ADDENDUM NO. 1

TO PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS FOR: 2020 ANNUAL WATER MAIN REPLACEMENT PROJECT HILLCREST SUBDIVISION CITY PROJECT 2020-10 DATED JANUARY 2020

AD-1-1 NOTICE

1.01 This Addendum No. 1 dated January 24, 2020, to the Plans, Specifications and Contract Documents for the above captioned project, supersedes all contrary and conflicting information of the above-mentioned bid proposal documents, which are hereby supplemented in certain particulars as follows:

AD-1-2 BID PROPOSAL

2.01 Insert the attached pre-bid meeting sign-in sheet and meeting minutes from the Pre-Bid Meeting on January 22, 2020

AD-1-3 APPENDIX D

3.01 Add Appendix D - Geotechnical Exploration Report – SKS Engineers

Please make the proper acknowledgment of **addenda #1** on page **15** of your bidding documents.

END OF ADDENDUM NO. 1

City Engineer: _____ Date: 1/24/2020

Pre-bid Meeting Minutes
for

2020 ANNUAL WATER MAIN REPLACEMENT PROJECT

CITY PROJECT 2020-10

Public Works Conference Room
10:00 a.m., Wednesday, January 22, 2020

I. Introduction

II. Project Review

Installing water main and associated appurtenances in Hillcrest Subdivision to include 7,900 feet of 8" Water Main, and 1,100' of 6" Water Main.

The work also includes erosion control, items of pavement and landscape restoration, and traffic control

III. Minority Participation Goals Review of City Code Chapter 28, Article 10 (Handout and Discussion).

A. Policy

*The City requires that general contractors show good faith efforts to meet the City's goals of 10% of the project amount be used to hire MBE subcontractors when subcontracting opportunities exist, **and** 18% total hours are to be worked by minority employees. Note that there are two goals that need to be addressed.*

B. Definitions

The Prospective bidders are directed to the attached handout that provides an excerpt of the State's definition of a minority.

C. Project Goals and Good Faith Efforts

1. Subcontracting is not required but if a subcontractor is used a Good Faith Effort must be made to fill the stated goal.

2. The Contractor shall put forward good faith efforts to "actively and aggressively" seek the participation of MBE or minority workers. Discuss options to assist in "actively and aggressively" seeking this participation.

It is expected that a demonstration of "active" and "aggressive" will include actual direct contact with or working with a minority subcontractor in a manner that leads them to provide actual quotes for the work to be subcontracted. This is benefited by the development of an ongoing relationship with minority subcontractors.

3. The City's expectation of what will be required to demonstrate a Good Faith Effort.

The City regards a good faith effort, at a minimum, to include direct contacts with 2-3 MBE subcontractors for ***each*** *subcontracting opportunity until the goal is met. The contacts must be with subcontractors that provide the type of work that is being subcontracted. Mass e-mail contacts alone are not considered a good faith effort. Documented follow up requests are required if no response is received. The bidder is to provide all work, all contacts, the method of contact (email, phone, personal, etc.), and the results of each contact.* ***Email requests with no reply or other evidence of direct contact are not considered to be acceptable direct contacts.***

City staff can have no contact with bidders regarding their bid submittal after bids have been opened, so their only opportunity to demonstrate a good faith effort, is to provide all supportive evidence with the bid document. For the benefit of the review that must be conducted by City staff, it is helpful for the bidders to group their direct contacts according to the subcontracting opportunity.

Minority Workers Goal: 18% total hours worked should be performed by minority workers.

The City tracks this goal through ePrismSoft and prevailing wage reports when required.

IV. Other Items

Bidders should check Decatur Blueprint's website before submitting a bid to make sure there are no addenda's missing. Only contractors on Decatur Blueprint's plan holder list will get updates on addenda's. You have to purchase the plans to get on their list. Simply downloading a set of plans from the website does not put you on the bidders list.

1. GC-27 Use of Fire Hydrants
   need to use a hydrant meter for any water used other than the first water main flush.
2. SP-2 Completion Date
   A 90 day internal milestone for the completion of a block to block area 90 days after starting the block. Completion shall include all final restoration, seeding and pavement.
3. SP-3 Schedule of Work
   Need to provide and adhere to a schedule, weekly schedule updates should be provided. Also highlighted the internal completion date to complete the work on Taylor.
4. Bore and Jack Alternate

END 10:15

Pre-Bid Sign-In Sheet

2020 Annual Water Main Replacement Project, Hillcrest Subdivision

2020-10

January 22nd, 2020 10:00 a.m. Public Works Conference Room

Name --- Email Address	Representing	Phone Number --- Fax Number	In Person (P) Conference Call (C)
1) Alex Trudeau	Darad inc.	217-251-4013	P
Email: dan.Truelove@icloud.com		217-251-4377	C
2) Jared Burdick	Burdick Plumbing	217-855-0322	P
Email: JARED@BURDICKPLUMBING.com		217-429-2385	C
3) Gary Burdine	Kinney Contractors	217-229-3322	(P)
Email: Kinney@roadbuilder.net		217-679-2679	C
4) Jeff Entler	Entler Excavating	217-521-3071	P
Email: entler@comcast.net			(C)
5) Daniel Bawks	J.L Sullivan Services	217-519-3122	P
Email: Bawks Excavating@gmail.com			C
6) Dan Lucas (Luka Co Inc)	Luka	217-519-1253	P
Email: DLUKA@[illegible].com			C
7) Shari Jewell	City	217-454-6711	P
Email:			C
8) Andrew Whitehead	City	217-825-5[illegible]	P
Email:			C
9)			P
Email:			C
10)			P
Email:			C
11)			P
Email:			C
12)			P
Email:			C
13)			P
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14)			P
Email:			C
15)			P
Email:			C

CITY CODE
CHAPTER 28, ARTICLE 10
MINORITY PARTICIPATION GOALS FOR PUBLIC WORKS CONTRACTS

The "minority person" definition contained in the Illinois Business Enterprise for Minorities, Females and Persons with Disabilities Act, 30 ILCS 575/2 is contained at the back of this handout.

SECTION 10-1. POLICY:

The City of Decatur encourages a diverse workforce for all public projects. Toward that end, the City establishes goals for participation by Minority Business Enterprises (MBE) and minority workers for public works contracts. The objectives of the minority participation goals include:

A. Ensuring non-discrimination in the award and administration of City public works contracts;
B. Encouraging a level playing field on which MBE and minority workers can compete fairly for City public works contracts;
C. Helping to remove barriers to the participation of MBE and minority workers in City public works contracts;
D. Promoting the use of MBE and minority workers in City public works projects;
E. Ensuring the minority participation goals are narrowly tailored in accordance with applicable law;
F. Providing appropriate flexibility to contractors in establishing and providing opportunities for MBE and minority workers;

SECTION 10-2. DEFINITIONS:

A. **MINORITY:** For purposes of this Article, the City hereby adopts and incorporates by reference "minority person" as defined in the Illinois Business Enterprise for Minorities, Females and Persons with Disabilities Act, 30 ILCS 575/2.
B. **MINORITY BUSINESS ENTERPRISE (MBE):** A business that is owned and controlled by minorities. There must be not less than 51 percent minority ownership of the business, and the minority ownership must control the management and daily operations of the business.

SECTION 10-3. MINORITY PARTICIPATION GOALS IN PUBLIC PROJECTS.

A. Contractors for City projects shall make a good faith effort to comply with the following minimum goals:
   (1) Ten (10) percent of the total dollar amount of the contract should be performed by Minority Business Enterprises if subcontracting opportunities are available; and,
   (2) Eighteen (18) percent of the total hours worked should be performed by minority workers.
B. Subcontracting is not required for a City project. If a subcontractor is used, the contractor shall make a good faith effort to meet the City's minority participation goals.

C. A contractor shall provide evidence of meeting the City's minority participation goals as directed and required by the Public Works Director or provide evidence that it made a good-faith effort to meet the goals.

D. A good faith effort means the contractor took reasonable and necessary steps to achieve the minority participation goals. Good faith means the contractor actively and aggressively sought participation by MBE or minority workers. The City shall consider the quality, quantity and intensity of efforts made by a contractor.

