CALL NO. 105

CONTRACT ID. 255382

HOPKINS COUNTY

FED/STATE PROJECT NUMBER STP BRZ 9030 (500)

DESCRIPTION KY 138

WORK TYPE BRIDGE REPLACEMENT

PRIMARY COMPLETION DATE 7/1/2027

LETTING DATE: July 24,2025

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN DAYLIGHT TIME July 24,2025. Bids will be publicly announced at 10:00 AM EASTERN DAYLIGHT TIME.

PLANS AVAILABLE FOR THIS PROJECT.

DBE CERTIFICATION REQUIRED - 2%

REQUIRED BID PROPOSAL GUARANTY: Not less than 5% of the total bid.

TABLE OF CONTENTS

PART I

SCOPE OF WORK

ADMINISTRATIVE DISTRICT - 02

CONTRACT ID - 255382

STP BRZ 9030 (500)

COUNTY - HOPKINS

PCN - BR05401382500
STP BRZ 9030 (500)

KY 138 (MP 8.422) ADDRESS DEFICIENCIES OF KY 138 OVER POND RIVER (054B00009N) (MP 8.491), A DISTANCE OF 0.03 MILES.BRIDGE REPLACEMENT SYP NO. 02-10024.00.

GEOGRAPHIC COORDINATES LATITUDE 37:18:36.00 LONGITUDE 87:30:16.00

ADT 1,841

COMPLETION DATE(S):

COMPLETED BY 07/01/2027 APPLIES TO ENTIRE CONTRACT

CONTRACT NOTES

INSURANCE

Refer to Kentucky Standard Specifications for Road and Bridge Construction, current edition.

PROPOSAL ADDENDA

All addenda to this proposal must be applied when calculating bid and certified in the bid packet submitted to the Kentucky Department of Highways. Failure to use the correct and most recent addenda may result in the bid being rejected.

BID SUBMITTAL

Bidder must use the Department's electronic bidding software. The Bidder must download the bid file located on the Bid Express website (www.bidx.com) to prepare a bid packet for submission to the Department. The bidder must submit electronically using Bid Express.

JOINT VENTURE BIDDING

Joint venture bidding is permissible. All companies in the joint venture must be prequalified in one of the work types in the Qualifications for Bidders for the project. The bidders must get a vendor ID for the joint venture from the Division of Construction Procurement and register the joint venture as a bidder on the project. Also, the joint venture must obtain a digital ID from Bid Express to submit a bid. A joint bid bond of 5% may be submitted for both companies or each company may submit a separate bond of 5%.

UNDERGROUND FACILITY DAMAGE PROTECTION

The contractor shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor's responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. When prescribed in said directives, the contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom shall be contacted through their individual Protection Notification Center. Non-compliance with these directives can result in the enforcement of penalties.

REGISTRATION WITH THE SECRETARY OF STATE BY A FOREIGN ENTITY

Pursuant to KRS 176.085(1)(b), an agency, department, office, or political subdivision of the Commonwealth of Kentucky shall not award a state contract to a person that is a foreign entity required by KRS 14A.9-010 to obtain a certificate of authority to transact business in the Commonwealth ("certificate") from the Secretary of State under KRS 14A.9-030 unless the person produces the certificate within fourteen (14) days of the bid or proposal opening. If the

foreign entity is not required to obtain a certificate as provided in KRS 14A.9-010, the foreign entity should identify the applicable exception. Foreign entity is defined within KRS 14A.1-070.

For all foreign entities required to obtain a certificate of authority to transact business in the Commonwealth, if a copy of the certificate is not received by the contracting agency within the time frame identified above, the foreign entity's solicitation response shall be deemed non-responsive or the awarded contract shall be cancelled.

Businesses can register with the Secretary of State at https://secure.kentucky.gov/sos/ftbr/welcome.aspx .

SPECIAL NOTE FOR PROJECT QUESTIONS DURING ADVERTISEMENT

Questions about projects during the advertisement should be submitted in writing to the Division of Construction Procurement. This may be done by email to kytc.projectquestions@ky.gov. The Department will attempt to answer all submitted questions. The Department reserves the right not to answer if the question is not pertinent or does not aid in clarifying the project intent.

The deadline for posting answers will be 3:00 pm Eastern Daylight Time, the day preceding the Letting. Questions may be submitted until this deadline with the understanding that the later a question is submitted, the less likely an answer will be able to be provided.

The questions and answers will be posted for each Letting under the heading "Questions & Answers" on the Construction Procurement website (www.transportation.ky.gov/construction-procurement). The answers provided shall be considered part of this Special Note and, in case of a discrepancy, will govern over all other bidding documents.

HARDWOOD REMOVAL RESTRICTIONS

The US Department of Agriculture has imposed a quarantine in Kentucky and several surrounding states, to prevent the spread of an invasive insect, the emerald ash borer. Hardwood cut in conjunction with the project may not be removed from the state. Chipping or burning on site is the preferred method of disposal.

INSTRUCTIONS FOR EXCESS MATERIAL SITES AND BORROW SITES

Identification of excess material sites and borrow sites shall be the responsibility of the Contractor. The Contractor shall be responsible for compliance with all applicable state and federal laws and may wish to consult with the US Fish and Wildlife Service to seek protection under Section 10 of the Endangered Species Act for these activities.

ACCESS TO RECORDS

The state agency certifies that it is in compliance with the provisions of KRS 45A.150, "Access to contractor's books, documents, papers, records, or other evidence directly pertinent to the contract." The Contractor, as defined in KRS 45A.030, agrees that the contracting agency, the

Finance and Administration Cabinet, the Auditor of Public Accounts, and the Legislative Research Commission, or their duly authorized representatives, shall have access to any books, documents, papers, records, or other evidence, which are directly pertinent to this agreement for the purpose of financial audit or program review. The Contractor also recognizes that any books, documents, papers, records, or other evidence, received during a financial audit or program review shall be subject to the Kentucky Open Records Act, KRS 61.870 to 61.884. Records and other prequalification information confidentially disclosed as part of the bid process shall not be deemed as directly pertinent to the agreement and shall be exempt from disclosure as provided in KRS 61.878(1)(c).

BOYCOTT PROVISIONS

If applicable, the contractor represents that, pursuant to KRS 45A.607, they are not currently engaged in, and will not for the duration of the contract engage in, the boycott of a person or an entity based in or doing business with a jurisdiction with which Kentucky can enjoy open trade. **Note:** The term Boycott does not include actions taken for bona fide business or economic reasons, or actions specifically required by federal or state law.

If applicable, the contractor verifies that, pursuant to KRS 41.480, they do not engage in, and will not for the duration of the contract engage in, in energy company boycotts as defined by KRS 41.472.

LOBBYING PROHIBITIONS

The contractor represents that they, and any subcontractor performing work under the contract, have not violated the agency restrictions contained in KRS 11A.236 during the previous ten (10) years, and pledges to abide by the restrictions set forth in such statute for the duration of the contract awarded.

The contractor further represents that, pursuant to KRS 45A.328, they have not procured an original, subsequent, or similar contract while employing an executive agency lobbyist who was convicted of a crime related to the original, subsequent, or similar contract within five (5) years of the conviction of the lobbyist.

SPECIAL NOTE – BUY AMERICA REQUIREMENTS AND BUILD AMERICA, BUY AMERICA (BABA) ACT 05/05/2025

1.0 BUY AMERICA REQUIREMENT.

Follow the "Buy America" provisions as required by 23 U.S.C. § 313 and 23 C.F.R. § 635.410. Except as expressly provided herein all manufacturing processes of steel or iron materials including but not limited to structural steel, guardrail materials, corrugated steel, culvert pipe, structural plate, prestressing strands, and steel reinforcing bars shall occur in the United States of America, including the application of:

- Coating,
- Galvanizing,
- Painting, and
- Other coating that protects or enhances the value of steel or iron products.

The following are exempt, unless processed or refined to include substantial amounts of steel or iron material, and may be used regardless of source in the domestic manufacturing process for steel or iron material:

- Pig iron,
- Processed, pelletized, and reduced iron ore material, or
- Processed alloys.

The Contractor shall submit a certification stating that all manufacturing processes involved with the production of steel or iron materials occurred in the United States.

Produce, mill, fabricate, and manufacture in the United States of America all aluminum components of bridges, tunnels, and large sign support systems, for which either shop fabrication, shop inspection, or certified mill test reports are required as the basis of acceptance by the Department.

Use foreign materials only under the following conditions:

1) When the materials are not permanently incorporated into the project; or
2) When the delivered cost of such materials used does not exceed 0.1 percent of the total Contract amount or $2,500.00, whichever is greater.

The Contractor shall submit to the Engineer the origin and value of any foreign material used.

2.0 – BUILD AMERICA, BUY AMERICA (BABA)

Contractor shall comply with the Federal Highway Administration (FHWA) Buy America Requirement in 23 C.F.R. § 635.410 and all relevant provisions of the Build America, Buy America Act (BABA), contained within the Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, §§ 70901-52 enacted November 15, 2021. The BABA requires iron, steel, manufactured products, and construction materials used in infrastructure projects funded by federal financial assistance to be produced in the United States. Comply with 2 C.F.R § 184.

BABA permits FHWA participation in the Contract only if domestic steel and iron will be used on the Project. To be considered domestic, all steel and iron used, and all products manufactured from steel and iron must be produced in the United States and all manufacturing processes, including application of a coating, for these materials must occur in the United States. Coating includes all processes that protect or enhance the value of the material to which the coating is applied. This requirement does not preclude a minimal use of foreign steel and iron materials, provided the cost of such materials does not exceed 0.1% of the total contract amount under the Contract or $2,500.00 whichever is greater.

BABA permits FHWA participation in the Contract only if all "construction materials" as defined in the Act are made in the United States. The Buy America preference applies to the following construction materials incorporated into infrastructure projects: non-ferrous metals; plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables); glass (including optic glass); Fiber optic cable; optical fiber; lumber; engineered wood; and drywall. Contractor will be

required to use construction materials produced in the United States on this Project. The Contractor shall submit a certification stating that all construction materials are certified to be BABA compliant.

3.0 FINAL RULE – FHWA'S BUY AMERICA REGULATION TO TERMINATE GENERAL APPLICABILITY WAIVER FOR MANUFACTURED PRODUCTS

- **March 17, 2025** (effective date): For all Federal-aid projects obligated on or after March 15, 2025, all iron or steel products, as defined in § 635.410(c)(1)(iii), must comply with FHWA's Buy America requirements for steel and iron in § 635.410(b). In addition, for all Federal-aid projects obligated on or after March 15, 2025, per § 635.410(c)(2), articles, materials, and supplies should be classified as an iron or steel product, a manufactured product, or another product as specified by law or in 2 CFR part 184 (such other products specified by law or in 2 CFR part 184 include "excluded materials" and "construction materials"); an article, material, or supply must not be considered to fall into multiple categories.
- **October 1, 2025:** The final assembly requirement will become effective for Federal-aid projects obligated on or after October 1, 2025. This means that, for manufactured product to be Buy America compliant, for Federal-aid projects obligated on or after October 1, 2025, final assembly of the manufactured product must occur in the United States.
- **October 1, 2026:** The 55 percent requirement will become effective for Federal-aid projects obligated on or after October 1, 2026. This means that, for manufactured product to be Buy America-compliant, for Federal-aid projects obligated on or after October 1, 2026, all manufactured products permanently incorporated into the project must both be manufactured in the United States (satisfy the final assembly requirement) and have the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States be greater than 55 percent of the total cost of all components of the manufactured product (satisfy the 55 percent requirement).

4.0 – ADDITIONAL REQUIREMENTS

The Contractor has completed and submitted, or shall complete and submit, to the Cabinet a Buy America/ Build America, Buy America Certificate prior to the Cabinet issuing the notice to proceed, in the format below. After submittal, the Contractor is bound by its original certification.

A false certification is a criminal act in violation of 18 U.S.C. § 1001. The Contractor has the burden of proof to establish that it's in compliance.

At the Contractor's request, the Cabinet may, but is not obligated to, seek a waiver of Buy America requirements if grounds for the waiver exist under 23 C.F.R. § 635.410(c) or will comply with the applicable Buy America requirements if a waiver of those requirements is not available or not pursued by the Cabinet.

Please refer to the Federal Highway Administration's Buy America webpage for more information.

Buy America - Construction Program Guide - Contract Administration - Construction - Federal Highway Administration (dot.gov)

BUY AMERICA / BUILD AMERICA, BUY AMERICA (ACT) MATERIALS CERTIFICATE OF COMPLIANCE

The Contractor hereby certifies that it will comply with all relevant provisions of the Build America, Buy America Act, contained within the Infrastructure Investment and Jobs Act, Pub. L. NO. 117-58, §§ 70901-52, the requirements of 23 U.S.C. § 313, 23 C.F.R. § 635.410 and 2 C.F.R § 184.

Date Submitted:_____

Contractor:_____

Signature:_____

Printed Name:_____

Title:_____

NOTE: THIS CERTIFICATION IS IN ADDITION TO ANY AND ALL REQUIREMENTS OUTLINED IN THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND/OR SPECIAL NOTES CONTAINED IN THE PROJECT PROPOSAL.

FEDERAL CONTRACT NOTES

The Kentucky Department of Highways, in accordance with the Regulations of the United States Department of Transportation 23 CFR 635.112 (h), hereby notifies all bidders that failure by a bidder to comply with all applicable sections of the current Kentucky Standard Specifications, including, but not limited to the following, may result in a bid not being considered responsive and thus not eligible to be considered for award:

102.02 Current Rating
102.13 Irregular Bid Proposals
102.09 Proposal Guaranty
102.08 Preparation and Delivery of Proposals
102.14 Disqualification of Bidders

CIVIL RIGHTS ACT OF 1964

The Kentucky Transportation Cabinet, Department of Highways, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, sex, age (over 40), religion, sexual orientation, gender identity, veteran status, disability, income- level, or Limited English Proficiency (LEP)in consideration for an award.

NOTICE TO ALL BIDDERS

To report bid rigging activities call: 1-800-424-9071.

The U.S. Department of Transportation (DOT) operates the above toll-free “hotline” Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the “hotline” to report such activities.

The “hotline” is part of the DOT’s continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

SECOND TIER SUBCONTRACTS

Second tier subcontracts are acceptable per Section 108.01 of the Standard Specifications for Road and Bridge Construction. S u b - Contractors fulfilling a disadvantaged business enterprise goal on a project may enter into a 2nd tier subcontract with a Non-DBE Subcontractor. However, in this instance, none of the work subcontracted to the Non-DBE Contractor will count toward fulfilling the established Disadvantaged Goal for the project.

DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

It is the policy of the Kentucky Transportation Cabinet ("the Cabinet") that Disadvantaged Business Enterprises ("DBE") shall have the opportunity to participate in the performance of highway construction projects financed in whole or in part by Federal Funds in order to create a level playing field for all businesses who wish to contract with the Cabinet. To that end, the Cabinet will comply with the regulations found in 49 CFR Part 26, and the definitions and requirements contained therein shall be adopted as if set out verbatim herein.

The Cabinet, contractors, subcontractors, and sub-recipients shall not discriminate on the basis of race, color, national origin, or sex in the performance of work performed pursuant to Cabinet contracts. The contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of federally assisted highway construction projects. The contractor will include this provision in all its subcontracts and supply agreements pertaining to contracts with the Cabinet.

Failure by the contractor to carry out these requirements is a material breach of its contract with the Cabinet, which may result in the termination of the contract or such other remedy as the Cabinet deems necessary.

DBE GOAL

The Disadvantaged Business Enterprise (DBE) goal established for this contract, as listed on the front page of the proposal, is the percentage of the total value of the contract.

The contractor shall exercise all necessary and reasonable steps to ensure that Disadvantaged Business Enterprises participate in a least the percent of the contract as set forth above as goals for this contract.

OBLIGATION OF CONTRACTORS

Each contractor prequalified to perform work on Cabinet projects shall designate and make known to the Cabinet a liaison officer who is assigned the responsibility of effectively administering and promoting an active program for utilization of DBEs.

If a formal goal has not been designated for the contract, all contractors are encouraged to consider DBEs for subcontract work as well as for the supply of material and services needed to perform this work.

Contractors are encouraged to use the services of banks owned and controlled by minorities and women.

CERTIFICATION OF CONTRACT GOAL

Contractors shall include the following certification in bids for projects for which a DBE goal has been established. BIDS SUBMITTED WHICH DO NOT INCLUDE CERTIFICATION OF DBE PARTICIPATION WILL NOT BE ACCEPTED. These bids will not be considered for award by the Cabinet and they will be returned to the bidder.

"The bidder certifies that it has secured participation by Disadvantaged Business Enterprises ("DBE") in the amount of_____percent of the total value of this contract and that the DBE participation is in compliance with the requirements of 49 CFR 26 and the policies of the Kentucky Transportation Cabinet pertaining to the DBE Program."

The certification statement is located in the electronic bid file. All contractors must certify their DBE participation on that page. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted.

DBE PARTICIPATION PLAN

Lowest responsive bidders must submit the *DBE Plan/ Subcontractor Request*, form TC 14-35 DBE, within 5 days of the letting. This is necessary before the Awards Committee will review and make a recommendation. **The project will not be considered for award prior to submission and approval of the apparent low bidder's DBE Plan/Subcontractor Request.**

The DBE Participation Plan shall include the following:

1. Name and address of DBE Subcontractor(s) and/or supplier(s) intended to be used in the proposed project;
2. Description of the work each is to perform including the work item, unit, quantity, unit price and total amount of the work to be performed by the individual DBE. The Proposal Line Number, Category Number, and the Project Line Number can be found in the "material listing" on the Construction Procurement website under the specific letting;
3. The dollar value of each proposed DBE subcontract and the percentage of total project contract value this represents. DBE participation may be counted as follows;
   a) If DBE suppliers and manufactures assume actual and contractual responsibility, the dollar value of materials to be furnished will be counted toward the goal as follows:
      - The entire expenditure paid to a DBE manufacturer;
      - 60 percent of expenditures to DBE suppliers that are not manufacturers provided the supplier is a regular dealer in the product involved. A regular dealer must be engaged in, as its principal business and in its own name, the sale of products to the public, maintain an inventory and own and operate distribution equipment; and
      - The amount of fees or commissions charged by the DBE firms for a bona fide service, such as professional, technical, consultant, or managerial services and assistance in the procurement of essential personnel, facilities, equipment, materials, supplies, delivery of materials and supplies or for furnishing bonds, or insurance, providing such fees or commissions are determined to be reasonable and customary.
   b) The dollar value of services provided by DBEs such as quality control testing, equipment repair and maintenance, engineering, staking, etc.;

c) The dollar value of joint ventures. DBE credit for joint ventures will be limited to the dollar amount of the work actually performed by the DBE in the joint venture;
4. Written and signed documentation of the bidder's commitment to use a DBE contractor whose participation is being utilized to meet the DBE goal; and
5. Written and signed confirmation from the DBE that it is participating in the contract as provided in the prime contractor's commitment.

AFTER PROJECT AWARD AND BEFORE NOTICE TO PROCEED/WORK ORDER IS ISSUED (SEE SECTION 103.06, STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION

Prime Contractors awarded a federally funded project with a DBE Goal greater than zero will be required to submit a fully executed DBE Subcontract, along with the attached FHWA 1273 and Certificate of Liability Insurance for each DBE Firm submitted as part of the previously approved DBE Utilization Plan (TC 14-35). A signed quote or purchase order shall be attached when the DBE subcontractor is a material supplier or broker.

The Certificate of Liability Insurance submitted must meet the requirements outlined in Section 107.18 of the Standard Specifications for Road and Bridge Construction.

Changes to ***APPROVED*** DBE Participation Plans must be approved by the Office for Civil Rights & Small Business Development. The Cabinet may consider extenuating circumstances including, but not limited to, changes in the nature or scope of the project, the inability or unwillingness of a DBE to perform the work in accordance with the bid, and/or other circumstances beyond the control of the prime contractor.

CONSIDERATION OF GOOD FAITH EFFORTS REQUESTS

If the DBE participation submitted in the bid by the apparent lowest responsive bidder does not meet or exceed the DBE contract goal, the apparent lowest responsive bidder must submit a Good Faith Effort Package to satisfy the Cabinet that sufficient good faith efforts were made to meet the contract goals prior to submission of the bid. Efforts to increase the goal after bid submission will not be considered in justifying the good faith effort, unless the contractor can show that the proposed DBE was solicited prior to the letting date. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted. One complete set (hard copy along with an electronic copy) of this information must be received in the Division of Contract Procurement no later than 12:00 noon of the tenth calendar day after receipt of notification that they are the apparent low bidder.

Where the information submitted includes repetitious solicitation letters it will be acceptable to submit a sample representative letter along with a distribution list of the firms solicited. Documentation of DBE quotations shall be a part of the good faith effort submittal as necessary to demonstrate compliance with the factors listed below which the Cabinet considers in judging good faith efforts. This documentation may include written subcontractors' quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

The Good Faith Effort Package shall include, but may not be limited to information showing evidence of the following:

1. Whether the bidder attended any pre-bid meetings that were scheduled by the Cabinet to inform DBEs of subcontracting opportunities;
2. Whether the bidder provided solicitations through all reasonable and available means;
3. Whether the bidder provided written notice to all DBEs listed in the DBE directory at the time of the letting who are prequalified in the areas of work that the bidder will be subcontracting;
4. Whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainly whether they were interested. If a reasonable amount of DBEs within the targeted districts do not provide an intent to quote or no DBEs are prequalified in the subcontracted areas, the bidder must notify the Disadvantaged Enterprise Business Liaison Officer (DEBLO) in the Office for Civil Rights and Small Business Development to give notification of the bidder's inability to get DBE quotes;
5. Whether the bidder selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise perform these work items with its own forces;
6. Whether the bidder provided interested DBEs with adequate and timely information about the plans, specifications, and requirements of the contract;
7. Whether the bidder negotiated in good faith with interested DBEs not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached;
8. Whether quotations were received from interested DBE firms but were rejected as unacceptable without sound reasons why the quotations were considered unacceptable. The fact that the DBE firm's quotation for the work is not the lowest quotation received will not in itself be considered as a sound reason for rejecting the quotation as unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a DBE quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy DBE goals;
9. Whether the bidder specifically negotiated with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be subcontracted includes potential DBE participation;
10. Whether the bidder made any efforts and/or offered assistance to interested DBEs in obtaining the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal; and
11. Any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include DBE participation.

FAILURE TO MEET GOOD FAITH REQUIREMENT

Where the apparent lowest responsive bidder fails to submit sufficient participation by DBE firms to meet the contract goal and upon a determination by the Good Faith Committee based upon the information submitted that the apparent lowest responsive bidder failed to make sufficient reasonable efforts to meet the contract goal, the bidder will be offered the opportunity to meet in person for administrative reconsideration. The bidder will be notified of the Committee's decision within 24 hours of its decision. The bidder will have 24 hours to request reconsideration of the Committee's decision. The reconsideration meeting will be held within two days of the receipt of a request by the bidder for reconsideration.

The request for reconsideration will be heard by the Office of the Secretary. The bidder will have the opportunity to present written documentation or argument concerning the issue of whether it met the goal or made an adequate good faith effort. The bidder will receive a written decision on the reconsideration explaining the basis for the finding that the bidder did or did not meet the goal or made adequate Good Faith efforts to do so.

The result of the reconsideration process is not administratively appealable to the Cabinet or to the United States Department of Transportation.

The Cabinet reserves the right to award the contract to the next lowest responsive bidder or to rebid the contract in the event that the contract is not awarded to the low bidder as the result of a failure to meet the good faith requirement.

SANCTIONS FOR FAILURE TO MEET DBE REQUIREMENTS OF THE PROJECT

Failure by the prime contractor to fulfill the DBE requirements of a project under contract or to demonstrate good faith efforts to meet the goal constitutes a breach of contract. When this occurs, the Cabinet will hold the prime contractor accountable, as would be the case with all other contract provisions. Therefore, the contractor's failure to carry out the DBE contract requirements shall constitute a breach of contract and as such the Cabinet reserves the right to exercise all administrative remedies at its disposal including, but not limited to the following:

- Suspension of Prequalification;
- Disallow credit toward the DBE goal;
- Withholding progress payments;
- Withholding payment to the prime in an amount equal to the unmet portion of the contract goal; and/or
- Termination of the contract.

PROMPT PAYMENT

The prime contractor will be required to pay the DBE and Non-DBE Subcontractors within seven (7) working days after he or she has received payment from the Kentucky Transportation Cabinet for work performed or materials furnished.

CONTRACTOR REPORTING

All contractors must keep detailed records and provide reports to the Cabinet on their progress in meeting the DBE requirement on any highway contract. These records may include, but shall not be limited to payroll, lease agreements, cancelled payroll checks, executed subcontracting agreements, etc. Prime contractors will be required to complete and submit a ***signed and notarized*** Affidavit of Subcontractor Payment (TC 18-7) and copies of checks for any monies paid to each DBE subcontractor or supplier utilized to meet a DBE goal. These documents must be completed and signed within 7 days of being paid by the Cabinet.

Payment information that needs to be reported includes date the payment is sent to the DBE, check number, Contract ID, amount of payment and the check date. Before Final Payment is made on this contract, the Prime Contractor will certify that all payments were made to the DBE subcontractor and/or DBE suppliers.

******* IMPORTANT *******

Please mail the original, signed and completed TC (18-7) Affidavit of Subcontractor Payment form and all copies of checks for payments listed above to the following address:

Office for Civil Rights and Small Business Development
6th Floor West 200 Mero Street
Frankfort, KY 40622

The prime contractor should notify the KYTC Office for Civil Rights and Small Business Development seven (7) days prior to DBE contractors commencing work on the project. The contact in this office is Mr. Tony Youssefi. Mr. Youssefi's current contact information is email address – tyousseffi@ky.gov and the telephone number is (502) 564-3601.

DEFAULT OR DECERTIFICATION OF THE DBE

If the DBE subcontractor or supplier is decertified or defaults in the performance of its work, and the overall goal cannot be credited for the uncompleted work, the prime contractor may utilize a substitute DBE or elect to fulfill the DBE goal with another DBE on a different work item. If after exerting good faith effort in accordance with the Cabinet's Good Faith Effort policies and procedures, the prime contractor is unable to replace the DBE, then the unmet portion of the goal may be waived at the discretion of the Cabinet.

PROHIBITION ON TELECOMMUNICATIONS EQUIPMENT OR SERVICES

In accordance with the FY 2019 National Defense Authorization Act (NDAA), 2 CFR 200.216, and 2 CFR 200.471, Federal agencies are prohibited, after August 13, 2020, from obligating or expending financial assistance to obtain certain telecommunications and video surveillance services and equipment from specific producers. As a result of these regulations, contractors and subcontractors are prohibited, on projects with federal funding participation, from providing telecommunication or video surveillance equipment, services, or systems produced by:

- Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities)
- Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities)

LEGAL REQUIREMENTS AND RESPONSIBILITY TO THE PUBLIC – CARGO PREFERENCE ACT (CPA).

(REV 12-17-15) (1-16)

SECTION 7 is expanded by the following new Article:

102.10 **Cargo Preference Act – Use of United States-flag vessels.**

Pursuant to Title 46CFR Part 381, the Contractor agrees

- To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.
- To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph 1 of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.
- To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.

ASPHALT MIXTURE

Unless otherwise noted, the Department estimates the rate of application for all asphalt mixtures to be 110 lbs/sy per inch of depth.

DGA BASE

Unless otherwise noted, the Department estimates the rate of application for DGA Base to be 115 lbs/sy per inch of depth.

DGA BASE FOR SHOULDERS

Unless otherwise noted, the Department estimates the rate of application for DGA Base for Shoulders to be 115 lbs/sy per inch of depth. The Department will not measure necessary grading and/or shaping of existing shoulders prior to placing of DGA Base, but shall be incidental to the Contract unit price per ton for DGA Base.

Accept payment at the Contract unit price per ton as full compensation for all labor, materials, equipment, and incidentals for grading and/or shaping of existing shoulders and furnishing, placing, and compacting the DGA Base.

INCIDENTAL SURFACING

The Department has included in the quantities of asphalt mixtures established in the proposal estimated quantities required for resurfacing or surfacing mailbox turnouts, farm field entrances, residential and commercial entrances, curve widening, ramp gores and tapers, and road and street approaches, as applicable. Pave these areas to the limits as shown on Standard Drawing RPM-110-06 or as directed by the Engineer. In the event signal detectors are present in the intersecting streets or roads, pave the crossroads to the right of way limit or back of the signal detector, whichever is the farthest back of the mainline. Surface or resurface these areas as directed by the Engineer. The Department will not measure placing and compacting for separate payment but shall be incidental to the Contract unit price for the asphalt mixtures.

FUEL AND ASPHALT PAY ADJUSTMENT

The Department has included the Contract items Asphalt Adjustment and Fuel Adjustment for possible future payments at an established Contract unit price of $1.00. The Department will calculate actual adjustment quantities after work is completed. If existing Contract amount is insufficient to pay all items on the contract with the adjustments, the Department will establish additional monies with a change order.

OPTION B

Be advised that the Department will control and accept compaction of asphalt mixtures furnished on this project under OPTION B in accordance with Sections 402 and 403.

SPECIAL NOTE FOR TRAFFIC CONTROL ON BRIDGE REPAIR CONTRACTS

I. TRAFFIC CONTROL GENERAL

Except as provided herein, traffic shall be maintained in accordance with the current standard specifications, section 112. The contractor will be responsible for developing and implementing the maintenance of traffic details with guidance through standard drawings and the MUTCD current editions. The developed traffic control plan must be approved by the Engineer prior to implementation. The contractor is expected to provide at a minimum the items listed in this note, however this note does not relieve the contractor of other items that may be necessary to comply with current standards.

Contrary to section 106.01, traffic control devices used on this project may be new or used in new condition, at the beginning of the work and maintained in like new condition until completion of the work.

The contractor must notify the engineer and public information officer at least 14 calendar days prior to the beginning work. Please see the Special Note for Liquidated Damages for additional information.

For projects where full closure of the roadway has been specified in the contract closure signs, detour signs, and bi-directional lane closure signs should be placed no sooner than two weeks prior to the closing of the bridge (when applicable) or placing lane closures.

Wayfinding detour signs should be placed a maximum of 2 miles apart unless specified by the engineer. Signs shall be covered or removed within 24 hours of opening the bridge to traffic.

II. PROJECT PHASING & CONSTRUCTION PROCEDURES

Project phasing shall be as directed by the plans, special notes, and the approved Traffic Control Plan prepared by the contractor. Maintain traffic over the bridge as long as possible. Once work on the structure begins that impacts traffic, ensure work progresses to minimize the effected time to the public. All materials that must be made specific for the project should be ordered and made prior to closure of the bridge or implementation of bi-directional lane closures so that delivery does not delay progress of the work, unless approved by the Engineer.

For projects which require an on-site diversion to be constructed to maintain traffic, the traffic control plan and project schedule prepared by the contractor shall include provisions such that traffic is not switched to the diversion until all materials that must be made specific for the project are ordered and made so that use of the diversion is minimized, unless approved by the Engineer.

III. PAVEMENT DROP-OFF

Less than two inches - no protection required. Warning signs should be placed in advance and throughout the drop-off area.
Two to four inches - plastic drums, vertical panels or barricades every 100 feet on tangent sections for speeds of 50 mph or greater. Cones may be used in place of plastic drums, panels, and barricades during daylight hours. For tangent sections with speeds less than 50 mph and curves devices should be placed every 50 feet. Spacing of devices on tapered sections should be in accordance with the manual on uniform traffic control devices, current edition.

Greater than four inches - positive separation or wedge with 3:1 or flatter slope needed. If there is five feet or more distance between the edge of the pavement and the drop-off, then drums, panel, or barricades may be used. If the drop-off is greater than 12 inches, positive separation is strongly encouraged. If concrete barriers are used, special reflective devices or steady burn lights should be used for overnight installations.

For temporary conditions, drop-offs greater than four inches may be protected with plastic drums, vertical panels or barricades for short distances during daylight hours while work is being done in the drop-off area.

IV. DETOUR AND ON-SITE DIVERSIONS

For projects which allow a full closure of the bridge, or if necessary to detour trucks, the traffic control plan proposed by the contractor shall include a signed detour route for the road closure. The traffic control plan along with the proposed detour plan will be delivered to the engineer 7 days prior to the pre-construction meeting. The proposed detour route shall meet the following requirements:

1) Detour routes must remain at minimum on the same classification of roadway (i.e. AA, AAA, state, county, etc.) Unless written approval is obtained through the owner of the facility.
2) The contractor must coordinate with other projects along the detour route to avoid ongoing construction projects along those routes.
3) It may be determined that two detour routes would be needed if the first selected route cannot accommodate truck traffic. If this occurs, the contractor is expected to sign both detours per the standard drawings and MUTCD. Additional clarification signage between the detours may be needed at points where they diverge.
4) For projects that involve the use of bi-directional lane closures and the temporary lane width per the plans or as proposed by the contractor is less than 10 feet, the contractor shall be required to provide a signed detour for oversized vehicles.

The traffic control plan must be submitted and approved to allow for coordination of the KYTC District public information officer with the closure notification. The public must be notified of the proposed detour route when they are notified of the closure, 2 weeks before closure. All

time and expenses necessary for the development of the detour plan(s) will be incidental to the lump sum bid item “Maintain and Control Traffic”.

For projects with an on-site diversion included in the construction, the preparation of traffic control plans for a detour and implementation of a detour will not be required, unless specified in the plans.

IV. PAYMENT

Unless otherwise noted in this Special Note and contract documents, payment for Maintenance and Control of Traffic during construction shall be in accordance with Section 112 of the Kentucky Transportation Cabinet, Department of Highways Standard Specifications for Road and Bridge Construction, (latest edition).

SPECIAL NOTE FOR CONCRETE SEALING

These Notes or designated portions thereof, apply where so indicated on the plans, proposals or bidding instruction.

I. DESCRIPTION. Perform all work in accordance with the Department's current Standard Specifications, and applicable Supplemental Specifications, the attached sketches, and these Notes. Section references are to the Standard Specifications.

This work consists of:

1. Furnish all labor, materials, tools, equipment, and incidental items necessary to complete the work.
2. Provide safe access to the bridge, in accordance with Section 107.01.01, for the Engineer to sound possible repair areas and for workers to complete the construction.
3. Repair cracks as applicable in accordance with the Special Note for Epoxy Injection Crack Repair.
4. Repair delaminated or spalled areas as applicable in accordance with the Special Note for Concrete Patching.
5. Apply Ordinary Surface Finish
6. Prepare the surfaces to receive sealing.
7. Apply concrete sealing.
8. Maintain & control traffic.
9. Any other work as specified as part of this contract.

II. MATERIALS.

A. Sealer. Use a sealer from the KYTC list of approved materials.

B. Coverage Rate: Follow all manufacturers recommendations for coverage rates except the application rate must not exceed the square footage coverage rate per gallon of sealer as given in the chart below. If the manufacturer recommends a coverage rate greater than given in the table below, apply sealer at the rate given in the table below for the chosen sealers silane percentage.

% Silane	Coverage rate (ft^2/gallon)
100	300
40	120
20	60

III. CONSTRUCTION.

A. Perform Concrete Repairs. Repair concrete surface in accordance with the Special Note for Epoxy Injection Crack Repair and/or the Special Note for Concrete Patching Repair if included in the contract documents.

B. **Curing Compound.** Contrary to Section 609.03.12 of the specifications, curing compound is not to be used on the deck due to potentially causing issues with the concrete sealer. During the deck pour, finishing, and tining operations the Class AA concrete shall be kept continuously moist with the use of a mister until burlap or curing blankets are applied to the surface. At no point should water be pooling or running off the surface or the surface of the concrete be allowed to become dry. After the burlap or curing blankets are installed, cure in accordance with the specifications. Include all costs in the unit price bid for Class AA concrete. Failure to properly cure the concrete in accordance with this note and the specifications may result in weakened or cracked concrete. If the concrete is weakened or cracked due to improper curing, the contractor will be responsible for providing alternates to fix the issues to the Engineer for review and the contractor will be solely responsible for all costs to do so, up to complete replacement. Do not begin any construction on fixing any issues without approval of the Engineer.

C. **Apply Ordinary Surface Finish.** In addition to new concrete, areas receiving epoxy injection, concrete patching, and other surface imperfections, including areas of minor cracking, should receive Ordinary Surface Finish in accordance with Section 601.03.18 of the Standard Specifications. Existing structural items not newly placed, patched, or repaired may be exempt from Ordinary Surface Finish. Use mortar of the same cement and fine aggregate as the concrete patching, or as directed by the Engineer. Payment will be incidental to Concrete Sealing. Finish surface of bridge decks in accordance with Section 609 of the Standard Specifications.

D. **Areas to Receive Concrete Sealing:**

1. Every exposed surface above a point 6” below ground or fill line of abutments, wing walls, end bent and pier caps, pedestals, back walls, columns, and exposed footings.
2. All exposed surfaces of concrete deck, barrier walls, parapets, curbs, and plinths.
3. Prestressed Concrete I-Girders, Concrete Beams, and Spread Prestressed Concrete Box Beams: The underneath surfaces of slab overhangs outside of exterior concrete girders and to the exterior side and bottom of exterior concrete girders and beams.
4. Adjacent Prestressed Concrete Composite Box Beams: Full length of the exterior face of all exterior beams from the top of the box beam to 1’-0” underneath the beams.
5. Prestressed Non-Composite Box Beams: All faces of all beams, excluding surfaces to be covered with a waterproofing membrane. Take care to ensure that the grout pockets are not sealed.
6. If the contract documents include the Special Note for Concrete Coating, do not apply concrete sealer to the areas where Concrete Coating is specified.

E. **Contract Time.** Concrete Sealing may need to be installed after contract time has elapsed in a separate mobilization and after the Engineer has declared the project otherwise complete. Liquidated damages shall not be charged provided Concrete Sealing is complete within 60 days after the last concrete pour on the structure. When the Contractor has not completed Concrete Sealing within the time frame allotted, Liquidated Damages shall be charged at 25 percent of the original contract daily charge from the expiration of the time allowed until the Contractor completes the work except the Department will not deduct liquated damages when weather limitations prohibit the Contractor from performing the work.

F. **Cleaning the Concrete Surfaces to be sealed.** Dry clean the concrete to remove all loose debris. Remove all visible hydrocarbons from the surface with detergent approved by the manufacturer of the deck sealant. Pressure wash all surfaces to be sealed at 2000 to 3000 psi. Install pressure gauges at each wand to verify pressure. Use 30° fan tip or as recommended by the manufacturer of the sealant. Hold pressure washing wand a minimum of 45° from the surfaces with a maximum stand-off distance of 12 inches.

G. **Sealing the Concrete.** Allow new concrete to cure a minimum 28 days prior to application of sealer. Monitor weather conditions prior to sealer application. Refer to manufacturer's recommendations for proper ambient conditions. Do not apply sealer if precipitation is anticipated within the time stated by the manufacturer. Allow the concrete to dry 24 hours (after washing or rain event) before sealer application. The bridge deck can be reopened to traffic while drying. Sealer must be applied within 48 hours of washing or the concrete must be rewashed. Divide the concrete into predefined areas of specific square footage to aid in determining usage. Comply with manufacturer's usage recommendation. Using a low-pressure pump, apply sealer and spread evenly with broom or squeegee; do not allow pooling to remain. When each predefined area is complete, measure the amount of sealer used to verify proper usage. After sealing, follow manufacturer's recommended cure time before opening to traffic. On vertical surfaces, apply the sealer in a flooding application from the bottom up, so the material runs down 6 to 8 inches below the spray pattern.

H. **Inspection:** Monitor all aspects of the project to assure compliance to this specification. Observe and document general conditions during the entirety of the project. Verify that each phase of work has been satisfactorily completed prior to beginning the next phase. Phases are described as follows:

1. Dry cleaning to remove loose debris, verify and document:
   a. All debris has been removed and disposed of properly.
2. Removal of hydrocarbons, verify and document:
   a. The manufacturer's recommended detergent is used for removal.
   b. Hydrocarbons have been satisfactorily removed.

SPECIAL NOTE

For Avoiding Stream Impacts from Lead Paint

Owing to the presence of lead paint on the bridge, the following measures must be taken:

- During preparation for either the rehab or removal of the bridge, construction debris is to be collected and prevented from dropping into the stream as much as practicable.
- The contractor shall develop a Debris Management Plan that outlines procedures for debris collection and prevention from dropping.
- Possible measures could include:
    - Use demolition techniques that minimize the generation of debris, such as cutting rather than breaking concrete.
    - Install temporary barriers such as nets, tarps, or fabric beneath and around the work area to catch falling debris. If the bridge or sections of it are to be dropped, these would be removed prior to dropping the bridge.
    - Set up collection platforms or scaffolding with debris catching systems under the work area.
    - Use vacuum systems or other suction devices to collect smaller particles.
    - Use floating booms or silt curtains in the stream to capture any debris that might escape the initial containment effort.
- All hazardous waste materials will be managed and disposed of in the manner specified by local or state regulation.
- For bridges that will be cleaned and painted, see Special Note Bridge Cleaning And Painting for specific instructions on handling the material.
- Worker exposure to materials containing lead during construction work is regulated by Federal OSHA [(29 CFR 1926.62 (a)]. This regulation requires worker protection during construction “where lead or materials containing lead are present.”
- **If there are any questions regarding this note, please contact Danny Peake, Director, Division of Environmental Analysis, 200 Mero Street, Frankfort, KY 40601, Phone (502) 564-7250, or O’Dail Lawson at (502) 562-5020**

Lead Paint Inspection Report

To: Tom Springer, QK4, Inc.

Date: August 2, 2024

Conducted By: Jason Boston, LFI, Inc.

Project and Structure Identification

Project: Hopkins County

Structure ID: #054B00009N

Structure Location: KY 138 over Pond River, Lyon County, Kentucky

Sample Description: The gray coating is considered lead-based paint.

Inspection Date: July 26, 2024

Results and Recommendations

Pursuant to EPA regulations, lead-based paint (LBP) is defined as paint or other surface coatings that contain an amount of lead equal to or greater than 1 milligram per square centimeter (1.0 mg/cm^2) or higher of lead by XRF analysis or 0.5% (5,000 ppm or 5 mg/kg) lead by weight. The lead level in a paint may require lead hazard abatement. Additionally, worker exposure to materials containing lead during construction work is regulated by Federal OSHA [(29 CFR 1926.62 (a)]. This regulation requires worker protection during construction "….where lead or materials containing lead are present".

One sample of gray paint was collected from the structure steel members. Lead concentrations were detected at concentrations of 1.3750% lead by weight in the gray coating. Applicable worker precautions should be implemented during future demolition activities, as necessary. Laboratory analytical data is attached.

Mrs. Inc. Analytical Laboratory
332 West Broadway / Suite # 902
Louisville, Kentucky - 40202 - 2133
Phone # (502) 495 - 1212 / E-Mail Address : CEOMRSInc@AOL.Com

LEAD EVALUATION DATA

AIHA # 102459

Project: LFI project # 2 - 10024
Client: L F I
Location: Hopkins County
Work Area: Hopkins County

Project #: # 3407302 B
Date Sampled : 7/26/2024
Date Received : 29-Jul-24
Date Analyzed : 30-Jul-24
Method: **NIOSH 7082**

Sample #	Location	Start Time	End Time	Time (m)	Flow Rate (L/m)	Volume (L)	ANALYTICAL RESULTS			
							Paint Description			Results (% By Weight Of Lead)
# 1	Hopkins County	N/A	N/A	N/A	N/A	N/A	Gray			1.3750

Results Code:
ND = None Detected
FTD = Filter Tampering or Damage
N/A = Not Applicable

Analytical Method : NIOSH 7082

Details: Please note that according to the EPA Regulations any sample that contains 0.5 % or greater by weight of Lead is considered to be a Lead Containing Material.

Sampled By : Jason Boston - LFI
Name

Winterford Mensah
Analyst

Signature

MRS, Inc.
332 West Broadway / Suite # 613
Louisville, Kentucky - 40202 - 2111

Phone #: (502) 495 - 1212
Fax #: (502) 491 - 7111

Client : Linebach Funkhouser, Inc.
Project : 287-22

CHAIN OF CUSTODY RECORD

PROJECT: 2-10024
LOCATION: Hopkins Co.
SAMPLED BY: Varon Boston
SAMPLE TYPE: COMPOSITE ____ GRAB ____
SAMPLE MATRIX: ____

COMMENTS AND/OR INSTRUCTIONS:

Group Method
Stop First Positive
point count < 4%

SAMPLE NUMBER	DATE AND TIME	SAMPLE LOCATION	ANALYSIS REQUIRED					
			PLM	Lead				
1	7-26-24			X				

Relinquished By: (Signature)	Date	Time	Received By: (Signature)
Jim P. Boston	7-29-24	1000	Kimberly Mercer
Relinquished By: (Signature)	Date	Time	Received By: (Signature)

3. Pressure washing, verify and document:
   a. Washing pressure at the wand.
   b. Tip size used.
   c. Wash angle and stand-off distance.
   d. The concrete is satisfactorily cleaned.
4. Sealer application, verify and document:
   a. Proper cure time for new concrete.
   b. Concrete surface is dry.
   c. Document time since washed.
   d. Was the bridge deck opened to traffic after washing?
   e. Document ambient temperature, surface temperature, relative humidity, and dew point.
   f. Application and distribution method.
   g. Coverage to be complete and even.
   h. Material is not allowed to remain pooled.
   i. Monitor material usage.
   j. No traffic on the bridge decks until proper cure time is allowed.

IV. MEASUREMENT

A. Concrete Sealing. The Department will measure the quantity per square feet of each area sealed.

B. Mobilization For Concrete Surf Treatment. The Department will pay the lump sum bid for an additional mobilization when Concrete Sealing must be performed after the Engineer has deemed the project complete except for Concrete Sealing and the structure is opened to traffic.

V. PAYMENT

A. 23378EC - Concrete Sealing – Sq. Ft. Payment at the contract unit price per square feet is full compensation for the following: (1) Furnish all labor, materials, tools, and equipment; (2) Clean the bridge deck; (3) Seal the bridge deck; (4) Maintain & control traffic; and, (5) Any other work specified as part of this contract.

B. 26233EC - Mobilization – For Concrete Surface Treatment – L.S. Payment at the contract lump sum price bid shall be full compensation for the Contractor to remobilize on the project to perform Concrete Sealing as detailed herein this special note.

SPECIAL NOTE

For Additional Environmental Commitments

IN ADDITION TO OTHER ENVIRONMENTAL COMMITMENTS LISTED IN THIS CONTRACT, THE FOLLOWING COMMITMENTS ALSO APPLY, AS THIS IS A FEDERALLY FUNDED UNDERTAKING AS DEFINED IN SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT, 36 CFR 800.16(Z):

1) The KYTC has completed a Phase 1 archaeological survey for a site-specific area surrounding the bridge. The cleared area is shown as "Archaeologically Cleared Area" or "Environmentally Cleared Area" on the concept plans and/or the map attached to this note or included elsewhere in the proposal. Likewise, any areas that must be avoided have been labeled "Do Not Disturb." The contractor shall install snow fencing to clearly delineate the boundary of the allowable work/staging area. This work/staging area is restricted to the following: the Archaeologically/Environmentally Cleared Area (noted previously); the right-of-way and easements wherein all activities, equipment, materials, etc. must be contained; and any additional, privately owned land obtained for temporary use by the Contractor through written agreement with the landowner.

   If the Contractor deems it necessary to use additional areas outside the Archaeologically/ Environmentally Cleared Area for any purposes—e.g., laydown yards, vehicle parking, parking cranes, delivering beams, borrow areas, waste areas, etc.—the Contractor must first get a written agreement with the landowner (assuming the additional area is outside the right-of-way). Then the Contractor shall seek approval of the use of the site—whether within or outside the right-of-way—by both the KYTC Section Supervisor and the Bridging Kentucky Environmental Lead at BKY_Env@docs.e-builder.net. The Contractor shall provide a map of the area(s) to be used, including access points, and property-owner agreements. The BKY Environmental Team will complete initial field investigations for archaeological, historical, ecological, and other environmental clearances. If any potentially significant site or resources are found, the KYTC has the right to deny the use of the proposed site. The maps and property owner agreements are to be submitted at least ten (10) business days prior to the Preconstruction Conference, or sixty (60) days prior to the Contractors access to the site, for coordination and review by the KYTC District and Bridging Kentucky Team.

   A Liquidated Damage of $50,000 will be assessed whenever the Contractor has used any restricted areas. The fee will be assessed on a *per bridge* basis, whether the contract involves bridge bundles or a single bridge. In addition, all fines, fees, penalties, remediation costs, and other damages related to breaches of Threatened and Endangered Species Act Section 7, National Historic Preservation Act Section 106, Clean Water Act Sections 401 and 404, Kentucky General Permit for Stormwater Discharges KYR10, Environmental Protection Agency requirements, State Historic Preservation Office requirements, and other related permitting agencies will be paid by the Contractor, including all associated costs and burdens placed upon the Kentucky Transportation Cabinet.

2) In the event that human remains are encountered during project activities, all work should be immediately stopped in the area. The area should be cordoned off, and, in accordance with KRS 72.020, the county coroner and local law enforcement must be contacted immediately. Upon confirmation that the human remains are not of forensic interest, the unanticipated discovery must be reported to Nicolas Laracuente at the Kentucky Heritage Council at (502) 892-3614, George Crothers at the Office of State Archaeology at (859) 257-1944, and KYTC DEA archaeologists at (502) 564-7250.

   For guidance regarding inadvertent discovery and treatment of human remains, refer to the KYTC's *Right of Way Guidance Manual* (Section ROW-1202), and the Advisory Council on Historic Preservation's (ACHP) *Policy Statement Regarding Treatment of Human Remains and Grave Goods* (adopted by ACHP February 23, 2007).

3) If, during the implementation of The Project, a previously unidentified historic/ archaeological property is discovered or a previously identified historic/archaeological property is affected in an unanticipated manner, the contractor shall (1) call KYTC DEA archaeologists at (502) 564-7250, (2) call SHPO archaeologists at (502) 892-3614, and (3) ensure that all work within a reasonable area of the discovery shall cease until such time as a treatment plan can be developed and implemented.

SPECIAL NOTE

FOR SEDIMENT PREVENTION AND EROSION CONTROL

FOR IMPACT REGARDLESS OF SIZE OF THE DISTRUBED AREA

Potential impacts to gray bat foraging habitat and habitat for federally listed fish and mussel species will be minimized by implementing erosion prevention and sediment control measures.

As required under Section 213 of the KYTC Standard Specifications, prior to onsite activities a **site-specific *Erosion Control Plan* including BMPs** to ensure continuous erosion control throughout the construction and post construction period. The plan will identify individual Disturbed Drainage Areas (DDA) where storm water from the construction area will be discharged off site or into waters of the Commonwealth.

Should the Contractor fail to create a BMP Plan or provide and maintain the necessary erosion control, Liquidated Damages will apply at the rate specified in the contract. If no rate is specified, Liquidated Damages will be applied at the rate specified in Section 108 of the Standard Specifications.

The erosion prevention and sediment controls proposed are presented below.

- The location of the individual erosion prevention/sediment control measures will be identified by the Resident Engineer and Contractor. The Contractor will place erosion control devices as identified in the site-specific BMP Plan prior to beginning work.
- Mulch will be placed, during grade and drain activities, across all areas where no work will be conducted for a period of 14 consecutive days.
- Tree clearing within the riparian zone will be minimized. Trees to be removed will be determined by the resident engineer and the contractor prior to disturbance. (Note: Any “Special Note for Tree Clearing Restrictions” must be adhered to.)
- Silt fence, or other approved method as appropriate, will be installed at the edge of waters within the project corridors to eliminate the deposition of rock and debris in the streams during construction activities. In the unforeseen event that unintended debris does enter the streams, the resident engineer will halt the contributing activity until appropriate remedial actions have been implemented.
- To the maximum extent plausible, construction activities will take place during low-flow periods.
- Equipment staging and cleaning areas will be located to eliminate direct inputs to waters of the Commonwealth. These areas will be located such that effluent will be filtered through vegetated areas and appropriate sediment controls prior to discharge offsite.

- Concrete will be poured in a manner to avoid spills into the streams. In the unforeseen event that a spill does occur, the USFWS will be notified, and the resident engineer will immediately halt the activity until remedial measures have been implemented.
- KYTC proposes to stabilize areas disturbed during construction activities through vegetation establishment and placement of riprap and geotextile fabric. Re-vegetation of the disturbed areas will allow thermoregulation of water within the streams, establish long-term, regenerative stabilization of the stream banks, and provide nutrients to the aquatic macroinvertebrate community through inputs of organic material.
- Areas disturbed during construction and not stabilized with rip rap and erosion blanket will be seeded using a standard seed mix. Depending on project slope and project location, application rates and seed mix types will vary. The Contractor shall perform all final seeding and protection, in accordance with the plans and Section 212 of KYTC Standard Specifications.
- Contrary to Section 213.03.03, paragraph 2, the Engineer shall conduct inspections as needed to verify compliance with Section 221 of KYTC Standard Specifications. The Engineer's inspections shall be performed a minimum of once per month and within seven (7) days after a storm of ½ inch or greater. Copies of the Engineer's inspections shall not be provided to the Contractor unless improvements to the BMPs are required. The Contractor shall initiate corrective action within 24 hours of any reported deficiency and complete the work within five (5) days. The Engineer shall use Form TC 63-61 A for this report. Inspections performed by the Engineer do not relieve the Contractor of any responsibility for compliance. If corrections are not made within the five (5) days specified, the liquidated damages will apply at the rate specified in the Liquidated Damages note in the contract.
- Contrary to Sections 212.05 and 213.05, unless listed in the proposal, bid items for temporary BMPs and items for permanent erosion control will not be measured for payment and will be replaced with one lump sum item for the services. Payment will be pro-rated based on the Project Schedule as submitted by the Contractor and as agreed to by the Engineer.
- The Contractor shall be responsible for applying "good engineering practices." The Contractor may use any temporary BMPs and permanent BMPs that fall within the guidance of the current Standard Specifications, KYTC's Best Management Practices manual, and with the approval of the KYTC Engineer.

FOR IMPACT GREATER THAN 1.0 ACRE

When the total disturbed area for a project, including laydown and waste/borrow areas, is greater than 1.0 acre, the Contractor shall be responsible for filing the Kentucky Pollution discharge Elimination System (KPDES) KYR10 permit Notice of Intent (NOI) with the Kentucky Division of Water (DOW). The Contractor will be responsible for following the KPDES requirements of local Municipal Separate Storm Sewer System (MS4) programs with jurisdiction. Required NOI shall name the Contractor as the Facility Operator and include the KYTC Contract ID Number (CID) for reference. For grouped contracts with more than one structure, each structure will be treated independently in regard to disturbed area unless another structure is within 0.25 mile of

the structure. For structures within 0.25 mile of each other, the total disturbed area will be the sum of the combined disturbed areas. The Contractor shall be responsible for filing the KPDES permit Notice of Termination (NOT) with the Kentucky DOW and any local MS4 Program that has jurisdiction. The NOT shall be filed after the Engineer agrees the project is stabilized or the project has been formally accepted.

The Contractor shall perform all temporary erosion/sediment control functions including providing a Best Management Practice (BMP) Plan, conducting required inspections, modifying the BMP Plan documents as construction progresses, and documenting the installation and maintenance of BMPs in conformance with the KPDES KYR10 permit effective on August 1, 2009, or a permit re-issued to replace that KYR10 permit. This work shall be conducted in conformance with the requirements of Section 213 of the KYTC current Department of Highways, Standard Specifications for Road and Bridge Construction (Standard Specifications).

The Contractor shall be responsible for the examination of the soils to be encountered and make his own independent determination of the temporary BMPs that will be required to accomplish effective erosion prevention and sediment control. The Contractor shall provide the Engineer copies of all documents required by the KPDES permit at the time they are prepared.

They KYR10 web page, which includes the General Permit and eNOI application is here: https://eec.ky.gov/Environmental-Protection/Water/PermitCert/KPDES/Documents/KYR10PermitPage.pdf

If there are any questions regarding this note, please contact Danny Peake, Director, Division of Environmental Analysis, 200 Mero Street, Frankfort, KY 40601, Phone (502) 564-7250.

ATTACH KPDES PERMIT

Kentucky Transportation Cabinet

Highway District 2

And

_____(2), Construction

Kentucky Pollutant Discharge Elimination System Permit KYR10 Best Management Practices (BMP) plan

Groundwater protection plan

For Highway Construction Activities

For

Rehab – Super Strengthen

Project: CID ## -

Revised 3/4/2016

KyTC BMP Plan for Project CID ## - ####

Project Information

Note – (1) = Design (2) = Construction (3) = Contractor

1. Owner – Kentucky Transportation Cabinet, District 2 (1)
2. Resident Engineer: (2)
3. Contractor Name: (2)

   Address: (2)

   Phone number: (2)

   Contact: (2)

   Contractor's agent responsible for compliance with KPDES permit requirements: (3)
4. Project Control Number: (2)
5. Route (Address): KY 138 over Pond River 1)
6. Latitude/Longitude (project mid-point): 37°31'35.7"N 87°21'15.5"W (1)
7. County (project mid-point): Hopkins County (1)
8. Project start date (date work will begin): (2)
9. Projected completion date: (2)

A. Site Description

1. **Nature of Construction Activity (from letting project description):** Address deficiencies of KY 138 Bridge (054B00009N) over Pond River, MP 8.48. Rehabilitation SYP No.2-10024. (1)

2. **Order of major soil disturbing activities:** (2) and (3)

3. **Projected volume of material to be moved:** (3)

4. **Estimate of total project area (acres):** (3)

5. **Estimate of area to be disturbed (acres):** (3)

6. **Post construction runoff coefficient** will be included in the project drainage folder. Persons needing information pertaining to the runoff coefficient will contact the resident engineer to request this information. (1)

7. **Data describing existing soil condition:** Soils mapped for the location by the United States Department of Agriculture (USDA)–National Resource Conservation Service (NRCS) consist of three soil types: Cape silty clay loam (Ce), Elk silt loam (EkC), and Otwood silt loam (OtB) (Soil Survey Staff 2019). As described in the soil survey, the setting for Cape silty clay loam is floodplains; they are derived from acid clayey alluvium, are poorly drained, and the frequency of flooding is occasional. Elk soils are found on stream terraces, are derived from mixed fine-silty alluvium, are well drained and rarely flooded. Otwood soils are found on stream terraces, are derived from mixed fine-silty alluvium, are moderately well drained, and are rarely flooded. (1) and (2)

8. **Data describing existing discharge water quality (if any):** (2)

9. **Receiving water name:** Pond River (1)

10. **TMDLs and Pollutants of Concern in Receiving Waters:** (1 DEA)

11. **Site map:** Project layout sheet plus the erosion control sheets in the project plans that depict Disturbed Drainage Areas (DDAs) and related information. These sheets depict the existing project conditions with areas delineated by DDA (drainage area bounded by watershed breaks and right of way limits), the storm water discharge locations (either as a point discharge or as overland flow) and the areas that drain to each discharge point. These plans define the limits of areas to be disturbed and the location of control measures. Controls will be either site specific as designated by the designer or will be annotated by the contractor and resident engineer before disturbance commences. The project layout sheet shows the surface waters and wetlands.

12. **Potential sources of pollutants:** The primary source of pollutants is solids that are mobilized during storm events. Other sources of pollutants include oil/fuel/grease from servicing and operating construction equipment, concrete washout water, sanitary wastes, and trash/debris. (3)

B. Sediment and Erosion Control Measures

1. Plans for highway construction projects will include erosion control sheets that depict Disturbed Drainage Areas (DDAs) and related information. These plan sheets will show the existing project conditions with areas delineated by DDA within the right of way limits, the discharge points and the areas that drain to each discharge point. Project managers and designers will analyze the DDAs and identify Best Management Practices (BMPs) that are site specific. The balance of the BMPs for the project will be listed in the bid documents for selection and use by the contractor on the project with approval by the resident engineer.

   Projects that do not have DDAs annotated on the erosion control sheets will employ the same concepts for development and managing BMP plans.

2. Following award of the contract, the contractor and resident engineer will annotate the erosion control sheets showing location and type of BMPs for each of the DDAs that will be disturbed at the outset of the project. This annotation will be accompanied by an order of work that reflects the order or sequence of major soil moving activities. The remaining DDAs are to be designated as "Do Not Disturb" until the contractor and resident engineer prepare the plan for BMPs to be employed. The initial BMP's shall be for the first phase (generally Clearing and Grubbing) and shall be modified as needed as the project changes phases. The BMP Plan will be modified to reflect disturbance in additional DDA's as the work progresses. <u>All DDA's will have adequate BMP's in place before being disturbed.</u>

3. As DDAs are prepared for construction, the following will be addressed for the project as a whole or for each DDA as appropriate:

   - **Construction Access—**This is the first land-disturbing activity. As soon as construction begins, bare areas will be stabilized with gravel and temporary mulch and/or vegetation.

   - **Sources—**At the beginning of the project, all DDAs for the project will be inspected for areas that are a source of storm water pollutants. Areas that are a source of pollutants will receive appropriate cover or BMPs to arrest the introduction of pollutants into storm water. Areas that have not been opened by the contractor will be inspected periodically (once per month) to determine if there is a need to employ BMPs to keep pollutants from entering storm water.

- **Clearing and Grubbing—**The following BMP's will be considered and used where appropriate.
  - Leaving areas undisturbed when possible.
  - Silt basins to provide silt volume for large areas.
  - Silt Traps Type A for small areas.
  - Silt Traps Type C in front of existing and drop inlets which are to be saved.
  - Diversion ditches to catch sheet runoff and carry it to basins or traps or to divert it around areas to be disturbed.
  - Brush and/or other barriers to slow and/or divert runoff.
  - Silt fences to catch sheet runoff on short slopes. For longer slopes, multiple rows of silt fence may be considered.
  - Temporary mulch for areas which are not feasible for the fore mentioned types of protections.
  - Non-standard or innovative methods.
- **Cut and Fill and Placement of Drainage Structures—**The BMP Plan will be modified to show additional BMP's such as:
  - Silt Traps Type B in ditches and/or drainways as they are completed.
  - Silt Traps Type C in front of pipes after they are placed.
  - Channel Lining.
  - Erosion Control Blanket.
  - Non-standard or innovative methods.
- **Profile and X-Section in Place—**The BMP Plan will be modified to show elimination of BMP's which had to be removed and the addition of new BMP's as the roadway was shaped. Probably changes include:
  - Silt Trap Type A, Brush and/or other barriers, Temporary mulch, and any other BMP which had to be removed for final grading to take place.
  - Additional Silt Traps Type B and Type C to be placed as final drainage patterns are put in place.
  - Additional Channel Lining and/or Erosion Control Blanket.
  - Temporary mulch for areas where Permanent Seeding and Protection cannot be done within 21 days.
  - Special BMP's such as Karst Policy.
- **Finish Work (Paving, Seeding, Protect, etc.)—**A final BMP Plan will result from modifications during this phase of construction. Probable changes include:

- Removal of Silt Traps Type B from ditches and drainways if they are protected with other BMP's which are sufficient to control erosion, i.e. Erosion Control Blanket, or Permanent Seeding and Protection on moderate grades.
- Permanent Seeding and Protection.
- Placing Sod.
- Planting trees and/or shrubs where they are included in the project.

➢ BMP's, including Storm Water Management Devices such as velocity dissipation devices and Karst policy BMP's, to be installed during construction to control the pollutants in storm water discharges that will occur after construction has been completed are: (3)

C. Other Control Measures

1. **Solid Materials**

   No solid materials, including building materials, shall be discharged to waters of the commonwealth, except as authorized by a Section 404 permit.

2. **Waste Materials**

   All waste materials that may leach pollutants (paint and paint containers, caulk tubes, oil/grease containers, liquids of any kind, soluble materials, etc.) will be collected and stored in appropriate covered waste containers. Waste containers shall be removed from the project site on a sufficiently frequent basis as to not allow wastes to become a source of pollution. All personnel will be instructed regarding the correct procedure for waste disposal. Wastes will be disposed in accordance with appropriate regulations. Notices stating these practices will be posted in the office.

3. **Hazardous Waste**

   All hazardous waste materials will be managed and disposed of in the manner specified by local or state regulation. The contractor shall notify the Section Engineer if there any hazardous wastes being generated at the project site and how these wastes are being managed. Site personnel will be instructed regarding proper storage and handling of hazardous wastes when required. The Transportation Cabinet will file for generator, registration when appropriate, with the Division of Waste Management and advise the contractor regarding waste management requirements.

4. **Spill Prevention**

   The following material management practices will be used to reduce the risk of spills or other exposure of materials and substances to the weather and/or runoff. (3)

- **Good Housekeeping**

  The following good housekeeping practices will be followed onsite during the construction project.

  - An effort will be made to store only enough product required to do the job.
  - All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
  - Products will be kept in their original containers with the original manufacturer's label.
  - Substances will not be mixed with one another unless recommended by the manufacturer.
  - Whenever possible, all the product will be used up before disposing of the container.
  - Manufacturers' recommendations for proper use and disposal will be followed.
  - The site contractor will inspect daily to ensure proper use and disposal of materials onsite.

- **Hazardous Products**

  These practices will be used to reduce the risks associated with all hazardous materials.

  - Products will be kept in original containers unless they are not resealable.
  - Original labels and material safety data sheets (MSDS) will be reviewed and retained.
  - Contractor will follow procedures recommended by the manufacturer when handling hazardous materials.
  - If surplus product must be disposed of, manufacturers' or state/local recommended methods for proper disposal will be followed.

5. **Product-specific Practices**

The following product-specific practices will be followed onsite:

- **Petroleum Products**

  - Vehicles and equipment that are fueled and maintained on site will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products

onsite will be stored in tightly sealed containers, which are clearly labeled and will be protected from exposure to weather.

- The contractor shall prepare an Oil Pollution Spill Prevention Control and Countermeasure plan when the project that involves the storage of petroleum products in 55 gallon or larger containers with a total combined storage capacity of 1,320 gallons. This is a requirement of 40 CFR 112.
- This project (will / will not) (3) have over 1,320 gallons of petroleum products with a total capacity, sum of all containers 55-gallon capacity and larger.

➢ **Fertilizers**

Fertilizers will be applied at rates prescribed by the contract, standard specifications or as directed by the resident engineer. Once applied, fertilizer will be covered with mulch or blankets or worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

➢ **Paints**

All containers will be tightly sealed and stored indoors or under roof when not being used. Excess paint or paint wash water will not be discharged to the drainage or storm sewer system but will be properly disposed of according to manufacturers' instructions or state and local regulations.

➢ **Concrete Truck Washout**

Concrete truck mixers and chutes will not be washed on pavement, near storm drain inlets, or within 75 feet of any ditch, stream, wetland, lake, or sinkhole. Where possible, excess concrete and wash water will be discharged to areas prepared for pouring new concrete, flat areas to be paved that are away from ditches or drainage system features, or other locations that will not drain off site. Where this approach is not possible, a shallow earthen wash basin will be excavated away from ditches to receive the wash water.

➢ **Spill Control Practices**

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup:

- Manufacturers' recommended methods for spill cleanup will be clearly posted. All personnel will be made aware of procedures and the location of the information and cleanup supplies.

- Materials and equipment necessary for spill cleanup will be kept in the material storage area. Equipment and materials will include as appropriate, brooms, dust pans, mops, rags, gloves, oil absorbents, sand, sawdust, and plastic and metal trash containers.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contract with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate state/local agency as required by KRS 224 and applicable federal law.
- The spill prevention plan will be adjusted as needed to prevent spills from reoccurring and improve spill response and cleanup.
- Spills of products will be cleaned up promptly. Wastes from spill clean-up will be disposed in accordance with appropriate regulations.

D. Other State and Local Plans

This BMP plan shall include any requirements specified in sediment and erosion control plans, storm water management plans or permits that have been approved by other state or local officials. Upon submittal of the NOI, other requirements for surface water protection are incorporated by reference into and are enforceable under this permit (even if they are not specifically included in this BMP plan). This provision does not apply to master or comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit issued for the construction site by state or local officials. (1)

E. Maintenance

1. The BMP plan shall include a clear description of the maintenance procedures necessary to keep the control measures in good and effective operating condition.

2. Maintenance of BMPs during construction shall be a result of weekly and post rain event inspections with action being taken by the contractor to correct deficiencies.

3. Post Construction maintenance will be a function of normal highway maintenance operations. Following final project acceptance by the cabinet, district highway crews will be responsible for identification and correction of deficiencies regarding ground cover and cleaning of storm water BMPs. The project manager shall identify any BMPs that will be for the purpose of post construction storm water management with specific guidance for any non-routine maintenance. (1)

F. Inspections

Inspection and maintenance practices that will be used to maintain erosion and sediment controls:

- All erosion prevention and sediment control measures will be inspected at least once each week and following any rain of one-half inch or more.
- Inspections will be conducted by individuals that have successfully completed KEPSC-RI course as required by Section 213.02.02 of the Standard Specifications for Road and Bridge Construction, current edition.
- Inspection reports will be written, signed, dated, and kept on file.
- Areas at final grade will be seeded and mulched within 14 days.
- Areas that are not at final grade where construction has ceased for a period of 21 days or longer and soil stockpiles shall receive temporary mulch no later than 14 days from the last construction activity in that area.
- All measures will be maintained in good working order. If a repair is necessary, it will be initiated within 24 hours of being reported.
- Built-up sediment will be removed from behind the silt fence before it has reached halfway up the height of the fence.
- Silt fences will be inspected for bypassing, overtopping, undercutting, depth of sediment, tears, and to ensure attachment to secure posts.
- Sediment basins will be inspected for depth of sediment, and built-up sediment will be removed when it reaches 50 percent of the design capacity and at the end of the job.
- Diversion dikes and berms will be inspected, and any breaches promptly repaired. Areas that are eroding or scouring will be repaired and re-seeded / mulched as needed.
- Temporary and permanent seeding and mulching will be inspected for bare spots, washouts, and healthy growth. Bare or eroded areas will be repaired as needed.
- All material storage and equipment servicing areas that involve the management of bulk liquids, fuels, and bulk solids will be inspected weekly for conditions that represent a release or possible release of pollutants to the environment.

G. Non–Storm Water Discharges

It is expected that non-storm water discharges may occur from the site during the construction period. Examples of non-storm water discharges include:

- Water from water line flushings.
- Water form cleaning concrete trucks and equipment.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).
- Uncontaminated groundwater and rainwater (from dewatering during excavation).

All non-storm water discharges will be directed to the sediment basin or to a filter fence enclosure in a flat vegetated infiltration area or be filtered via another approved commercial product.

H. Groundwater Protection Plan (3)

This plan serves as the groundwater protection plan as required by 401 KAR 5:037.

- Contractors statement: (3)

The following activities, as enumerated by 401 KAR 5:037 Section 2, require the preparation and implementation of a groundwater protection plan, and will or may be conducted as part of this construction project:

_____2. (e) Land treatment or land disposal of a pollutant.

_____2. (f) Storing…or related handling of hazardous waste, solid waste or special waste…in tanks, drums, or other containers, or in piles (does not include wastes managed in a container placed for collection and removal of municipal solid waste for disposal off site).

_____2. (g) …handling of materials in bulk quantities (equal or greater than 55 gallons or 100 pounds net dry weight transported held in an individual container) that, if released to the environment, would be a pollutant.

_____2. (j) Storing or related handling of road oils, dust suppressants at a central location.

_____2. (k) Application or related handling of road oils, dust suppressants or deicing materials (does not include use of chloride-based deicing materials applied to roads or parking lots).

_____2. (m) Installation, construction, operation, or abandonment of wells, bore holes, or core holes (does not include bore holes for the purpose of explosive demolition).

Or, check the following only if there are no qualifying activities:

_____ There are no activities for this project as listed in 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan.

The contractor is responsible for the preparation of a plan that addresses the 401 KAR 5:037 Section 3. (3) Elements of site-specific groundwater protection plan:

(a) General information about this project is covered in the Project information.

(b) Activities that require a groundwater protection plan have been identified above.

(c) Practices that will protect groundwater from pollution are addressed in *Section C: Other Control Measures*.

(d) Implementation schedule—all practices required to prevent pollution of groundwater are to be in place prior to conducting the activity.

(e) Training is required as a part of the ground water protection plan. All employees of the contractor, sub-contractor, and resident engineer personnel will be trained to understand the nature and requirements of this plan as they pertain to their job function(s). Training will be accomplished within one week of employment and annually thereafter. A record of training will be maintained by the contractor with a copy provided to the resident engineer.

(f) Areas of the project and groundwater plan activities will be inspected as part of the weekly sediment and erosion control inspections.

(g) Certification (see signature page).

Contractor and Resident Engineer Plan Certification

The contractor that is responsible for implementing this BMP plan is identified in the Project Information section of this plan.

The following certification applies to all parties that are signatory to this BMP plan:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, this plan complies with the requirements of 401 KAR 5:037. By this certification, the undersigned state that the individuals signing the plan have reviewed the terms of the plan and will implement its provisions as they pertain to ground water protection.

Resident Engineer and Contractor Certification:

(2) Resident Engineer signature

Signed _____ _____, _____
Typed or printed name[2] Title Signature

(3) Signed _____ _____, _____
Typed or printed name[1] Title Signature

1. *Contractors Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort, Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued.*

2. *KYTC note: to be signed by the Chief District Engineer or a person designated to have the authority to sign reports by such a person (usually the resident engineer) in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort, Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued.*

Sub-Contractor Certification

The following sub-contractor shall be made aware of the BMP plan and responsible for implementation of BMPs identified in this plan as follows:

Subcontractor Name:

Address:

Phone:

The part of BMP plan this subcontractor is responsible to implement is:

I certify under penalty of law that I understand the terms and conditions of the general Kentucky Pollutant Discharge Elimination System permit that authorizes the storm water discharges, the BMP plan that has been developed to manage the quality of water to be discharged as a result of storm events associated with the construction site activity and management of non-storm water pollutant sources identified as part of this certification.

Signed _____ _____, _____

Typed or printed name[1] Title Signature

1. *Sub-Contractor Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort, Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued*.

SPECIAL NOTE FOR CONTRACT COMPLETION DATE AND LIQUIDATED DAMAGES ON BRIDGE REPAIR CONTRACTS

I. COMPLETION DATE.

Upon Notice to Proceed, the Contractor has the option of selecting the Begin Work date. Once selected, notify the Department in writing of the date selected at least two weeks prior to beginning work and provide a proposed project schedule. All work is to be completed by the specified contract completion date. The Contractor is allotted 550 calendar days once work begins to complete all work to safely reopen the structure with no lane closures. At a minimum, prior to reopening the lane to traffic, all strength requirements and curing for materials used shall be completed per Division 600 of the Standard Specifications.

The Engineer will begin charging calendar days for a structure on the day the Contractor begins work, with the exception of placement of signs, regardless of holidays or seasonal weather limitations.

II. LIQUIDATED DAMAGES.

Liquidated damages will be assessed to the Contractor in accordance with the Transportation Cabinet, Department of Highway's current Standard Specifications for Road and Bridge Construction, Section 112.03.15A, when the lane closures are used beyond the allotted number of calendar days. Liquidated Damages will be assessed per the Standard Specification Section 108.09 when the contract time extends beyond the contract date.

Contrary to the Standard Specifications, liquidated damages will be assessed to the Contractor during the months of December, January, February and March when the contract time has expired on any individual bridge. Contract time will be charged during these months. All construction must be completed in accordance with the weather limitations specified in Section 606 and/or Section 601 as applicable. No extension of Contract time will be granted due to inclement weather or temperature limitations that occur due to starting work on the Contract or a structure late in the construction season.

SPECIAL NOTE

Seasonal Tree Clearing Restriction

DUE TO THE RECOVERY PLAN FOR ENDANGERED BATS, NO TREE CLEARING IS PERMITTED FROM MAY 15 THROUGH JULY 31.

If there are any questions regarding this note, please contact Danny Peake, Director, Division of Environmental Analysis, 200 Mero Street, Frankfort, KY 40601, Phone (502) 564-7250.

SPECIAL NOTE FOR NON-TRACKING TACK COAT

1. DESCRIPTION AND USEAGE. This specification covers the requirements and practices for applying a non-tracking tack asphalt coating. Place this material on the existing pavement course, prior to placement of a new asphalt pavement layer. Use when expedited paving is necessary or when asphalt tracking would negatively impact the surrounding area. This material is not suitable for other uses. Ensure material can "break" within 15 minutes under conditions listed in 3.2.

2. MATERIALS, EQUIPMENT, AND PERSONNEL.

2.1 Non-Tracking Tack. Provide material conforming to Subsection 2.1.1.

2.1.1 Provide a tack conforming to the following material requirements:

Property	Specification	Test Procedure
Viscosity, SFS, 77 ˚ F	20 – 100	AASHTO T 72
Sieve, %	0.3 max.	AASHTO T 59
Asphalt Residue[1], %	50 min.	AASHTO T 59
Oil Distillate, %	1.0 max.	AASHTO T 59
Residue Penetration, 77 ˚ F	0 - 30	AASHTO T 49
Original Dynamic Shear (G*/sin δ), 82 ˚ C	1.0 min.	AASHTO T 315
Softening Point, ˚ F	149 min.	AASHTO T 53
Solubility, %	97.5 min.	AASHTO T 44

[1] Bring sample to 212 ˚F over a 10-15 minute period. Maintain 212 ˚F for 15-20 minutes or until 30-40 mL of water has distilled. Continue distillation as specified in T59.

2.2. Equipment. Provide a distributor truck capable of heating, circulating, and spraying the tack between 170 ˚F and 180 ˚F. Do not exceed 180 ˚F. Circulate the material while heating. Provide the correct nozzles that is recommend by the producer to ensure proper coverage of tack is obtained. Ensure the bar can be raised to between 14" and 18" from the roadway.

2.3. Personnel. Ensure the tack supplier has provided training to the contractor on the installation procedures for this product. Make a technical representative from the supplier available at the request of the Engineer.

3. CONSTRUCTION.

3.1 Surface Preparation. Prior to the application of the non-tracking tack, ensure the pavement surface is thoroughly dry and free from dust or any other debris that would inhibit adhesion. Clean the surface by scraping, sweeping, and the use of compressed air. Ensure this preparation process occurs shortly before application to prevent the return of debris on to the pavement. If rain is expected within one hour after application, do not apply material. Apply material only when the surface is dry, and no precipitation is expected.

3.2 Non-tracking Tack Application. Placement of non-tracking tack is not permitted from October 1st to May 15th. When applying material, ensure the roadway temperature is a minimum of 40˚F and rising. Prior to application, demonstrate competence in applying the tack according to this note to the satisfaction of the Engineer. Heat the tack in the distributor to between 170 – 180 ˚F. After the initial heating, between 170 – 180 ˚F, the material may be sprayed between 165 ˚F and 180 ˚F. Do not apply outside this temperature range. Apply material at a minimum rate of 0.70 pounds (0.08 gallons) per square yard. Ensure full coverage of the material on the pavement surface. Full coverage of this material is critical. Increase material application rate if needed to achieve full coverage. Schedule the work so that, at the end of the day's production, all non-tracking tack is covered with the asphalt mixture. If for some reason the non-tracking tack cannot be covered by an asphalt mixture, ensure the non-tracking tack material is clean and reapply the non-tracking tack prior to placing the asphalt mixture. Do not heat material more than twice in one day.

