.	0.	1251.
87.00	437.	591.	0.	0.	1303.
86.00	437.	642.	0.	0.	1354.
85.00	437.	693.	0.	0.	1405.
84.00	437.	745.	0.	0.	1457.
83.00	437.	796.	0.	0.	1508.
82.00	437.	848.	0.	0.	1560.
81.00	437.	899.	0.	0.	1611.
80.00	437.	950.	0.	0.	1663.
79.00	437.	1017.	0.	0.	1714.
78.00	437.	1175.	0.	0.	1765.
77.00	437.	1322.	0.	0.	1817.
76.10	437.	1291.	0.	0.	1863.
76.00	437.	1287.	0.	0.	1868.
75.00	437.	1404.	0.	0.	1920.
74.00	437.	1686.	0.	0.	1971.
73.00	437.	1905.	0.	0.	2023.
72.03	437.	2176.	0.	0.	2074.
71.00	437.	1983.	0.	0.	2125.

```
'TINLEY CREEK - SB-11
CONTROL  CANTILEVER  DESIGN  1.00  1.50
WALL   100
SURFACE RIGHTSIDE   2    0    100
                  100    100
SURFACE LEFTSIDE   3    0    91
                  15    91
                  16    100
SOIL RIGHTSIDE  STRENGTHS   3    1   1.5
   95    90    19    230    0    0    96   0
   120    115    28    270    0    0    92   0
   95    90    19    230    0    0
SOIL LEFTSIDE  STRENGTHS   1    1   1.5
   95    90    19    230    0    0
WATER ELEVATIONS   62.4    99    92
FINISHED
```