E. Evidence of a good-faith effort includes, but is not limited to, as appropriate:

(i) Soliciting through all reasonable and available means the interest of MBE and minority workers;

(ii) Outreach and recruitment efforts of MBE and minority workers;

(iii) Packaging requirements, when feasible, into tasks or quantities that permit maximum participation from MBE and minority workers;

(iv) Providing interested MBE and firms that employ minority workers with adequate information about the bidding process, adequate time to respond and assistance in responding to a solicitation;

(v) Negotiating in good faith with MBE and firms that employ minority workers;

(vi) Assisting interested MBE and firms that employ minority workers in obtaining bonding, lines of credit or insurance;

(vii) Assisting interested MBE and firms that employ minority workers in obtaining necessary equipment, supplies or materials;

(viii) Seeking services from available minority community organizations; minority contractors' groups, minority business assistance offices and other organizations, as appropriate, to provide assistance in recruiting MBE and minority workers;

(ix) If an MBE or a firm that employs minority workers is rejected, providing sound reasons for rejection based on a thorough investigation of the firm;

(x) Providing payroll records or other evidence showing the percentage of minority workers employed on the project or the percentage of project hours completed by minority workers; *[This is provide through Prevailing Wage documentation]*

(xi) All other good faith efforts or evidence of due diligence to meet the City's minority participation goals.

F. The minority participation goals shall be reviewed annually by the City Manager or his designee. Any changes of the goals shall require a majority vote by Decatur City Council.

SECTION 10-4. PROGRAM ADMINISTRATION:

A. The Public Works Director, or his designee, shall:

(i) Administer and enforce the provisions of this Article;

(ii) Monitor, track and report on contractors over the contract duration to ensure compliance with this Article.

SECTION 10-5. PENALTIES:

A. If a contractor fails to meet the City's minority participation goals and fails to provide evidence of a good faith effort to meet the goals, the Public Works Director or his designee may, as appropriate:

(i) Order immediate corrective action, as appropriate and practicable, to meet the minority participation goals or to show a good faith effort toward meeting the goals;
(ii) Assess a fine or penalty not to exceed $2,000 for each offense, and each day on which a violation occurs or continues shall be considered a separate offense;
(iii) Withhold the fine or penalty assessed from the unpaid portion of the contract;
(iv) Order that the contractor will not be considered a responsive responsible bidder for future City projects until the contractor provides evidence of making a good faith effort toward meeting the City's minority participation goals.

SECTION 10-6. APPEALS:

The penalty assessed by the Public Works Director or his designee shall be appealable to the City's Human Relations Commission.

SECTION 10-7. WAIVER:

A. If a contractor does not or cannot meet the City's minority participation goals for contracts, it may seek in writing a waiver. The waiver request shall include, as appropriate:
(i) Evidence of the contractor's good faith efforts to secure participation by MBE and minority workers;
(ii) Evidence the contractor received no proposals or inquiries from qualified MBE or firms that employ minority workers in response to a good faith effort to secure participation.

B. The Public Works Director or his designee may, at his or her discretion, waive the minority participation goals upon finding:
(i) The project is essential for city operations;
(ii) Emergency circumstances require a waiver;
(iii) Evidence of a good faith effort by the contractor;
(iv) Evidence the contractor received no proposals or inquiries from qualified MBE or firms that employ minority workers in response to a good faith effort to secure participation.

Illinois Business Enterprise for Minorities, Females and Persons with Disabilities Act, 30 ILCS 575/2

(30 ILCS 575/2)

(Section scheduled to be repealed on June 30, 2016)

Sec. 2. Definitions.

(A) For the purpose of this Act, the following terms shall have the following definitions:

(1) "Minority person" shall mean a person who is a citizen or lawful permanent resident of the United States and who is any of the following:

(a) American Indian or Alaska Native (a person having origins in any of the original peoples of North and South America, including Central America, and who maintains tribal affiliation or community attachment).

(b) Asian (a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including, but not limited to, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam).

(c) Black or African American (a person having origins in any of the black racial groups of Africa). Terms such as "Haitian" or "Negro" can be used in addition to "Black or African American".

(d) Hispanic or Latino (a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race).

(e) Native Hawaiian or Other Pacific Islander (a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands).

Appendix D

GEOTECHNICAL EXPLORATION
AND
FOUNDATION RECOMMENDATIONS

NEW WATERLINE UNDER BNSF RAILROAD
MOFFET LANE & ILLINOIS ROUTE 36

CITY OF DECATUR

DECATUR, MACON COUNTY, ILLINOIS

SKS
ENGINEERS, LLC
CONSULTING ENGINEERS

AUGUST 2019

GEOTECHNICAL EXPLORATION AND FOUNDATION INVESTIGATION

NEW WATERLINE UNDER BNSF RAILROAD
MOFFET LANE & ILLINOIS ROUTE 36

CITY OF DECATUR

DECATUR, MACON COUNTY, ILLINOIS

Prepared For
City of Decatur
#1 Gary K. Anderson Plaza
Decatur, Illinois 62523

Prepared By
SKS Engineers, LLC
2900 N. Martin Luther King Jr. Dr.
Decatur, Illinois 62526

August 7, 2019

SKS Project No. I1-916479

INTRODUCTION

This geotechnical exploration was performed by SKS Engineers, LLC (SKS) at the planned location of a 16-inch steel casing for a waterline under the railroad tracks near the intersection of Illinois Route 36 and North Moffet Lane in Decatur, Macon County, Illinois. Mr. Paul Caswell, with the City of Decatur, authorized the work on March 18, 2019. The work was performed in accordance with our standard procedures for such geotechnical investigations.

This geotechnical report has been prepared to present the results of our field and laboratory tests, our engineering review, and project recommendations. The purpose of this report is to provide recommendations for the safe and economical construction of the proposed project. It should be noted that our work is intended for geotechnical purposes only. The soil borings were not intended for use as environmental borings.

Our work was performed in general accordance with current ASTM standards, accepted geotechnical engineering procedures, and within the limitations and general conditions for soil and foundation investigations governing this type of work, as described in Appendix A.

SITE DESCRIPTION

The portion of the site explored for this investigation is located near the intersection of Illinois Route 36 and North Moffet Lane in Decatur, Macon County, Illinois. A site location map, which is a portion of an aerial map for this part of Macon County, Illinois, is included in Appendix B. A boring location plan for this area is also included in Appendix B.

The topography of the waterline site varies somewhat. This topography is typical for most of Macon County, Illinois. It is the result of glaciation and later, weathering.

This site lies in a physiographic section of Illinois known as the Bloomington Ridged Plain. Throughout this section, the surface topography is controlled by deposits consisting of low broad morainic ridges, alternating with intervening wide stretches of flat to rolling till plains. Often, these formations are blanketed with a wind-blown soil, known as loess. Maps indicate that this part of Macon County is covered with about six (6) to eight (8) feet of loessial soils deposited on a Wisconsin aged glacial till moraine. Locally, the moraine is covered with material deposited by the glacier melt water, called outwash. The thickness of the glacial drift is believed to be in excess of 100 feet. The loessial soils were deposited over many years. Weathering occurred during these periods of deposition. This pattern of deposition created generally silty subsoils, with layers that may contain large amounts of clay. The glacial till soil is a hard (very compact), soil composed of lean clay mixed with silt and containing sand and gravel particles. This soil was transported, mixed and deposited by glacial ice and compacted by the weight of the ice mass. This material is often covered with and/or contains pockets, layers, and seams of sand and silt. Often between the loessial soils and the glacial till soils, a thin layer of sandy or silty glacial outwash is encountered.

FIELD AND LABORATORY EXPLORATION

SCOPE

Two (2) test borings were drilled at the site. Soil samples were secured from the borings for laboratory analyses. The borings were drilled to a depth of 21 feet. Standard penetration tests were performed during the advancement of the borings. Unconfined compression tests and moisture content determinations were performed in the laboratory on the soil samples suitable for testing.

BORING LOCATION PLAN

The test borings were drilled at the locations shown on the overhead map view. (See Appendix B). The number, depths and locations of the borings were established by the City of Decatur and SKS Engineers, LLC (SKS), in accordance with project requirements.

BORING, SAMPLING AND LABORATORY PROCEDURES

Logs of borings were prepared and copies have been enclosed in Appendix B. These logs show thicknesses, locations, and descriptions of the soil types encountered. Data concerning the penetration resistance values, sample locations, water levels, etc., are given on the logs.

Boring, sampling, and laboratory procedures are discussed in detail on Sheets C-1 through C-3, included in this report as Appendix C. All soil samples were examined and classified; cohesive soil samples were tested for moisture content and unconfined compressive strengths. Descriptions of these tests are given on Sheet C-2. Laboratory test results are given on the boring logs. Descriptive terminology and the classification system used in preparing the boring logs are shown on Sheet C-3. The Unified Soil Classification Chart is also included in Appendix C for further clarification.

PROPOSED CONSTRUCTION

It is our understanding that the proposed construction along this site will consist of a 16-inch steel casing pipe for a water main. The steel casing and water line will be installed under the railroad using trenchless methods of bore and jack. According to the information given to SKS, the water line will be ten (10) to twelve (12) feet below ground surface when crossing below the railroad tracks.