3.3 Non-tracking Tack Certification. Furnish the tack certification to the Engineer stating the material conforms to all requirements herein prior to use.

3.4 Sampling and Testing. The Department will require a sample of non-tracking tack be taken from the distributor at a rate of one sample per 15,000 tons of mix. Take two 1 gallon samples of the heated material and forward the sample to the Division of Materials for testing within 7 days. Ensure the product temperature is between 170 and 180 °F at the time of sampling.

4. MEASUREMENT. The Department will measure the quantity of non-tracking tack in tons. The Department will not measure for payment any extra materials, labor, methods, equipment, or construction techniques used to satisfy the requirements of this note. The Department will not measure for payment any trial applications of non-tracking tack, the cleaning of the pavement surface, or furnishing and placing the non-tracking tack. The Department will consider all such items incidental to the non-tracking tack.

5. PAYMENT. The Department will pay for the non-tracking tack at the Contract unit bid price and apply an adjustment for each manufacturer's lot of material based on the degree of compliance as defined in the following schedule. Non-tracking tack will not be permitted for use from October 1st to May 15th. During this timeframe, the department will allow the use of an approved asphalt emulsion in lieu of a non-tracking tack product but will not adjust the unit bid price of the material. When a sample fails on two or more tests, the Department may add the deductions, but the total deduction will not exceed 100 percent.

Non-Tracking Tack Price Adjustment Schedule						
Test	Specification	100% Pay	90% Pay	80% Pay	50% Pay	0% Pay
Viscosity, SFS, 77 ˚ F	20 – 100	19 - 102	17 - 18 103 - 105	15 - 16 106 - 107	14 108 - 109	≤13 ≥ 110
Sieve, %	0.30 max.	≤ 0.40	0.41 - 0.50	0.51 - 0.60	0.61 - 0.70	≥ 0.71
Asphalt Residue, %	50 min.	≥49.0	48.5 – 48.9	48.0 – 48.4	47.5-47.9	≤ 47.4
Oil Distillate, %	1.0 max.	≤1.0	1.1-1.5	1.6 - 1.7	1.8-1.9	>2.0
Residue Penetration, 77 ° F.	30 max.	≤ 31	32 - 33	34 - 35	36 - 37	≥ 38
Original Dynamic Shear (G*/sin δ), 82 ˚ C	1.0 min.	≥0.95	0.92 – 0.94	0.90 – 0.91	0.85 - 0.89	≤ 0.84
Softening Point, º F	149 min.	≥145	142 - 144	140 - 141	138 - 139	≤ 137
Solubility, %	97.5 min.	≥ 97.0	96.8 – 96.9	96.6 – 96.7	96.4 – 96.5	≤ 96.3

Code	Pay Item	Pay Unit
24970EC	Asphalt Material for Tack Non-Tracking	Ton

Revised: May 23, 2022

SPECIAL NOTE FOR ELECTRONIC DELIVERY MANAGEMENT SYSTEM (e-Ticketing) ASPHALT

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's Standard Specifications for Road and Bridge Construction current edition.

1.0 DESCRIPTION. Incorporate an e-Ticketing Delivery Software for weighed asphalt material delivered to the project to report loads and provide daily running totals of weighed asphalt material for pay items and incidental work during the construction processes from the point of measurement and loading to the point of incorporation to the project.

2.0 MATERIALS AND EQUIPMENT. Contractor shall supply material data in JavaScript Object Notation (JSON) documents to the KYTC e-Ticketing Delivery Software (KYTC e-Ticketing Portal) via Application Programming Interface (API) or direct connection. Test and verify that ticket data can be shared from the original source no fewer than 30 days prior to material placement activities. An e-Ticketing Delivery Software supplier can provide a qualified representative for on-site technical assistance during the initial setup, pre-construction verifications, and data management and processing as needed during the Project to maintain material data delivery capabilities. Virtual meetings may be hosted in lieu of on-site meetings when deemed appropriate by the Engineer.

Provide e-Ticketing Delivery Software that will meet the following:

1. The e-Ticketing Delivery Software shall be fully integrated with the Contractor's Load Read-Out scale system at the material source location.

2. The e-Ticketing Delivery Software shall provide real-time delivery to KYTC e-Ticketing Portal.

3. Transmit any updates to the ticket data within 5 minutes of a change.

3.0 CONSTRUCTION. Provide the Engineer with the manufacturer's specifications and all required documentation for data access at the pre-construction conference.

A. Construction Requirements

1. Install and operate software in accordance with the manufacturer's specifications.

2. Verify that all pertinent information is provided by the software within the requirements of this Special Note.

B. Data Deliverables

Provide to the Engineer a means in which to gather report summaries by way of iOS apps, web pages, or any other method at the disposal of the Engineer. The Engineer may request data at any time during the project.

1. Asphalt Material

a. **Real-time Continuous Data Items**

Provide the Engineer access to JSON documents capable of being transmitted through the KYTC's e-Ticketing Portal that displays the following information in real-time with a web-based system compatible with iOS and Windows environments.

- Each Truck
  - Supplier Name
  - Supplier Address
  - Supplier Phone
  - Plant location
  - Date
  - Time at source
  - Project Location

- Contract ID#
- Carrier Name
- Unique Truck ID
- Description of Material
- Mix Design Number
- Gross, Tare and Net Weight
- Weighmaster

4.0 MEASUREMENT. The Department will not measure the electronic delivery management system.

5.0 PAYMENT. The Department will not measure this work for payment and will consider all items contained in this note to be incidental to the asphalt mixtures on the project, as applicable.

May 5, 2025

SPECIAL NOTE FOR ELECTRONIC DELIVERY MANAGEMENT SYSTEM (e-Ticketing) AGGREGATE

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's Standard Specifications for Road and Bridge Construction current edition.

1.0 DESCRIPTION. Incorporate an e-Ticketing Delivery Software for weighed aggregate material delivered to the project to report loads and provide daily running totals of weighed aggregate material for pay items and incidental work during the construction processes from the point of measurement and loading to the point of incorporation to the project.

2.0 MATERIALS AND EQUIPMENT. Contractor shall supply material data in JavaScript Object Notation (JSON) documents to the KYTC e-Ticketing Delivery Software (KYTC e-Ticketing Portal) via Application Programming Interface (API) or direct connection. Test and verify that ticket data can be shared from the original source no fewer than 30 days prior to material placement activities. An e-Ticketing Delivery Software supplier can provide a qualified representative for on-site technical assistance during the initial setup, pre-construction verifications, and data management and processing as needed during the Project to maintain material data delivery capabilities. Virtual meetings may be hosted in lieu of on-site meetings when deemed appropriate by the Engineer.

Provide e-Ticketing Delivery Software that will meet the following:

1. The e-Ticketing Delivery Software shall be fully integrated with the Contractor's Load Read-Out scale system at the material source location.

2. The e-Ticketing Delivery Software shall provide real-time delivery to KYTC e-Ticketing Portal.

3. Transmit any updates to the ticket data within 5 minutes of a change.

3.0 CONSTRUCTION. Provide the Engineer with the manufacturer's specifications and all required documentation for data access at the pre-construction conference.

A. Construction Requirements

1. Install and operate software in accordance with the manufacturer's specifications.

2. Verify that all pertinent information is provided by the software within the requirements of this Special Note.

B. Data Deliverables

Provide to the Engineer a means in which to gather report summaries by way of iOS apps, web pages, or any other method at the disposal of the Engineer. The Engineer may request data at any time during the project.

1. Aggregate Material

a. **Real-time Continuous Data Items**

Provide the Engineer access to JSON documents capable of being transmitted through the KYTC's e-Ticketing Portal that displays the following information in real-time with a web-based system compatible with iOS and Windows environments.

- Each Truck
  - Supplier Name
  - Supplier Address
  - Supplier Phone
  - Plant location
  - Date
  - Time at source
  - Project Location

- Contract ID#
- Carrier Name
- Unique Truck ID
- Description of Material
- Load Number
- Gross, Tare and Net Weight
- Weighmaster

4.0 MEASUREMENT. The Department will measure the electronic delivery management system as a lump sum item.

5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

1. Payment is full compensation for all work associated with providing all required equipment, training, and documentation.

2. Payment will be full compensation for costs related to providing the e-Ticketing Delivery Software, including integration with plant load-out systems, and report viewing/exporting process. All quality control procedures including the software representative's technical support and on-site training shall be included in the Contract lump sum price.

Code	Pay Item	Pay Unit
26248EC	ELECTRONIC DELIVERY MGMT SYSTEM-AGG	LS

May 5, 2025

SPECIAL NOTE FOR RECYCLED ASPHALT PAVEMENT (RAP) STOCKPILE MANAGEMENT

I. GENERAL

The use of reclaimed asphalt pavement (RAP) from Department projects or other approved sources in hot mix asphalt (HMA) or warm mix asphalt (WMA) shall be subject to stockpile management and handling of material as described in this section.

The Department approves RAP on a stockpile basis, following the process set forth in this method. The contractor's responsibilities in the process are as follows:

- To obtain the Department's approval of all RAP prior to its use on a Department project and to deliver test data and samples as required
- To monitor and preserve the quality and uniformity of the approved material during storage and handling, adding no unapproved material to the existing stockpile
- To comply with the Department's requirements regarding replenishment of approved stockpiles

The Department will approve RAP based on its composition and variability in gradation and asphalt content, and on visual inspections of the stockpile, which the Department may conduct at its discretion. The Department may withdraw approval of a stockpile if the requirements of this specification are not followed in good faith.

The Maximum Percentage Allowed in a mix design will be based on these criteria and on the category of RAP source, as defined in this document.

II. APPROVAL PROCESS

Qualified asphalt producers (listed in List of Approved Materials-Asphalt Mixing Plants) may submit requests for RAP stockpile approval to the Asphalt Branch, Division of Materials, in the Annual Certification for Previously Approved Asphalt Mixing Plants and Related Equipment. The requester shall provide test results as prescribed in Part IID. The Division of Materials may, at their discretion, collect samples or inspect a RAP stockpile consistent with Section IIE.

Upon completion of the review of testing results and, if applicable, visual inspection, the Division of Materials, Asphalt Branch will approve or disapprove the material by letter and will assign a Stockpile Identification Number for each approved RAP stockpile. Note: The contractor's average gradation and asphalt content, as listed in the approval letter, shall be the gradation used in subsequent mix designs. The approval letter will state the applicable limits on the use of the material in mix designs and will summarize the Department's findings, listing the average gradation and asphalt content from the contractor's tests and the corresponding values found by the Department. Where the Maximum Percentage Allowed is low due to variability, the contractor may elect to improve the uniformity of the material by further processing and may again sample, test, and request approval for the material.

No material shall be added to a stockpile after it has been approved, except as provided in Parts V, VI, and VII below.

IIA. RAP Quality Management Plan

For a contractor to receive approval to use RAP on any department project, a RAP Quality Management Plan must first be approved by the department. The RAP Quality Management Plan shall be submitted to the

Division of Materials annually for approval as part of the Contractor's Quality Control Plan/Checklist. The Quality Management Plan is required to demonstrate how the Contractor will provide consistency and quality of material utilized in all asphalt mixes produced for use on Department projects. The Quality Management Plan shall include:

- Unprocessed RAP Stockpiles
  - Designation of stockpile(s) as single or multiple source
  - Designation of stockpile(s) as classified or unclassified
  - Designation of stockpile(s) as captive or continuously replenishing
  - Plan for how stockpile(s) is built (layers, slope, etc.)
  - Plan to minimize stockpile(s) contamination
- Processing and Crushing
  - Equipment used to feed screener or crusher
  - Excavation process based on equipment type
- Processing Millings
  - Single Project or Source
    - Screening, Fractionation, or Crushing plan
  - Multiple Source
    - Process to achieve uniform material from stockpile
    - Screening, Fractionation, or Crushing plan
- Processed RAP Stockpiles
  - Minimization of segregation
  - Minimization of moisture

IIB. RAP Stockpile Placement

All processed RAP stockpiles shall be placed on a sloped, paved surface. The requirement for a paved surface may be waived by the Cabinet if the Contractor's RAP Quality Management Plan demonstrates effective material handling that will minimize deleterious material from beneath the processed stockpile entering the plant. *No processed stockpile will be placed directly on grass or dirt.*

IIC. Stockpile Identification Signs

RAP stockpiles shall be identified with posted signs displaying the gradation of material in the stockpile (course, intermediate, or fine). These signs shall be made of weatherproof material and shall be highly visible. Numerals shall be easily readable from outside the stockpile area. If a stockpile exists in two or more parts, each part must have its own sign.

IID. Standard Approval Procedure

The Contractor shall obtain random samples representative of the entire stockpile and shall have each sample tested for gradation and asphalt content according to KM 64-426, KM 64-427, and AASHTO T308. The material samples must be in its final condition after all crushing and screening. At least one sample shall be obtained for each 1,000 tons of processed RAP, with a minimum of five samples per stockpile. Sampling shall be performed according to the method prescribed for asphalt mix aggregates in the Department's Materials Field Testing and Sampling Manual and KM 64-601. The minimum sampling size (after quartering) for tests of RAP samples is 1,500 g. except for samples containing particles more than one inch in diameter, for which the minimum is 2,000 g.

To request approval of a RAP stockpile, submit the following documents to the Division of Materials. It is the requester's responsibility to correctly address, label, and deliver these submittals:

• Submit request for approval at beginning of the paving season as part of the Annual Certification for Previously Approved Asphalt Mixing Plants and Related Equipment.

• If requesting approval after paving season begins, submit memo, including stockpile portion of the inspection list for Annual Certification for Previously Approved Asphalt Mixing Plants and Related Equipment, to Division of Materials.

• Reports of the tests prescribed above using the Stockpile <INSERT NAME> document.

• A drawing of the plant site showing the location of the stockpile to be approved *and all other stockpiles on the premises*

Mail, deliver or email the request form, with test reports and site drawing, to:

Kentucky Transportation Cabinet
Division of Materials
ATTN: Asphalt Branch Manager
1227 Wilkinson Boulevard
Frankfort, Kentucky 40601

Robert.Semones@ky.gov

IIE. Tests and inspections by the Department

The Department shall have the right to observe the collection of samples, or to perform the sampling and testing as a verification of contractor submittal. As a condition of approval, the Department may at any time inspect and sample RAP stockpiles for which approval has been requested and may perform additional quality control tests to determine the consistency and quality of the material.

The approval letter issued by the Department will include any results of verification testing performed by the Cabinet. The approved contractor results should be used by mix design technicians in the design calculations.

III. RAP STOCKPILE TIERED MANAGEMENT AND EFFECTIVE BINDER CONTENT

The stockpile management and approval requirements will be tiered based on the maximum cold feed percentages as defined in this section and Table 1. below.

Table 1. Tiered Testing Requirements

Mix Type	0-≤12%	12-≤20%	20-≤35%
Surface	Tier 1	Tier 2	Tier 3
Base	Tier 1	Tier 2	Tier 3

NOTE: All asphalt mixes and binder selection will be subject to Section 409 of the current Standard Specifications.

The following requirements will apply based on the percentage of RAP in the mix.

Tier 1

Tier 1 mixes (less than or equal to 12% RAP) will be subject to the requirements of sections IIA, IIB, and IIC.

Tier 2

Tier 2 mixes (12% to less than 20% RAP) will be subject to the requirements of Section II in its entirety and Table 2 requirements.

Tier 3

Tier 3 Asphalt Base mixes with 20% to less than 35% RAP, Tier 3 Asphalt Surface mixes with 20% to less than 30% RAP will be subject to Section II in its entirety and Table 2 requirements.

IV. MAXIMUM PERCENTAGE OF RAP ALLOWED

The Maximum Percent of RAP allowed in mix designs shall be the lowest percentage determined by the gradation and asphalt content of the RAP, as established under the criteria below, and requirements listed in Section III.

Limits according to range in gradation and bitumen content

The Maximum Percent of RAP Allowed, based on gradation and asphalt content, shall be determined by the Department using the standard deviation of these values. This standard deviation will be calculated using data provided by the contractor from at least five samples. While the contractor is required to provide the data from these tested samples, the Department retains the discretion to perform its own sampling and testing to support or verify its findings. An apparent outlier shall not be considered in determining these ranges. Where one result appears to be unrepresentative of the whole, two or more additional samples shall be tested. The outlying value of all tests shall then be excluded from the range. The maximum percentage of RAP allowable shall be the lowest percentage determined according to Table 2 below.

Table 2. Maximum Percent RAP According to Variability in Test Results

	Standard Deviation as calculated above:		
Surface			
% asphalt content	< 0.4	< 0.5	
% passing No. 200 sieve	< 1.25	< 1.5	
% passing Median Sieve	< 4.0	< 5.0	
	Allowable RAP Cold Feed %		
	Tier 3 - 20%-30%	Tier 2 - 12%-20%	Tier 1 - 0%-12%
Base			
% asphalt content	< 0.5	< 0.75	
% passing No. 200 sieve	< 1.5	< 2.25	
% passing Median sieve	< 5.0	< 7.0	
	Allowable RAP Cold Feed %		
	Tier 3 - 20%-35%	Tier 2 - 12%-20%	Tier 1 - 0%-12%

NOTE: These allowances notwithstanding, the Contractor is required to maintain the mixture within the Mixture Control Tolerances of Kentucky Method 443.
The percentage allowable in mix designs shall be limited to meet the design criteria for viscosity established in the Standard Specifications.

V. GENERAL STOCKPILE REQUIREMENTS AND REPLENISHMENT

V.A. Single Pavement Source

Early approval of material from a single pavement source. When a new stockpile is to consist entirely of millings removed from a single existing pavement, the stockpile may be approved based on samples taken during the milling and processing operations, prior to completion of milling. The initial stockpile may be approved as either a new stockpile or a new stockpile in continual replenishment status.

For continual replenishment status, samples shall be taken from the processed stockpile after it reaches 1,000 tons. A total of five initial samples, plus one additional sample for every 1,000 tons, is required. As prescribed in Part II above, the contractor shall test all samples and deliver the test results, together with a letter request for approval in Continual Replenishment status, to the address indicated. The stockpile shall be subject to initial approval as prescribed above in Part II. Once approved, it may be replenished without further approvals as provided in Part VII below.

V.B. Heterogeneous or contaminated material

Asphalt pavement millings containing traffic detection loops, raised pavement markers, or other debris must be separated and excluded before stockpiling RAP for approval for use in KYTC asphaltic concrete mixtures.

No material other than RAP from an approved stockpile shall be included in mixtures for State projects. The following materials are specifically excluded:

• Material contaminated with foreign matter such as liquids, soil, concrete, or debris

• Plant waste, especially waste containing abnormal concentrations of bitumen, drum build-up, or material from spills or plant clean-up operations

The following materials shall not be added to or placed in proximity to an approved stockpile but may be accumulated in a separate stockpile and submitted for approval according to Part III:

- Production mixtures returned to the plant for any reason.
- Mis-proportioned mixtures, especially those generated at start-up.

VI. REPLENISHMENT OF STOCKPILES

An approved RAP stockpile may be replenished with Department approval, provided the replenishment material meets all necessary requirements for approval and maintains uniformity in gradation and asphalt content as outlined in this document.

VI.A. Procedure and approval criteria

The procedure for requesting approval of a stockpile replenishment, that is not in continual replenishment status, shall be the same as for approval of an original stockpile, and the material for the replenishment shall meet all criteria for approval as a new stockpile. RAP proposed for replenishment shall be sampled and tested by the Contractor for gradation and asphalt cement as prescribed in Section II above. The Laboratory shall

review these results and provide approval for use in Department asphalt mix designs, according to Table 2 above.

VI.B. Effect of replenishment on existing approved mix designs

Replenishment of a stockpile may render certain mix designs invalid, depending on the percent RAP allowed in the design and on the difference in average properties between the old and new stockpiles. A replenished stockpile may be used as the RAP ingredient in an existing approved design provided that:

1. The Maximum Percent Allowed for the replenishment stockpile equals or exceeds the percent RAP called for in the mix design. In no case may the Maximum Percent Allowed be exceeded.

However, if a mix design calls for up to 5.0 percent more than the Maximum Percent Allowed for the replenishment, the *design* may be adjusted, with approval, to use the lower percent allowed, provided that the production mixture continues to meet all acceptance criteria. For example, a design which calls for 20 percent RAP may be adjusted and produced with 15 percent if it continues to meet for acceptance.

VII. CONTINUAL REPLENISHMENT WITHOUT RE-APPROVAL

At the request of the contractor, a previously approved stockpile may be placed in Continual Replenishment Status and may be replenished any number of times without re-approval provided that:

1. Replenishment is within six months of the last stockpile addition.
2. The contractor shall continue to monitor and test the materials added to the stockpile and shall forward these results to the Division of Materials for every 1,000 tons of RAP added to the stockpile.
3. The contractor must certify that replenishment materials are free of contaminants.
4. The Department shall be notified by letter to the Director of the Division of Materials that the stockpile is being replenished on a continual basis.
5. The RAP Maximum Percent Allowed for continual replenishment shall be limited by Sections III and IV.

Note: Upon request, one 20-pound sample bag of RAP for each Continual Replenishment Stockpile shall be submitted to the Division of Materials for petrographic analysis every 12 months.

The Department may inspect, sample, and test such stockpiles at its discretion and may, upon determining that the stockpile is unsuitable, withdraw approval of the material and all mix designs which include it. Approval of the stockpile may be withdrawn at any time based upon extreme or erratic ingredient proportions, unsuitable ingredients, or poor performance, as determined by the Division of Materials, Asphalt Branch. The Department will conduct periodic comparison testing on the opposite quarters of samples submitted by the Contractor for special replenishment approval category. The approval of the stockpile may be withdrawn if

erroneous information was found on the contractor's testing and/or improper sampling procedures were involved after a thorough investigation.

VIII. DEPLETION OF STOCKPILE AND EXPIRATION OF APPROVAL

When a stockpile has been fully depleted, the Contractor may replenish it within 24 months after the date of depletion; a depleted stockpile not replenished after 24 months will be removed from the approved list and may not be replenished.

Approval of a stockpile may be withdrawn if, in the finding of the Division of Materials, Asphalt Branch, the total amount of material used in new mixtures equals the total tonnage of the original stockpile plus all approved replenishments. Six years from the original approval of a stockpile or from its most recent replenishment, a stockpile shall be presumed to be depleted, and its approval shall expire. This shall apply to all stockpiles, regardless of status or history of use.

IX. RECORDS

The Contractor shall maintain records at the plant site on all RAP stockpiles. These records shall be available for inspection by representatives of the Department and shall include the following:

- All test results.
- The Department's approval letter for each stockpile and replenishment, together with the Contractor's requests for approval and all data submitted therewith.
- A current drawing of all stockpile locations at the plant site, including unapproved stockpiles, showing stockpile numbers of all stockpiles approved for State work.

X. RELOCATION OF STOCKPILE

If material from an approved RAP stockpile is to be moved to another location, the contractor shall seek approval from the Department prior to its further use on State projects. A letter request shall be submitted to the Division of Materials indicating the current stockpile location, the total quantity of material to be moved, and the amount, if any, to remain in the current location. The Division of Materials will issue an approval letter applicable to the new location.

June 18, 2025

SPECIAL NOTE FOR DOUBLE ASPHALT SEAL COAT

Use RS-2 or RS-2C asphalt material that is compatible with the seal aggregate. Apply the first course of asphalt seal coat at the rate of 3.2 lbs/sy of asphalt and 30 lbs/sy of size #78 seal coat aggregate. Apply the second course at 2.8 lbs/sy of asphaltt and 20 lbs/sy of size #9M seal coat aggregate. The Engineer may adjust the rate of application as conditions warrant. Use caution in applying liquid asphalt material to avoid over spray getting on curbs, gutter, barrier walls, bridges, guardrail, and other roadway appurtenances.

The Department will not measure any surface preparation required prior to applying the asphalt seal coat, but shall be incidental to “Asphalt Material for Asphalt Seal Coat”.

1-3215 Double Asphalt Seal Coat
01/02/2012

Special Note for Bridge Demolition, Renovation and Asbestos Abatement

If the project includes any bridge demolition or renovation, the successful bidder is required to notify Kentucky Division for Air Quality (KDAQ) via filing of form (DEP 7036) a minimum of 10 working days prior to commencement of any bridge demolition or renovation work.

Any available information regarding possible asbestos containing materials (ACM) on or within bridges to be affected by the project has been included in the bid documents. These are to be included with the Contractor's notification filed with the KDAQ. If not included in the bid documents, the Department will provide that information to the successful bidder for inclusion in the KDAQ notice as soon as possible. If there are no documents stating otherwise, the bidders should assume there are no asbestos containing materials that will in any way affect the work.

Asbestos Inspection Report

To: Tom Springer, QK4, Inc.

Date: January 31, 2019

Conducted By: Jason Boston, LFI, Inc.
Kentucky Accredited Asbestos Inspector #57253

Project and Structure Identification

Project: Hopkins County: Item No. 2-10024

Structure ID: #054B00009N

Structure Location: Ky-138 Over Pond River, Hopkins County, Kentucky

Sample Description: Mastic in deck joints

Inspection Date: January 25, 2019

Results and Recommendations

The asbestos inspection was performed in accordance with current United States Environmental Protection Agency (US EPA) regulations, specifically 40 CFR Part 61, Asbestos National Emissions Standards for Hazardous Air Pollutants (NESHAP) revision, final rule effective November 20, 1990.

It is recommended that this report accompany the 10-Day Notice of Intent for Demolition (DEP7036 Form) which is to be submitted to the Kentucky Division of Air Quality prior to abatement, demolition, or renovation of any building or structure in the Commonwealth.

No suspect asbestos containing (ACM) were observed.

MRS, INC. *MRS, Inc. Analytical Laboratory Division*

332 West Broadway / Suite # 902 (502) 495-1212
Louisville, Kentucky - 40202 - 2133 Fax: (502) 491-7111

BULK SAMPLE ASBESTOS ANALYSIS

Analysis N # # 91293 D Address: Hopkins County - 2 - 10024
Client Name: L F I Project # 168 - 18
Sampled By: Jason Boston

				% FIBROUS ASBESTOS				% NON-ASBESTOS FIBERS			
Sample ID	Color	Layered	Fibrous	Chrysotile	Amosite	crocidolite	Others	Cellulose	Fiberglass	Syn. Fiber	Other/Mat.
# 1 A	Black	Yes	No	2%	(To Be	Point Counted)		2%			96%
# 1 B	Black	Yes	No	2%	(To Be	Point Counted)		2%			96%

Methodology : EPA Method 600/R-93-116
Date Analyzed : 29-Jan-19
Analyst : Winterford Mensah Reviewed By: Winterford Mensah Signature

MRS, INC. *MRS, Inc. Analytical Laboratory Division*

332 West Broadway / Suite # 902 *Phone # : (502) 495-1212*
Louisville, Kentucky - 40202 - 2133 *E-Mail Address: CEOMRSInc@AOL.Com*

Client:	**LFI**	**Project No:**	**# 91293 D**
Address:	**114 Fairfax Avenue**	**Sample ID:**	**# 1 A**
	Louisville, KY	**Sampled:**	**25-Jan-19**
	40207	**Received:**	**28-Jan-19**
		Analyzed:	**29-Jan-19 - Point Count -**
	Attention : Russell Brooks		

Bulk Sample Analysis

Sampled By : **Jason Boston**
Facility/Location: **Hopkins County - 2 - 10024**
Field Description: **Deck Joint - Tar**
Laboratory Description:
Thick Black material

Asbestos Materials:
Chrysotile = 1/400 = 0.25 % (< 1 %) Sample Is Negative

Non-Asbestos Fibrous Materials :

Cellulose	0.25 %
Binders	99.50 %

Remarks: The sample was analyzed for asbestos content following the EPA Methodology (600/R-93/116). The test relates only to the items tested. This report does not represent endorsement by NVLAP or any agency of the U.S. Government.

Analyst: Winterford Mensah Reviewed By: Winterford Mensah Signature

MRS, INC. *MRS, Inc. Analytical Laboratory Division*

332 West Broadway / Suite # 902 *Phone # : (502) 495-1212*
Louisville, Kentucky - 40202 - 2133 *E-Mail Address: CEOMRSInc@AOL.Com*

Client:	**LFI**	**Project No:**	**# 91293 D**
Address:	**114 Fairfax Avenue**	**Sample ID:**	**# 1 B**
	Louisville, KY	**Sampled:**	**25-Jan-19**
	40207	**Received:**	**28-Jan-19**
		Analyzed:	**29-Jan-19 - Point Count -**
	Attention : Russell Brooks		

Bulk Sample Analysis

Sampled By : **Jason Boston**
Facility/Location: **Hopkins County - 2 - 10024**
Field Description: **Deck Joint - Tar**
Laboratory Description:
Thick Black material

Asbestos Materials:
Chrysotile = 1/400 = 0.25 % (< 1 %) Sample Is Negative

Non-Asbestos Fibrous Materials :

Cellulose	0.25 %
Binders	99.50 %

Remarks: The sample was analyzed for asbestos content following the EPA Methodology (600/R-93/116). The test relates only to the items tested. This report does not represent endorsement by NVLAP or any agency of the U.S. Government.

Analyst: Winterford Mensah Reviewed By: Winterford Mensah Signature

MRS, Inc.
P.O. Box 19424
Louisville, Kentucky 40259-0424

Phon (502) 495 - 1212
Fax (502) 491 - 7111

Client : Linebach Funkhouser
Project : 168-18

CHAIN OF CUSTODY RECORD

PROJECT: Hopkins County
LOCATION: I-10024
SAMPLED BY: Jason Buston
DATE: January 25, 2019

COMMENTS AND/OR INSTRUCTIONS:

Group Method
Stop First Positive
point count <4%

SAMPLE NUMBER	LOCATION	MATRIX	COLOR	SIZE	COMMENTS	T/L	W/C	.PLM
1A/1B	Deck joint	tar	black					

Relinquished By: (Signature)	Date	Time	Received By: (Signature)
[signature]	1/28/19	1330	[signature]
Relinquished By: (Signature	Date	Time	Received By: (Signature)

Commonwealth of Kentucky
Department for Environmental Protection
Division for Air Quality

Jason P Boston

Has met the requirements of 401 KAR 58:005 and is accredited as an:

Asbestos Inspector

Agency Interest Id:	**148138**
License Number:	**57253**
Issue Date:	**10/17/2018**
Expiration Date:	**07/02/2019**

PAGE 1 OF
INITIAL SUBMITTAL DATE
REVISION DATE
NOTIFICATION # -

NOTIFICATION OF ASBESTOS ABATEMENT/DEMOLITION/RENOVATION

(Instructions for completing form on back)

File this form with Regional Office where project will be performed

Kentucky Division for Air Quality
300 Sower Boulevard, 2nd Floor
Frankfort, KY 40601

OFFICE USE ONLY
ID #
LOG #

Contractor _____
Address _____
City _____ State _____ Zip _____
Phone _____ Contact Person _____
Owner _____
Address _____
City _____ State _____ Zip _____
Phone _____ Contact Person _____
Project Location _____
Address _____
City _____ State _____ Zip _____
Facility Age (yrs.) _____ Size of Facility or Affected Part (sq.ft.) _____
#Floors Affected _____ Present and Prior Use of Facility _____

TYPE OF PROJECT (CHECK ONLY ONE):

Renovation ☐ Demolition ☐ Ordered Demolition ☐ Emergency ☐ Long-term ☐

PROJECT DATES:

Start Removal _____ End Removal _____
Start Renovation/Demolition _____ End Renovation/Demolition _____

Amount of ACM to be Removed:

	Regulated ACM (RACM)	Category II nonfriable ACM (optional)	Category I nonfriable ACM (optional)
Linear Feet			
Square Feet			
Cubic Feet			

Description of planned renovation/demolition, including abatement methods & demo/reno methods. _____

Description of affected facility components _____

Asbestos detection technique _____

Amount of Cat. I & II nonfriable ACM involved but will not be removed:

Describe **physical characteristics** that make it nonfriable and **methods** to keep it nonfriable (optional): _____

Describe **contingency plan** should nonfriable ACM become friable or additional ACM be uncovered during renovation/ demolition: _____

Transporter _____
Address _____
City _____ State _____ Zip _____
Phone _____
Disposal Site _____
Address _____
City _____ State _____ Zip _____

I hereby certify that at least one person trained as required by 40 CFR 61.145(c)(8) will supervise the abatement work described herein. (optional for strictly non-friable work)

Submitted by: _____
Company Name: _____

INSTRUCTIONS FOR COMPLETING FORM DEP7036: NOTIFICATION OF ASBESTOS ABATEMENT/DEMOLITION/RENOVATION

Filing Deadline: This form must be completed and filed with the Kentucky Division for Air Quality at least ten (10) working days before starting any asbestos removal, demolition, or other work which will disturb asbestos-containing material (ACM) in Kentucky facilities outside Jefferson County and in schools statewide, including Jefferson County. File with appropriate Regional Office.
Renotification: If developments occur that invalidate information on a notification (e.g., changes in dates, amounts, locations), file a revised form within the time frames specified in 401 KAR 58:025. Notifications may be numbered in the top-left corner (optional). First two digits are project year; remaining digits are project number (e.g., the first project in 1999 is 99-1).
Attachments: Attachments may be included to provide additional information, propose alternative procedures, declare nonfriable removal, identify secondary transporters, etc.

Line-by-Line Instructions:
Contractor/Owner: the contractor is the asbestos remover (or, for zero-asbestos demolitions, the demolition contractor). The owner is the entity having the work done.
Project Location: The location at the address given where the work is taking place (e.g., which building/floor/room?).
Present/Prior Use: Enter the present and prior use(s) of the facility.
Type of Project: Each choice shown in this category has a specific description under 401 KAR 58:025:

Emergency renovations result from a sudden, unexpected event. If the project is an emergency renovation, attach a detailed description of the sudden, unexpected event that necessitated removal. Include the exact date and hour the event occurred and explain how the event caused an unsafe condition, or would cause equipment damage or unreasonable financial burden.

Planned renovations are renovations that do not qualify as emergency renovations.

A long-term notification is a type of planned renovation which involves a number of nonscheduled small-scale removals whose annual total exceeds the NESHAP threshold amounts and can be estimated based on past years' experience. File yearly estimate at least 10 working days before the beginning of the calendar year for which a long-term notification is being given.

Demolitions involve the wrecking or taking out of a load-supporting structural member, such as a load-bearing beam or wall. Tearing down a structure, dismantling it piecemeal, and moving it from one place to another are all considered demolitions.

Ordered demolitions must result from a demolition order issued by a government agency because the building is structurally unsound and in danger of imminent collapse. For ordered demolitions, attach to the notification a signed, dated copy of order that includes demolition deadlines and name/title/authority of the government representative issuing the order.

Project Dates: Schedules must be precise and accurate. The "start removal" date is the date the removers arrive on-site and begin physically preparing the work area for removal. "End removal" is the date the removers dismantle the work area after cleaning and clearing it. If circumstances arise that invalidate previously submitted start dates, a revised notification must be submitted showing the updated, correct start date. If the start date has been moved up, submit written renotification at least ten working days before the new start date. If the start date has been moved back, telephone the Division as soon as possible before the original date and submit written renotification no later than the original start date.
Schedules for renovation and demolition (next line after removal schedule) are handled similarly, except that renotification is required only for schedule changes involving demolitions, not renovations.
Amount of ACM: In this table, enter the amount and type (RACM , Category I, and/or Category II) of asbestos that will be removed. Although the regulation does not require you to identify the amount of nonfriable ACM that will be removed, the table provides space for nonfriable ACM to accommodate those notifiers who choose to document these removals.
Description of project: Describe the demolition or renovation work to be performed and method(s) to be used , including work practices and engineering controls to be used.
Asbestos Detection Technique: Give a general description of the asbestos survey, for example, "AHERA-style survey by accredited inspector; samples analyzed by PLM."
Amount of nonfriable ...: If all nonfriable ACM will be properly removed, enter "NA."
Contingency Plans: If Category II nonfriable ACM becomes crumbled, pulverized, or reduced to powder, or if additional RACM is discovered, describe procedures to be followed. For example, "Move demolition activity away from ACM immediately; remove the ACM using regulation-required procedures." Even "Stop work, call Division for Air Quality" is OK.

KENTUCKY TRANSPORTATION CABINET
Department of Highways
DIVISION OF RIGHT OF WAY & UTILITIES

TC 62-226
Rev. 01/2016
Page 1 of 1

RIGHT OF WAY CERTIFICATION

☒ **Original** ☐ **Re-Certification** — **RIGHT OF WAY CERTIFICATION**

ITEM #	COUNTY	PROJECT # (STATE)	PROJECT # (FEDERAL)
02-10024	Hopkins	1100 FD04 121 9414001R	

PROJECT DESCRIPTION

Bridging Kentucky - 054B00009N - KY 138 over Pond Creek (rehab)

☒ **No Additional Right of Way Required**

Construction will be within the limits of the existing right of way. The right of way was acquired in accordance to FHWA regulations under the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, as amended. No additional right of way or relocation assistance were required for this project.

☐ **Condition # 1 (Additional Right of Way Required and Cleared)**

All necessary right of way, including control of access rights when applicable, have been acquired including legal and physical possession. Trial or appeal of cases may be pending in court but legal possession has been obtained. There may be some improvements remaining on the right-of-way, but all occupants have vacated the lands and improvements, and KYTC has physical possession and the rights to remove, salvage, or demolish all improvements and enter on all land. Just Compensation has been paid or deposited with the court. All relocations have been relocated to decent, safe, and sanitary housing or that KYTC has made available to displaced persons adequate replacement housing in accordance with the provisions of the current FHWA directive.

☐ **Condition # 2 (Additional Right of Way Required with Exception)**

The right of way has not been fully acquired, the right to occupy and to use all rights-of-way required for the proper execution of the project has been acquired. Some parcels may be pending in court and on other parcels full legal possession has not been obtained, but right of entry has been obtained, the occupants of all lands and improvements have vacated, and KYTC has physical possession and right to remove, salvage, or demolish all improvements. Just Compensation has been paid or deposited with the court for most parcels. Just Compensation for all pending parcels will be paid or deposited with the court prior to AWARD of construction contract

☐ **Condition # 3 (Additional Right of Way Required with Exception)**

The acquisition or right of occupancy and use of a few remaining parcels are not complete and/or some parcels still have occupants. All remaining occupants have had replacement housing made available to them in accordance with 49 CFR 24.204. KYTC is hereby requesting authorization to advertise this project for bids and to proceed with bid letting even though the necessary right of way will not be fully acquired, and/or some occupants will not be relocated, and/or the just compensation will not be paid or deposited with the court for some parcels until after bid letting. KYTC will fully meet all the requirements outlined in 23 CFR 635.309(c)(3) and 49 CFR 24.102(j) and will expedite completion of all acquisitions, relocations, and full payments after bid letting and prior to AWARD of the construction contract or force account construction.

		EXCEPTION (S) Parcel #	ANTICIPATED DATE OF POSSESSION WITH EXPLANATION
Total Number of Parcels on Project	0		
Number of Parcels That Have Been Acquired			
Signed Deed	0		
Condemnation	0		
Signed ROE	0		

Notes/ Comments (Use Additional Sheet if necessary)
Acquisition complete

LPA RW Project Manager		Right of Way Supervisor	
Printed Name		Printed Name	Mark Askin, PE
Signature		Signature	
Date		Date	06/21/19
Right of Way Director		**FHWA**	
Printed Name	Dean M. Loy	Printed Name	
Signature		Signature	
Date		Date	

UTILITIES AND RAIL CERTIFICATION NOTE

Hopkins County
No federal number available
No state project number available
Mile point: 8.457 TO 8.493
BRIDGE PROJECT IN HOPKINS COUNTY ON (054B00009N) KY-138 at POND RIVER
ITEM NUMBER: 02-10024.00

PROJECT NOTES ON UTILITIES

For all projects under 2000 Linear feet which require a normal excavation locate request pursuant to KRS 367.4901-4917, the awarded contractor shall field mark the proposed excavation or construction boundaries of the project (also called white lining) using the procedure set forth in KRS 367.4909(9)(k). For all projects over 2000 linear feet, which are defined as a "Large Project" in KRS 367.4903(18), the awarded contractor shall initially mark the first 2000 linear feet minimally of proposed excavation or construction boundaries of the project to be worked using the procedure set forth in KRS 367.4909(9)(k). This temporary field locating of the project excavation boundary shall take place prior to submitting an excavation location request to the underground utility protection Kentucky Contact Center. For large projects, the awarded contractor shall work with the impacted utilities to determine when additional white lining of the remainder of the project site will take place. This provision shall not alter or relieve the awarded contractor from complying with requirements of KRS 367.4905 to 367.4917 in their entirety.

Please Note: The information presented in this Utility Note is informational in nature and the information contained herein is not guaranteed.

The contractor will be responsible for contacting all utility facility owners on the subject project to coordinate his activities. The contractor will coordinate his activities to minimize and, where possible, avoid conflicts with utility facilities. Due to the nature of the work proposed, it is unlikely to conflict with the existing utilities beyond minor facility adjustments. Where conflicts with utility facilities are unavoidable, the contractor will coordinate any necessary relocation work with the facility owner and Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs. The utility facilities as noted in the previous section(s) have been determined using data garnered by varied means and with varying degrees of accuracy: from the facility owners, a result of S.U.E., field inspections, and/or reviews of record drawings. The facilities defined may not be inclusive of all utilities in the project scope and are not Level A quality, unless specified as such. It is the contractor's responsibility to verify all utilities and their respective locations before excavating.

The contractor shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor's responsibility to determine and take steps necessary to be in compliance

UTILITIES AND RAIL CERTIFICATION NOTE

Hopkins County
No federal number available
No state project number available
Mile point: 8.457 TO 8.493
BRIDGE PROJECT IN HOPKINS COUNTY ON (054B00009N) KY-138 at POND RIVER
ITEM NUMBER: 02-10024.00

with federal and state damage prevention directives. The contractor is instructed to contact KY 811 for the location of existing underground utilities. Contact shall be made a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY 811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom are to be contacted through their individual Protection Notification Center. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area. Non-compliance with these directives can result in the enforcement of penalties.

NOTE: DO NOT DISTURB THE FOLLOWING FACILITIES LOCATED WITHIN THE PROJECT DISTURB LIMITS

The Contractor is fully responsible for protection of all utilities listed above

THE FOLLOWING FACILITY OWNERS ARE RELOCATING/ADJUSTING THEIR FACILITIES WITHIN THE PROJECT LIMITS AND WILL BE COMPLETE PRIOR TO CONSTRUCTION

City of Calhoun - Water

North Hopkins Water District - Water

AT&T- Communication

UTILITIES AND RAIL CERTIFICATION NOTE

Hopkins County
No federal number available
No state project number available
Mile point: 8.457 TO 8.493
BRIDGE PROJECT IN HOPKINS COUNTY ON (054B00009N) KY-138 at POND RIVER
ITEM NUMBER: 02-10024.00

THE FOLLOWING FACILITY OWNERS HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE OWNER OR THEIR SUBCONTRACTOR AND IS TO BE COORDINATED WITH THE ROAD CONTRACT

Kentucky Utilities - Electric Transmission. KU will have transmission lines relocated by November 1st , 2024

THE FOLLOWING FACILITY OWNERS HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE ROAD CONTRACTOR AS INCLUDED IN THIS CONTRACT

Not Applicable

RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED

☒ **No Rail Involvement** ☐ **Rail Involved** ☐ **Rail Adjacent**

Form Revised 6/24/16

UTILITIES AND RAIL CERTIFICATION NOTE

Hopkins County
No federal number available
No state project number available
Mile point: 8.457 TO 8.493
BRIDGE PROJECT IN HOPKINS COUNTY ON (054B00009N) KY-138 at POND RIVER
ITEM NUMBER: 02-10024.00

AREA FACILITY OWNER CONTACT LIST

Facility Owner	Address	Contact Name	Phone	Email
AT&T-AT&T KY - Communication	3719 Bardstown Road Louisville KY 40218	Gary Kidd	5024544591	gk7523@att.com
City of Calhoun - Water	PO Box 284 Calhoun KY 42327	Ron Coleman	2702733092	mayor@cityofcalhounky.com
Kentucky Utilities - Electric	220 West Main Street, Louisville, KY 40202	Kyle Godsave	502-627-2489	kyle.godsave@lge-ku.com
North Hopkins Water District - Water	316 Liberty Church Loop Madisonville Ky 42431	Tim Moore	2708759947	nhwaterfo@gmail.com

Form Revised 6/24/16

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING JR PL
LOUISVILLE, KY 40202

January 8, 2024

Regulatory Division
South Branch
ID No. LRL-2023-00577-ncc

Mr. Andrew Logsdon
Kentucky Transportation Cabinet
DEA
200 Mero Street
Frankfort, Kentucky 40622

Dear Mr. Logsdon:

This is in response to your request for authorization to discharge dredged or fill material into "waters of the United States (U.S.)" associated with the replacement of Bridge ID 054B00009N, which carries Jewell City Road (KY-138) over Pond River (KYTC Item No. 2-10024.00). The proposed project would entail the complete removal of the existing bridge and construction of a new bridge without load restrictions on a new alignment downstream (north) of the existing structure, with geometrics (width, length, hydraulic opening, etc.) similar to the current structure. New approaches would be required for a distance of approximately 1,400 feet west and approximately 800 feet east of the new bridge. Due to construction of a new structure and removal of the existing structure, activities within the stream, including two temporary work pads and a coffer dam, are expected. In addition, the proposed project would require the relocation of approximately 0.20 miles of 69kV transmission line (Rumsey – Corydon 691003) and transmission structures from construction disturbance limits of the new KY-138 bridge crossing at Pond River. No impacts or fill would occur in Pond River or "waters of the United States (U.S.)" due to the project. The proposed project is located on Jewell Road (KY-138) at Pond River near Jewel City, Hopkins County, Kentucky (Latitude: 37.526592/Longitude: 87.354295), and would permanently impact approximately 40 linear feet (0.009 acre) of Pond River, 0.035 acre of open water pond, and 0.063 acres of four wetlands, respectively, and temporarily impact approximately 40 linear feet of Pond River. The information supplied by you was reviewed to determine whether a Department of the Army (DA) permit will be required under the provisions of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

Your project is considered a discharge of backfill or bedding material for a road crossing. The project is authorized under the provisions of 33 CFR 330 Nationwide Permit (NWP) No. 14, Linear Transportation Projects, and NWP No. 57, Electric Utility Line and Telecommunications Activities, as published in the Federal Register December 27, 2021. Under the provisions of this

authorization, you must comply with the enclosed Terms and General Conditions for NWP Nos. 14 and 57, and the following Special Conditions:

a. All work authorized by this permit shall be performed in strict compliance with the attached "LRL-2023-00577 Jewell City Road Bridge Replacement Location and Design Plan", which is a part of this permit. Any modification to these plans affecting the authorized work shall be approved by the U.S. Army Corps of Engineers prior to implementation.

b. The Permittee shall comply with all conditions of the General Section 401 WQC Certification for NWP 14, Transportation Projects, and NWP 57, Electric Utility Line and Telecommunication Activities, issued on February 25, 2022 by KDOW, which are incorporated herein by reference.

c. The permittee shall account for potential adverse effects to the Indiana bat and their habitat through the processes identified in the 2015 Interim Programmatic Agreement for Forest Dwelling Bats between the Permittee, the Federal Highway Administration, and the U.S. Fish and Wildlife Service's Kentucky Field Office.

d. The Permittee shall implement the sedimentation and erosion control methods outlined in pages 19-20 of the project's biological assessment to minimize potential adverse effects on gray bats, their prey, and their foraging habitat.

e. The Permittee shall mark "Do Not Disturb" on construction maps and in the field at the edge of the southwest quadrant of the area of potential effect and shall restricted activities south and west of the intersection of KY 138 (Jewel City Road) and KY 370 (Onion Road).

f. The Permittee shall fully implement all stipulations in the MOA between the Permittee, the KYSHPO, and the FHWA, for KY 138 (Jewell City Road) Bridge (No. 054B00009N) over Pond River, Hopkins County, Kentucky, Kentucky Transportation Cabinet Item No. 2-10024.00, dated December 1, 2022, which is incorporated herein by reference.

g. Within 30 days from the date of completing the authorized work, the Permittee shall restore 40 linear feet of temporary stream impacts to pre-existing contours and elevations. The affected areas shall be re-vegetated, as appropriate to minimize erosion and ensure site stability.

h. The Permittee must comply with the enclosed General Conditions and Kentucky Regional Conditions.

This verification is valid until the NWPs are modified, reissued, or revoked. NWP Nos. 14 and 57 will be modified, reissued, or revoked on **March 14, 2026**. It is incumbent upon KYTC to remain informed of changes to the NWPs. If the Permittee commences or is under contract to commence this activity before the date that the relevant NWPs are modified or revoked, they will have 12 months from the date of the modification or revocation of the NWPs

to complete the activity under the present terms and conditions of these NWPs. The enclosed Compliance Certification must be submitted to the District Engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later. Please note that we also perform periodic inspections to ensure compliance with our permit conditions and applicable Federal laws. A copy of this letter will be forwarded to your agent and to the KDOW.

For your information, effective March 9, 1999, the Corps of Engineers instituted an administrative appeals process. A permit applicant may appeal an individual permit denial or an individual permit that was issued with conditions (a proffered individual permit). To initiate the appeals process regarding the terms and conditions of this permit, you must write a letter to the district engineer explaining your objections to the permit. The enclosed Notification of Applicant Options (NAO) outlines the initial appeals process and options available to you. The objection letter must be received by the district engineer within 60 days of the date of the NAO. Please be aware that no work can occur in jurisdictional waters until the appeals process is completed.

Based on the information provided to this office, the site contains approximately 40 linear feet of one perennial stream, 0.035 acre of open water pond, and 0.063 acres of four wetlands, respectively, that may be considered jurisdictional “waters of the U.S.,” in accordance with the Regulatory Guidance Letter for Jurisdictional Determinations issued by the U.S. Army Corps of Engineers on October 31, 2016 (RGL No. 16-01).

As indicated in the guidance, this Preliminary Jurisdictional Determination (PJD) is non-binding and cannot be appealed and only provides a written indication that “waters of the U.S.,” including wetlands, may be present on-site. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a PJD will treat all waters and wetlands on the site as if they are jurisdictional “waters of the U.S.”

Attached to this letter are a PJD, a Notification of Administrative Appeal Options and Process and Request for Appeal (NAO-NAP) form, as mentioned above. However, a PJD is not appealable and impacting “waters of the U.S.” identified in the PJD will result in you waiving the right to request an AJD at a later date. An AJD may be requested (which may be appealed), by contacting me for further instruction.

The delineation included herein has been conducted to identify the location and extent of the aquatic resource boundaries and/or the jurisdictional status of aquatic resources for purposes of the Clean Water Act for the particular site identified in this request. This delineation and/or jurisdictional determination may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should discuss the applicability of a certified wetland determination with the local USDA service center prior to starting work.

If you have any questions, please contact us by writing to the District Regulatory Office at the above address, ATTN: CELRL-RDS, or contact Norma Condra directly at (502) 315-6680 or norma.c.condra@usace.army.mil. Any correspondence on this matter should refer to our ID Number LRL-2023-00577-ncc.

Sincerely

David Baldridge

Digitally signed by David Baldridge
Date: 2024.01.08 11:40:04 -05'00'

David Baldridge
Chief, South Branch
Regulatory Division

Enclosures

Enclosures:
1. NWP Nos. 14 and 57 Terms and Conditions
2. NWP General Conditions
3. WQC Conditions
4. LRL-2023-00577 Jewell Road Bridge Replacement Location and Design Plan

Copies Furnished:

Mr. Richard Clausen (Agent)
RES Kentucky, LLC
rclausen@res.us

Kentucky Energy & Environment Cabinet
Division of Water
401wqc@ky.gov

Compliance Certification:

Permit Number: **LRL-2023-00577-ncc**

Name of Permittee: **Kentucky Transportation Cabinet**

Date of Issuance: **January 8, 2024**

Upon completion of the activity authorized by this permit and any mitigation required by this permit, sign this certification, and return it to the following address:

U.S. Army Corps of Engineers
CELRL-RDS
P.O. Box 59
Louisville, Kentucky 40201

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

_____ _____

Signature of Permittee Date

U.S. Army Corps of Engineers (USACE)

PRELIMINARY JURISDICTIONAL DETERMINATION (PJD)

For use of this form, see Sec 404 CWA, Sec 10 RHA, Sec 103 MPRSA; the proponent agency is CECW-COR.

Form Approved -
OMB No. 0710-0024
Expires 2024-04-30

DATA REQUIRED BY THE PRIVACY ACT OF 1974

Authority Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.

Principal Purpose The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the review area that may be subject to federal jurisdiction under the regulatory authorities referenced above.

Routine Uses This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice or FOIA request as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in any resulting jurisdictional determination (JD), which may be made available to the public on the District's website and/or on the Headquarters USACE website.

Disclosure Submission of requested information is voluntary; however, if information is not provided, the request for a JD cannot be evaluated nor can a PJD be issued.

The Agency Disclosure Notice (ADN)

The public reporting burden for this collection of information, 0710-0024, is estimated to average 25 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

SECTION I - BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: 2023-12-22

B. NAME AND ADDRESS OF PERSON REQUESTING PJD:
Mr. Andrew Logsdon
Kentucky Transportation Cabinet
DEA
200 Mero Street
Frankfort, Kentucky 40622

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:
RDS, Jewell City Road (KY-138) Bridge Replacement, LRL-2023-00577-ncc

D. PROJECT LOCATION AND BACKGROUND INFORMATION:
(*USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES*)

State: Kentucky County/Parish/Borough: Hopkins City: Jewell City

Center coordinates of site (*lat/long in degree decimal format*): Latitude: 37.526592 ° Longitude: 87.354295 °

Universal Transverse Mercator:

Name of nearest waterbody: Pond River

E. REVIEW PERFORMED FOR SITE EVALUATION (*CHECK ALL THAT APPLY*):

☒ Office (*Desk*) Determination. Date: 2023-12-04

☐ Field Determination

Date(s):

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

	Site Number	Latitude (*decimal degrees*)	Longitude (*decimal degrees*)	Estimated amount of aquatic resource in review area (*acreage and linear feet, if applicable*)	Type of aquatic resource (*i.e., wetland vs. non-wetland waters*)	Geographic authority to which the aquatic resource "may be" subject (*i.e., Section 404 or Section 10/404*)

	Site Number	Latitude (*decimal degrees*)	Longitude (*decimal degrees*)	Estimated amount of aquatic resource in review area (*acreage and linear feet, if applicable*)	Type of aquatic resource (*i.e., wetland vs. non-wetland waters*)	Geographic authority to which the aquatic resource "may be" subject (*i.e., Section 404 or Section 10/404*)
	Wetland 1	37.52730	-87.35094	0.021 ac.	PEM	404
	Wetland 4	37.52719	-87.35051	0.009 ac.	PEM	404
	Pond River	37.52663	-87.35424	40 lf.	Perennial	10/404
	Wetland 2	37.52696	-87.35331	0.008 ac.	PEM	404
	Wetland 5	37.52637°/-87.35618°	-87.35618	0.025 ac.	PEM	404
	Open Water 1	37.52641°/-87.35618°	-87.35618	0.035 ac.	PUBHh (OW)	404

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD or no JD whatsoever, which do not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the USACE has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD or reliance on no JD whatsoever; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of USACE permit authorization based on a PJD or no JD whatsoever constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the USACE will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

F. SUPPORTING DATA. Data reviewed for PJD (*check all that apply)*

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:

Map: BRIDGE NO.: 054B00009N
HOPKINS COUNTY, KENTUCKY
KYTC ITEM NO.: 2-10024.00, Project Development Map

☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.

☒ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report.

Rationale: _____

☐ Data sheets prepared by the USACE:

☐ Corps navigable waters' study:

☐ U.S. Geological Survey Hydrologic Atlas:

☐ USGS NHD data.

☐ USGS 8 and 12 digit HUC maps.

☐ U.S. Geological Survey map(s). Cite scale & quad name:

☐ USDA Natural Resources Conservation Service Soil Survey.

Citation: _____

☐ National Wetlands Inventory map(s).

Cite Name: _____

☐ State/Local Wetland Inventory map(s):

☐ FEMA/FIRM maps:

☐ 100-year Floodplain Elevation is: _____. (National Geodectic Vertical Datum of 1929)

☒ Photographs: ☐ Aerial (*Name & Date*): _____

or ☒ Other (*Name & Date*): KY 138 Bridge Replacement Project (Item 12-10024) Bridge ID 054B00009N, Bridging KY Waters Photos, dated 1/18/2023.

☐ Previous determination(s). File no. and date of response letter:

☐ Other information (*please specify*):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the USACE and should not be relied upon for later jurisdictional determinations.

Name of Regulatory Staff Member Completing PJD	Date	Signature of Regulatory Staff Member Completing PJD
Norma C. Condra	2023-12-22	CONDRA.NORMA.C.1082941726 Digitally signed by CONDRA.NORMA.C.1082941726 Date: 2023.12.22 13:04:27 -05'00'
Name of Person Requesting PJD	Date	Signatureof Person Requesting PJD *(REQUIRED, unless obtaining the Signature is Impracticable*
Andrew Logsdon, KYTC		DocuSigned by: Andrew Logsdon 7EE59F3CD1E0420...

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

2021 KENTUCKY REGIONAL GENERAL CONDITIONS

These regional conditions are in addition to, but do not supersede, the requirements in the Federal Register (See volume 86, date January 13, 2021, pp 2867-2874 for the text of Section C, General Conditions).

Notifications for all Nationwide Permits (NWPs) shall be in accordance with General Condition No. 32.

1. For activities that would result in a loss of Outstanding State or National Resource Waters (OSNRWs), Exceptional Waters (EWs), Coldwater Aquatic Habitat Waters (CAHs) and waters with Designated Critical Habitat (DCH) under the Endangered Species Act for the NWPs listed below, a Pre-Construction Notification (PCN) will be required to the Corps. The Corps will coordinate with the appropriate resource agencies (see attached list) on these NWPs for impacts to these waters.

   NWP 3 (Maintenance)
   NWP 4 (Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities)
   NWP 5 (Scientific Measurement Devices)
   NWP 6 (Survey Activities)
   NWP 12 (Oil or Natural Gas Pipeline Activities)
   NWP 13 (Bank Stabilization)
   NWP 14 (Linear Transportation Projects)
   NWP 15 (U.S. Coast Guard Approved Bridges)
   NWP 16 (Return Water from Upland Contained Disposal Areas)
   NWP 17 (Hydropower Projects)
   NWP 18 (Minor Discharges)
   NWP 19 (Minor Dredging)
   NWP 20 (Response Operations for Oil or Hazardous Substances)
   NWP 22 (Removal of Vessels)
   NWP 23 (Approved Categorical Exclusions)
   NWP 25 (Structural Discharges)
   NWP 30 (Moist Soil Management for Wildlife)
   NWP 32 (Completed Enforcement Actions)
   NWP 33 (Temporary Construction, Access, and Dewatering)
   NWP 36 (Boat Ramps)
   NWP 41 (Reshaping Existing Drainage Ditches)
   NWP 51 (Land-Based Renewable Energy Generation Facilities)
   NWP 57 (Electric Utility Line and Telecommunications Activities)
   NWP 58 (Utility Line Activities for Water and Other Substances)

2. In addition to the notification and agency coordination requirements in the NWPs, for impacts greater than 0.25 acres in all “waters of the U.S.” for the NWPs listed below, a PCN will be required to the Corps. The Corps will coordinate with the appropriate resource agencies (see attached list) on these NWPs:

NWP 3 (Maintenance)
NWP 14 (Linear Transportation Projects)

3. Nationwide Permit No. 14 – Linear Transportation Projects.

(a) New road alignments or realignments are limited to a permanent loss of 500 linear feet of intermittent or perennial stream length or the stream bed acreages listed in the table below at each crossing. Road crossings with permanent losses greater than 500 linear feet of intermittent or perennial stream or the stream bed acreages listed in the table below associated with new alignments or realignments will be evaluated as an individual permit (i.e., a Letter of Permission or Standard Permit).

Table of Acreages at Varying Stream Widths for 500 Linear Feet of Impact	
Stream Width (Feet)	Acres of Stream at Varying Widths for 500 Linear Feet of Stream
1	0.011
2	0.023
3	0.034
4	0.046
5	0.057
6	0.069
7	0.080
8	0.092
9	0.103
10	0.115

(b) In addition to the notification requirements contained in NWP 14, the permittee must submit a PCN to the district engineer prior to commencing the activity for the permanent loss of greater than 300 linear feet of stream bed or the stream bed acreages listed in the table below. (See General Condition 32 and the definition of "loss of waters of the United States" in the Nationwide Permits for further information.)

Table of Acreages at Varying Stream Widths for 300 Linear Feet of Impact	
Stream Width (Feet)	Acres of Stream at Varying Widths for 300 Linear Feet of Stream
1	0.007
2	0.014
3	0.021
4	0.028
5	0.034
6	0.041
7	0.048
8	0.055
9	0.062
10	0.069

4. Notification in accordance with General Condition 32 is required to the Corps for all activities located in the following Section 10 waterways, to include the portion of their tributaries below the Ordinary High Water Mark or navigation pool, or otherwise subject to inundation, by the Section 10 waterway:

- Mississippi River
- Ohio River
- Licking River
- Kentucky River
- Salt River
- Green River
- Cumberland River
- Tennessee River
- Big Sandy River (from mouth to Louisa, KY)

5. All applications and requests should be submitted electronically. To submit applications or other requests electronically, all documents should be saved as a PDF document, and then submitted as an attachment in an email to the following email address:

CELRL.Door.To.The.Corps@usace.army.mil

Your email should include the following:
a) Subject Line with the name of the applicant, type of request, and location (County and State). Example: RE: Doe, John, DA Permit Application, Jefferson County, KY
b) Brief description of the request and contact information (phone number, mailing address, and email address) for the applicant and/or their agent.

c) Project Location: Address and Latitude/Longitude in decimal degrees (e.g. 42.927883, -88.362576).

All forms that require signature must be digitally signed or signed manually, scanned and then sent electronically.

Electronic documents must have sufficient resolution to show project details. In order to have the highest quality documents, the original digital documents should be converted to PDF rather than providing scanned copies of original documents.

The electronic application and attached documents must not exceed 10 megabytes (10MB).

6. For all activities, the applicant shall review the U.S. Fish and Wildlife Service's IPaC website: http://ecos.fws.gov/ipac to determine if the activity might affect threatened and/or endangered species or designated critical habitat. If federally-listed species or designated critical habitat are identified, a PCN in accordance with General Condition 18 and 32 would be triggered and the official species list generated from the IPaC website must be submitted with the PCN.

Further information:

Outstanding State or National Resource Water (OSNRWs), Exceptional Waters (EWs), and Coldwater Aquatic Habitat Waters (CAHs) are waters designated by the Commonwealth of Kentucky, Natural Resources and Environmental Protection Cabinet. The list can be found at the following link: http://eppcapp.ky.gov/spwaters/

Designated Critical Habitat (DCH) under the Endangered Species Act is determined within the Commonwealth of Kentucky by the U.S. Fish and Wildlife Service. The current list of Kentucky's Threatened, Endangered, and Federal Candidate Species can be found at the following link: http://www.fws.gov/frankfort/EndangeredSpecies.html

Information on Pre-Construction Notification (PCN) can be found at NWP General Condition No. 32 in the Federal Register (See volume 86, date January 13, 2021, pp 2867-2874 for the text of Section C, General Conditions).

COORDINATING RESOURCE AGENCIES

Chief, Wetlands Regulatory Section
U.S. Environmental Protection Agency
Region IV
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303

Supervisor
U.S. Fish & Wildlife Service
JC Watts Federal Building, Room 265
330 West Broadway
Frankfort, Kentucky 40601

Supervisor
401 Water Quality Certification
Kentucky Division of Water
300 Sower Boulevard, 3rd Floor
Frankfort, KY 40601

Commissioner
Department of Fish and Wildlife Resources
#1 Sportsman's Lane
Frankfort, KY 40601

Executive Director and State Historic Preservation Officer
Kentucky Heritage Council
410 High Street
Frankfort, KY 40601

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ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

ANTHONY R. HATTON
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

General Certification--Nationwide Permit # 14
Linear Transportation Projects

This General Certification is issued **December 18, 2020**, in conformity with the requirements of Section 401 of the Clean Water Act of 1977, as amended (33 U.S.C. §1341), as well as Kentucky Statute KRS 224.16-050.

For this General Certification and all General Certifications of Nationwide Permits (NWP), the term 'surface water' is defined pursuant to 401 KAR Chapter 10, Section 1(72): Surface Waters means those waters having well-defined banks and beds, either constantly or intermittently flowing; lakes and impounded waters; marshes and wetlands; and any subterranean waters flowing in well-defined channels and having a demonstrable hydrologic connection with the surface. Lagoons used for waste treatment and effluent ditches that are situated on property owned, leased, or under valid easement by a permitted discharger are not considered to be surface waters of the Commonwealth.

As required by 40 CFR Part 121 – State Certification of Activities Requiring a Federal License or Permit, all conditions include a statement explaining why the condition is necessary to assure that any discharge authorized under the general permit will comply with water quality requirements and a citation to federal, state, or tribal law that authorizes the condition. The statements and citations are included with each condition. The statements are written entirely at the end of the certification under the section *Statements of Necessity*.

Agricultural operations, as defined by KRS 224.71-100(1) conducting activities pursuant to KRS 224.71-100 (3), (4), (5), (6), or 10 are deemed to have certification if they are implementing an Agriculture Water Quality Plan pursuant to KRS 224.71-145.

For all other operations, the Commonwealth of Kentucky hereby certifies under Section 401 of the Clean Water Act (CWA) that it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 303, 306 and 307 of the CWA, will not be violated for the activity covered under NATIONWIDE PERMIT 14, namely Linear Transportation Projects, provided that the conditions in this certification are met. Activities that do not meet the conditions of this General Certification require an Individual Section 401 Water Quality Certification.

General Certification--Nationwide Permit # 14
Linear Transportation Projects
Page 2

1. Activities occurring within surface waters assessed by the Kentucky Division of Water as designated Outstanding State Resource Waters, National Resource Waters, Cold Water Aquatic Habitat, Exceptional Waters, or identified as candidate Outstanding State Resource Waters or candidate Exceptional Waters are not authorized under this General Certification and require an Individual Certification. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(1), Section 1(2), & Section 1(3); and 401 KAR 10:031, Section 4(2) & Section 8]

2. Activities impacting surface waters assessed by the Kentucky Division of Water as impaired for warm water or cold water aquatic habitat where the parameter or source is related to habitat* are not authorized under this General Certification and require an Individual Certification. [Statement B and citations KRS 224.70-110 and 401 KAR 10:031, Section 2 & Section 4]

   *These include waters impaired by the parameter 'habitat assessment', 'combined biota/habitat bioassessment' or any parameter from the parameter group 'habitat alterations, and/or waters where the parameter identified as a cause of impairment has a source from the source group 'habitat impacts'.

3. Activities impacting surface waters assessed by the Kentucky Division of Water as full support for warm water or cold water aquatic habitat are not authorized under this General Certification and require an Individual Certification. [Statements A and B and citations KRS 224.70-110 and 401 KAR 10:031, Section 2 & Section 4]

4. The activity will not occur within surface waters identified as perpetually-protected mitigation sites (e.g., deed restriction or conservation easement). [Statement C and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3); and 40 C.F.R. 230.97]

5. Activities with cumulative temporary and permanent impacts greater than 1/2 acre of wetland or 300 linear feet of surface waters are not authorized under this General Certification and require an Individual Certification. This General Certification shall not apply to projects where multiple Nationwide Permits are issued for individual crossings which are part of a single, larger transportation projects. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

6. For complete linear transportation projects, all impacts shall not exceed a cumulative length of 500 linear feet within each Hydrologic Unit Code (HUC) 14. [401 KAR 10:030 and 401 KAR 10:031]

7. Stream realignment greater than 100 feet is not authorized under this General Certification and require and Individual Certification. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

8. Surface water impacts covered under this General Certification and undertaken by those persons defined as an agricultural operation under the Agricultural Water Quality Act must be completed in compliance with the Kentucky Agricultural Water Quality Plan (KAWQP). [Statements A and F and citations KRS 224.71-145(1), 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

9. Any crossings must be constructed in a manner that does not impede natural water flow. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

10. The use of creek rock for bank stabilization; grouted rip-rap; unformed, poured grout; unformed, poured concrete; poured asphalt; or asphalt pieces is not authorized under this General Certification and requires an Individual Certification. Poured concrete or grout will be authorized under this General Certification when contained by tightly sealed forms or cells. Equipment shall not discharge waste washwater into surface waters at any time without adequate wastewater treatments. [Statement A and citations 401 KAR 10:030, Section 1(3)(b) & 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

11. New stormwater detention/ retention basins constructed in surface waters or modifications to stormwater detention/ retention basins resulting in the reduction in reach or that cause impairment of flow of surface waters are not authorized under this General Certification and require an Individual Certification. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

12. Erosion and sedimentation pollution control plans and Best Management Practices (BMPs) must be designed, installed, and maintained in effective operating condition at all times during construction activities so that violations of state water quality standards do not occur. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

13. Sediment and erosion control measures, such as check-dams constructed of any material, silt fencing, hay bales, etc., shall not be placed within surface waters, either temporarily or permanently, without prior approval by the Kentucky Division of Water's Water Quality Certification Section. If placement of sediment and erosion control measures in surface waters is unavoidable, design and placement of temporary erosion control measures shall not be conducted in such a manner that may result in instability of streams that are adjacent to, upstream, or downstream of the structures. All sediment and erosion control devices shall be removed and the natural grade restored within the completion timeline of the activities. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

General Certification--Nationwide Permit # 14
Linear Transportation Projects
Page 4

14. Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering surface waters. [Statements A and D and citations. [KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

15. Removal of riparian vegetation shall be limited to that necessary for equipment access. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

16. To the maximum extent practicable, all in-stream work under this certification shall be performed under low-flow conditions [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

17. Heavy equipment (e.g., bulldozers, backhoes, and draglines), if required for this project, should not be used or operated within the stream channel. In those instances in which such in-stream work is unavoidable, then it shall be performed in such a manner and duration as to minimize turbidity and disturbance to substrates and bank or riparian vegetation. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

18. Any fill shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If rip-rap is utilized, it should be of such weight and size that bank stress or slump conditions will not be created because of its placement. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

19. If domestic water supply intakes are located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the operator when such work will be done prior to construction. [Statement E and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

20. Should evidence of stream pollution or jurisdictional wetland impairment and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the Kentucky Division of Water shall be notified immediately by calling (800) 928-2380. [Statement A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

21. The Kentucky Division of Water requires submission of a formal application for any federal applicant that is not required to submit a Preconstruction Notification that would typically be required of any non-federal applicant. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

General Certification--Nationwide Permit # 14
Linear Transportation Projects
Page 5

22. The Kentucky Division of Water may require submission of a formal application for an Individual Certification for any project that has been determined to likely have a significant adverse effect upon water quality or degrade surface waters so that existing uses of the water body or downstream waters are precluded. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

23. If the final issued General Permit for Nationwide Permit 14 Linear Transportation Projects changes significantly, the Division of Water may opt to deny certification for this permit. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

Statements of Necessity:

A. This condition is necessary to protect waters categorized under the anti-degradation policy to protect the designated and existing uses and to maintain the associated water quality criteria necessary to protect these water resources.

B. This condition is necessary to protect existing uses and the level of water quality necessary to protect those existing uses shall be assured in impaired water.

C. This condition is necessary for long-term protection of compensatory mitigation sites.

D. This condition is necessary to provide for the prevention, abatement, and control of all water pollution and to conserve water resources for legitimate uses, safeguard from pollution the uncontaminated waters, prevent the creation of any new pollution, and abate any existing pollution.

E. This condition is necessary to protect domestic water supply use.

F. This condition is necessary to evaluate, develop, and improve best-management practices in conservation plans, compliance plans, and forest stewardship management plans; establish statewide and regional agriculture water quality plans; and otherwise promote soil and water conservation activities that protect surface waters from the adverse impacts of agriculture operations within the Commonwealth.

Violation of Kentucky state water quality standards may result in civil penalties and remediation actions.

For assistance contact the Kentucky Division of Water, Water Quality Certification Section by email (401WQC@ky.gov) or by phone (502)-564-3410.

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FRANKFORT, KENTUCKY 40601

General Certification--Nationwide Permit (NWP) 2021

NWP 12 – Oil or Natural Gas Pipeline Activities
NWP 57 – Electrical Utility Line and Telecommunications Activities
NWP 58 – Utility Line Activities for Water and Other Substances

This General Certification is issued **December 18, 2020** in conformity with the requirements of Section 401 of the Clean Water Act of 1977, as amended (33 U.S.C. §1341), as well as Kentucky Statute KRS 224.16-050.

For this General Certification and all General Certifications of Nationwide Permits (NWP), the term 'surface water' is defined pursuant to 401 KAR Chapter 10, Section 1(72): Surface Waters means those waters having well-defined banks and beds, either constantly or intermittently flowing; lakes and impounded waters; marshes and wetlands; and any subterranean waters flowing in well-defined channels and having a demonstrable hydrologic connection with the surface. Lagoons used for waste treatment and effluent ditches that are situated on property owned, leased, or under valid easement by a permitted discharger are not considered to be surface waters of the Commonwealth.

As required by 40 CFR Part 121 – State Certification of Activities Requiring a Federal License or Permit, all conditions include a statement explaining why the condition is necessary to assure that any discharge authorized under the general permit will comply with water quality requirements and a citation to federal, state, or tribal law that authorizes the condition. The statements and citations are included with each condition. The statements are written entirely at the end of the certification under the section *Statements of Necessity*.

Agricultural operations, as defined by KRS 224.71-100(1) conducting activities pursuant to KRS 224.71-100 (3), (4), (5), (6), or 10 are deemed to have certification if they are implementing an Agriculture Water Quality Plan pursuant to KRS 224.71-145.

The Commonwealth of Kentucky hereby certifies under Section 401 of the Clean Water Act (CWA) that it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 303, 306 and 307 of the CWA, will not be violated for the activities covered by the above listed Nationwide Permits, provided that the conditions in

this General Certification are met. Activities that do not meet the conditions of this General Certification require an Individual Section 401 Water Quality Certification.

1. Activities occurring within surface waters assessed by the Kentucky Division of Water as designated Outstanding State Resource Waters, National Resource Waters, Cold Water Aquatic Habitat, Exceptional Waters, or identified as candidate Outstanding State Resource Waters or candidate Exceptional Waters are not authorized under this General Certification and require an Individual Certification. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(1), Section 1(2), & Section 1(3); and 401 KAR 10:031, Section 4(2) & Section 8]

2. Activities impacting surface waters assessed by the Kentucky Division of Water as impaired for warm water or cold water aquatic habitat where the parameter or source is related to habitat* are not authorized under this General Certification and require an Individual Certification. [Statement B and citations KRS 224.70-110 and 401 KAR 10:031, Section 2 & Section 4]

   *These include waters impaired by the parameter 'habitat assessment', 'combined biota/habitat bioassessment' or any parameter from the parameter group 'habitat alterations, and/or waters where the parameter identified as a cause of impairment has a source from the source group 'habitat impacts'.

3. Activities impacting surface waters assessed by the Kentucky Division of Water as full support for warm water or cold water aquatic habitat are not authorized under this General Certification and require an Individual Certification. [Statements A and B and citations KRS 224.70-110 and 401 KAR 10:031, Section 2 & Section 4]

4. The activity will not occur within surface waters identified as perpetually-protected mitigation sites (e.g., deed restriction or conservation easement). [Statement C and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3); and 40 C.F.R. 230.97]

5. Activities with cumulative temporary and permanent impacts greater than 1/2 acre of wetland or 300 linear feet of surface waters are not authorized under this General Certification and require an Individual Certification. This General Certification shall not apply to projects where multiple Nationwide Permits are issued for individual crossings which are part of a single, larger utility projects. Cumulative impacts include utility line crossings, permanent or temporary access roads, headwalls, associated bank stabilization areas, substations, pole or tower foundations, maintenance corridor, and staging areas. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

6. For a single crossing, impacts from the construction and maintenance corridor in surface waters shall not exceed 50 feet of bank disturbance. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

7. Stream impacts under Conditions 5 and 6 of this certification are defined as the length of bank disturbed. For utility line crossings and roads, only one bank length is used in calculation of the totals. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

8. This General Certification is limited to the crossing of surface waters by utility lines. This certification does not authorize the installation of utility lines in a linear manner within the stream channel or below the top of the stream bank. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

9. Stream relocation, realignment, straightening, and/or widening are not authorized under this General Certification and require an Individual Certification. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

10. Any crossings must be constructed in a manner that does not impede natural water flow. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

11. Blasting of stream channels, even under dry conditions, is not allowed under this General Certification and require and Individual Certification. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

12. Utility lines trenched parallel to the stream shall be located at least 50 feet from an intermittent or perennial stream, measured from the top of the stream bank. Construction within the 50 foot buffer may be authorized if avoidance and minimization efforts are shown and adequate methods are utilized to prevent soil from entering the stream. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

13. Utility line stream crossings shall be constructed by methods that maintain flow and allow for dry excavation. Water pumped from the excavation shall be contained and allowed to settle prior to re-entering the stream. Excavation equipment and vehicles shall operate outside of the flowing portion of the stream. Spoil material from the excavation shall not be allowed to enter the flowing portion of the stream. [Statement A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]
14. The activities shall not result in any permanent changes in pre-construction elevation contours in surface waters or stream dimension, pattern or profile. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

15. Utility line activities which impact wetlands shall not result in conversion of the area to non-wetland status. [Statement A and citations KRS 224.70-110, 401 KAR

10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

16. Clearing of forested wetlands for the installation or maintenance of utility lines is not authorized under this certification. [Statement A and citations 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

17. Surface water impacts covered under this General Certification and undertaken by those persons defined as an agricultural operation under the Agricultural Water Quality Act must be completed in compliance with the Kentucky Agricultural Water Quality Plan (KAWQP). [Statements A and F and citations KRS 224.71-145(1), 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

18. The use of creek rock for bank stabilization; grouted rip-rap; unformed, poured grout; unformed, poured concrete; poured asphalt; or asphalt pieces is not authorized under this General Certification and requires an Individual Certification. Poured concrete or grout will be authorized under this General Certification when contained by tightly sealed forms or cells. Equipment shall not discharge waste washwater into surface waters at any time without adequate wastewater treatments. [Statement A and citations 401 KAR 10:030, Section 1(3)(b) & 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

19. New stormwater detention/ retention basins constructed in surface waters or modifications to stormwater detention/ retention basins resulting in the reduction in reach or that cause impairment of flow of surface waters are not authorized under this General Certification and require an Individual Certification. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

20. Erosion and sedimentation pollution control plans and Best Management Practices (BMPs) must be designed, installed, and maintained in effective operating condition at all times during construction activities so that violations of state water quality standards do not occur. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

21. Sediment and erosion control measures, such as check-dams constructed of any material, silt fencing, hay bales, etc., shall not be placed within surface waters, either temporarily or permanently, without prior approval by the Kentucky Division of Water's Water Quality Certification Section. If placement of sediment and erosion control measures in surface waters is unavoidable, design and placement of temporary erosion control measures shall not be conducted in such a manner that may result in instability of streams that are adjacent to, upstream, or downstream of the structures. All sediment and erosion control devices shall be removed and the natural grade restored within the completion timeline of the activities. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

22. Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering surface waters. [Statements A and D and citations. [KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

23. Removal of riparian vegetation shall be limited to that necessary for equipment access. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

24. To the maximum extent practicable, all in-stream work under this certification shall be performed under low-flow conditions [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

25. Heavy equipment (e.g. bulldozers, backhoes, and draglines), if required for this project, should not be used or operated within the stream channel. In those instances in which such in-stream work is unavoidable, then it shall be performed in such a manner and duration as to minimize turbidity and disturbance to substrates and bank or riparian vegetation. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

26. Any fill shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If rip-rap is utilized, it should be of such weight and size that bank stress or slump conditions will not be created because of its placement. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

27. If domestic water supply intakes are located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the operator when such work will be done prior to construction. [Statement E and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]
28. Should evidence of stream pollution or jurisdictional wetland impairment and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the Kentucky Division of Water shall be notified immediately by calling (800) 928-2380. [Statement A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

29. The Kentucky Division of Water requires submission of a formal application for any federal applicant that is not required to submit a Preconstruction Notification that would typically be required of any non-federal applicant. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

30. The Kentucky Division of Water may require submission of a formal application for an Individual Certification for any project that has been determined to likely have a significant adverse effect upon water quality or degrade surface waters so that existing uses of the water body or downstream waters are precluded. [Statement A and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

31. If the final issued General Permit for Nationwide Permit # 12, 57, or 58 changes significantly, the Division of Water may opt to deny certification for this permit. [Statements A and D and citations KRS 224.70-110, 401 KAR 10:030, Section 1(3)(b) & Section 1(4)(b); and 401 KAR 10:031, Section 2 & Section 4]

Statements of Necessity:

A. This condition is necessary to protect waters categorized under the anti-degradation policy to protect the designated and existing uses and to maintain the associated water quality criteria necessary to protect these water resources.