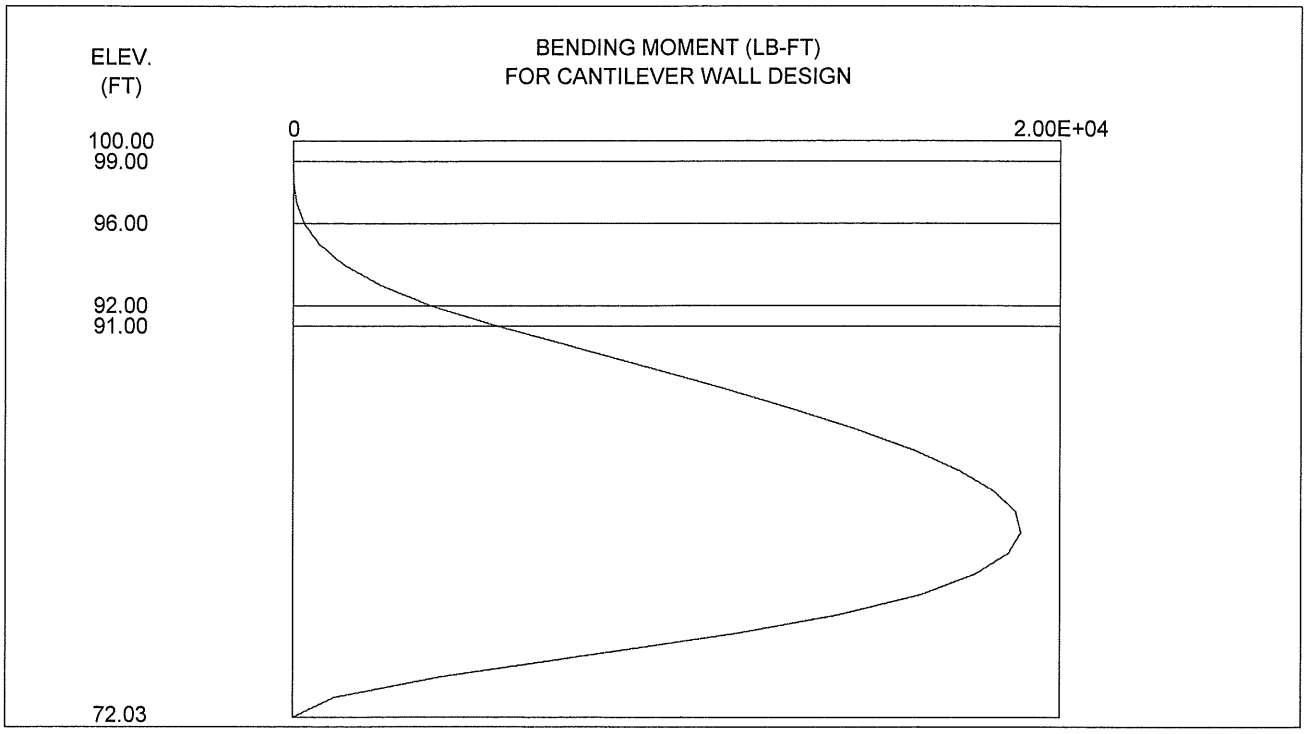
6/10

21/35

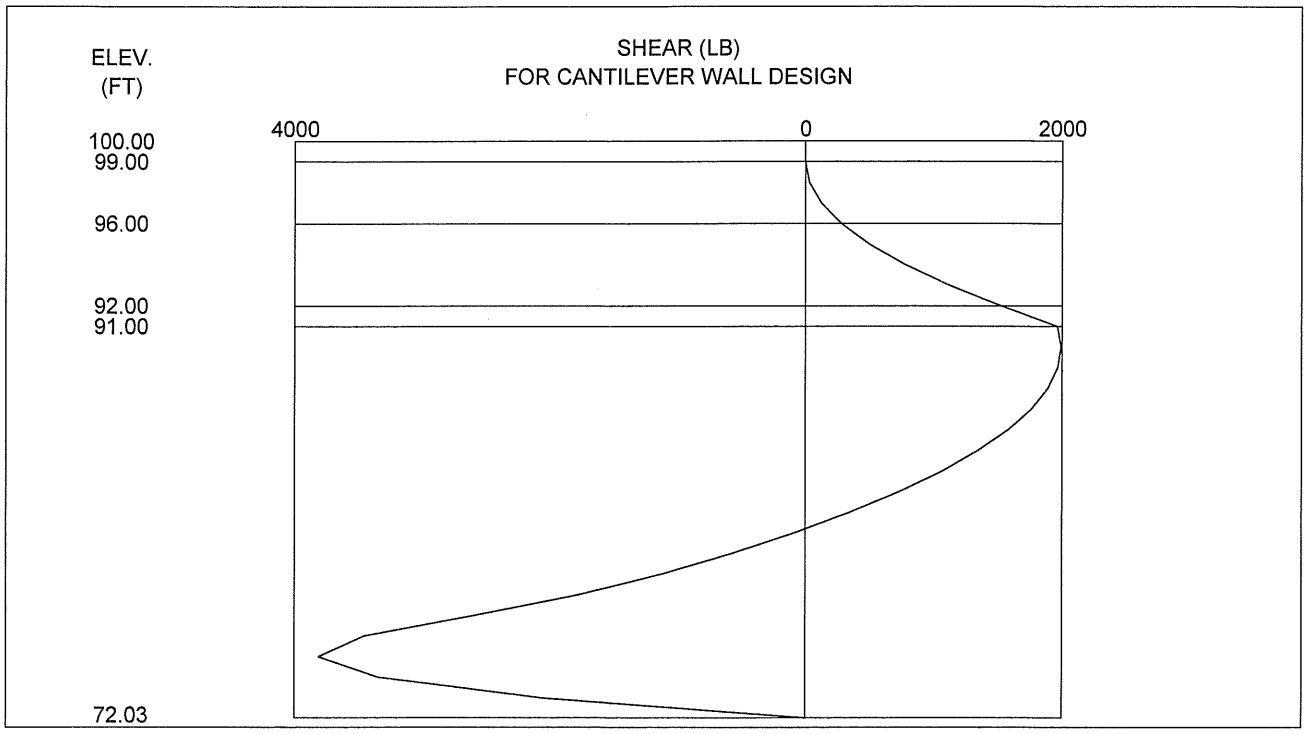
'TINLEY CREEK - SB-11



'TINLEY CREEK - SB-11



'TINLEY CREEK - SB-11



Wang Engineering

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1145 North Main Street
Lombard, IL 60148
Telephone: 630-953-9928
Fax: 630-953-9938

BORING LOG SB-11

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Depth (ft)	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	Soft to medium stiff, dark brown ORGANIC LEAN CLAY with roots (OL)		1	PUSH	0.25 B	31
			2	PUSH	0.74 B	36
5 ▼	Stiff, brown and gray LEAN CLAY (CL)		3	PUSH	1.23 B	29
			4	PUSH	1.15 B	28
	Soft, gray FAT CLAY (CH)		5	PUSH	0.49 B	30
10			6	PUSH	0.41 B	31
			7	PUSH	0.33 B	33
15			8	PUSH	0.25 B	34
			9	PUSH	0.25 B	36
	Boring terminated at 18.00 ft					
20						
25						

GENERAL NOTES

Begin Drilling: **03-15-2012** Complete Drilling: **03-15-2012**
Drilling Contractor: **WTS** Drill Rig: **Hand Auger**
Driller: **R & N** Logger: **B. Wilson** Checked by: **N. Davis**
Drilling Method: **1.50" IDA Geoprobe; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **4.00 ft**
At Completion of Drilling ▼ **5.00 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.

WANGENGINC 7071702.GPJ WANGENG.GDT 4/2/12

25/35

S.O. No. _____

Subject: Tinley Creek SB14

LATERAL EARTH PRESSURE Sheet No. 1 of 10

Drawing No. _____

Computed by REC Checked By JAD Date 6/21/12

Baker

LATERAL EARTH PRESSURE - BASED ON AASHTO 3.11.5.7.2 ON COHESIVE SOILS SHOULD BE DETERMINED IN ACCORDANCE WITH AASHTO 3.11.5.7.1 (EQ 3.11.5.7.1-1) $P_a = K_a \gamma' H$

$K_a = \tan^2(45^\circ - \phi_s/2)$ FOR LEVEL SLOPE BEHIND WALL

$\phi_s = 28^\circ$ (CL) $C = 270$ PSF (NAVFAC DM-4 TABLE 1 Pg 7.2-39)

$\therefore$ USE $K_a = 0.361$

$\gamma_m = 115$ PCF $\gamma_{SAT} = 120$ PCF

EST. Pile TIP EL. = 79' (21' Below Top of Pile)

MAX. BENDING MOMENT = 11.85'K @ DEPTH 14.3'

NOTE: q_u VALUES IN SB-14 ARE HIGH ENOUGH TO ENABLE CLAY TO STAND VERTICALLY. HOWEVER STREAM ACTION AND WEATHERING WILL SOFTEN CLAY AND A LOWER STRENGTH WAS USED.

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-JUNE-2012 TIME: 14:28:35

****
* INPUT DATA *
****

I.--HEADING
'TINLEY CREEK - SB -14

II.--CONTROL
CANTILEVER WALL DESIGN
FACTOR OF SAFETY FOR ACTIVE PRESSURES = 1.00
FACTOR OF SAFETY FOR PASSIVE PRESSURES = 1.50

III.--WALL DATA
ELEVATION AT TOP OF WALL = 100.00 FT.

IV.--SURFACE POINT DATA

IV.A.--RIGHTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
0.00	100.00
100.00	100.00

IV.B.--LEFTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
0.00	91.00
15.00	91.00
16.00	100.00

V.--SOIL LAYER DATA

V.A.--RIGHTSIDE
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURE = 1.00
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURE = 1.50

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
120.00	115.00	28.00	270.00	0.00	0.00	90.50	0.00	DEF	DEF
120.00	115.00	28.00	270.00	0.00	0.00			DEF	DEF

V.B.--LEFTSIDE
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURE = 1.00
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURE = 1.50

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
120.00	115.00	28.00	270.00	0.00	0.00	90.50	0.00	DEF	DEF
120.00	115.00	28.00	270.00	0.00	0.00			DEF	DEF