SUBSURFACE CONDITIONS

SUBSOILS

The information obtained from the soil borings indicates the soils are relatively uniform. The site is covered to a depth of five (5) to seven (7) feet with a moist, firm to stiff, low plasticity lean clay with a trace to little sand. It is commonly believed that these soils were developed from loess, a wind deposited silty soil. Below the loess derived soils, a second stratum of soil was encountered. The second soil stratum is composed of a moist, stiff to hard, low plasticity sandy lean clay with traces of gravel. This stratum is likely glacial till. In boring B-1, at five (5) to seven (7) feet of depth, a layer or seam of moist, loose clayey sand with a trace of gravel was found. Sand seams are often found interbedded in the glacial till stratum.

The types, stratification and laboratory test results of the subsoils encountered, within the depths drilled, are shown on the enclosed boring logs (Appendix B), as are the depths to groundwater, and other pertinent information.

GROUNDWATER

Groundwater observations were made for each of the borings, and are indicated on the logs, both during the drilling procedure and soon thereafter. In boring B-1, free water was first encountered at 7.5 feet and rose to 5.5 by the end of the drilling operation. Boring B-2 was dry during and after drilling. The depth of groundwater during drilling should not be viewed as a permanent condition. It has been our experience that free subsurface water can often be found trapped in pervious zones within the upper loessial and outwash soil strata. This water is precipitation that seeps into these soils and becomes trapped. The resulting quantity and elevation of this type of groundwater will vary seasonally.

FINDINGS AND RECOMMENDATIONS

GENERAL

Based on the investigation, geotechnical recommendations are provided for a working platform and dewatering guidance. The bore and jack installation operation is the responsibility of the specialty contractor. Therefore, the selection of bore and jack equipment and operational procedures should be selected by the specialty contractor. Specific boring data are provided in Appendix B for use by the contractor. Generic guidelines for bore and jack operation are provided in this report. The recommendations are based upon the materials encountered on the site. If the assumed construction methods change from bore and jack to another trenchless type of construction, SKS should be notified so the report recommendations can be amended.

BORE AND JACK

Jack and bore is a trenchless construction method of simultaneously excavating inside sections of casing pipe as they are jacked through the soil. Spoils are removed from inside the casing by means of a rotating flight auger. The auger rotates inside the casing as it being jacked. The auger should not advance ahead of the casing to avoid over-excavation at the face, which can result in surface settlement. The carrier pipe should not be directly jacked into position. The steel casing pipe will form a temporary liner into which the carrier pipe may be installed and grouted. The use of a casing pipe provides a means to jack through the soil without damaging the carrier pipe and allows for proper alignment of the carrier pipe following jacking.

LAUNCH AND EXIT SHAFTS

A launch shaft and an exit shaft will be required at the jack and bore crossing. The launch shafts are required to be large enough to accommodate the jacking equipment. The exit shafts can be a smaller area. Actual shaft size will depend on the contractor's equipment size and means and methods. All shafts should extend to about two (2) feet below the proposed pipe invert. Based on the planned soil cover of casing pipe and the size of the casing, shaft depths are expected to be about fourteen (14) feet below the existing ground surface. The launch shafts should have a concrete or stone mat at the bottom of the excavations to serve as a working mat. The thickness of the mat will be determined by the contractor and will be based on their construction equipment and procedures. The shafts are anticipated to be below the groundwater level based on the groundwater conditions observed at time of the exploration. Therefore, dewatering by means of pumping will likely be required. A drainage layer should be provided under the working mat in order to provide a means by which to maintain a dry and stable excavation subgrade. Approximately six (6) to twelve (12) inches of compacted crushed stone should be used for the drainage layer. The stone should be separated from the underlying soils by a filter fabric to prevent the migration of fines into the stone.

EXCAVATION SUPPORT

Due to the depth of the shafts, and their proximity to an active railroad and roadway, and other structures, excavation support will be required. Excavation support, consisting of trench boxes, interlocking steel sheet piling, or soldier piles and timber lagging, is considered suitable. The excavation support should be designed to resist the full earth, water, and surcharge loads acting on it. Surcharge loads from the roadway and railroads must be considered. In addition, thrust loads from the jacking operations must be considered in the design of the launch shafts. Other additional loads may be required based on the contractor's planned construction methods. The design and construction of the launch and exit shafts is the responsibility of the contractor. The shafts should be designed by a professional engineer, experienced in excavation support design, and registered in the State of Illinois.

JACKING LOADS AND THRUST BLOCKS

The subcontractor will be responsible for the design of the thrust block for the launch shaft. The thrust block must be capable of supporting the maximum jacking loads anticipated at the launch shaft. Jacking loads should be estimated and thrust blocks designed based on friction resistance on the steel casing. If actual jacking loads exceed the estimated jacking loads, a lubricant should be used to help reduce the frictional resistance and reduce the required loads. Lubricant should consist of bentonite slurry or a similar commercial product.

CONTROL AND CONTAINMENT

The bore and jacking operations should be monitored continuously by experienced personnel, who have been trained in all aspects of the bore and jacking process. These procedures include a very accurate monitoring and control system to track the progress and exact location of the leading pipe end at all times.

MONITORING

Contractor personnel should be onsite during the drilling activities and continuously monitor all operations. The drilling operator should maintain records on rates, pressures, spoil material, etc. throughout the course of the drilling activities. Drilling is typically performed during daytime hours. If nighttime drilling activities are necessary, appropriate lighting should be provided to assure continued monitoring of operations and settlements.

The bore and jack installation discussed in this report is along live railroad tracks. Therefore, a survey grid line should be established. Monitoring points should be utilized to provide early indications of settlement. The survey grid should conform to BNSF requirements. Settlement of the tracks is not expected to occur. However, in the event settlement does occur of more than 3/16", BNSF shall be notified immediately. If settlements greater than 3/8" occur, work should be immediately stopped and BNSF notified. The drilling procedures shall be re-evaluated and adjusted appropriately in order to prevent any further settlements.

LATERAL EARTH PRESSURES

Lateral earth pressures will be imposed on those jack pit walls and other such structural walls retaining fill materials or supporting structural backfill below grade. The net lateral pressure, which will develop against these walls, will depend upon the type of movement the wall can undergo, the backfill soil used, the wall height, and surcharge loading.

The lateral earth pressure on non-yielding structural walls such as rigid cylindrical walls (valve vaults), is the earth pressure at rest condition. This type of earth pressure may be estimated by assuming the wall pressure is equal to the pressure imposed by a fluid with a unit weight of 60.0 lbs. per cu. ft. This pressure is based on a coefficient of lateral earth pressure (at rest) equal to 0.5 for sand or gravel backfill. If low plasticity silty clays are used for backfill, this coefficient should be increased to 0.75 and the unit weight of the assumed fluid should be increased to 90.0 lbs. per cu. ft. In addition to the earth pressure, the expected water pressure should be added to compute the total lateral pressure.

The lateral earth pressure for yielding structural walls, such as temporary sheet pile walls and other walls restrained only at the bottom, is the active earth pressure condition. This type of

earth pressure may be estimated by assuming wall pressure equal to the pressure imposed by a fluid with a unit weight of 40.0 lbs. per cu. ft. This pressure is based on a coefficient of active earth pressure equal to 0.33 for sand or gravel backfill. If the temporary sheet pile walls must stand for more than a few months, the fluid pressure should be increased to 60.0 lbs. per cu. ft. because the clayey soils will tend to creep, thus increasing the wall pressure.

The lateral pressure caused by a surcharge load, such as a traffic load, should be incorporated in the wall design. This lateral pressure may be computed by multiplying the coefficient of earth pressure by the surcharge pressure.

CORROSION CONSIDERATIONS

Based on our past experience with soil conditions in this area, it is our judgment that the cohesive natural soils are slightly to moderately corrosive to buried steel. Therefore, all buried utilities of different metallic construction should be carefully isolated from each other using dielectric connections, or similar methods to minimize corrosion problems. All mechanical connections should be carefully coated with coal tar epoxy paint, or a similar coating suitable for underground applications. Further, any metal extending into the ground may also require cathodic protection.

The corrosive nature of the soils does not, in our judgment, extend to concrete corrosion. Therefore, we recommend the use of conventional Type 1 Portland Cement. However, all steel in concrete structures extending below grade, should receive a maximum amount of concrete cover to avoid contact with corrosive soils. Further, project specifications should detail densification practices for the concrete to assure that it is a dense mass with a low permeability.

CONSTRUCTION DEWATERING

Dewatering may be required during construction. Dewatering of excavations is normally the responsibility of the contractor and should be a design-build system. The contractor should be familiar with the prevailing conditions, and obtain additional information if needed to design the required dewatering method. The native sand seams are anticipated to have relatively high permeability.

Controlled dewatering should be performed to avoid possible piping/blowout at the base of excavations or to avoid excessive settlement problems in the surrounding areas. All dewatering systems should be properly designed to prevent pumping soil fines with the discharge water. This work should be closely monitored during construction.