B. This condition is necessary to protect existing uses and the level of water quality necessary to protect those existing uses shall be assured in impaired water.

C. This condition is necessary for long-term protection of compensatory mitigation sites.

D. This condition is necessary to provide for the prevention, abatement, and control of all water pollution and to conserve water resources for legitimate uses, safeguard from pollution the uncontaminated waters, prevent the creation of any new pollution, and abate any existing pollution.

E. This condition is necessary to protect domestic water supply use.

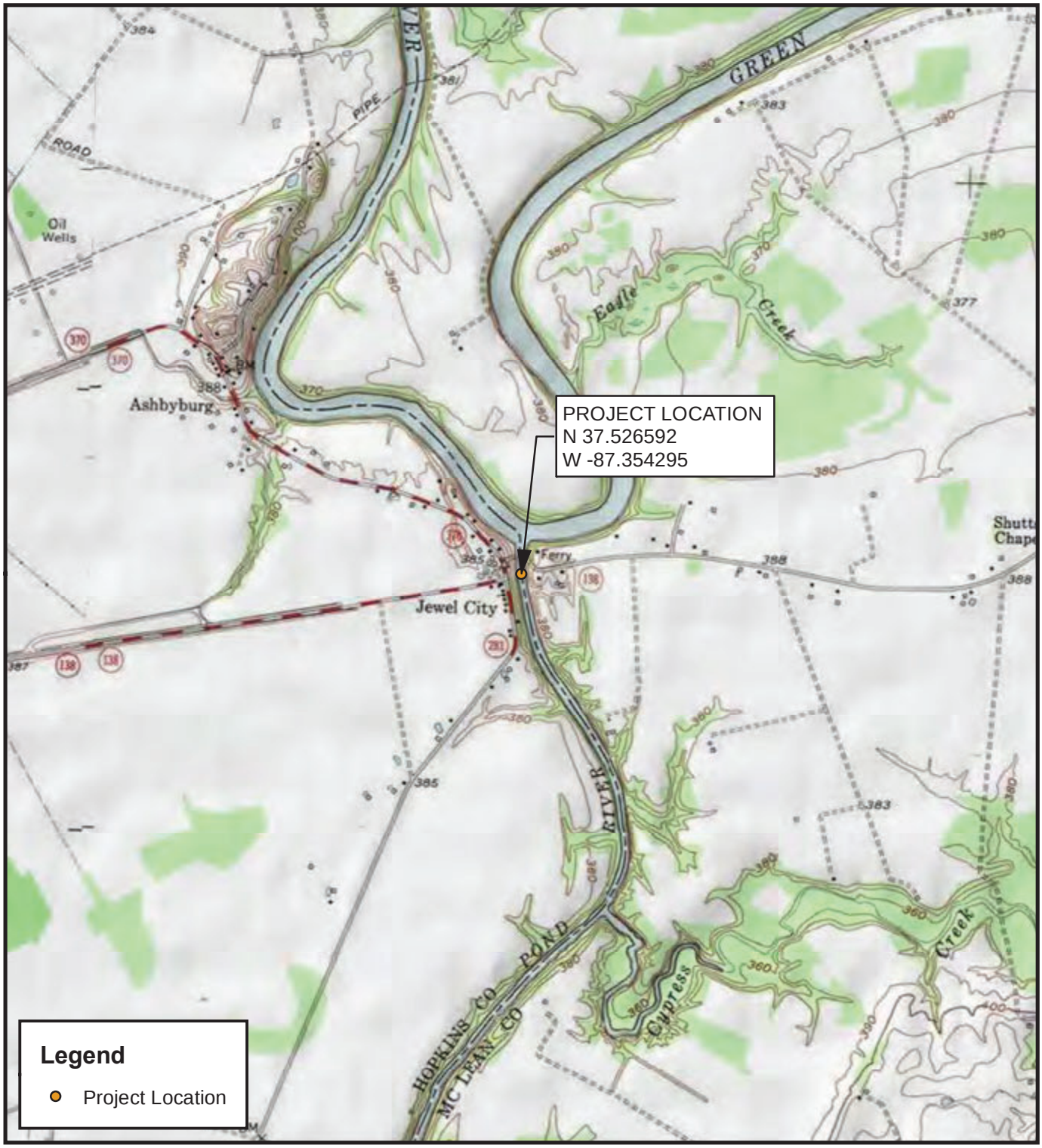
F. This condition is necessary to evaluate, develop, and improve best-management practices in conservation plans, compliance plans, and forest stewardship management plans; establish statewide and regional agriculture water quality plans; and otherwise promote soil and water conservation activities that protect surface waters from the adverse impacts of agriculture operations within the Commonwealth.

Violation of Kentucky state water quality standards may result in civil penalties and remediation actions.

For assistance contact the Kentucky Division of Water, Water Quality Certification Section by email (401WQC@ky.gov) or by phone (502)-564-3410.

R:\Archives\Redwing\Projects\2018 Projects\18-077-GEC KYTC Bridges\18-077-01\Reports\Initial Screening\Biennium Projects\Projects\054B00009N\054B00009N_ Project Location Map.mxd, 05-5-2023, ebowman

Source: USA Topo Maps, (2013) National Geographic Society, USGS 7.5-minute Topographic Map - Beech Grove and Calhoun, Kentucky Quadrangles.



BRIDGE NO.: 054B00009N
HOPKINS COUNTY, KENTUCKY
KYTC ITEM NO.: 2-10024.00

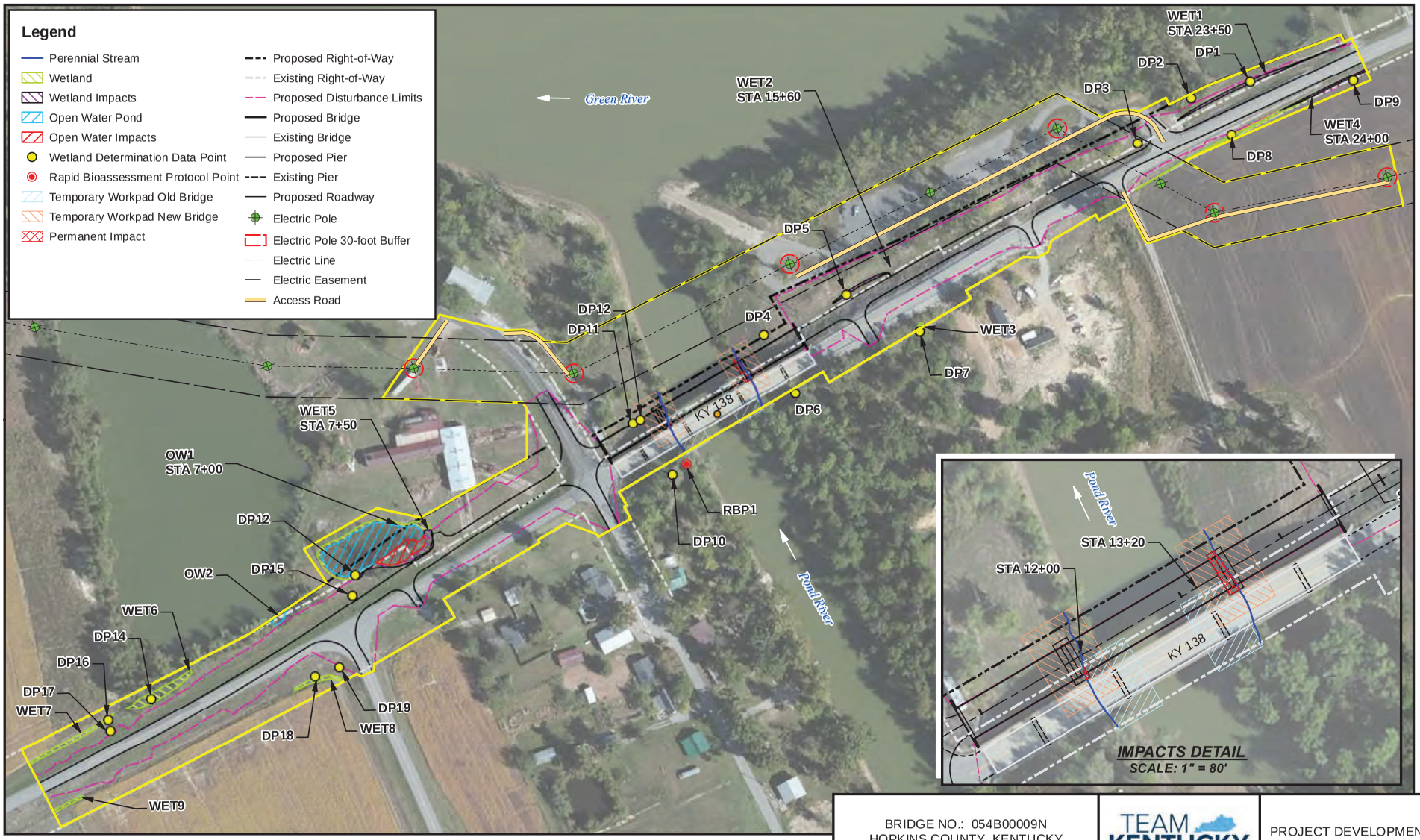
TEAM KENTUCKY
TRANSPORTATION CABINET

PROJECT LOCATION MAP

REVISED DATE: 05-05-23 | DRAWN BY: EDB

FIGURE 1

Source: World Imagery Clarity - Esri and the GIS User Community (2018).



BRIDGE NO.: 054B00009N
HOPKINS COUNTY, KENTUCKY
KYTC ITEM NO.: 2-10024.00

REVISED DATE: 05-23-23 | DRAWN BY: EDB

TEAM KENTUCKY TRANSPORTATION CABINET

PROJECT DEVELOPMENT MAP

FIGURE 2

R:\Archives\Redwing\Projects\2018 Projects\18-077-GEC KYTC Bridges\18-077-01\Reports\Initial Screening\Biennium Projects\Projects\054B00009N\054B00009N_Project Development Map.mxd, 05-24-2023, e

A2 D2 054B00009N Hopkins

Communicate All Promises:#1

Subject: Use of Kittinger Park
Creator: Springer, Tom
Date Created: 11.03.2021 09:26AM

Status: Closed

Commitments	**Kittinger Park (NE quadrant) is a public-owned park and is protected from use during construction by Section 4(f) (23 CFR 774), with the following exceptions:** **(1) The temporary easement and right-of-way purchased for this bridge project can and should be used for their intended purposes.** **(2) The contractor may pursue temporary use of the remaining area of the park for parking and staging during construction, if:** **(a) the details are coordinated with and approved by the McLean County Fiscal Court Judge/Executive Curtis Dame in writing and provided to the KYTC: Office: 270-273-3213 Cell: 270-499-8277, cdame@mcleanky.com;** **(b) adequate access to the park, including the boat ramp and parking, remain open and available to the public at all times.** **(c) any damages caused by the temporary use are restored to the pre-construction conditions.** **Likewise, the property in the NE quadrant outside of the right-of-way is owned by McLean County (even though it is in Hopkins County) and is designated as a future park area. Any temporary use of that future park must be coordinated with and approved by the McLean County Judge/Executive.** **This CAP was written by Tom Springer of the Bridging KY Team, please call or email with any questions: 502-544-6310, tspringer@qk4.com**
Discipline Category	**Environmental**
Initiator Comments	

Comments

Report of Geotechnical Exploration

054B00009N
KY 138 over Pond River
Hopkins County, Kentucky

BRIDGING KENTUCKY
Restore | Renew | Replace

Prepared by:
Stantec Consulting Services Inc.
Lexington, Kentucky

January 25, 2022

BRIDGING KENTUCKY
Restore | Renew | Replace

Stantec Consulting Services Inc.
3052 Beaumont Centre Circle, Lexington KY 40513-1703

January 25, 2022
File: rpt_001_let_178568003

Attention: Mr. Rodney Little, PE
Bridging Kentucky Area 2 Team Lead
Qk4
149 Creek Terrace, Suite 2
Somerset, Kentucky 42503

Reference: Report of Geotechnical Exploration
054B00009N
KY 138 over Pond River
Hopkins County, Kentucky

Dear Mr. Little,

Stantec Consulting Services Inc. (Stantec) is submitting the geotechnical engineering report for the referenced structure with this letter.

This report presents results of the field exploration along with our recommendations for the design and construction for the referenced bridge. As always, we enjoy working with your staff and if we can be of further assistance, please contact our office.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Donald Blanton aac

Donald Blanton, PE
Project Manager
Phone: (859) 422-3033
Fax: (859) 422-3100
Donald.blanton@stantec.com

/dlb

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

REPORT OF GEOTECHNICAL EXPLORATION

January 25, 2022

1.0 INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) has initiated the Bridging Kentucky program. The purpose of the program is to rehabilitate or replace over 1,000 bridges across the state. Bridges that have been identified to be a part of the program are structures that because of their deteriorating conditions and resulting low load ratings are limiting the movement of people and freight across the state.

This report addresses the geotechnical considerations for Bridge 054B00009N, KY 138 over Pond River. The subject bridge site is in Hopkins County. The bridge location is shown on Figure 1 below.

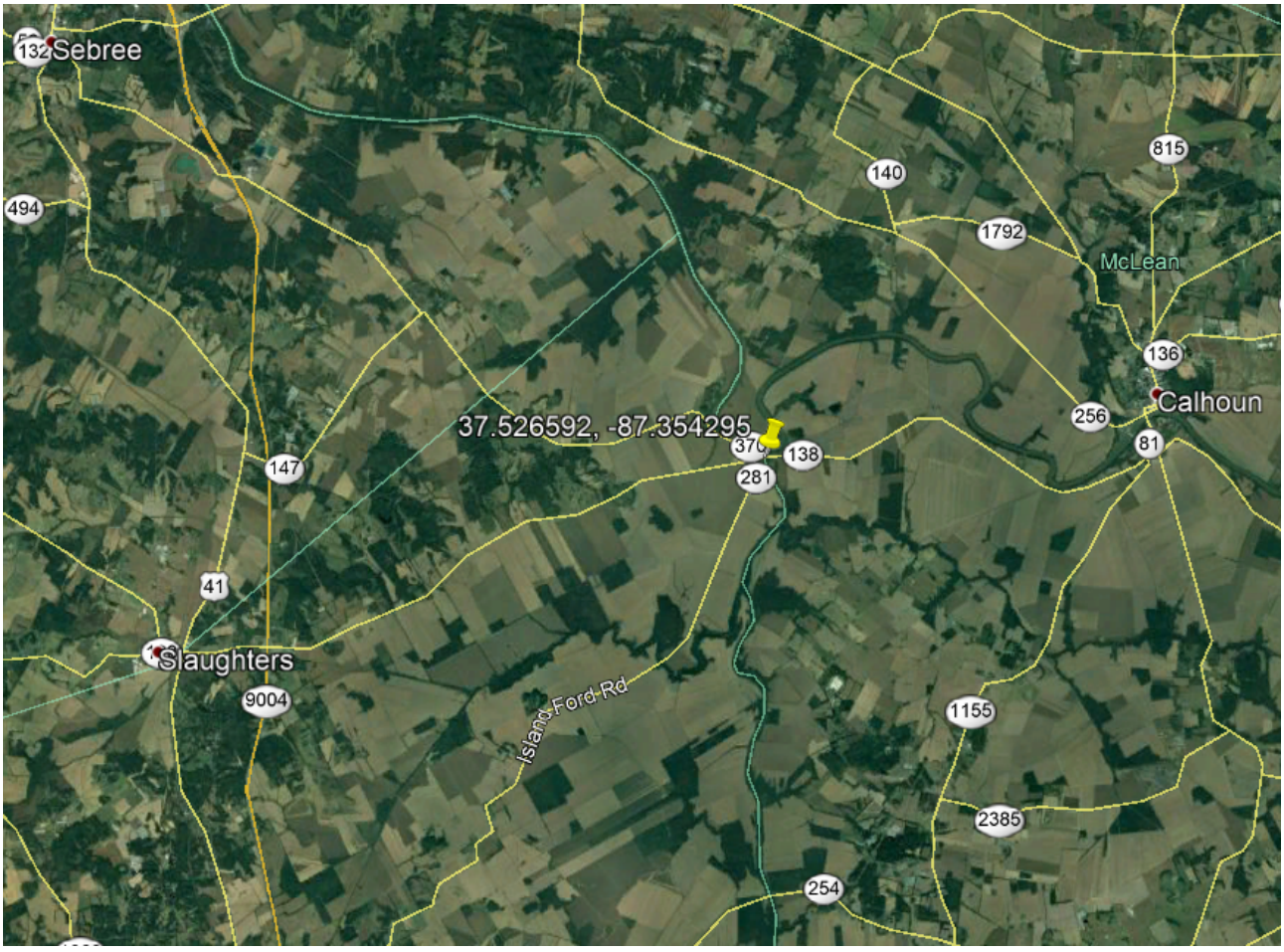


Figure 1. Google Image Showing Project Site.

2.0 SITE TOPOGRAPHY AND GEOLOGIC CONDITIONS

The topography of the site is representative of the Western Coal Field Physiographic area of western Kentucky and is described as a gently rolling uplands. Specifically, the bridge site crosses a drainage feature referenced as Pond River near its confluence with the Green River. This area is a relatively flat plain in the eastern edge of the county in the Green and Pond River Valleys that tends to be subject to flooding because stream gradients that are low.

The site is on the Geologic Map of the Calhoun Quadrangle, Western Kentucky (GQ-1239). Based on the review of this geologic map, the bridge site is underlain by alluvium and lacustrine deposits of the Pleistocene and Holocene geological epoch. This deposit consists of sand, clay, silt, and gravel and are on the order of 110 feet thick.

The Rough Creek fault system is located approximately 1 mile north-northwest of the proposed bridge replacement site.

3.0 FIELD INVESTIGATION

A geotechnical exploration was conducted in March of 2021 which consisted of one subsurface boring, designated herein as 054B00009N-1. Initial design for the bridge had the structure being relocated to the north of the existing bridge. Because of this relocation and the amount of new embankment to be constructed, additional analyses were necessary. Therefore, a second geotechnical exploration was conducted in October of 2021which consisted of two additional boring 054B00009N-2 and 054B00009N-3. The boring locations and surface elevations were obtained by the Bridging Kentucky TEAM and are presented in Appendix A. Table 1 provides a summary of the location, elevation, and depth of each boring drilled for the proposed bridge.

Table 1. KY 138 over Pond River – Boring Summary

Hole No.	Latitude	Longitude	Surface Elevation (ft.) MSL	Top of Rock/Refusal		Bottom of Hole	
				Depth (ft.)	Elevation (ft.) MSL	Depth (ft.)	Elevation (ft.) MSL
054B00009N-1	37.526979	-87.353811	376.0	N/A	N/A	81.5	294.5
054B00009N-2	37.526839	-87.353847	374.7	99.5	275.2	100.6	274.1
054B00009N-3	37.526662	-87.354808	373.2	96.8	276.4	100.2	273.0

[a] No auger refusal was encountered in boring 045B00009N-1.

The drill crew operated a truck-mounted drill rig equipped with hollow-stem augers. The field personnel generally performed soil sampling at five-foot intervals of depth to obtain in situ strength data and specimens for subsequent laboratory natural moisture content determinations and classification testing. Standard penetration testing (SPT) was conducted at regular intervals at these boring locations.

4.0 SUBSURFACE CONDITIONS

In general, the subsurface materials observed in the sample borings consisted primarily of brown to gray lean clay with varying amounts of silt and sand that was moist to wet, and very soft to stiff. Silty sand materials were encountered near bedrock. Standard penetration test blow counts (N) in soil material ranged from 0 to 52 blows per foot. The soil thickness encountered was found to be on the order of 100 feet at the bridge location. Detailed logs of the borings are presented in Appendix B.

Observation wells were not installed. Water was encountered at the time of drilling at depths between 15 and 33 feet. Groundwater can be expected to be encountered at the level of Pond River. Groundwater levels and/or conditions may vary considerably, with time, according to the prevailing climate, rainfall or other factors.

5.0 LABORATORY TESTING AND RESULTS

Stantec performed laboratory testing on soil samples from the borings. All laboratory tests were performed in accordance with the applicable AASHTO or Kentucky Methods soil and rock testing specifications. Laboratory testing consisted of natural moisture content, grain size-sieve analyses (silt plus clay determinations), and soil classification index testing.

The SPT soil samples tested classify as CL, CL-ML and ML according to USCS and A-6 and A-4 based on the AASHTO classification system. Results of the laboratory testing are also presented in Appendix C.

Undisturbed (Shelby) tube samples were obtained from selected locations. Soil samples were extruded from the tubes, trimmed into six-inch specimens, and described visually. Unit weights (wet and dry) and natural moisture contents were determined for each six-inch specimen. Selected specimens were subjected to engineering classification, unconfined compressive strength, consolidated-undrained triaxial testing and one-dimensional consolidation testing. The results of these tests are presented on the appropriate sections in Appendix C.

6.0 ENGINEERING ANALYSES

6.1 GENERAL

This project will consist of replacing the existing bridge. Initial design for the bridge had the structure being relocated to the north of the existing bridge. Because of this relocation, depth to bedrock and the amount of new embankment to be constructed, slope stability and settlement analyses were necessary. Any grading requirements or material placement that may be needed should be placed at 2H:1V slopes or flatter. Based on a combination of existing

conditions and anticipated grades, a recommendation for steel H piles is being provided for support of the foundation elements for the subject structure.

6.2 EMBANKMENT STABILITY ANALYSES

Station 14+50 was evaluated for short- and long-term slope stability along with a rapid drawdown analysis. Stantec evaluated the global stability of the embankment slopes utilizing the SLOPE/W software. Short-term analyses, using total-stress shear-strength parameters for foundations and embankment materials, simulate conditions that will exist immediately following completion of the embankments. Long-term analyses, using effective-stress shear-strength parameters, simulate conditions that will exist long after the embankment is constructed and excess pore pressures within the foundation materials have dissipated.

Based on the proposed construction limits, it is estimated that the majority of the roadway embankments will be constructed from an unknown borrow source. Shear-strength parameters for the soil embankment materials were estimated through trial and error to determine the minimum typical soil strength values which would meet the KYTC factor of safety requirements. The shear strength parameters for the foundation soils were derived from soil classifications, unconfined compressive strength, consolidated-undrained triaxial testing and associated published correlations of such data. Shear-strength parameters used for the embankment and foundation materials are shown on the embankment stability sections in Appendix D. Table 2 summarizes the shear-strength parameters modeled for the embankment materials.

Table 2. Embankment Shear-Strength Parameters

Soil Fill Material						
Short-Term Total Stress				Long-Term Effective Stress		
c	=	1,000 psf		$\overline{c}$	=	200 psf
ϕ	=	0°		$\overline{\phi}$	=	19°
γ	=	120 pcf		γ	=	120 pcf

Results of slope stability analyses, including predicted minimum factors of safety, predicted failure surfaces, and modeled groundwater table positions are presented on the computer output in Appendix D. A summary of the results of the embankment stability analyses is provided in Table 3.

Table 3. Summary of Embankment Stability Analysis

Station	Slope Geometry (H:V)	Approximate Embankment Height (ft)	Factor of Safety		
			Short-Term	Long-Term	Rapid draw-down
14+50	2.1	20	1.8	1.6	1.3

The factors of safety presented in Table 3 meet or exceed the minimum target values outlined in the KYTC Geotechnical Manual and indicate the 2:1 (H:V) embankment configurations should exhibit adequate stability as proposed for the embankment configurations.

6.3 SETTLEMENT AND LATERAL SQUEEZE POTENTIAL

This project will consist of replacing the existing bridge. The new bridge will be relocated to the north of the existing bridge. Project plans indicate the back-station approach embankment will be on the order of 22 feet in height. The subsurface exploration indicates the foundation soils at End Bent 2 to consist of approximately 95 feet of clay and silty clay materials overlying silty sands to a depth of approximately 97 feet. Settlement parameters used in the analyses were based on the one-dimensional consolidation testing results. Based on the analyses, at total of approximately 9 inches of settlement will occur at the left shoulder at End Bent 2. It is estimated that the approximate time for to achieve primary consolidation (90% of total settlement) of the clays soils is on the order of 1,656 days (4.5 years). Based on these results and the anticipated construction schedule it is estimated that the foundation elements will be designed to accommodate the down drag loads.

Studies conducted by the FHWA have shown that some bridge end bents supported on piles driven through thick deposits of compressive soils have tilted or rotated toward the embankment. FHWA guidelines suggest that if the pressure exerted by the weight of the embankment exceeds three times the undrained shear strength of the foundation soils, the potential for lateral squeeze exists. A review of the subsurface data obtained from the borings indicates the clay soils beneath End Bent 2 approach embankment exhibit an undrained shear strength of 950 psf. The maximum embankment loading at this location was estimated to be approximately 2,640 psf. Based on the noted criteria, the embankment loading does not exceed three times the average soil shear strength, indicating the potential for lateral squeeze is low at this location.

6.4 DOWNDRAG ESTIMATES

Based on the anticipated loads and the subsurface profile at the bridge site, a foundation system consisting of deep foundation elements bearing on the underlying bedrock. The settlement analyses presented in Section 6.3, the foundation soils at End Bent 2 may experience 9 inches due to construction of the new embankment. Studies indicate that little as 0.4 to 0.5 inches of settlement is sufficient to mobilize negative skin friction forces at the pile-soil interface. It is our understanding that because of anticipated construction schedule the foundation elements will be installed without a waiting period for settlement. Therefore, the proposed piles at the abutment locations will be subject to negative skin friction. Based on the settlement analyses, the pile length subjected to downdrag is 93.3 feet (based on an estimated top of pile elevation 393 feet). The estimated drag load for a 12x53 H-pile is 356.9 kips (178.5 tons). The estimated drag load for a 14x89 H-pile is 414.5 kips (207.3 tons).

6.5 STEEL H-PILE ANALYSES

6.5.1 Pile Capacity

Because of the anticipated loads and the subsurface profile at the bridge site, a foundation system consisting of deep foundation elements bearing on the underlying bedrock is being recommended. Due to the nature of the soil deposits and the subsurface conditions observed at the site, an axial resistance factor (ϕ_c) of 0.6 is recommended for good driving conditions as outlined in Section 6.5.4.2 of the current LRFD Design Specifications. The estimated total factored axial resistance of a 12x53 H-pile using (ϕ_c) of 0.6, is 465.0 kips. For 14x89 piles, the estimated total factored axial resistance is 783.0 kips. An idealized soil profile is presented in Appendix E.

6.5.2 Hammer Energy

Static pile analyses were conducted to estimate the ultimate driving resistance that 12-inch and 14-inch steel H-piles would experience during the installation process. Drivability analyses were performed at the End Bent locations. The analyses were performed using guidelines presented in the FHWA "Soils and Foundations Workshop Manual".

The soil column contributing to driving resistance at the End Bent locations includes existing embankment material and foundation soils. The pile is estimated to encounter silty, sandy clay materials. The results of FHWA research and other literature regarding pile installation indicate that significant reductions in skin resistances occur during pile driving, primarily due to the dynamics of the installation process. Soils are remolded and pore water pressures apparently increase, causing reductions in shear strengths. The driving resistances were estimated under the condition that no interruptions, and therefore no pile "set" characteristics would be experienced during the driving process.

The drivability analyses were conducted using the GRLWEAP (Version 2010) computer program for steel H-piles driven to depth. To perform the drivability analyses, two situations were modeled. The first one involved determining the minimum hammer energy which would drive the H-piles to depth without excessive blows, and which would achieve the maximum allowable pile capacity. This condition would show the minimum hammer energy necessary to drive the pile to depth. The second part of the analyses would determine what the maximum hammer energy can be to drive the piles to depth, and one which would not damage the pile during the driving process. The FHWA publication titled "Soils and Foundations Workshop Manual-Second Edition" defines a reasonable range of hammer blows to be between 30 and 144 blows per foot for a steel H-pile.

The results of the drivability analyses indicate that a hammer with a minimum energy of 60 foot-kips and a maximum energy of 186 foot-kips will be required to drive 12x53 steel H-piles to practical refusal without encountering excessive blow counts or damaging the piles.

The drivability analyses for the 14-inch H-piles indicate that a hammer with a minimum energy of 66 foot-kips and a maximum energy of 265 foot-kips will be required to drive 14x89 steel H-piles to practical refusal without encountering excessive blow counts or damaging the piles.

7.0 SEISMIC DESIGN CONSIDERATIONS

The 2020 AASHTO LRFD Bridge Design Specifications provide guidelines for determining the seismic hazard at a bridge site. The seismic hazard for a bridge site is characterized by the acceleration response spectrum and the site factors for the relevant site classification. Based on the results of the exploration and the geology of the area, the soil and rock profile in the vicinity of the bridge should be classified as site classification E, as per AASHTO, Table 3.10.3.1.1 - Site Class Definitions, and used for design purposes.

8.0 ROADWAY AND BRIDGE RECOMMENDATIONS

Stantec developed the following recommendations based upon reviews of available data, information obtained during the field exploration, results of laboratory testing and engineering analyses, and discussions with TEAM personnel.

8.1 ROADWAY GEOTECHNICAL NOTES

8.1.1. Clearing and grubbing of embankment areas shall be completed in accordance with Section 202 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

8.1.2. Removal of existing structures and other obstructions shall be completed in accordance with Section 203 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

8.1.3. Procedures shall be performed as required to control erosion and water pollution in accordance with Sections 212 and 213 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

8.1.4. All water wells and/or cisterns within the limits of construction, whether shown on the plans or not, shall be plugged in accordance with Section 708 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

8.1.5. All catch basins and manholes shall be filled and capped and all septic tanks shall be filled in accordance with Section 708 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

8.1.6. All channel changes and special ditches shall be constructed prior to placement of any embankment materials adjacent to them in accordance with Section 206 of the current

Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Materials excavated from these areas may be utilized in construction of the embankments but may require aeration to the proper moisture contents prior to compaction operations. No extra payment shall be permitted for re-handling, hauling, stockpiling and/or manipulating these materials.

8.1.7. In accordance with Section 206 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, the moisture content of embankment and subgrade materials shall not vary from the optimum moisture content, as determined by KM 64-511, by more than plus or minus two percent. This moisture content requirement shall have equal weight with the density requirement when determining the acceptability of embankment or subgrade construction. Refer to the family of curves for moisture-density relationships.

8.1.8 All soils, whether from roadway excavation or borrow, may require manipulation to obtain proper moisture contents prior to compaction. Direct payment shall not be permitted for re-handling, hauling, stockpiling and/or manipulating soils.

8.1.9. The Contractor is responsible for conducting any operations necessary to excavate the cut areas to the required typical sections. The cost of these operations shall be incidental to the earthwork.

8.1.10. Slope protection meeting the requirements of Section 703 and 805 of the Standard Specifications for Road and Bridge Construction, current edition, will be required at the end bent locations. Place Type I Geotextile Fabric, in accordance with Sections 214 and 843 of the Standard Specifications between the embankment and the protection.

8.1.11. Any saturated, soft, unstable areas encountered within embankment foundation limits and/or any other areas as directed by the Engineer shall be drained and stabilized using broken rock excavated beneath the RDZ. An estimated 3-foot working platform shall be constructed in such areas.

8.1.12. The Contractor shall construct embankment foundation benches and transverse benches as indicated on the plans or as directed by the Engineer, prior to placement of embankments in areas requiring such benches.

8.1.13. Embankment foundation benches/slope serrations and perforated pipe underdrains shall be constructed at the following approximate locations in accordance with current Kentucky Department of Highways Standard Drawings RGX-010 and RDP-006, project cross-sections and as directed by the Engineer. The benches shall be constructed one at a time beginning with the lowest bench. Each bench shall be backfilled prior to excavation of the next bench. This procedure should be followed to help maintain stability of the existing slopes in these areas.

Approximate Station Limits

Mailnline
0+50 to 4+00, Right

Approximate Station Limits

Mailnline
2+50 to 5+50, Left
18+50 to 18+75, Right
21+50 to 24+25, Right
22+00 to 24+50, Left

8.1.14. Conventional transverse benches shall be constructed, and perforated pipe underdrains installed at the following approximate locations in accordance with Kentucky Department of Highways Standard Drawings RDP-005 and RDP-006, project cross-sections (as applicable), and as directed by the Engineer. Contrary to Standard Drawing RDP-006, transverse benches and perforated pipe underdrains shall be installed in both uphill and downhill transition areas between cuts and fills. Existing perforated pipe underdrains along I-71 should be extended.

Approximate Station Limits

Mainline
10+25
18+25

8.1.15. Perforated pipes for subgrade drainage shall be installed at vertical sags and at the upgrade ends of structures, in accordance with Kentucky Department of Highways Standard Drawing RDP-005 and/or as directed by the Engineer. Contrary to Standard Drawing RDP-005, such drains shall be installed even when a rock roadbed is being constructed. These drainage features shall be installed at the following approximate locations:

Approximate Station Limits

Mainline
10+25
15+00

8.1.16. At the writing of this report, a borrow source for embankment material has not been identified. It is recommended that borrow materials to be used for embankment construction meet the following minimum strength parameters.

Soil Fill Material						
Short-Term Total Stress				**Long-Term Effective Stress**		
c	=	1,000 psf		$\overline{c}$	=	200 psf
ϕ	=	0°		$\overline{\phi}$	=	19°
γ	=	120 pcf		γ	=	120 pcf

The Contractor shall perform laboratory testing to confirm that the minimum total stress and effective stress strength parameters are equal to or greater than the above values per material type for each borrow area. The test results shall be submitted to the Engineer for approval.

8.2 BRIDGE FOUNDATION RECOMMENDATIONS

8.2.1. **A plan note should be included by the designer** that indicates that temporary shoring, sheeting, cofferdams, and/or dewatering methods may be required to facilitate foundation construction. It should be anticipated that groundwater will be encountered at foundation locations within the flood plain of Pond River.

8.2.2. The following table provides recommended pile lengths applicable at the referenced substructure element locations. It is estimated that 12-inch or 14-inch H-pile foundations are being planned for use in supporting the new bridge substructure elements.

Hole No.	Total Factored Axial Resistance[a] (kips)	Top of Rock (ft) MSL
12x53 H-Pile	465	276.4 to 275.2
14x89 H-pile	783	276.4 to 275.2

a. Obtained using φ=0.6 based on good driving conditions.

8.2.3. **A plan note should be included by the designer** which states the following hammer criteria: At the End Bent locations, a diesel pile driving hammer with a rated energy between 60 foot-kips and 186 foot-kips will be required to drive 12x53 steel H-piles to practical refusal without encountering excessive blow counts or damaging the piles. Alternatively, a diesel pile driving hammer with a rated energy between 66 foot-kips and 265 foot-kips will be required to drive 14x89 steel H-piles to practical refusal without encountering excessive blow counts or damaging the piles. The Contractor shall submit the proposed pile driving system to the Engineer for approval prior to the installation of the first pile. Approval of the pile driving system by the Engineer will be subject to satisfactory field performance of the pile driving procedures.

8.2.4. The design and installation of the pile foundations should conform to current AASHTO LRFD Bridge Design Specifications, and Section 604 of the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

8.2.5. The AASHTO LRFD Bridge Design Specifications recommend a resistance factor for horizontal geotechnical resistance of a single pile or pile group of 1.0 for lateral capacity analyses.

8.2.6. The 2020 AASHTO LRFD Bridge Design Specifications recommends axial resistance factors based on pile driving conditions (good or severe driving conditions). Based on the general subsurface conditions encountered across the project, it is anticipated that there will be good pile driving conditions. Therefore, it is recommended that the axial resistance of piles in

compression (φ_c) used in design be 0.60. Further, the combined axial and flexural resistance factors for design should be $\varphi_c = 0.70$ and $\varphi_f = 1.00$ as noted in Section 6.5.4.2 of the referenced AASHTO specifications.

9.0 CLOSING

9.1. The conclusions and recommendations presented herein are based on data and subsurface conditions from the borings drilled during the geotechnical exploration using that degree of care and skill ordinarily exercised under similar circumstances by competent members of the engineering profession. No warranties can be made regarding the continuity of conditions across the site.

9.2. General soil descriptions and indicated boundaries are based on an engineering interpretation of all available subsurface information and may not necessarily reflect the actual variation in subsurface conditions between borings.

9.3. The observed water levels and/or conditions indicated on the boring log are as recorded at the time of exploration. These water levels and/or conditions may vary considerably, with time, according to the prevailing climate, rainfall, tail water elevations or other factors and are otherwise dependent on the duration of and methods used in the exploration program.

9.4. Stantec exercised sound engineering judgment in preparing the subsurface information presented herein. This information has been prepared and is intended for design and estimating purposes. Its presentation on the plans or elsewhere is for the purpose of providing intended users with access to the same information. This subsurface information interpretation is presented in good faith and is not intended as a substitute for independent interpretations or judgments of the Contractor.

9.5. All structure details shown herein are for illustrative purposes only and may not be indicative of the final design conditions shown in the contract plans.

APPENDIX A
SITE MAP

LEGEND

◎ SOIL BORING WITH UNDISTURBED (SHELBY) TUBE SAMPLES AND/OR STANDARD PENETRATION TESTS

BRIDGING KENTUCKY
Restore | Renew | Replace

GRAPHIC SCALE: 1" = 50'

BRIDGING KENTUCKY

DATE: 04/08/2021
DRAWN BY: RWE
CKD. BY: DLB
STANTEC JOB NO.: 178568003
FILE NAME:

BRIDGE: 054B00009N
PAGE NO.: -
SHEET: KY 138 OVER POND RIVER HOPKINS/McCLEAN COUNTY, KY
FIG. NO.: -

PLOT DATE: 12/13/2021 USER: ELLISON, DOC
V:\1785\ACTIVE\178568003\GEOTECHNICAL\054B00009N\DRAWING\054B00009N_LAYO.DWG

APPENDIX B
TYPED BORING LOGS

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

Printed: 1/25/22

Project ID: ***178568003***	***Statewide - Various***	Project Type: ***Structure Bridge***
Item Number: ***Statewide***		Project Manager: -

Hole Number ***054B00009N-1***	Immediate Water Depth ***15.0 (03/30/21)***	Start Date ***03/30/2021***	Hole Type ***sample***
Surface Elevation ***376.0'***	Static Water Depth ***NA***	End Date ***03/31/2021***	Rig_Number ***55#4***
Total Depth ***81.5'***	Driller ***M. Martin***	Latitude(83) ***37.526979***	
Location ***+ ' Lt.***		Longitude(83) ***-87.353811***	

Lithology Elevation	Lithology Depth	Description (Overburden / Rock Core)	Sample No. / Std/Ky RQD	Depth (ft) / Run (ft)	Rec. (ft) / Rec (ft)	SPT Blows / Rec (%)	Sample Type / SDI (JS)	Remarks
			1	2.0-3.5	1.5	2-3-2	SPT	
5								5
			2	5.0-6.5	1.0	3-3-3	SPT	
10								10
			3	10.0-11.5	1.5	3-2-3	SPT	
15								15
			4	15.0-16.5	1.5	3-5-5	SPT	
20		Medium stiff to stiff, light brown to brown, moist to wet, lean clay.						20
			5	20.0-21.5	1.5	2-3-4	SPT	
25								25
			6	25.0-26.5	1.5	3-3-3	SPT	
30								30
			7	30.0-31.5	1.5	2-3-3	SPT	
35								35
			8	35.0-36.5	1.5	0-2-3	SPT	
40	336.0	40.0						40
			9	40.0-41.5	1.5	2-2-3	SPT	
45		Soft to stiff, light gray to gray, wet, silty lean clay with sand.						45
			10	45.0-46.5	1.5	1-2-3	SPT	
50								50

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

Project ID: ***178568003***	***Statewide - Various***	Project Type: ***Structure Bridge***
Item Number: ***Statewide***		Project Manager: -

Hole Number ***054B00009N-1***	Immediate Water Depth ***15.0 (03/30/21)***	Start Date ***03/30/2021***	Hole Type ***sample***
Surface Elevation ***376.0'***	Static Water Depth ***NA***	End Date ***03/31/2021***	Rig_Number ***55#4***
Total Depth ***81.5'***	Driller ***M. Martin***	Latitude(83) ***37.526979***	
Location ***+ ' Lt.***		Longitude(83) ***-87.353811***	

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample No.	Depth (ft) Run (ft)	Rec. (ft) Rec (ft)	SPT Blows Rec (%)	Sample Type SDI (JS)	Remarks
		Soft to stiff, light gray to gray, wet, silty lean clay with sand.	Overburden	11	50.0-51.5	1.5	5-6-6	SPT	
55				12	55.0-56.5	1.3	4-5-4	SPT	55
60				13	60.0-61.5	1.5	3-4-6	SPT	60
65				14	65.0-66.5	1.5	1-2-3	SPT	65
70				15	70.0-71.5	1.5	2-2-4	SPT	70
75				16	75.0-76.5	1.5	1-3-4	SPT	75
80									80
294.5	81.5			17	80.0-81.5	1.5	0-0-3	SPT	
85		(Bottom of Hole 81.5') (No Refusal)							85
90									90
95									95
100									100

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

Printed: 1/25/22

Project ID: ***178568003***	***Statewide - Various***	Project Type: ***Structure Bridge***
Item Number: ***Statewide***		Project Manager: -

Hole Number ***054B00009N-2***	Immediate Water Depth ***33.0 (10/19/21)***	Start Date ***10/19/2021***	Hole Type ***sample***
Surface Elevation ***374.7'***	Static Water Depth ***NA***	End Date ***10/20/2021***	Rig_Number ***55T***
Total Depth ***100.6'***	Driller ***Andrew Clements***	Latitude(83) ***37.526839***	
Location ***+ ' Lt.***		Longitude(83) ***-87.353847***	

Lithology Elevation	Lithology Depth	Description (Overburden / Rock Core)	Sample No.	Depth (ft) Run (ft)	Rec. (ft) Rec (ft)	SPT Blows Rec (%)	Sample Type SDI (JS)	Remarks
374.3	0.4	Topsoil.						
			1	2.0-3.5	1.3	3-2-2	SPT	
5								5
			1	5.0-7.0	1.7		ST	
10								10
			2	10.0-11.5	1.5	4-4-5	SPT	
		Soft to stiff, light brown to brown, moist, lean clay.						
15								15
			2	15.0-17.0	1.7		ST	
20								20
			3	20.0-21.5	1.5	2-3-4	SPT	
25	349.7	25.0						25
			3	25.0-27.0	1.8		ST	
		Soft, light brownish gray to grayish brown, moist, lean clay.						
30	344.7	30.0						30
			4	30.0-31.5	1.5	0-1-2	SPT	
35		Soft to stiff, light gray to gray, moist, lean clay.						35
			4	35.0-37.0	1.8		ST	
40	334.7	40.0						40
			5	40.0-41.5	1.3	2-2-2	SPT	
45		Soft, dark gray to gray, wet, silt with sand.						45
			5	45.0-47.0	2.0		ST	
50								50

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

Printed: 1/25/22

Project ID: ***178568003***	***Statewide - Various***	Project Type: ***Structure Bridge***
Item Number: ***Statewide***		Project Manager: -

Hole Number ***054B00009N-2***	Immediate Water Depth ***33.0 (10/19/21)***	Start Date ***10/19/2021***	Hole Type ***sample***
Surface Elevation ***374.7'***	Static Water Depth ***NA***	End Date ***10/20/2021***	Rig_Number ***55T***
Total Depth ***100.6'***	Driller ***Andrew Clements***	Latitude(83) ***37.526839***	
Location ***+ ' Lt.***		Longitude(83) ***-87.353847***	

Lithology Elevation	Lithology Depth	Description (Overburden / Rock Core)	Sample No. / Std/Ky RQD	Depth (ft) / Run (ft)	Rec. (ft) / Rec (ft)	SPT Blows / Rec (%)	Sample Type / SDI (JS)	Remarks
			6	50.0-51.5	1.5	2-1-1	SPT	
		Soft, dark gray to gray, wet, silt with sand.						
55 319.7	55.0							55
			6	55.0-56.0	0.7		ST	
60								60
			7	60.0-61.5	1.3	0-1-1	SPT	
65		Very soft to stiff, light gray to gray, moist, lean clay with sand.						65
			7	65.0-67.0	0.0		ST	
			8	67.0-68.5	1.5	3-7-5	SPT	
70								70
			9	70.0-71.5	1.4	0-1-5	SPT	
75 299.7	75.0							75
			8	75.0-77.0	2.0		ST	
80								80
			10	80.0-81.5	1.5	0-0-0	SPT	
85		Very soft to medium stiff, gray to light gray, moist, sandy silty clay.						85
			9	85.0-87.0	2.0		ST	
90								90
			11	90.0-91.5	0.0	0-0-4	SPT	
95 279.7	95.0							95
			10	95.0-95.1	0.0	11-17-18	ST	
		Dense, light gray, wet, sand with gravel and silt.	12	95.1-96.6	1.4		SPT	
275.2 100	99.5							100

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

Printed: 1/25/22

Project ID: ***178568003***	***Statewide - Various***	Project Type: ***Structure Bridge***
Item Number: ***Statewide***		Project Manager:

Hole Number ***054B00009N-2***	Immediate Water Depth ***33.0 (10/19/21)***	Start Date ***10/19/2021***	Hole Type ***sample***
Surface Elevation ***374.7'***	Static Water Depth ***NA***	End Date ***10/20/2021***	Rig_Number ***55T***
Total Depth ***100.6'***	Driller ***Andrew Clements***	Latitude(83) ***37.526839***	
Location ***+ ' Lt.***		Longitude(83) ***-87.353847***	

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample No. / Std/Ky RQD	Depth (ft) / Run (ft)	Rec. (ft) / Rec (ft)	SPT Blows / Rec (%)	Sample Type / SDI (JS)	Remarks
274.1	100.6	Black, carbonaceous shale.		13	100.0-100.6	0.6	40-50/0.10'	SPT	
		(Bottom of Hole 100.6') (Refusal @ 100)							

105 110 115 120 125 130 135 140 145 150

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

Printed: 1/25/22

Project ID: ***178568003***	***Statewide - Various***	Project Type: ***Structure Bridge***
Item Number: ***Statewide***		Project Manager:

Hole Number ***054B00009N-3***	Immediate Water Depth ***NA***	Start Date ***10/20/2021***	Hole Type ***sample***
Surface Elevation ***373.2'***	Static Water Depth ***NA***	End Date ***10/21/2021***	Rig_Number ***55T***
Total Depth ***100.2'***	Driller ***Andrew Clements***	Latitude(83) ***37.526662***	
Location ***+ ' Lt.***		Longitude(83) ***-87.354808***	

Lithology Elevation	Lithology Depth	Description (Overburden / Rock Core)	Sample No.	Depth (ft) Run (ft)	Rec. (ft) Rec (ft)	SPT Blows Rec (%)	Sample Type SDI (JS)	Remarks
			Std/Ky RQD					
372.8	0.4	Topsoil.						
			1	2.5-4.0	1.5	2-1-3	SPT	
5								5
			1	5.0-7.0	2.0		ST	
10								10
			2	10.0-11.5	1.5	2-3-5	SPT	
15								15
			2	15.0-17.0	1.9		ST	
20								20
			3	20.0-21.5	1.5	3-2-4	SPT	
25		Soft to medium stiff, light brown to brown, moist, lean clay.						25
			3	25.0-27.0	2.0		ST	
30								30
			4	30.0-31.5	1.5	1-1-3	SPT	
35								35
			4	35.0-37.0	2.0		ST	
40								40
			5	40.0-41.5	1.5	1-1-3	SPT	
45								45
			5	45.0-47.0	2.0		ST	
50	323.2	50.0						50

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

Printed: 1/25/22

Project ID: ***178568003***	***Statewide - Various***	Project Type: ***Structure Bridge***
Item Number: ***Statewide***		Project Manager: -

Hole Number ***054B00009N-3***	Immediate Water Depth ***NA***	Start Date ***10/20/2021***	Hole Type ***sample***
Surface Elevation ***373.2'***	Static Water Depth ***NA***	End Date ***10/21/2021***	Rig_Number ***55T***
Total Depth ***100.2'***	Driller ***Andrew Clements***	Latitude(83) ***37.526662***	
Location ***+ ' Lt.***		Longitude(83) ***-87.354808***	

Lithology Elevation	Lithology Depth	Description	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
		Overburden	6	50.0-51.5	1.3	0-0-1	SPT	
55		Very soft to soft, light gray, moist, lean clay.						55
			6	55.0-57.0	2.0		ST	
60 313.2	60.0							60
		Rock Core	7	60.0-61.5	1.5	0-0-4	SPT	
65								65
			7	65.0-67.0	2.0		ST	
		Medium stiff, gray, moist, silty clay.						
70								70
			8	70.0-71.5	1.5	0-2-5	SPT	
75 298.2	75.0							75
			8	75.0-77.0	2.0		ST	
80								80
			9	80.0-81.5	1.5	0-0-1	SPT	
		Very soft to stiff, gray, wet, silty clay with sand.						
85								85
			9	85.0-87.0	0.0		ST	
			10	87.0-88.5	1.5	2-3-11	SPT	
90 283.2	90.0							90
			11	90.0-91.5	0.9	16-30-22	SPT	
95		Medium dense to dense, gray, wet, silty sand with gravel.						95
			10	95.0-95.2	0.2	11-11-9	ST	
276.4	96.8		12	95.2-96.7	1.5		SPT	
		Black, carbonaceous shale.						
100 273.0	100.2							100

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

Printed: 1/25/22

Project ID: ***178568003***	***Statewide - Various***	Project Type: ***Structure Bridge***
Item Number: ***Statewide***		Project Manager:

Hole Number ***054B00009N-3***	Immediate Water Depth ***NA***	Start Date ***10/20/2021***	Hole Type ***sample***
Surface Elevation ***373.2'***	Static Water Depth ***NA***	End Date ***10/21/2021***	Rig_Number ***55T***
Total Depth ***100.2'***	Driller ***Andrew Clements***	Latitude(83) ***37.526662***	
Location ***+ ' Lt.***		Longitude(83) ***-87.354808***	

Lithology		Description	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Overburden / Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
			13	100.0-100.2	0.2	50/0.20'	SPT	
105		(Bottom of Hole 100.2') (Refusal @ 100)						105
110								110
115								115
120								120
125								125
130								130
135								135
140								140
145								145
150								150

APPENDIX C
LABORATORY DATA SHEETS

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-1, 2.0'-3.5', 5.0'-6.5'	Lab ID	1275
Sample Type	SPT Composite	Date Received	4-1-21
		Date Reported	4-12-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
3/4"	19	100.0
3/8"	9.5	99.0
No. 4	4.75	98.9
No. 10	2	98.7
No. 40	0.425	98.0
No. 200	0.075	88.8
	0.02	56.8
	0.005	32.7
	0.002	25.1
estimated	0.001	19.7

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	1.1	1.3
Coarse Sand	0.2	0.7
Medium Sand	0.7	---
Fine Sand	9.2	9.2
Silt	56.1	63.7
Clay	32.7	25.1

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	33
Plastic Limit:	18
Plasticity Index:	15
Activity Index:	0.6

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.73

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-6 (13)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-1, 2.0'-3.5', 5.0'-6.5'
Lab ID: 1275

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared using: AASHTO T 87

Particle Shape: Rounded and Angular
Particle Hardness: Hard and Durable

Tested By: TRH
Test Date: 04-02-2021
Date Received: 04-01-2021

Maximum Particle size: 3/4" Sieve

Sieve Size	% Passing
3/4"	100.0
3/8"	99.0
No. 4	98.9
No. 10	98.7

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on -3 inch fraction only

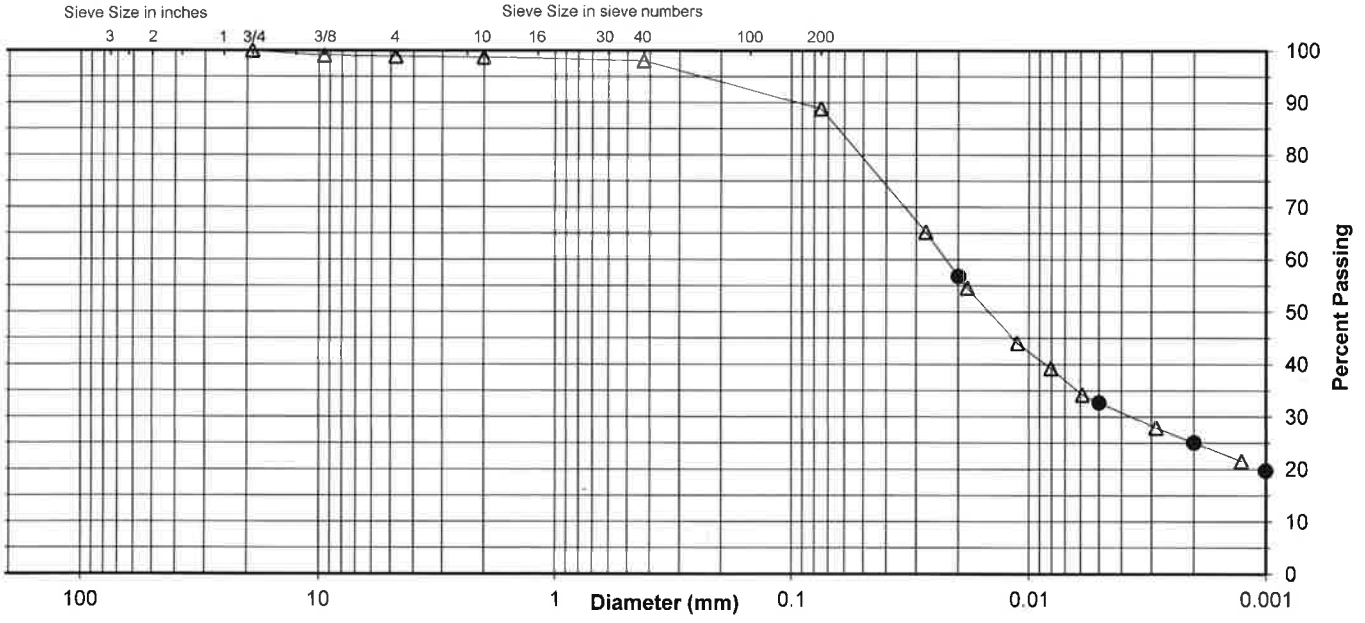
Specific Gravity: 2.73

Dispersed using Apparatus A - Mechanical, for 1 minute

No. 40	98.0
No. 200	88.8
0.02 mm	56.8
0.005 mm	32.7
0.002 mm	25.1
0.001 mm	19.7

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	1.1	0.2	0.7	9.2	56.1	32.7
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	1.3			0.7	9.2	63.7	25.1



Comments

Reviewed By RJ

Template: lmp_sum_input.xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

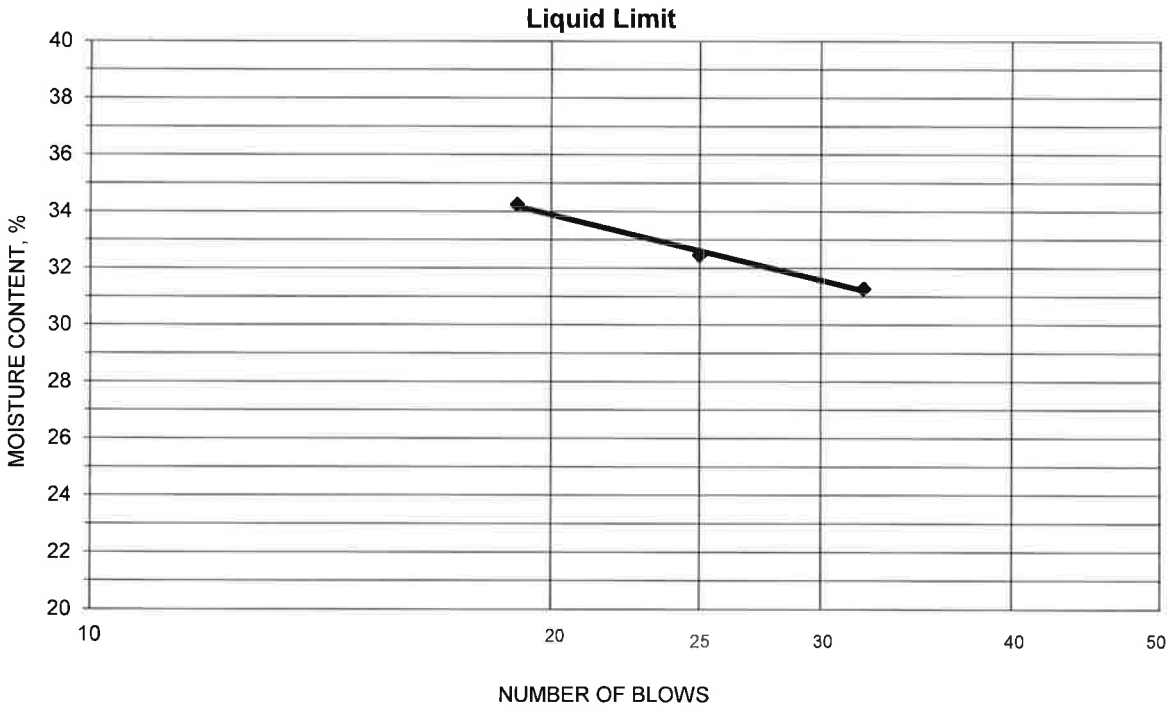
Reported By: RJ
Report Date: 04/12/2021

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-1, 2.0'-3.5', 5.0'-6.5'	Lab ID	1275
		% + No. 40	2
Tested By	JMB	Test Method	AASHTO T 89 & T 90
Test Date	04-09-2021	Prepared	Dry
		Date Received	04-01-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
11.85	10.07	4.38	32	31.3	
11.46	9.71	4.32	25	32.5	
11.73	9.85	4.36	19	34.2	33



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
11.92	10.75	4.32	18.2	18	15
11.38	10.34	4.34	17.3		

Remarks: _____

Reviewed By RJ

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-1, 10.0'-11.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 1170
Particle Shape: N/A
Particle Hardness: N/A
Sample Dry Mass (g): 305.68
Moisture Content (%): 22.0

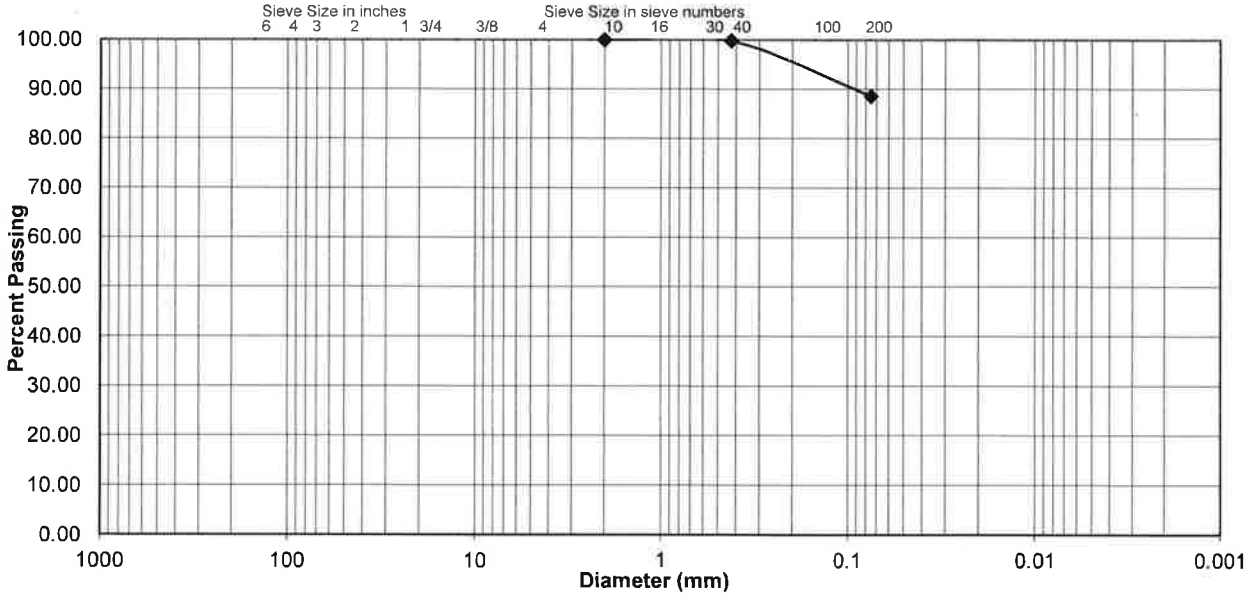
Project Number: 178568003
Lab ID: 1278
Date Received: 04-01-2021
Preparation Date: 04-01-2021
Test Date: 04-06-2021

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 10	0.00	0.0	100.0
No. 40	0.52	0.2	99.8
No. 200	34.33	11.2	88.6
Pan	270.83	88.6	---

% Gravel	0.0
% Sand	11.4
% Fines	88.6
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By: RHB

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Version: 20170216
Approved By: RJ

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Lexington, Kentucky

Reported By: RHB
Report Date: 04/06/2021

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-1, 15.0'-16.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 1170
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 393.22
Moisture Content (%): 26.6

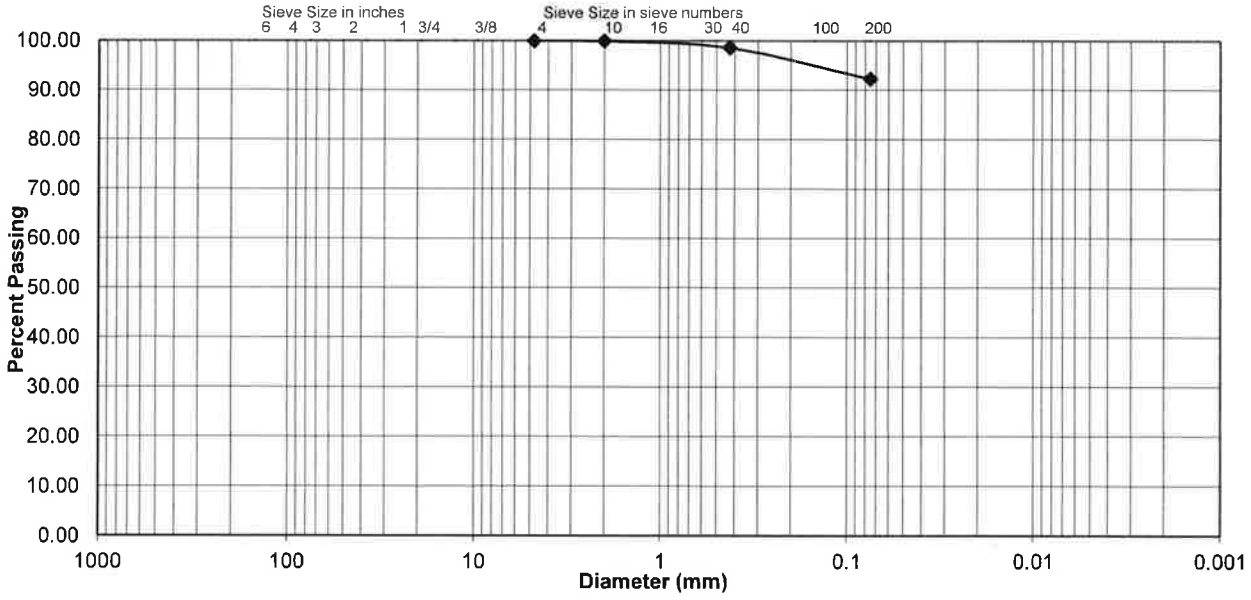
Project Number: 178568003
Lab ID: 1279
Date Received: 04-01-2021
Preparation Date: 04-01-2021
Test Date: 04-06-2021

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.21	0.1	99.9
No. 40	5.25	1.3	98.6
No. 200	24.93	6.3	92.3
Pan	362.83	92.3	---

% Gravel	0.1
% Sand	7.7
% Fines	92.3
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

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Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RHB
Report Date: 04/06/2021

Stantec

Gradation Analysis

AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-1, 20.0'-21.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 1170
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 419.06
Moisture Content (%): 24.2

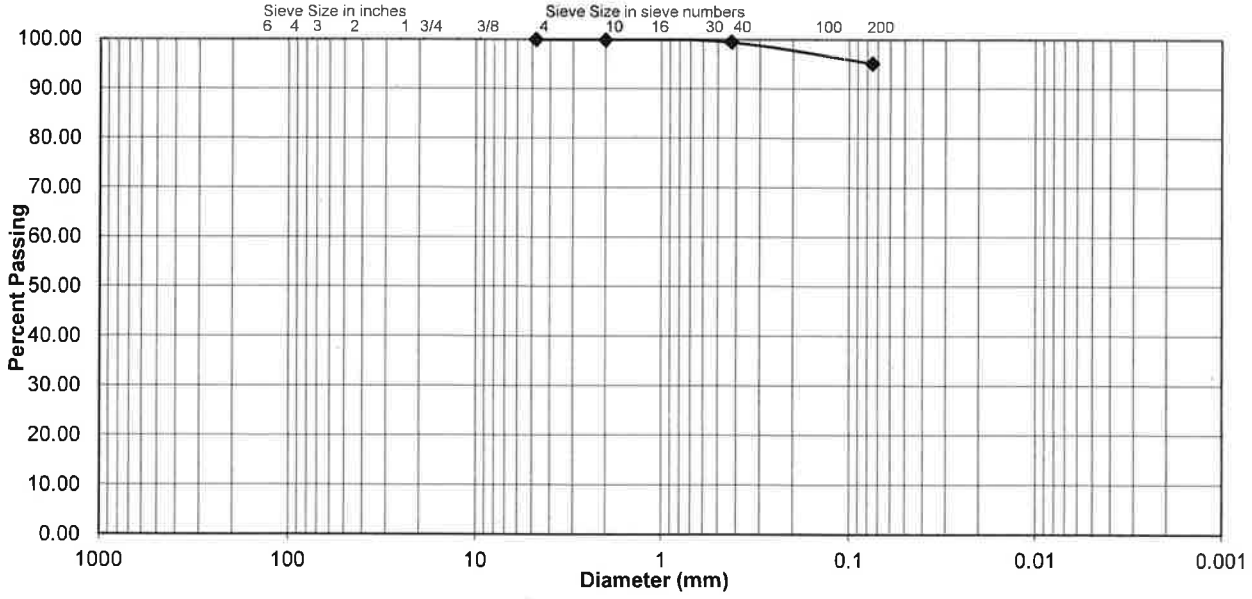
Project Number: 178568003
Lab ID: 1280
Date Received: 04-01-2021
Preparation Date: 04-01-2021
Test Date: 04-06-2021

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.28	0.1	99.9
No. 40	1.75	0.4	99.5
No. 200	18.25	4.4	95.2
Pan	398.78	95.2	---

% Gravel	0.1
% Sand	4.8
% Fines	95.2
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By: RHB

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-1, 25.0'-26.5', 30.0'-31.5'	Lab ID	1281
Sample Type	SPT Composite	Date Received	4-1-21
		Date Reported	4-9-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
3/4"	19	100.0
3/8"	9.5	99.3
No. 4	4.75	99.2
No. 10	2	98.9
No. 40	0.425	98.5
No. 200	0.075	89.7
	0.02	62.2
	0.005	32.7
	0.002	24.8
estimated	0.001	19.4

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.8	1.1
Coarse Sand	0.3	0.4
Medium Sand	0.4	---
Fine Sand	8.8	8.8
Silt	57.0	64.9
Clay	32.7	24.8

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	33
Plastic Limit:	18
Plasticity Index:	15
Activity Index:	0.6

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.73

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-6 (13)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-1, 25.0'-26.5', 30.0'-31.5'
Lab ID: 1281

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared using: AASHTO T 87

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: TRH
Test Date: 04-02-2021
Date Received: 04-01-2021

Maximum Particle size: 3/4" Sieve

Sieve Size	% Passing
3/4"	100.0
3/8"	99.3
No. 4	99.2
No. 10	98.9

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on -3 inch fraction only

Specific Gravity: 2.73

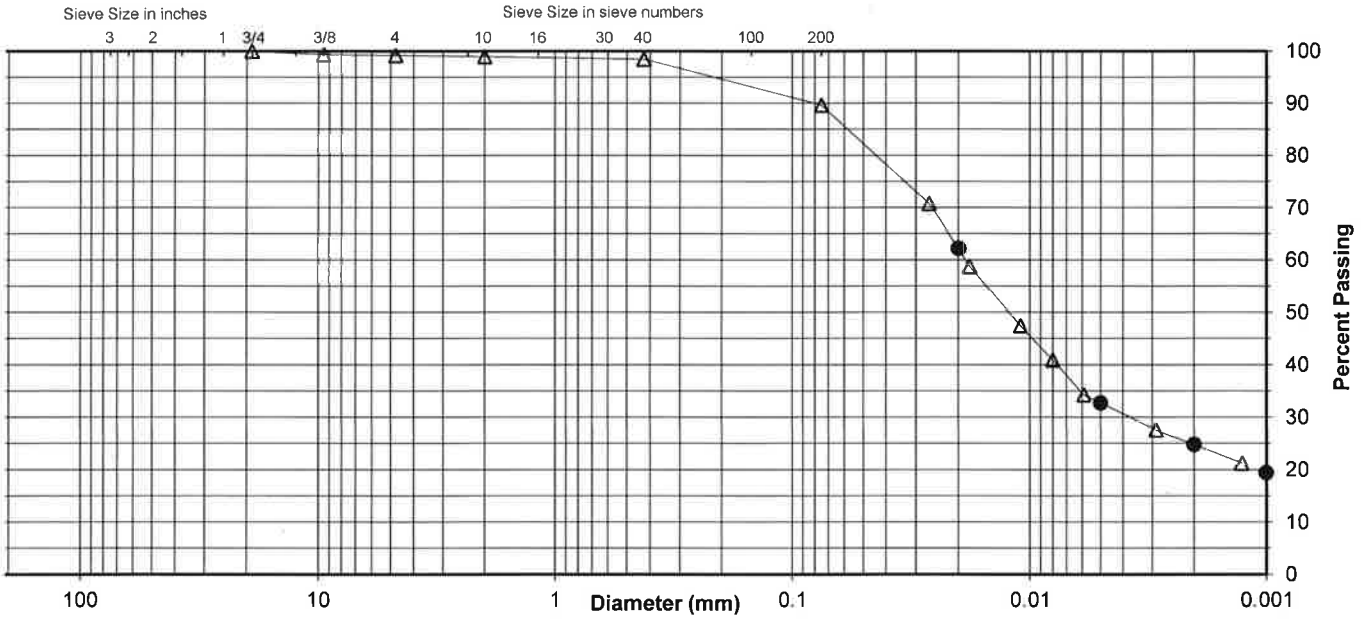
Dispersed using Apparatus A - Mechanical, for 1 minute

No. 40	98.5
No. 200	89.7
0.02 mm	62.2
0.005 mm	32.7
0.002 mm	24.8
0.001 mm	19.4

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.8	0.3	0.4	8.8	57.0	32.7

	Gravel	Coarse Sand	Fine Sand	Silt	Clay
AASHTO	1.1	0.4	8.8	64.9	24.8



Comments

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Stantec Consulting Services Inc.
Lexington, Kentucky

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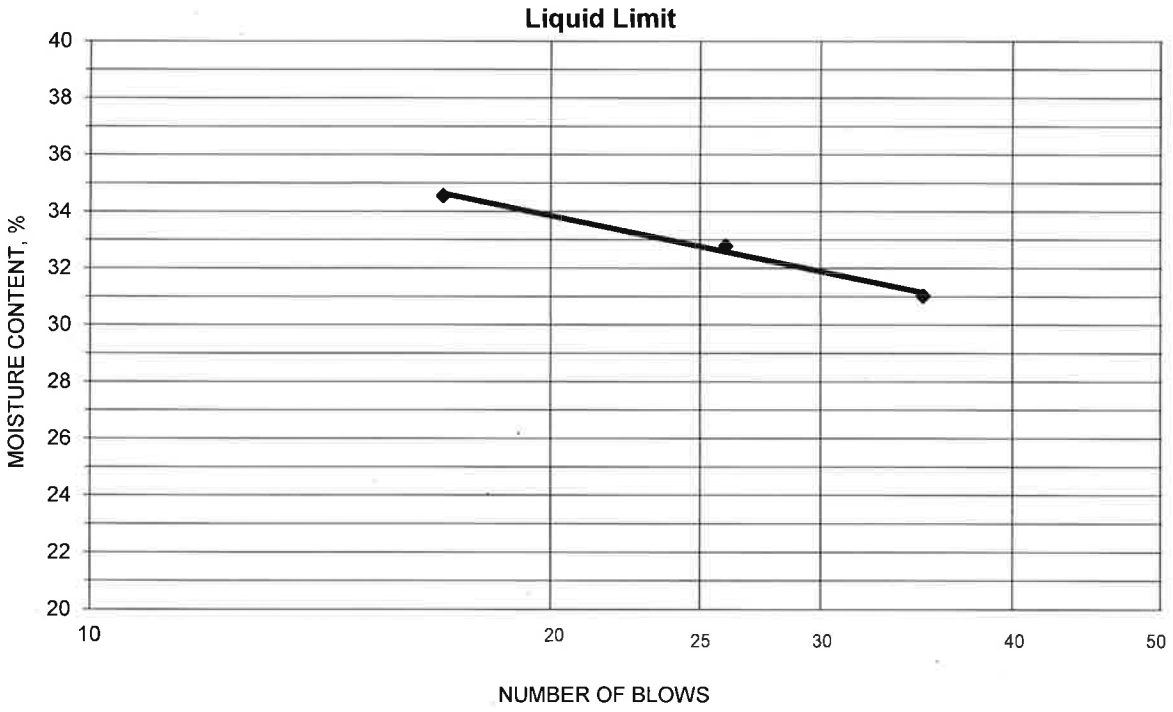
Report Date: 04/09/2021

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-1, 25.0'-26.5', 30.0'-31.5'	Lab ID	1281
		% + No. 40	2
Tested By	JMB	Test Method	AASHTO T 89 & T 90
Test Date	04-08-2021	Prepared	Dry
		Date Received	04-01-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
16.96	15.62	11.30	35	31.0	
20.99	18.60	11.31	26	32.8	
19.53	17.44	11.39	17	34.5	33



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.65	18.43	11.54	17.7	18	15
19.42	18.16	11.38	18.6		

Remarks: _____

Reviewed By RJ

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-1, 35.0'-36.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 1170
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 300.78
Moisture Content (%): 23.4

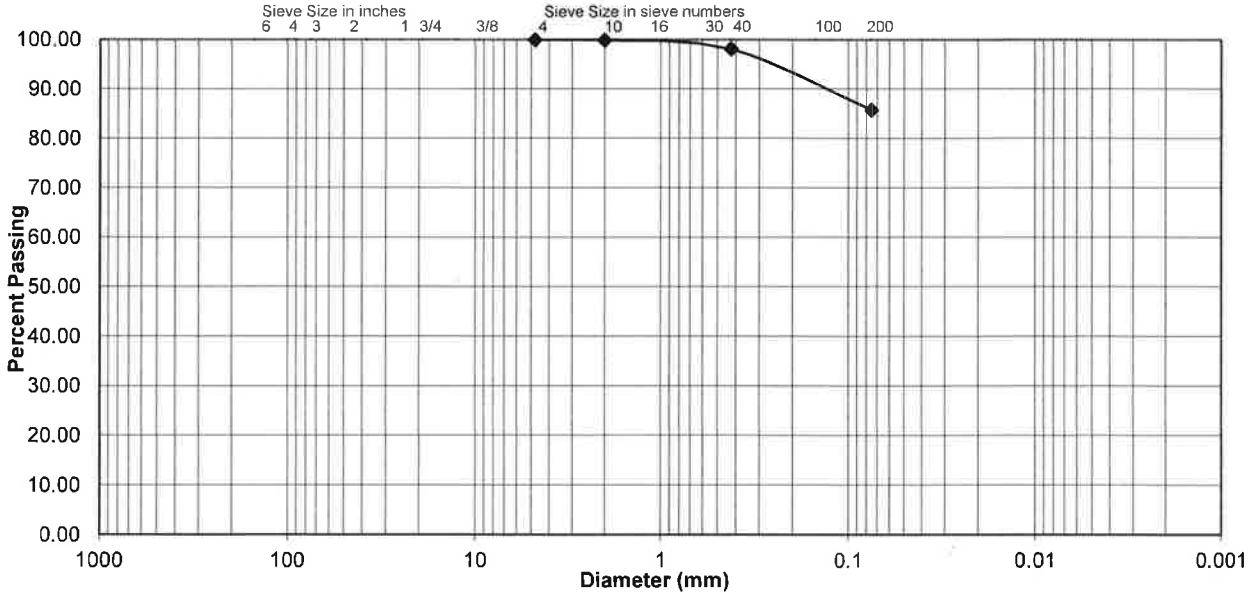
Project Number: 178568003
Lab ID: 1284
Date Received: 04-01-2021
Preparation Date: 04-01-2021
Test Date: 04-06-2021

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.23	0.1	99.9
No. 40	5.40	1.8	98.1
No. 200	37.23	12.4	85.8
Pan	257.92	85.8	---

% Gravel	0.1
% Sand	14.2
% Fines	85.8
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

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Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RHB
Report Date: 04/06/2021