VI.--WATER DATA
UNIT WEIGHT = 62.40 (PCF)
RIGHTSIDE ELEVATION = 99.00 (FT)
LEFTSIDE ELEVATION = 92.00 (FT)
NO SEEPAGE

VII.--VERTICAL SURCHARGE LOADS
NONE

VIII.--HORIZONTAL LOADS
NONE

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-JUNE-2012 TIME: 14:30:10

****
* SOIL PRESSURES FOR *
* CANTILEVER WALL DESIGN *
****

I.--HEADING
'TINLEY CREEK - SB -14

II.--SOIL PRESSURES

RIGHTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

				<------NET------>			
	NET	<---LEFTSIDE--->		(SOIL + WATER)		<--RIGHTSIDE--->	
ELEV.	WATER	PASSIVE	ACTIVE	ACTIVE	PASSIVE	ACTIVE	PASSIVE
(FT)	(PSF)	(PSF)	(PSF)	(PSF)	(PSF)	(PSF)	(PSF)
100.0	0.0	0.0	0.0	0.0	509.6	0.0	509.6
99.0	0.0	0.0	0.0	0.0	711.2	0.0	711.2
98.0	62.4	0.0	0.0	62.4	917.8	0.0	855.4
97.0	124.8	0.0	0.0	124.8	1095.6	0.0	970.8
96.0	187.2	0.0	0.0	187.2	1273.4	0.0	1086.2
95.0	249.6	0.0	0.0	249.6	1451.2	0.0	1201.6
94.0	312.0	0.0	0.0	312.0	1629.0	0.0	1317.0
93.0	374.4	0.0	0.0	374.4	1806.8	0.0	1432.4
92.0	436.8	0.0	0.0	436.8	1984.6	0.0	1547.8
91.0+	436.8	0.0	0.0	436.8	2100.0	0.0	1663.2
91.0-	436.8	509.6	0.0	-72.8	2100.0	0.0	1663.2
90.5	436.8	567.3	0.0	-130.5	2157.7	0.0	1720.9
90.0	436.8	625.0	0.0	-188.2	2215.4	0.0	1778.6
89.0	436.8	740.4	0.0	-303.6	2330.8	0.0	1894.0
88.0	436.8	855.8	0.0	-419.0	2446.2	0.0	2009.4
87.0	436.8	971.2	0.0	-534.4	2561.6	0.0	2124.8
86.0	436.8	1086.6	0.0	-649.8	2677.0	0.0	2240.2
85.0	436.8	1202.0	0.0	-765.2	2792.4	0.0	2355.6
84.0	436.8	1317.4	0.0	-880.6	2907.8	0.0	2471.0
83.0	436.8	1432.8	0.0	-996.0	3023.2	0.0	2586.4
82.0	436.8	1548.2	0.0	-1111.4	3138.6	0.0	2701.8
81.0	436.8	1676.3	0.0	-1239.5	3254.0	0.0	2817.2
80.0	436.8	1845.9	0.0	-1409.1	3369.4	0.0	2932.6
79.0	436.8	2060.9	0.0	-1624.1	3484.9	0.0	3048.1
78.0	436.8	2546.9	0.0	-2110.1	3600.3	0.0	3163.5
77.0	436.8	2953.8	0.0	-2517.0	3715.7	0.0	3278.9
76.0	436.8	2744.4	0.0	-2307.6	3831.1	0.0	3394.3
75.0	436.8	3089.1	0.0	-2652.3	3946.5	0.0	3509.7
74.0	436.8	4000.7	0.0	-3563.9	4061.9	0.0	3625.1
73.0	436.8	4745.5	0.0	-4308.7	4177.3	0.0	3740.5
72.0	436.8	5749.0	0.0	-5312.2	4292.7	0.0	3855.9
71.0	436.8	5044.8	0.0	-4490.3	4408.1	117.7	3971.3
70.0	436.8	6103.4	0.0	-5383.7	4523.5	283.0	4086.7
69.0	436.8	6412.1	0.0	-5634.4	4638.9	340.9	4202.1
68.0	436.8	8044.0	0.0	-7245.4	4754.3	361.7	4317.5
67.0	436.8	13975.8	0.0	-13156.5	4869.7	382.5	4432.9
66.0	436.8	11147.1	0.0	-10306.9	4985.1	403.3	4548.3
65.0	436.8	6147.8	0.0	-5286.9	5100.5	424.1	4663.7
64.0	436.8	16657.5	0.0	-15775.8	5215.9	444.9	4779.1
63.0	436.8	17451.4	0.0	-16548.9	5331.3	465.7	4894.5
62.0	436.8	1670.4	571.0	-747.1	4875.7	486.5	5009.9

61.0	436.8	1728.0	874.4	-783.9	4687.7	507.3	5125.3
60.0	436.8	6235.6	629.1	-5270.8	5048.4	528.1	5240.7

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-JUNE-2012 TIME: 14:30:13

****
* SUMMARY OF RESULTS FOR *
* CANTILEVER WALL DESIGN *
****

I.--HEADING
'TINLEY CREEK - SB -14

II.--SUMMARY

RIGHTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

LEFTSIDE SOIL PRESSURES DETERMINED BY SWEEP SEARCH WEDGE METHOD.

WALL BOTTOM ELEV. (FT) : 79.57
PENETRATION (FT) : 11.43

MAX. BEND. MOMENT (LB-FT) : 1.1848E+04
AT ELEVATION (FT) : 85.76

MAX. SCALED DEFL. (LB-IN^3): 2.3754E+09
AT ELEVATION (FT) : 100.00

NOTE: DIVIDE SCALED DEFLECTION MODULUS OF ELLASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN^4 TO OBTAIN DEFLECTION IN INCHES.

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHOREDOR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 19-JUNE-2012 TIME: 14:30:13

****
* COMPLETE OF RESULTS FOR *
* CANTILEVER WALL DESIGN *
****

I.--HEADING
'TINLEY CREEK - SB -14

II.--RESULTS

ELEVATION (FT)	BENDING MOMENT (LB-FT)	SHEAR (LB)	SCALED DEFLECTION (LB-IN^3)	NET PRESSURE (PSF)
100.00	0.0000E+00	0.	2.3754E+09	0.00
99.00	5.2387E-10	0.	2.1967E+09	0.00
98.00	1.0400E+01	31.	2.0181E+09	62.40
97.00	8.3200E+01	125.	1.8394E+09	124.80
96.00	2.8080E+02	281.	1.6609E+09	187.20
95.00	6.6560E+02	499.	1.4830E+09	249.60

94.00	1.3000E+03	780.	1.3062E+09	312.00
93.00	2.2464E+03	1123.	1.1317E+09	374.40
92.00	3.5672E+03	1529.	9.6115E+08	436.80
91.00+	5.3144E+03	1966.	7.9682E+08	436.80
91.00-	5.3144E+03	1966.	7.9682E+08	-72.76
90.50	6.2857E+03	1915.	7.1791E+08	-130.49
90.00	7.2244E+03	1835.	6.4170E+08	-188.19
89.00	8.9462E+03	1589.	4.9904E+08	-303.59
88.00	1.0364E+04	1228.	3.7180E+08	-418.99
87.00	1.1364E+04	751.	2.6240E+08	-534.40
86.00	1.1828E+04	159.	1.7256E+08	-649.80
85.00	1.1643E+04	-548.	1.0307E+08	-765.20
84.00	1.0693E+04	-1371.	5.3586E+07	-880.61
83.00	8.8624E+03	-2310.	2.2455E+07	-996.01
82.23	6.7921E+03	-3106.	9.0974E+06	-1084.42
82.00	6.0394E+03	-3314.	6.4946E+06	-688.64
81.00	2.6633E+03	-3156.	8.7790E+05	1003.35
80.00	2.9047E+02	-1307.	7.8785E+03	2695.33
79.57	0.0000E+00	0.	0.0000E+00	3418.79