EXCAVATION SLOPE SAFETY

The contractor should be aware that slope height, slope incline, or excavation depths (including trench excavations) should, in no case, exceed those specified in local, state, or federal safety regulations (e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations). Such regulations are strictly enforced. If they are not followed, the owner, contractor, and/or earthwork and utility contractors could be liable for substantial penalties.

As can be seen from the boring logs, most of the waterline will be in Type "A" or Type "B" soils. The contractor needs to be aware that soils to be penetrated by the proposed waterline excavation may vary significantly from those found during drilling. The soil classifications were determined based upon the soils encountered within the exploratory borings. If different subsurface conditions are encountered at the time of construction, SKS recommends that we be contacted **immediately** to evaluate the conditions found.

For excavations extending to a depth of twenty (20) feet more, it is necessary (per OSHA) to have the side slopes designed by a professional engineer, registered in the State of Illinois.

As a safety measure, it is recommended that all vehicles and soil piles be kept a minimum lateral distance from the crest of the slope, as directed by the contractor's competent person, as described in 29 CFR. The exposed slope face should be protected against the elements. We recommend that you retain SKS to monitor the exposed soils in all excavations, and to provide engineering services for such slopes. This will provide an opportunity to monitor the soils types encountered, and to modify the excavation slopes as necessary. It also offers an opportunity to verify the stability of the excavation slopes during construction. Typical excavation diagrams have been prepared for each of these soil types and for different combinations. See Appendix D for these diagrams.

As an alternative to temporary slopes, vertical excavations can be temporarily shored. The contractor, or the contractor's specialty subcontractor, would be responsible for the design of the temporary shoring, in accordance with applicable regulatory requirements.

CLOSURE

This report presents our findings and conclusions regarding subsurface and groundwater conditions, and considerations for the design and construction of a waterline under the railroad in Decatur, Macon County, Illinois. The analyses, conclusions and recommendations contained herein are based on the details of the proposed construction outlined in the report, on the site, subsurface and groundwater conditions as they existed at the time the borings were made. SKS Engineers, LLC should be contacted if any of the assumptions or estimates concerning the project design are incorrect or not project specific. We will develop new recommendations at that time.

RESPECTFULLY SUBMITTED
SKS ENGINEERS, LLC

Patrick A. Hahn, P.E.

Aug 7, 2019

The recommendations in this report are for the use of the client only. The use of the recommendations in this report, by any third party, is done solely at that party's own risk. SKS Engineers, LLC does not provide any guarantee or warranty to any third party user of this report.

This report should be read in its entirety, including all appendices, prior to utilizing the recommendations. No portion or portions of this report should be utilized without regard to the remainder of the report.

APPENDIX A

LIMITATIONS AND GENERAL CONDITIONS

SKS

SKS ENGINEERS, LLC

LIMITATIONS AND GENERAL CONDITIONS FOR SOIL AND FOUNDATION INVESTIGATIONS

1. It must be recognized by all parties concerned that the recommendations developed during our investigations must consider many indeterminate factors and problems for which exact solutions are not available. Thus, SKS Engineers, LLC has attempted to provide practical answers using the professional standards and techniques available to us in our profession at the time of the investigation. Of necessity, the recommendations developed on the Client's behalf must not be considered a warranty, direct or indirect, as to the final performance of the project. Since many of the subsurface conditions will remain unknown, even with drilling of borings, it must be recognized that the Geotechnical Engineer should be given an opportunity to evaluate the subsurface conditions during construction and that some changes may be required during design and construction to achieve the maximum economy and safety for the project.

2. SKS Engineers, LLC believes all services are performed within time, monetary and technical limitations prescribed by our Clients and their consultants, with the usual thoroughness and competence of the Geotechnical Profession in this part of the country at the time of the investigation. No warranty or presentation, either expressed or implied, is included or intended in our proposals, contracts, oral communications or written reports.

3. Our reports are prepared to be used in the design of the proposed project and are not intended as a bidding document, and any contractors reviewing our reports must draw their own conclusions regarding construction procedures and difficulties for the project at this site.

4. The stratification lines shown on the logs of borings represent approximate interpolated boundaries between soil types, and the transitions may be gradual.

5. Water levels indicated on the boring logs are the levels measured in the borings at the times indicated, and the actual water level may fluctuate depending on many conditions such as improvements on and near the site, drainage, rainfall, season, etc.

6. Our boring logs present generalized subsurface conditions interpreted from soils sampling and apply only at the boring location and the date drilled. It is not warranted to be representative of the subsurface conditions at other locations and other times.

7. This report is prepared for the specific site location and specific proposed project. If the project location or the design considerations are changed, SKS Engineers, LLC should be consulted to review the conditions and issue applicable recommendations. This report should not be used for other types of structures at the same site location or similar structures at other locations.

8. If there is a substantial lapse of time (say, more than twelve months) between the submission of our report and the start of construction work on the site, or if conditions have changed due to natural causes, plan changes, or construction operations at or adjacent to the site, it is recommended that this report be reviewed by the Geotechnical Engineer to determine the continued applicability of the recommendations.

9. SKS Engineers, LLC will retain samples for a maximum of 90 days beyond the issuance of their final project report, at which time SKS Engineers, LLC reserves the right to destroy the remaining unused samples unless further storage or transfer of samples is arranged by the Client or Owner within the 90 day holding period.