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-1, 40.0'-41.5', 45.0'-46.5', 50.0'-51.5'	Lab ID	1285
Sample Type	SPT Composite	Date Received	4-1-21
		Date Reported	4-12-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
3/8"	9.5	100.0
No. 4	4.75	99.8
No. 10	2	99.7
No. 40	0.425	99.4
No. 200	0.075	77.4
	0.02	41.2
	0.005	21.7
	0.002	15.3
estimated	0.001	11.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.2	0.3
Coarse Sand	0.1	0.3
Medium Sand	0.3	---
Fine Sand	22.0	22.0
Silt	55.7	62.1
Clay	21.7	15.3

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	22
Plastic Limit:	17
Plasticity Index:	5
Activity Index:	0.3

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol:	CL-ML
Group Name:	Silty clay with sand
AASHTO Classification:	A-4 (2)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-1, 40.0'-41.5', 45.0'-46.5', 50.0'-51.5'
Lab ID: 1285

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared using: AASHTO T 87

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: TRH
Test Date: 04-02-2021
Date Received: 04-01-2021

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3/8"	100.0
No. 4	99.8
No. 10	99.7

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on -3 inch fraction only

Specific Gravity: 2.7

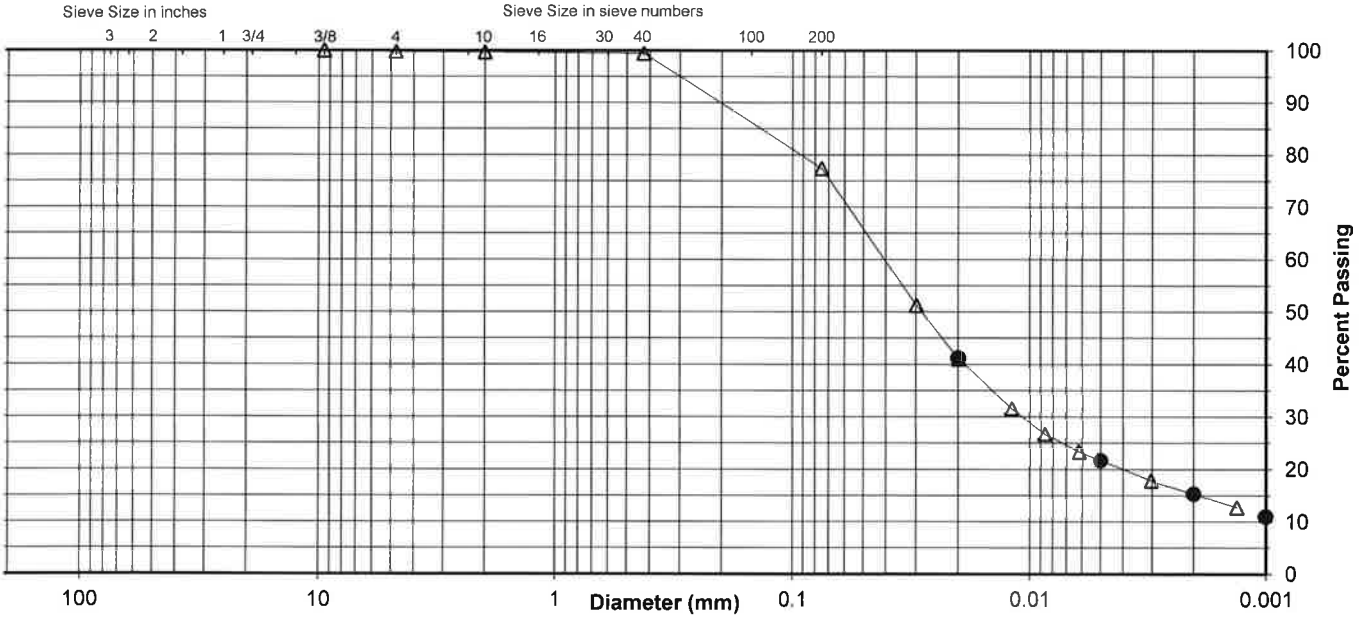
Dispersed using Apparatus A - Mechanical, for 1 minute

No. 40	99.4
No. 200	77.4
0.02 mm	41.2
0.005 mm	21.7
0.002 mm	15.3
0.001 mm	11.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.2	0.1	0.3	22.0	55.7	21.7

	Gravel	Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.3	0.3	22.0	62.1	15.3



Comments

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Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 04/12/2021

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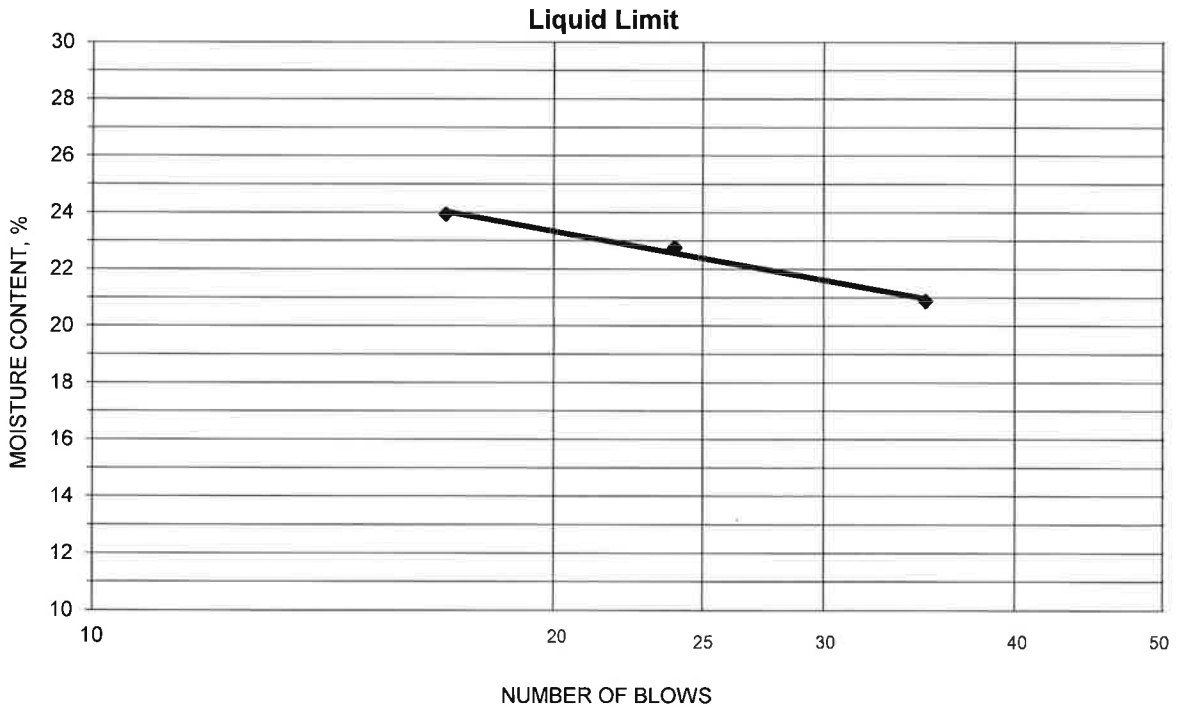
ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-1, 40.0'-41.5', 45.0'-46.5', 50.0'-51.5'	Lab ID	1285
		% + No. 40	1
Tested By	JMB	Test Method	AASHTO T 89 & T 90
Test Date	04-09-2021	Prepared	Dry
		Date Received	04-01-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
17.96	16.81	11.30	35	20.9	
20.10	18.48	11.36	24	22.8	
17.95	16.67	11.32	17	23.9	22



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
20.37	19.11	11.32	16.2	17	5
19.09	17.95	11.33	17.2		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-1, 55.0'-56.5', 60.0'-61.5'	Lab ID	1289
Sample Type	SPT Composite	Date Received	4-1-21
		Date Reported	4-9-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 10	2	100.0
No. 40	0.425	99.6
No. 200	0.075	85.8
	0.02	52.8
	0.005	27.2
	0.002	19.2
estimated	0.001	14.6

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.4
Medium Sand	0.4	---
Fine Sand	13.8	13.8
Silt	58.6	66.6
Clay	27.2	19.2

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	25
Plastic Limit:	15
Plasticity Index:	10
Activity Index:	0.5

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.73

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-4 (6)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-1, 55.0'-56.5', 60.0'-61.5'
Lab ID: 1289

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared using: AASHTO T 87

Particle Shape: N/A
Particle Hardness: N/A

Tested By: TRH
Test Date: 04-02-2021
Date Received: 04-01-2021

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on -3 inch fraction only

Specific Gravity: 2.73

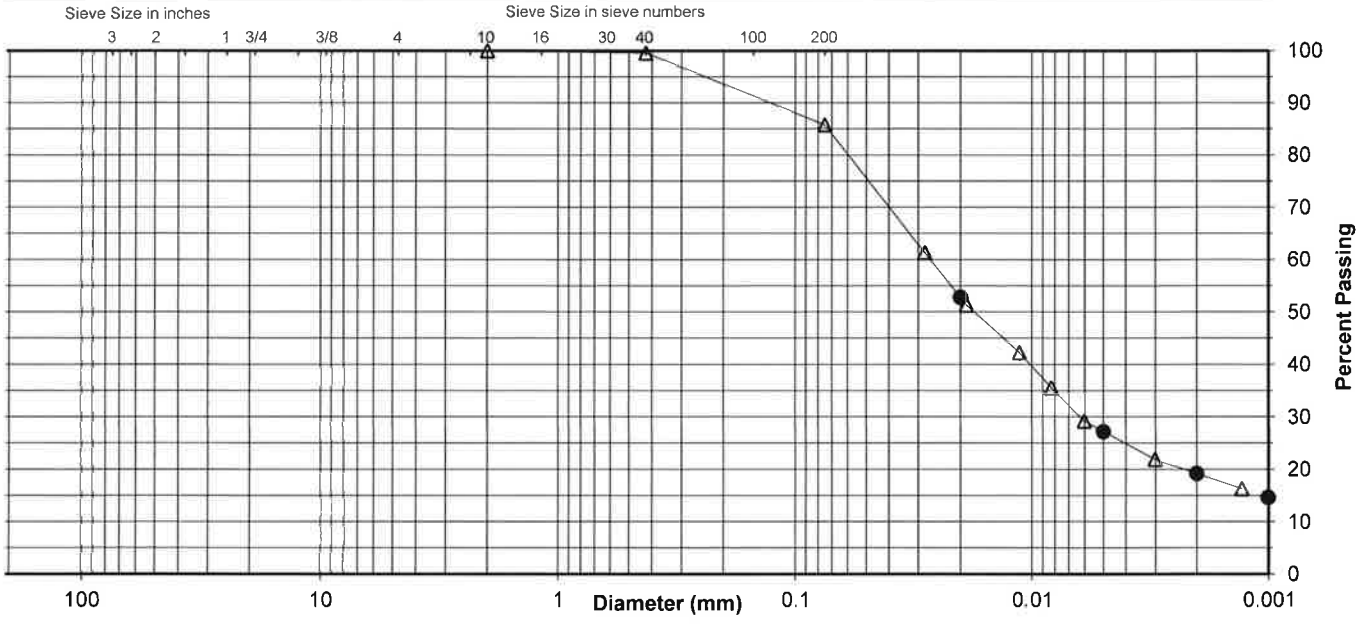
Dispersed using Apparatus A - Mechanical, for 1 minute

No. 40	99.6
No. 200	85.8
0.02 mm	52.8
0.005 mm	27.2
0.002 mm	19.2
0.001 mm	14.6

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.0	0.4	13.8	58.6	27.2

	Gravel	Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.0	0.4	13.8	66.6	19.2



Comments

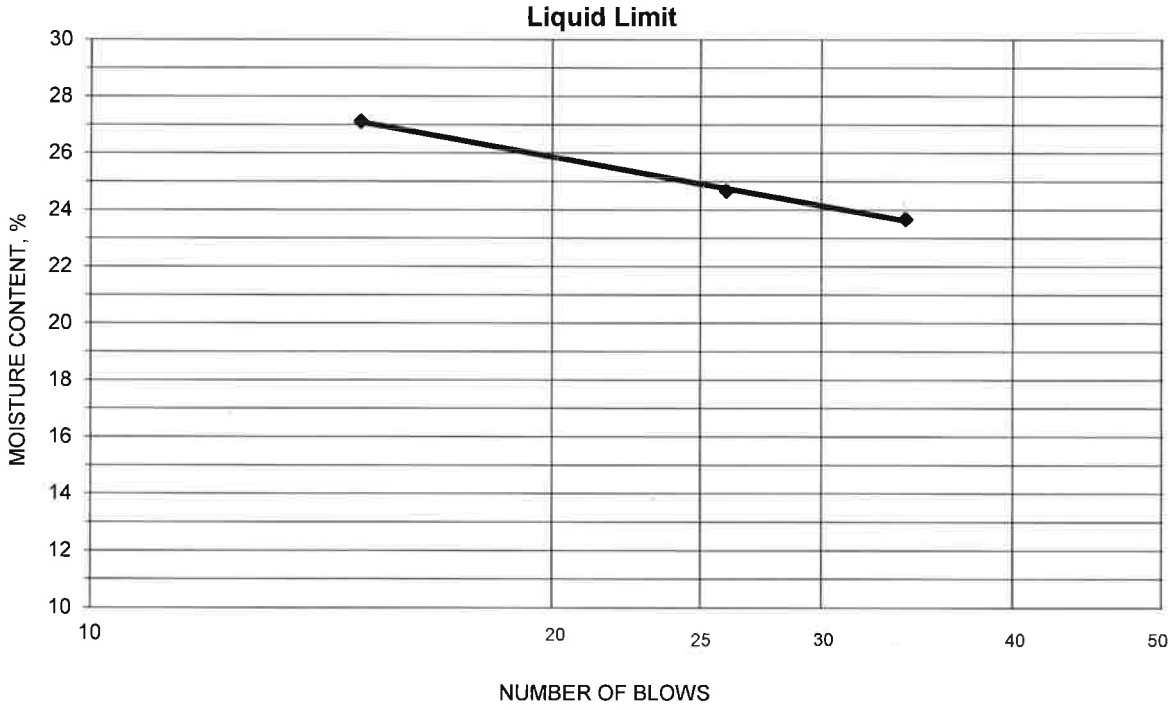
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-1, 55.0'-56.5', 60.0'-61.5'	Lab ID	1289
		% + No. 40	0
Tested By	JMB	Test Method	AASHTO T 89 & T 90
Test Date	04-08-2021	Prepared	Dry
		Date Received	04-01-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
14.62	12.66	4.38	34	23.7	
10.89	9.60	4.37	26	24.7	
13.01	11.15	4.29	15	27.1	25



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
11.39	10.47	4.34	15.0	15	10
10.71	9.88	4.34	15.0		

Remarks: _____

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-1, 65.0'-66.5', 70.0'-71.5'	Lab ID	1292
Sample Type	SPT Composite	Date Received	4-1-21
		Date Reported	4-9-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
3/8"	9.5	100.0
No. 4	4.75	99.9
No. 10	2	99.8
No. 40	0.425	99.4
No. 200	0.075	80.9
	0.02	48.7
	0.005	24.1
	0.002	17.0
estimated	0.001	13.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.1	0.2
Coarse Sand	0.1	0.4
Medium Sand	0.4	---
Fine Sand	18.5	18.5
Silt	56.8	63.9
Clay	24.1	17.0

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	26
Plastic Limit:	17
Plasticity Index:	9
Activity Index:	0.5

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.72

Classification

Unified Group Symbol: CL
Group Name: Lean clay with sand

AASHTO Classification: A-4 (5)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-1, 65.0'-66.5', 70.0'-71.5'
Lab ID: 1292

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared using: AASHTO T 87

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: TRH
Test Date: 04-02-2021
Date Received: 04-01-2021

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3/8"	100.0
No. 4	99.9
No. 10	99.8

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on -3 inch fraction only

Specific Gravity: 2.72

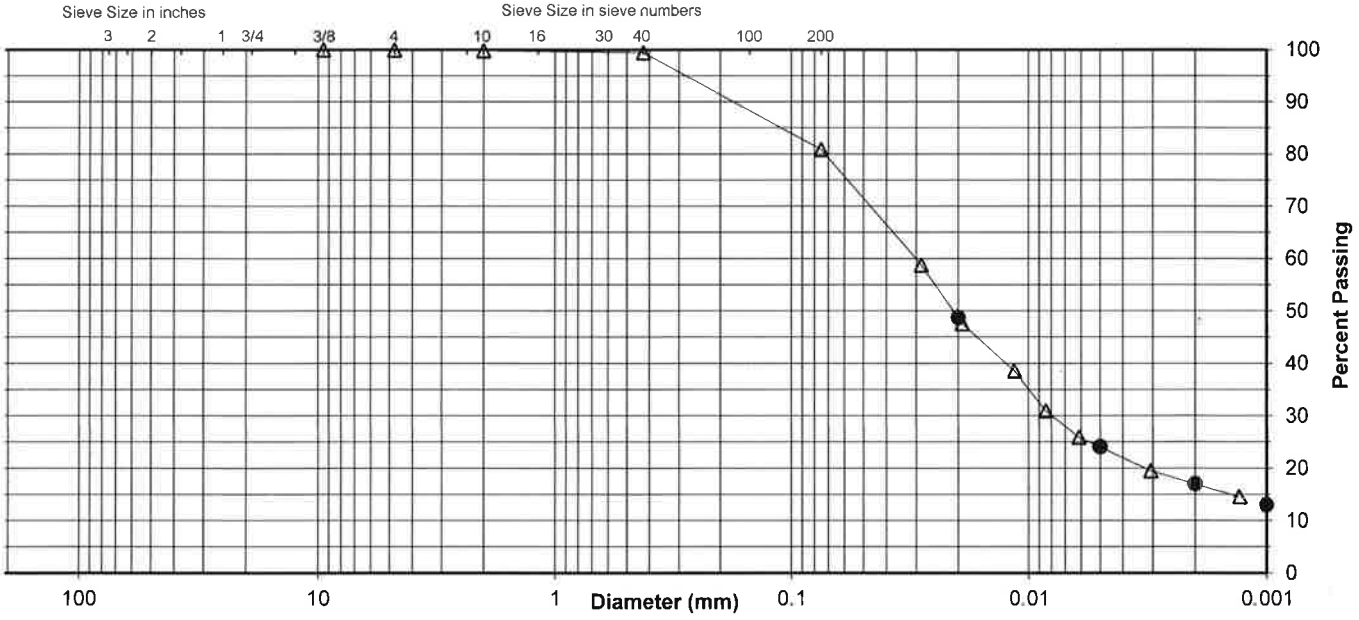
Dispersed using Apparatus A - Mechanical, for 1 minute

No. 40	99.4
No. 200	80.9
0.02 mm	48.7
0.005 mm	24.1
0.002 mm	17.0
0.001 mm	13.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.1	0.1	0.4	18.5	56.8	24.1

	Gravel	Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.2	0.4	18.5	63.9	17.0



Comments

Reviewed By: RJ

Template: tmp_sum_input.xlsm
Version: 20170217
Approved By: RJ

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Lexington, Kentucky

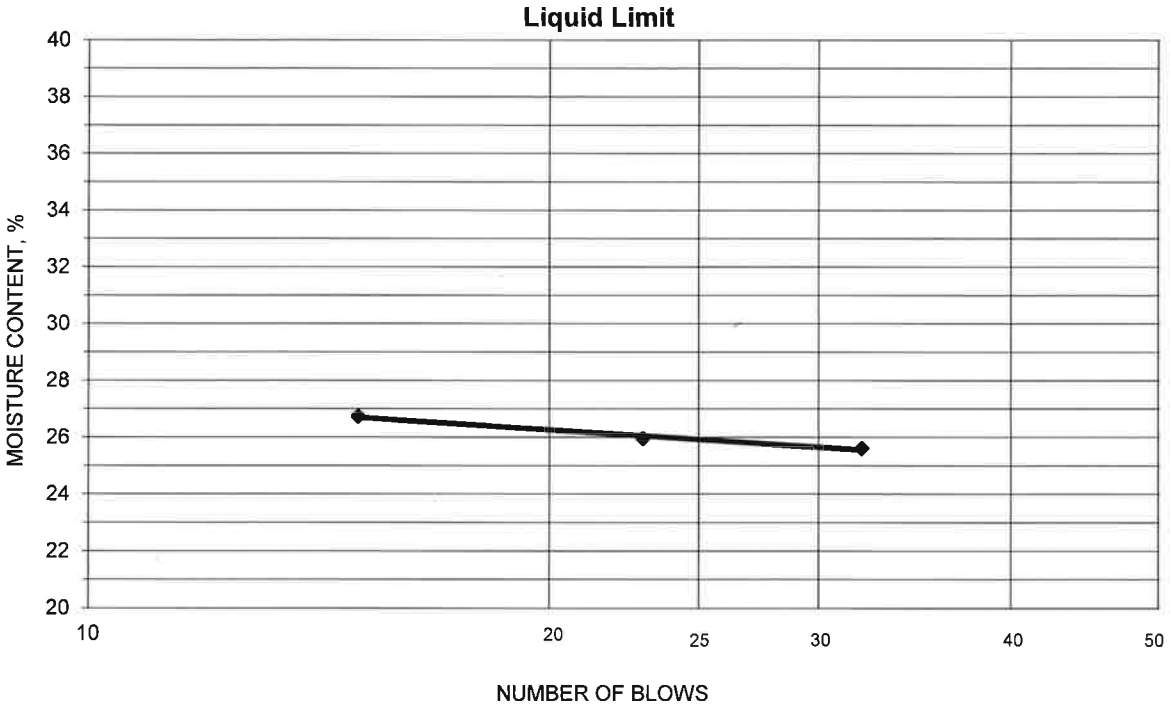
Reported By: RJ
Report Date: 04/09/2021

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N			Project No.	178568003
Source	054B00009N-1, 65.0'-66.5', 70.0'-71.5'			Lab ID	1292
				% + No. 40	1
Tested By	JMB	Test Method	AASHTO T 89 & T 90	Date Received	04-01-2021
Test Date	04-08-2021	Prepared	Dry		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
13.09	11.29	4.26	32	25.6	
12.13	10.51	4.27	23	26.0	
13.27	11.38	4.31	15	26.7	26



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
12.23	11.05	4.26	17.4	17	9
12.25	11.10	4.34	17.0		

Remarks: _____

Reviewed By RJ

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-1, 75.0'-76.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 1170
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 353.92
Moisture Content (%): 24.5

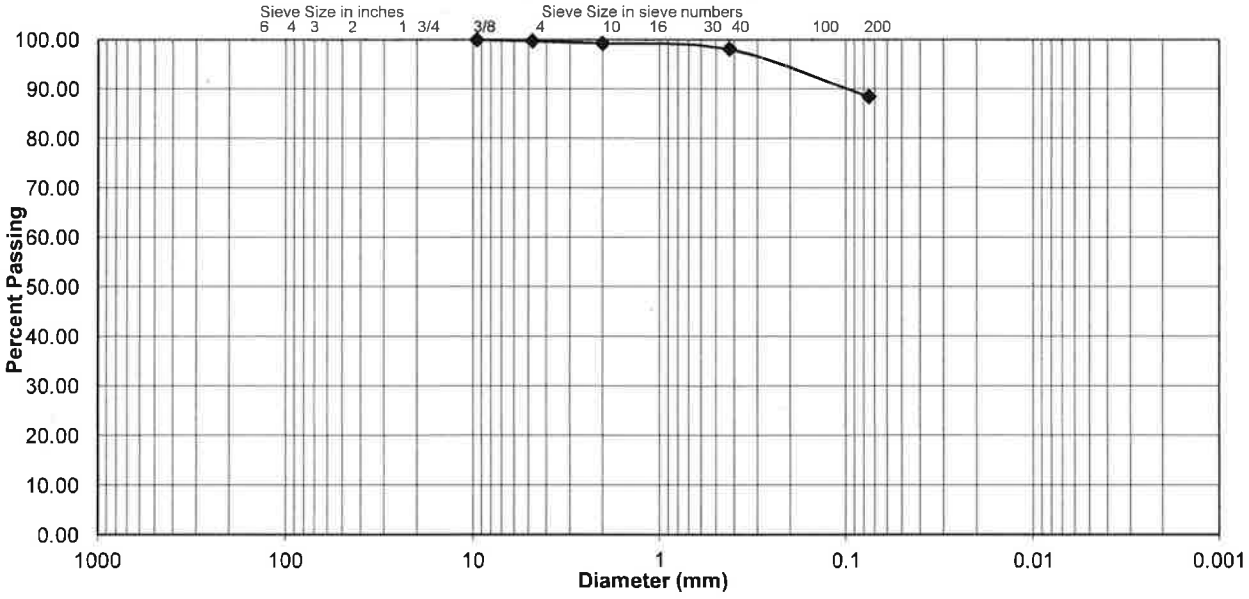
Project Number: 178568003
Lab ID: 1295
Date Received: 04-01-2021
Preparation Date: 04-01-2021
Test Date: 04-06-2021

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
3/8"	0.00	0.0	100.0
No. 4	0.89	0.3	99.7
No. 10	1.62	0.5	99.3
No. 40	4.06	1.1	98.1
No. 200	34.36	9.7	88.4
Pan	312.99	88.4	---

% Gravel	0.7
% Sand	10.9
% Fines	88.4
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By: RHB

Template: tmp_200_input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RHB
Report Date: 04/06/2021

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-1, 80.0'-81.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 1170
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 415.03
Moisture Content (%): 20.0

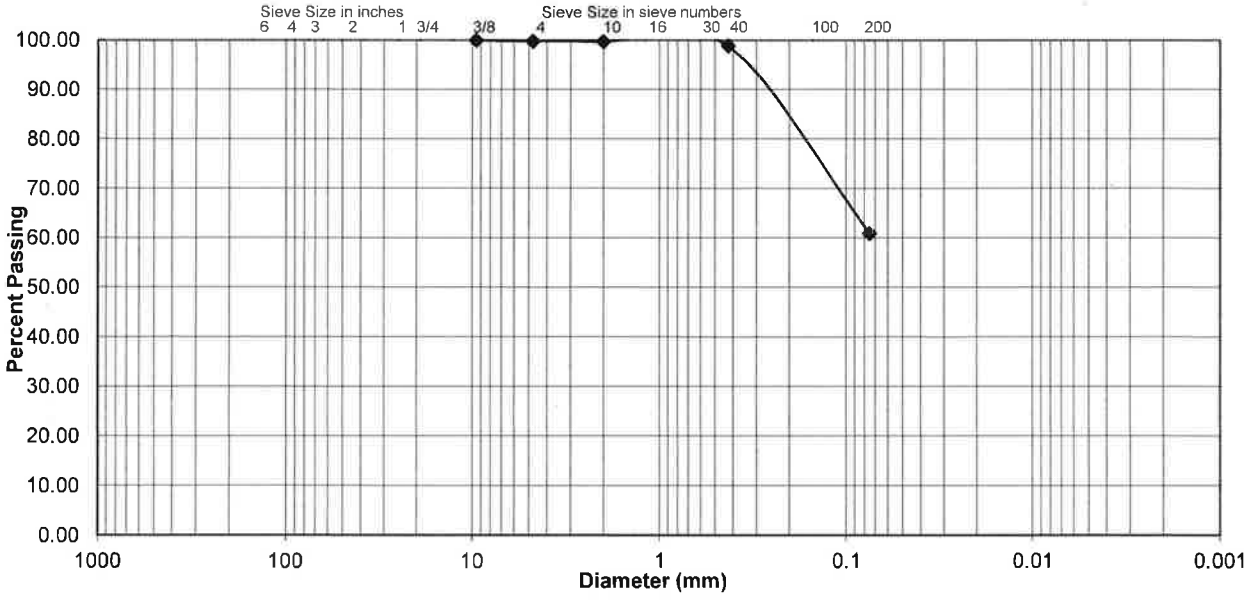
Project Number: 178568003
Lab ID: 1296
Date Received: 04-01-2021
Preparation Date: 04-01-2021
Test Date: 04-06-2021

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
3/8"	0.00	0.0	100.0
No. 4	0.78	0.2	99.8
No. 10	0.38	0.1	99.7
No. 40	3.53	0.9	98.9
No. 200	157.67	38.0	60.9
Pan	252.67	60.9	---

% Gravel	0.3
% Sand	38.8
% Fines	60.9
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By: RHB

Template: tmp_200_input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RHB
Report Date: 04/06/2021

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Moisture Content of Soil

AASHTO T 265

Project Name Bridging KY - 054B00009N

Project Number 178568003

Tested By TRH

Test Method AASHTO

Maximum Particle Size in Sample	No. 40	No. 4	1/2"	1"	2"	
Recommended Minimum Mass (g)	10	100	300	500	1,000	

Material Type: Stratified, Laminated, Lensed, Homogeneous, Disturbed

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
054B00009N-1, 2.0'-3.5'	1276	4/1/21	Hom	No. 40			Yes	30.48	166.04	138.98	24.9
054B00009N-1, 5.0'-6.5'	1277	4/1/21	Hom	1/2"			No	30.06	169.88	141.36	25.6
054B00009N-1, 10.0'-11.5'	1278	4/1/21	Hom	No. 4			Yes	303.75	676.56	609.43	22.0
054B00009N-1, 15.0'-16.5'	1279	4/1/21	Hom	No. 40			Yes	313.53	811.59	706.80	26.6
054B00009N-1, 20.0'-21.5'	1280	4/1/21	Dist	No. 40			Yes	286.32	806.65	705.38	24.2
054B00009N-1, 25.0'-26.5'	1282	4/1/21	Dist	No. 4			Yes	31.49	187.74	157.15	24.3
054B00009N-1, 30.0'-31.5'	1283	4/1/21	Dist	No. 4			Yes	30.11	164.85	138.70	24.1
054B00009N-1, 35.0'-36.5'	1284	4/1/21	Hom	No. 4			Yes	300.36	671.55	601.14	23.4
054B00009N-1, 40.0'-41.5'	1286	4/1/21	Hom	No. 4			Yes	29.75	198.36	164.60	25.0
054B00009N-1, 45.0'-46.5'	1287	4/1/21	Dist	No. 40			Yes	30.70	198.53	164.69	25.3
054B00009N-1, 50.0'-51.5'	1288	4/1/21	Hom	No. 4			Yes	31.58	192.45	168.59	17.4
054B00009N-1, 55.0'-56.5'	1290	4/1/21	Hom	No. 4			Yes	30.56	223.24	185.23	24.6
054B00009N-1, 60.0'-61.5'	1291	4/1/21	Hom	No. 4			Yes	31.02	209.82	176.31	23.1
054B00009N-1, 65.0'-66.5'	1293	4/1/21	Hom	No. 4			Yes	30.13	195.93	160.78	26.9
054B00009N-1, 70.0'-71.5'	1294	4/1/21	Hom	No. 4			Yes	30.21	210.03	170.55	28.1
054B00009N-1, 75.0'-76.5'	1295	4/1/21	Hom	No. 4			Yes	304.84	745.50	658.76	24.5
054B00009N-1, 80.0'-81.5'	1296	4/1/21	Hom	No. 4			Yes	305.70	803.76	720.73	20.0

Comments

Reviewed By RJ

Stantec

Gradation Analysis

AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 2.0'-3.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 350
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 116.54
Moisture Content (%): 19.2

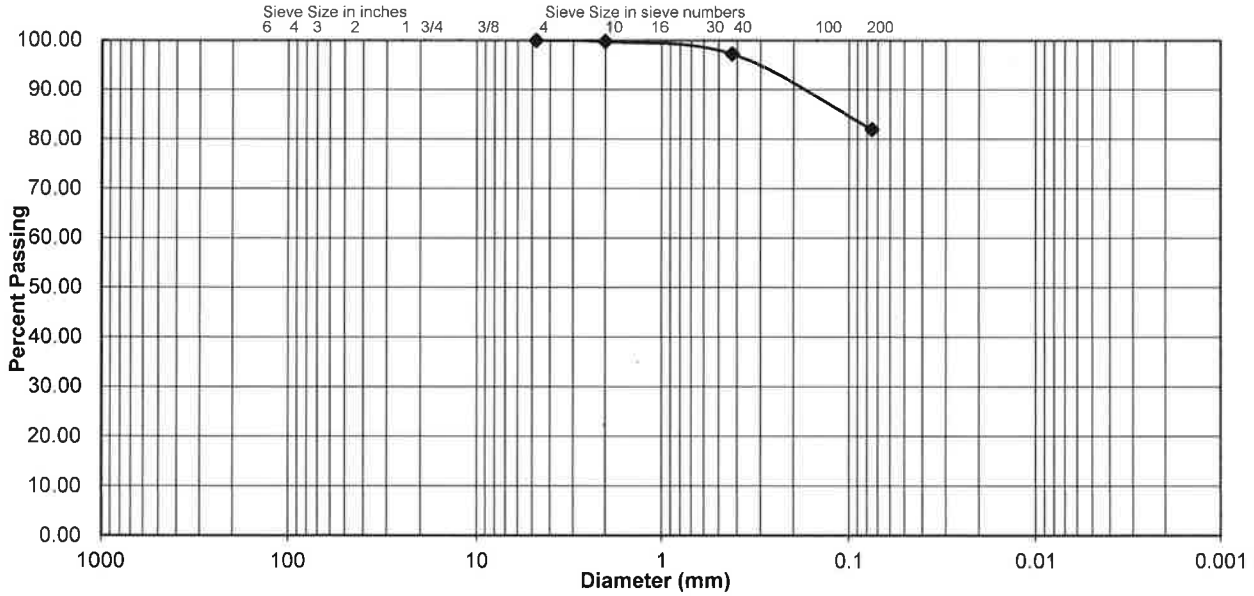
Project Number: 178568003
Lab ID: 1314
Date Received: 10-21-2021
Preparation Date: 10-22-2021
Test Date: 10-26-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.28	0.2	99.8
No. 40	2.93	2.5	97.2
No. 200	17.84	15.3	81.9
Pan	95.49	81.9	---

% Gravel	0.2
% Sand	17.8
% Fines	81.9
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-2, 5.0'-7.0'	Lab ID	1340
Sample Type	ST	Date Received	10-25-21
		Date Reported	11-11-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 4	4.75	100.0
No. 10	2	99.9
No. 40	0.425	99.6
No. 200	0.075	87.6
	0.02	59.7
	0.005	33.1
	0.002	26.2
Estimated	0.001	21.4

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.1
Coarse Sand	0.1	0.3
Medium Sand	0.3	---
Fine Sand	12.0	12.0
Silt	54.5	61.4
Clay	33.1	26.2

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	32
Plastic Limit:	18
Plasticity Index:	14
Activity Index:	0.5

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.64

Classification

Unified Group Symbol:	CL
Group Name:	Lean clay
AASHTO Classification:	A-6 (11)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 5.0'-7.0'

Project Number: 178568003
Lab ID: 1340

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: DW
Test Date: 10-28-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 4 Sieve

Sieve Size	% Passing
No. 4	100.0
No. 10	99.9

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

Specific Gravity: 2.64

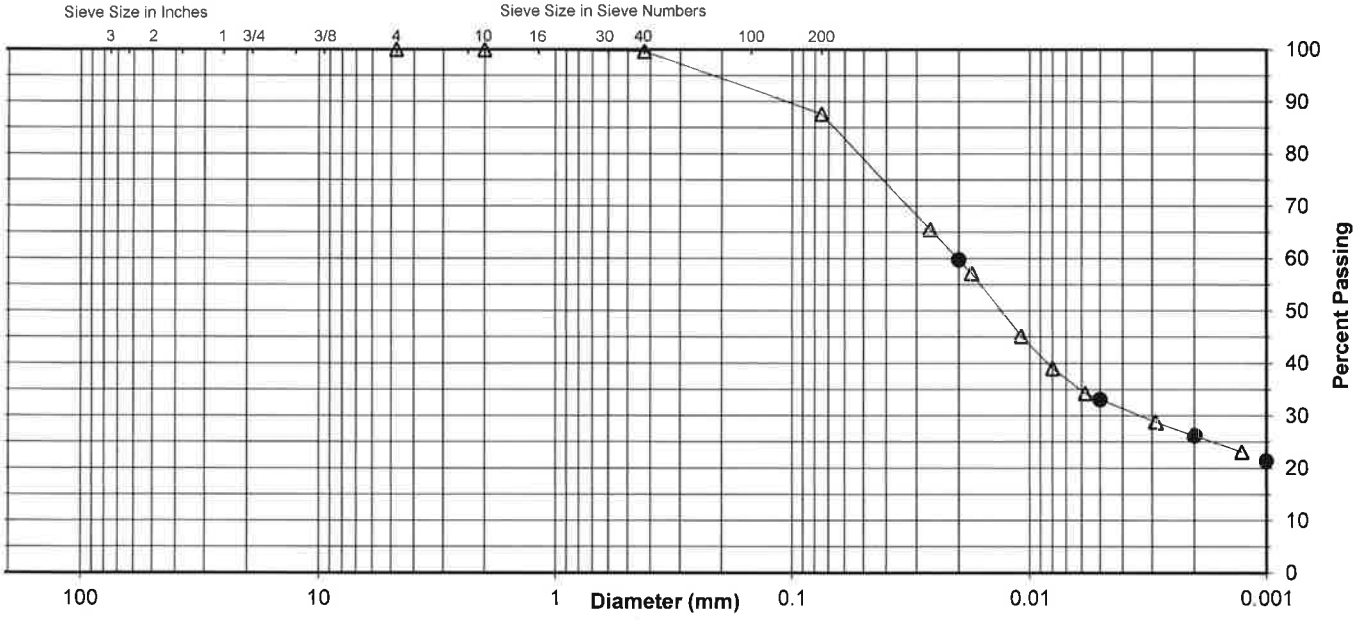
Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	99.6
No. 200	87.6
0.02 mm	59.7
0.005 mm	33.1
0.002 mm	26.2
0.001 mm	21.4

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.1	0.3	12.0	54.5	33.1

	Gravel	Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.1	0.3	12.0	61.4	26.2



Comments

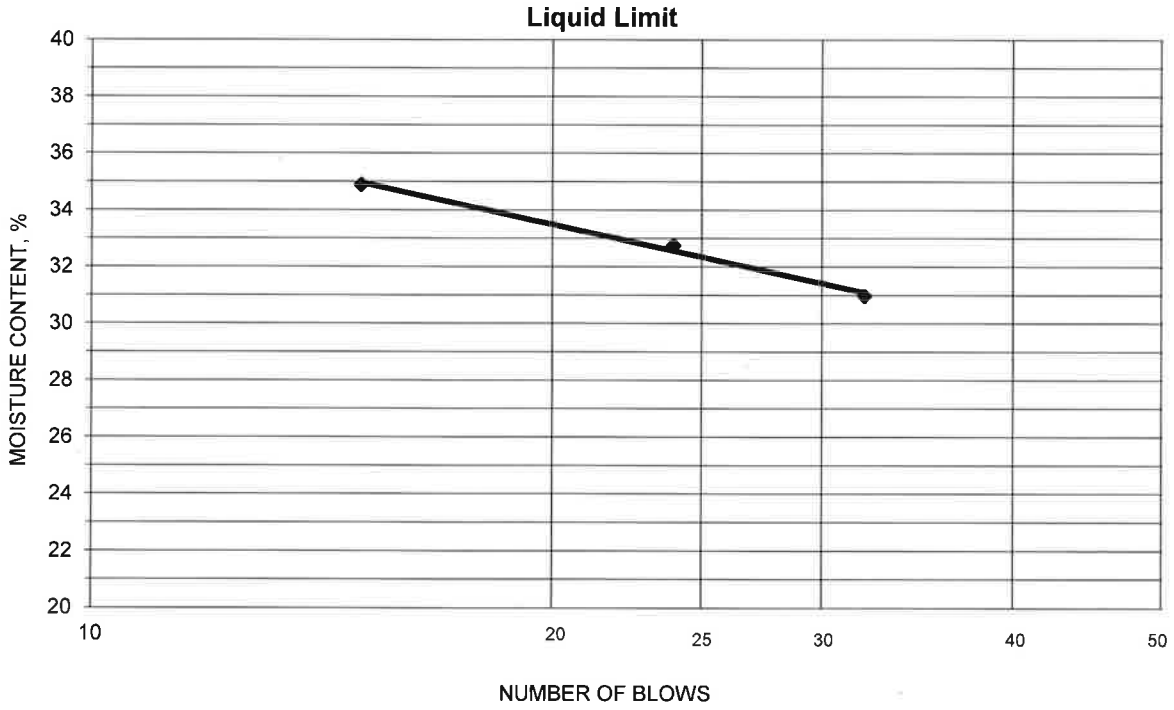
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-2, 5.0'-7.0'	Lab ID	1340
		% + No. 40	0
Tested By	JMB	Test Method	AASHTO T 89 & T 90
Test Date	10-29-2021	Prepared	Dry
		Date Received	10-25-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
17.90	16.28	11.05	32	31.0	
18.55	16.64	10.81	24	32.8	
18.40	16.46	10.90	15	34.9	32



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
17.28	16.30	11.01	18.5	18	14
17.33	16.38	11.09	18.0		

Remarks: _____

Reviewed By RJ

Stantec

Unconfined Compressive Strength of Cohesive Soil

KM 64-522

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 5.0'-7.0'
Lab ID: 1340
Visual Description: Lean Clay (CL), brown, moist, firm

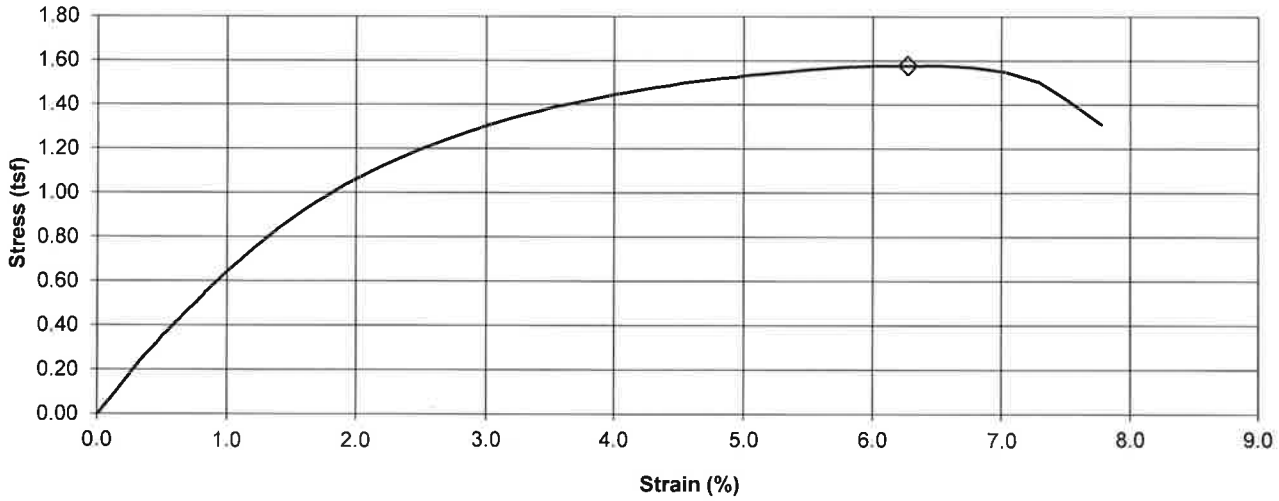
Recovered: 1.2'
Test Interval: 5.1' - 5.6'

Specimen Type: Undisturbed
LL: 32
PL: 18
PI: 14

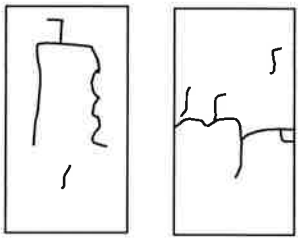
Date Extruded: 10/26/2021
Date Tested: 10/27/2021

Initial Wet Density (pcf)	125.0		
Initial Moisture Content (%)	22.5	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	102.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.64		
Degree of Saturation (%)	96.6	Unconfined Compressive Strength (tsf)	1.58
Average Height (in)	6.011	Undrained Shear Strength (tsf)	0.79
Average Diameter (in)	2.881	Strain at Maximum Stress (%)	6.3
Height to Diameter Ratio	2.1	Strain Rate to Failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: RJ

Template: lmp_uc_input.xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/11/2021

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 10.0'-11.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 360
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 171.67
Moisture Content (%): 21.2

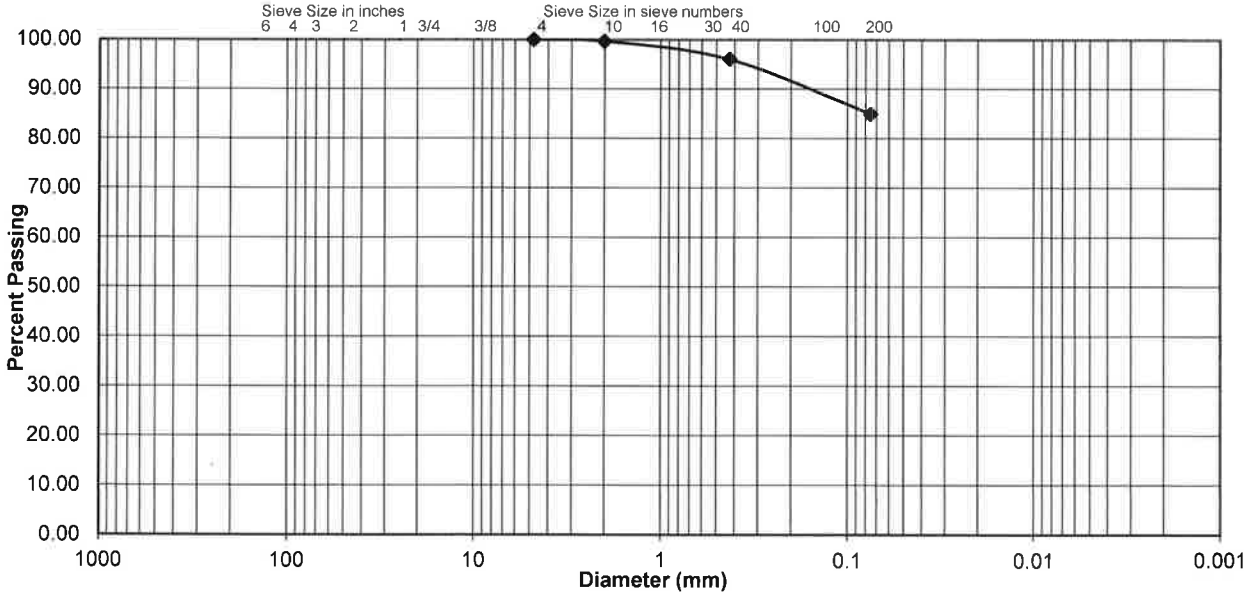
Project Number: 178568003
Lab ID: 1315
Date Received: 10-21-2021
Preparation Date: 10-22-2021
Test Date: 10-26-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.57	0.3	99.7
No. 40	6.22	3.6	96.0
No. 200	19.02	11.1	85.0
Pan	145.86	85.0	---

% Gravel	0.3
% Sand	14.7
% Fines	85.0
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Stantec

Summary of Soil Tests

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 15.0'-17.0'
Lab ID: 1341
Sample Type: ST
Date Received: 10-25-21
Date Reported: 11-11-21

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
1"	25	100.0
3/4"	19	95.1
3/8"	9.5	95.1
No. 4	4.75	95.1
No. 10	2	95.1
No. 40	0.425	95.0
No. 200	0.075	84.9
	0.02	57.3
	0.005	33.6
	0.002	26.7
Estimated	0.001	22.7

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	4.9	4.9
Coarse Sand	0.0	0.1
Medium Sand	0.1	---
Fine Sand	10.1	10.1
Silt	51.3	58.2
Clay	33.6	26.7

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry
Liquid Limit: 36
Plastic Limit: 19
Plasticity Index: 17
Activity Index: 0.6

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.68

Classification

Unified Group Symbol: CL
Group Name: Lean clay with sand
AASHTO Classification: A-6 (14)

Comments:

Reviewed By: RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 15.0'-17.0'

Project Number: 178568003
Lab ID: 1341

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: DW
Test Date: 11-04-2021
Date Received: 10-25-2021

Maximum Particle Size: 1" Sieve

Sieve Size	% Passing
1"	100.0
3/4"	95.1
3/8"	95.1
No. 4	95.1
No. 10	95.1

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

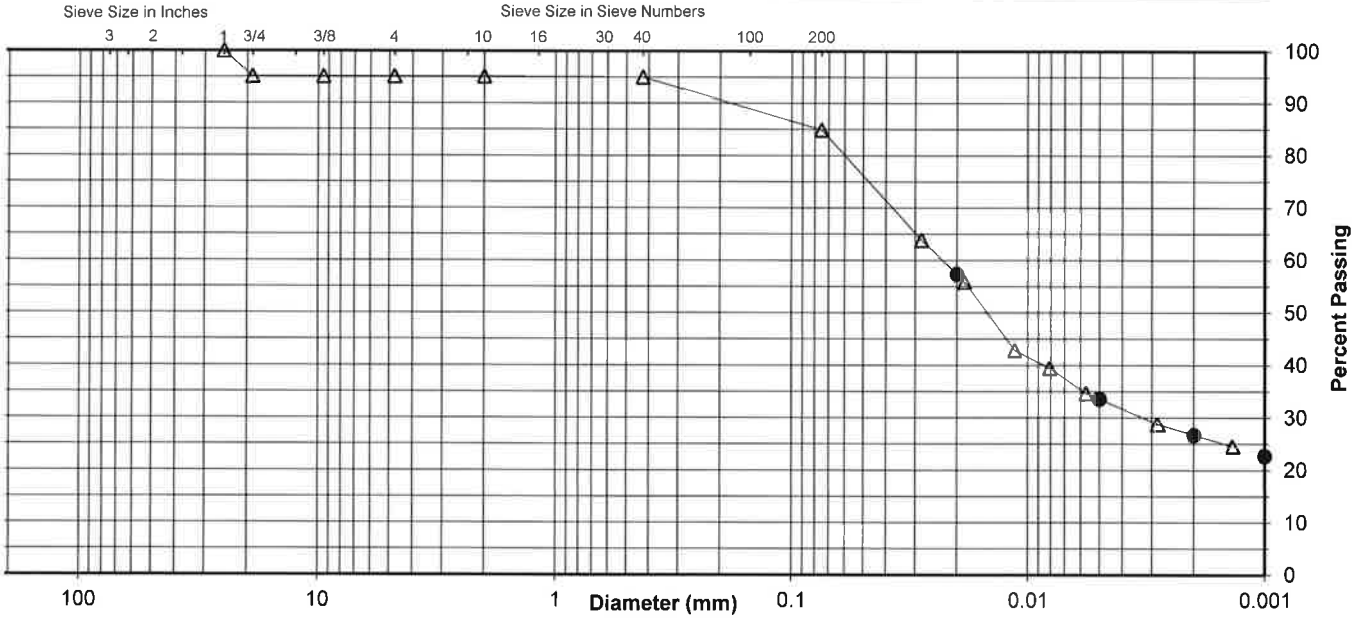
Specific Gravity: 2.68

Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	95.0
No. 200	84.9
0.02 mm	57.3
0.005 mm	33.6
0.002 mm	26.7
0.001 mm	22.7

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	4.9	0.0	0.0	0.1	10.1	51.3	33.6
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	4.9			0.1	10.1	58.2	26.7



Comments

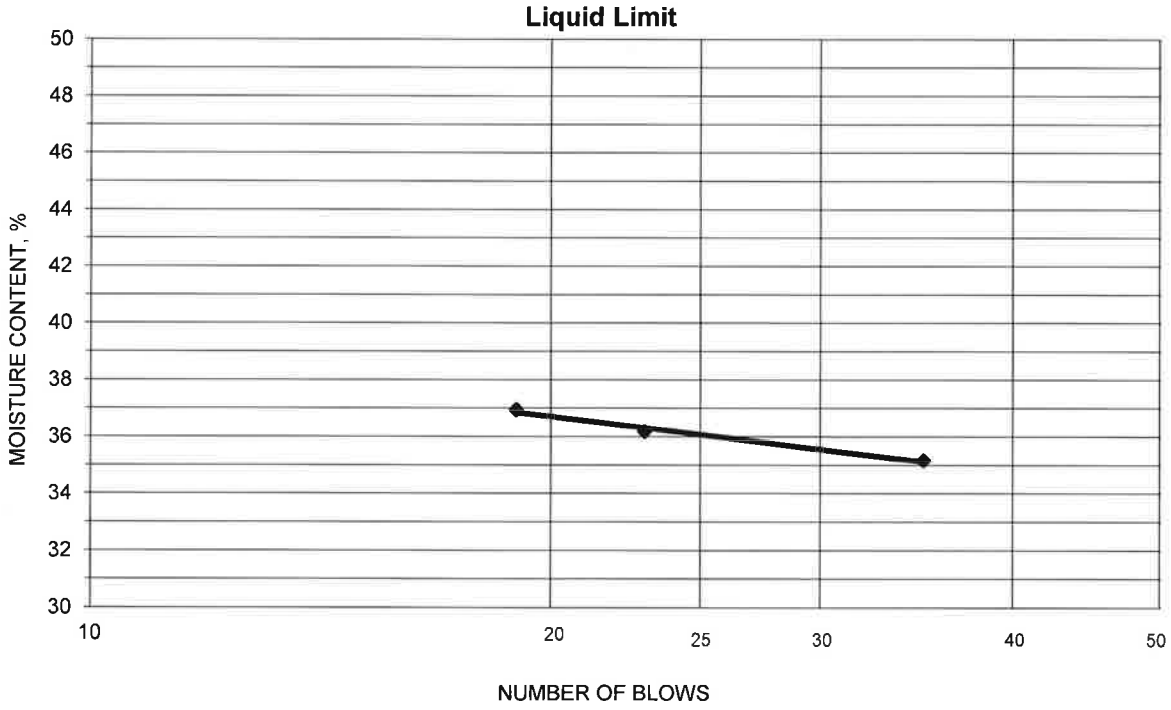
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-2, 15.0'-17.0'	Lab ID	1341
		% + No. 40	5
Tested By	KG	Test Method	AASHTO T 89 & T 90
Test Date	11-09-2021	Prepared	Dry
		Date Received	10-25-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
19.51	17.33	11.13	35	35.2	
20.01	17.64	11.09	23	36.2	
20.29	17.80	11.06	19	36.9	36



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.58	18.28	11.38	18.8	19	17
19.66	18.34	11.30	18.8		

Remarks: _____

Reviewed By RJ

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 20.0'-21.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 360
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 157.33
Moisture Content (%): 23.5

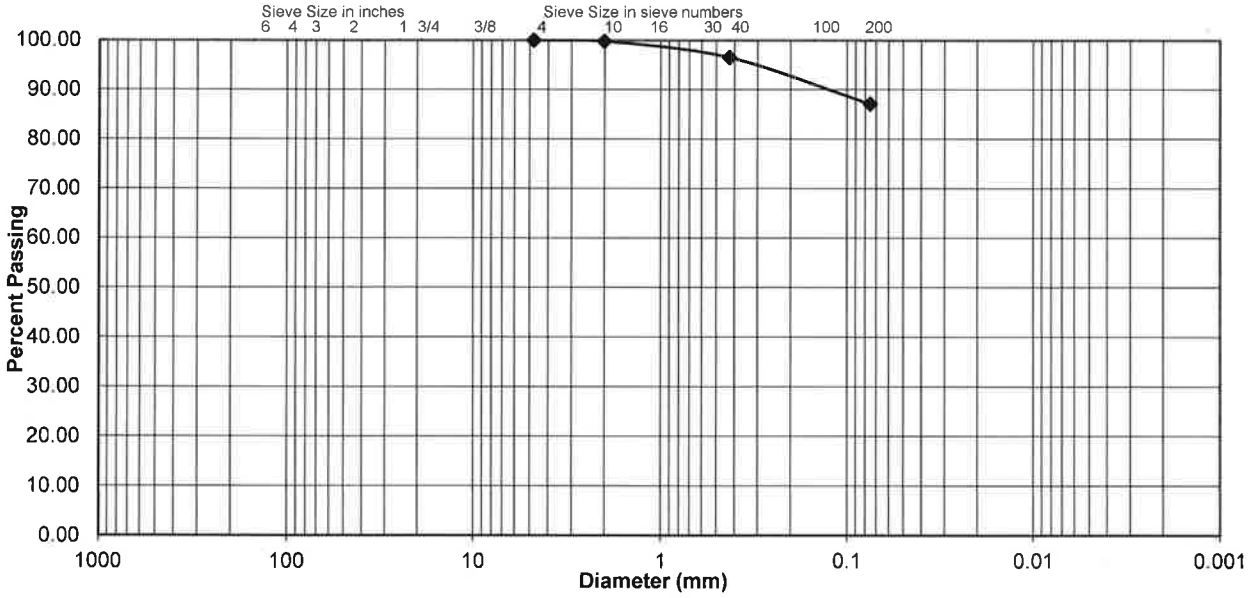
Project Number: 178568003
Lab ID: 1316
Date Received: 10-21-2021
Preparation Date: 10-22-2021
Test Date: 10-26-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.30	0.2	99.8
No. 40	5.13	3.3	96.5
No. 200	14.90	9.5	87.1
Pan	137.00	87.1	---

% Gravel	0.2
% Sand	12.7
% Fines	87.1
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Stantec

Summary of Soil Tests

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 25.0'-27.0'
Lab ID: 1342
Sample Type: ST
Date Received: 10-25-21
Date Reported: 11-11-21

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 10	2	100.0
No. 40	0.425	99.2
No. 200	0.075	93.3
	0.02	70.2
	0.005	34.9
	0.002	26.3
Estimated	0.001	22.6

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.8
Medium Sand	0.8	---
Fine Sand	5.9	5.9
Silt	58.4	67.0
Clay	34.9	26.3

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry
Liquid Limit: 36
Plastic Limit: 18
Plasticity Index: 18
Activity Index: 0.7

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay
AASHTO Classification: A-6 (17)

Comments:

Reviewed By: RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 25.0'-27.0'
Lab ID: 1342

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: N/A
Particle Hardness: N/A

Tested By: DW
Test Date: 10-27-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 10 Sieve

Sieve Size	% Passing
No. 10	100.0

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

Specific Gravity: 2.7

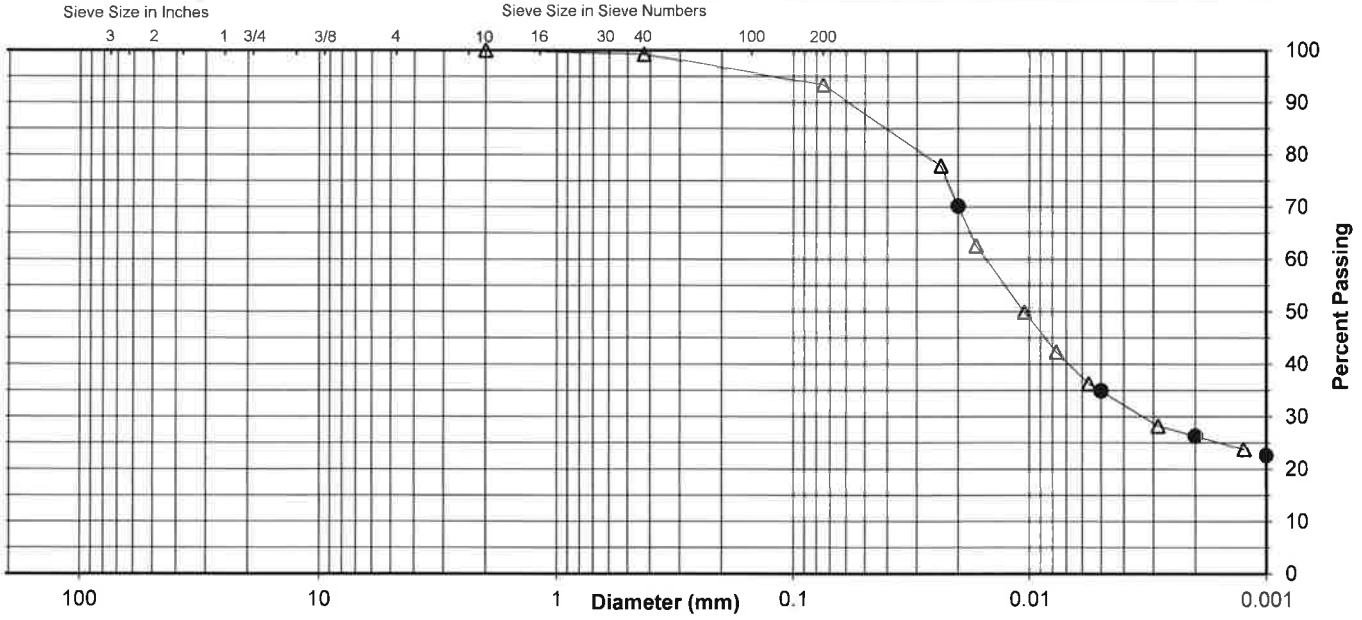
Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	99.2
No. 200	93.3
0.02 mm	70.2
0.005 mm	34.9
0.002 mm	26.3
0.001 mm	22.6

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.0	0.8	5.9	58.4	34.9

	Gravel	Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.0	0.8	5.9	67.0	26.3



Comments

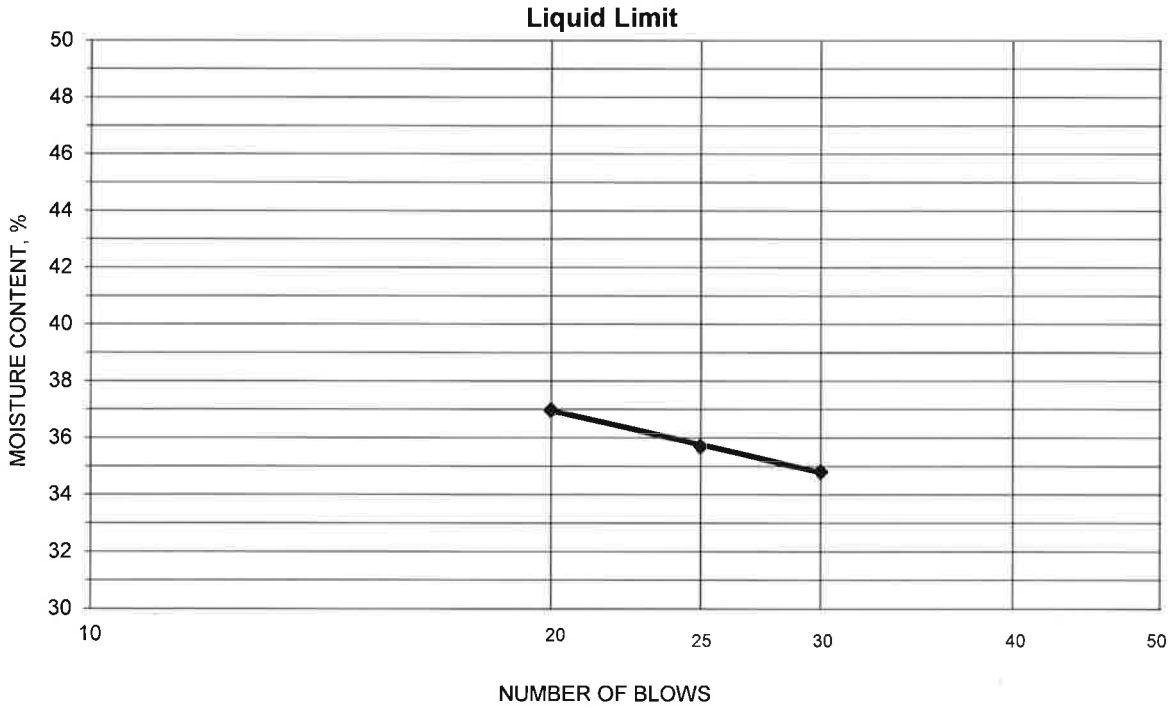
Reviewed By RJ

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N			Project No.	178568003
Source	054B00009N-2, 25.0'-27.0'			Lab ID	1342
				% + No. 40	1
Tested By	JMB	Test Method	AASHTO T 89 & T 90	Date Received	10-25-2021
Test Date	10-29-2021	Prepared	Dry		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
18.38	16.49	11.06	30	34.8	
16.90	15.39	11.16	25	35.7	
18.25	16.32	11.10	20	37.0	36



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.12	17.02	11.05	18.4	18	18
17.51	16.60	11.70	18.6		

Remarks: _____

Reviewed By RJ

Stantec

Gradation Analysis

AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 30.0'-31.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 370
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 255.55
Moisture Content (%): 22.0

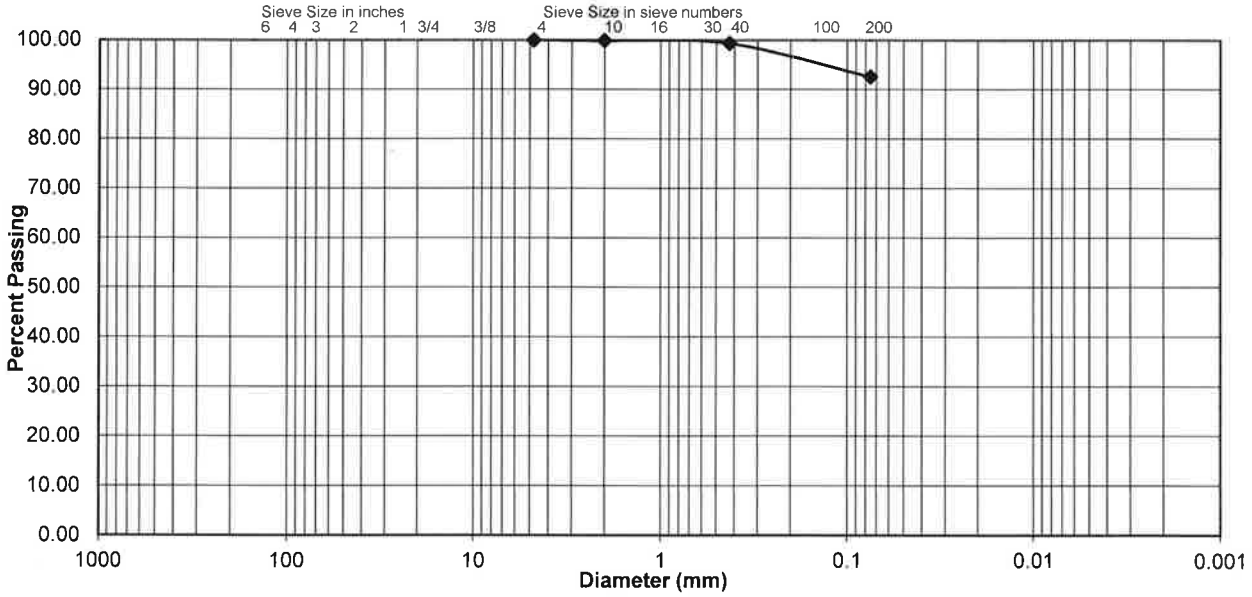
Project Number: 178568003
Lab ID: 1317
Date Received: 10-21-2021
Preparation Date: 10-22-2021
Test Date: 10-27-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.28	0.1	99.9
No. 40	1.41	0.6	99.3
No. 200	17.40	6.8	92.5
Pan	236.46	92.5	---

% Gravel	0.1
% Sand	7.4
% Fines	92.5
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-2, 35.0'-37.0'	Lab ID	1343
Sample Type	ST	Date Received	10-25-21
		Date Reported	11-11-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 10	2	100.0
No. 40	0.425	99.6
No. 200	0.075	92.3
	0.02	62.5
	0.005	33.2
	0.002	24.7
Estimated	0.001	21.0

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.4
Medium Sand	0.4	---
Fine Sand	7.3	7.3
Silt	59.1	67.6
Clay	33.2	24.7

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	30
Plastic Limit:	17
Plasticity Index:	13
Activity Index:	0.5

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-6 (11)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 35.0'-37.0'
Lab ID: 1343

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: N/A
Particle Hardness: N/A

Tested By: DW
Test Date: 10-28-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 10 Sieve

Sieve Size	% Passing
No. 10	100.0

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

Specific Gravity: 2.7

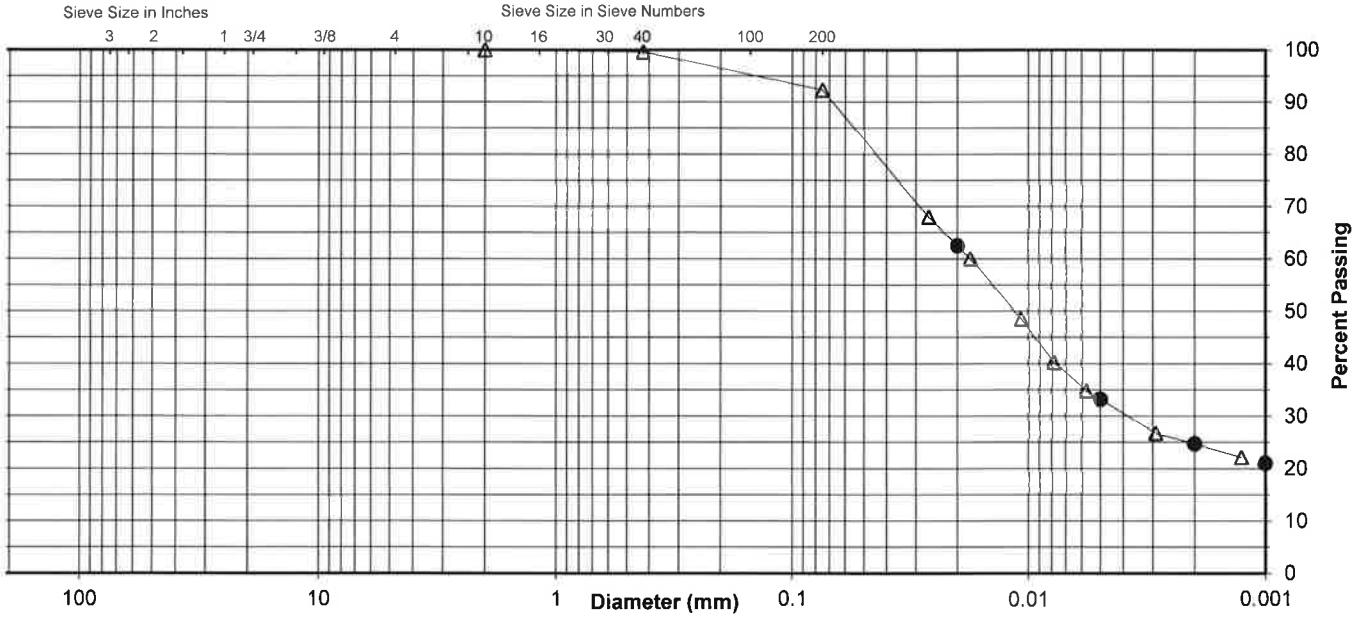
Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	99.6
No. 200	92.3
0.02 mm	62.5
0.005 mm	33.2
0.002 mm	24.7
0.001 mm	21.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.0	0.4	7.3	59.1	33.2

	Gravel	Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.0	0.4	7.3	67.6	24.7



Comments

Reviewed By: RJ

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Version: 20170217
Approved By: RJ

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Lexington, Kentucky

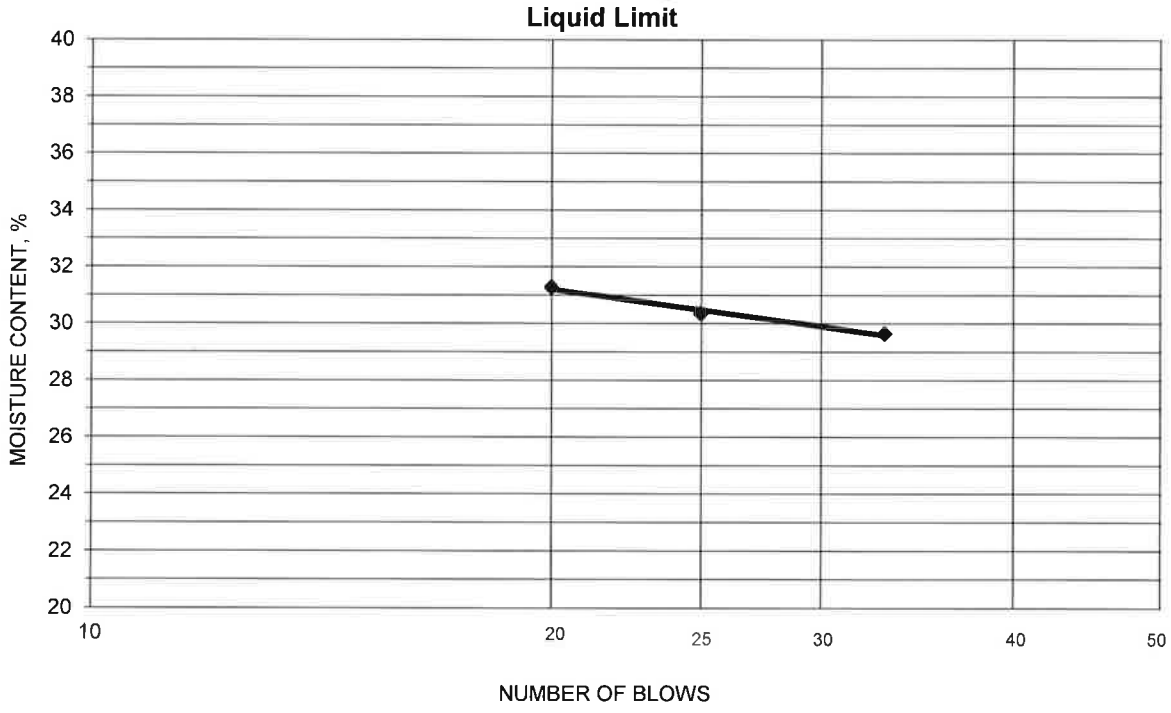
Reported By: RJ
Report Date: 11/11/2021

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-2, 35.0'-37.0'	Lab ID	1343
		% + No. 40	0
Tested By	JMB	Test Method	AASHTO T 89 & T 90
Test Date	10-29-2021	Prepared	Dry
		Date Received	10-25-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
18.52	16.80	11.00	33	29.7	
20.35	18.14	10.86	25	30.4	
19.42	17.54	11.53	20	31.3	30



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
17.08	16.21	11.19	17.3	17	13
18.27	17.17	10.92	17.6		

Remarks: _____

Reviewed By RJ

Stantec

Unconfined Compressive Strength of Cohesive Soil

KM 64-522

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 35.0'-37.0'
Lab ID: 1343
Visual Description: Lean Clay (CL), gray, moist, firm

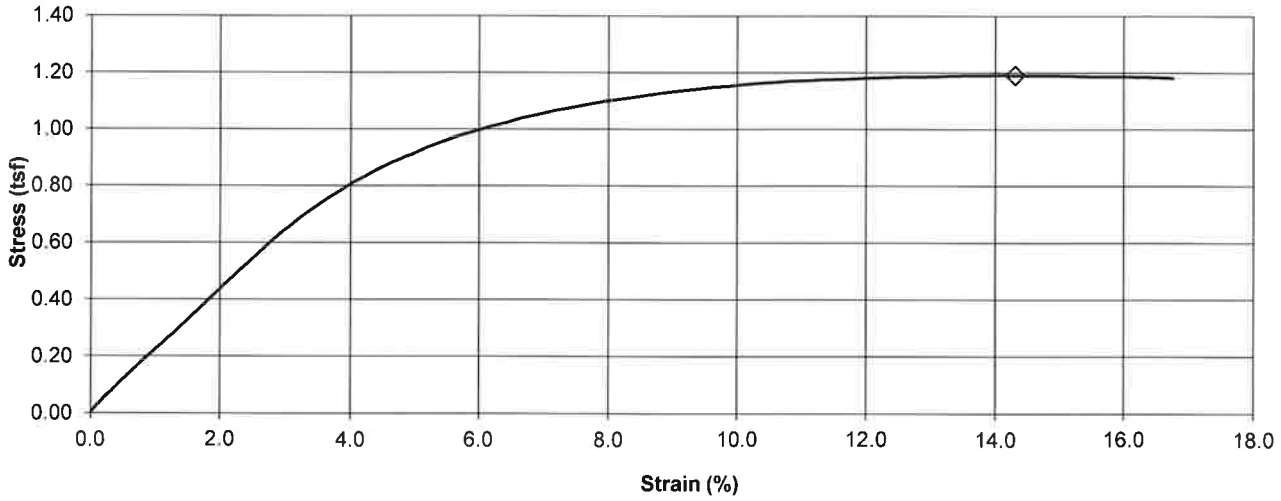
Recovered: 1.8'
Test Interval: 36.2' - 36.7'

Specimen Type: Undisturbed
LL: 30
PL: 17
PI: 13

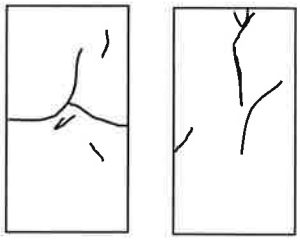
Date Extruded: 10/27/2021
Date Tested: 10/27/2021

Initial Wet Density (pcf)	128.7		
Initial Moisture Content (%)	22.7	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	104.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.7		
Degree of Saturation (%)	101.2	Unconfined Compressive Strength (tsf)	1.19
Average Height (in)	5.989	Undrained Shear Strength (tsf)	0.60
Average Diameter (in)	2.863	Strain at Maximum Stress (%)	14.3
Height to Diameter Ratio	2.1	Strain Rate to Failure (% / min.)	0.99

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

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Version: 20170217
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Lexington, Kentucky

Reported By: RJ
Report Date: 11/11/2021

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 40.0'-41.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 370
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 245.35
Moisture Content (%): 24.1

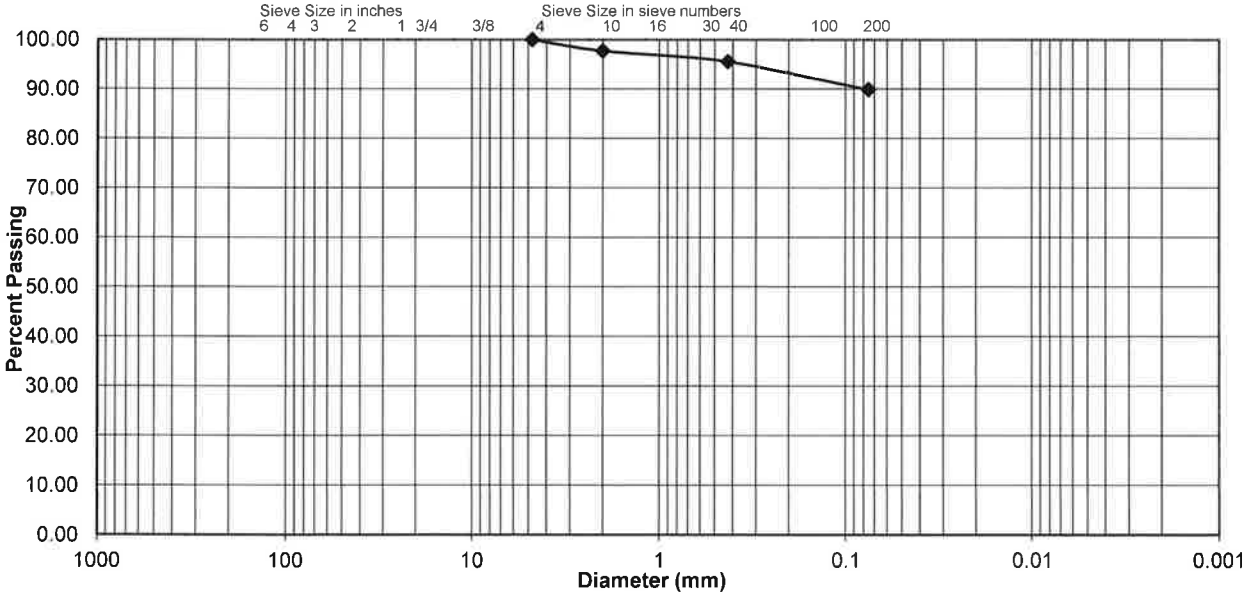
Project Number: 178568003
Lab ID: 1318
Date Received: 10-21-2021
Preparation Date: 10-22-2021
Test Date: 10-27-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	5.62	2.3	97.7
No. 40	5.28	2.2	95.6
No. 200	13.98	5.7	89.9
Pan	220.47	89.9	---