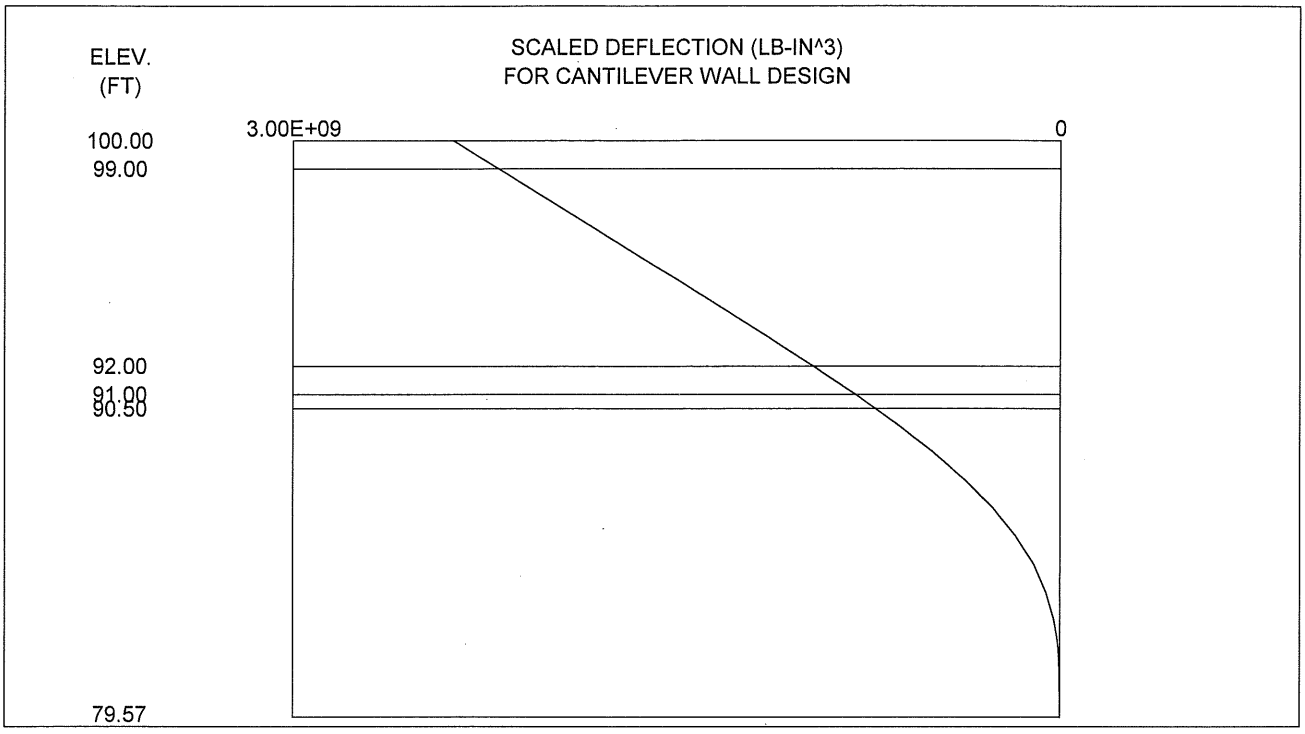
NOTE: DIVIDE SCALED DEFLECTION MODULUS OF ELLASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN^4 TO OBTAIN DEFLECTION IN INCHES.

III.--WATER AND SOIL PRESSURES

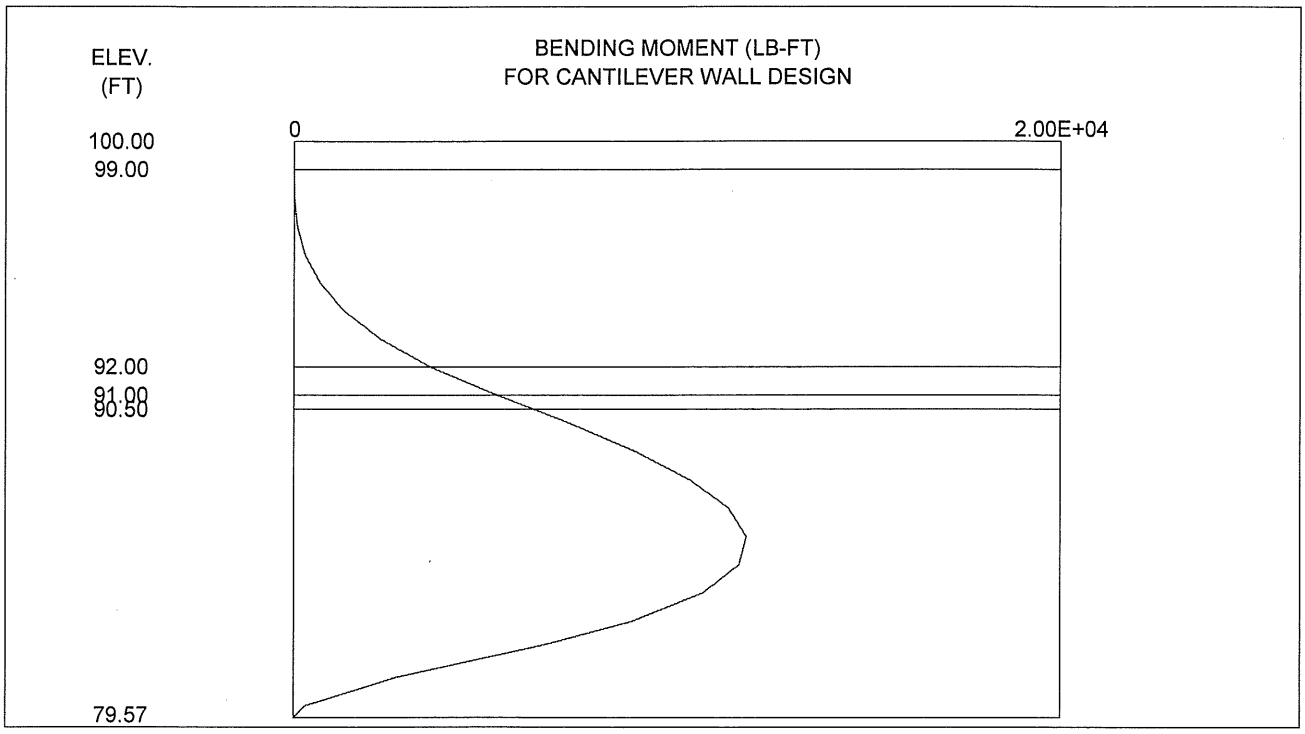
		<----------SOIL PRESSURES---------->			
	WATER	<----LEFTSIDE----->		<---RIGHTSIDE---->	
ELEVATION	PRESSURE	PASSIVE	ACTIVE	ACTIVE	PASSIVE
(FT)	(PSF)	(PSF)	(PSF)	(PSF)	(PSF)
100.00	0.	0.	0.	0.	510.
99.00	0.	0.	0.	0.	711.
98.00	62.	0.	0.	0.	855.
97.00	125.	0.	0.	0.	971.
96.00	187.	0.	0.	0.	1086.
95.00	250.	0.	0.	0.	1202.
94.00	312.	0.	0.	0.	1317.
93.00	374.	0.	0.	0.	1432.
92.00	437.	0.	0.	0.	1548.
91.00+	437.	0.	0.	0.	1663.
91.00-	437.	510.	0.	0.	1663.
90.50	437.	567.	0.	0.	1721.
90.00	437.	625.	0.	0.	1779.
89.00	437.	740.	0.	0.	1894.
88.00	437.	856.	0.	0.	2009.
87.00	437.	971.	0.	0.	2125.
86.00	437.	1087.	0.	0.	2240.
85.00	437.	1202.	0.	0.	2356.
84.00	437.	1317.	0.	0.	2471.
83.00	437.	1433.	0.	0.	2586.
82.23	437.	1521.	0.	0.	2675.
82.00	437.	1548.	0.	0.	2702.
81.00	437.	1676.	0.	0.	2817.
80.00	437.	1846.	0.	0.	2933.
79.57	437.	2061.	0.	0.	3048.
78.00	437.	2547.	0.	0.	3163.

```
'TINLEY CREEK - SB -14
CONTROL  CANTILEVER  DESIGN  1.00  1.50
WALL   100
SURFACE RIGHTSIDE   2     0     100
                  100     100
SURFACE LEFTSIDE   3     0     91
                  15      91
                  16      100
SOIL RIGHTSIDE  STRENGTHS   2     1    1.5
   120     115     28     270     0     0     90.5    0
   120     115     28     270     0     0
SOIL LEFTSIDE  STRENGTHS   2     1    1.5
   120     115     28     270     0     0     90.5    0
   120     115     28     270     0     0
WATER ELEVATIONS   62.4     99     92
FINISHED
```