APPENDIX B

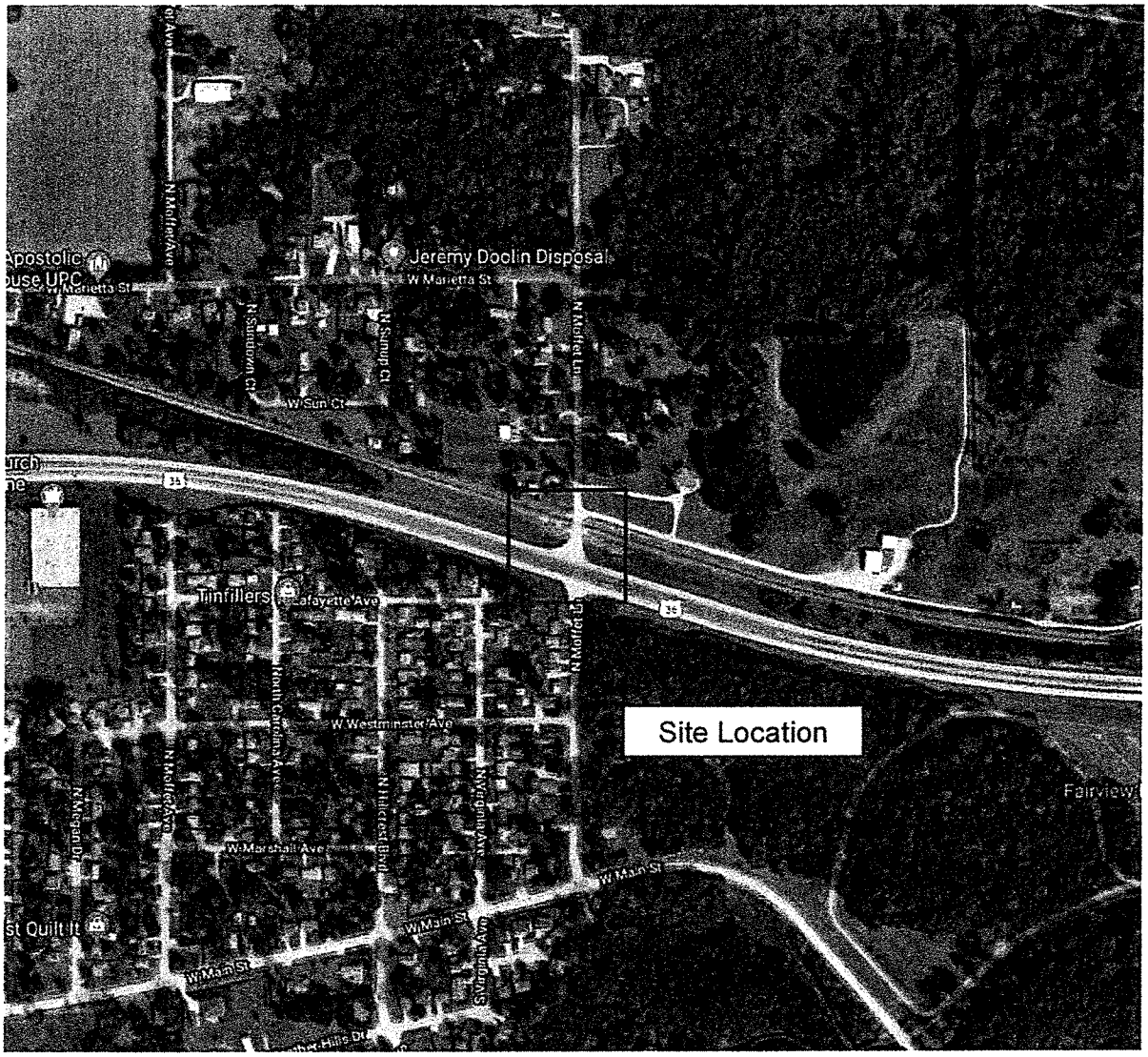
SITE LOCATION MAP

BORING LOCATION PLAN

BORING LOGS

SKS

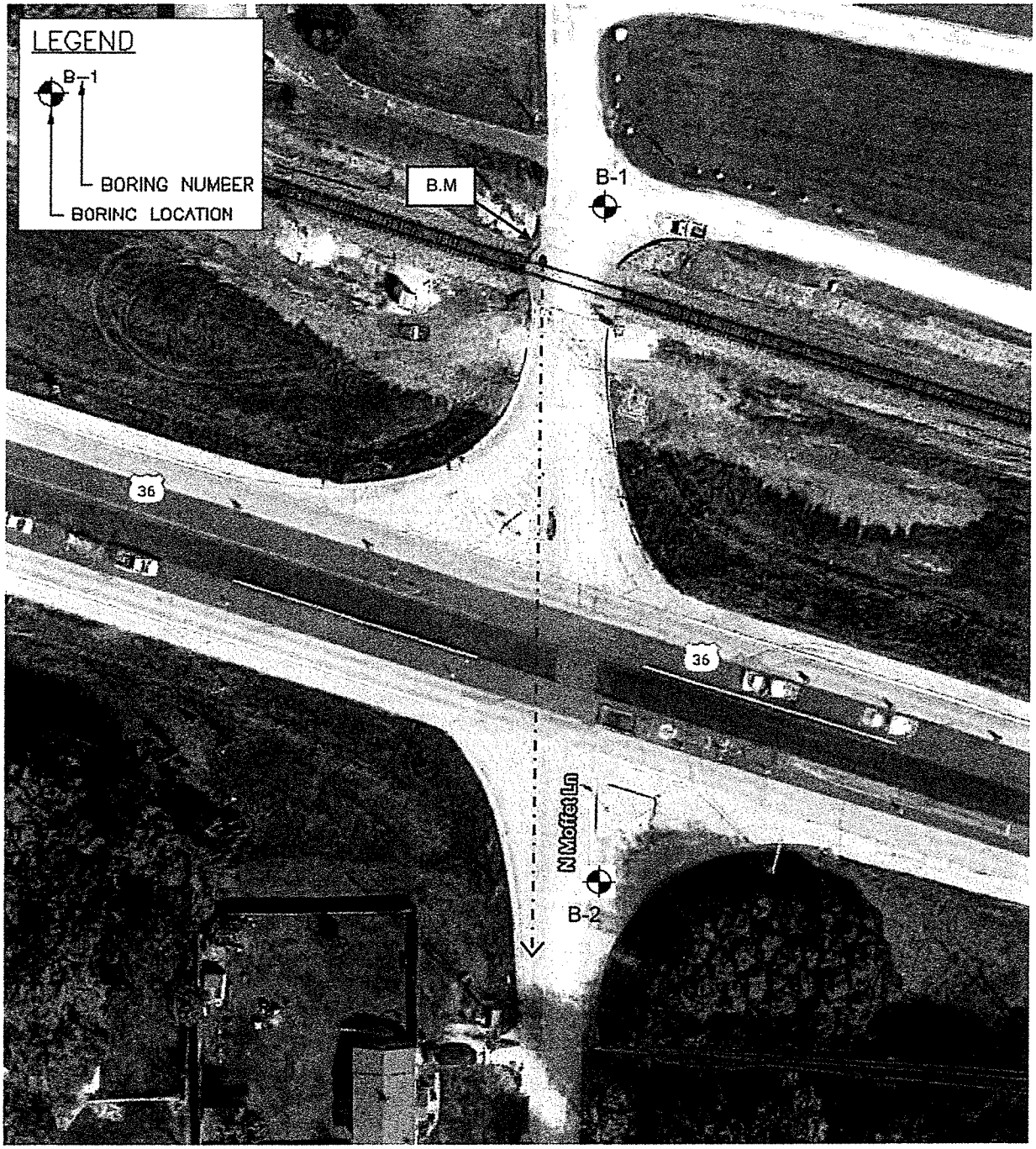
Site Location Map
Decatur, Macon County, Illinois
SKS Project No. I1-916479



↑ North

SKS

Boring Location Plan
Decatur, Macon County, Illinois
SKS Project No. I1-916479



B.M. – TOP OF RAIL IN LINE WITH WHITE LINE OF HASHED AREA. STATIONING RUNS SOUTH OF BENCHMARK

↑ North

BORING NO. B-1

SKS ENGINEERS, LLC

PROJECT NO.: 916479

PROJECT: WATERMAIN UNDER RAILROAD

CLIENT: CITY OF DECATUR — DATE: 7/17/19

PROJ. LOCATION: DECATUR, ILLINOIS — LOCATION: 0+79/L15

DRILLING METHOD: HOLLOW STEM/SAFETY HAMMER — ELEVATION: 99.51

DRILLER: EJ

LOGGED BY: DW

WEATHER: SUNNY, 81

DEPTH TO - WATER> INITIAL: ▽ 5.5 AFTER 24 HOURS: ▽ — CAVING> C

SAMPLE NO.	SAMPLE TYPE	DEPTH (feet)	Description	BLOW COUNT	Uncon. Comp. Str. Qu (tsf)	P. Penetrometer (tsf)	Torvane (tsf)	USCS ID	SOIL TYPE
		0							
A			3" ASPHALT on SILTY SAND Dark Gray, moist, fine-medium, trace gravel					SM	
1			LEAN CLAY Brown, moist, firm-stiff, low plasticity, little sand	8 4 4	2.4	2.0	1.37	CL	
2		5	CLAYEY SAND Brown, moist, loose, fine-medium, trace gravel	3 4 4				SC	
3			SANDY LEAN CLAY Brown, moist, stiff, low plasticity, trace gravel (*)free water @ 7.5'	4 5 7	1.7	1.5	1.37	CL	
4		10		5 5 6	1.7	1.5	1.37		
5		15	SANDY LEAN CLAY Brownish Gray, moist, hard, low plasticity, trace gravel	14 14 19	4.8	4.0	2.12	CL	
6		20	SANDY LEAN CLAY Gray, moist, very stiff, low plasticity, trace gravel	6 8 13	2.4	3.0	1.25	CL	
			END OF BORING @ 21.0 FT.						
		25							
		30							