% Gravel	2.3
% Sand	7.9
% Fines	89.9
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By RJ

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Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/09/2021

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-2, 45.0'-47.0'	Lab ID	1344
Sample Type	ST	Date Received	10-25-21
		Date Reported	11-11-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 10	2	100.0
No. 40	0.425	99.9
No. 200	0.075	78.9
	0.02	32.6
	0.005	12.5
	0.002	9.9
Estimated	0.001	8.5

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.1
Medium Sand	0.1	---
Fine Sand	21.0	21.0
Silt	66.4	69.0
Clay	12.5	9.9

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	NP
Plastic Limit:	NP
Plasticity Index:	NP
Activity Index:	N/A

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.65

Classification

Unified Group Symbol:	ML
Group Name:	Silt with sand
AASHTO Classification:	A-4 (0)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 45.0'-47.0'
Project Number: 178568003
Lab ID: 1344

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: N/A
Particle Hardness: N/A

Tested By: DW
Test Date: 10-28-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 10 Sieve

Sieve Size	% Passing
No. 10	100.0

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

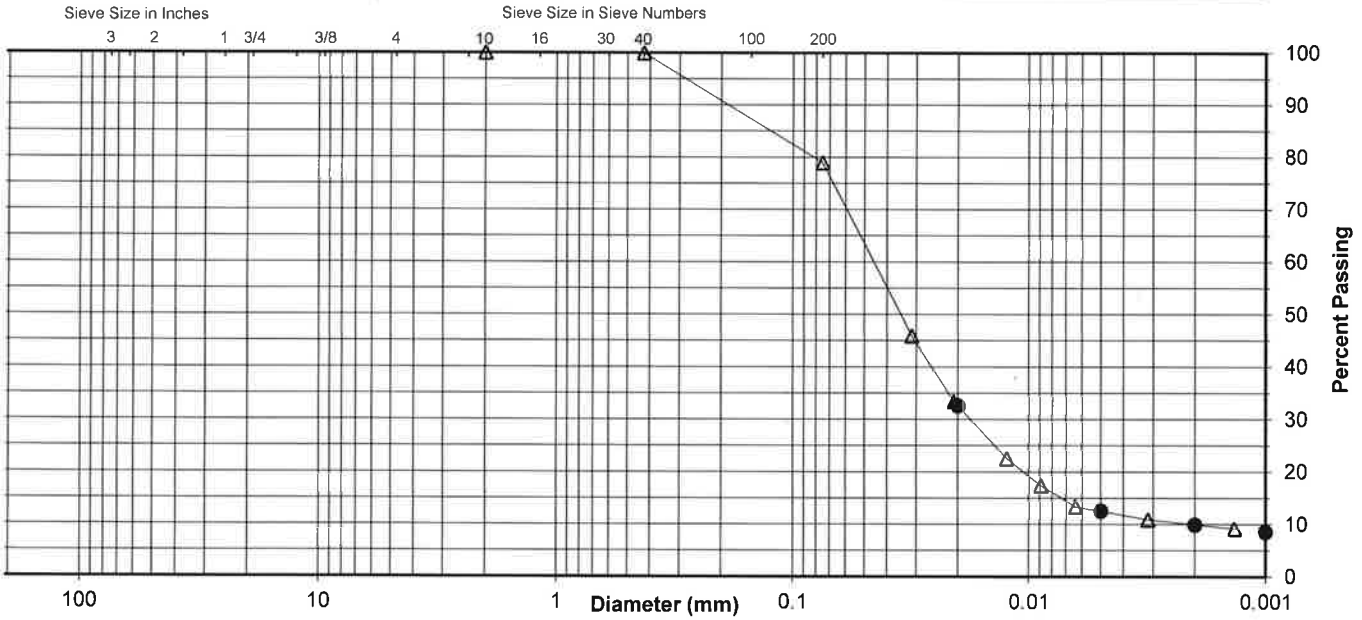
Specific Gravity: 2.65

Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	99.9
No. 200	78.9
0.02 mm	32.6
0.005 mm	12.5
0.002 mm	9.9
0.001 mm	8.5

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	0.1	21.0	66.4	12.5
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.1	21.0	69.0	9.9



Comments

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Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

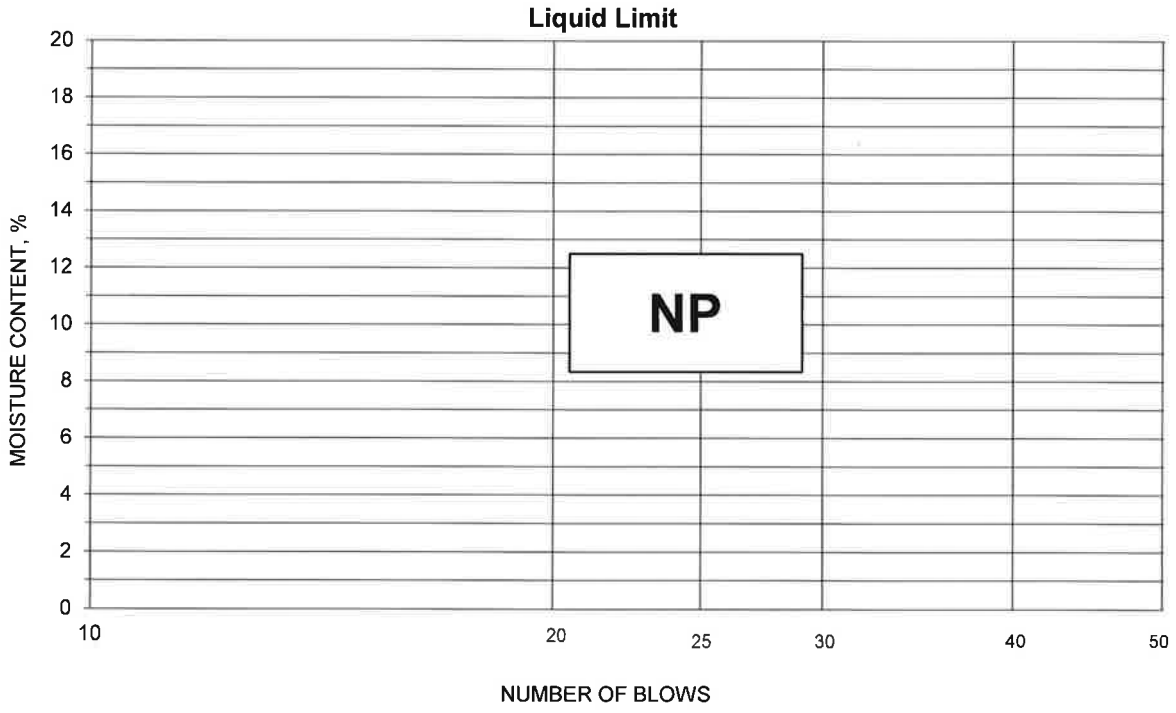
Reported By: RJ
Report Date: 11/11/2021

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N			Project No.	178568003
Source	054B00009N-2, 45.0'-47.0'			Lab ID	1344
				% + No. 40	0
Tested By	JMB	Test Method	AASHTO T 89 & T 90	Date Received	10-25-2021
Test Date	10-29-2021	Prepared	Dry		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index

Remarks: _____

Reviewed By RJ

Stantec

Unconfined Compressive Strength of Cohesive Soil

KM 64-522

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 45.0'-47.0'
Lab ID: 1344
Visual Description: Silt with Sand (ML), gray, moist, soft

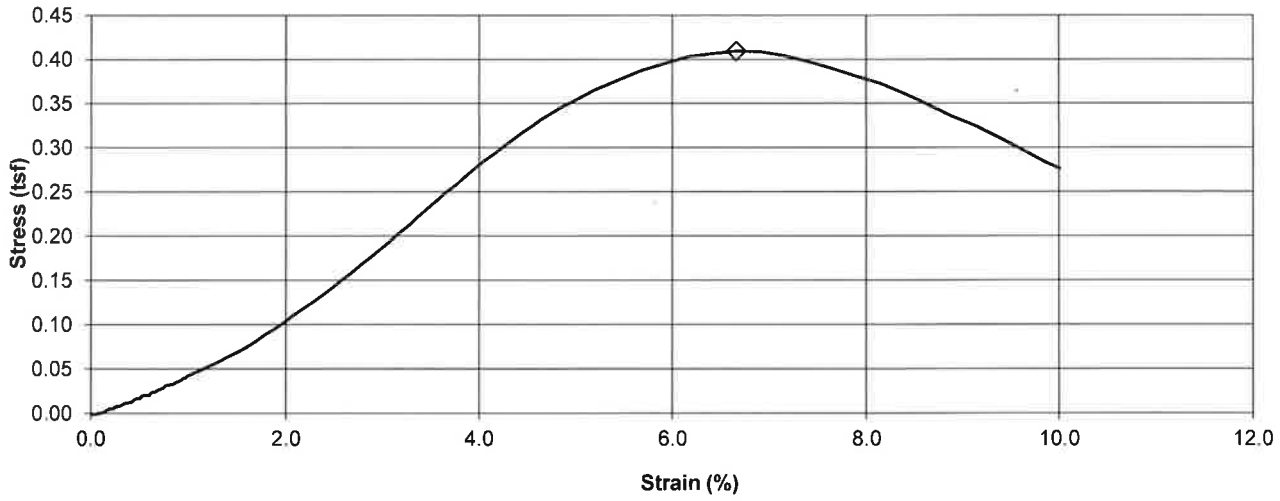
Recovered: 1.7'
Test Interval: 45.8' - 46.3'

Specimen Type: Undisturbed
LL: NP
PL: NP
PI: NP

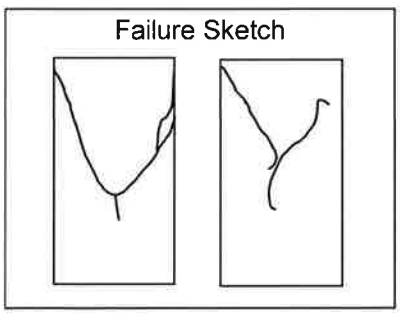
Date Extruded: 10/27/2021
Date Tested: 10/27/2021

Initial Wet Density (pcf)	127.6	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	21.0		
Initial Dry Density (pcf)	105.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.65		
Degree of Saturation (%)	97.7	Unconfined Compressive Strength (tsf)	0.41
Average Height (in)	5.899	Undrained Shear Strength (tsf)	0.20
Average Diameter (in)	2.863	Strain at Maximum Stress (%)	6.7
Height to Diameter Ratio	2.1	Strain Rate to Failure (% / min.)	0.98

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: RJ

Template: tmp_uc_input.xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/11/2021

Stantec

Gradation Analysis

AASHTO T 88

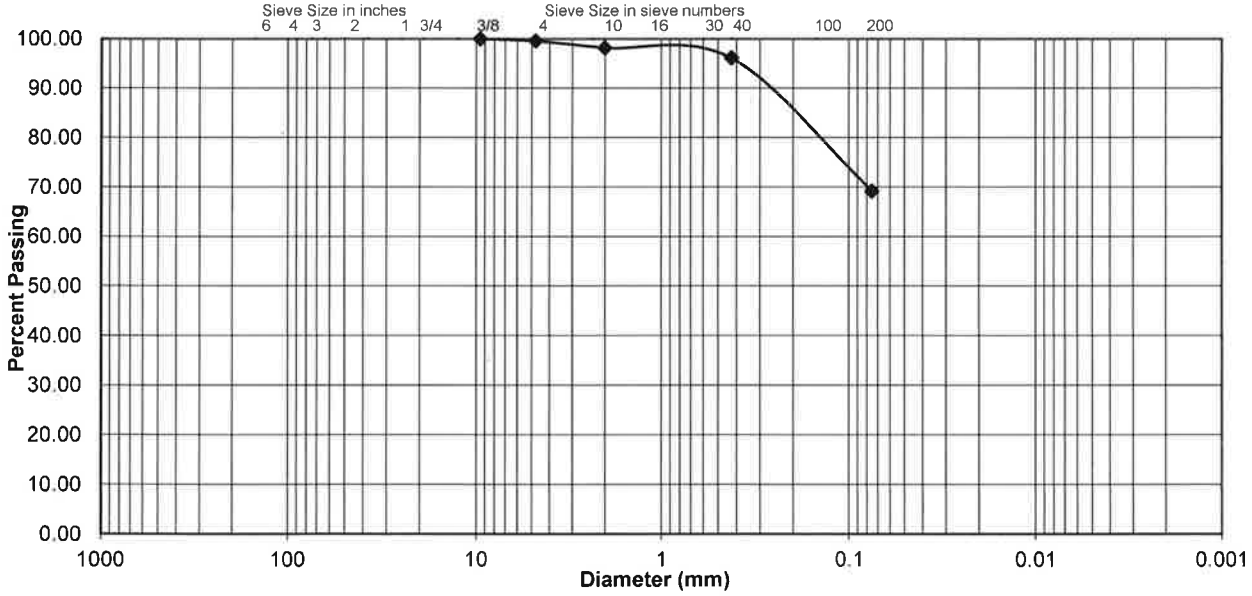
Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-2, 50.0'-51.5'	Lab ID	1319
Preparation Method	AASHTO T 11 Method A	Date Received	10-21-2021
Soak Time (min)	380	Preparation Date	10-22-2021
Particle Shape	Rounded	Test Date	10-27-2021
Particle Hardness	Hard and Durable		
Sample Dry Mass (g)	343.99		
Moisture Content (%)	22.2		

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
3/8"	0.00	0.0	100.0
No. 4	1.40	0.4	99.6
No. 10	4.90	1.4	98.2
No. 40	7.06	2.1	96.1
No. 200	92.80	27.0	69.1
Pan	237.83	69.1	---

% Gravel	1.8
% Sand	29.0
% Fines	69.1
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 55.0'-56.0'
Lab ID: 1345
Sample Type: ST
Date Received: 10-25-21
Date Reported: 11-11-21

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
3/4"	19	100.0
3/8"	9.5	99.6
No. 4	4.75	98.9
No. 10	2	98.3
No. 40	0.425	97.6
No. 200	0.075	70.9
	0.02	45.7
	0.005	22.1
	0.002	13.8
Estimated	0.001	9.8

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	1.1	1.7
Coarse Sand	0.6	0.7
Medium Sand	0.7	---
Fine Sand	26.7	26.7
Silt	48.8	57.1
Clay	22.1	13.8

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry
Liquid Limit: 25
Plastic Limit: 17
Plasticity Index: 8
Activity Index: 0.6

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.61

Classification

Unified Group Symbol: CL
Group Name: Lean clay with sand
AASHTO Classification: A-4 (3)

Comments:

Reviewed By: RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 55.0'-56.0'
Lab ID: 1345

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: Rounded and Angular
Particle Hardness: Hard and Durable

Tested By: DW
Test Date: 10-28-2021
Date Received: 10-25-2021

Maximum Particle Size: 3/4" Sieve

Sieve Size	% Passing
3/4"	100.0
3/8"	99.6
No. 4	98.9
No. 10	98.3

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

Specific Gravity: 2.61

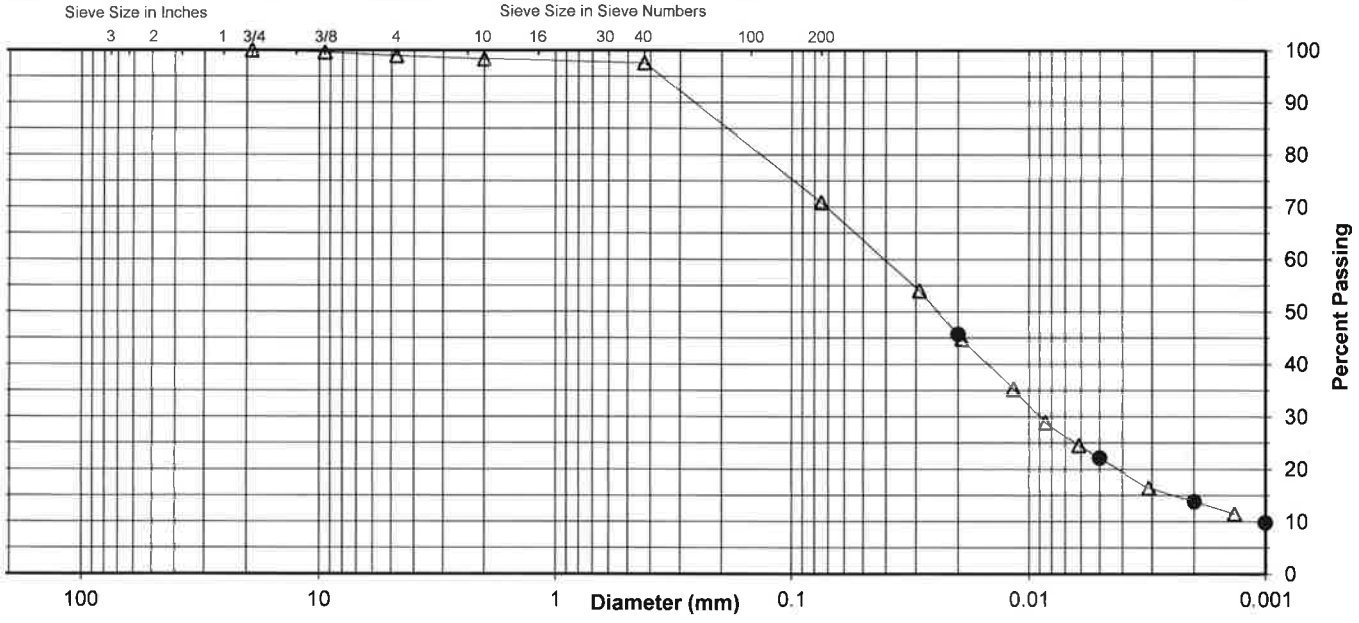
Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	97.6
No. 200	70.9
0.02 mm	45.7
0.005 mm	22.1
0.002 mm	13.8
0.001 mm	9.8

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	1.1	0.6	0.7	26.7	48.8	22.1

AASHTO	Gravel	Coarse Sand	Fine Sand	Silt	Clay
	1.7	0.7	26.7	57.1	13.8



Comments

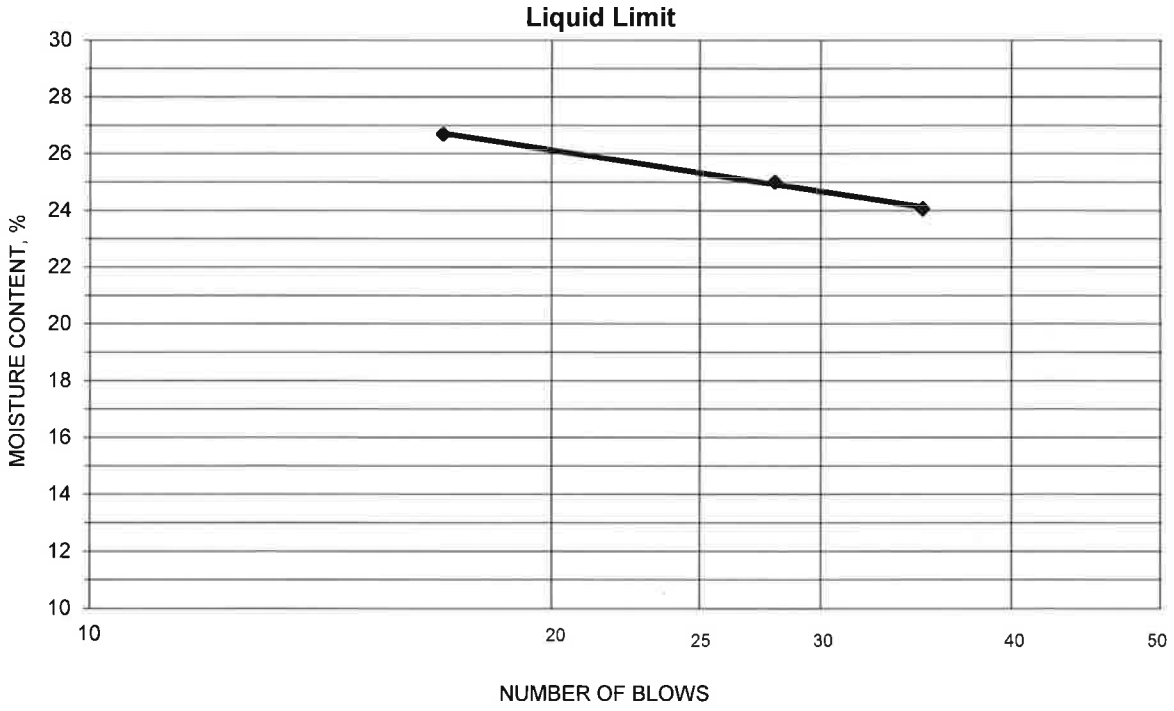
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N			Project No.	178568003
Source	054B00009N-2, 55.0'-56.0'			Lab ID	1345
				% + No. 40	2
Tested By	JMB	Test Method	AASHTO T 89 & T 90	Date Received	10-25-2021
Test Date	10-29-2021	Prepared	Dry		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
17.84	16.63	11.60	35	24.1	
18.00	16.71	11.55	28	25.0	
17.98	16.59	11.38	17	26.7	25



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.93	18.68	11.08	16.4	17	8
19.02	17.81	10.64	16.9		

Remarks: _____

Reviewed By RJ

Stantec

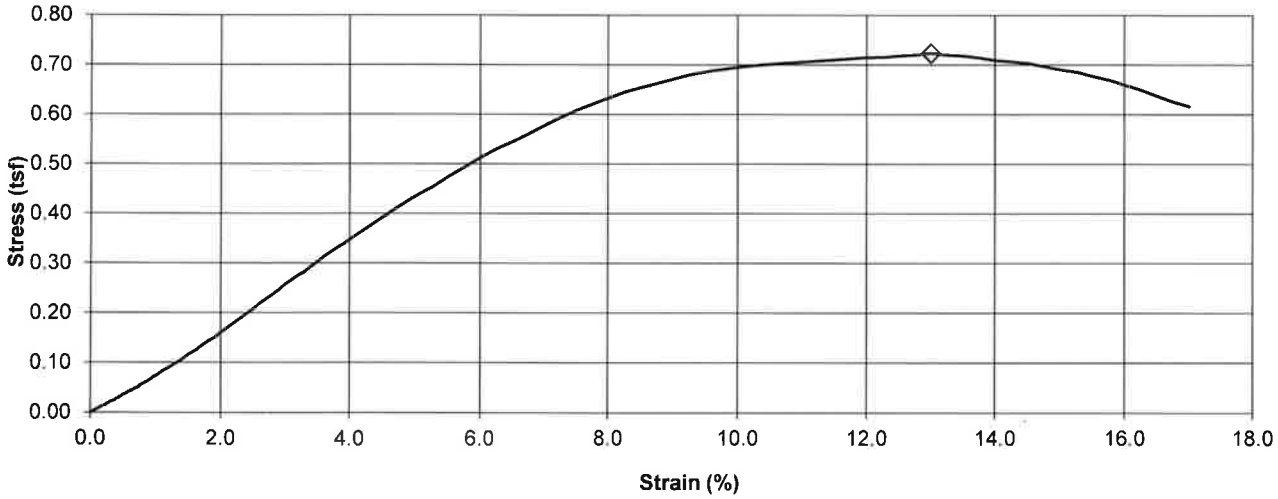
Unconfined Compressive Strength of Cohesive Soil

KM 64-522

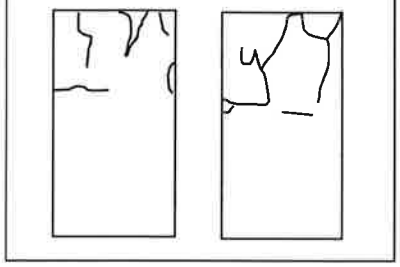
Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 55.0'-56.0'
Lab ID: 1345
Visual Description: Lean Clay with Sand (CL), gray, wet, soft
Recovered: 0.6'
Test Interval: 55.1' - 55.6'
Specimen Type: Undisturbed
LL: 25
PL: 17
PI: 8
Date Extruded: 10/27/2021
Date Tested: 10/27/2021

Initial Wet Density (pcf)	131.0		
Initial Moisture Content (%)	17.4	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	111.6		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.61		
Degree of Saturation (%)	98.6	Unconfined Compressive Strength (tsf)	0.72
Average Height (in)	5.953	Undrained Shear Strength (tsf)	0.36
Average Diameter (in)	2.886	Strain at Maximum Stress (%)	13.0
Height to Diameter Ratio	2.1	Strain Rate to Failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: RJ

Template: tmp_uc_input.xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/11/2021

Stantec

Gradation Analysis

AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 60.0'-61.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 370
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 349.36
Moisture Content (%): 25.4

Project Number: 178568003
Lab ID: 1320
Date Received: 10-21-2021
Preparation Date: 10-22-2021
Test Date: 10-27-2021

Analysis Based on Total Sample.

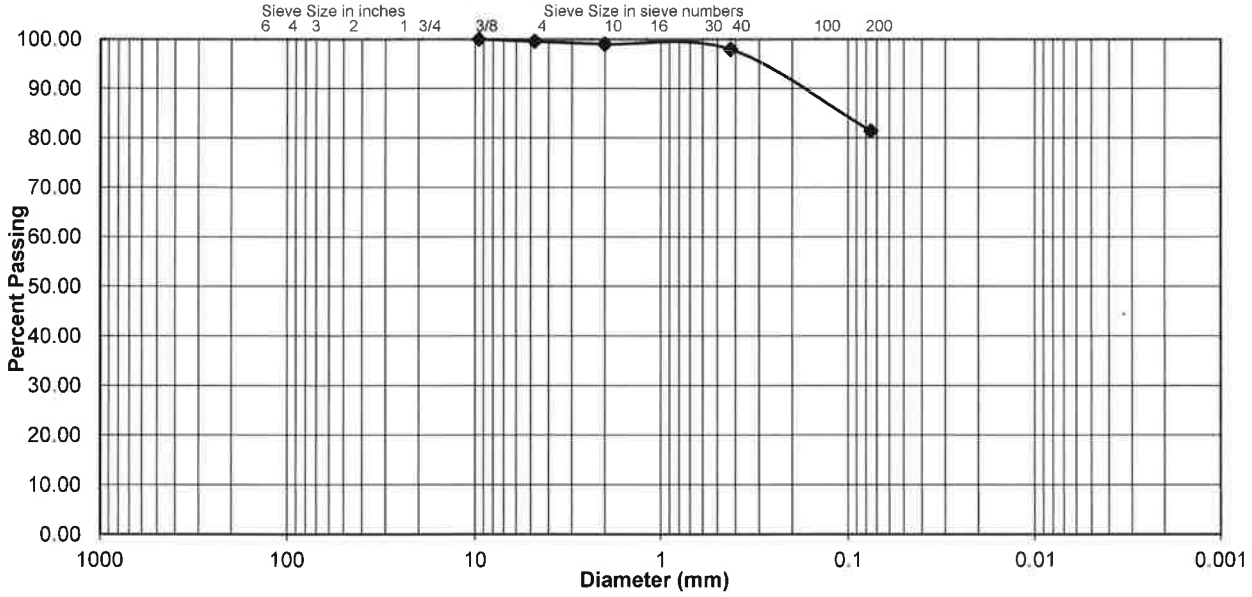
Sieve Size	Grams Retained	% Retained	% Passing
3/8"	0.00	0.0	100.0
No. 4	1.54	0.4	99.6
No. 10	1.86	0.5	99.0
No. 40	3.69	1.1	98.0
No. 200	58.03	16.6	81.4
Pan	284.24	81.4	---

% Gravel: 1.0
% Sand: 17.7
% Fines: 81.4
Fines Classification: N/A

D_{10} (mm): N/A
D_{30} (mm): N/A
D_{60} (mm): N/A

Cu: N/A
Cc: N/A

Particle Size Distribution



Comments

Reviewed By

Template: tmp_200_input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/09/2021

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 67.0'-68.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 380
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 283.45
Moisture Content (%): 28.1

Project Number: 178568003
Lab ID: 1321
Date Received: 10-21-2021
Preparation Date: 10-21-2022
Test Date: 10-27-2021

Analysis Based on Total Sample.

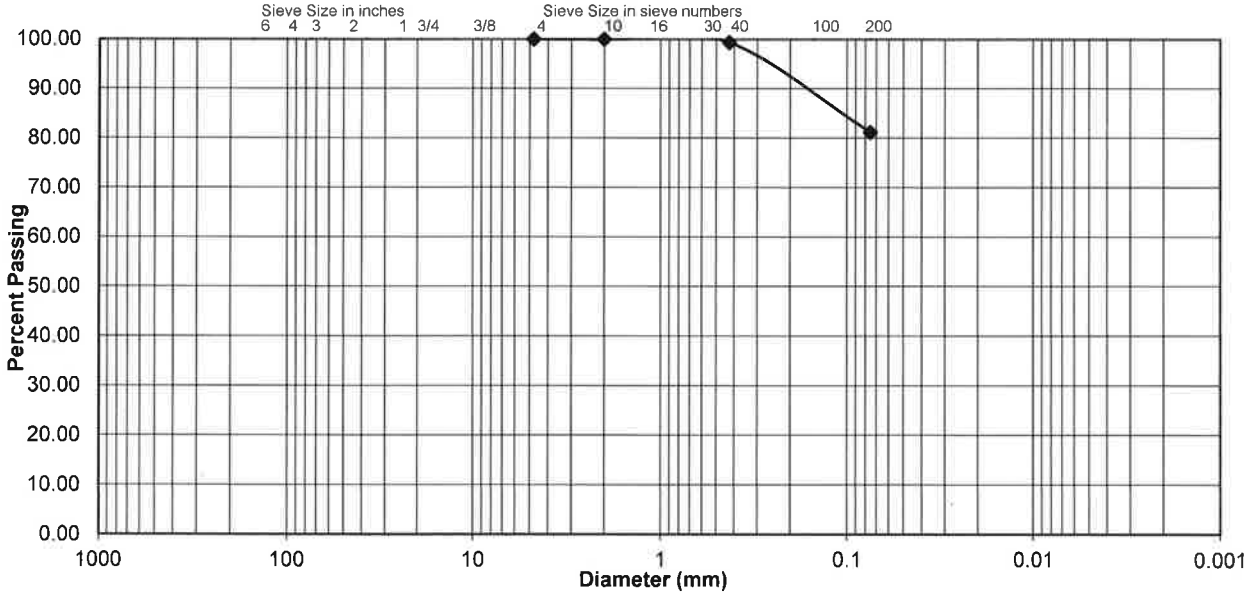
Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.08	0.0	100.0
No. 40	1.78	0.6	99.3
No. 200	51.68	18.2	81.1
Pan	229.91	81.1	---

% Gravel: 0.0
% Sand: 18.9
% Fines: 81.1
Fines Classification: N/A

D_{10} (mm): N/A
D_{30} (mm): N/A
D_{60} (mm): N/A

Cu: N/A
Cc: N/A

Particle Size Distribution



Comments

Reviewed By

Template: tmp_200_input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/09/2021

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 70.0'-71.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 380
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 277.45
Moisture Content (%): 29.7

Project Number: 178568003
Lab ID: 1322
Date Received: 10-21-2021
Preparation Date: 10-22-2021
Test Date: 10-27-2021

Analysis Based on Total Sample.

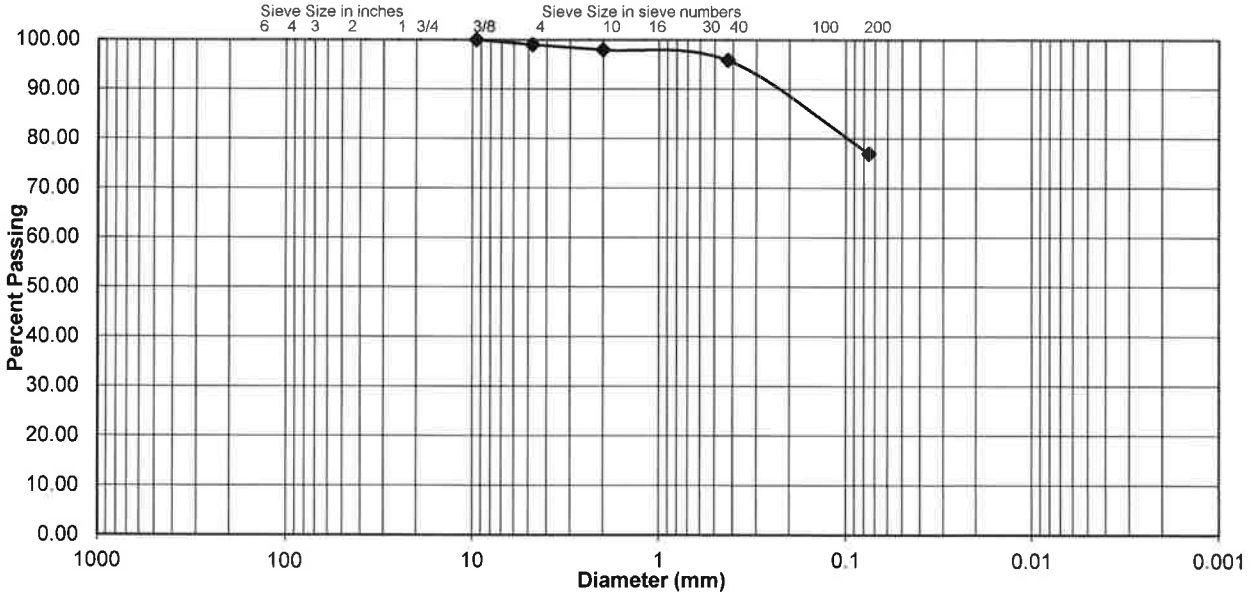
Sieve Size	Grams Retained	% Retained	% Passing
3/8"	0.00	0.0	100.0
No. 4	2.73	1.0	99.0
No. 10	2.94	1.1	98.0
No. 40	5.86	2.1	95.8
No. 200	52.39	18.9	77.0
Pan	213.53	77.0	---

% Gravel: 2.0
% Sand: 21.0
% Fines: 77.0
Fines Classification: N/A

D_{10} (mm): N/A
D_{30} (mm): N/A
D_{60} (mm): N/A

Cu: N/A
Cc: N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-2, 75.0'-77.0'	Lab ID	1347
Sample Type	ST	Date Received	10-25-21
		Date Reported	11-11-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
3/4"	19	100.0
3/8"	9.5	99.2
No. 4	4.75	98.6
No. 10	2	97.3
No. 40	0.425	96.7
No. 200	0.075	69.0
	0.02	41.9
	0.005	21.2
	0.002	15.0
Estimated	0.001	11.8

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	1.4	2.7
Coarse Sand	1.3	0.6
Medium Sand	0.6	---
Fine Sand	27.7	27.7
Silt	47.8	54.0
Clay	21.2	15.0

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	22
Plastic Limit:	17
Plasticity Index:	5
Activity Index:	0.3

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.64

Classification

Unified Group Symbol: CL-ML
Group Name: Sandy silty clay

AASHTO Classification: A-4 (1)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 75.0'-77.0'
Lab ID: 1347

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: Rounded and Angular
Particle Hardness: Hard and Durable

Tested By: DW
Test Date: 10-29-2021
Date Received: 10-25-2021

Maximum Particle Size: 3/4" Sieve

Sieve Size	% Passing
3/4"	100.0
3/8"	99.2
No. 4	98.6
No. 10	97.3

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

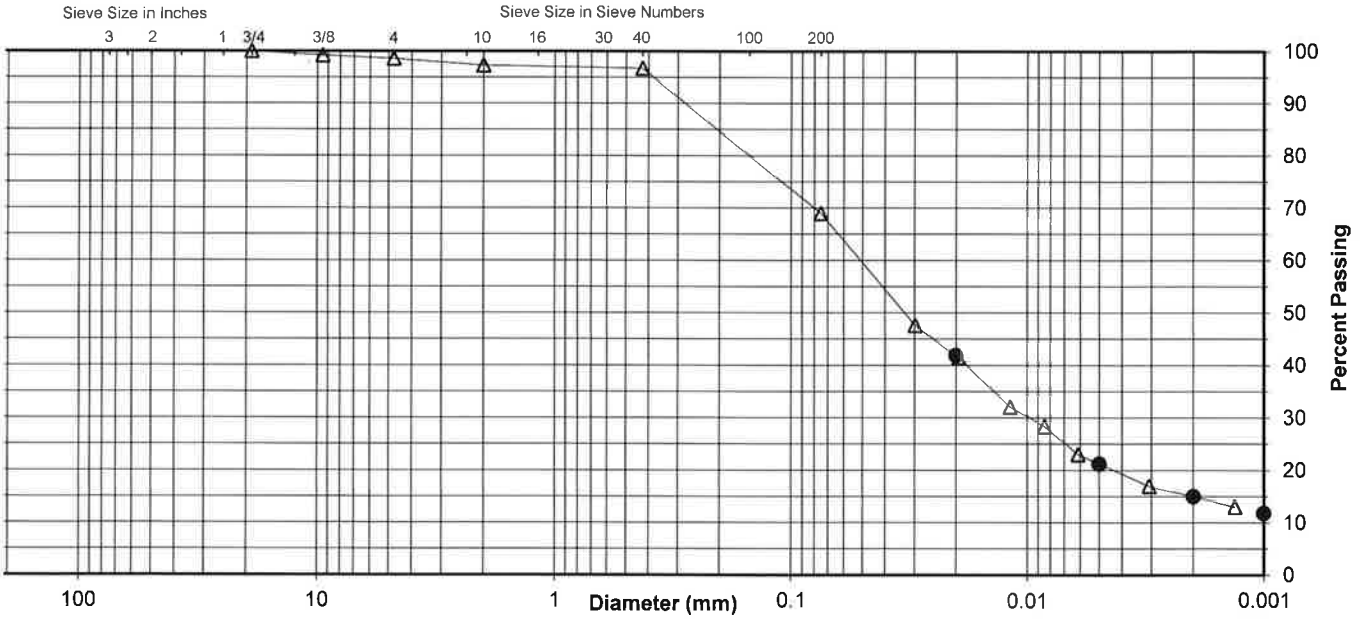
Specific Gravity: 2.64

Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	96.7
No. 200	69.0
0.02 mm	41.9
0.005 mm	21.2
0.002 mm	15.0
0.001 mm	11.8

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	1.4	1.3	0.6	27.7	47.8	21.2
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	2.7			0.6	27.7	54.0	15.0



Comments

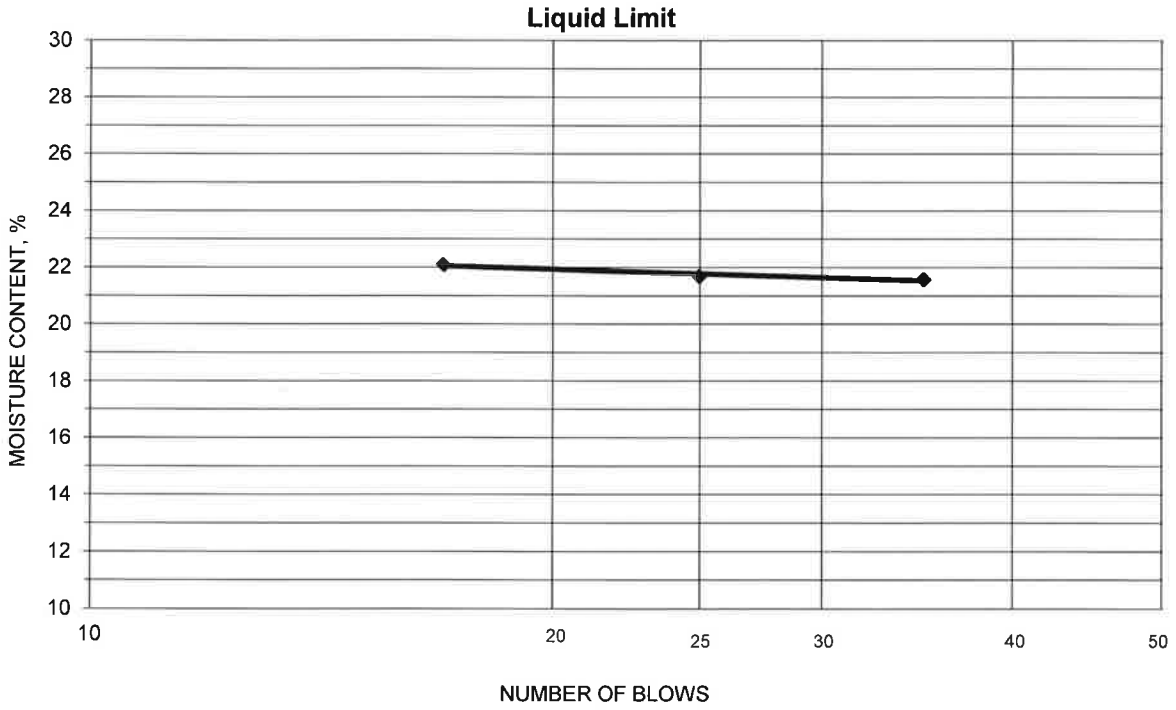
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N			Project No.	178568003
Source	054B00009N-2, 75.0'-77.0'			Lab ID	1347
				% + No. 40	3
Tested By	JMB	Test Method	AASHTO T 89 & T 90	Date Received	10-25-2021
Test Date	11-04-2021	Prepared	Dry		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
19.00	17.66	11.45	35	21.6	
19.20	17.81	11.40	25	21.7	
17.74	16.60	11.44	17	22.1	22



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.94	18.55	10.78	17.9	17	5
19.35	18.18	11.00	16.3		

Remarks: _____

Reviewed By RJ

Stantec

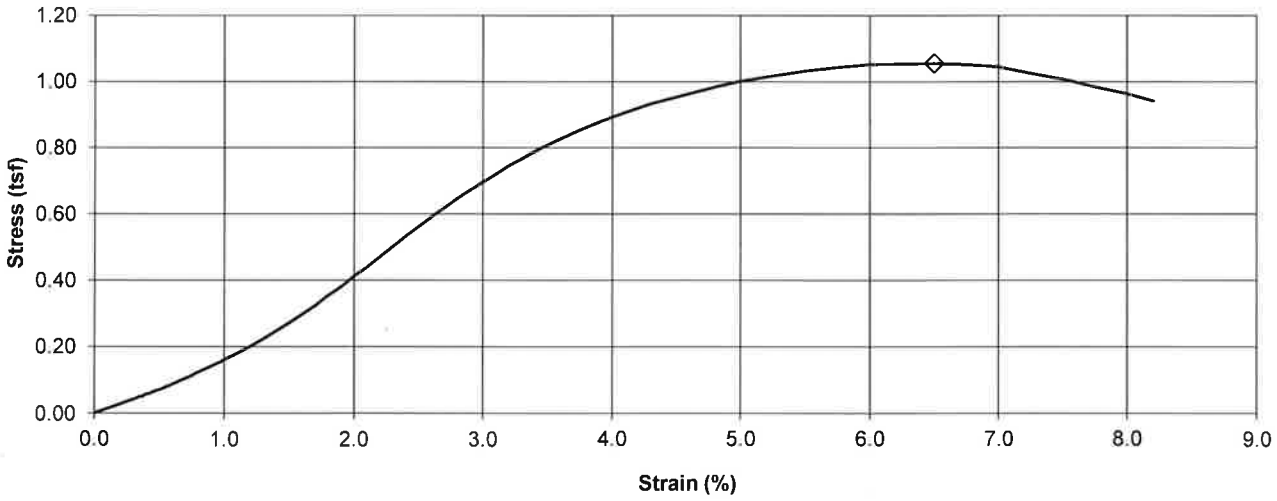
Unconfined Compressive Strength of Cohesive Soil

KM 64-522

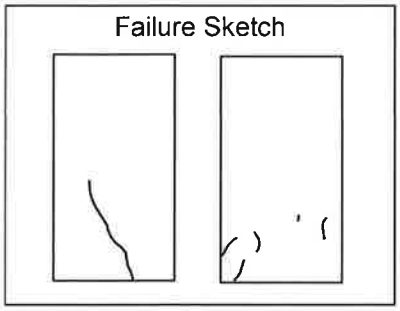
Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 75.0'-77.0'
Lab ID: 1347
Visual Description: Sandy Silty Clay (CL-ML), gray, moist, firm
Recovered: 2.3'
Test Interval: 76.3' - 76.9'
Specimen Type: Undisturbed
LL: 22
PL: 17
PI: 5
Date Extruded: 10/27/2021
Date Tested: 10/27/2021

Initial Wet Density (pcf)	132.6		
Initial Moisture Content (%)	19.2	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	111.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.64		
Degree of Saturation (%)	105.2	Unconfined Compressive Strength (tsf)	1.06
Average Height (in)	6.010	Undrained Shear Strength (tsf)	0.53
Average Diameter (in)	2.853	Strain at Maximum Stress (%)	6.5
Height to Diameter Ratio	2.1	Strain Rate to Failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: RJ

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 80.0'-81.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 380
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 422.63
Moisture Content (%): 21.4

Project Number: 178568003
Lab ID: 1323
Date Received: 10-21-2021
Preparation Date: 10-22-2021
Test Date: 10-27-2021

Analysis Based on Total Sample.

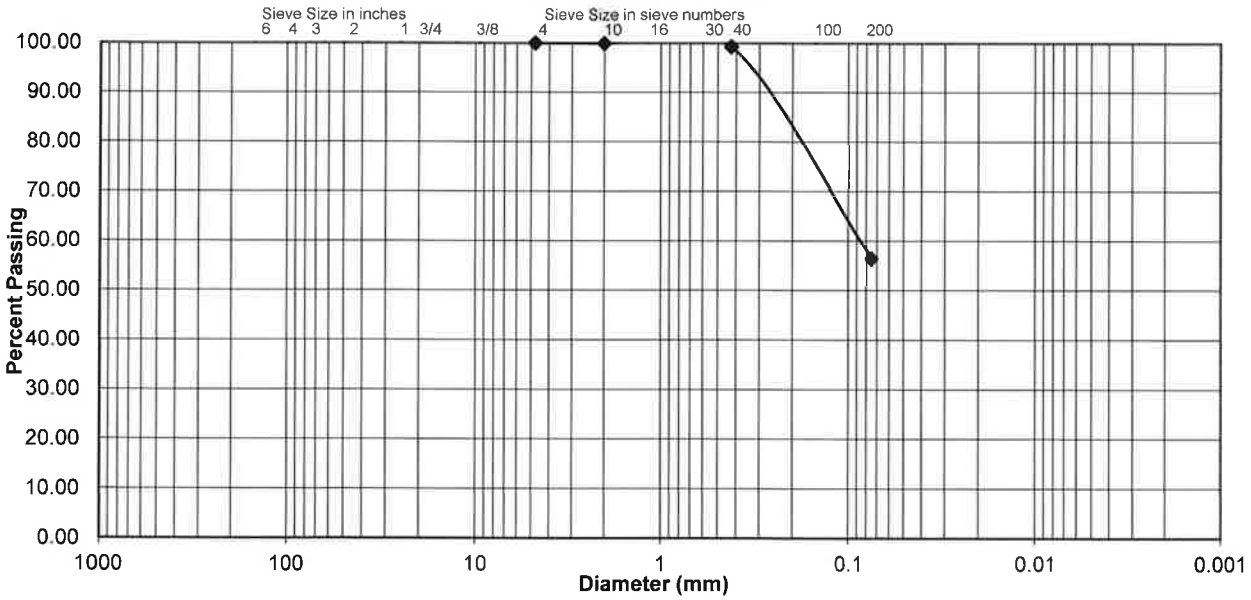
Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.34	0.1	99.9
No. 40	2.70	0.6	99.3
No. 200	181.18	42.9	56.4
Pan	238.41	56.4	---

% Gravel: 0.1
% Sand: 43.5
% Fines: 56.4
Fines Classification: N/A

D_{10} (mm): N/A
D_{30} (mm): N/A
D_{60} (mm): N/A

Cu: N/A
Cc: N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Stantec

Summary of Soil Tests

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 85.0'-87.0'
Lab ID: 1348
Sample Type: ST
Date Received: 10-25-21
Date Reported: 11-11-21

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 4	4.75	100.0
No. 10	2	99.9
No. 40	0.425	99.7
No. 200	0.075	70.1
	0.02	43.6
	0.005	23.9
	0.002	16.9
Estimated	0.001	12.5

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.1
Coarse Sand	0.1	0.2
Medium Sand	0.2	---
Fine Sand	29.6	29.6
Silt	46.2	53.2
Clay	23.9	16.9

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry
Liquid Limit: 23
Plastic Limit: 17
Plasticity Index: 6
Activity Index: 0.4

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.69

Classification

Unified Group Symbol: CL-ML
Group Name: Silty clay with sand
AASHTO Classification: A-4 (2)

Comments:

Reviewed By: RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 85.0'-87.0'

Project Number: 178568003
Lab ID: 1348

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: DW
Test Date: 11-01-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 4 Sieve

Sieve Size	% Passing
No. 4	100.0
No. 10	99.9

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

Specific Gravity: 2.69

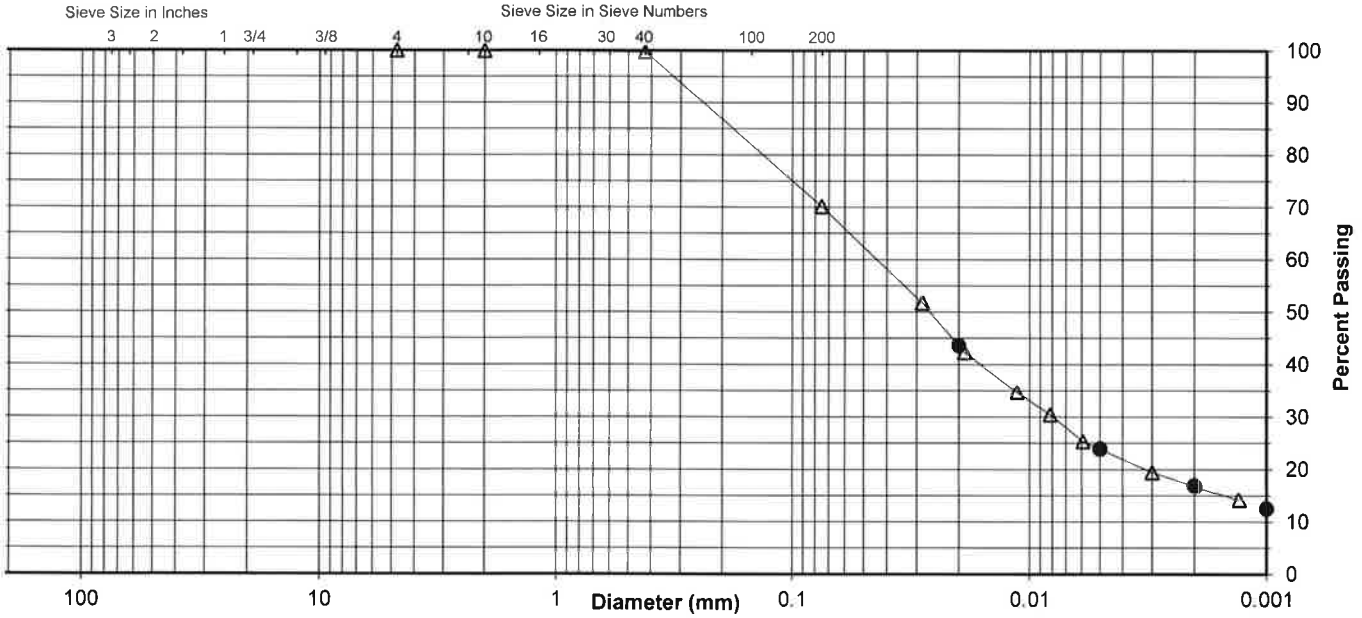
Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	99.7
No. 200	70.1
0.02 mm	43.6
0.005 mm	23.9
0.002 mm	16.9
0.001 mm	12.5

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.1	0.2	29.6	46.2	23.9

	Gravel	Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.1	0.2	29.6	53.2	16.9



Comments

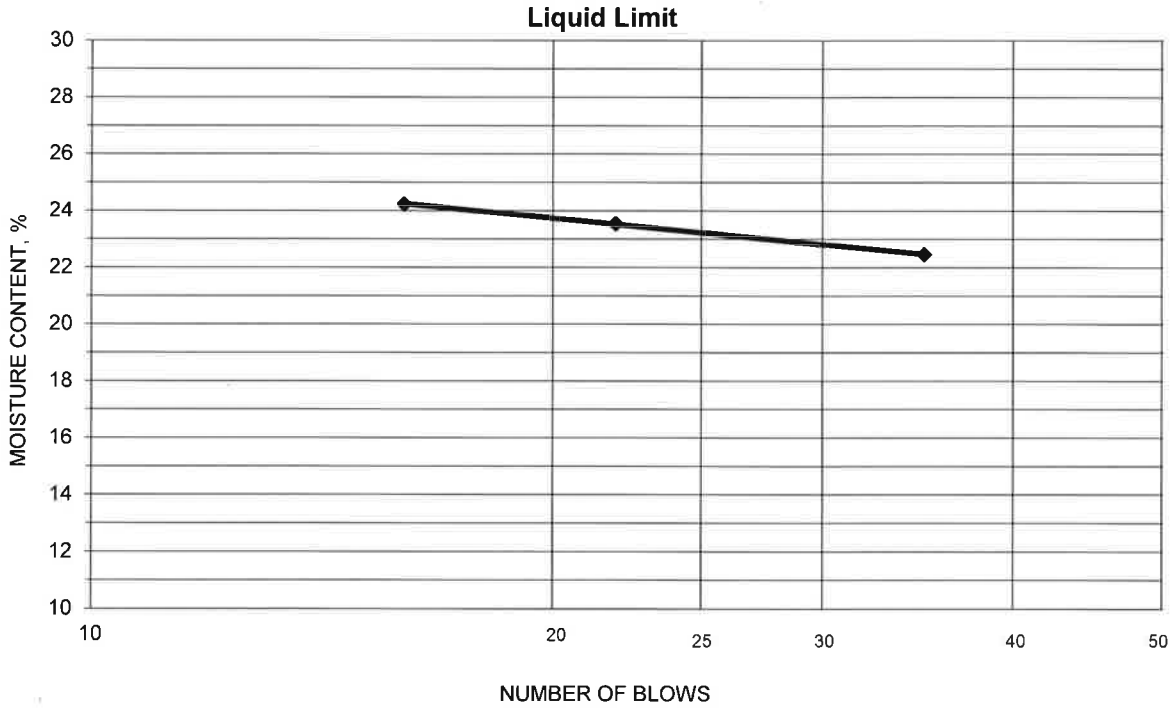
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-2, 85.0'-87.0'	Lab ID	1348
		% + No. 40	0
Tested By	JMB	Test Method	AASHTO T 89 & T 90
Test Date	11-05-2021	Prepared	Dry
		Date Received	10-25-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
17.93	16.72	11.33	35	22.4	
18.79	17.38	11.39	22	23.5	
19.09	17.60	11.45	16	24.2	23



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.93	18.63	10.76	16.5	17	6
20.13	18.82	10.88	16.5		

Remarks: _____

Reviewed By RJ

Stantec

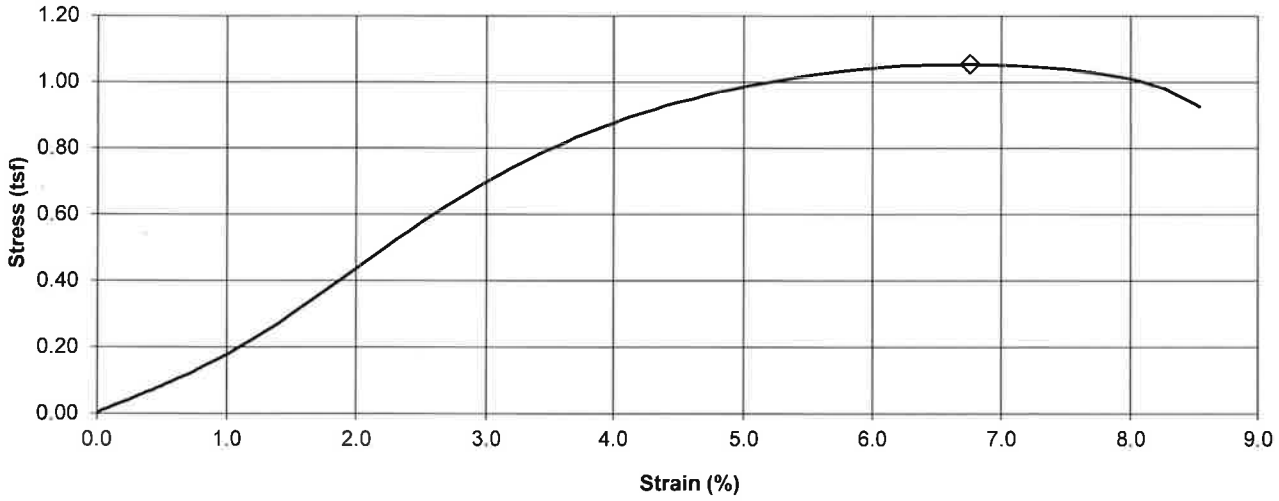
Unconfined Compressive Strength of Cohesive Soil

KM 64-522

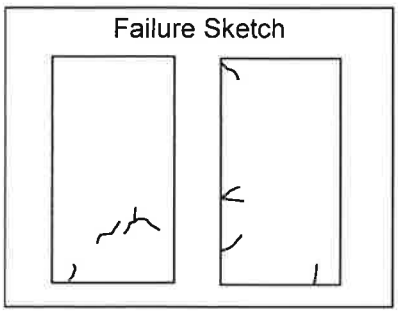
Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-2, 85.0'-87.0'
Lab ID: 1348
Visual Description: Silty Clay with Sand (CL-ML), gray, moist, firm
Recovered: 2.3'
Test Interval: 86.7' - 87.2'
Specimen Type: Undisturbed
LL: 23
PL: 17
PI: 6
Date Extruded: 10/28/2021
Date Tested: 10/28/2021

Initial Wet Density (pcf)	130.6		
Initial Moisture Content (%)	22.2	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	106.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.69		
Degree of Saturation (%)	104.4	Unconfined Compressive Strength (tsf)	1.05
Average Height (in)	6.010	Undrained Shear Strength (tsf)	0.53
Average Diameter (in)	2.850	Strain at Maximum Stress (%)	6.8
Height to Diameter Ratio	2.1	Strain Rate to Failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: RJ

Template: tmp_uc_input.xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/11/2021

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 95.1'-96.6'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 380
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 335.80
Moisture Content (%): 19.8

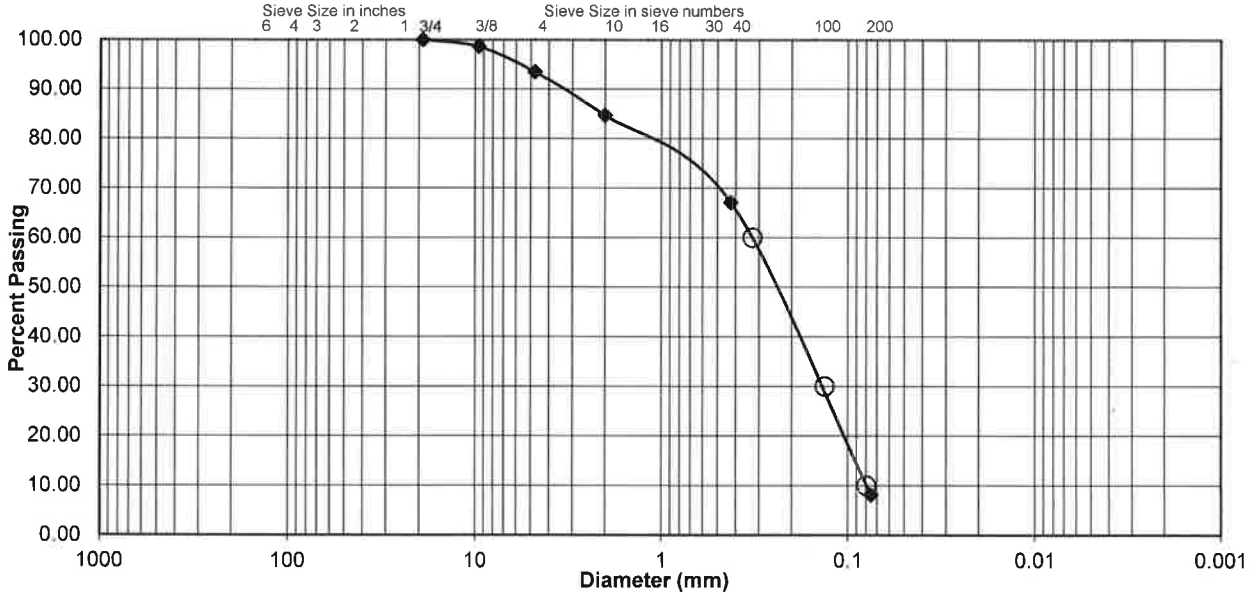
Project Number: 178568003
Lab ID: 1325
Date Received: 10-21-2021
Preparation Date: 10-22-2021
Test Date: 10-27-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
3/4"	0.00	0.0	100.0
3/8"	4.68	1.4	98.6
No. 4	17.27	5.1	93.5
No. 10	29.37	8.7	84.7
No. 40	59.21	17.6	67.1
No. 200	198.05	59.0	8.1
Pan	27.22	8.1	---

% Gravel	15.3
% Sand	76.6
% Fines	8.1
Fines Classification	N/A
D_{10} (mm)	0.0793
D_{30} (mm)	0.1328
D_{60} (mm)	0.3251
Cu	4.10
Cc	0.68

Particle Size Distribution



Comments

Reviewed By

Stantec

Gradation Analysis

AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 100.0'-100.6'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 390
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 125.04
Moisture Content (%): 15.3

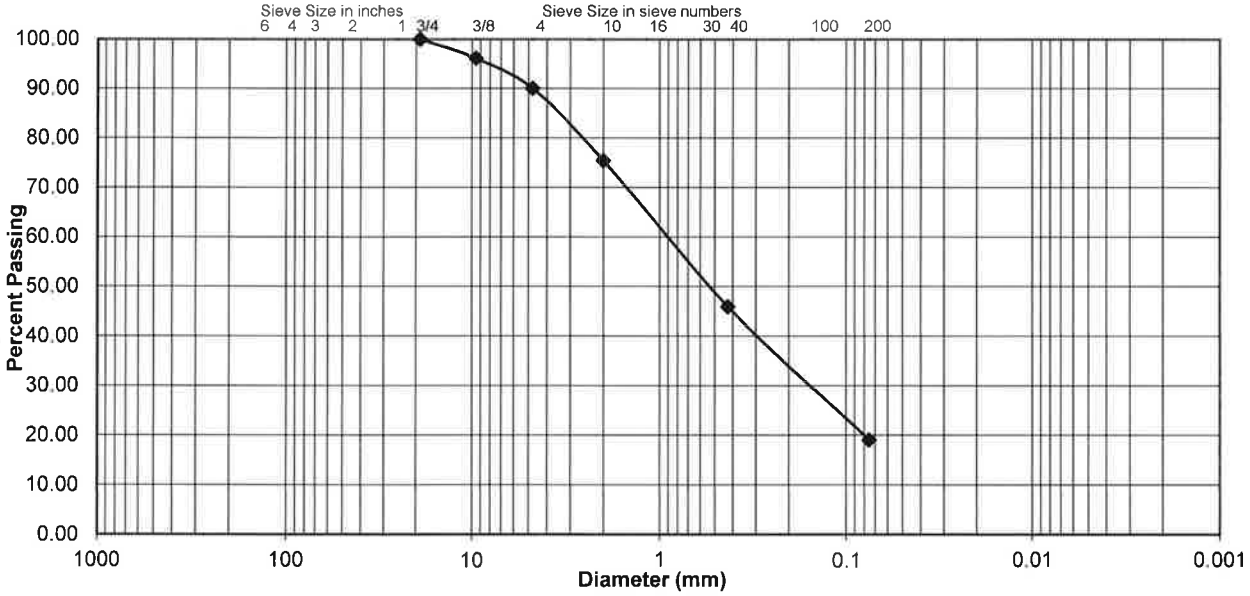
Project Number: 178568003
Lab ID: 1326
Date Received: 10-21-2021
Preparation Date: 10-22-2021
Test Date: 10-27-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
3/4"	0.00	0.0	100.0
3/8"	4.87	3.9	96.1
No. 4	7.63	6.1	90.0
No. 10	18.24	14.6	75.4
No. 40	36.87	29.5	45.9
No. 200	33.61	26.9	19.0
Pan	23.82	19.0	---

% Gravel	24.6
% Sand	56.4
% Fines	19.0
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Stantec

Moisture Content of Soil

AASHTO T 265

Project Name Bridging KY - 054B00009N

Project Number 178568003

Tested By DW

Test Method AASHTO

Maximum Particle Size in Sample	No. 40	No. 4	1/2"	1"	2"	
Recommended Minimum Mass (g)	10	100	300	500	1,000	

Material Type: Stratified, Laminated, Lensed, Homogeneous, Disturbed

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & Can Weight (g)	Moisture Content (%)
054B00009N-2, 2.0'-3.5'	1314	10/21/21	Hom	No. 4			Yes	301.18	440.04	417.72	19.2
054B00009N-2, 10.0'-11.5'	1315	10/21/21	Hom	No. 4			Yes	309.36	517.37	481.03	21.2
054B00009N-2, 20.0'-21.5'	1316	10/21/21	Hom	No. 4			Yes	300.39	494.66	457.72	23.5
054B00009N-2, 30.0'-31.5'	1317	10/21/21	Hom	No. 4			Yes	308.48	620.20	564.03	22.0
054B00009N-2, 40.0'-41.5'	1318	10/21/21	Hom	No. 4			Yes	300.44	604.91	545.79	24.1
054B00009N-2, 50.0'-51.5'	1319	10/21/21	Hom	1/2"			Yes	300.58	720.89	644.57	22.2
054B00009N-2, 60.0'-61.5'	1320	10/21/21	Hom	1/2"			Yes	296.88	735.10	646.24	25.4
054B00009N-2, 67.0'-68.5'	1321	10/21/21	Hom	No. 4			Yes	308.06	671.17	591.51	28.1
054B00009N-2, 70.0'-71.5'	1322	10/21/21	Hom	1/2"			No	300.58	660.30	578.03	29.7
054B00009N-2, 80.0'-81.5'	1323	10/21/21	Hom	No. 4			Yes	303.76	816.78	726.39	21.4
054B00009N-2, 90.0'-91.5' No Recovery	1324	10/21/21									
054B00009N-2, 95.1'-96.6'	1325	10/21/21	Dist	1"			No	304.22	706.51	640.02	19.8
054B00009N-2, 100.0'-100.6'	1326	10/21/21	Dist	1"			No	305.10	449.27	430.14	15.3

Comments

Reviewed By RJ

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 2.5'-4.0'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 200
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 178.10
Moisture Content (%): 23.3

Project Number: 178568003
Lab ID: 1327
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

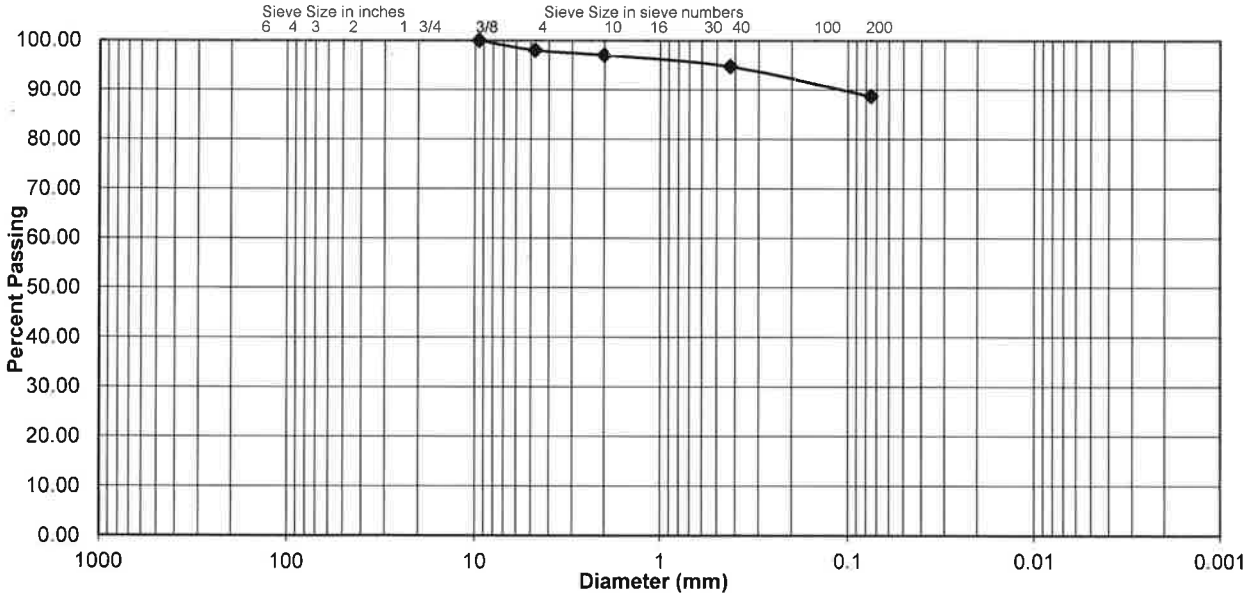
Sieve Size	Grams Retained	% Retained	% Passing
3/8"	0.00	0.0	100.0
No. 4	3.54	2.0	98.0
No. 10	1.69	0.9	97.1
No. 40	4.11	2.3	94.8
No. 200	10.78	6.1	88.7
Pan	157.98	88.7	---

% Gravel: 2.9
% Sand: 8.4
% Fines: 88.7
Fines Classification: N/A

D_{10} (mm): N/A
D_{30} (mm): N/A
D_{60} (mm): N/A

Cu: N/A
Cc: N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Template: tmp_200_input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/09/2021

Stantec

Summary of Soil Tests

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 5.0'-7.0'
Lab ID: 1350
Sample Type: ST
Date Received: 10-25-21
Date Reported: 11-11-21

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 10	2	100.0
No. 40	0.425	99.9
No. 200	0.075	98.9
	0.02	93.6
	0.005	68.9
	0.002	48.5
Estimated	0.001	35.5

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.1
Medium Sand	0.1	---
Fine Sand	1.0	1.0
Silt	30.0	50.4
Clay	68.9	48.5

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry
Liquid Limit: 42
Plastic Limit: 20
Plasticity Index: 22
Activity Index: 0.5

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.73

Classification

Unified Group Symbol: CL
Group Name: Lean clay
AASHTO Classification: A-7-6 (24)

Comments:

Reviewed By: RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 5.0'-7.0'
Lab ID: 1350

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: N/A
Particle Hardness: N/A

Tested By: DW
Test Date: 11-01-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 10 Sieve

Sieve Size	% Passing
No. 10	100.0

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

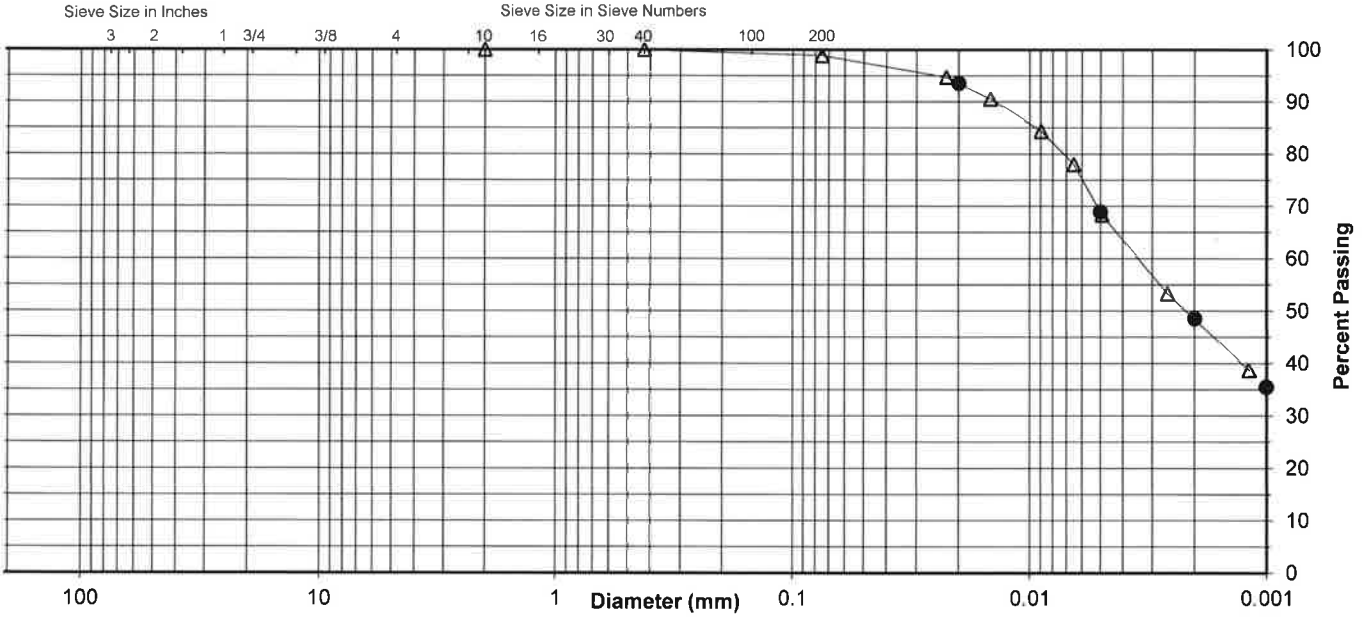
Specific Gravity: 2.73

Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	99.9
No. 200	98.9
0.02 mm	93.6
0.005 mm	68.9
0.002 mm	48.5
0.001 mm	35.5

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	0.1	1.0	30.0	68.9
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.1	1.0	50.4	48.5



Comments

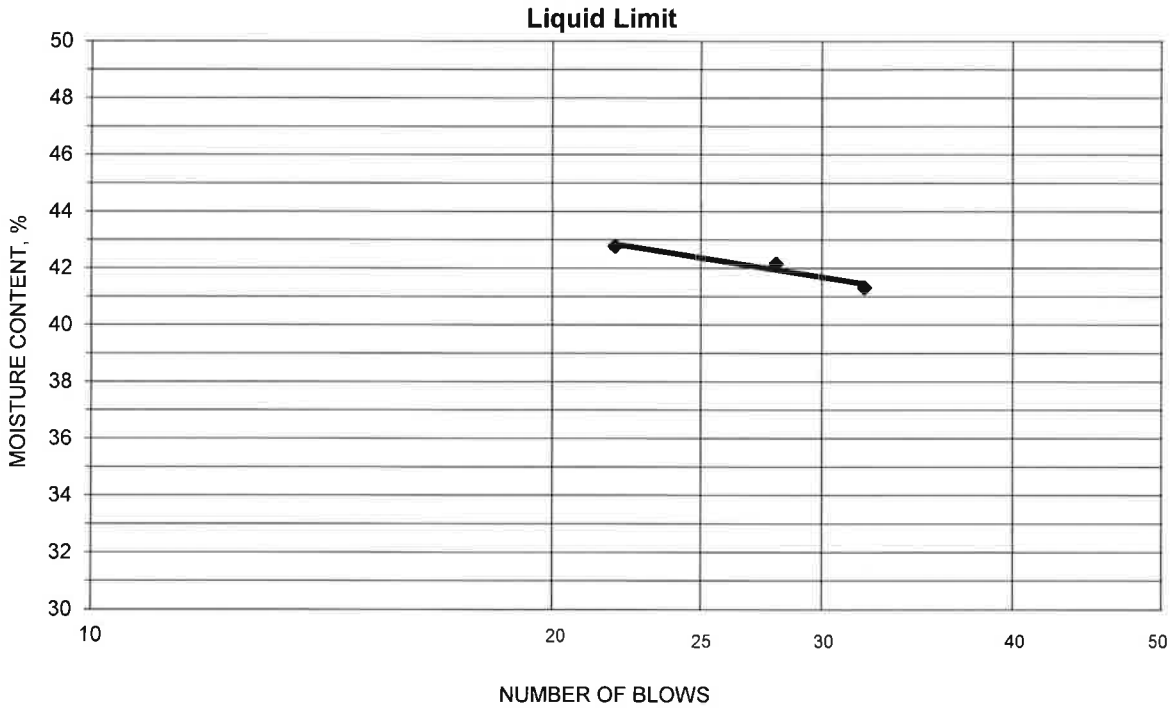
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-3, 5.0'-7.0'	Lab ID	1350
		% + No. 40	0
Tested By	KG/RJ	Test Method	AASHTO T 89 & T 90
Test Date	11-09-2021	Prepared	Dry
		Date Received	10-25-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
18.70	16.44	10.97	32	41.3	
18.78	16.50	11.09	28	42.1	
20.62	17.81	11.24	22	42.8	42



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.65	17.46	11.40	19.6	20	22
18.26	17.11	11.41	20.2		

Remarks: _____

Reviewed By RJ

Stantec

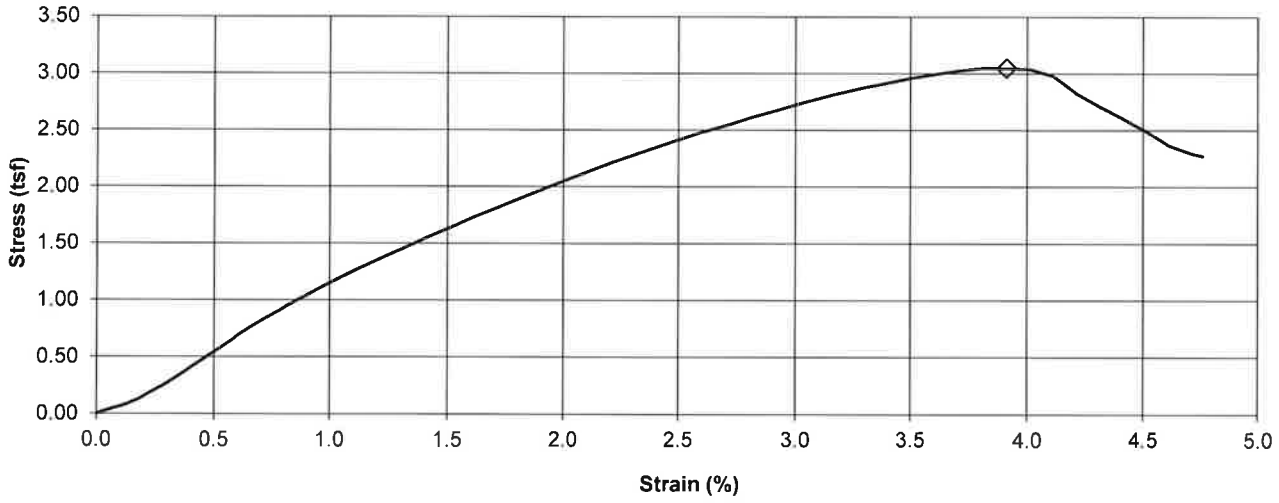
Unconfined Compressive Strength of Cohesive Soil