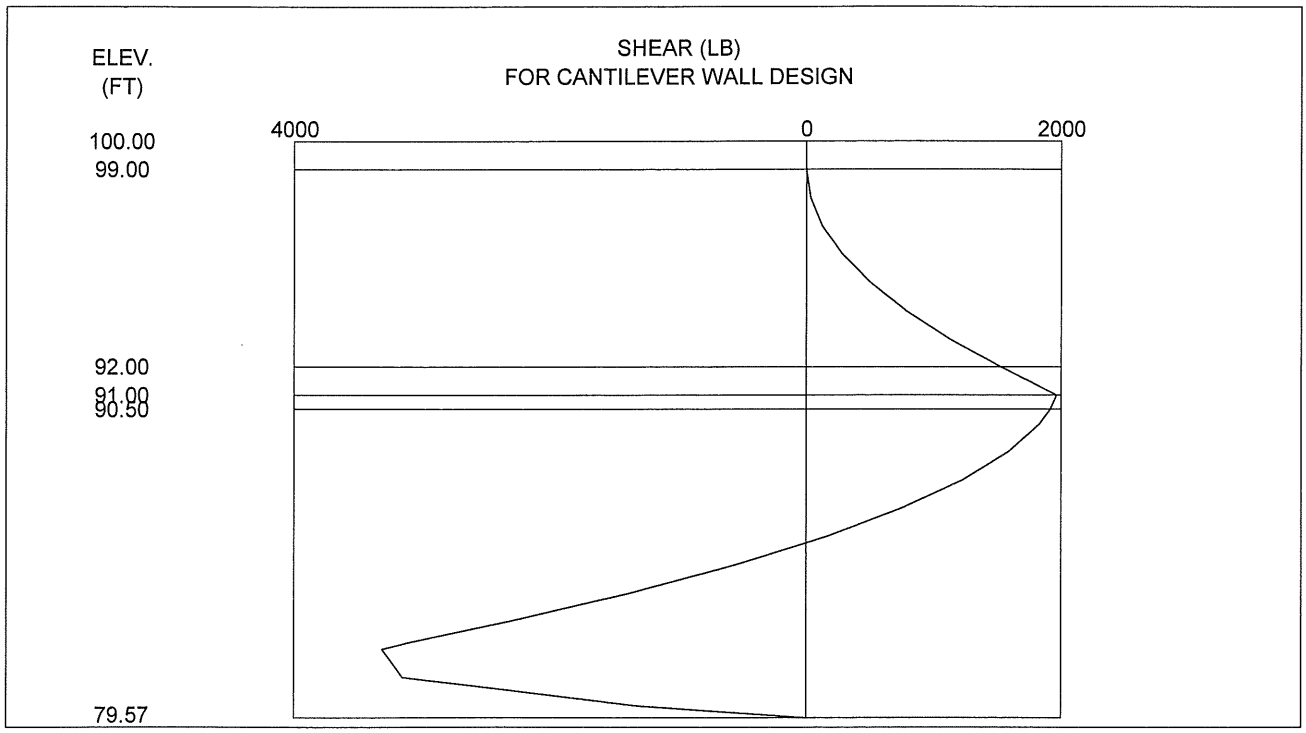
'TINLEY CREEK - SB -14



'TINLEY CREEK - SB -14



'TINLEY CREEK - SB -14



Wang Engineering

wangeng@wangeng.com
1145 North Main Street
Lombard, IL 60148
Telephone: 630-953-9928
Fax: 630-953-9938

BORING LOG SB-14

WEI Job No.: 707-17-02

Client: **Michael Baker Jr, Inc.**
Project: **Streambed Stabilization Project**
Location: **Orland Park, IL**

Datum: NAVD
Elevation: ft
North: ft
East: ft
Station:
Offset:

Depth (ft)	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	12-inch thick, dark brown LEAN CLAY					
	--TOPSOIL--					
	Stiff, brown and gray LEAN CLAY (CL)		1	2 2 2	1.50 P	26
	--FILL--					
5			2	2 3 3	1.56 B	25
			3	2 2 4	1.25 P	29
10			4	2 3 3	1.15 B	26
	Stiff, dark brown LEAN CLAY (CL)		5	2 4 5	1.50 P	31
	--BURIED TOPSOIL--					
	Stiff to very stiff, brown and gray LEAN CLAY (CL)		6	2 4 5	2.13 B	20
15			7	4 5 7	1.72 B	17
20			8	4 6 10	3.85 B	12
	Boring terminated at 20.00 ft					
25						