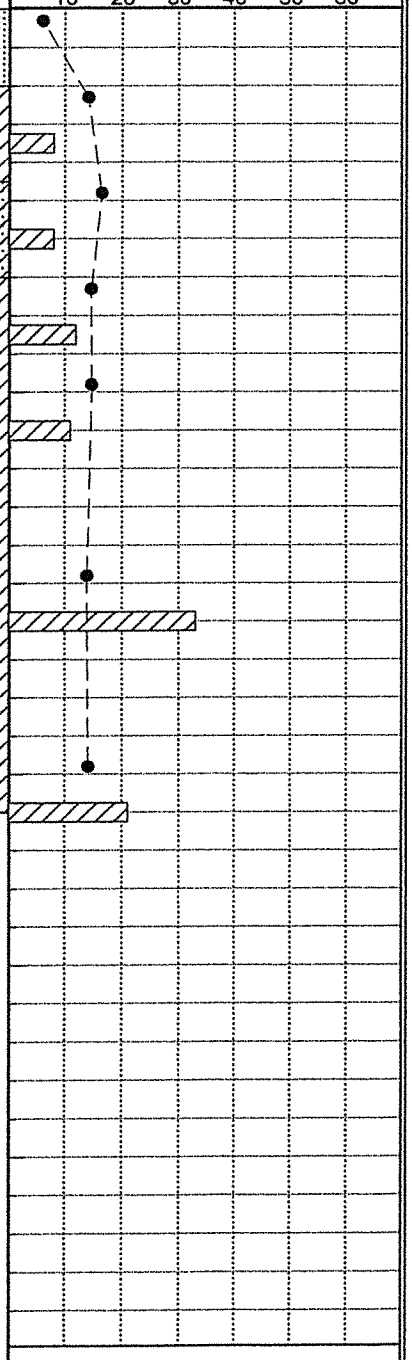
TEST RESULTS

Plastic Limit ⊢—⊣ Liquid Limit

Water Content - ●

Blow Count - ▨

10 20 30 40 50 60



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

2900 N. Martin Luther King Jr. Drive Decatur, IL 62526 (217)877-2100

BORING NO. B-2

SKS ENGINEERS, LLC

PROJECT NO.: 916479

PROJECT: WATERMAIN UNDER RAILROAD

CLIENT: CITY OF DECATUR — DATE: 7/17/19

PROJ. LOCATION: DECATUR, ILLINOIS — LOCATION: 3+64/L27

DRILLING METHOD: HOLLOW STEM/SAFETY HAMMER — ELEVATION: 96.05

DRILLER: EJ

LOGGED BY: DW

WEATHER: SUNNY, 85

DEPTH TO - WATER> INITIAL: DRY — AFTER 24 HOURS: — CAVING> C

SAMPLE NO.	SAMPLE TYPE	DEPTH (feet)	Description	BLOW COUNT	Uncon. Comp. Str. Qu (tsf)	P. Penetrometer (tsf)	Torvane (tsf)	USCS ID	SOIL TYPE
		0							
A			3" ASPHALT on 2" GRAVEL on 12" CONCRETE on LEAN CLAY					CL	
1			Gray, moist, stiff, low plasticity, trace sand	3 5 8	2.4	4.0	0.75		
2		5	LEAN CLAY	7 7 7		1.25	0.75	CL	
			Brown, moist, stiff, low plasticity, trace sand						
3			SANDY LEAN CLAY	4 4 8	1.4	1.25	0.875	CL	
			Brown, moist, stiff, low plasticity, trace gravel						
4		10	-very stiff	8 8 11		4.25	1.62		
5		15		8 12 14	5.0	4.5	2.37		
6		20	SANDY LEAN CLAY	9 10 9	4.0	3.5	1.12	CL	
			Gray, moist, very stiff, low plasticity, trace gravel						
			END OF BORING @ 21.0 FT.						
		25							
		30							

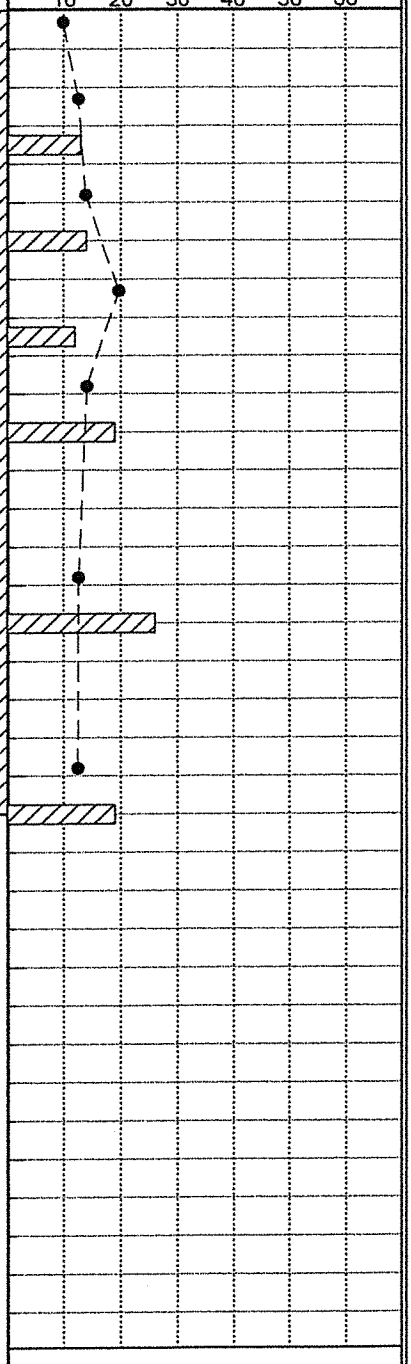
TEST RESULTS

Plastic Limit ⊢——⊣ Liquid Limit

Water Content - ●

Blow Count - ▨

10 20 30 40 50 60



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

2900 N. Martin Luther King Jr. Drive Decatur, IL 62526 (217)877-2100

APPENDIX C

BORING, SAMPLING AND LABORATORY PROCEDURES

BORING AND SAMPLING METHODS

The borings are drilled with a rotary drill rig equipped with hollow-stem or continuous flight auger. The hollow-stem auger remains in the ground until the boring is completed and provides a casing for the drill hole. The samples are secured in advance of and through the hollow-stem of the auger. When the continuous flight auger is used, it is removed from the hole to permit sampling at the bottom of the uncased boring; its use is restricted to cohesive soils. The equipment and methods used are as required by the methods for "Penetration Test and Split-Barrel Sampling of Soils", ASTM* Designation: D 1586, and "Thin-Walled Tube Sampling of Soils", ASTM Designation: D 1587.

The standard penetration test is a measure of the resistance of the soil to the penetration of the split-barrel sampler. The number of blows required by a 140-pound hammer falling 30 inches to drive the sampler 12 inches is the penetration resistance or N-value. This resistance is a rough indication of the consistency of cohesive soils and a fairly reliable measure of the relative density of non-cohesive materials.

The soil samples are removed from the split-barrel sampler, visually classified, placed in air-tight containers and brought to our laboratory for further examination and testing.

Thin-walled tube sampling is used to obtain undisturbed soil samples for strength, consolidation, density, and permeability testing. The results of tests made on undisturbed samples are more accurate than those made on split-barrel samples.

*American Society for Testing and Materials

LABORATORY CLASSIFICATION AND TESTING

Soil classifications, visual and by laboratory test data, are based on the "Classification of Soils for Engineering Purposes", ASTM Designation: D 2487. A chart, which outlines this classification system, follows Sheet C-3. Descriptive terminology in use by our firm is outlined on the following sheet, C-3. The soil classifications are correlated with the field descriptions for the preparation of the final boring logs.

Soil classifications are dependent upon plasticity characteristics and the grain size distribution of the material. Plasticity is determined in accordance with ASTM Designations: D 423 (Liquid Limit) and D 424 (Plastic Limit & Plasticity Index). Grain size distribution is determined by sieve and/or hydrometer analyses, ASTM D 422. These types of tests are generally limited to representative samples selected from the test borings.

Cohesive soil samples obtained in 3-inch O.D. thin-walled tubes and those split-barrel samples recovered in suitable condition for testing are routinely tested for natural moisture content (ASTM D 2216) and unconfined compressive strength (ASTM D 2166). The split-barrel samples normally undergo varying degrees of disturbance during sampling, thus the strength test results must be used with engineering judgment.

More refined soil tests, (E.g. triaxial compression, consolidation, permeability, etc.) are performed when required. These tests are carried out in accordance with applicable ASTM standards.

Torvane shear and pocket penetrometer values are frequently determined. These are calibrated devices that give an indication of the unconfined compressive strength of cohesive soils.

*American Society for Testing and Materials

SkS

DESCRIPTIVE TERMINOLOGY

MOISTURE CONDITIONS

DRY	Seems dry, but contains some moisture	Contains no noticeable moisture
MOIST	Moisture below the plastic limit	Contains a noticeable amount of moisture, but no appreciable free water
VERY MOIST	Moisture above the plastic, but below the liquid limit	Contains free water in a limited quantity
WET	Moisture may approach the liquid limit	Contains considerable free water, but voids are not water filled
SATURATED	Moisture is frequently at or above the liquid limit	Soil voids are water filled or nearly so

Consistency

Fine-Grained Cohesive Soil

Term	Unconfined Compressive Strength Tons/sq.ft.	"N" Value
Very soft	0.00 to 0.25	0 - 2
Soft	0.25 to 0.50	2 - 4
Firm	0.50 to 1.00	4 - 8
Stiff	1.00 to 2.00	8 - 16
Very Stiff	2.00 to 4.00	16 - 30
Hard	Over 4.00	> 30

Relative Density

Coarse-Grained Non-Cohesive Soils

Term	"N" Value
Very loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Over 50

NOTE: "N" Value = Blows of a 140 lb. hammer falling 30" required to drive a 2" O.D. split barrel sampler 12 inches.

PARTICLE SIZES

TERM	SIEVE SIZES
Boulders	Over 12"
Cobbles	3" to 12"
Gravel	
Coarse	¾" to 3"
Fine	#4 to ¾"
Sand	
Coarse	#10 to #4
Medium	#40 to #10
Fine	#200 to #40
Silt and Clay	
Silt*	0.002 - 0.074 mm
Clay*	less than 0.002 mm

*Silt and Clay normally determined by plasticity characteristics.

RELATIVE PROPORTIONS

TERM	RANGE
Trace	Less than 10%
Little	10% - 20%
Some	20% - 30%
With	30%+

AF	=	Fill
CL	=	Clay (Lean)
L	=	Low Plasticity
LM	=	Low to Medium Plasticity
ML	=	Silt (Lean)

NOTE: "N" Value = Blows of a 140 lb. hammer falling 30" required to drive a 2" O.D. split barrel sampler 12 inches.