KM 64-522

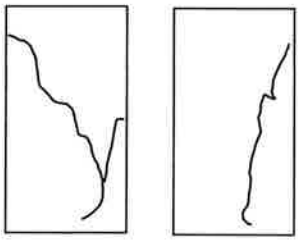
Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 5.0'-7.0'
Lab ID: 1350
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.9'
Test Interval: 6.2' - 6.7'
Specimen Type: Undisturbed
LL: 42
PL: 20
PI: 22
Date Extruded: 10/28/2021
Date Tested: 10/28/2021

Initial Wet Density (pcf)	127.6		
Initial Moisture Content (%)	24.2	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	102.7		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.73		
Degree of Saturation (%)	100.1	Unconfined Compressive Strength (tsf)	3.05
Average Height (in)	6.039	Undrained Shear Strength (tsf)	1.52
Average Diameter (in)	2.863	Strain at Maximum Stress (%)	3.9
Height to Diameter Ratio	2.1	Strain Rate to Failure (% / min.)	0.99

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: RJ

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 10.0'-11.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 210
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 155.76
Moisture Content (%): 25.3

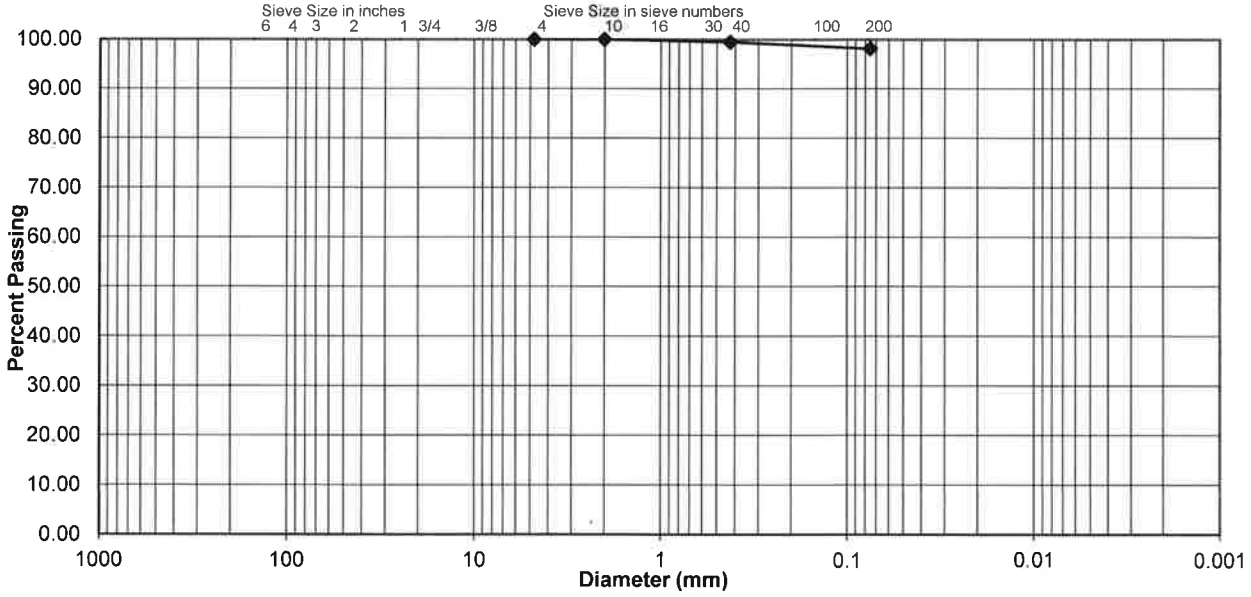
Project Number: 178568003
Lab ID: 1328
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.03	0.0	100.0
No. 40	0.80	0.5	99.5
No. 200	2.05	1.3	98.2
Pan	152.88	98.2	---

% Gravel	0.0
% Sand	1.8
% Fines	98.2
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-3, 15.0'-17.0'	Lab ID	1351
Sample Type	ST	Date Received	10-25-21
		Date Reported	11-11-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 10	2	100.0
No. 40	0.425	99.9
No. 200	0.075	98.3
	0.02	92.7
	0.005	70.2
	0.002	47.0
Estimated	0.001	33.9

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.1
Medium Sand	0.1	---
Fine Sand	1.6	1.6
Silt	28.1	51.3
Clay	70.2	47.0

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	39
Plastic Limit:	22
Plasticity Index:	17
Activity Index:	0.4

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.77

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-6 (18)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 15.0'-17.0'
Lab ID: 1351

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: N/A
Particle Hardness: N/A

Tested By: DW
Test Date: 11-01-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 10 Sieve

Sieve Size	% Passing
No. 10	100.0

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

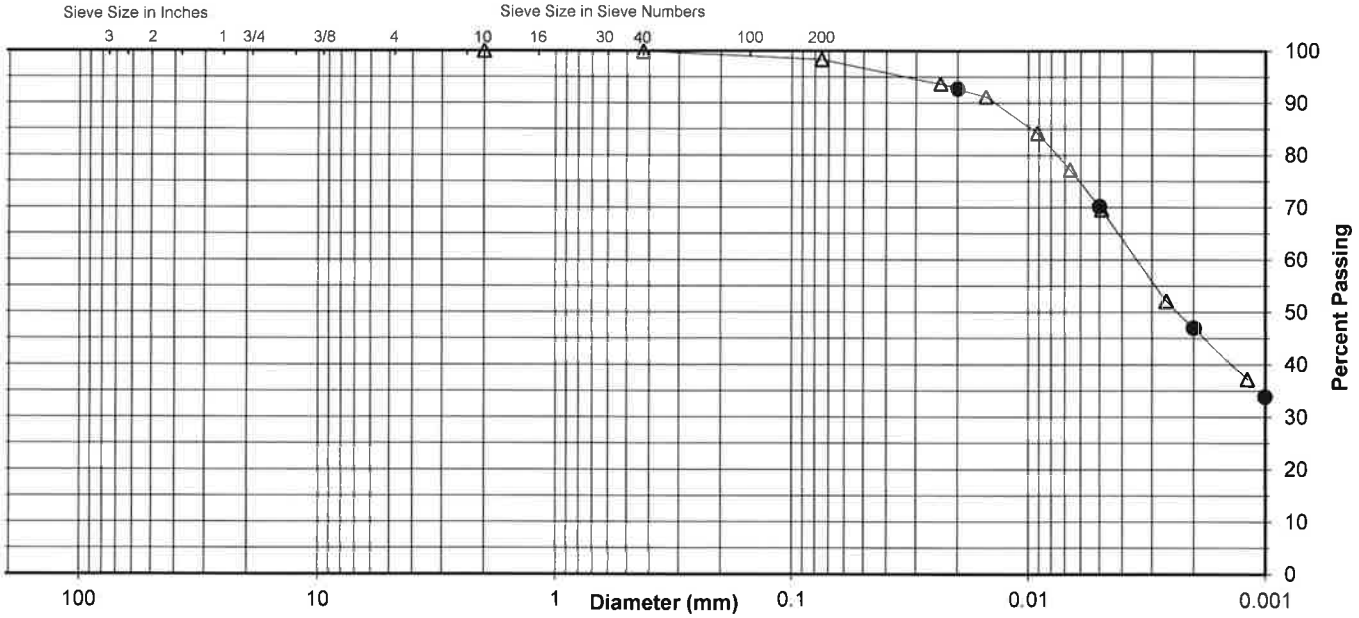
Specific Gravity: 2.77

Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	99.9
No. 200	98.3
0.02 mm	92.7
0.005 mm	70.2
0.002 mm	47.0
0.001 mm	33.9

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	0.1	1.6	28.1	70.2
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.1	1.6	51.3	47.0



Comments

Reviewed By: RJ

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Lexington, Kentucky

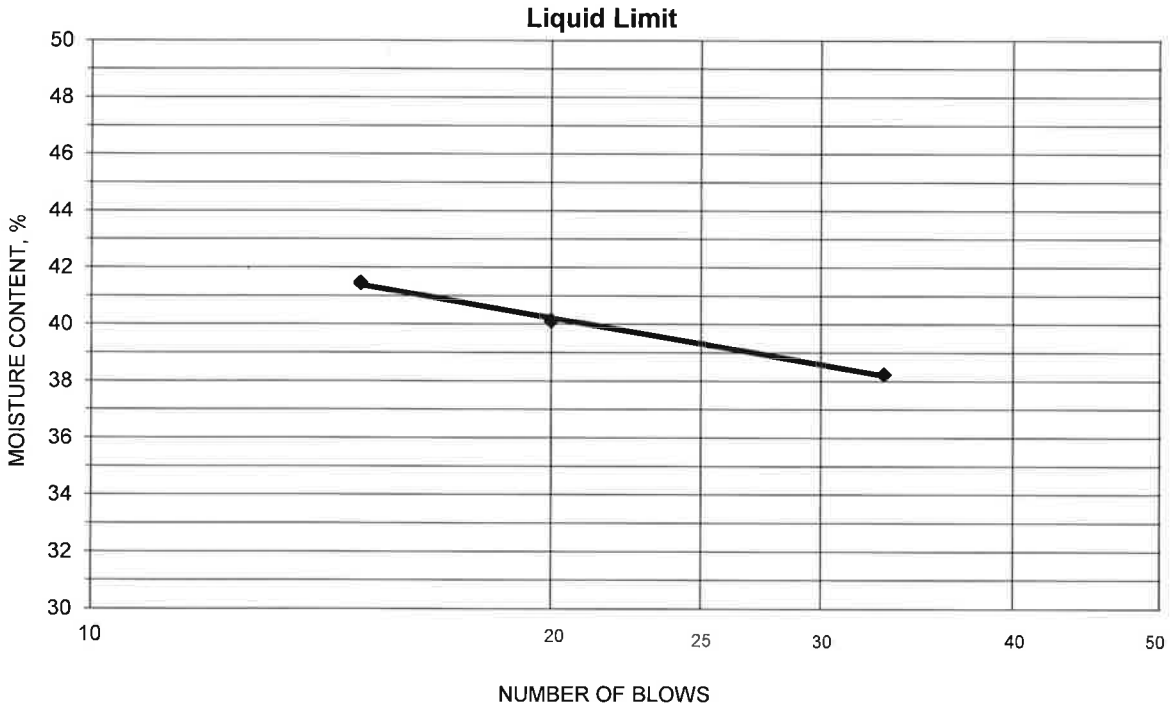
Reported By: RJ
Report Date: 11/11/2021

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-3, 15.0'-17.0'	Lab ID	1351
		% + No. 40	0
Tested By	JMB	Test Method	AASHTO T 89 & T 90
Test Date	11-04-2021	Prepared	Dry
		Date Received	10-25-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
16.51	14.98	10.98	33	38.3	
16.23	14.83	11.34	20	40.1	
16.92	15.27	11.29	15	41.5	39



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
21.01	19.17	10.74	21.8	22	17
20.70	19.02	11.36	21.9		

Remarks: _____

Reviewed By RJ

Stantec

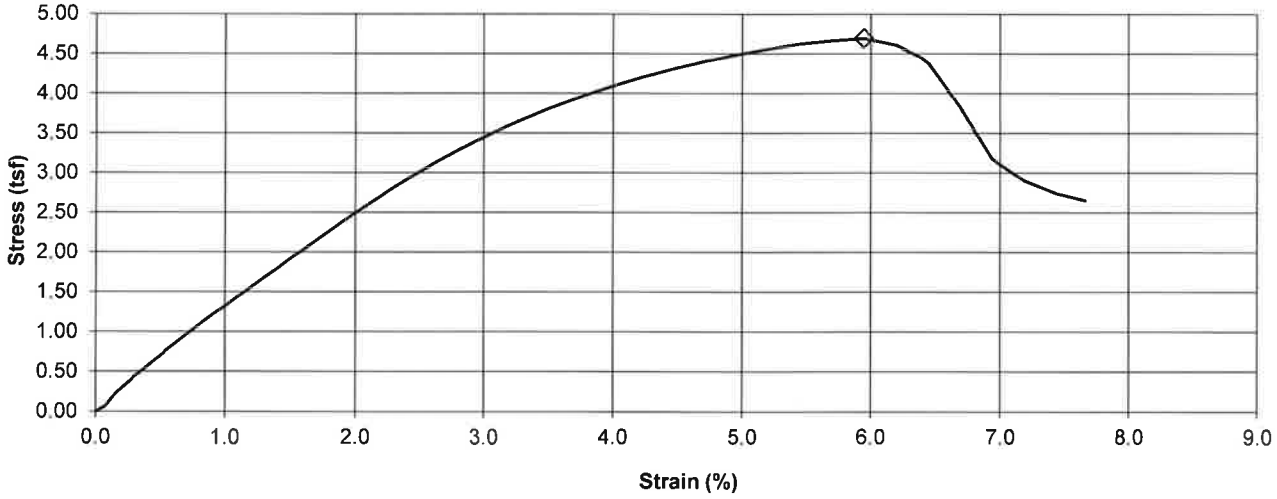
Unconfined Compressive Strength of Cohesive Soil

KM 64-522

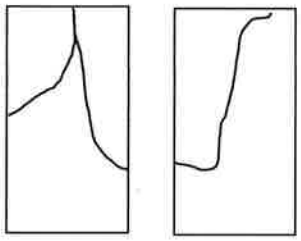
Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 15.0'-17.0'
Lab ID: 1351
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.8'
Test Interval: 16.1' - 16.6'
Specimen Type: Undisturbed
LL: 39
PL: 22
PI: 17
Date Extruded: 10/28/2021
Date Tested: 10/28/2021

Initial Wet Density (pcf)	129.9		
Initial Moisture Content (%)	22.9	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	105.7		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.77		
Degree of Saturation (%)	99.6	Unconfined Compressive Strength (tsf)	4.69
Average Height (in)	6.061	Undrained Shear Strength (tsf)	2.35
Average Diameter (in)	2.860	Strain at Maximum Stress (%)	5.9
Height to Diameter Ratio	2.1	Strain Rate to Failure (% / min.)	0.99

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: RJ

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Version: 20170217
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Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/11/2021

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 20.0'-21.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 230
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 213.97
Moisture Content (%): 22.8

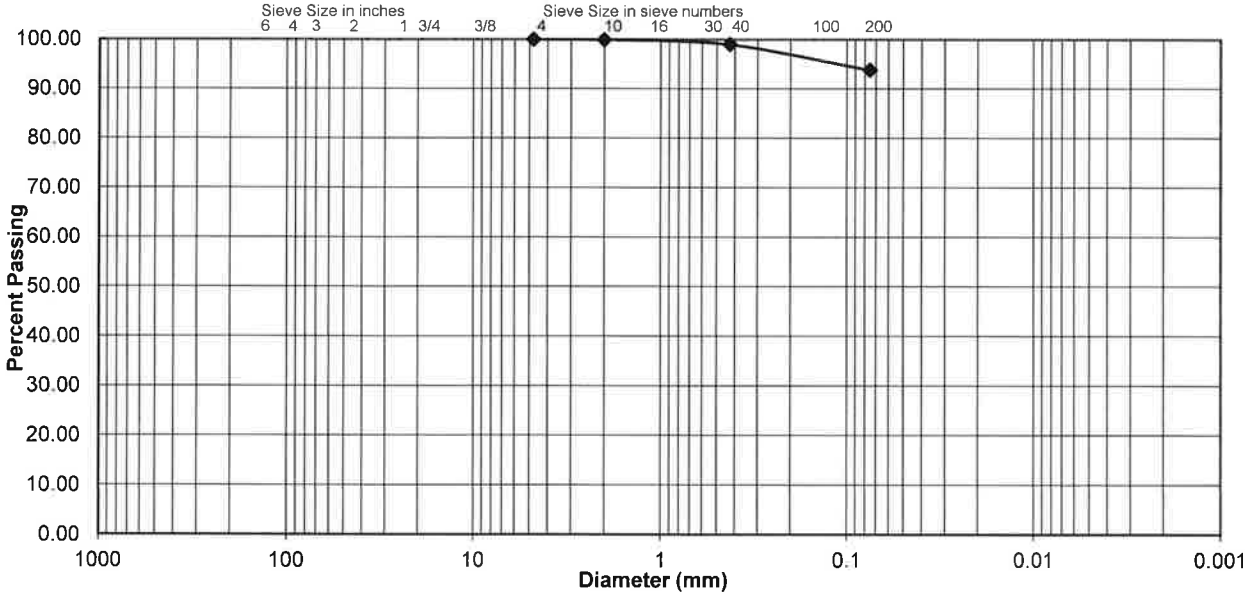
Project Number: 178568003
Lab ID: 1329
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.17	0.1	99.9
No. 40	2.00	0.9	99.0
No. 200	11.13	5.2	93.8
Pan	200.67	93.8	---

% Gravel	0.1
% Sand	6.1
% Fines	93.8
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 25.0'-27.0'
Lab ID: 1352
Sample Type: ST
Date Received: 10-25-21
Date Reported: 11-11-21

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 10	2	100.0
No. 40	0.425	100.0
No. 200	0.075	96.9
	0.02	66.2
	0.005	32.4
	0.002	23.4
Estimated	0.001	17.4

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.0
Medium Sand	0.0	---
Fine Sand	3.1	3.1
Silt	64.5	73.5
Clay	32.4	23.4

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry
Liquid Limit: 30
Plastic Limit: 17
Plasticity Index: 13
Activity Index: 0.6

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.69

Classification

Unified Group Symbol: CL
Group Name: Lean clay
AASHTO Classification: A-6 (12)

Comments:

Reviewed By: RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 25.0'-27.0'

Project Number: 178568003
Lab ID: 1352

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: N/A
Particle Hardness: N/A

Tested By: DW
Test Date: 11-01-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 10 Sieve

Sieve Size	% Passing
No. 10	100.0

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

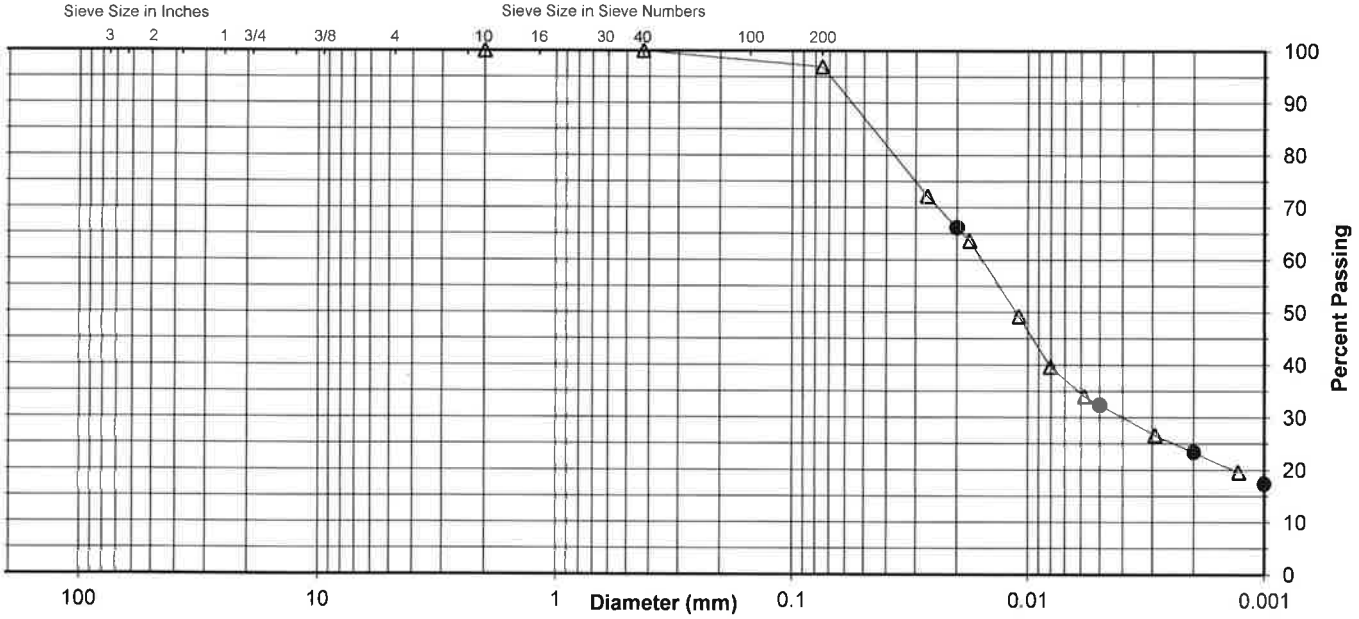
Specific Gravity: 2.69

Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	100.0
No. 200	96.9
0.02 mm	66.2
0.005 mm	32.4
0.002 mm	23.4
0.001 mm	17.4

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.0	0.0	3.1	64.5	32.4
	Gravel			Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.0			0.0	3.1	73.5	23.4



Comments

Reviewed By: RJ

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Approved By: RJ

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Lexington, Kentucky

Reported By: RJ
Report Date: 11/11/2021

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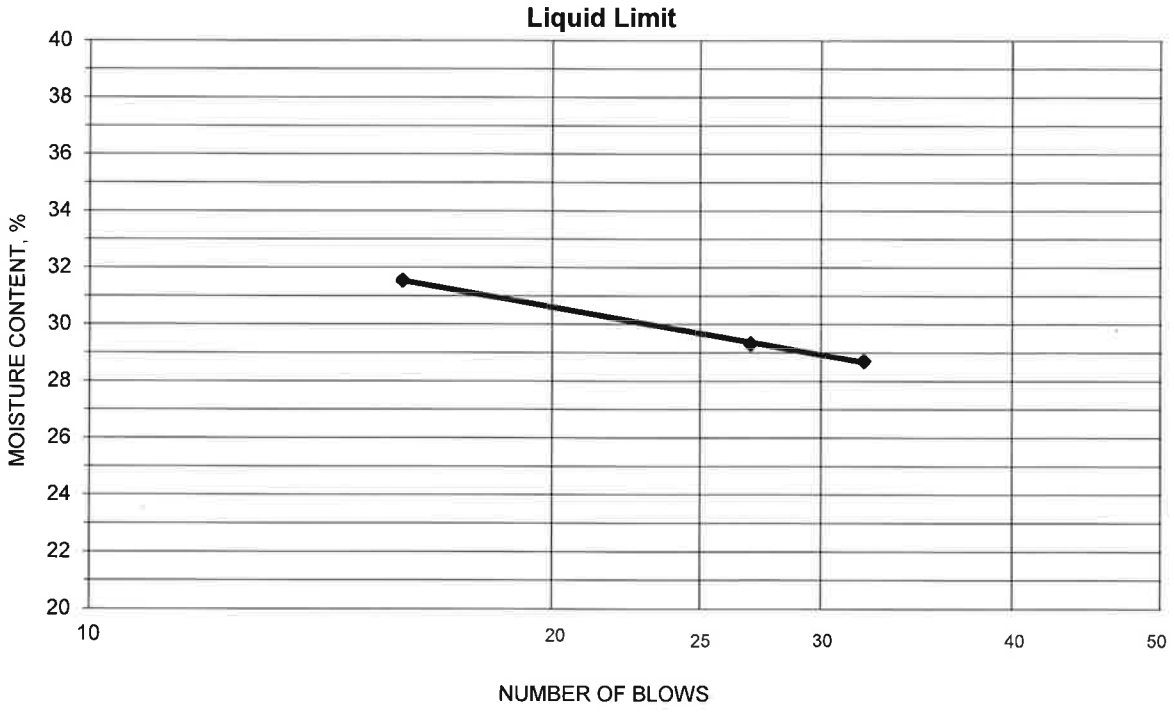
ATTERBERG LIMITS

Project	Bridging KY - 054B00009N			Project No.	178568003
Source	054B00009N-3, 25.0'-27.0'			Lab ID	1352
				% + No. 40	0
Tested By	JMB	Test Method	AASHTO T 89 & T 90	Date Received	10-25-2021
Test Date	11-05-2021	Prepared	Dry		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
18.80	17.15	11.40	32	28.7	
19.40	17.58	11.37	27	29.3	
19.09	17.28	11.54	16	31.5	30



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
20.19	18.82	11.02	17.6	17	13
19.06	17.91	11.26	17.3		

Remarks: _____

Reviewed By RJ

Stantec

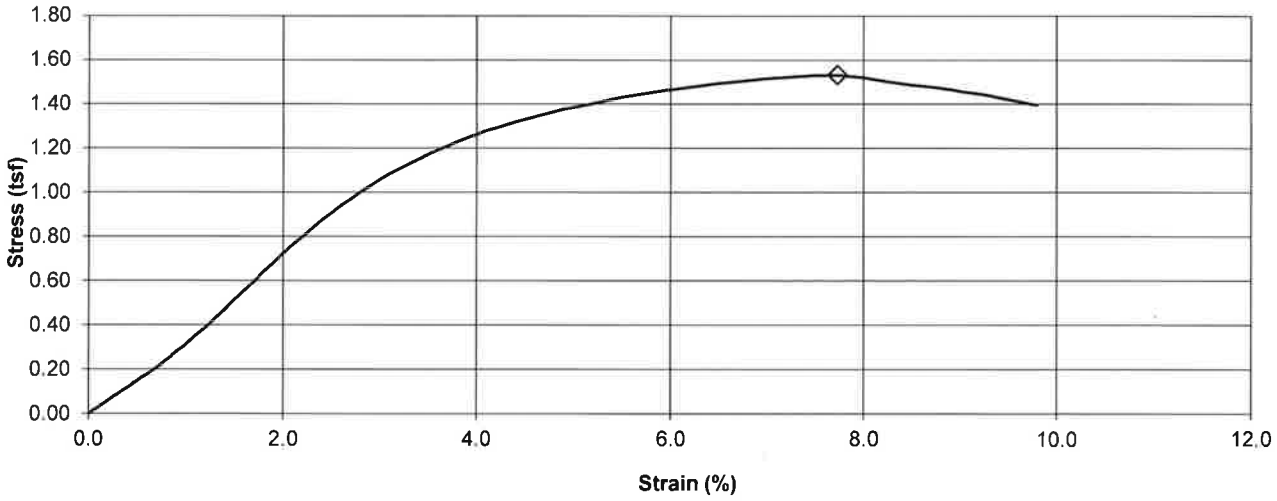
Unconfined Compressive Strength of Cohesive Soil

KM 64-522

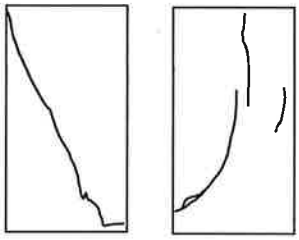
Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 25.0'-27.0'
Lab ID: 1352
Visual Description: Lean Clay (CL), gray, moist, firm
Recovered: 2'
Test Interval: 26.5' - 27.0'
Specimen Type: Undisturbed
LL: 30
PL: 17
PI: 13
Date Extruded: 10/28/2021
Date Tested: 10/28/2021

Initial Wet Density (pcf)	128.2		
Initial Moisture Content (%)	21.4	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	105.6		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.69		
Degree of Saturation (%)	97.5	Unconfined Compressive Strength (tsf)	1.53
Average Height (in)	6.018	Undrained Shear Strength (tsf)	0.77
Average Diameter (in)	2.862	Strain at Maximum Stress (%)	7.7
Height to Diameter Ratio	2.1	Strain Rate to Failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: RJ

Template: tmp_uc_input.xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/11/2021

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 30.0'-31.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 240
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 279.87
Moisture Content (%): 21.4

Project Number: 178568003
Lab ID: 1330
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

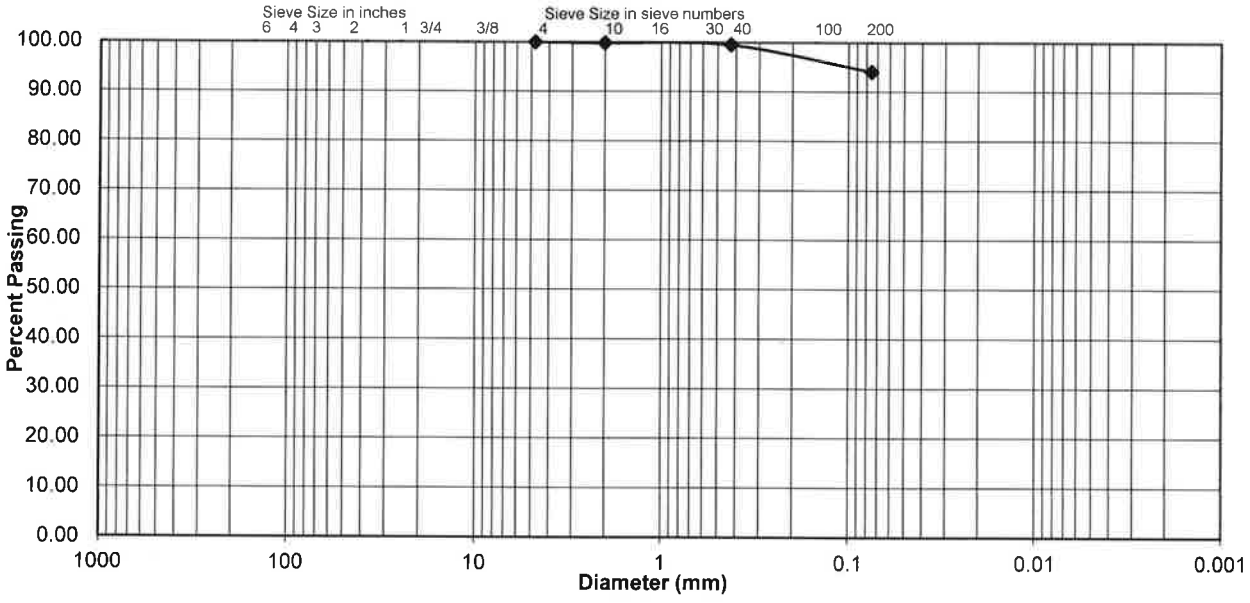
Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.49	0.2	99.8
No. 40	0.94	0.3	99.5
No. 200	15.13	5.4	94.1
Pan	263.31	94.1	---

% Gravel: 0.2
% Sand: 5.7
% Fines: 94.1
Fines Classification: N/A

D_{10} (mm): N/A
D_{30} (mm): N/A
D_{60} (mm): N/A

Cu: N/A
Cc: N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Template: tmp_200_input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/09/2021

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-3, 35.0'-37.0'	Lab ID	1353
Sample Type	ST	Date Received	10-25-21
		Date Reported	11-11-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 10	2	100.0
No. 40	0.425	100.0
No. 200	0.075	94.4
	0.02	65.8
	0.005	35.2
	0.002	25.0
Estimated	0.001	18.6

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.0
Medium Sand	0.0	---
Fine Sand	5.6	5.6
Silt	59.2	69.4
Clay	35.2	25.0

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	31
Plastic Limit:	18
Plasticity Index:	13
Activity Index:	0.5

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-6 (12)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 35.0'-37.0'
Lab ID: 1353

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: N/A
Particle Hardness: N/A

Tested By: DW
Test Date: 11-01-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 10 Sieve

Sieve Size	% Passing
No. 10	100.0

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

Specific Gravity: 2.7

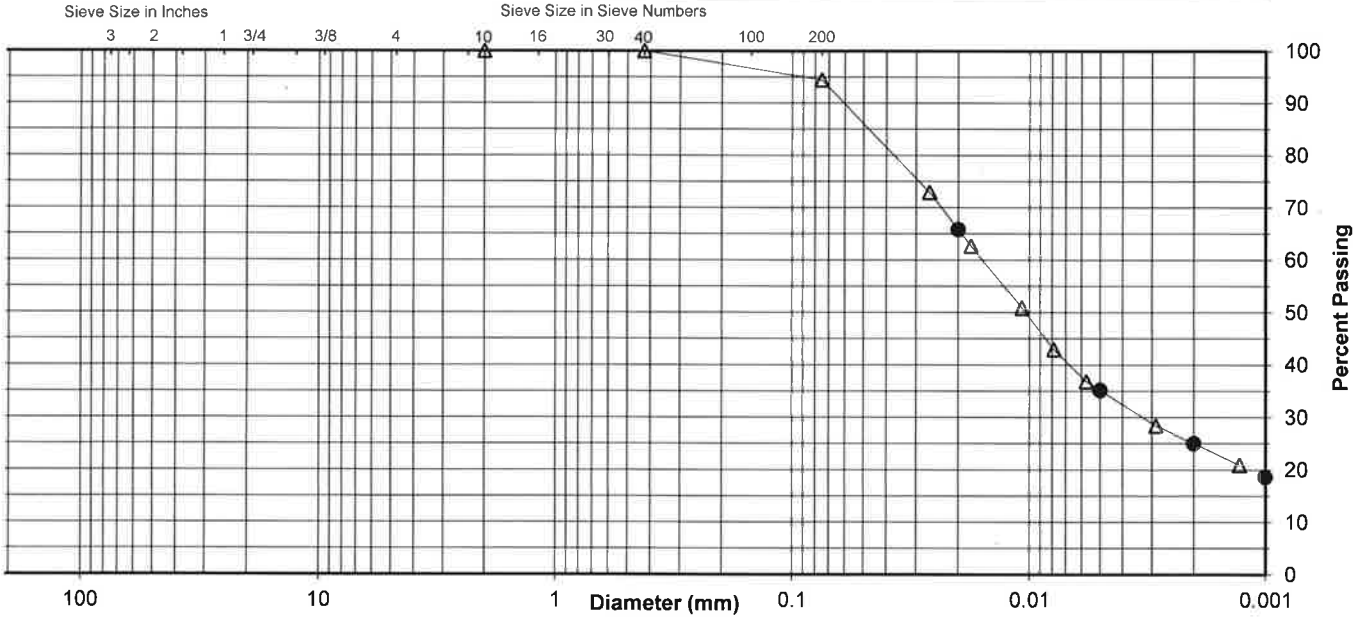
Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	100.0
No. 200	94.4
0.02 mm	65.8
0.005 mm	35.2
0.002 mm	25.0
0.001 mm	18.6

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.0	0.0	5.6	59.2	35.2

	Gravel	Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.0	0.0	5.6	69.4	25.0



Comments

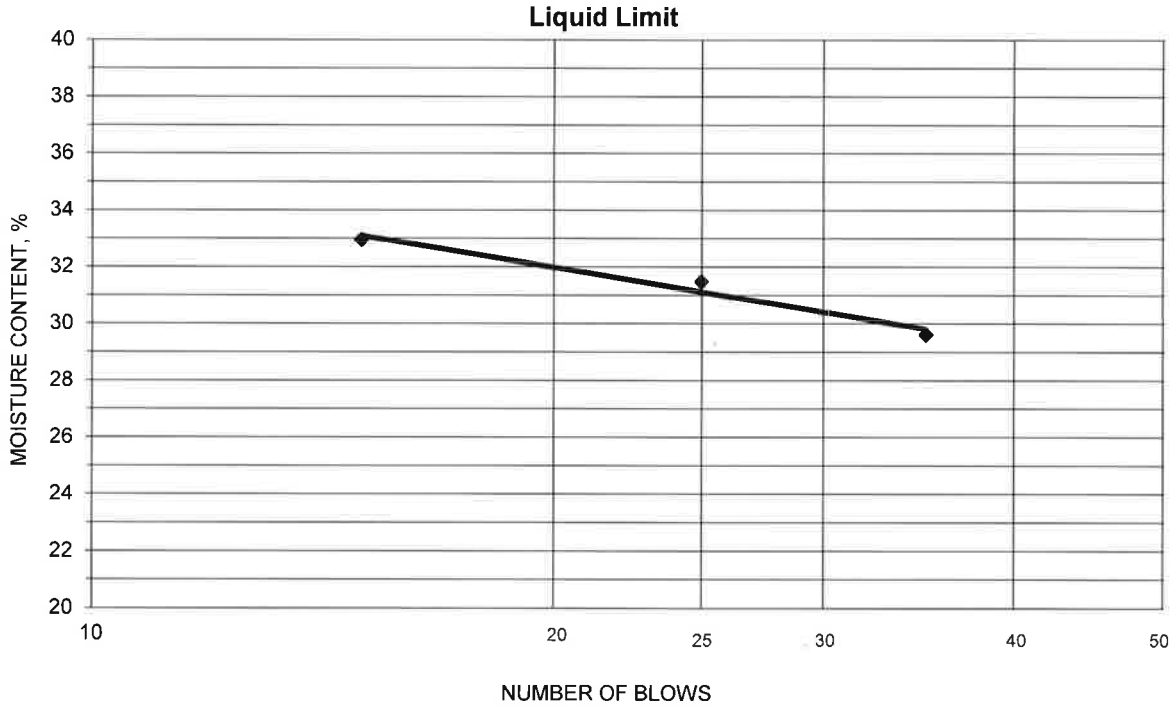
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-3, 35.0'-37.0'	Lab ID	1353
		% + No. 40	0
Tested By	JMB	Test Method	AASHTO T 89 & T 90
Test Date	11-05-2021	Prepared	Dry
		Date Received	10-25-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
16.76	15.44	10.98	35	29.6	
17.28	15.93	11.64	25	31.5	
18.82	16.83	10.79	15	32.9	31



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
17.24	16.27	10.71	17.4	18	13
17.16	16.17	10.86	18.6		

Remarks: _____

Reviewed By RJ

Stantec

Gradation Analysis

AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 40.0'-41.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 300
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 264.37
Moisture Content (%): 22.1

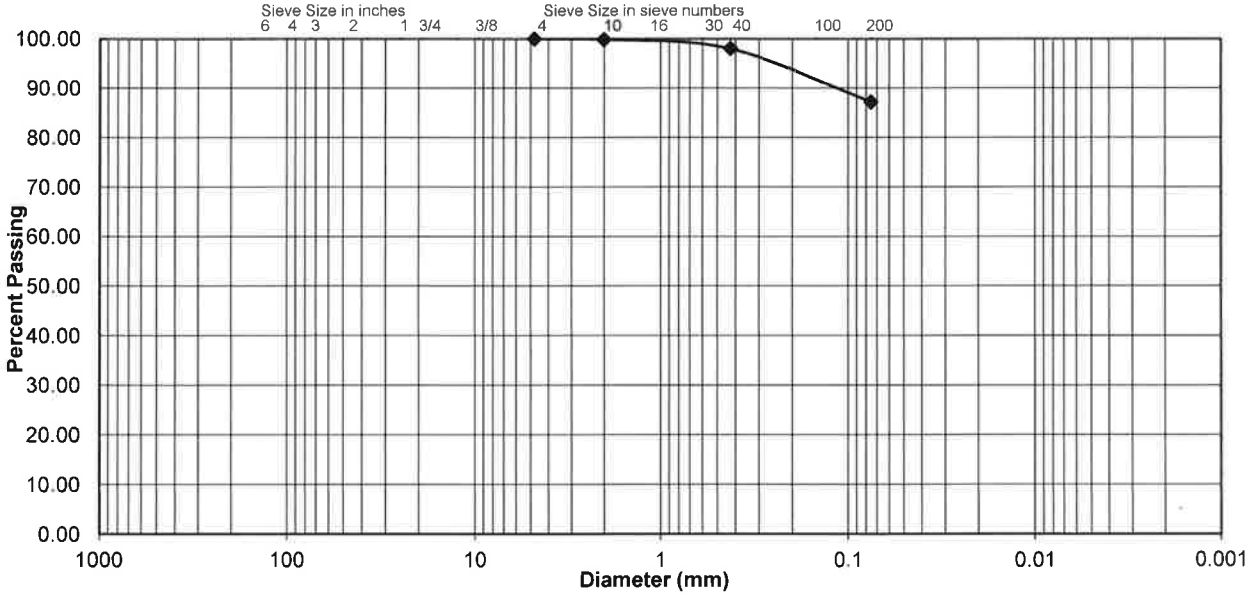
Project Number: 178568003
Lab ID: 1331
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 4	0.00	0.0	100.0
No. 10	0.38	0.1	99.9
No. 40	4.89	1.8	98.0
No. 200	28.65	10.8	87.2
Pan	230.45	87.2	---

% Gravel	0.1
% Sand	12.7
% Fines	87.2
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By RJ

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-3, 45.0'-47.0'	Lab ID	1354
Sample Type	ST	Date Received	10-25-21
		Date Reported	11-11-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 10	2	100.0
No. 40	0.425	100.0
No. 200	0.075	82.8
	0.02	50.1
	0.005	24.5
	0.002	17.5
Estimated	0.001	12.8

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.0
Medium Sand	0.0	---
Fine Sand	17.2	17.2
Silt	58.3	65.3
Clay	24.5	17.5

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	26
Plastic Limit:	17
Plasticity Index:	9
Activity Index:	0.5

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay with sand

AASHTO Classification: A-4 (6)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 45.0'-47.0'
Lab ID: 1354

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: N/A
Particle Hardness: N/A

Tested By: DW
Test Date: 11-01-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 10 Sieve

Sieve Size	% Passing
No. 10	100.0

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

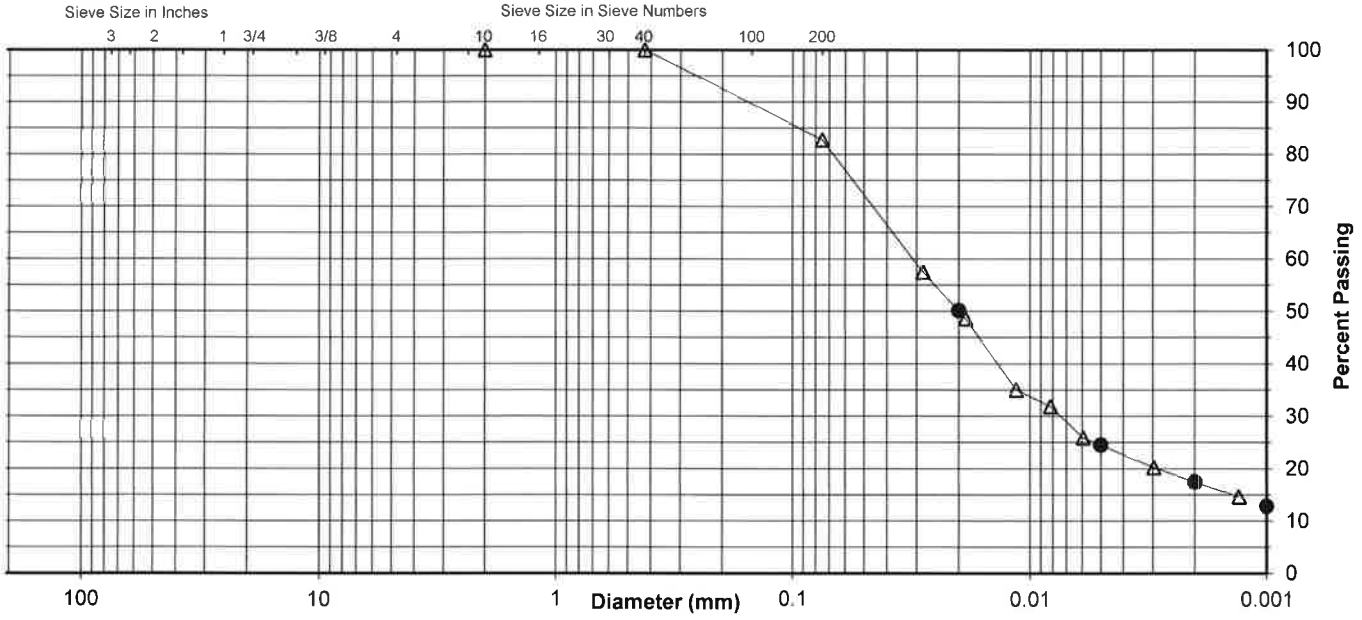
Specific Gravity: 2.7

Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	100.0
No. 200	82.8
0.02 mm	50.1
0.005 mm	24.5
0.002 mm	17.5
0.001 mm	12.8

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	0.0	17.2	58.3	24.5
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.0	17.2	65.3	17.5



Comments:

Reviewed By: RJ

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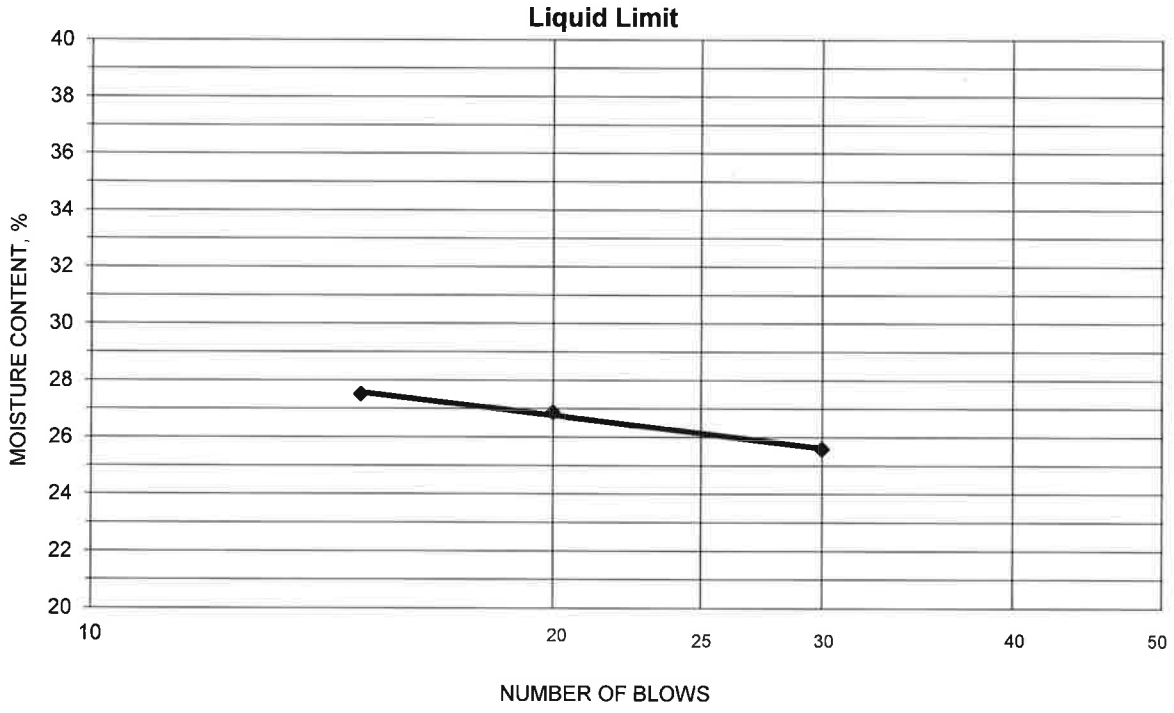
ATTERBERG LIMITS

Project	Bridging KY - 054B00009N			Project No.	178568003
Source	054B00009N-3, 45.0'-47.0'			Lab ID	1354
				% + No. 40	0
Tested By	JMB	Test Method	AASHTO T 89 & T 90	Date Received	10-25-2021
Test Date	11-04-2021	Prepared	Dry		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
16.96	15.76	11.07	30	25.6	
18.76	17.07	10.78	20	26.9	
17.81	16.42	11.37	15	27.5	26



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
20.36	19.01	11.01	16.9	17	9
19.13	17.99	11.10	16.5		

Remarks: _____

Reviewed By RJ

Stantec

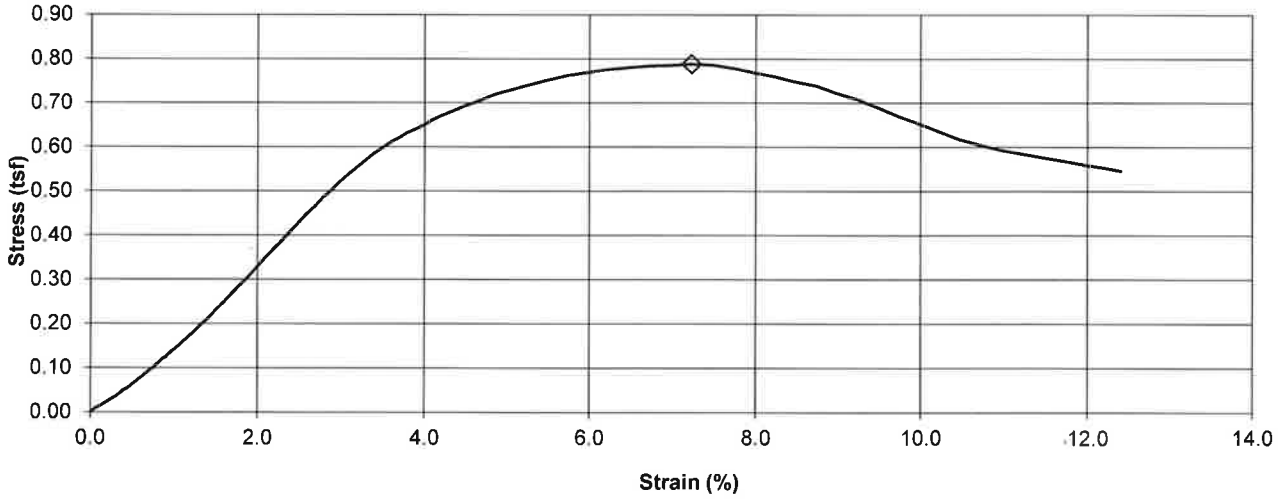
Unconfined Compressive Strength of Cohesive Soil

KM 64-522

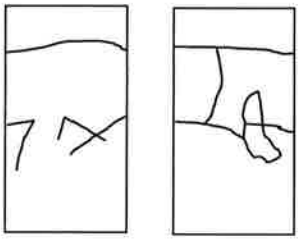
Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 45.0'-47.0'
Lab ID: 1354
Visual Description: Lean Clay with Sand (CL), gray, moist, firm
Recovered: 2'
Test Interval: 46.4' - 46.9'
Specimen Type: Undisturbed
LL: 26
PL: 17
PI: 9
Date Extruded: 10/28/2021
Date Tested: 10/28/2021

Initial Wet Density (pcf)	127.4		
Initial Moisture Content (%)	20.4	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	105.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.7		
Degree of Saturation (%)	92.9	Unconfined Compressive Strength (tsf)	0.79
Average Height (in)	6.027	Undrained Shear Strength (tsf)	0.39
Average Diameter (in)	2.875	Strain at Maximum Stress (%)	7.2
Height to Diameter Ratio	2.1	Strain Rate to Failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: RJ

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Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/11/2021

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 50.0'-51.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 320
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 316.83
Moisture Content (%): 21.8

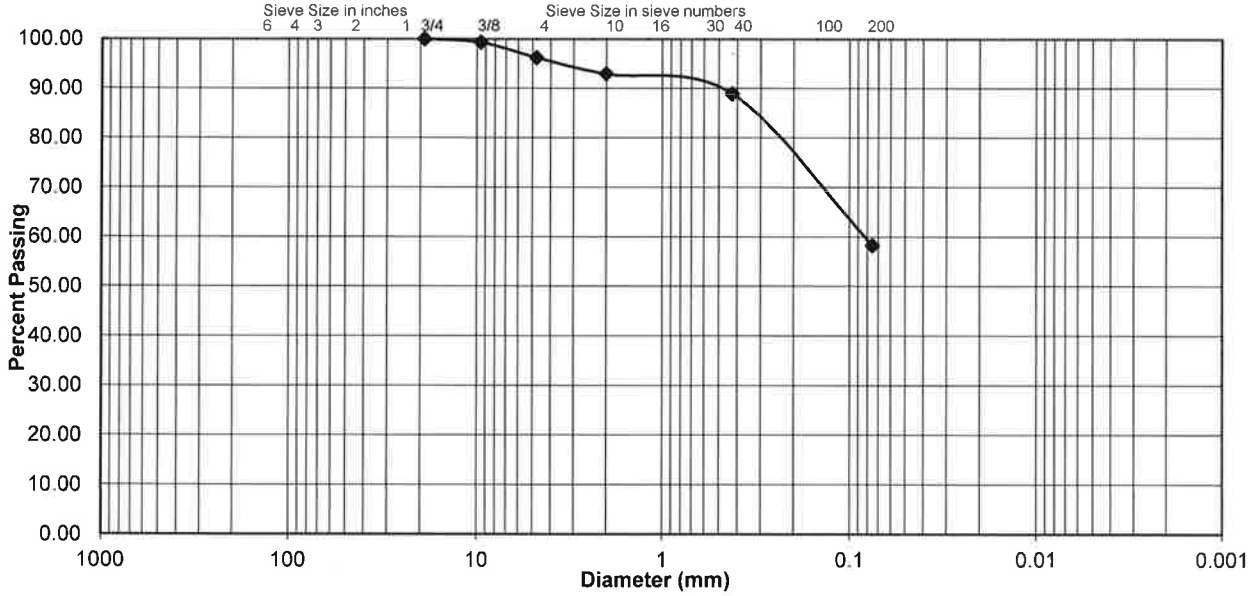
Project Number: 178568003
Lab ID: 1332
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
3/4"	0.00	0.0	100.0
3/8"	2.20	0.7	99.3
No. 4	9.80	3.1	96.2
No. 10	10.40	3.3	92.9
No. 40	12.66	4.0	88.9
No. 200	97.40	30.7	58.2
Pan	184.37	58.2	---

% Gravel	7.1
% Sand	34.7
% Fines	58.2
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By: RJ

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Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/09/2021

Stantec

Summary of Soil Tests

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 55.0'-57.0'
Lab ID: 1355
Sample Type: ST
Date Received: 10-25-21
Date Reported: 11-11-21

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 4	4.75	100.0
No. 10	2	99.8
No. 40	0.425	99.1
No. 200	0.075	90.4
	0.02	67.0
	0.005	35.2
	0.002	24.2
Estimated	0.001	19.5

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.2
Coarse Sand	0.2	0.7
Medium Sand	0.7	---
Fine Sand	8.7	8.7
Silt	55.2	66.2
Clay	35.2	24.2

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry
Liquid Limit: 30
Plastic Limit: 19
Plasticity Index: 11
Activity Index: 0.5

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.69

Classification

Unified Group Symbol: CL
Group Name: Lean clay
AASHTO Classification: A-6 (9)

Comments:

Reviewed By: RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 55.0'-57.0'
Lab ID: 1355

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: DW
Test Date: 11-02-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 4 Sieve

Sieve Size	% Passing
No. 4	100.0
No. 10	99.8

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

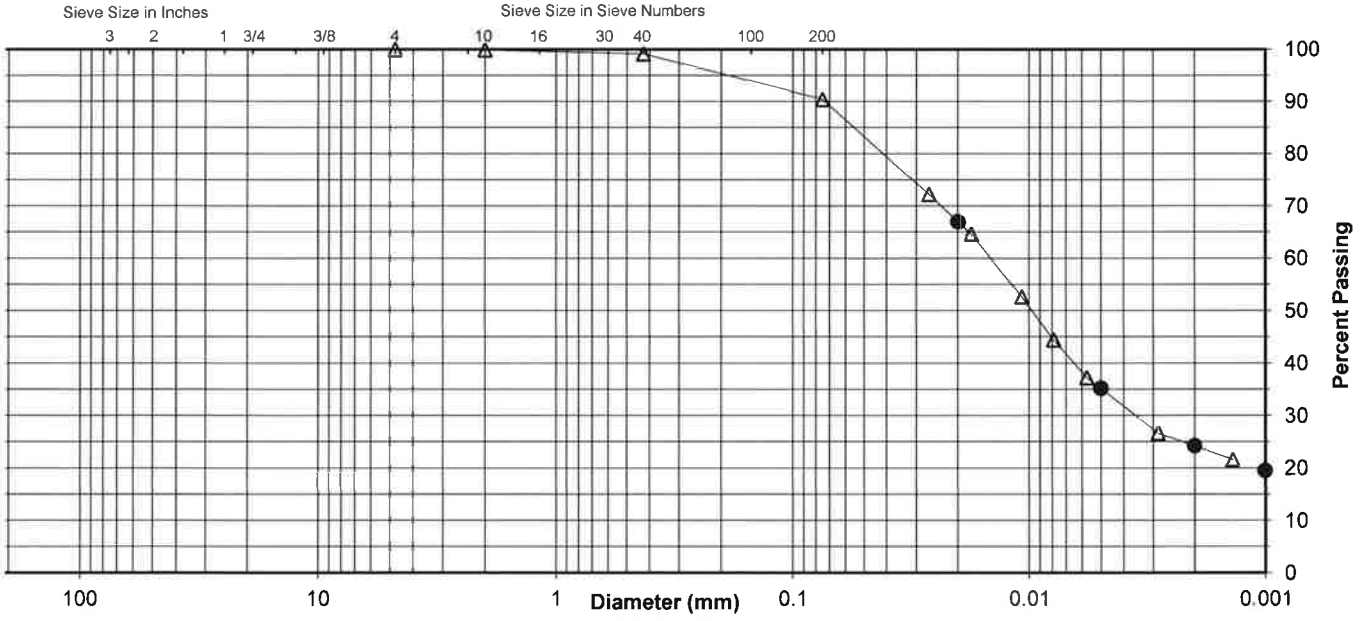
Specific Gravity: 2.69

Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	99.1
No. 200	90.4
0.02 mm	67.0
0.005 mm	35.2
0.002 mm	24.2
0.001 mm	19.5

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.2	0.7	8.7	55.2	35.2
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.2			0.7	8.7	66.2	24.2



Comments:

Reviewed By: RJ

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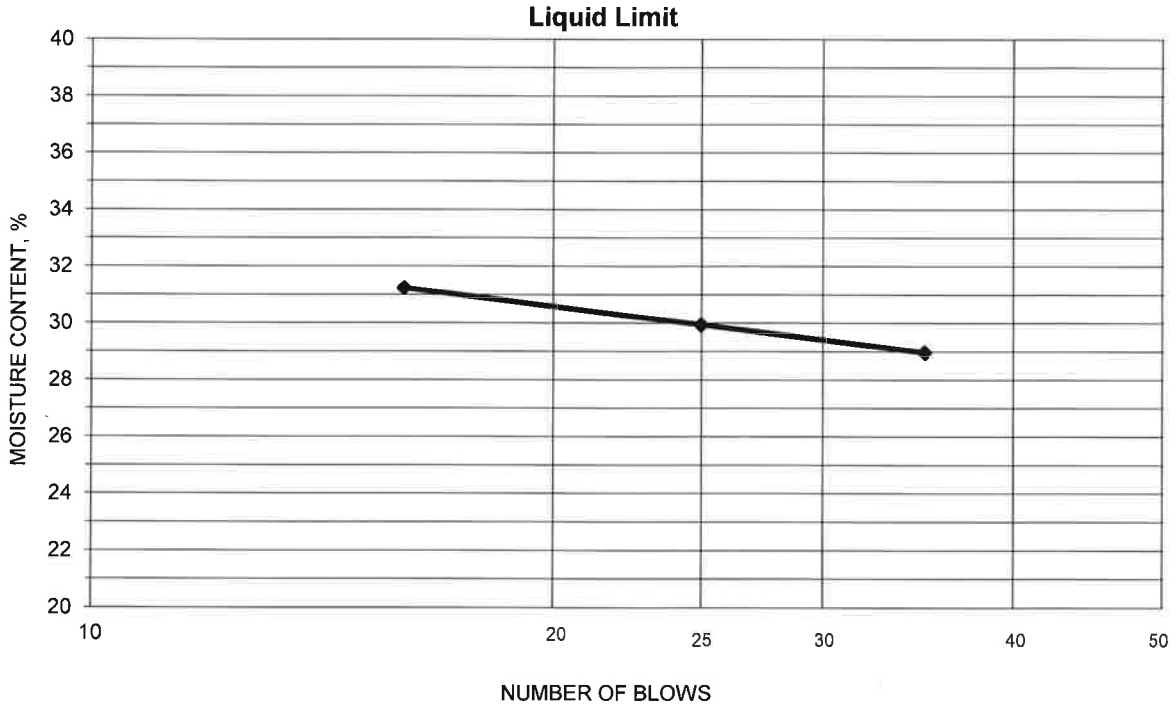
ATTERBERG LIMITS

Project	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-3, 55.0'-57.0'	Lab ID	1355
		% + No. 40	1
Tested By	JMB	Test Method	AASHTO T 89 & T 90
Test Date	11-05-2021	Prepared	Dry
		Date Received	10-25-2021

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
17.92	16.37	11.02	35	29.0	
18.73	16.94	10.96	25	29.9	
17.48	15.94	11.01	16	31.2	30



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
17.70	16.62	10.90	18.9	19	11
20.54	19.11	11.52	18.8		

Remarks: _____

Reviewed By RJ

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 60.0'-61.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 330
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 265.33
Moisture Content (%): 26.1

Project Number: 178568003
Lab ID: 1333
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

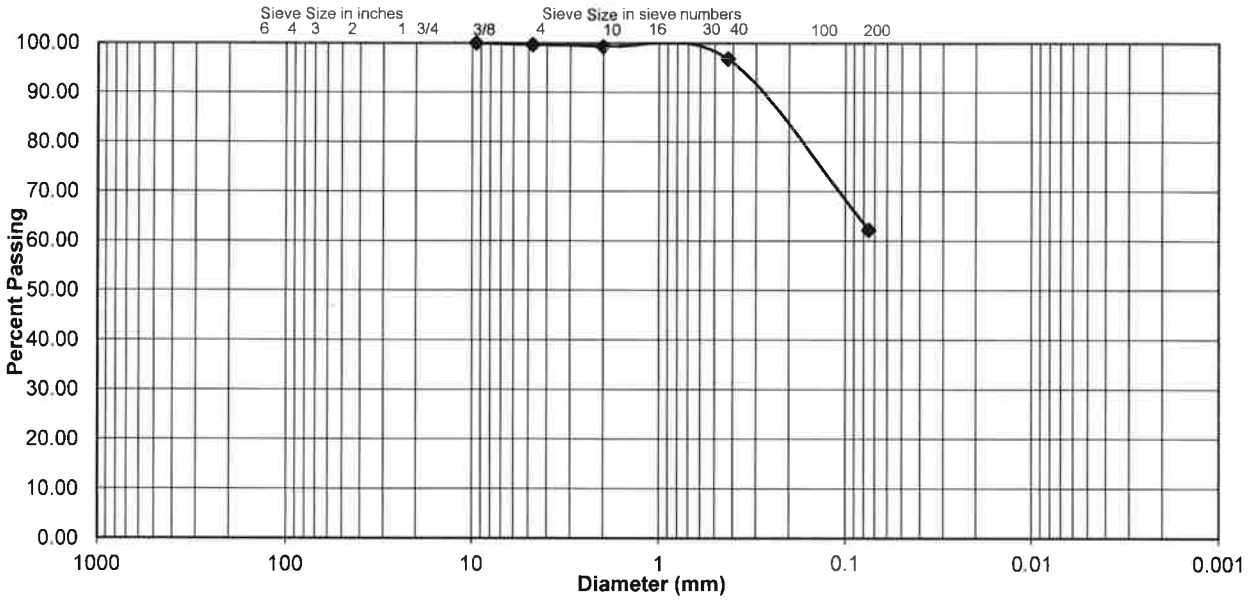
Sieve Size	Grams Retained	% Retained	% Passing
3/8"	0.00	0.0	100.0
No. 4	0.93	0.4	99.6
No. 10	1.01	0.4	99.3
No. 40	6.44	2.4	96.8
No. 200	91.93	34.6	62.2
Pan	165.02	62.2	---

% Gravel: 0.7
% Sand: 37.1
% Fines: 62.2
Fines Classification: N/A

D_{10} (mm): N/A
D_{30} (mm): N/A
D_{60} (mm): N/A

Cu: N/A
Cc: N/A

Particle Size Distribution



Comments

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Approved By: RJ

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Lexington, Kentucky

Reported By: RJ
Report Date: 11/09/2021

Stantec

Summary of Soil Tests

Project Name	Bridging KY - 054B00009N	Project Number	178568003
Source	054B00009N-3, 65.0'-67.0'	Lab ID	1356
Sample Type	ST	Date Received	10-25-21
		Date Reported	11-11-21

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
No. 4	4.75	100.0
No. 10	2	99.9
No. 40	0.425	99.4
No. 200	0.075	88.9
	0.02	56.2
	0.005	25.8
	0.002	18.2
Estimated	0.001	14.8

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.1
Coarse Sand	0.1	0.5
Medium Sand	0.5	---
Fine Sand	10.5	10.5
Silt	63.1	70.7
Clay	25.8	18.2

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry

Liquid Limit:	25
Plastic Limit:	18
Plasticity Index:	7
Activity Index:	0.4

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.69

Classification

Unified Group Symbol: CL-ML
Group Name: Silty clay

AASHTO Classification: A-4 (5)

Comments:

Reviewed By RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 65.0'-67.0'
Lab ID: 1356

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: DW
Test Date: 11-02-2021
Date Received: 10-25-2021

Maximum Particle Size: No. 4 Sieve

Sieve Size	% Passing
No. 4	100.0
No. 10	99.9

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

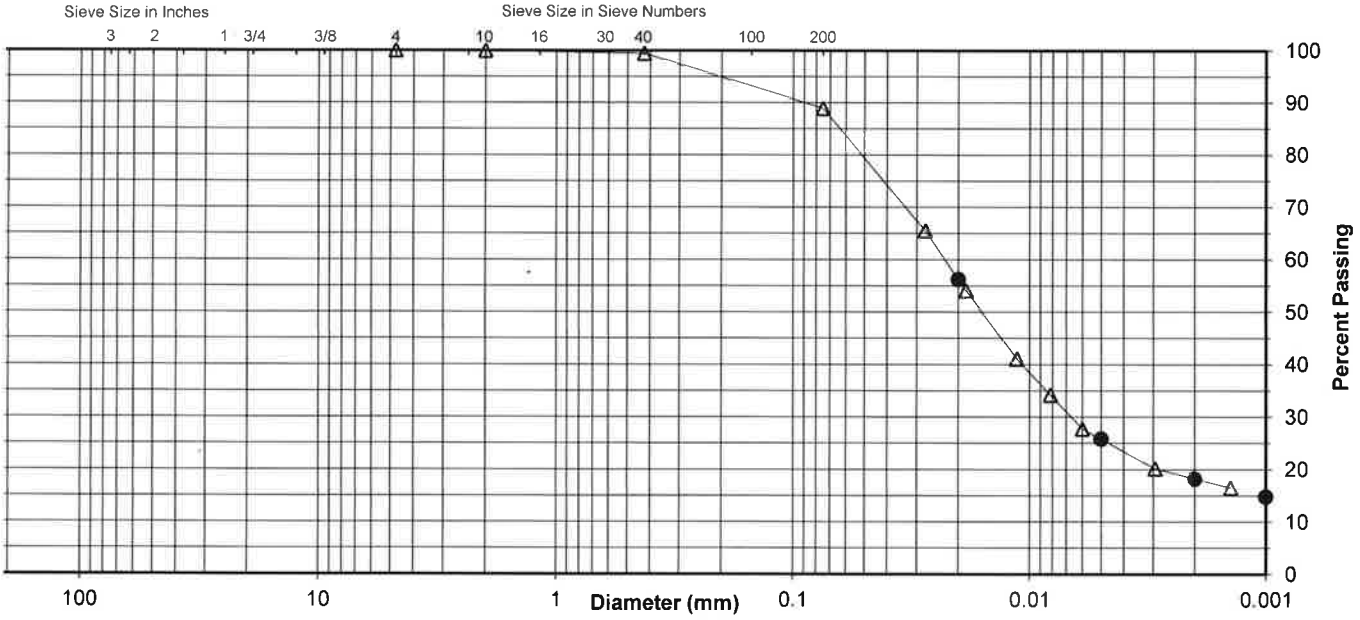
Specific Gravity: 2.69

Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	99.4
No. 200	88.9
0.02 mm	56.2
0.005 mm	25.8
0.002 mm	18.2
0.001 mm	14.8

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.1	0.5	10.5	63.1	25.8
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.1			0.5	10.5	70.7	18.2



Comments

Reviewed By: RJ

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Approved By: RJ

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Lexington, Kentucky

Reported By: RJ
Report Date: 11/11/2021

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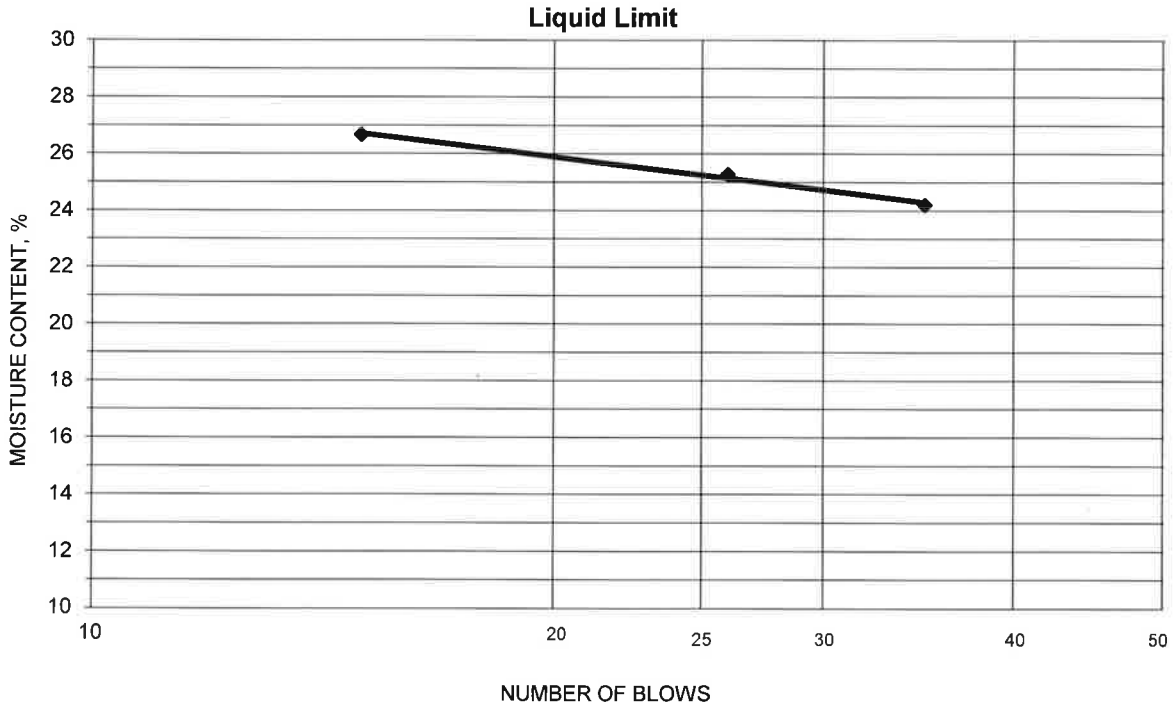
ATTERBERG LIMITS

Project	Bridging KY - 054B00009N			Project No.	178568003
Source	054B00009N-3, 65.0'-67.0'			Lab ID	1356
				% + No. 40	1
Tested By	JMB	Test Method	AASHTO T 89 & T 90	Date Received	10-25-2021
Test Date	11-04-2021	Prepared	Dry		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
18.29	16.86	10.95	35	24.2	
18.18	16.81	11.39	26	25.3	
17.96	16.48	10.93	15	26.7	25



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.02	17.82	11.14	18.0	18	7
18.59	17.39	10.89	18.5		

Remarks: _____

Reviewed By RJ

Stantec

Unconfined Compressive Strength of Cohesive Soil

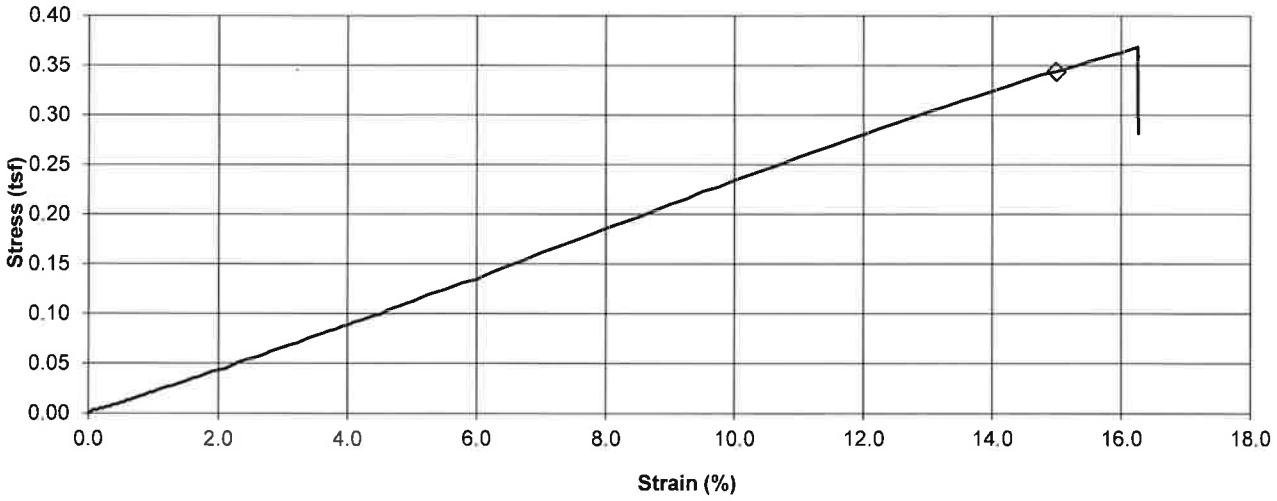
KM 64-522

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 65.0'-67.0'
Lab ID: 1356
Visual Description: Silty Clay (CL-ML), gray, moist to wet, soft
Recovered: 1.7'
Test Interval: 66.1' - 66.6'

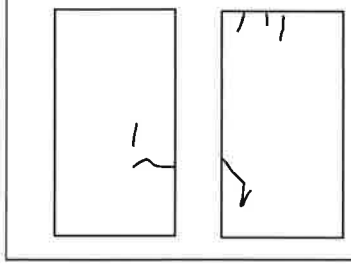
Specimen Type: Undisturbed
LL: 25
PL: 18
PI: 7
Date Extruded: 10/28/2021
Date Tested: 10/28/2021

Initial Wet Density (pcf)	129.8		
Initial Moisture Content (%)	22.0	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	106.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.69		
Degree of Saturation (%)	102.4	Unconfined Compressive Strength (tsf)	0.34
Average Height (in)	5.812	Undrained Shear Strength (tsf)	0.17
Average Diameter (in)	2.920	Strain at Maximum Stress (%)	15.0
Height to Diameter Ratio	2.0	Strain Rate to Failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: RJ

Stantec

Gradation Analysis

AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 70.0'-71.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 350
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 301.24
Moisture Content (%): 20.7

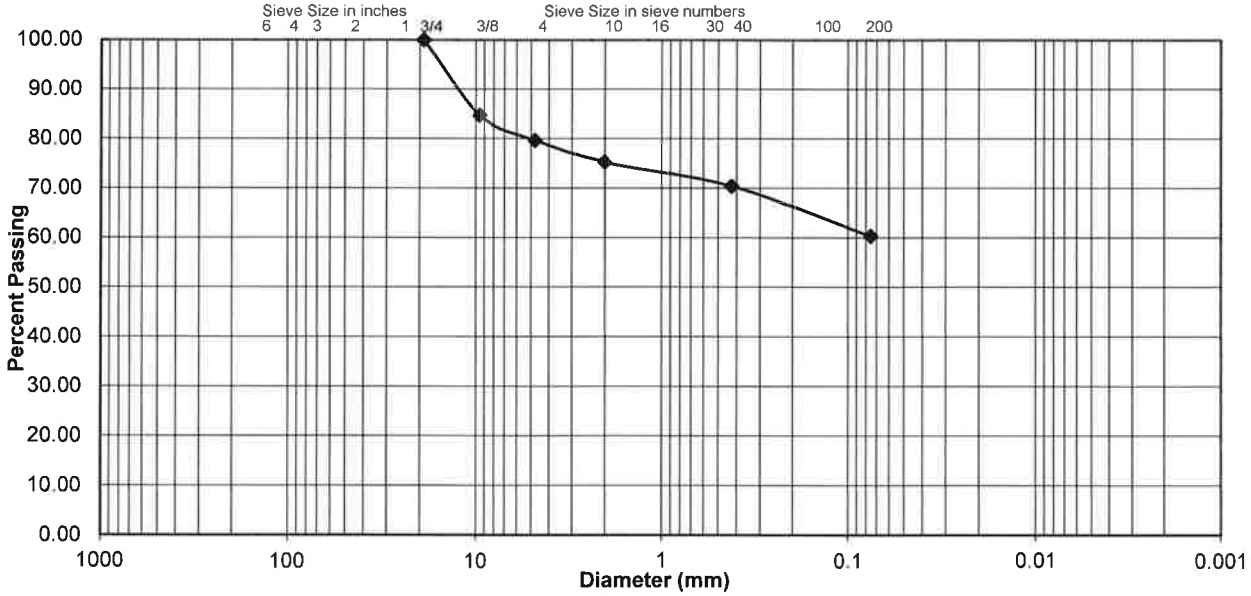
Project Number: 178568003
Lab ID: 1334
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
3/4"	0.00	0.0	100.0
3/8"	46.14	15.3	84.7
No. 4	15.22	5.1	79.6
No. 10	13.14	4.4	75.3
No. 40	14.65	4.9	70.4
No. 200	30.48	10.1	60.3
Pan	181.61	60.3	---

% Gravel	24.7
% Sand	15.0
% Fines	60.3
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 75.0'-77.0'
Lab ID: 1357
Sample Type: ST
Date Received: 10-25-21
Date Reported: 11-11-21

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
	N/A	
	N/A	
3/8"	9.5	100.0
No. 4	4.75	100.0
No. 10	2	99.2
No. 40	0.425	98.7
No. 200	0.075	74.4
	0.02	48.8
	0.005	27.2
	0.002	18.6
Estimated	0.001	13.2

Plus 3 in. Material, Not Included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.8
Coarse Sand	0.8	0.5
Medium Sand	0.5	---
Fine Sand	24.3	24.3
Silt	47.2	55.8
Clay	27.2	18.6

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry
Liquid Limit: 24
Plastic Limit: 17
Plasticity Index: 7
Activity Index: 0.4

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.68

Classification

Unified Group Symbol: CL-ML
Group Name: Silty clay with sand
AASHTO Classification: A-4 (3)

Comments:

Reviewed By: RJ

Stantec

Particle-Size Analysis of Soils
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Project Number: 178568003
Source: 054B00009N-3, 75.0'-77.0'
Lab ID: 1357

Sieve Analysis for the Portion Coarser than the No. 10 Sieve

Test Method: AASHTO T 88
Prepared Using: AASHTO T 87

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: DW
Test Date: 11-02-2021
Date Received: 10-25-2021