$\bar{q}_u = 1.36$ TSF = 2.72 KSF

$\bar{N} = 5.5$

10.5

$\bar{q}_u = 2.3$ TSF = 4.6 KSF

$\bar{N} = 11.5$

20'

GENERAL NOTES

Begin Drilling: 03-19-2012 Complete Drilling: 03-19-2012
Drilling Contractor: WTS Drill Rig: B-57 TMR
Driller: R & N Logger: B. Wilson Checked by: N. Davis
Drilling Method: 3.25" IDA HSA; Boring backfilled upon completion

WATER LEVEL DATA

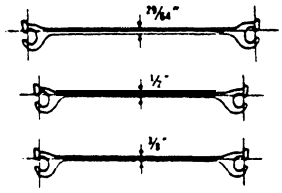
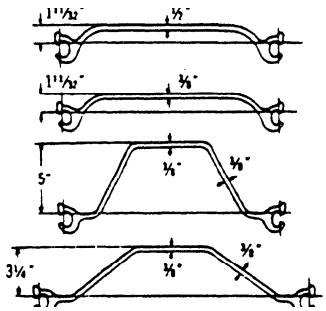
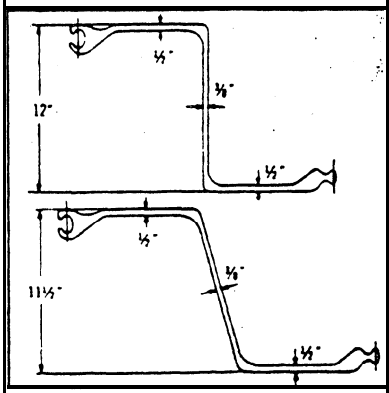
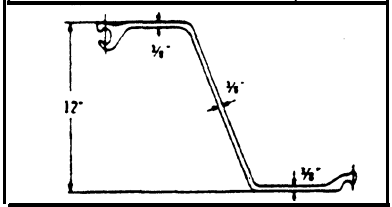
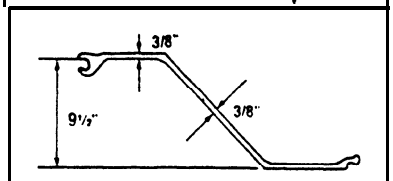
While Drilling: DRY
At Completion of Drilling: DRY
Time After Drilling: NA
Depth to Water: NA

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

WANGENGINC 7071702.GPJ WANGENG.GDT 4/2/12

35/35

Steel Sheet Piling Sections

Profile	Section Index		Distri Rolle	Driv-ing Dis-tance per Pile	Weight		Web Thick-ness	Section Modulus		Area	Moment of Inertia	
					Per Foot	Per Square Foot of Wall		Per Pile	Per Foot of Wall	Per Pile	Per Pile	Per Foot of Wall
				In.	Lbs.	Lbs.	In.	In.³	In.³	In.²	In.⁴	In.⁴
	Interlock with Each Other	PSX 32	H.	16½	44.0	32.0	29/64	3.3	2.4	12.94	5.1	3.7
		PS32*	H.S.	15	40.0	32.0	½	2.4	1.9	11.77	3.6	2.9
		PS28	H.S.	15	35.0	28.0	⅜	2.4	1.9	10.30	3.5	2.8
	Interlock with Each Other	PSA 28*	H.	16	37.3	28.0	½	3.3	2.5	10.98	6.0	4.5
		PSA 23	H.S.	16	30.7	23.0	⅜	3.2	2.4	8.99	5.5	4.1
		PDA 27	H.S.	16	36.0	27.0	⅜	14.3	10.7	10.59	53.0	39.8
		PMA 22	H.S.	19⅝	36.0	22.0	⅜	8.8	5.4	10.59	22.4	13.7
	Interlock with Each Other and with PSA 23 or PSA 2	PZ 38	H.	18	57.0	38.0	⅜	70.2	46.8	16.77	421.2	280.8
		PZ 32	H.	21	56.0	32.0	⅜	67.0	38.3	16.47	385.7	220.4
		PZ 27	H.	18	40.5	27.0	⅜	45.3	30.2	11.91	276.3	184.2
		PZ 22	H.	22	0.3	22.0	⅜	34.8	9.0	11.9	167	91.1

*Sections PS32 and PSA28 ate infre-quently rolled and we do not advise their use in a design unless an adequate ton-nage can be ordered at one time to assure a minimum rolling.

Complete data regarding these sections will be found in a separate publication entitled "USS Steel Sheet Piling?

H-Homestead, Pa. (Pittsburgh District)
S-South Chicago (Chicago District)

Suggested Allowable Design Stresses-Sheet Piling

Steel Brand or Grade	Minimum Yield Point, psi	Allowable Design Stress, psi*
USS-EX-TEN 55 (ASTM A572 GR 55)	55,000	35,000
USS EX-TEN 50 (ASTM A572 GR 50)	50,000	32,000
USS MARINER STEEL	50,000	32,000
USS EX-TEN 45 (ASTM A572 GR 45)	45,000	29,000
Regular Carbon Grade (ASTM A 328)	38,500	25,000

*Based on 65% of minimum yield point. Some increase for temporary Overstresses generally permissible.

ORLAND PARK

INVITATION TO BID
ITB #25-049

Tinley Creek Streambank Stabilization, Construction – AMENDED

ISSUED

October 3, 2025

BID OPENING

November 13, 2025
11:00 A.M.

Office of the Village Clerk
2ND Floor
14700 S. Ravinia Ave.
Orland Park, IL 60462

TABLE OF CONTENTS

I. INSTRUCTIONS TO BIDDERS

II. ATTACHMENTS

III. REQUIRED BID SUBMISSION DOCUMENTS

SECTION I – INSTRUCTIONS TO BIDDERS

ORLAND PARK

ITB #25-049
Tinley Creek Streambank Stabilization, Construction

OVERVIEW

The Village of Orland Park ("Village") is requesting bids for Tinley Creek Streambank Stabilization, Construction ("Project"). The Contractor shall furnish all labor, materials, equipment, and incidentals necessary to stabilize eroded sections along both sides of the creek. The work to be performed by the successful proposer shall be substantially complete by December 31, 2026, and 100% complete by August 31, 2027. Work includes:

- Installation of gabion walls
- Stone toe protection and stone bank armoring
- Slope grading and restoration
- Selective tree removals
- All collateral and incidental work required to complete the improvements in accordance with the attached plans, specifications, and special conditions

Funding and Compliance Requirements

This project is jointly funded by a grant from the Metropolitan Water Reclamation District of Greater Chicago (MWRD) and by local funds from the Village of Orland Park.