UNIFIED SOIL CLASSIFICATION SYSTEM

Soil Classification						
Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]					Group Symbol	Group Name[B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $1 \leq Cc \leq 3^E$		GW	Well-graded gravel[F]
			$Cu < 4$ and/or $1 > Cc > 3^E$		GP	Poorly graded gravel[F]
		Gravels with Fines More than 12% fines[C]	Fines classify as ML or MH		GM	Silty gravel[F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[E]	$Cu \geq 6$ and $1 \leq Cc \leq 3^E$		SW	Well-graded sand[I]
			$Cu < 6$ and/or $1 > Cc > 3^E$		SP	Poorly graded sand[I]
		Sands with Fines More than 12% fines[D]	Fines classify as ML or MH		SM	Silty sand[G,H,I]
			Fines classify as CL or CH		SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	Inorganic	PI > 7 and plots on or above "A" line[J]		CL	Lean clay[K,L,M]
			PI < 4 or plots below "A" line[J]		ML	Silt[K,L,M]
		Organic	Liquid limit - oven dried / Liquid limit - not dried	<0.75	OL	Organic clay[K,L,M,N] / Organic silt[K,L,M,O]
	Silts and Clays Liquid limit 50 or more	Inorganic	PI plots on or above "A" line		CH	Fat clay[K,L,M]
			PI plots below "A" line		MH	Elastic silt[K,L,M]
		Organic	Liquid limit - oven dried / Liquid limit - not dried	<0.75	OH	Organic clay[K,L,M,P] / Organic silt[K,L,M,Q]
Highly organic soils			Primarily organic matter, dark in color, and organic odor		PT	Peat

A Based on the material passing the 3-inch (75-mm) sieve.

B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

C Gravels with 5 to 12% fines require dual symbols:
GW-GM = well-graded gravel with silt
GW-GC = well-graded gravel with clay
GP-GM = poorly graded gravel with silt
GP-GC = poorly graded gravel with clay

D Sands with 5 to 12% fines require dual symbols:
SW-SM = well-graded sand with silt
SW-SC = well-graded sand with clay
SP-SM = poorly graded sand with silt
SP-SC = poorly graded sand with clay

E $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D^{10} \times D^{60}}$

F If soil contains ≥ 15% sand, add "with sand" to group name.

G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

H If fines are organic, add "with organic fines" to group name.

I If soil contains ≥ 15% gravel, add "with gravel" to group name.

J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel", whichever is predominant.

L If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

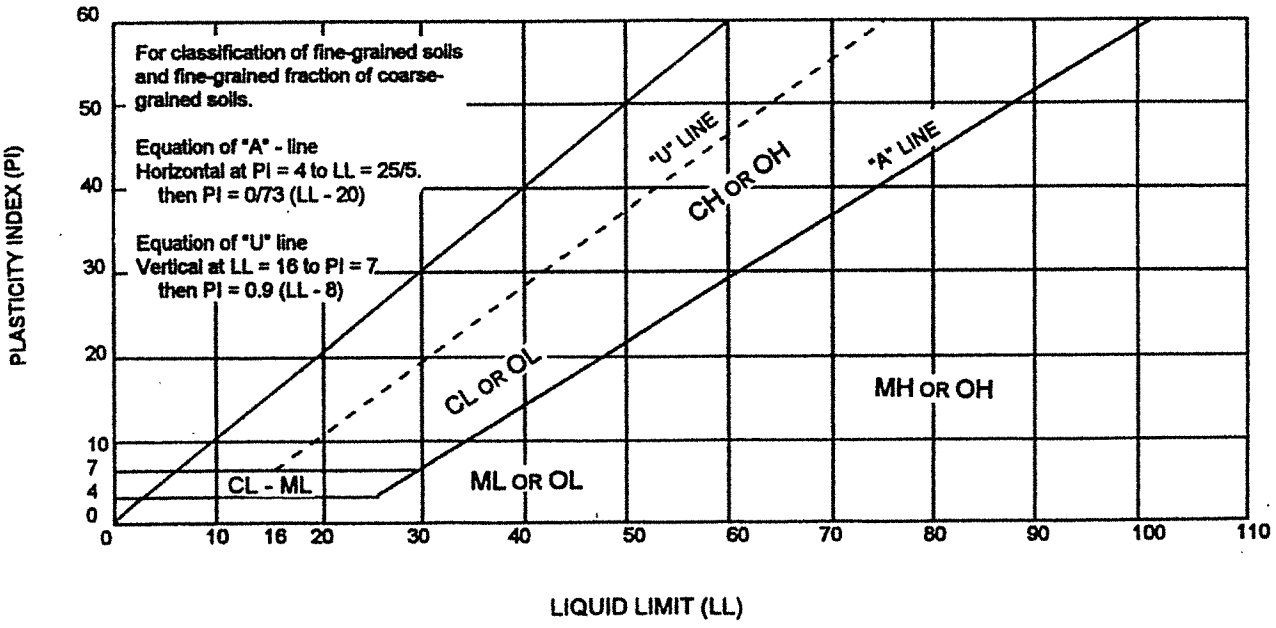
M If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

N PI ≥ 4 and plots on or above "A" line.

O PI < 4 or plots below "A" line.

P PI plots on or above "A" line.

Q PI plots below "A" line.

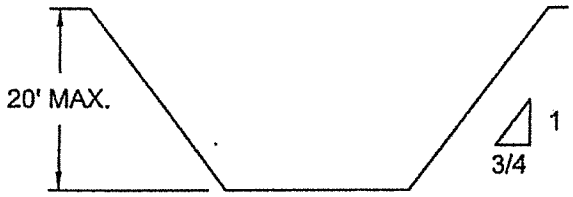


APPENDIX D

OSHA REQUIREMENTS – SLOPE CONFIGURATIONS

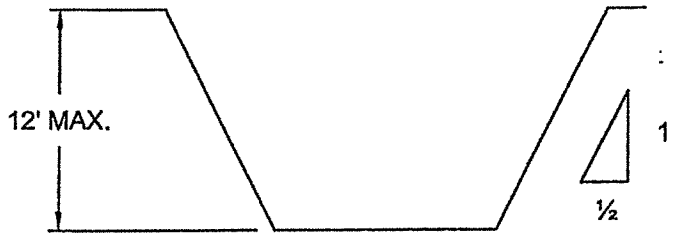
I. Slope Configurations in Type A Soil
(All slopes stated below are in the horizontal to vertical ratio)

A. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.



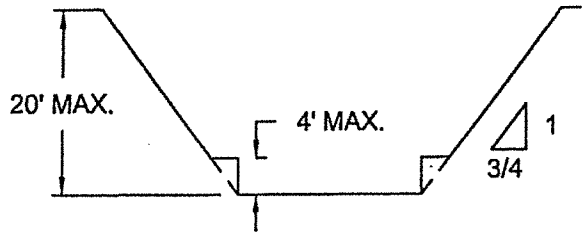
SIMPLE SLOPE - GENERAL

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of ½:1.

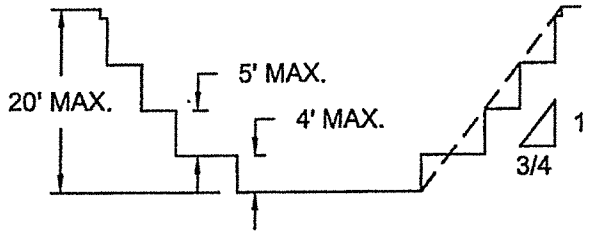


SIMPLE SLOPE - SHORT TERM

B. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4:1 and maximum bench dimensions as follows:

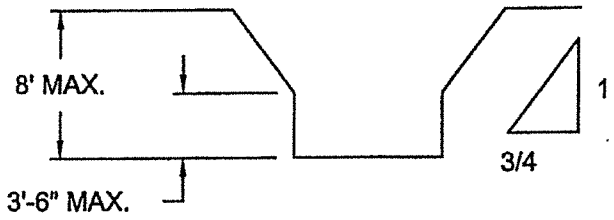


SIMPLE BENCH



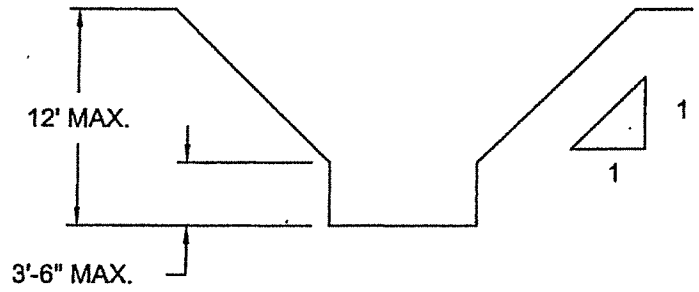
MULTIPLE BENCH

C. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3½ feet.