Maximum Particle Size: 3/8" Sieve

Sieve Size	% Passing
3/8"	100.0
No. 4	100.0
No. 10	99.2

Analysis for the Portion Finer than the No. 10 Sieve

Analysis Based on -3 inch Fraction Only

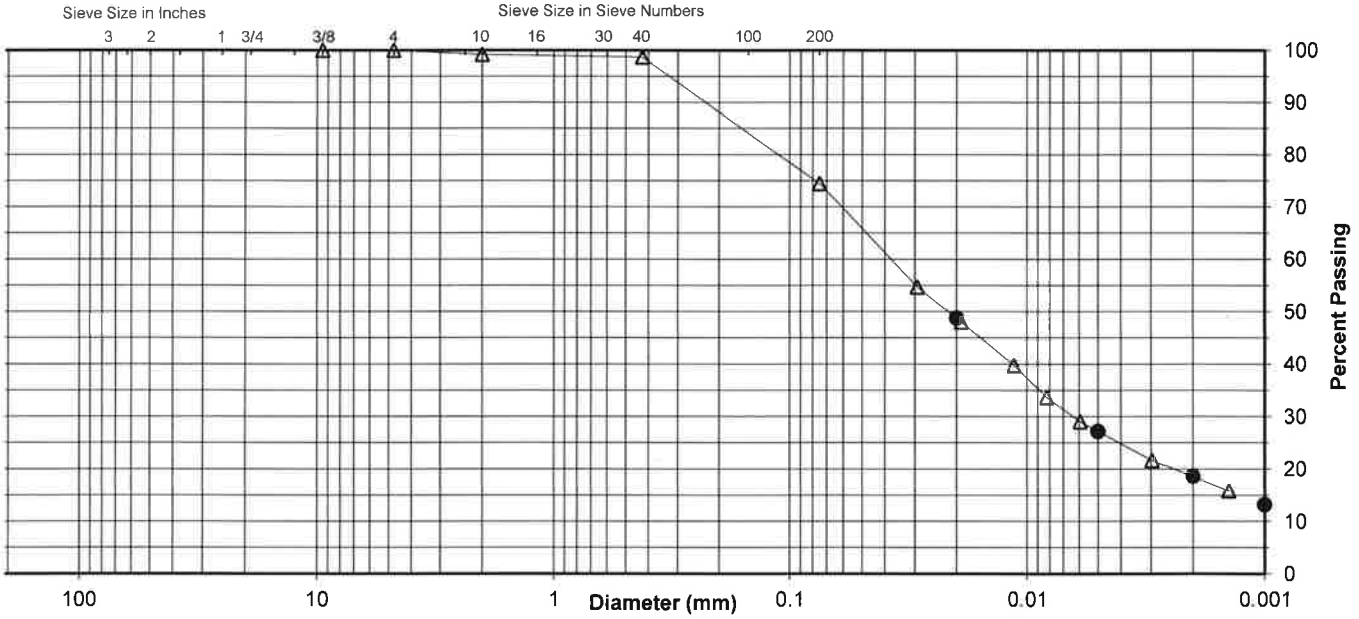
Specific Gravity: 2.68

Dispersed Using Apparatus A - Mechanical, for 1 Minute

No. 40	98.7
No. 200	74.4
0.02 mm	48.8
0.005 mm	27.2
0.002 mm	18.6
0.001 mm	13.2

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.8	0.5	24.3	47.2	27.2
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.8			0.5	24.3	55.8	18.6



Comments:

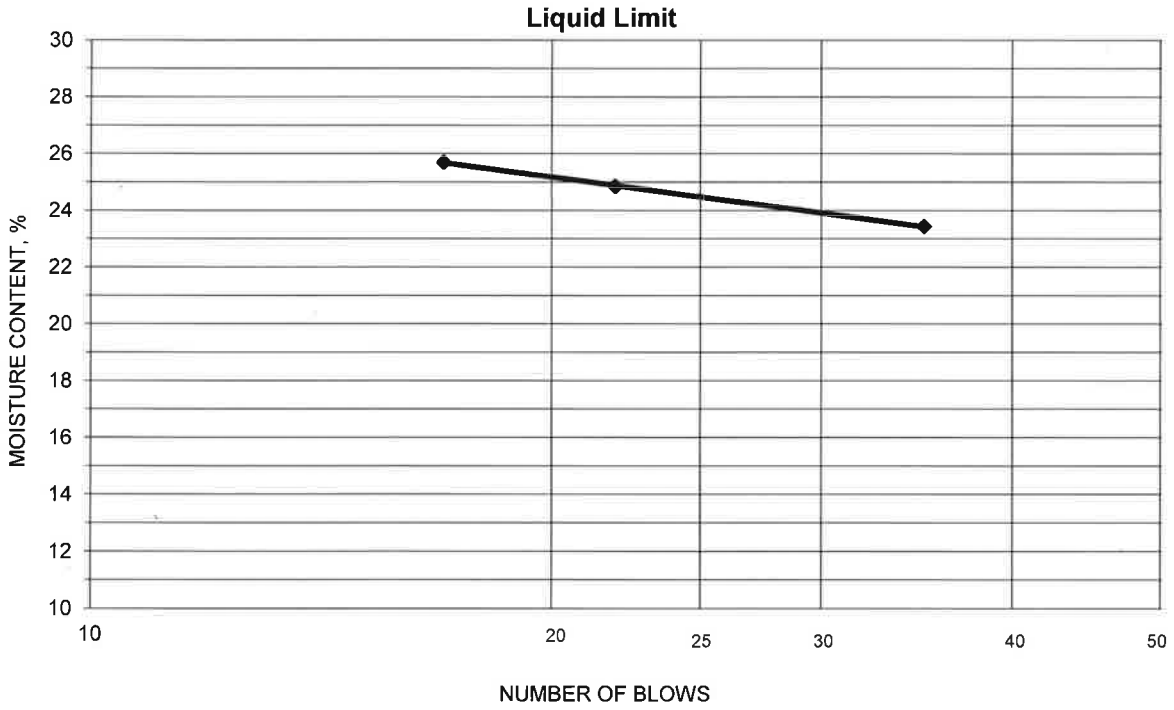
Reviewed By: RJ

Stantec

ATTERBERG LIMITS

Project	Bridging KY - 054B00009N			Project No.	178568003
Source	054B00009N-3, 75.0'-77.0'			Lab ID	1357
				% + No. 40	1
Tested By	JMB	Test Method	AASHTO T 89 & T 90	Date Received	10-25-2021
Test Date	11-05-2021	Prepared	Dry		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
18.99	17.41	10.67	35	23.4	
17.56	16.26	11.03	22	24.9	
16.92	15.73	11.10	17	25.7	24



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
21.03	19.84	12.64	16.5	17	7
22.00	20.72	13.03	16.6		

Remarks: _____

Reviewed By RJ

Stantec

Unconfined Compressive Strength of Cohesive Soil

KM 64-522

Project Name Bridging KY - 054B00009N
Project Number 178568003
Source 054B00009N-3, 75.0'-77.0'
Lab ID 1357
Visual Description Silty Clay with Sand (CL-ML), gray, moist, soft

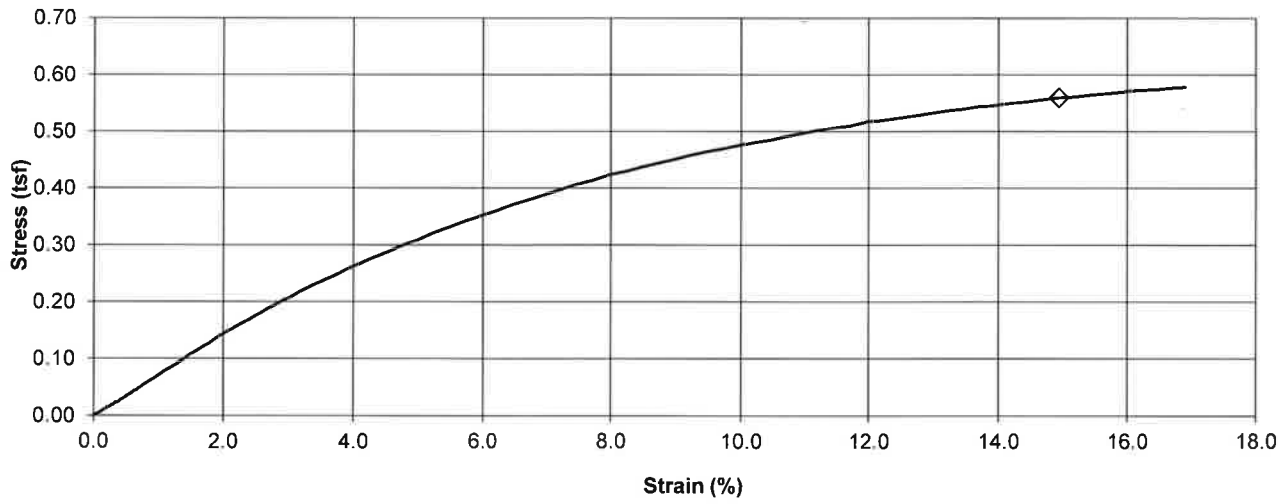
Recovered 2'
Test Interval 76.4' - 76.9'

Specimen Type: Undisturbed
LL 24
PL 17
PI 7

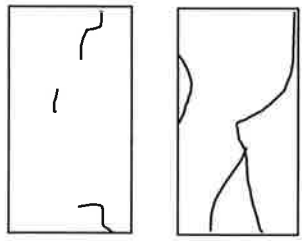
Date Extruded 10/28/2021
Date Tested 10/28/2021

Initial Wet Density (pcf)	128.8		
Initial Moisture Content (%)	20.4	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	107.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	2.68		
Degree of Saturation (%)	96.9	Unconfined Compressive Strength (tsf)	0.56
Average Height (in)	5.933	Undrained Shear Strength (tsf)	0.28
Average Diameter (in)	2.887	Strain at Maximum Stress (%)	14.9
Height to Diameter Ratio	2.1	Strain Rate to Failure (% / min.)	0.99

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A
Torvane Reading (kg/cm^2) N/A

Comments

Reviewed By RJ

Template: tmp_uc_input.xlsm
Version: 20170217
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/11/2021

Stantec

Gradation Analysis

AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 80.0'-81.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 360
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 254.25
Moisture Content (%): 23.7

Project Number: 178568003
Lab ID: 1335
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

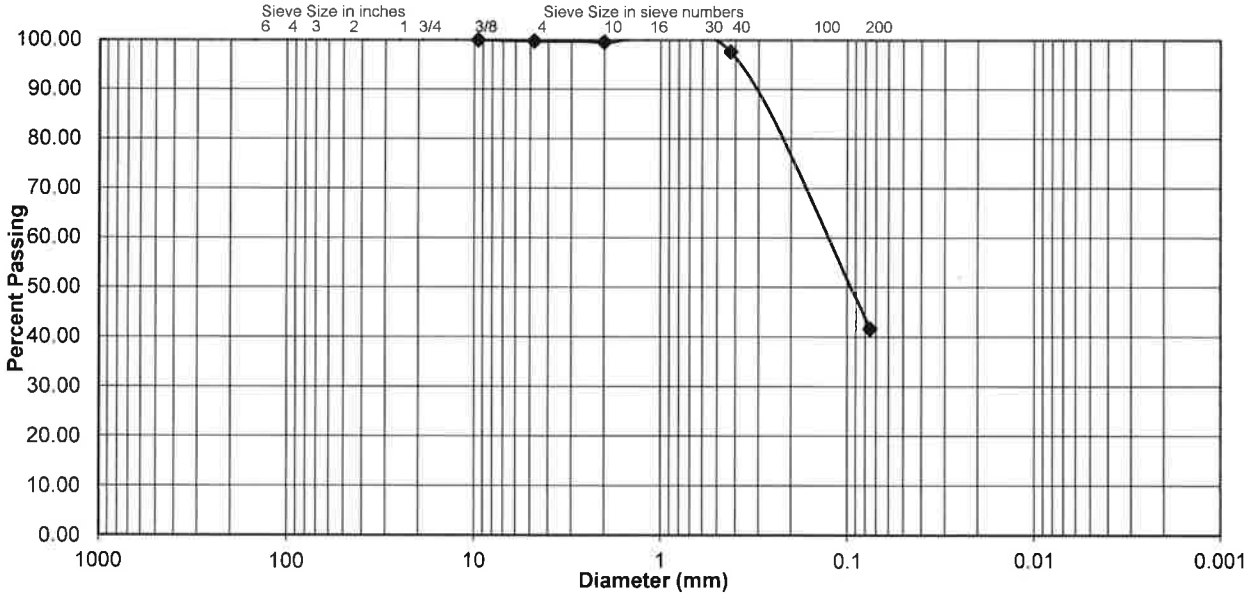
Sieve Size	Grams Retained	% Retained	% Passing
3/8"	0.00	0.0	100.0
No. 4	0.60	0.2	99.8
No. 10	0.52	0.2	99.6
No. 40	4.92	1.9	97.6
No. 200	142.31	56.0	41.7
Pan	105.90	41.7	---

% Gravel: 0.4
% Sand: 57.9
% Fines: 41.7
Fines Classification: N/A

D_{10} (mm): N/A
D_{30} (mm): N/A
D_{60} (mm): N/A

Cu: N/A
Cc: N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 87.0'-88.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 380
Particle Shape: Angular
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 282.09
Moisture Content (%): 22.2

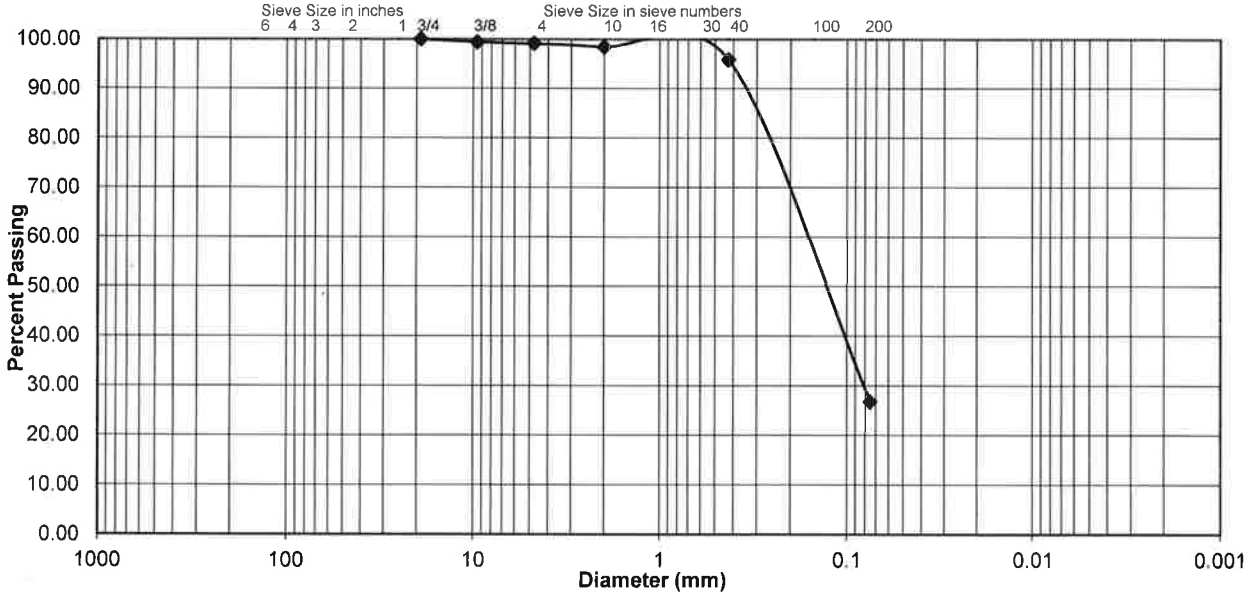
Project Number: 178568003
Lab ID: 1336
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

Sieve Size	Grams Retained	% Retained	% Passing
3/4"	0.00	0.0	100.0
3/8"	1.70	0.6	99.4
No. 4	0.77	0.3	99.1
No. 10	1.93	0.7	98.4
No. 40	7.19	2.5	95.9
No. 200	195.10	69.2	26.7
Pan	75.40	26.7	---

% Gravel	1.6
% Sand	71.7
% Fines	26.7
Fines Classification	N/A
D_{10} (mm)	N/A
D_{30} (mm)	N/A
D_{60} (mm)	N/A
Cu	N/A
Cc	N/A

Particle Size Distribution



Comments

Reviewed By

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 90.0'-91.5'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 390
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 252.95
Moisture Content (%): 17.5

Project Number: 178568003
Lab ID: 1337
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

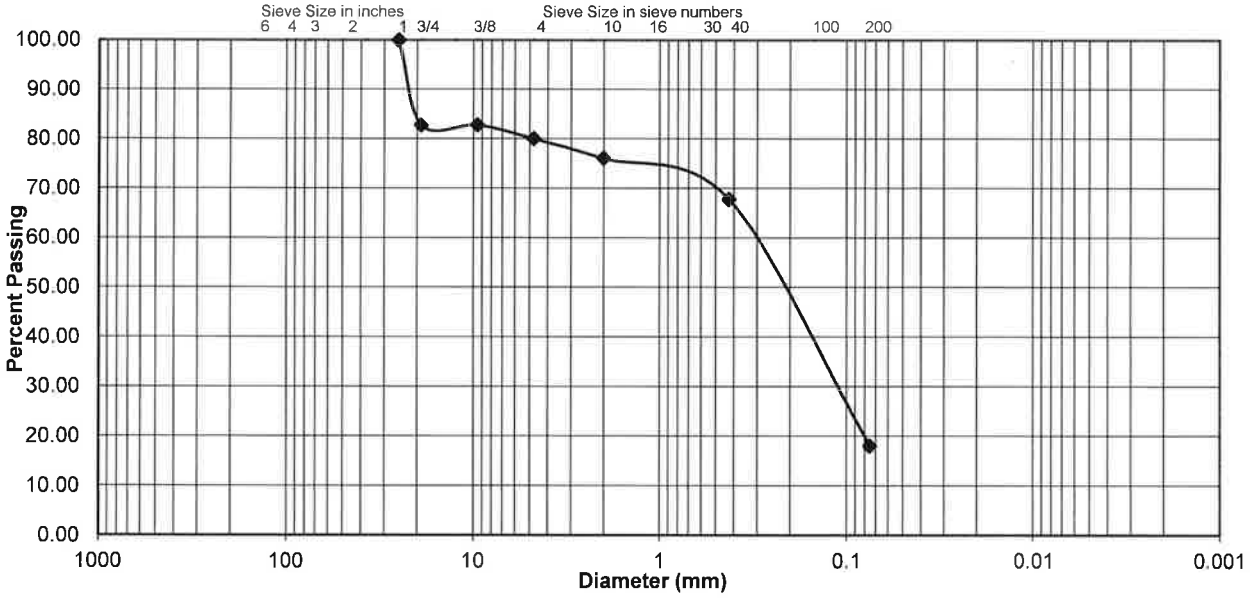
Sieve Size	Grams Retained	% Retained	% Passing
1"	0.00	0.0	100.0
3/4"	43.65	17.3	82.7
3/8"	0.00	0.0	82.7
No. 4	6.94	2.7	80.0
No. 10	10.07	4.0	76.0
No. 40	20.84	8.2	67.8
No. 200	125.86	49.8	18.0
Pan	45.59	18.0	---

% Gravel: 24.0
% Sand: 58.0
% Fines: 18.0
Fines Classification: N/A

D_{10} (mm): N/A
D_{30} (mm): N/A
D_{60} (mm): N/A

Cu: N/A
Cc: N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Template: tmp_200_input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: RJ
Report Date: 11/09/2021

Stantec

Gradation Analysis
AASHTO T 88

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-3, 95.2'-96.7'
Preparation Method: AASHTO T 11 Method A
Soak Time (min): 410
Particle Shape: Rounded
Particle Hardness: Hard and Durable
Sample Dry Mass (g): 328.15
Moisture Content (%): 20.0

Project Number: 178568003
Lab ID: 1338
Date Received: 10-25-2021
Preparation Date: 10-27-2021
Test Date: 11-02-2021

Analysis Based on Total Sample.

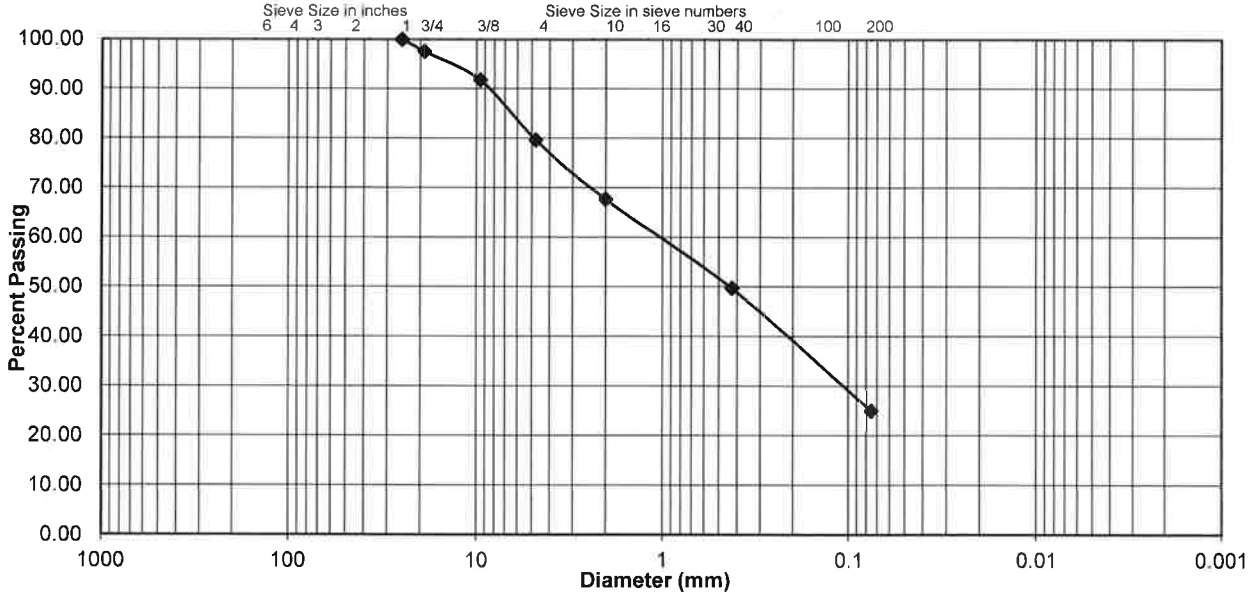
Sieve Size	Grams Retained	% Retained	% Passing
1"	0.00	0.0	100.0
3/4"	8.06	2.5	97.5
3/8"	18.96	5.8	91.8
No. 4	39.92	12.2	79.6
No. 10	39.32	12.0	67.6
No. 40	58.93	18.0	49.7
No. 200	81.10	24.7	24.9
Pan	81.86	24.9	---

% Gravel: 32.4
% Sand: 42.7
% Fines: 24.9
Fines Classification: N/A

D_{10} (mm): N/A
D_{30} (mm): N/A
D_{60} (mm): N/A

Cu: N/A
Cc: N/A

Particle Size Distribution



Comments

Reviewed By: RJ

Stantec

Moisture Content of Soil
AASHTO T 265

Project Name Bridging KY - 054B00009N

Project Number 178568003
Tested By DW

Test Method AASHTO

Maximum Particle Size in Sample	No. 40	No. 4	1/2"	1"	2"	
Recommended Minimum Mass (g)	10	100	300	500	1,000	

Material Type: Stratified, Laminated, Lensed, Homogeneous, Disturbed

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & Can Weight (g)	Moisture Content (%)
054B00009N-3, 2.5'-4.0'	1327	10/27/21	Hom	1/2"			No	300.01	519.58	478.11	23.3
054B00009N-3, 10.0'-11.5'	1328	10/27/21	Hom	No. 4			Yes	308.37	503.47	464.13	25.3
054B00009N-3, 20.0'-21.5'	1329	10/27/21	Hom	No. 4			Yes	310.39	573.13	524.36	22.8
054B00009N-3, 30.0'-31.5'	1330	10/27/21	Hom	No. 4			Yes	306.81	646.54	586.68	21.4
054B00009N-3, 40.0'-41.5'	1331	10/27/21	Hom	No. 4			Yes	299.31	621.99	563.68	22.1
054B00009N-3, 50.0'-51.5'	1332	10/27/21	Hom	1"			No	299.65	685.46	616.48	21.8
054B00009N-3, 60.0'-61.5'	1333	10/27/21	Hom	1/2"			No	299.45	633.95	564.78	26.1
054B00009N-3, 70.0'-71.5'	1334	10/27/21	Dist	1"			No	286.18	649.92	587.42	20.7
054B00009N-3, 80.0'-81.5'	1335	10/27/21	Dist	1/2"			No	309.10	623.59	563.35	23.7
054B00009N-3, 87.0'-88.5'	1336	10/27/21	Dist	1"			No	300.17	644.89	582.26	22.2
054B00009N-3, 90.0'-91.5'	1337	10/27/21	Dist	1"			No	310.18	607.42	563.13	17.5
054B00009N-3, 95.2'-96.7'	1338	10/27/21	Dist	1"			No	283.89	677.52	612.04	20.0
054B00009N-3, 100.0'-100.2'	1339	10/27/21	Dist	1"			No	31.43	87.63	78.24	20.1

Comments

Reviewed By RJ

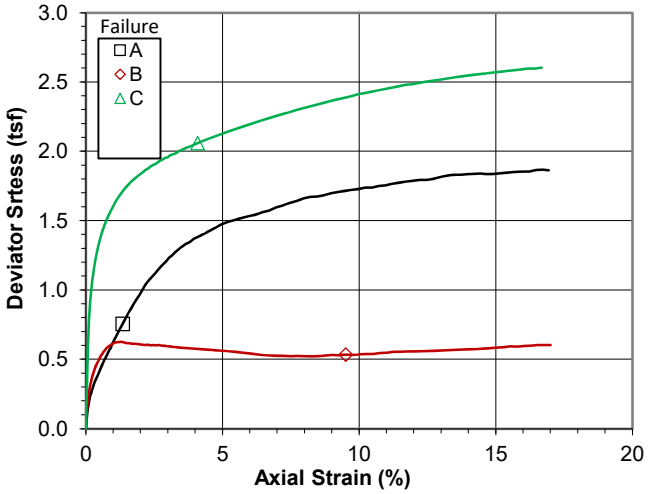
Consolidated Undrained Triaxial Compression

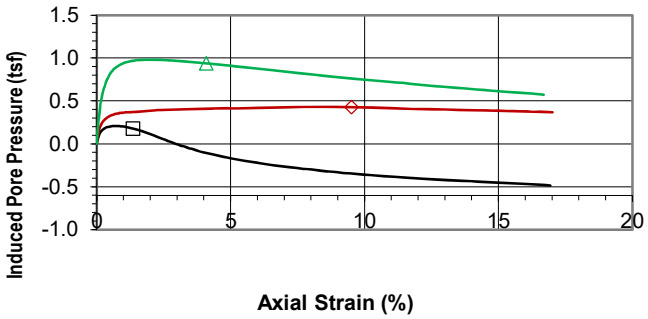
AASHTO T 297

Project Name Bridging KY - 054B00009N

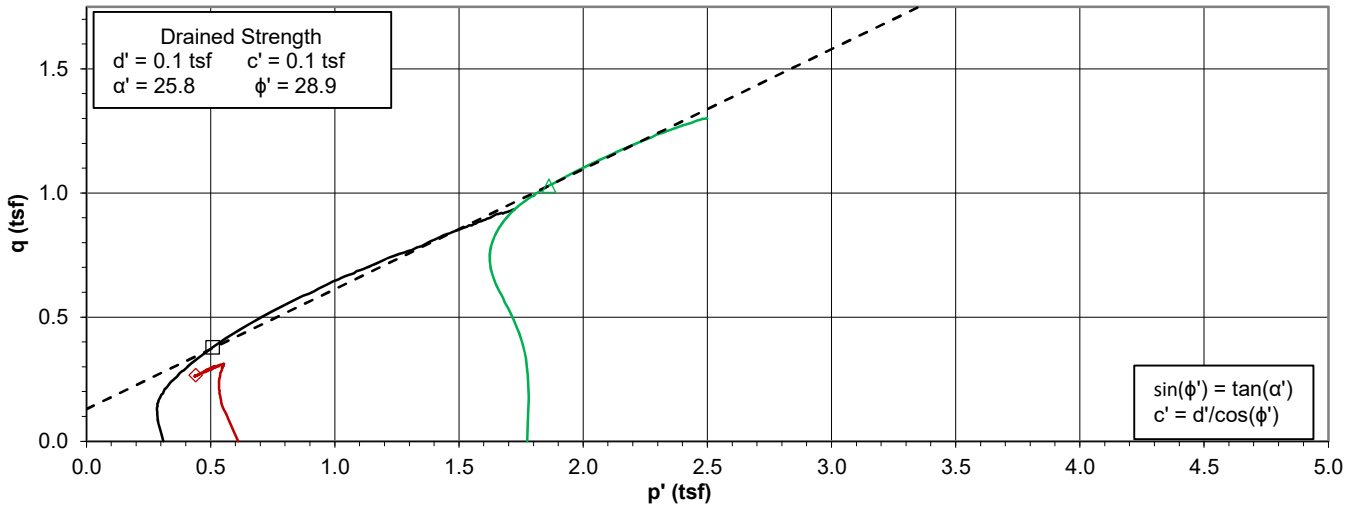
Project 178568003
Set ID 1

Test	Lab ID	Source	Description	Gs	LL	PL	PI
A	1340B	054B00009N-2, 5.6'-6.1'	Lean Clay (CL), brown, moist, firm	2.64	32	18	14
B	1341A	054B00009N-2, 15.1'-15.6'	Lean Clay with Sand (CL), brown, moist, firm	2.60	36	19	17
C	1341B	054B00009N-2, 15.6'-16.2'	Lean Clay with Sand (CL), brown, moist, firm	2.60	36	19	17





Specimen	A	B	C		
	Initial Specimen Conditions				
Average Height (in)	6.011	6.065	6.061		
Average Diameter (in)	2.881	2.866	2.887		
Moist Unit Weight (pcf)	125.0	122.0	125.7		
Moisture Content (%)	22.2	22.3	21.5		
Dry Unit Weight (pcf)	102.3	99.8	103.5		
Void Ratio	0.608	0.624	0.565		
Degree of Saturation (%)	96.5	92.7	98.8		
	Consolidated Specimen Conditions				
Moist Unit Weight (pcf)	125.3	123.3	126.6		
Moisture Content (%)	23.6	24.5	21.2		
Dry Unit Weight (pcf)	101.3	99.0	104.5		
Void Ratio	0.623	0.636	0.551		
Degree of Saturation (%)	100.0	100.0	100.0		
Eff. Con. Stress, σ_3' (tsf)	0.310	0.610	1.774		
	At Drained Failure				
Failure Criterion	Max. Eff. Prin. Stress Ratio				
Axial Strain (%)	1.349	9.514	4.089		
Deviator Stress (tsf)	0.756	0.532	2.059		
Induced Pore Press. (tsf)	0.178	0.428	0.938		
Minor Eff. Stress, σ_3' (tsf)	0.130	0.174	0.832		
Major Eff. Stress, σ_1' (tsf)	0.886	0.707	2.892		
Eff. Stress Ratio, σ_1'/σ_3'	6.800	4.053	3.475		
p' (tsf)	0.508	0.441	1.862		
q (tsf)	0.378	0.266	1.030		



Comments

Reviewed By KG

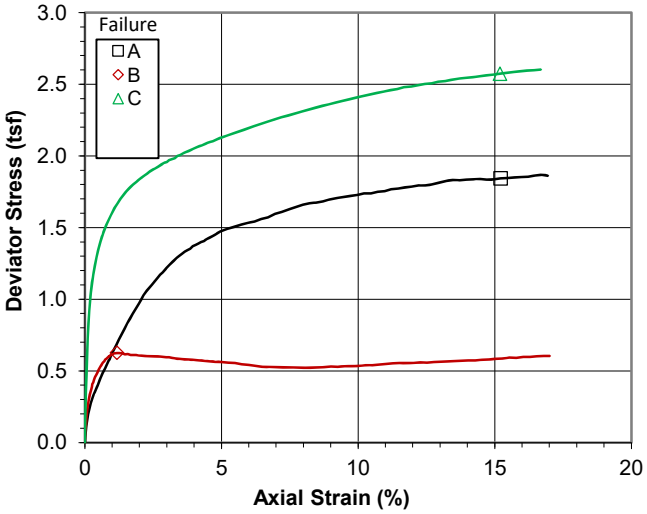
Consolidated Undrained Triaxial Compression

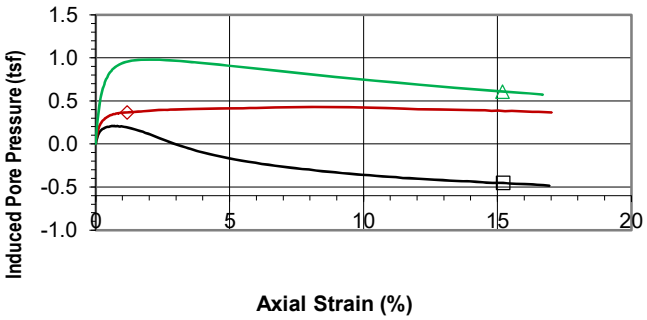
AASHTO T 297

Project Name Bridging KY - 054B00009N

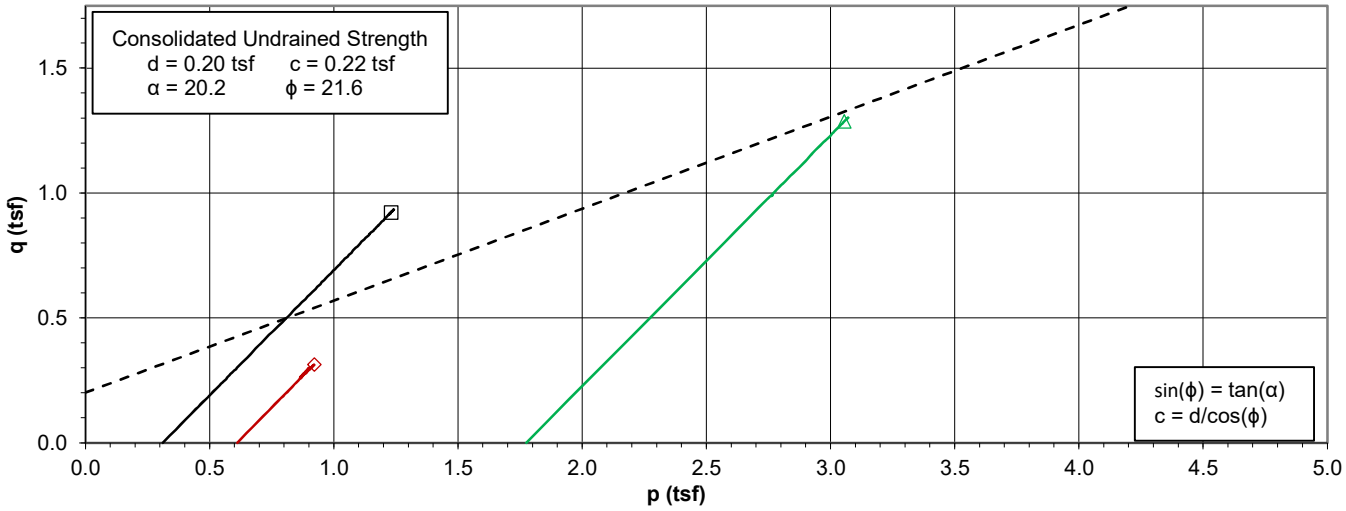
Project 178568003
Set ID 1

Test	Lab ID	Source	Description	Gs	LL	PL	PI
A	1340B	054B00009N-2, 5.6'-6.1'	Lean Clay (CL), brown, moist, firm	2.64	32	18	14
B	1341A	054B00009N-2, 15.1'-15.6'	Lean Clay with Sand (CL), brown, moist, firm	2.60	36	19	17
C	1341B	054B00009N-2, 15.6'-16.2'	Lean Clay with Sand (CL), brown, moist, firm	2.60	36	19	17





Specimen	A	B	C		
	Initial Specimen Conditions				
Average Height (in)	6.011	6.065	6.061		
Average Diameter (in)	2.881	2.866	2.887		
Moist Unit Weight (pcf)	125.0	122.0	125.7		
Moisture Content (%)	22.2	22.3	21.5		
Dry Unit Weight (pcf)	102.3	99.8	103.5		
Void Ratio	0.608	0.624	0.565		
Degree of Saturation (%)	96.5	92.7	98.8		
	Consolidated Specimen Conditions				
Moist Unit Weight (pcf)	125.3	123.3	126.6		
Moisture Content (%)	23.6	24.5	21.2		
Dry Unit Weight (pcf)	101.3	99.0	104.5		
Void Ratio	0.623	0.636	0.551		
Degree of Saturation (%)	100.0	100.0	100.0		
Eff. Con. Stress, σ_3' (tsf)	0.310	0.610	1.774		
	At Consolidated Undrained Failure				
Failure Criterion	Max. σ_D or 15% Strain				
Axial Strain (%)	15.217	1.171	15.192		
Deviator Stress (tsf)	1.843	0.626	2.574		
Min. Prin. Stress, σ_3 (tsf)	0.310	0.609	1.768		
Maj. Prin. Stress, σ_1 (tsf)	2.152	1.234	4.343		
p (tsf)	1.231	0.921	3.055		
q (tsf)	0.921	0.313	1.287		



Comments

Consolidated Undrained Triaxial Compression

AASHTO T 297

Project Name	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-2, 5.6'-6.1'	Lab ID	1340B
Description	Lean Clay (CL), brown, moist, firm	Test ID	1-A
Specimen Type	Intact		
Preparation	Wet Mounting	Date Received	10/25/2021
		Date Tested	11/01/2021

Specific Gravity	2.64
	ASTM D 854, Dry
Liquid Limit	32
Plastic Limit	18
Plasticity Index	14
	ASTM D 4318

Target Test Parameters

Nominal Chamber Pressure (psi)	90
Nominal Back Pressure (psi)	85
Nominal Consolidation Pressure (psi)	5

Saturation / Consolidation Results

Pore Pressure Parameter B	0.96
Measured Effective Consol. Stress (tsf)	0.309
Time to 50% Consolidation (min)	3.40
Actual Axial Strain Rate of Test (%/min)	0.088

Consolidated Specimen Conditions

Moist Unit Weight (pcf)	125.3
Moisture Content (%)	23.6
Dry Unit Weight (pcf)	101.3
Void Ratio	0.623
Degree of Saturation (%)	100.0

At Drained Failure

Failure Criterion: Max. Eff. Prin. Stress Ratio

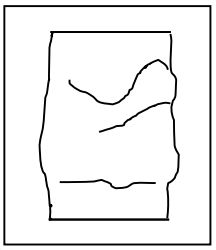
Axial Strain (%)	1.349
Deviator Stress (tsf)	0.756
Induced Pore Pressure (tsf)	0.178
Minor Effective Stress, σ_3' (tsf)	0.130
Major Effective Stress, σ_1' (tsf)	0.886
Eff. Principal Stress Ratio, σ_1'/σ_3'	6.800
p' (tsf)	0.508
q (tsf)	0.378

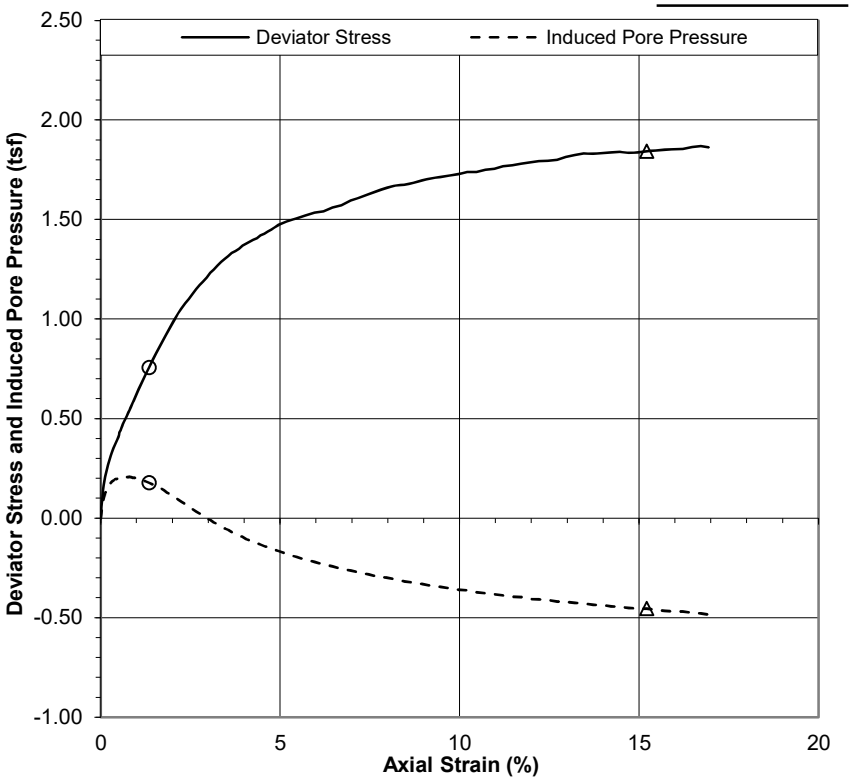
At Consolidated Undrained Failure

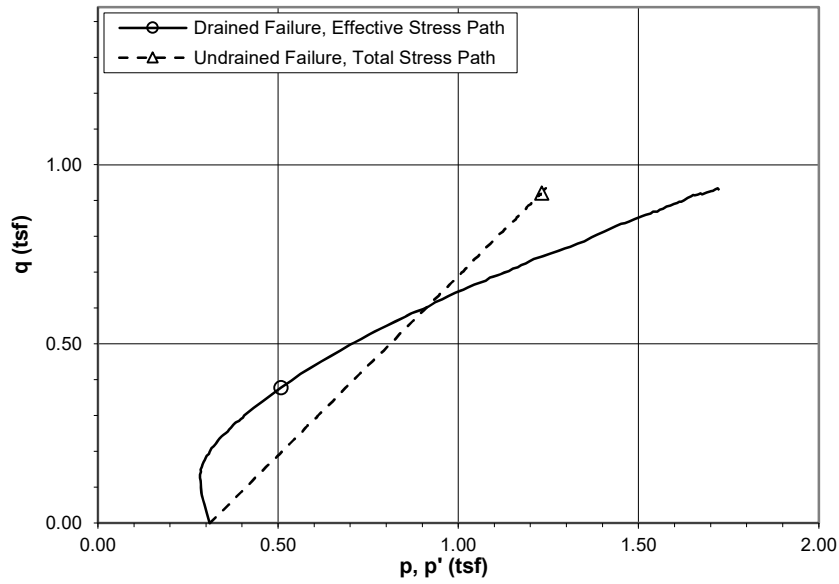
Failure Criterion: 15% Axial Strain

Axial Strain (%)	15.217
Deviator Stress (tsf)	1.843
Minor Principal Stress, σ_3 (tsf)	0.310
Major Principal Stress, σ_1 (tsf)	2.152
p (tsf)	1.231
q (tsf)	0.921

Failure Sketch







Comments

Reviewed KG

Stantec

Consolidated Undrained Triaxial Compression

ASTM D 4767

Project Name Bridging KY - 054B00009N
Source 054B00009N-2, 5.6'-6.1'
Description Lean Clay (CL), brown, moist, firm

Project No. 178568003
Lab ID 1340B
Test ID 1-A

Initial Specimen Conditions		Consolidated Specimen Conditions	
Average Height (in)	6.011	Calculated Height (in)	6.004
Average Diameter (in)	2.881	Calculated Diameter (in)	2.897
Calculated Area (in^2)	6.520	Calculated Area (in^2)	6.590
Moist Weight (lb)	2.836	Moist Weight (lb)	2.868
Moist Unit Weight (pcf)	125.0	Moist Unit Weight (pcf)	125.3
Moisture Content (%)	22.2	Moisture Content (%)	23.6
Dry Weight (lb)	2.320	Dry Weight (lb)	2.320
Dry Unit Weight (pcf)	102.3	Dry Unit Weight (pcf)	101.3
Void Ratio	0.608	Void Ratio	0.623
Degree of Saturation (%)	96.5	Degree of Saturation (%)	100.0

Specific Gravity 2.64
ASTM D 854, Dry

Liquid Limit 32
Plastic Limit 18
Plasticity Index 14
ASTM D 4318

Confining Stress
σ_3 (tsf) 0.310

Effective Consolidation Stress
σ_3' (tsf) 0.310

Moisture contents obtained using partial specimen.
Specimen consolidated cross-sectional area determined using method B.
Membrane corrections have been applied,where Em = 200 lbf/in and t = 0.012 in.
All other tests performed in association with this specimen are reported separately.

Project: 178568003			Source: 054B00009N-2, 5.6'-6.1'								Lab ID: 1340B		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in^2)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
0.0	0.0	0.000	0.00	6.590	0.000	0.000	6.170	0.000	0.310	0.310	0.310	0.310	0.310	0.000	1.000
0.3	5.3	0.001	0.02	6.591	0.058	0.058	6.208	0.038	0.368	0.330	0.273	0.339	0.302	0.029	1.212
0.6	9.5	0.003	0.05	6.593	0.103	0.103	6.237	0.067	0.415	0.348	0.245	0.363	0.296	0.052	1.422
0.9	13.0	0.004	0.07	6.594	0.142	0.141	6.261	0.091	0.452	0.361	0.220	0.381	0.290	0.071	1.644
1.2	15.7	0.006	0.09	6.596	0.171	0.171	6.280	0.110	0.482	0.372	0.201	0.396	0.287	0.085	1.849
1.4	17.9	0.007	0.11	6.597	0.196	0.195	6.293	0.123	0.506	0.384	0.188	0.409	0.286	0.098	2.037
1.7	19.8	0.008	0.14	6.599	0.216	0.216	6.303	0.133	0.527	0.394	0.178	0.419	0.286	0.108	2.214
2.0	21.6	0.010	0.16	6.600	0.236	0.236	6.314	0.143	0.546	0.403	0.167	0.428	0.285	0.118	2.409
2.3	23.2	0.011	0.19	6.602	0.253	0.252	6.322	0.152	0.561	0.409	0.157	0.435	0.283	0.126	2.610
2.6	24.8	0.013	0.21	6.603	0.270	0.270	6.331	0.160	0.579	0.419	0.149	0.444	0.284	0.135	2.812
2.9	26.3	0.014	0.24	6.605	0.286	0.286	6.338	0.167	0.597	0.429	0.144	0.454	0.286	0.143	2.991
3.1	27.5	0.016	0.26	6.607	0.300	0.299	6.344	0.174	0.609	0.435	0.136	0.459	0.285	0.150	3.202
3.4	28.8	0.017	0.29	6.608	0.314	0.313	6.348	0.178	0.623	0.445	0.132	0.466	0.289	0.157	3.375
3.7	30.1	0.019	0.31	6.610	0.328	0.328	6.354	0.183	0.637	0.454	0.126	0.473	0.290	0.164	3.595
4.0	31.3	0.020	0.33	6.612	0.341	0.340	6.358	0.187	0.650	0.463	0.123	0.480	0.293	0.170	3.764
4.3	32.5	0.022	0.37	6.614	0.353	0.352	6.362	0.191	0.664	0.473	0.120	0.488	0.296	0.176	3.935
4.6	33.5	0.024	0.39	6.616	0.365	0.364	6.365	0.195	0.676	0.481	0.117	0.494	0.299	0.182	4.112
4.9	34.6	0.025	0.42	6.617	0.376	0.375	6.367	0.196	0.686	0.489	0.114	0.498	0.302	0.188	4.280
5.1	35.5	0.026	0.44	6.619	0.387	0.386	6.367	0.197	0.697	0.501	0.115	0.504	0.308	0.193	4.352
5.4	36.5	0.028	0.47	6.620	0.397	0.396	6.369	0.198	0.706	0.508	0.112	0.509	0.310	0.198	4.526
5.7	37.5	0.030	0.49	6.622	0.408	0.407	6.370	0.200	0.716	0.516	0.109	0.512	0.312	0.203	4.729
6.0	38.5	0.031	0.51	6.623	0.419	0.418	6.374	0.203	0.727	0.524	0.106	0.518	0.315	0.209	4.927
6.3	39.6	0.032	0.53	6.624	0.431	0.430	6.374	0.203	0.740	0.536	0.107	0.525	0.321	0.215	5.029
6.6	40.7	0.033	0.56	6.626	0.442	0.441	6.375	0.205	0.752	0.547	0.106	0.531	0.326	0.220	5.158
6.9	41.7	0.035	0.58	6.628	0.453	0.451	6.377	0.207	0.762	0.556	0.104	0.537	0.330	0.226	5.331
7.1	42.7	0.036	0.60	6.629	0.464	0.462	6.378	0.208	0.772	0.565	0.103	0.541	0.334	0.231	5.507
7.4	43.6	0.037	0.62	6.631	0.474	0.472	6.379	0.208	0.782	0.574	0.102	0.546	0.338	0.236	5.642
7.7	44.7	0.039	0.65	6.633	0.485	0.483	6.379	0.209	0.794	0.585	0.102	0.552	0.344	0.242	5.743
8.0	45.6	0.041	0.67	6.634	0.494	0.493	6.378	0.208	0.804	0.596	0.103	0.557	0.349	0.246	5.794
8.3	46.5	0.042	0.70	6.636	0.504	0.503	6.378	0.208	0.814	0.606	0.104	0.563	0.355	0.251	5.856
8.6	47.3	0.044	0.73	6.638	0.513	0.512	6.377	0.207	0.823	0.616	0.104	0.567	0.360	0.256	5.908
8.8	48.2	0.045	0.75	6.640	0.523	0.521	6.376	0.206	0.831	0.625	0.104	0.571	0.365	0.260	6.005
9.1	49.2	0.047	0.78	6.641	0.534	0.532	6.377	0.206	0.842	0.635	0.104	0.576	0.369	0.266	6.136
9.4	50.2	0.048	0.80	6.643	0.544	0.542	6.378	0.208	0.851	0.644	0.102	0.580	0.373	0.271	6.340
9.7	51.1	0.050	0.83	6.645	0.554	0.552	6.377	0.206	0.860	0.653	0.102	0.584	0.378	0.276	6.419
10.0	52.1	0.051	0.85	6.646	0.564	0.562	6.376	0.206	0.871	0.665	0.103	0.590	0.384	0.281	6.451
10.3	52.9	0.053	0.88	6.648	0.573	0.571	6.374	0.203	0.880	0.677	0.106	0.595	0.392	0.285	6.368
10.6	53.8	0.054	0.90	6.649	0.583	0.581	6.373	0.203	0.890	0.687	0.107	0.600	0.397	0.290	6.435
10.8	54.6	0.056	0.93	6.651	0.591	0.588	6.374	0.203	0.900	0.696	0.108	0.606	0.402	0.294	6.454

Project: 178568003			Source: 054B00009N-2, 5.6'-6.1'								Lab ID: 1340B		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
11.1	55.7	0.057	0.95	6.652	0.603	0.600	6.374	0.204	0.910	0.706	0.106	0.610	0.406	0.300	6.663
12.3	59.6	0.063	1.05	6.659	0.645	0.642	6.369	0.199	0.952	0.753	0.111	0.631	0.432	0.321	6.780
13.4	63.3	0.069	1.15	6.666	0.684	0.681	6.364	0.193	0.992	0.799	0.118	0.652	0.458	0.340	6.776
14.5	66.8	0.075	1.25	6.673	0.721	0.718	6.357	0.186	1.028	0.842	0.124	0.669	0.483	0.359	6.783
15.7	70.4	0.081	1.35	6.680	0.759	0.756	6.349	0.178	1.065	0.886	0.130	0.687	0.508	0.378	6.800
16.8	74.1	0.087	1.45	6.687	0.798	0.794	6.340	0.170	1.104	0.934	0.140	0.707	0.537	0.397	6.677
18.0	77.7	0.093	1.55	6.694	0.836	0.832	6.333	0.163	1.141	0.979	0.146	0.725	0.562	0.416	6.689
19.1	80.7	0.099	1.66	6.700	0.867	0.863	6.322	0.151	1.171	1.020	0.156	0.739	0.588	0.432	6.522
20.2	84.4	0.106	1.76	6.708	0.906	0.902	6.312	0.142	1.212	1.071	0.169	0.761	0.620	0.451	6.350
21.4	87.2	0.111	1.85	6.714	0.935	0.931	6.299	0.129	1.240	1.111	0.180	0.774	0.646	0.465	6.168
22.5	90.4	0.118	1.96	6.721	0.968	0.963	6.290	0.119	1.274	1.155	0.192	0.793	0.673	0.482	6.023
23.6	93.7	0.124	2.07	6.729	1.002	0.997	6.277	0.107	1.306	1.200	0.202	0.808	0.701	0.499	5.931
24.8	96.6	0.129	2.15	6.734	1.033	1.028	6.264	0.094	1.339	1.245	0.217	0.825	0.731	0.514	5.743
25.9	99.4	0.136	2.26	6.742	1.061	1.056	6.252	0.081	1.365	1.284	0.227	0.837	0.756	0.528	5.642
27.1	101.7	0.142	2.36	6.749	1.085	1.079	6.240	0.069	1.388	1.318	0.239	0.848	0.779	0.540	5.514
28.2	103.8	0.147	2.46	6.755	1.106	1.101	6.229	0.059	1.410	1.351	0.251	0.860	0.801	0.550	5.387
29.3	106.2	0.153	2.56	6.762	1.131	1.125	6.217	0.047	1.434	1.387	0.263	0.872	0.825	0.562	5.283
30.5	108.7	0.160	2.66	6.770	1.156	1.150	6.204	0.033	1.461	1.428	0.278	0.886	0.853	0.575	5.137
31.6	110.8	0.166	2.76	6.776	1.178	1.171	6.194	0.024	1.480	1.457	0.286	0.895	0.871	0.586	5.101
32.7	112.5	0.171	2.85	6.783	1.195	1.188	6.179	0.009	1.498	1.489	0.301	0.904	0.895	0.594	4.947
33.9	114.6	0.177	2.95	6.790	1.215	1.208	6.168	-0.002	1.518	1.521	0.312	0.914	0.916	0.604	4.871
35.0	117.0	0.183	3.05	6.797	1.239	1.232	6.161	-0.009	1.543	1.552	0.320	0.927	0.936	0.616	4.845
36.2	118.7	0.189	3.15	6.804	1.256	1.249	6.148	-0.022	1.557	1.580	0.331	0.933	0.955	0.624	4.777
37.3	120.9	0.196	3.26	6.811	1.278	1.270	6.141	-0.029	1.581	1.610	0.341	0.946	0.975	0.635	4.728
38.4	122.6	0.202	3.36	6.819	1.295	1.287	6.129	-0.042	1.594	1.636	0.349	0.951	0.993	0.643	4.685
39.6	124.3	0.208	3.46	6.826	1.311	1.303	6.118	-0.052	1.613	1.666	0.363	0.962	1.014	0.652	4.594
40.7	125.6	0.213	3.55	6.832	1.324	1.316	6.111	-0.059	1.625	1.684	0.369	0.967	1.026	0.658	4.570
41.8	127.3	0.219	3.66	6.840	1.340	1.332	6.100	-0.070	1.640	1.710	0.378	0.975	1.044	0.666	4.519
43.0	128.5	0.226	3.76	6.847	1.351	1.342	6.091	-0.079	1.652	1.731	0.389	0.980	1.060	0.671	4.451
44.1	129.7	0.231	3.85	6.854	1.362	1.353	6.081	-0.090	1.663	1.753	0.400	0.987	1.076	0.676	4.383
45.3	131.4	0.237	3.95	6.861	1.379	1.369	6.076	-0.095	1.678	1.773	0.403	0.994	1.088	0.685	4.395
46.4	132.4	0.243	4.06	6.868	1.388	1.379	6.066	-0.105	1.687	1.792	0.413	0.998	1.102	0.689	4.336
47.5	133.5	0.249	4.16	6.875	1.398	1.388	6.059	-0.112	1.699	1.811	0.422	1.005	1.117	0.694	4.286
48.7	134.6	0.255	4.25	6.882	1.408	1.398	6.051	-0.119	1.708	1.827	0.429	1.009	1.128	0.699	4.261
49.8	135.6	0.262	4.36	6.890	1.417	1.406	6.044	-0.126	1.717	1.843	0.437	1.014	1.140	0.703	4.221
50.9	137.0	0.267	4.45	6.897	1.430	1.420	6.038	-0.132	1.729	1.861	0.442	1.019	1.152	0.710	4.213
52.1	138.0	0.274	4.56	6.904	1.439	1.428	6.029	-0.141	1.738	1.879	0.451	1.024	1.165	0.714	4.167
53.2	139.3	0.280	4.66	6.911	1.451	1.440	6.025	-0.146	1.749	1.895	0.455	1.029	1.175	0.720	4.163
54.4	140.3	0.286	4.76	6.919	1.460	1.449	6.016	-0.154	1.757	1.912	0.463	1.033	1.187	0.725	4.132
55.5	141.7	0.292	4.86	6.926	1.473	1.461	6.011	-0.159	1.770	1.929	0.468	1.039	1.198	0.731	4.125
56.6	143.0	0.298	4.96	6.933	1.485	1.473	6.005	-0.165	1.781	1.946	0.473	1.044	1.210	0.737	4.113
59.5	145.1	0.313	5.21	6.952	1.503	1.490	5.990	-0.180	1.800	1.981	0.490	1.055	1.236	0.745	4.039
62.3	146.9	0.328	5.46	6.970	1.518	1.505	5.975	-0.195	1.813	2.008	0.503	1.061	1.256	0.752	3.991
65.1	148.8	0.343	5.71	6.988	1.533	1.520	5.962	-0.208	1.831	2.039	0.519	1.071	1.279	0.760	3.927
68.0	150.6	0.358	5.96	7.007	1.548	1.534	5.951	-0.220	1.842	2.062	0.528	1.075	1.295	0.767	3.904
70.8	151.8	0.373	6.21	7.026	1.556	1.541	5.937	-0.233	1.848	2.081	0.540	1.078	1.311	0.771	3.853
73.7	154.1	0.388	6.46	7.045	1.575	1.560	5.928	-0.243	1.868	2.111	0.551	1.088	1.331	0.780	3.832
76.5	155.8	0.403	6.71	7.063	1.588	1.572	5.916	-0.254	1.881	2.135	0.563	1.095	1.349	0.786	3.790
79.3	158.5	0.418	6.97	7.083	1.612	1.595	5.907	-0.263	1.904	2.167	0.572	1.107	1.370	0.798	3.787
82.2	160.4	0.433	7.21	7.101	1.626	1.609	5.897	-0.274	1.916	2.189	0.580	1.111	1.385	0.805	3.773
85.0	162.7	0.448	7.47	7.121	1.645	1.627	5.888	-0.282	1.937	2.219	0.592	1.123	1.406	0.814	3.749
87.8	164.6	0.463	7.71	7.140	1.660	1.641	5.878	-0.293	1.949	2.241	0.600	1.128	1.421	0.821	3.736
90.7	166.8	0.478	7.96	7.159	1.677	1.659	5.872	-0.298	1.969	2.267	0.608	1.140	1.437	0.829	3.727
93.5	168.5	0.493	8.21	7.179	1.690	1.670	5.863	-0.308	1.979	2.287	0.617	1.144	1.452	0.835	3.708
96.4	169.4	0.508	8.46	7.198	1.695	1.674	5.853	-0.317	1.982	2.300	0.625	1.145	1.463	0.837	3.677
99.2	170.9	0.523	8.71	7.218	1.704	1.684	5.847	-0.323	1.992	2.315	0.632	1.150	1.474	0.842	3.665
102.0	172.7	0.538	8.96	7.238	1.718	1.696	5.840	-0.330	2.008	2.338	0.642	1.160	1.490	0.848	3.644
104.9	174.2	0.553	9.21	7.258	1.728	1.706	5.830	-0.340	2.014	2.355	0.649	1.161	1.502	0.853	3.629
107.7	175.4	0.568	9.47	7.279	1.735	1.713	5.826	-0.344	2.023	2.367	0.654	1.166	1.511	0.856	3.618
110.5	176.8	0.583	9.71	7.298	1.744	1.721	5.819	-0.351	2.029	2.381	0.660	1.169	1.520	0.860	3.607
113.4	178.0	0.598	9.97	7.319	1.751	1.727	5.811	-0.359	2.037	2.397	0.669	1.174	1.533	0.864	3.581
116.2	179.7	0.613	10.22	7.339	1.763	1.739	5.808	-0.363	2.047	2.410	0.671	1.178	1.540	0.869	3.591
119.1	180.3	0.629	10.47	7.360	1.764	1.739	5.798	-0.372	2.049	2.421	0.682	1.180	1.552	0.869	3.548
121.9	181.9	0.644	10.72	7.381	1.775	1.749	5.794	-0.377	2.058	2.434	0.685	1.183	1.560	0.875	3.553
124.7	183.1	0.659	10.97	7.402	1.781	1.755	5.789	-0.381	2.064	2.446	0.691	1.187	1.568	0.877	3.539
127.6	184.9	0.673	11.21	7.422	1.793	1.767	5.783	-0.388	2.074	2.461	0.695	1.190	1.578	0.883	3.543
130.4	186.0	0.689	11.47	7.443	1.800	1.772	5.775	-0.395	2.080	2.475	0.702	1.194	1.589	0.886	3.523
133.2	187.5	0.703	11.72	7.464	1.809	1.781	5.773	-0.397	2.092	2.489	0.708	1.202	1.598	0.890	3.515
136.1	188.6	0.718	11.96	7.485	1.815	1.786	5.765	-0.405	2.095	2.500	0.714	1.202	1.607	0.893	3.500

Project: 178568003			Source: 054B00009N-2, 5.6'-6.1'								Lab ID: 1340B		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in^2)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
138.9	190.1	0.733	12.21	7.506	1.823	1.794	5.763	-0.407	2.102	2.510	0.716	1.205	1.613	0.897	3.505
141.8	190.7	0.748	12.46	7.527	1.824	1.794	5.759	-0.411	2.105	2.516	0.722	1.208	1.619	0.897	3.486
144.6	191.9	0.764	12.72	7.550	1.830	1.800	5.752	-0.418	2.108	2.526	0.726	1.208	1.626	0.900	3.480
147.4	194.0	0.778	12.96	7.571	1.845	1.814	5.749	-0.421	2.123	2.543	0.729	1.215	1.636	0.907	3.489
150.3	195.7	0.793	13.21	7.593	1.856	1.824	5.745	-0.425	2.133	2.558	0.734	1.221	1.646	0.912	3.484
153.1	197.1	0.808	13.46	7.614	1.863	1.831	5.741	-0.429	2.139	2.568	0.736	1.223	1.652	0.916	3.488
156.0	197.5	0.824	13.72	7.637	1.862	1.829	5.736	-0.434	2.137	2.571	0.742	1.222	1.656	0.915	3.466
158.8	198.6	0.838	13.97	7.659	1.867	1.834	5.735	-0.436	2.145	2.581	0.747	1.228	1.664	0.917	3.455
161.6	199.6	0.853	14.21	7.681	1.871	1.837	5.728	-0.442	2.144	2.587	0.750	1.226	1.668	0.919	3.451
164.5	200.5	0.868	14.46	7.704	1.874	1.839	5.726	-0.444	2.148	2.592	0.752	1.228	1.672	0.920	3.445
167.3	200.7	0.884	14.72	7.727	1.870	1.835	5.719	-0.451	2.143	2.594	0.759	1.225	1.676	0.918	3.419
170.2	201.6	0.899	14.97	7.749	1.873	1.837	5.716	-0.454	2.144	2.598	0.760	1.225	1.679	0.919	3.416
173.0	202.8	0.914	15.22	7.772	1.879	1.843	5.717	-0.454	2.152	2.606	0.764	1.231	1.685	0.921	3.413
175.8	203.8	0.929	15.47	7.795	1.882	1.846	5.711	-0.460	2.153	2.613	0.767	1.230	1.690	0.923	3.406
178.7	205.0	0.944	15.72	7.818	1.888	1.850	5.706	-0.464	2.159	2.624	0.773	1.234	1.699	0.925	3.392
181.5	205.9	0.959	15.98	7.842	1.891	1.852	5.702	-0.468	2.159	2.627	0.775	1.233	1.701	0.926	3.391
184.3	206.8	0.974	16.23	7.866	1.893	1.854	5.701	-0.469	2.165	2.634	0.780	1.238	1.707	0.927	3.378
187.2	208.5	0.989	16.48	7.890	1.903	1.864	5.695	-0.475	2.170	2.646	0.782	1.238	1.714	0.932	3.384
190.0	209.8	1.004	16.72	7.913	1.909	1.869	5.692	-0.478	2.177	2.655	0.786	1.242	1.720	0.935	3.380
192.7	209.6	1.017	16.94	7.934	1.902	1.862	5.686	-0.484	2.169	2.653	0.791	1.238	1.722	0.931	3.353

Consolidated Undrained Triaxial Compression

AASHTO T 297

Project Name	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-2, 15.1'-15.6'	Lab ID	1341A
Description	Lean Clay with Sand (CL), brown, moist, firm	Test ID	1-B
Specimen Type	Intact		
Preparation	Wet Mounting	Date Received	10/25/2021
		Date Tested	10/29/2021

Specific Gravity	2.60
	ASTM D 854, Dry
Liquid Limit	36
Plastic Limit	19
Plasticity Index	17

Target Test Parameters

Nominal Chamber Pressure (psi)	90
Nominal Back Pressure (psi)	80
Nominal Consolidation Pressure (psi)	10

Saturation / Consolidation Results

Pore Pressure Parameter B	0.95
Measured Effective Consol. Stress (tsf)	0.606
Time to 50% Consolidation (min)	5.40
Actual Axial Strain Rate of Test (%/min)	0.056

Consolidated Specimen Conditions

Moist Unit Weight (pcf)	123.3
Moisture Content (%)	24.5
Dry Unit Weight (pcf)	99.0
Void Ratio	0.636
Degree of Saturation (%)	100.0

At Drained Failure

Failure Criteria: Max. Eff. Prin. Stress Ratio

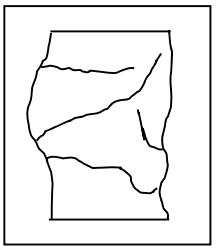
Axial Strain (%)	9.514
Deviator Stress (tsf)	0.532
Induced Pore Pressure (tsf)	0.428
Minor Effective Stress, σ_3' (tsf)	0.174
Major Effective Stress, σ_1' (tsf)	0.707
Eff. Principal Stress Ratio, σ_1'/σ_3'	4.053
p' (tsf)	0.441
q (tsf)	0.266

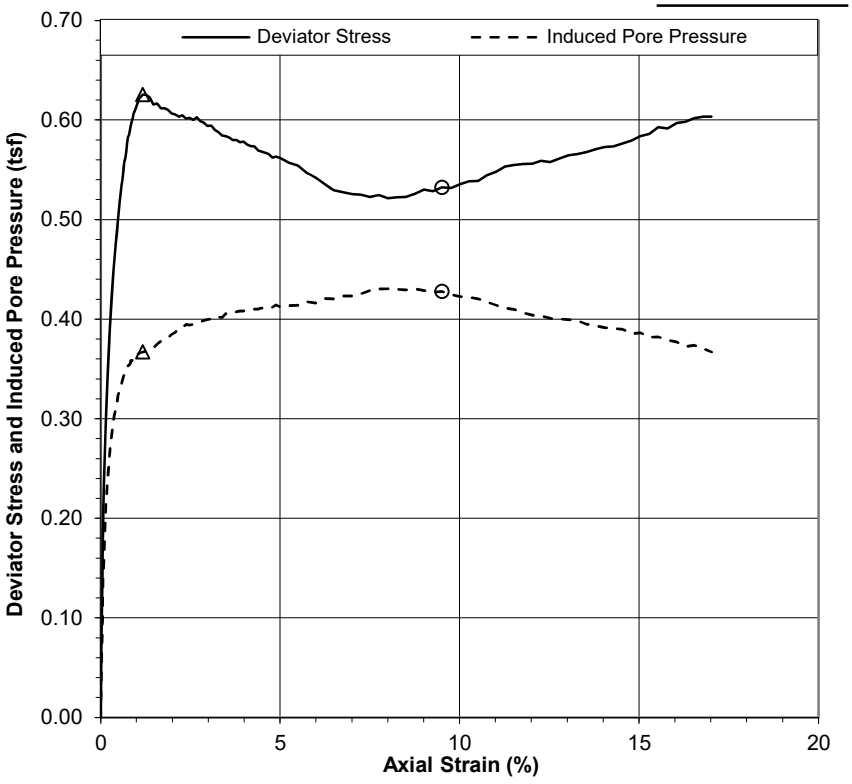
At Consolidated Undrained Failure

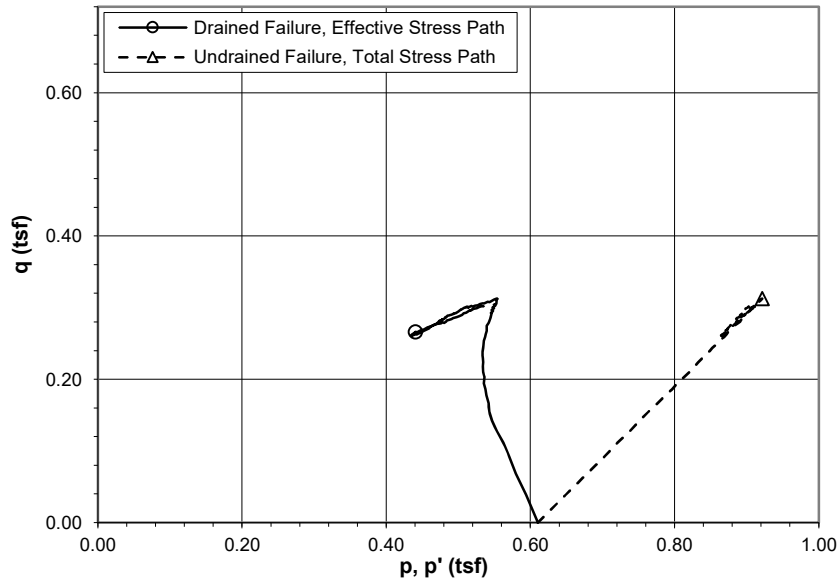
Failure Criterion: Peak Deviator Stress

Axial Strain (%)	1.171
Deviator Stress (tsf)	0.626
Minor Principal Stress, σ_3 (tsf)	0.609
Major Principal Stress, σ_1 (tsf)	1.234
p (tsf)	0.921
q (tsf)	0.313

Failure Sketch







Comments

Reviewed KG

Stantec

Consolidated Undrained Triaxial Compression

ASTM D 4767

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 15.1'-15.6'
Description: Lean Clay with Sand (CL), brown, moist, firm

Project No.: 178568003
Lab ID: 1341A
Test ID: 1-B

Initial Specimen Conditions		Consolidated Specimen Conditions	
Height (in)	6.065	Height (in)	6.035
Diameter (in)	2.866	Calculated Diameter (in)	2.883
Area (in^2)	6.450	Calculated Area (in^2)	6.528
Moist Weight (lb)	2.761	Moist Weight (lb)	2.810
Moist Unit Weight (pcf)	122.0	Moist Unit Weight (pcf)	123.3
Moisture Content (%)	22.3	Moisture Content (%)	24.5
Dry Weight (lb)	2.258	Dry Weight (lb)	2.258
Dry Unit Weight (pcf)	99.8	Dry Unit Weight (pcf)	99.0
Void Ratio	0.624	Void Ratio	0.636
Degree of Saturation (%)	92.7	Degree of Saturation (%)	100.0

Specific Gravity: 2.60
ASTM D 854, Dry

Liquid Limit: 36
Plastic Limit: 19
Plasticity Index: 17

Confining Stress
σ_3 (tsf): 0.610

Effective Consolidation Stress
σ_3' (tsf): 0.610

Moisture contents obtained using partial specimen.
Specimen consolidated cross-sectional area determined using method B.
Membrane corrections have been applied,where Em = 200 lbf/in and t = 0.012 in.
All other tests performed in association with this specimen are reported separately.