- **MWRD Grant Portion:** MWRD will provide **$3.70 million** toward the project. All work funded by this amount must fully comply with **all MWRD requirements**, including participation goals for **Minority Business Enterprises (MBE), Women-owned Business Enterprises (WBE), Small Business Enterprises (SBE), and Veteran-owned Small Business enterprises ("VBE").** Specific participation goals are detailed in the intergovernmental agreement (IGA) between the Village and MWRD, attached as Exhibit C. Bidders are responsible for familiarizing themselves with and complying with all applicable provisions of the IGA.

- **MBE Reporting:** If MBE goals are only partially met, proposers must specify the percentage achieved for each MBE category.

- **Village-Funded Portion:** Any portion of the bid **exceeding the $3.70 million grant** must comply with all **Village of Orland Park requirements**.

Payment

- **Invoices:** All payment invoices will be submitted to and paid for by the **Village of Orland Park**

SUBMISSION DEADLINE

Bids must be submitted **no later than 11:00 a.m., local time, on November 13, 2025**. No consideration will be given to bids received after the stated date and time. Bids submitted must include all information and documents as requested in this Invitation to Bid. No oral or electronic bids sent by facsimile or via email will be accepted or considered. All bids received after the submittal deadline will be rejected and returned unopened. Failure to follow these instructions may result in rejection of the bid.

THE VILLAGE RESERVES THE RIGHT TO REJECT ANY AND ALL BIDS AND TO WAIVE ANY IRREGULARITIES.

QUESTION INFORMATION

All questions related to this proposal must be submitted online through BidNet Direct, **no later than 12:00 p.m., local time, on October 24, 2025**. No oral comments will be made to any Bidder as to the meaning of the bid documents. Any and all questions will be answered through BidNet Direct in an addendum after the question period closes. This policy affords all parties submitting bids the same information.

Before the submission deadline, the Village will make available to the public answers to questions or any modifications or additions to this Project or ITB in the form of an Addendum to be posted on the Village's page on BidNet Direct. Answers to questions will not be mailed to potential proposers.

In order to receive notification of any Addenda, please "FOLLOW" the solicitation on BidNet Direct to ensure that you receive notification of any addenda that may be issued.

Bidders will not be relieved of obligations due to failure to examine or receive documents, visit the BidNet Direct website or become familiar with conditions or facts of which the Bidder should have been aware and the Village will reject all claims related thereto. Information other than in the form of a written Addendum issued by the Village from any officer, agent, or employee of the Village or any other person shall not affect the risks or obligations assumed by the Bidder or relieve him from fulfilling any of the conditions and obligations set forth in this ITB. In the event of conflict with the original ITB documents, addenda shall govern to the extent specified. Subsequent addenda shall govern over prior addenda only to the extent specified.

PRE-BID MEETING

A pre-proposal meeting, at which attendance is not mandatory, will be held at the Village Hall Board Room on **October 14, 2025 at 11:00 a.m.** The Village Hall is located at 14700 Ravinia Avenue, Orland Park, IL 40462.

BID SPECIFICATIONS

Scope of Work

The Scope of Work for this ITB #25-049 is attached under separate cover.

BID SUBMISSION REQUIREMENTS

Bid Bond

Each bid must be accompanied by a bid deposit, as earnest money, in the form of a bid bond, a certified check or cashier's check, drawn on a responsible bank, made payable to the *Village of Orland Park* for ten percent (10%) of the total amount of the bid price. After Contract award, the Village will return deposits to unsuccessful Bidders.

Only one (1) original bid bond document is required and is to be submitted with the paper copy to the Clerk's Office.

Responsible Bidder Ordinance Requirements

In the manner and to the extent required by 1-16-7 (Construction Bidding and Contracts) applicable to Village Code, on Village public works projects with a value of $25,000 or more, the bidder/proposer must comply with the specific criteria set forth therein and submit acceptable evidence of such compliance, in addition to any other requirements as determined from time to time by the Village for the specific type of work to be performed.

Bidder/Proposer must meet all of the requirements per amended Village Code Section 1-16-7, including participation in apprenticeship and training programs applicable to the work to be performed on the project, with the United States Department of Labor's Bureau of Apprenticeship and Training or the Illinois Department of Labor, including the graduation of at least five (5) apprentices in each of the applicable construction crafts in the preceding five (5) years must provide certifications and supporting documents as proof.

Copies

Bidders must submit three (3) complete, sealed and signed hardcopies of the bid. One (1) hardcopy shall be an original unbound version, marked "Original" and must contain original signatures. Two (2) hardcopies shall be complete, identical, bound copies of the bid. Bids shall include all requested information, forms, certificate and addendum acknowledgements (if applicable) in each copy in order to be considered responsive.

Bidders must submit bids in a sealed envelope labeled ITB #25-049 Tinley Creek Streambank Stabilization, Construction in the lower left-hand corner. All sealed bids must be submitted to Village of Orland Park, Office of the Village Clerk, 14700 South Ravinia Avenue, Orland Park, Illinois 60462.

All sealed bids submitted properly will be opened publicly and read aloud immediately following the

stated submission time for the Project.

Other

Each Bidder is responsible for reading this ITB and determining that the Bid Specifications describe the Project in sufficient detail. Bidders shall notify the Village of any inappropriate service, brand name, component, or equipment called for by the Village in this ITB and shall note in its bid the adjustments made to accommodate such deficiencies.

After bids have been opened, no Bidder shall assert that there was a misunderstanding concerning the nature of the Project or the quantities and specifications of the material/equipment/items to be delivered, and no such claim shall relieve a Bidder from its obligation to perform. All bids must be made only on the forms provided by the Village and must be made in accordance with this ITB, which is on file and may be obtained for examination in the Clerk's Office at the above address and are made part of this notice as though fully set forth herein.

Required Forms

Bidders shall provide all the information requested in *Section III* of this ITB.

1. *Bidder Summary Sheet* – The Bidder Summary Sheet must be completed, signed and submitted with the bid. Prices must include all permits, insurance, equipment, work and expenses necessary to provide the Project. The submitted bid price(s) shall not include any amount for sales or use taxes, or any other tax from which the Village is exempt. The Bidder Summary Sheet is attached under separate cover.

2. *Certificate of Compliance* – The Certificate of Compliance must be completed, signed, and submitted with the bid. The Certificate of Compliance is attached under separate cover.