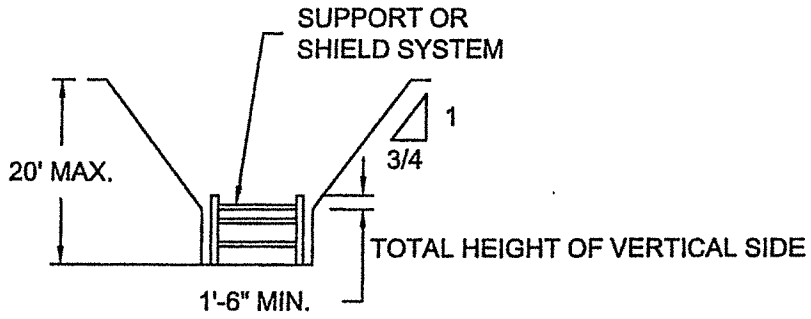
UNSUPPORTED VERTICALLY SIDED LOWER PORTION MAXIMUM 8 FEET DEEP

All excavations more than 8 feet but not more than 12 feet in depth which have unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.



UNSUPPORTED VERTICALLY SIDED LOWER PORTION MAXIMUM 12 FEET DEEP

All excavations 20 feet or less depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 3/4:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

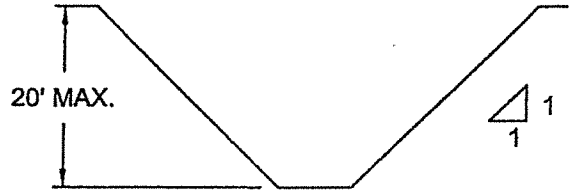


SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

D. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted.

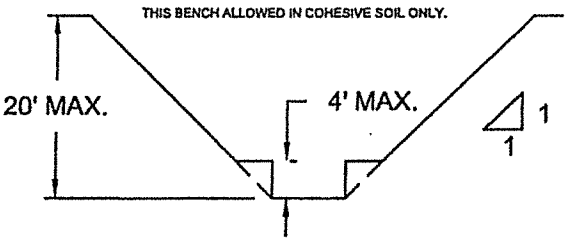
II. Slope Configurations in Type B Soil

A. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

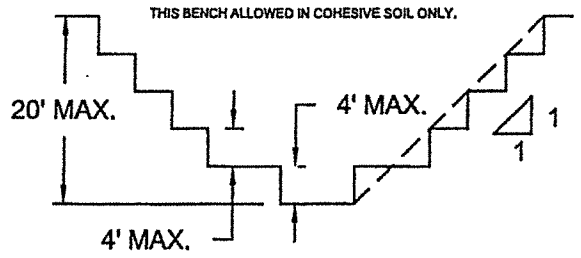


SIMPLE SLOPE

B. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:

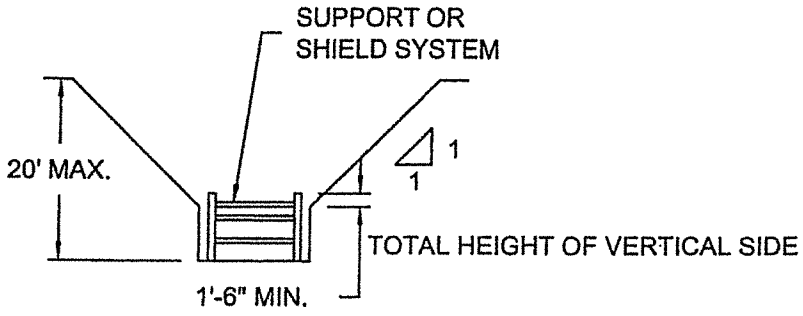


SINGLE BENCH



MULTIPLE BENCH

C. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.

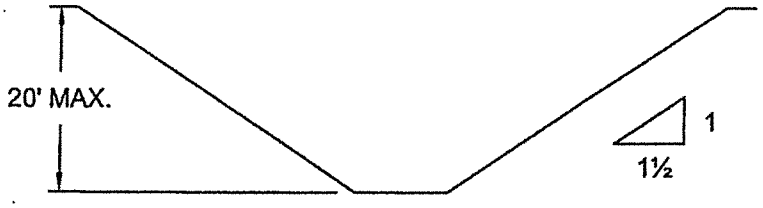


VERTICALLY SIDED LOWER PORTION

D. All other sloped excavations shall be in accordance with the other options permitted.

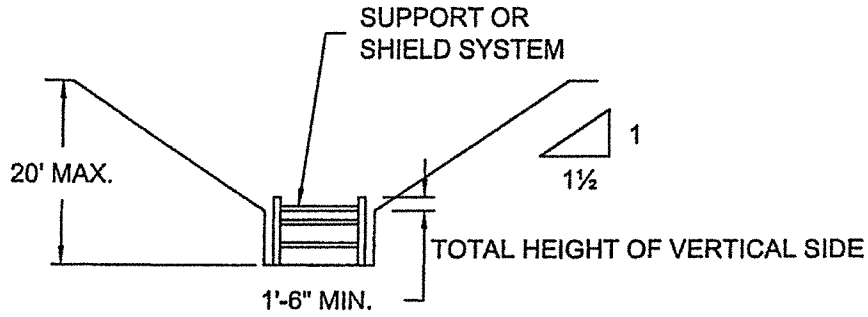
III. Slope Configurations in Type C Soil

A. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



SIMPLE SLOPE

B. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1½:1.

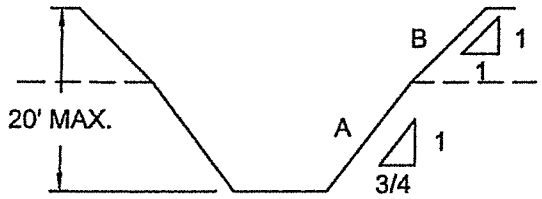


VERTICALLY SIDED LOWER PORTION

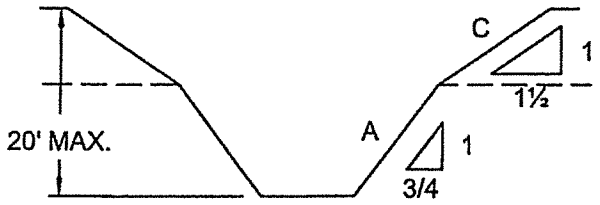
C. All other sloped excavations shall be in accordance with the other options permitted.

IV. Slope Configurations in Layered Soils

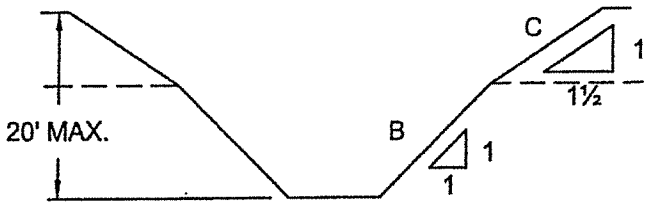
A. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for layer as set forth below:



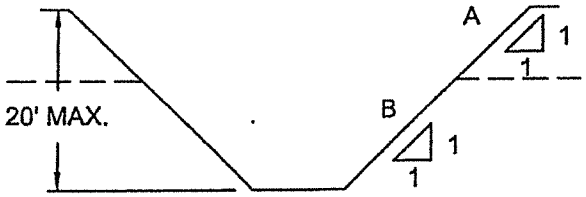
B OVER A



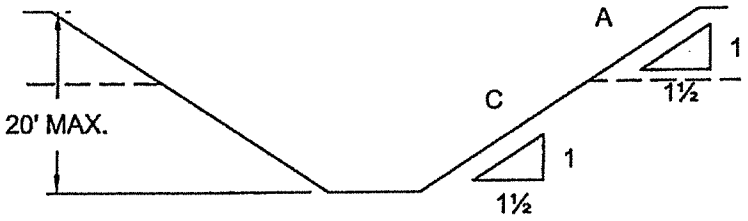
C OVER A



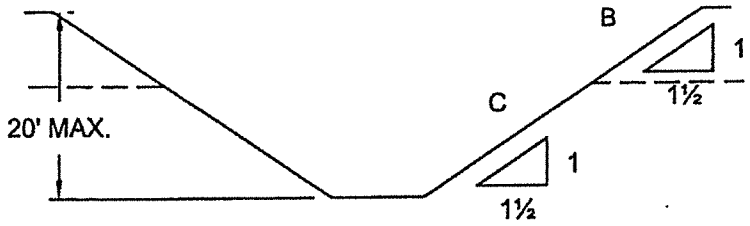
C OVER B



A OVER B



A OVER C



B OVER C

B. All other sloped excavations shall be in accordance with the other options permitted.