3. *References* – The References form must be completed and submitted with the bid. Bidders shall provide three (3) references for which they have performed similar work. By providing this information, Bidders grant Village permission to contact said references and ask questions regarding prior work performance. Village may use the information gained from Bidder's references to further evaluate Bidder responsibility. The References form is attached under separate cover.

4. *Insurance Requirements* – The Insurance Requirements must be completed, signed and submitted with the bid. Bidders may submit with the bid a current policy Certificate of Insurance showing the insurance coverages the bidder currently has in force. Insurance Requirements is attached under separate cover.

5. *Unit Pricing* – The unit price sheet is Under Separate Cover.

Withdrawal of Bids

Once submitted, no bid may be withdrawn without the Village's consent, but it may be superseded by a subsequent timely bid. Any bid received after the time and date specified for opening, or any

postponement thereof, will not be considered. Bids shall be irrevocable for at minimum ninety (90) calendar days after the Village opens them.

EVALUATION OF BIDS/BIDDERS

The Village of Orland Park will evaluate proposals based on prices, vendor's qualifications, and additional factors deemed relevant.

The Village of Orland Park retains the right to accept any proposal, any part or parts thereof or reject all proposals. The Village reserves the right to waive minor informalities or irregularities in the proposals received, to accept any proposal deemed advantageous to the Village. Conditional proposal, or those which take exception to the Contract documents without prior written approval from the Village, may be considered non-responsive and may be rejected.

The Village may make such investigations as it deems necessary to determine the ability of the Proposer to perform the work in conformity with the Proposal and Contract documents, and the Proposer shall furnish to the Village all such information and data for this purpose as the Village may request.

SUBMITTAL CHECKLIST

In order to be responsive, each Bidder must submit the following items **no later than 11:00 a.m., local time, on November 13, 2025:**

1. Three (3) sealed hardcopies of the bid: Not later than the bid opening, Bidders must submit bids in a sealed envelope labeled ITB #25-049 Tinley Creek Streambank Stabilization, Construction in the lower left-hand corner and addressed to:

   Village of Orland Park
   Attn: Clerk's Office
   14700 S. Ravinia Ave.
   Orland Park, IL 60462

2. Bid Bond for ten percent (10%) of the bid price. Include the original document in the unbound bid copy if applicable.

3. Responsible Bidder Ordinance (RBO). Attach certifications and supporting documents as proof if RBO is applicable.

4. Signed and completed forms from *Section III*:

   a. Bidder Summary Sheet

   b. Certificate of Compliance

   c. References (*3 total*)

   d. Insurance Requirements Form and policy specimen Certificate of Insurance

   e. Unit Price Sheet – Under Separate Cover

ORLAND PARK

ADDENDUM #5 - Unit Price Sheet

ITB #25-049

Tinley Creek Streambank Stabilization, Construction

rees to furnish to the VILLAGE all necessary materials, equipment, labor, etc. to complete the PROJECT in accordance with provisions, instructions, and specifications of the VILLAGE for the prices as follows:

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	Cost
1	CONSTRUCTION ACCESS AND RESTORATION	1	LSUM		$ -
2	PRE-CONSTRUCTION VIDEO RECORDING	1	LSUM		$ -
3	PRE-CONSTRUCTION/POST CONSTRUCTION SANITARY SEWER TELEVISING	1	LSUM		$ -
4	CONSTRUCTION LAYOUT	1	LSUM		$ -
5	IEPA CLEAN CONSTRUCTION AND DEMOLITION DEBRIS DISPOSAL ANALYSIS	1	LSUM		$ -
6	STABILIZED CONSTRUCTION ENTRANCE	1	LSUM		$ -
7	CLEARING AND GRUBBING	16,700	SY		$ -
8	TREE PROTECTION FENCE	923	LF		$ -
9	TREE REMOVAL (6 TO 15 UNITS DIAMETER)	4,509	IN		$ -
10	TREE REMOVAL (OVER 15 UNITS DIAMETER)	1,943	IN		$ -
11	STORM DRAIN OUTLET MODIFICATION	52	EA		$ -
12	EXISTING OUTFALL RESTORATION (12" - 21")	19	EA		$ -
13	EXISTING OUTFALL RESTORATION (24" and 32x52 outlet)	3	EA		$ -
14	EXISTING OUTFALL RESTORATION (48x66 outlet)	1	EA		$ -
15	24" CONCRETE FES	1	EA		$ -
16	18" CONCRETE FES	1	EA		$ -
17	15" CONCRETE FES	2	EA		$ -
18	12" CONCRETE FES	1	EA		$ -
19	TREES	1,000	EA		$ -
20	SHRUBS	250	EA		$ -
21	SEEDING (BROAD SPECTRUM SEED MIX)	11,182	SY		$ -
22	ROCK VANE INSTALLATION	10	EACH		$ -
23	SHEET PILE WALL INSTALLATION	58	LF		$ -
24	GABION BASKET BANK STABILIZATION (3 FEET TALL)	10	LF		$ -
25	GABION BASKET BANK STABILIZATION (4.5 FEET TALL)	476	LF		$ -
26	GABION BASKET BANK STABILIZATION (6 FEET TALL)	1,081	LF		$ -
27	GABION BASKET BANK STABILIZATION (7.5 FEET TALL)	303	LF		$ -
28	GABION BASKET BANK STABILIZATION (9 FEET TALL)	1	LF		$ -
29	PULL BACK SLOPES	5,867	LF		$ -
30	SOLDIER PILE WALL	120	LF		$ -
31	SUPPLEMENTAL STONE	358	LF		$ -
32	STONE TOE STABILIZATION	2,275	LF		$ -
33	STONE BANK STABILIZATION	530	SY		$ -
34	REMOVE EXISTING FENCE AND REPLACE IN-KIND	1,070	LF		$ -
35	REMOVE EXISTING RETAINING WALL	970	LF		$ -
36	RELOCATE EXISTING SHED	4	EACH		$ -
37	PERIMETER EROSION BARRIER	1,000	LF		$ -
38	CONSTRUCTION FENCE	13,480	LF		$ -
39	SIDEWALK REMOVAL AND REPLACEMENT	220	LF		$ -
40	SITE DEWATERING	1	LSUM		$ -
41	AS-BUILT DRAWINGS	1	LSUM		$ -
42	MAINTENANCE AND MONITORING	3	YEAR		$ -
				***GRAND TOTAL BID PRICE**	$ -

*Please enter Total Cost on Bidder Summary Sheet

Proposer: _____

Firm Name: _____

Signed: _____

Title: _____

Dated: _____