Project: 178568003			Source: 054B00009N-2, 15.1'-15.6'								Lab ID: 1341A		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in^2)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
0.0	0.0	0.000	0.00	6.528	0.000	0.000	5.870	0.000	0.610	0.610	0.610	0.610	0.610	0.000	1.000
0.5	7.0	0.001	0.02	6.529	0.078	0.078	5.925	0.055	0.688	0.633	0.555	0.649	0.594	0.039	1.140
0.9	12.4	0.003	0.05	6.531	0.137	0.137	5.968	0.098	0.747	0.649	0.511	0.678	0.580	0.069	1.268
1.4	16.8	0.004	0.06	6.532	0.185	0.185	6.002	0.132	0.795	0.663	0.478	0.703	0.570	0.092	1.387
1.8	20.3	0.005	0.08	6.533	0.224	0.224	6.028	0.158	0.832	0.674	0.451	0.721	0.563	0.112	1.496
2.3	23.2	0.007	0.11	6.535	0.255	0.255	6.054	0.184	0.865	0.681	0.426	0.737	0.554	0.127	1.598
2.7	25.8	0.008	0.14	6.537	0.284	0.284	6.074	0.204	0.893	0.689	0.405	0.751	0.547	0.142	1.700
3.2	28.2	0.010	0.16	6.538	0.311	0.310	6.091	0.221	0.919	0.698	0.388	0.763	0.543	0.155	1.800
3.7	30.3	0.011	0.18	6.540	0.334	0.333	6.104	0.234	0.943	0.709	0.375	0.776	0.542	0.167	1.887
4.1	32.4	0.013	0.21	6.542	0.356	0.356	6.118	0.248	0.965	0.717	0.361	0.787	0.539	0.178	1.985
4.6	33.9	0.014	0.23	6.543	0.373	0.373	6.129	0.259	0.983	0.724	0.351	0.797	0.538	0.186	2.061
5.0	35.4	0.016	0.26	6.545	0.390	0.389	6.138	0.268	0.998	0.730	0.341	0.803	0.535	0.194	2.142
5.5	37.0	0.017	0.28	6.546	0.407	0.407	6.147	0.277	1.016	0.739	0.333	0.813	0.536	0.203	2.222
5.9	38.2	0.019	0.31	6.548	0.421	0.420	6.155	0.285	1.030	0.744	0.325	0.820	0.535	0.210	2.293
6.4	39.6	0.020	0.33	6.550	0.436	0.435	6.163	0.293	1.044	0.752	0.317	0.827	0.534	0.217	2.373
6.8	40.8	0.021	0.35	6.551	0.448	0.448	6.168	0.298	1.056	0.758	0.311	0.833	0.534	0.224	2.441
7.3	41.9	0.023	0.38	6.553	0.460	0.459	6.174	0.304	1.068	0.764	0.305	0.838	0.534	0.230	2.508
7.7	42.9	0.025	0.41	6.555	0.471	0.470	6.179	0.309	1.077	0.769	0.298	0.842	0.534	0.235	2.575
8.2	43.7	0.026	0.43	6.556	0.480	0.479	6.185	0.315	1.088	0.773	0.294	0.848	0.533	0.240	2.630
8.7	44.5	0.028	0.46	6.558	0.489	0.488	6.187	0.317	1.096	0.778	0.291	0.852	0.534	0.244	2.679
9.1	45.4	0.029	0.48	6.559	0.499	0.498	6.193	0.323	1.106	0.784	0.286	0.858	0.535	0.249	2.739
9.6	46.4	0.031	0.51	6.561	0.509	0.508	6.196	0.326	1.115	0.789	0.282	0.862	0.535	0.254	2.802
10.0	47.3	0.032	0.53	6.563	0.519	0.518	6.201	0.331	1.127	0.796	0.278	0.869	0.537	0.259	2.861
10.5	48.1	0.034	0.56	6.565	0.527	0.526	6.204	0.334	1.135	0.801	0.275	0.872	0.538	0.263	2.914
10.9	48.9	0.035	0.59	6.566	0.536	0.535	6.206	0.336	1.143	0.807	0.272	0.875	0.539	0.268	2.969
11.4	49.5	0.037	0.61	6.568	0.543	0.541	6.209	0.339	1.149	0.810	0.269	0.878	0.539	0.271	3.014
11.9	50.3	0.038	0.64	6.570	0.551	0.550	6.213	0.343	1.157	0.814	0.265	0.882	0.540	0.275	3.077
12.3	51.0	0.040	0.66	6.571	0.559	0.557	6.216	0.346	1.166	0.821	0.264	0.888	0.542	0.279	3.115
12.8	51.5	0.042	0.69	6.573	0.564	0.562	6.218	0.348	1.172	0.824	0.262	0.891	0.543	0.281	3.145
13.2	52.1	0.043	0.72	6.575	0.571	0.569	6.219	0.349	1.178	0.829	0.260	0.893	0.544	0.285	3.191
13.7	52.8	0.045	0.74	6.577	0.578	0.576	6.221	0.351	1.184	0.833	0.257	0.896	0.545	0.288	3.240
14.1	53.4	0.046	0.76	6.578	0.585	0.583	6.224	0.354	1.191	0.838	0.255	0.900	0.546	0.291	3.288
14.6	53.6	0.048	0.79	6.580	0.587	0.585	6.224	0.354	1.192	0.838	0.253	0.899	0.545	0.292	3.311
15.0	54.2	0.050	0.82	6.582	0.593	0.591	6.226	0.356	1.200	0.844	0.253	0.904	0.548	0.296	3.339
15.5	54.4	0.051	0.84	6.583	0.595	0.593	6.228	0.358	1.201	0.843	0.249	0.904	0.546	0.297	3.379
15.9	54.9	0.052	0.87	6.585	0.601	0.599	6.228	0.358	1.208	0.849	0.250	0.908	0.550	0.299	3.391
16.4	55.1	0.054	0.89	6.587	0.603	0.601	6.229	0.359	1.207	0.848	0.247	0.907	0.548	0.300	3.430
16.9	55.7	0.055	0.91	6.588	0.608	0.606	6.230	0.360	1.215	0.855	0.249	0.912	0.552	0.303	3.438
17.3	55.9	0.057	0.94	6.590	0.611	0.608	6.233	0.363	1.216	0.853	0.245	0.912	0.549	0.304	3.484

Project: 178568003			Source: 054B00009N-2, 15.1'-15.6'								Lab ID: 1341A		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
17.8	56.1	0.058	0.97	6.591	0.613	0.610	6.232	0.362	1.219	0.858	0.247	0.914	0.553	0.305	3.466
19.6	57.2	0.064	1.06	6.598	0.624	0.621	6.236	0.366	1.230	0.864	0.242	0.919	0.553	0.311	3.563
21.4	57.6	0.071	1.17	6.605	0.628	0.626	6.237	0.367	1.234	0.867	0.242	0.921	0.554	0.313	3.590
23.2	57.7	0.077	1.27	6.612	0.628	0.625	6.238	0.368	1.234	0.866	0.241	0.921	0.553	0.313	3.597
25.0	57.5	0.083	1.37	6.619	0.626	0.623	6.240	0.370	1.231	0.861	0.238	0.920	0.550	0.311	3.612
26.8	57.0	0.089	1.47	6.625	0.619	0.616	6.241	0.371	1.222	0.851	0.235	0.914	0.543	0.308	3.614
28.6	57.1	0.095	1.58	6.632	0.620	0.617	6.245	0.375	1.224	0.849	0.233	0.916	0.541	0.308	3.650
30.4	56.8	0.102	1.68	6.640	0.616	0.612	6.248	0.378	1.220	0.842	0.230	0.914	0.536	0.306	3.661
32.3	56.9	0.108	1.78	6.646	0.616	0.612	6.250	0.380	1.220	0.840	0.228	0.914	0.534	0.306	3.682
34.0	56.8	0.114	1.88	6.653	0.615	0.610	6.252	0.382	1.217	0.835	0.225	0.912	0.530	0.305	3.710
35.9	56.5	0.119	1.98	6.659	0.611	0.607	6.255	0.385	1.215	0.830	0.224	0.912	0.527	0.303	3.712
37.7	56.5	0.125	2.07	6.666	0.610	0.605	6.257	0.387	1.213	0.826	0.221	0.910	0.523	0.303	3.744
39.5	56.4	0.132	2.18	6.673	0.608	0.603	6.261	0.391	1.212	0.822	0.218	0.911	0.520	0.302	3.762
41.3	56.6	0.137	2.28	6.680	0.610	0.605	6.262	0.392	1.212	0.821	0.216	0.910	0.518	0.302	3.800
43.1	56.4	0.144	2.38	6.687	0.607	0.601	6.265	0.395	1.210	0.815	0.214	0.909	0.515	0.301	3.813
44.9	56.5	0.150	2.48	6.694	0.608	0.602	6.264	0.394	1.209	0.815	0.213	0.908	0.514	0.301	3.827
46.7	56.4	0.156	2.58	6.701	0.606	0.600	6.265	0.395	1.208	0.813	0.213	0.908	0.513	0.300	3.821
48.5	56.7	0.162	2.68	6.707	0.609	0.603	6.267	0.397	1.210	0.813	0.211	0.909	0.512	0.301	3.858
50.3	56.5	0.168	2.78	6.715	0.606	0.599	6.268	0.398	1.205	0.808	0.209	0.906	0.508	0.299	3.871
52.1	56.4	0.174	2.88	6.721	0.604	0.597	6.269	0.399	1.204	0.805	0.208	0.905	0.506	0.299	3.874
53.9	56.2	0.180	2.98	6.728	0.601	0.594	6.270	0.400	1.200	0.801	0.207	0.903	0.504	0.297	3.877
55.7	56.3	0.186	3.08	6.735	0.602	0.594	6.271	0.401	1.201	0.800	0.206	0.904	0.503	0.297	3.884
57.6	55.9	0.192	3.19	6.743	0.597	0.590	6.270	0.400	1.195	0.795	0.205	0.900	0.500	0.295	3.871
59.4	55.9	0.198	3.28	6.749	0.596	0.588	6.272	0.402	1.195	0.793	0.205	0.901	0.499	0.294	3.870
61.2	55.6	0.204	3.38	6.756	0.593	0.584	6.272	0.402	1.190	0.788	0.204	0.898	0.496	0.292	3.871
63.0	55.6	0.210	3.48	6.763	0.592	0.584	6.276	0.406	1.191	0.785	0.201	0.899	0.493	0.292	3.901
64.8	55.6	0.216	3.58	6.770	0.591	0.583	6.275	0.405	1.189	0.785	0.202	0.898	0.493	0.291	3.884
66.6	55.4	0.222	3.68	6.777	0.589	0.580	6.276	0.406	1.186	0.780	0.200	0.896	0.490	0.290	3.902
68.4	55.5	0.228	3.79	6.785	0.589	0.580	6.278	0.408	1.187	0.779	0.199	0.897	0.489	0.290	3.906
70.2	55.4	0.234	3.88	6.791	0.587	0.578	6.278	0.408	1.184	0.775	0.198	0.895	0.487	0.289	3.922
72.0	55.5	0.240	3.98	6.799	0.588	0.578	6.278	0.408	1.183	0.774	0.196	0.893	0.485	0.289	3.946
73.8	55.3	0.246	4.08	6.805	0.585	0.575	6.279	0.409	1.180	0.771	0.196	0.893	0.484	0.288	3.934
75.6	55.2	0.252	4.18	6.813	0.584	0.574	6.279	0.409	1.178	0.769	0.196	0.892	0.483	0.287	3.931
77.4	55.3	0.258	4.28	6.820	0.584	0.573	6.280	0.410	1.180	0.770	0.196	0.893	0.483	0.287	3.925
79.2	55.0	0.265	4.39	6.828	0.580	0.569	6.280	0.410	1.176	0.766	0.196	0.891	0.481	0.285	3.902
81.1	55.0	0.271	4.48	6.834	0.579	0.568	6.281	0.411	1.175	0.764	0.196	0.891	0.480	0.284	3.906
82.9	54.9	0.277	4.59	6.842	0.578	0.567	6.281	0.411	1.172	0.761	0.194	0.888	0.477	0.283	3.924
84.7	54.9	0.283	4.69	6.849	0.577	0.566	6.281	0.411	1.172	0.761	0.195	0.889	0.478	0.283	3.899
86.5	54.6	0.289	4.79	6.856	0.574	0.562	6.282	0.412	1.167	0.755	0.193	0.886	0.474	0.281	3.916
88.3	54.8	0.295	4.88	6.863	0.575	0.563	6.284	0.414	1.170	0.755	0.192	0.888	0.474	0.282	3.934
90.1	54.8	0.302	5.00	6.871	0.574	0.562	6.283	0.413	1.167	0.754	0.192	0.886	0.473	0.281	3.920
94.6	54.5	0.317	5.25	6.889	0.570	0.557	6.284	0.414	1.164	0.750	0.193	0.885	0.471	0.279	3.891
99.1	54.4	0.332	5.50	6.908	0.567	0.554	6.284	0.414	1.160	0.746	0.192	0.883	0.469	0.277	3.885
103.6	53.9	0.347	5.75	6.926	0.561	0.547	6.288	0.418	1.153	0.735	0.188	0.879	0.461	0.273	3.910
108.1	53.7	0.362	5.99	6.944	0.556	0.542	6.286	0.416	1.147	0.730	0.189	0.876	0.459	0.271	3.875
112.6	53.2	0.377	6.25	6.963	0.550	0.535	6.291	0.421	1.141	0.720	0.184	0.873	0.452	0.268	3.906
117.1	52.8	0.392	6.50	6.981	0.545	0.529	6.291	0.420	1.133	0.713	0.183	0.869	0.448	0.265	3.885
121.7	52.9	0.407	6.75	7.000	0.544	0.528	6.294	0.423	1.132	0.708	0.181	0.868	0.445	0.264	3.916
126.2	52.9	0.423	7.00	7.019	0.542	0.526	6.293	0.423	1.129	0.706	0.180	0.866	0.443	0.263	3.922
130.7	53.0	0.438	7.25	7.038	0.542	0.525	6.296	0.426	1.128	0.702	0.178	0.866	0.440	0.262	3.954
135.2	53.0	0.453	7.51	7.057	0.541	0.523	6.299	0.429	1.127	0.698	0.176	0.866	0.437	0.261	3.974
139.7	53.4	0.468	7.75	7.076	0.543	0.525	6.300	0.430	1.130	0.699	0.175	0.867	0.437	0.262	4.005
144.2	53.3	0.483	8.00	7.096	0.540	0.521	6.301	0.431	1.126	0.695	0.174	0.865	0.434	0.261	4.001
148.7	53.6	0.499	8.26	7.116	0.542	0.522	6.300	0.430	1.126	0.696	0.173	0.865	0.435	0.261	4.012
153.2	53.8	0.513	8.50	7.134	0.543	0.523	6.300	0.430	1.126	0.696	0.173	0.864	0.435	0.261	4.014
157.7	54.3	0.528	8.76	7.154	0.547	0.526	6.300	0.430	1.130	0.699	0.173	0.867	0.436	0.263	4.032
162.2	55.0	0.544	9.01	7.174	0.552	0.530	6.299	0.429	1.133	0.704	0.174	0.868	0.439	0.265	4.041
166.7	55.0	0.559	9.26	7.194	0.551	0.528	6.297	0.427	1.130	0.703	0.175	0.866	0.439	0.264	4.023
171.2	55.6	0.574	9.51	7.214	0.555	0.532	6.298	0.428	1.134	0.707	0.174	0.868	0.441	0.266	4.053
175.8	55.8	0.590	9.77	7.234	0.555	0.532	6.295	0.425	1.134	0.709	0.177	0.868	0.443	0.266	3.998
180.3	56.4	0.605	10.02	7.255	0.560	0.536	6.293	0.423	1.137	0.715	0.179	0.870	0.447	0.268	3.987
184.8	56.9	0.620	10.27	7.275	0.563	0.539	6.292	0.422	1.142	0.720	0.181	0.873	0.451	0.269	3.967
189.3	57.1	0.635	10.52	7.295	0.564	0.539	6.291	0.421	1.142	0.721	0.183	0.873	0.452	0.269	3.950
193.8	57.9	0.650	10.77	7.315	0.570	0.545	6.287	0.417	1.147	0.730	0.185	0.875	0.457	0.272	3.940
198.3	58.5	0.665	11.03	7.337	0.574	0.548	6.284	0.414	1.150	0.736	0.188	0.876	0.462	0.274	3.919
202.8	59.3	0.680	11.27	7.357	0.580	0.553	6.281	0.411	1.155	0.744	0.191	0.878	0.467	0.277	3.903
207.3	59.7	0.695	11.52	7.378	0.582	0.555	6.280	0.410	1.158	0.748	0.193	0.880	0.471	0.277	3.873
211.8	60.0	0.710	11.77	7.399	0.584	0.556	6.276	0.406	1.159	0.753	0.197	0.881	0.475	0.278	3.822
216.3	60.3	0.726	12.03	7.421	0.585	0.556	6.274	0.404	1.159	0.754	0.198	0.881	0.476	0.278	3.805

Project: 178568003			Source: 054B00009N-2, 15.1'-15.6'								Lab ID: 1341A		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in^2)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
220.8	60.8	0.741	12.28	7.441	0.588	0.559	6.274	0.404	1.161	0.758	0.199	0.882	0.478	0.279	3.811
225.3	60.9	0.756	12.53	7.463	0.588	0.558	6.271	0.401	1.160	0.759	0.202	0.881	0.481	0.279	3.766
229.9	61.5	0.771	12.78	7.484	0.592	0.561	6.270	0.400	1.164	0.764	0.202	0.883	0.483	0.281	3.774
234.4	62.1	0.787	13.03	7.506	0.596	0.564	6.270	0.400	1.167	0.767	0.202	0.884	0.485	0.282	3.789
238.9	62.5	0.801	13.28	7.527	0.598	0.566	6.269	0.399	1.168	0.769	0.204	0.885	0.487	0.283	3.776
243.4	62.9	0.817	13.53	7.549	0.600	0.568	6.265	0.395	1.169	0.774	0.207	0.885	0.490	0.284	3.749
247.9	63.5	0.832	13.79	7.572	0.604	0.571	6.264	0.394	1.172	0.778	0.207	0.886	0.493	0.285	3.751
252.4	63.9	0.847	14.03	7.593	0.606	0.573	6.262	0.391	1.174	0.782	0.210	0.888	0.496	0.286	3.730
256.9	64.3	0.862	14.29	7.616	0.608	0.573	6.261	0.391	1.176	0.785	0.211	0.889	0.498	0.287	3.715
261.4	64.8	0.877	14.54	7.638	0.611	0.576	6.260	0.390	1.179	0.789	0.213	0.891	0.501	0.288	3.705
265.9	65.4	0.893	14.79	7.661	0.615	0.579	6.256	0.386	1.181	0.795	0.216	0.891	0.505	0.290	3.687
270.4	66.1	0.907	15.04	7.683	0.620	0.584	6.257	0.387	1.186	0.799	0.215	0.894	0.507	0.292	3.710
275.0	66.6	0.923	15.29	7.706	0.623	0.586	6.252	0.382	1.186	0.804	0.218	0.893	0.511	0.293	3.687
279.5	67.6	0.938	15.54	7.728	0.630	0.593	6.252	0.382	1.195	0.813	0.220	0.899	0.516	0.296	3.698
284.0	67.8	0.953	15.79	7.752	0.629	0.591	6.249	0.379	1.192	0.812	0.221	0.896	0.517	0.296	3.676
288.5	68.6	0.969	16.05	7.776	0.635	0.597	6.247	0.377	1.197	0.820	0.223	0.898	0.521	0.298	3.680
293.0	69.0	0.983	16.30	7.799	0.637	0.598	6.243	0.373	1.198	0.825	0.227	0.898	0.526	0.299	3.641
297.5	69.7	0.998	16.54	7.821	0.641	0.602	6.244	0.374	1.204	0.830	0.228	0.903	0.529	0.301	3.636
302.0	70.1	1.014	16.79	7.845	0.644	0.603	6.240	0.370	1.204	0.834	0.231	0.903	0.532	0.302	3.616
306.1	70.4	1.027	17.02	7.867	0.644	0.603	6.237	0.367	1.204	0.837	0.234	0.903	0.535	0.302	3.582

Consolidated Undrained Triaxial Compression

AASHTO T 297

Project Name	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-2, 15.6'-16.2'	Lab ID	1341B
Description	Lean Clay with Sand (CL), brown, moist, firm	Test ID	1-C
Specimen Type	Intact		
Preparation	Wet Mounting	Date Received	10/25/2021
		Date Tested	11/01/2021

Specific Gravity	2.60
	ASTM D 854, Dry
Liquid Limit	36
Plastic Limit	19
Plasticity Index	17
	ASTM D 4318

Target Test Parameters

Nominal Chamber Pressure (psi)	90
Nominal Back Pressure (psi)	65
Nominal Consolidation Pressure (psi)	25

Saturation / Consolidation Results

Pore Pressure Parameter B	0.99
Measured Effective Consol. Stress (tsf)	1.771
Time to 50% Consolidation (min)	13.50
Actual Axial Strain Rate of Test (%/min)	0.022

Consolidated Specimen Conditions

Moist Unit Weight (pcf)	126.6
Moisture Content (%)	21.2
Dry Unit Weight (pcf)	104.5
Void Ratio	0.551
Degree of Saturation (%)	100.0

At Drained Failure

Failure Criteria: Max. Eff. Prin. Stress Ratio

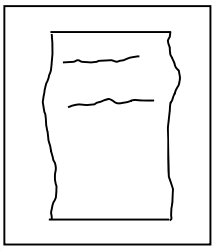
Axial Strain (%)	4.089
Deviator Stress (tsf)	2.059
Induced Pore Pressure (tsf)	0.938
Minor Effective Stress, σ_3' (tsf)	0.832
Major Effective Stress, σ_1' (tsf)	2.892
Eff. Principal Stress Ratio, σ_1'/σ_3'	3.475
p' (tsf)	1.862
q (tsf)	1.030

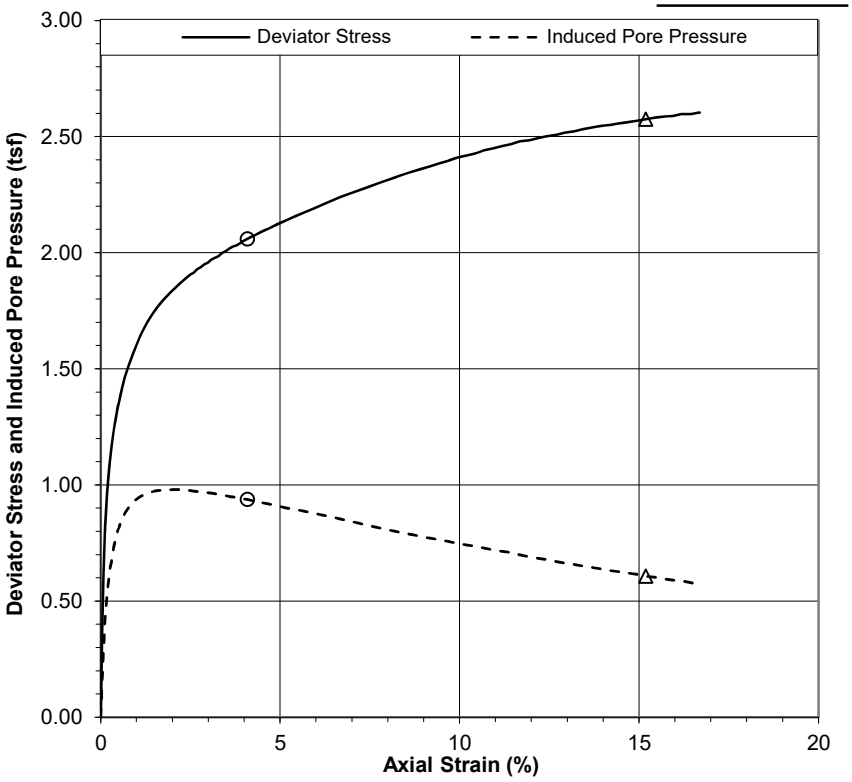
At Consolidated Undrained Failure

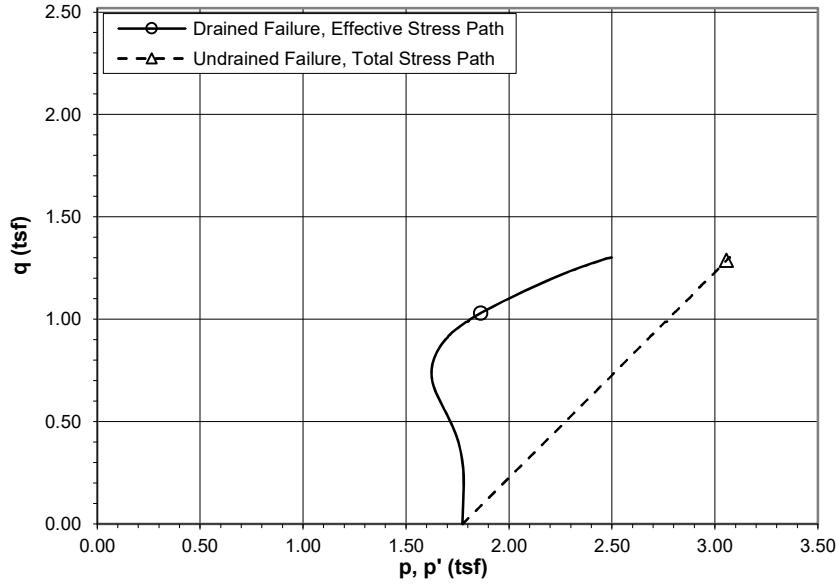
Failure Criterion: 15% Axial Strain

Axial Strain (%)	15.192
Deviator Stress (tsf)	2.574
Minor Principal Stress, σ_3 (tsf)	1.768
Major Principal Stress, σ_1 (tsf)	4.343
p (tsf)	3.055
q (tsf)	1.287

Failure Sketch







Comments

Reviewed KG

Stantec

Consolidated Undrained Triaxial Compression

ASTM D 4767

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 15.6'-16.2'
Description: Lean Clay with Sand (CL), brown, moist, firm

Project No.: 178568003
Lab ID: 1341B
Test ID: 1-C

Initial Specimen Conditions		Consolidated Specimen Conditions	
Height (in)	6.061	Height (in)	6.000
Diameter (in)	2.887	Calculated Diameter (in)	2.888
Area (in^2)	6.548	Calculated Area (in^2)	6.553
Moist Weight (lb)	2.888	Moist Weight (lb)	2.881
Moist Unit Weight (pcf)	125.7	Moist Unit Weight (pcf)	126.6
Moisture Content (%)	21.5	Moisture Content (%)	21.2
Dry Weight (lb)	2.377	Dry Weight (lb)	2.377
Dry Unit Weight (pcf)	103.5	Dry Unit Weight (pcf)	104.5
Void Ratio	0.565	Void Ratio	0.551
Degree of Saturation (%)	98.8	Degree of Saturation (%)	100.0

Specific Gravity: 2.60
ASTM D 854, Dry

Liquid Limit: 36
Plastic Limit: 19
Plasticity Index: 17
ASTM D 4318

Confining Stress
σ_3 (tsf): 1.774

Effective Consolidation Stress
σ_3' (tsf): 1.774

Moisture contents obtained using whole specimen.
Specimen consolidated cross-sectional area determined using method B.
Membrane corrections have been applied,where Em = 200 lbf/in and t = 0.012 in.
All other tests performed in association with this specimen are reported separately.

Project: 178568003			Source: 054B00009N-2, 15.6'-16.2'								Lab ID: 1341B		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in^2)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
0.0	0.0	0.000	0.00	6.553	0.000	0.000	4.706	0.000	1.774	1.774	1.774	1.774	1.774	0.000	1.000
1.1	14.9	0.001	0.02	6.554	0.163	0.163	4.785	0.079	1.938	1.859	1.696	1.856	1.777	0.082	1.096
2.3	31.9	0.003	0.04	6.556	0.351	0.351	4.875	0.168	2.124	1.956	1.605	1.949	1.781	0.175	1.218
3.4	47.9	0.004	0.07	6.557	0.526	0.526	4.965	0.259	2.299	2.041	1.515	2.036	1.778	0.263	1.347
4.5	60.9	0.006	0.10	6.559	0.669	0.669	5.045	0.339	2.443	2.104	1.435	2.108	1.769	0.334	1.466
5.7	71.0	0.007	0.12	6.560	0.780	0.779	5.112	0.406	2.553	2.147	1.367	2.163	1.757	0.390	1.570
6.8	78.9	0.008	0.14	6.562	0.865	0.865	5.169	0.463	2.639	2.176	1.311	2.206	1.743	0.433	1.660
7.9	84.9	0.010	0.17	6.564	0.931	0.931	5.216	0.509	2.705	2.195	1.264	2.239	1.730	0.465	1.736
9.0	90.2	0.012	0.20	6.566	0.989	0.988	5.257	0.550	2.762	2.212	1.223	2.268	1.718	0.494	1.808
10.2	94.8	0.013	0.22	6.567	1.039	1.038	5.294	0.587	2.812	2.225	1.187	2.293	1.706	0.519	1.875
11.3	98.5	0.015	0.24	6.569	1.080	1.080	5.324	0.617	2.853	2.236	1.156	2.313	1.696	0.540	1.934
12.4	102.1	0.016	0.27	6.570	1.118	1.118	5.353	0.647	2.891	2.244	1.126	2.332	1.685	0.559	1.993
13.6	105.2	0.018	0.30	6.572	1.152	1.151	5.377	0.671	2.925	2.254	1.102	2.349	1.678	0.576	2.044
14.7	108.0	0.019	0.32	6.574	1.183	1.182	5.400	0.694	2.955	2.261	1.079	2.364	1.670	0.591	2.095
15.8	110.4	0.021	0.34	6.575	1.209	1.208	5.420	0.714	2.981	2.267	1.059	2.377	1.663	0.604	2.141
16.9	112.8	0.022	0.36	6.577	1.235	1.234	5.440	0.734	3.007	2.274	1.040	2.390	1.657	0.617	2.187
18.1	115.0	0.023	0.39	6.578	1.258	1.257	5.457	0.751	3.031	2.280	1.023	2.402	1.651	0.629	2.229
19.2	116.9	0.025	0.42	6.580	1.279	1.278	5.473	0.766	3.051	2.285	1.007	2.412	1.646	0.639	2.269
20.3	119.0	0.027	0.44	6.582	1.301	1.300	5.487	0.781	3.073	2.292	0.992	2.423	1.642	0.650	2.311
21.4	120.8	0.027	0.46	6.583	1.321	1.320	5.500	0.794	3.093	2.298	0.978	2.433	1.638	0.660	2.350
22.6	122.5	0.029	0.48	6.584	1.340	1.338	5.513	0.807	3.111	2.304	0.966	2.442	1.635	0.669	2.386
23.7	124.1	0.031	0.51	6.586	1.357	1.356	5.525	0.818	3.129	2.311	0.955	2.451	1.633	0.678	2.419
24.9	125.7	0.032	0.53	6.588	1.374	1.373	5.535	0.829	3.146	2.317	0.944	2.459	1.630	0.686	2.454
26.0	127.3	0.033	0.56	6.589	1.391	1.390	5.545	0.839	3.162	2.323	0.933	2.467	1.628	0.695	2.489
27.1	128.8	0.035	0.58	6.591	1.407	1.406	5.555	0.849	3.179	2.330	0.924	2.476	1.627	0.703	2.521
28.2	130.4	0.036	0.60	6.593	1.424	1.422	5.564	0.858	3.195	2.337	0.915	2.484	1.626	0.711	2.555
29.3	131.8	0.038	0.63	6.594	1.439	1.438	5.572	0.866	3.210	2.344	0.906	2.491	1.625	0.719	2.586
30.5	133.0	0.039	0.66	6.596	1.452	1.451	5.580	0.874	3.223	2.349	0.899	2.498	1.624	0.725	2.614
31.6	134.3	0.040	0.67	6.597	1.465	1.464	5.586	0.880	3.236	2.356	0.892	2.504	1.624	0.732	2.640
36.1	139.0	0.047	0.78	6.604	1.515	1.513	5.611	0.905	3.286	2.381	0.867	2.529	1.624	0.757	2.744
40.6	143.2	0.053	0.88	6.611	1.560	1.558	5.630	0.923	3.330	2.406	0.848	2.551	1.627	0.779	2.836
45.2	147.1	0.059	0.98	6.618	1.600	1.598	5.644	0.938	3.370	2.432	0.834	2.571	1.633	0.799	2.916
49.7	150.7	0.065	1.08	6.625	1.638	1.635	5.655	0.949	3.407	2.458	0.823	2.589	1.640	0.817	2.987
54.2	153.7	0.071	1.18	6.631	1.669	1.666	5.664	0.957	3.437	2.479	0.814	2.604	1.647	0.833	3.047
58.7	156.7	0.077	1.29	6.638	1.699	1.696	5.670	0.964	3.467	2.503	0.807	2.619	1.655	0.848	3.102
63.2	159.3	0.083	1.39	6.645	1.726	1.722	5.675	0.969	3.493	2.524	0.802	2.632	1.663	0.861	3.148
67.7	161.6	0.089	1.49	6.652	1.749	1.745	5.680	0.973	3.516	2.543	0.797	2.643	1.670	0.873	3.188
72.2	163.7	0.095	1.59	6.658	1.770	1.766	5.682	0.976	3.537	2.561	0.795	2.654	1.678	0.883	3.223
76.7	165.8	0.101	1.69	6.665	1.791	1.787	5.684	0.977	3.557	2.579	0.792	2.663	1.686	0.893	3.255

Project: 178568003			Source: 054B00009N-2, 15.6'-16.2'								Lab ID: 1341B		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in^2)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
81.2	167.5	0.107	1.78	6.672	1.808	1.803	5.685	0.979	3.573	2.594	0.791	2.672	1.693	0.902	3.280
85.8	169.2	0.113	1.89	6.679	1.823	1.819	5.686	0.979	3.589	2.610	0.791	2.680	1.700	0.909	3.300
90.3	170.9	0.120	1.99	6.686	1.841	1.836	5.687	0.981	3.606	2.625	0.790	2.688	1.707	0.918	3.325
94.8	172.4	0.126	2.09	6.693	1.855	1.850	5.687	0.980	3.620	2.639	0.790	2.695	1.715	0.925	3.342
99.3	173.9	0.131	2.18	6.699	1.869	1.864	5.687	0.981	3.634	2.654	0.789	2.702	1.721	0.932	3.362
103.8	175.4	0.137	2.28	6.706	1.883	1.878	5.685	0.979	3.647	2.668	0.790	2.708	1.729	0.939	3.375
108.3	176.9	0.143	2.38	6.713	1.897	1.892	5.684	0.978	3.661	2.683	0.791	2.715	1.737	0.946	3.390
112.8	178.4	0.150	2.50	6.721	1.911	1.905	5.683	0.977	3.674	2.698	0.793	2.722	1.745	0.953	3.404
117.4	179.3	0.155	2.59	6.727	1.919	1.913	5.680	0.974	3.682	2.708	0.795	2.726	1.752	0.957	3.406
121.9	181.0	0.162	2.69	6.734	1.935	1.929	5.679	0.973	3.698	2.726	0.797	2.734	1.761	0.964	3.420
126.4	182.1	0.168	2.79	6.741	1.945	1.938	5.676	0.970	3.707	2.737	0.799	2.738	1.768	0.969	3.425
130.9	183.3	0.173	2.88	6.747	1.956	1.950	5.676	0.969	3.720	2.750	0.801	2.745	1.776	0.975	3.434
135.4	184.4	0.180	3.00	6.755	1.965	1.958	5.673	0.967	3.728	2.762	0.804	2.750	1.783	0.979	3.436
139.9	185.7	0.185	3.08	6.761	1.977	1.970	5.671	0.965	3.740	2.775	0.805	2.755	1.790	0.985	3.446
144.4	186.6	0.191	3.19	6.768	1.985	1.978	5.669	0.963	3.756	2.793	0.816	2.767	1.805	0.989	3.424
149.0	187.6	0.197	3.29	6.776	1.993	1.985	5.666	0.960	3.756	2.796	0.811	2.763	1.803	0.993	3.449
153.4	189.1	0.203	3.39	6.783	2.007	1.999	5.663	0.957	3.770	2.813	0.813	2.770	1.813	1.000	3.458
158.0	190.1	0.209	3.49	6.790	2.016	2.007	5.660	0.954	3.778	2.824	0.817	2.774	1.820	1.004	3.458
162.5	191.3	0.215	3.59	6.797	2.026	2.018	5.657	0.951	3.788	2.837	0.820	2.779	1.828	1.009	3.462
167.0	192.3	0.221	3.69	6.804	2.035	2.026	5.655	0.949	3.796	2.848	0.821	2.783	1.834	1.013	3.468
171.5	193.1	0.228	3.80	6.811	2.041	2.032	5.651	0.945	3.802	2.857	0.825	2.786	1.841	1.016	3.465
176.0	194.2	0.233	3.89	6.818	2.051	2.041	5.650	0.944	3.811	2.867	0.826	2.790	1.847	1.021	3.472
180.5	195.2	0.239	3.98	6.824	2.059	2.050	5.647	0.940	3.820	2.880	0.830	2.795	1.855	1.025	3.470
185.0	196.4	0.245	4.09	6.832	2.069	2.059	5.644	0.938	3.830	2.892	0.832	2.800	1.862	1.030	3.475
189.6	197.4	0.251	4.19	6.839	2.078	2.068	5.640	0.934	3.838	2.904	0.836	2.804	1.870	1.034	3.473
194.1	198.2	0.258	4.29	6.847	2.085	2.074	5.637	0.931	3.845	2.914	0.840	2.808	1.877	1.037	3.469
198.6	199.3	0.263	4.39	6.854	2.093	2.083	5.634	0.928	3.855	2.927	0.844	2.813	1.885	1.041	3.469
203.1	200.2	0.269	4.49	6.861	2.101	2.091	5.631	0.925	3.862	2.937	0.847	2.817	1.892	1.045	3.469
207.6	201.1	0.275	4.59	6.868	2.109	2.098	5.628	0.922	3.869	2.947	0.849	2.820	1.898	1.049	3.470
212.1	201.9	0.281	4.69	6.875	2.115	2.103	5.625	0.919	3.874	2.955	0.852	2.823	1.904	1.052	3.469
223.4	204.5	0.296	4.94	6.893	2.136	2.124	5.616	0.910	3.894	2.984	0.860	2.832	1.922	1.062	3.469
234.7	206.6	0.311	5.19	6.912	2.153	2.140	5.607	0.901	3.910	3.009	0.869	2.840	1.939	1.070	3.462
246.0	209.0	0.327	5.45	6.930	2.171	2.158	5.600	0.894	3.929	3.036	0.877	2.850	1.956	1.079	3.460
257.2	211.1	0.341	5.69	6.948	2.187	2.174	5.593	0.886	3.945	3.058	0.885	2.858	1.971	1.087	3.457
268.5	213.3	0.357	5.94	6.967	2.204	2.190	5.585	0.878	3.961	3.083	0.893	2.866	1.988	1.095	3.452
279.8	215.5	0.371	6.18	6.985	2.222	2.207	5.576	0.870	3.978	3.108	0.901	2.875	2.005	1.103	3.448
291.1	217.7	0.386	6.44	7.004	2.238	2.223	5.570	0.863	3.995	3.132	0.909	2.884	2.020	1.111	3.445
302.3	219.9	0.401	6.68	7.022	2.255	2.239	5.560	0.853	4.011	3.157	0.918	2.891	2.038	1.120	3.439
313.6	222.1	0.416	6.94	7.041	2.271	2.254	5.551	0.844	4.026	3.182	0.928	2.899	2.055	1.127	3.430
324.9	224.2	0.431	7.19	7.060	2.287	2.269	5.543	0.836	4.040	3.204	0.934	2.906	2.069	1.135	3.429
336.2	226.0	0.446	7.44	7.079	2.299	2.281	5.533	0.827	4.052	3.225	0.944	2.911	2.084	1.140	3.417
347.5	228.2	0.461	7.69	7.099	2.315	2.296	5.525	0.819	4.066	3.247	0.951	2.918	2.099	1.148	3.414
358.8	230.3	0.477	7.94	7.118	2.329	2.310	5.517	0.810	4.079	3.268	0.958	2.924	2.113	1.155	3.411
370.0	232.1	0.491	8.19	7.137	2.342	2.322	5.508	0.802	4.090	3.288	0.966	2.929	2.127	1.161	3.404
381.3	234.2	0.506	8.43	7.156	2.357	2.336	5.500	0.794	4.105	3.311	0.975	2.937	2.143	1.168	3.397
392.6	236.2	0.521	8.69	7.176	2.370	2.349	5.492	0.786	4.117	3.331	0.982	2.942	2.157	1.175	3.393
403.9	238.0	0.536	8.93	7.196	2.381	2.360	5.485	0.778	4.128	3.350	0.990	2.948	2.170	1.180	3.385
415.2	239.9	0.551	9.19	7.216	2.394	2.372	5.477	0.771	4.140	3.369	0.997	2.954	2.183	1.186	3.379
426.4	241.9	0.566	9.43	7.235	2.407	2.384	5.471	0.765	4.154	3.389	1.005	2.961	2.197	1.192	3.373
437.7	243.7	0.581	9.68	7.255	2.419	2.396	5.463	0.757	4.165	3.408	1.012	2.967	2.210	1.198	3.366
449.0	245.9	0.596	9.94	7.276	2.433	2.409	5.455	0.749	4.178	3.429	1.020	2.974	2.225	1.205	3.361
460.3	247.5	0.611	10.18	7.296	2.442	2.418	5.448	0.742	4.187	3.445	1.027	2.978	2.236	1.209	3.354
471.5	249.2	0.626	10.44	7.317	2.452	2.427	5.443	0.737	4.197	3.460	1.033	2.984	2.247	1.214	3.350
482.8	251.3	0.641	10.68	7.336	2.466	2.440	5.435	0.729	4.211	3.482	1.042	2.991	2.262	1.220	3.343
494.1	252.9	0.657	10.95	7.358	2.475	2.449	5.426	0.720	4.219	3.499	1.050	2.994	2.275	1.224	3.332
505.4	254.7	0.671	11.18	7.378	2.486	2.459	5.421	0.715	4.229	3.515	1.056	3.000	2.285	1.229	3.329
516.7	256.4	0.686	11.44	7.399	2.495	2.467	5.415	0.709	4.237	3.528	1.061	3.003	2.295	1.234	3.326
528.0	258.3	0.701	11.68	7.420	2.507	2.479	5.406	0.700	4.248	3.548	1.069	3.008	2.309	1.239	3.318
539.2	259.7	0.717	11.94	7.442	2.513	2.484	5.397	0.691	4.254	3.563	1.079	3.012	2.321	1.242	3.303
550.5	261.4	0.731	12.19	7.462	2.522	2.493	5.391	0.685	4.262	3.577	1.084	3.015	2.330	1.246	3.300
561.8	263.1	0.746	12.44	7.484	2.531	2.501	5.385	0.678	4.270	3.592	1.091	3.020	2.341	1.251	3.293
573.1	264.5	0.762	12.69	7.505	2.538	2.507	5.377	0.671	4.275	3.605	1.097	3.022	2.351	1.254	3.285
584.3	266.3	0.776	12.93	7.526	2.548	2.517	5.370	0.664	4.285	3.621	1.104	3.026	2.362	1.258	3.280
595.6	267.8	0.791	13.19	7.548	2.554	2.523	5.365	0.659	4.292	3.633	1.111	3.031	2.372	1.261	3.271
606.9	269.6	0.806	13.44	7.570	2.564	2.532	5.358	0.652	4.302	3.650	1.118	3.036	2.384	1.266	3.264
618.2	271.2	0.821	13.69	7.592	2.572	2.539	5.352	0.646	4.309	3.663	1.124	3.039	2.393	1.270	3.259
629.4	272.7	0.836	13.93	7.614	2.579	2.545	5.346	0.639	4.314	3.675	1.130	3.042	2.402	1.273	3.253
640.7	274.1	0.852	14.20	7.637	2.584	2.550	5.338	0.632	4.319	3.687	1.137	3.044	2.412	1.275	3.243
652.0	275.6	0.867	14.45	7.659	2.591	2.556	5.333	0.627	4.326	3.699	1.142	3.048	2.421	1.278	3.238

Project: 178568003			Source: 054B00009N-2, 15.6'-16.2'								Lab ID: 1341B		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in^2)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
663.3	277.1	0.882	14.69	7.681	2.598	2.562	5.327	0.620	4.331	3.711	1.148	3.050	2.429	1.281	3.232
674.6	278.6	0.897	14.95	7.704	2.603	2.568	5.321	0.615	4.337	3.722	1.154	3.053	2.438	1.284	3.225
685.9	280.2	0.912	15.19	7.727	2.611	2.574	5.314	0.608	4.343	3.735	1.160	3.055	2.448	1.287	3.218
697.1	281.8	0.927	15.45	7.750	2.618	2.581	5.309	0.603	4.350	3.747	1.166	3.059	2.457	1.290	3.213
708.4	283.2	0.941	15.69	7.772	2.623	2.586	5.303	0.597	4.354	3.758	1.172	3.061	2.465	1.293	3.207
719.7	284.4	0.957	15.95	7.796	2.627	2.589	5.297	0.591	4.357	3.766	1.177	3.063	2.472	1.294	3.199
731.0	286.1	0.971	16.18	7.818	2.635	2.596	5.295	0.588	4.365	3.777	1.181	3.067	2.479	1.298	3.199
742.3	287.2	0.987	16.44	7.842	2.637	2.597	5.286	0.580	4.367	3.787	1.190	3.068	2.488	1.299	3.183
753.5	288.8	1.001	16.69	7.865	2.644	2.604	5.278	0.572	4.373	3.801	1.197	3.071	2.499	1.302	3.176
753.6	288.7	1.001	16.69	7.865	2.642	2.603	5.277	0.570	4.370	3.800	1.198	3.069	2.499	1.301	3.173

Stantec

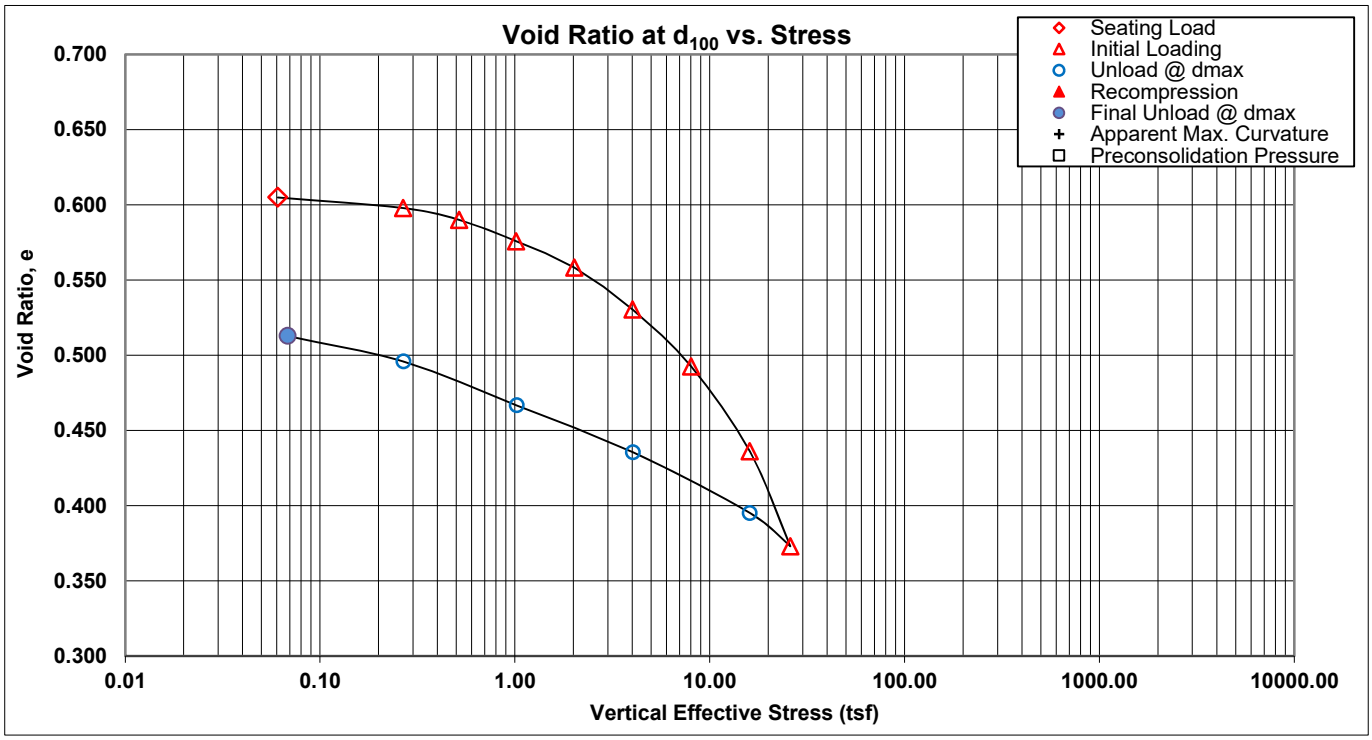
One Dimensional Consolidation of Soils Using Incremental Loading

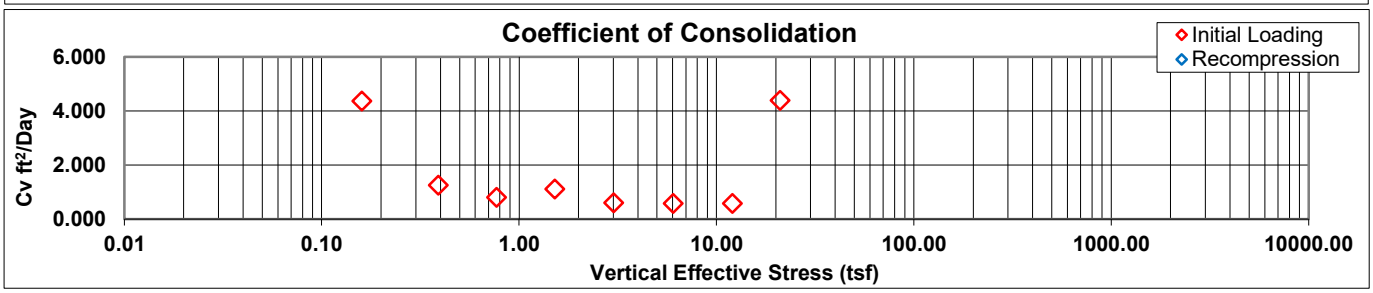
ASTM D 2435

Project Name	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-2, 16.2'-16.5'	Lab ID	1341
Description	Lean Clay with Sand (CL), brown and gray, moist, firm, Mn	Date Received	10/25/2021
Specimen Type	Undisturbed		

LL	36	Specific Gravity	2.7 ASTM D 854, Dry	Prepared	Using Cutting Ring
PL	19			Test Method	B - for 30 min.
PI	17			Test Condition	Inundated at 0.05 tsf

Initial Specimen Conditions		Final Specimen Conditions	
Moisture Content (%)	21.8	Moisture Content (%)	19.9
Dry Unit Weight (pcf)	104.8	Dry Unit Weight (pcf)	111.2
Void Ratio	0.605	Void Ratio	0.513
Degree of Saturation (%)	97.3	Degree of Saturation (%)	104.7
Initial Specimen Height (in)	1.0007	Final Specimen Height (in)	0.9433
Equivalent Height of Solids (in)	0.624	Preconsolidation Pressure* (tsf)	
		Void Ratio @ Preconsolidation Pressure	





Comments

Reviewed By KG

Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Project No.: 178568003
Source: 054B00009N-2, 16.2'-16.5'
Lab ID: 1341
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn
Date Received: 10/25/2021
Specimen Type: Undisturbed

Load Increment tsf σ_v	Specimen Height (in) @ d_0	Specimen Height (in) @ d_{100}	Void Ratio e @ d_{100}	Specimen Height (in) @ d_{max}	Void Ratio e @ d_{max}	Load At Cv tsf	Specimen Height (in) @ d_{50}	Fitting Time** (min) @ t_{50}	Fitting Time** (min) @ t_{90}	Cv ft^2/day
0.06	1.0007	----	----	----	----	----	----	----	----	----
0.27	0.9975	0.9963	0.598	0.9959	0.597	0.16	0.9969		0.5	4.362
0.52	0.9934	0.9914	0.590	0.9905	0.589	0.39	0.9924		1.7	1.255
1.02	0.9856	0.9825	0.576	0.9813	0.574	0.77	0.9841		2.6	0.802
2.02	0.9755	0.9716	0.558	0.9699	0.555	1.52	0.9736		1.8	1.103
4.02	0.9610	0.9542	0.530	0.9523	0.527	3.02	0.9576		3.2	0.600
8.04	0.9416	0.9306	0.492	0.9274	0.487	6.03	0.9361		3.2	0.573
16.06	0.9115	0.8954	0.436	0.8911	0.429	12.05	0.9035		3.0	0.572
25.93	0.8710	0.8561	0.373	0.8545	0.371	20.99	0.8635		0.4	4.391
16.07	0.8643			0.8699	0.395					
4.03	0.8786			0.8951	0.436					
1.02	0.8998			0.9145	0.467					
0.27	0.9179			0.9327	0.496					
0.07	0.9346			0.9433	0.513					

Testing Details:

Consolidation Press ID: CON-5
Trimming Ring ID: GS-86
Initial MC from Trimmings (%): 21.8
Final Differential Height (in): -0.015
Test Start Date: 11/01/2021
Technician: KG
Test End Date: 11/05/2021
Technician: KG

When available, all other tests performed in association with this specimen are reported separately.
* When presented, The preconsolidation pressure evaluated using the Casagrande Method, as per ASTM D 2435.
** Cv Computation Methods:

@ t_{50}, Cv calculated using Log Time Method.

@ t_{90}, Cv calculated using Square Root of Time Method.

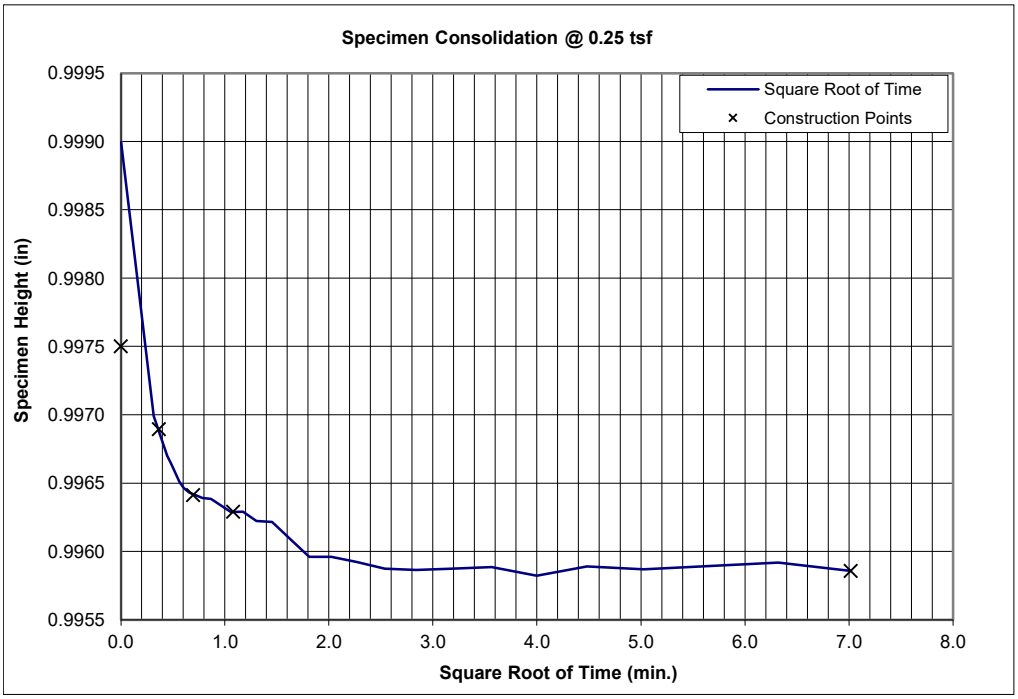
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	0.25
Actual Load (tsf)	0.27
Cycle	Load
Start Date	11/01/2021
Start Time	10:28
End Date	11/01/2021
End Time	11:18



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9975
@ t_{50}	0.1	0.9969
@ t_{90}	0.5	0.9964
@ t_{100}	1.2	0.9963
@ t_{max}	49.2	0.9959

Square Root of Time (min)	Spec. Height (in)
0.00	0.9990
0.32	0.9970
0.45	0.9967
0.48	0.9966
0.56	0.9965
0.61	0.9965
0.66	0.9964
0.79	0.9964
0.87	0.9964
0.96	0.9963
1.06	0.9963
1.18	0.9963
1.30	0.9962
1.45	0.9962
1.62	0.9961
1.81	0.9960
2.02	0.9960
2.27	0.9959
2.54	0.9959
2.84	0.9959
3.18	0.9959
3.57	0.9959
4.00	0.9958
4.48	0.9959
5.02	0.9959
5.6	0.9959
6.32	0.9959
7.02	0.9959

Comments

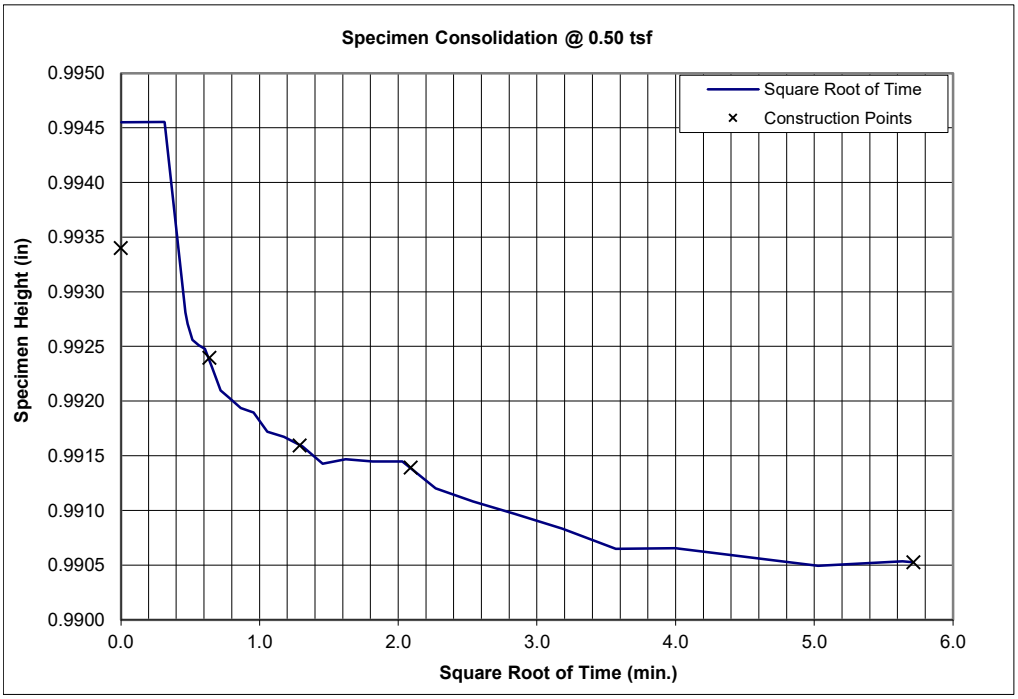
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	0.5
Actual Load (tsf)	0.52
Cycle	Load
Start Date	11/01/2021
Start Time	11:18
End Date	11/01/2021
End Time	11:50



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9934
@ t_{50}	0.4	0.9924
@ t_{90}	1.7	0.9916
@ t_{100}	4.4	0.9914
@ t_{max}	32.6	0.9905

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9945	5.03	0.9905				
0.32	0.9946	5.64	0.9905				
0.47	0.9928	5.71	0.9905				
0.48	0.9927						
0.52	0.9926						
0.56	0.9925						
0.61	0.9925						
0.66	0.9923						
0.72	0.9921						
0.79	0.9920						
0.87	0.9919						
0.96	0.9919						
1.06	0.9917						
1.18	0.9917						
1.31	0.9916						
1.45	0.9914						
1.62	0.9915						
1.82	0.9914						
2.03	0.9914						
2.27	0.9912						
2.54	0.9911						
2.84	0.9910						
3.18	0.9908						
3.57	0.9906						
4.00	0.9907						
4.5	0.9906						

Comments

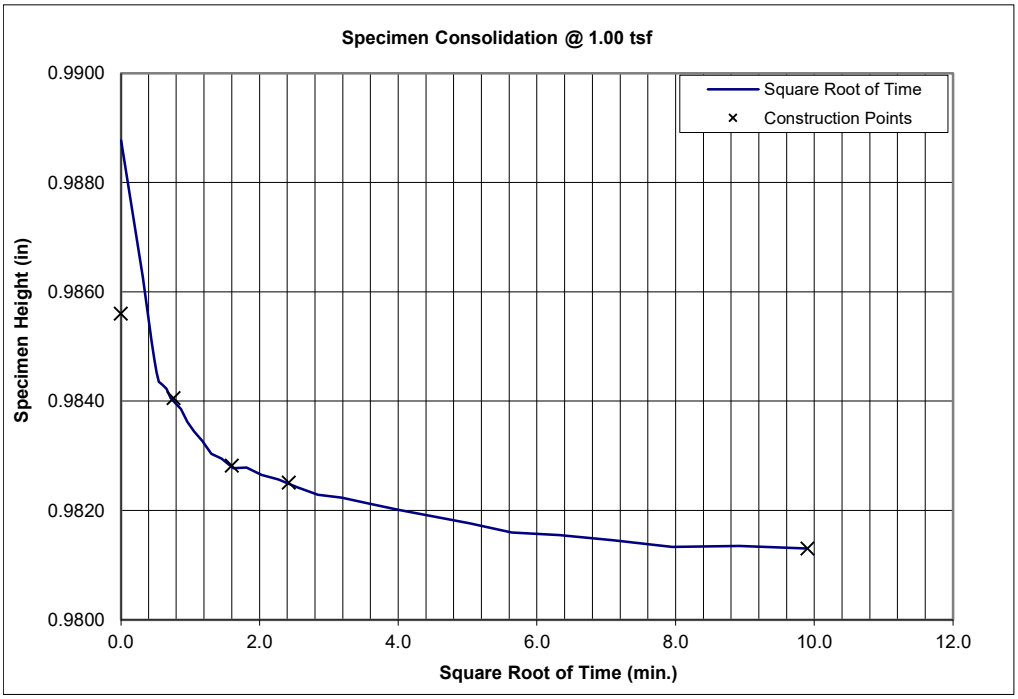
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	1
Actual Load (tsf)	1.02
Cycle	Load
Start Date	11/01/2021
Start Time	11:50
End Date	11/01/2021
End Time	13:28



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9856
@ t_{50}	0.6	0.9841
@ t_{90}	2.6	0.9828
@ t_{100}	5.9	0.9825
@ t_{max}	98.0	0.9813

Square Root of Time (min)	Spec. Height (in)
0.00	0.9888
0.32	0.9863
0.45	0.9851
0.48	0.9848
0.52	0.9845
0.55	0.9844
0.61	0.9843
0.66	0.9842
0.72	0.9841
0.79	0.9840
0.87	0.9839
0.96	0.9836
1.06	0.9834
1.18	0.9833
1.30	0.9830
1.45	0.9829
1.62	0.9828
1.81	0.9828
2.03	0.9826
2.27	0.9826
2.54	0.9824
2.84	0.9823
3.18	0.9822
3.57	0.9821
4.00	0.9820
4.5	0.9819

Square Root of Time (min)	Spec. Height (in)
5.02	0.9818
5.64	0.9816
6.32	0.9816
7.09	0.9815
7.95	0.9813
8.92	0.9813
9.90	0.9813

Square Root of Time (min)	Spec. Height (in)

Square Root of Time (min)	Spec. Height (in)

Comments

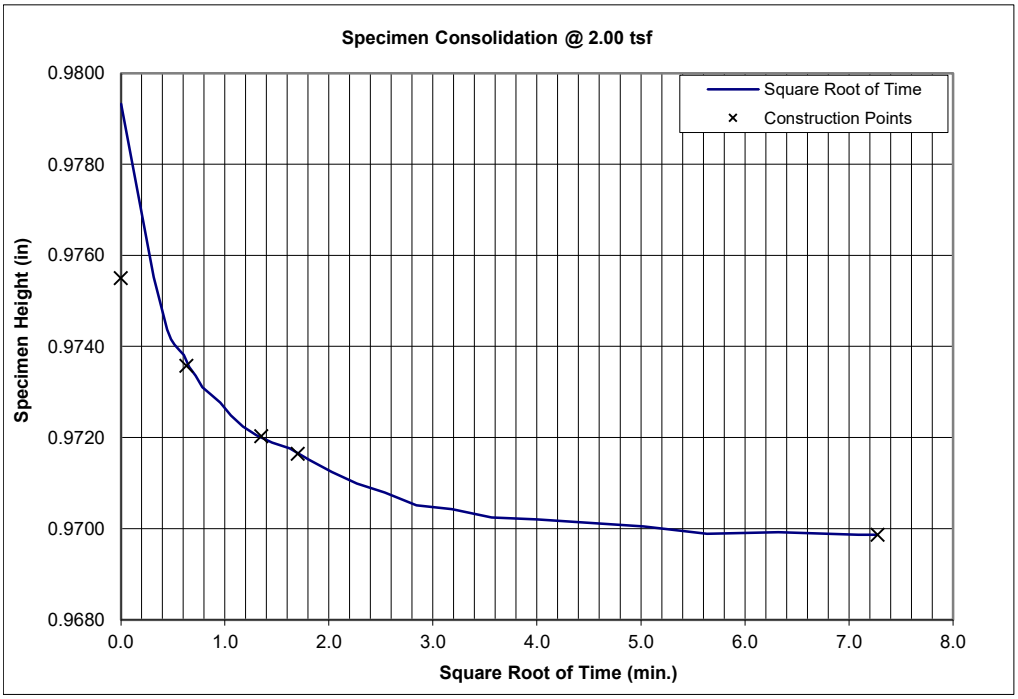
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	2
Actual Load (tsf)	2.02
Cycle	Load
Start Date	11/01/2021
Start Time	13:28
End Date	11/01/2021
End Time	14:21



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9755
@ t_{50}	0.4	0.9736
@ t_{90}	1.8	0.9720
@ t_{100}	2.9	0.9716
@ t_{max}	52.9	0.9699

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9793	5.02	0.9700				
0.32	0.9755	5.64	0.9699				
0.45	0.9744	6.32	0.9699				
0.48	0.9742	7.09	0.9699				
0.52	0.9740	7.28	0.9699				
0.56	0.9739						
0.61	0.9738						
0.66	0.9736						
0.72	0.9734						
0.79	0.9731						
0.87	0.9729						
0.96	0.9728						
1.06	0.9725						
1.18	0.9722						
1.30	0.9721						
1.45	0.9719						
1.62	0.9718						
1.81	0.9715						
2.03	0.9712						
2.27	0.9710						
2.54	0.9708						
2.84	0.9705						
3.18	0.9704						
3.57	0.9702						
4.00	0.9702						
4.5	0.9701						

Comments

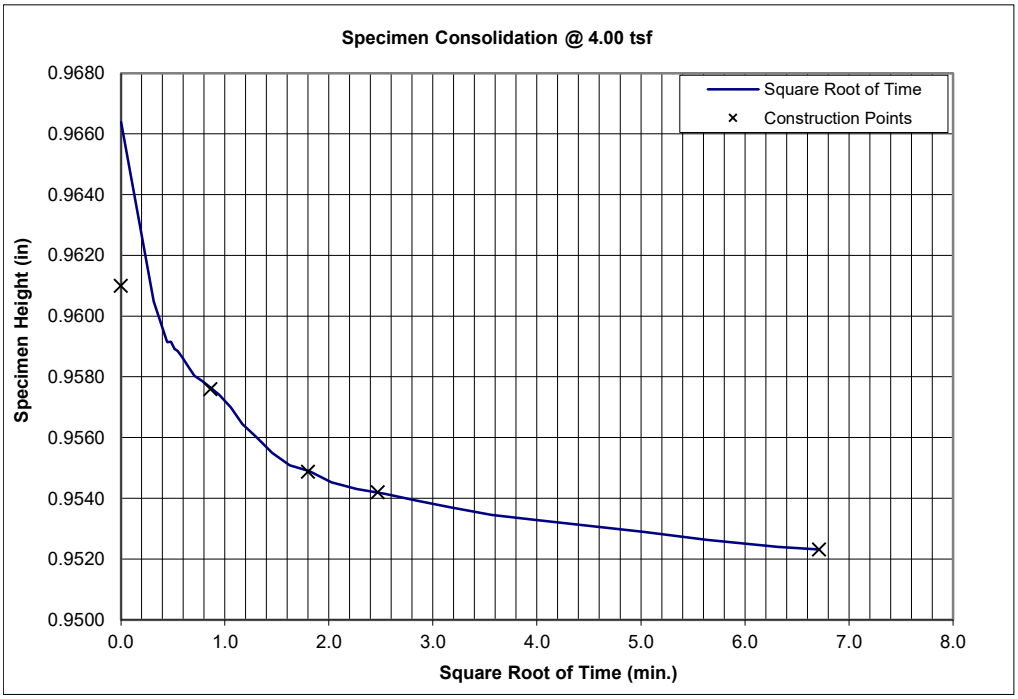
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	4
Actual Load (tsf)	4.02
Cycle	Load
Start Date	11/01/2021
Start Time	14:21
End Date	11/01/2021
End Time	15:06



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9610
@ t_{50}	0.7	0.9576
@ t_{90}	3.2	0.9549
@ t_{100}	6.1	0.9542
@ t_{max}	45.1	0.9523

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9664	5.02	0.9529				
0.32	0.9605	5.63	0.9526				
0.45	0.9591	6.32	0.9524				
0.48	0.9592	6.71	0.9523				
0.52	0.9589						
0.55	0.9588						
0.59	0.9586						
0.65	0.9584						
0.71	0.9580						
0.79	0.9579						
0.86	0.9577						
0.95	0.9574						
1.06	0.9570						
1.17	0.9564						
1.30	0.9560						
1.45	0.9555						
1.62	0.9551						
1.81	0.9549						
2.02	0.9545						
2.27	0.9543						
2.54	0.9541						
2.84	0.9539						
3.18	0.9537						
3.57	0.9535						
4.00	0.9533						
4.5	0.9530						

Comments

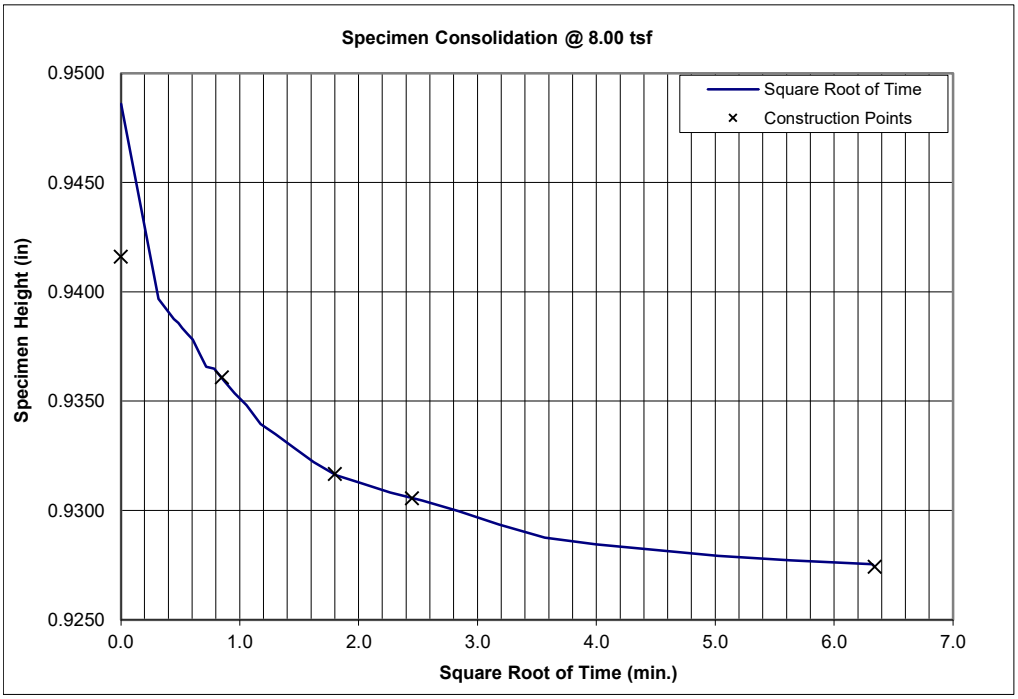
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	8
Actual Load (tsf)	8.04
Cycle	Load
Start Date	11/01/2021
Start Time	15:06
End Date	11/01/2021
End Time	15:46



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9416
@ t_{50}	0.7	0.9361
@ t_{90}	3.2	0.9317
@ t_{100}	6.0	0.9306
@ t_{max}	40.2	0.9274

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9486	5.02	0.9279				
0.32	0.9397	5.63	0.9277				
0.45	0.9388	6.32	0.9275				
0.48	0.9386	6.34	0.9274				
0.52	0.9383						
0.56	0.9381						
0.61	0.9378						
0.66	0.9372						
0.72	0.9366						
0.79	0.9365						
0.87	0.9359						
0.96	0.9354						
1.06	0.9348						
1.18	0.9339						
1.30	0.9335						
1.45	0.9329						
1.62	0.9322						
1.81	0.9316						
2.02	0.9312						
2.27	0.9308						
2.54	0.9304						
2.84	0.9300						
3.18	0.9294						
3.57	0.9287						
4.00	0.9285						
4.5	0.9282						

Comments

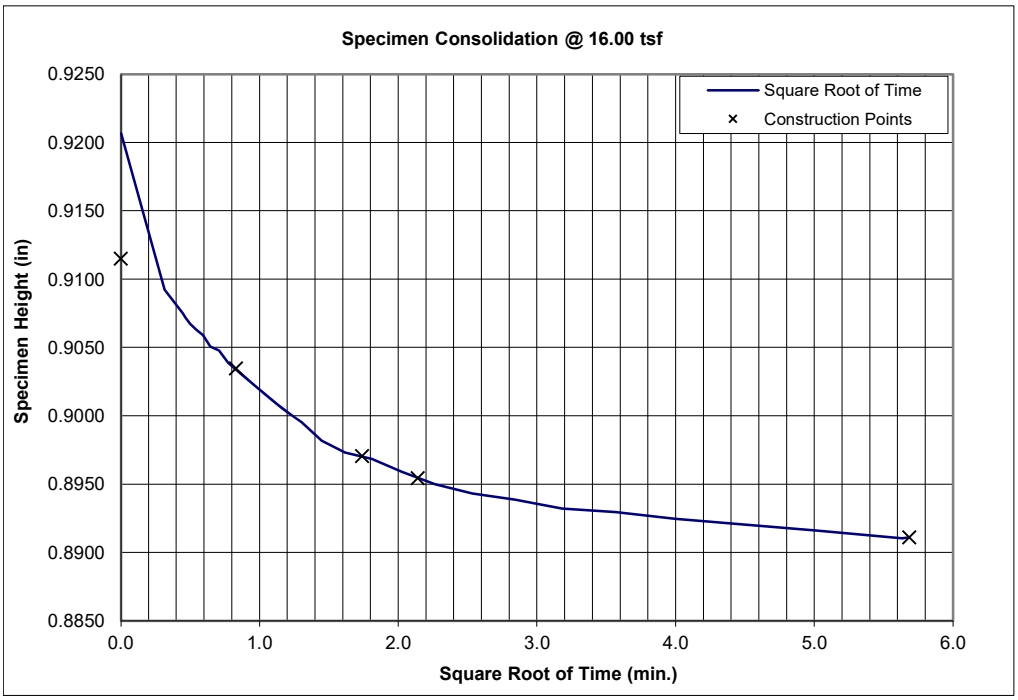
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	16
Actual Load (tsf)	16.06
Cycle	Load
Start Date	11/01/2021
Start Time	15:46
End Date	11/01/2021
End Time	16:19



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9115
@ t_{50}	0.7	0.9035
@ t_{90}	3.0	0.8970
@ t_{100}	4.6	0.8954
@ t_{max}	32.3	0.8911

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9207	5.02	0.8916				
0.32	0.9092	5.63	0.8910				
0.45	0.9075	5.68	0.8911				
0.47	0.9072						
0.50	0.9067						
0.55	0.9063						
0.59	0.9059						
0.65	0.9051						
0.71	0.9048						
0.77	0.9039						
0.86	0.9032						
0.95	0.9023						
1.06	0.9015						
1.17	0.9005						
1.30	0.8995						
1.45	0.8982						
1.62	0.8973						
1.81	0.8968						
2.02	0.8959						
2.27	0.8950						
2.54	0.8943						
2.84	0.8939						
3.18	0.8932						
3.57	0.8929						
4.00	0.8925						
4.5	0.8920						

Comments

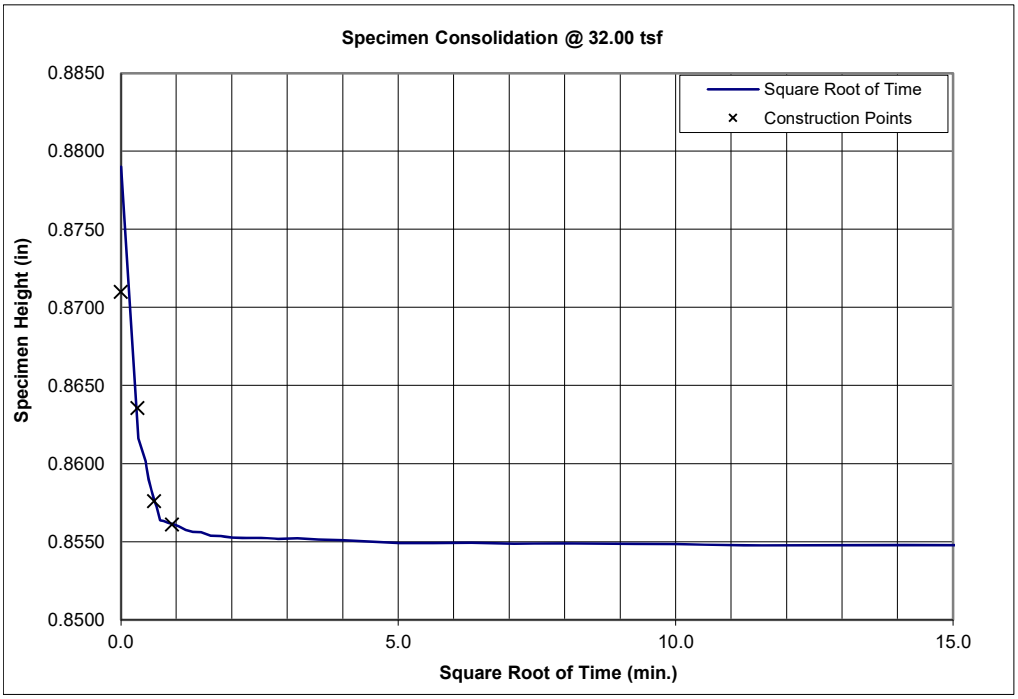
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	32
Actual Load (tsf)	25.93
Cycle	Load
Start Date	11/01/2021
Start Time	16:19
End Date	11/02/2021
End Time	8:06



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8710
@ t_{50}	0.1	0.8635
@ t_{90}	0.4	0.8576
@ t_{100}	0.8	0.8561
@ t_{max}	947.7	0.8545

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8790	5.02	0.8549				
0.32	0.8616	5.63	0.8549				
0.45	0.8601	6.32	0.8549				
0.47	0.8597	7.09	0.8549				
0.50	0.8590	7.95	0.8549				
0.55	0.8584	8.92	0.8549				
0.59	0.8577	10.01	0.8548				
0.65	0.8572	11.23	0.8548				
0.71	0.8564	12.59	0.8548				
0.77	0.8563	14.13	0.8548				
0.86	0.8562	15.85	0.8548				
0.95	0.8561	17.79	0.8548				
1.05	0.8560	19.96	0.8548				
1.17	0.8558	22.39	0.8548				
1.30	0.8556	25.12	0.8545				
1.45	0.8556	28.19	0.8545				
1.62	0.8554	30.78	0.8545				
1.81	0.8554						
2.02	0.8553						
2.26	0.8552						
2.53	0.8552						
2.84	0.8552						
3.18	0.8552						
3.56	0.8551						
4.00	0.8551						
4.5	0.8551						

Comments

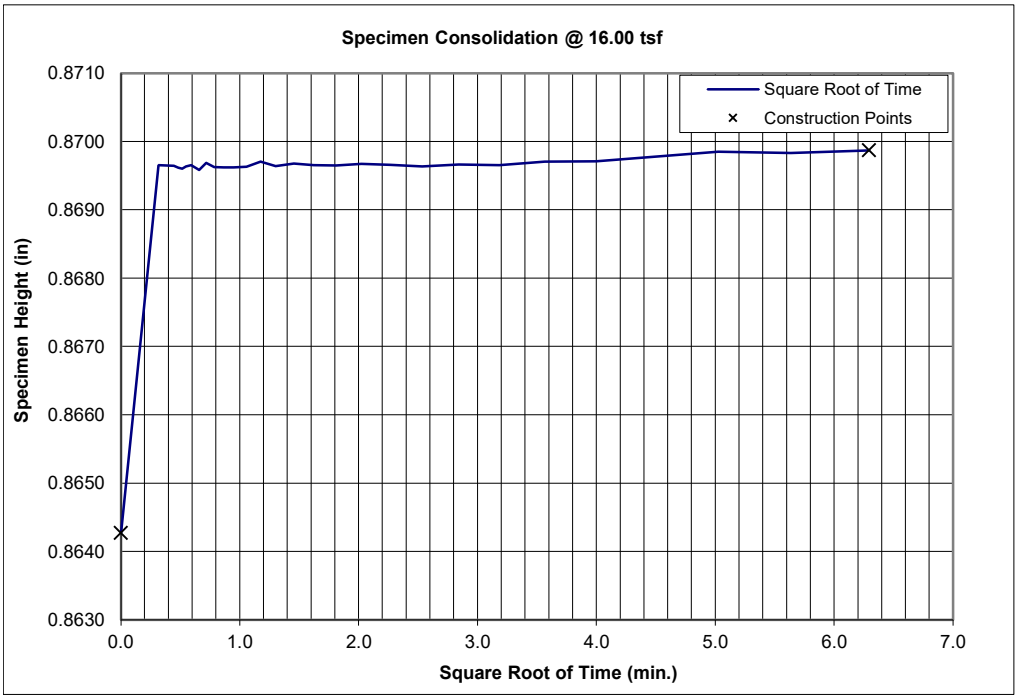
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	16
Actual Load (tsf)	16.07
Cycle	Unload
Start Date	11/02/2021
Start Time	8:06
End Date	11/02/2021
End Time	8:46



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8643
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	39.6	0.8699

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8643	5.02	0.8699				
0.32	0.8697	5.64	0.8698				
0.45	0.8696	6.29	0.8699				
0.48	0.8696						
0.52	0.8696						
0.55	0.8696						
0.59	0.8697						
0.66	0.8696						
0.72	0.8697						
0.79	0.8696						
0.87	0.8696						
0.95	0.8696						
1.06	0.8696						
1.18	0.8697						
1.30	0.8696						
1.45	0.8697						
1.62	0.8697						
1.81	0.8696						
2.02	0.8697						
2.27	0.8697						
2.54	0.8696						
2.84	0.8697						
3.18	0.8697						
3.57	0.8697						
4.00	0.8697						
4.5	0.8697						

Comments

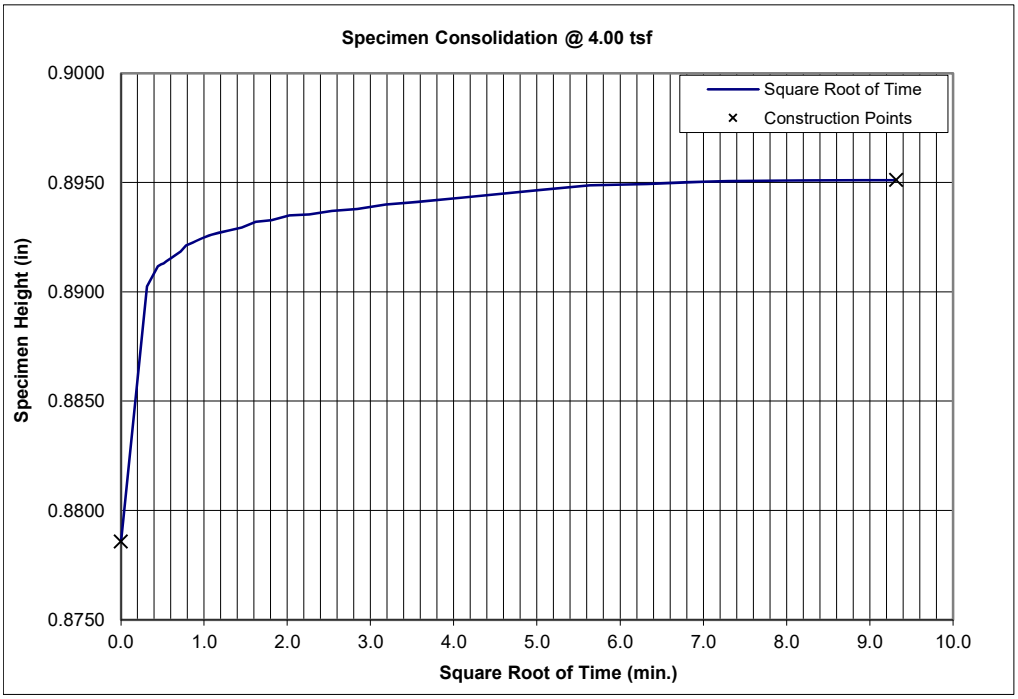
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	4
Actual Load (tsf)	4.03
Cycle	Unload
Start Date	11/02/2021
Start Time	8:46
End Date	11/02/2021
End Time	10:13



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8786
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	86.8	0.8951

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8786	5.02	0.8947				
0.32	0.8902	5.64	0.8949				
0.45	0.8912	6.32	0.8949				
0.48	0.8913	7.09	0.8950				
0.52	0.8913	7.95	0.8951				
0.55	0.8914	8.92	0.8951				
0.61	0.8915	9.32	0.8951				
0.66	0.8917						
0.72	0.8918						
0.79	0.8921						
0.87	0.8922						
0.96	0.8924						
1.06	0.8926						
1.18	0.8927						
1.30	0.8928						
1.45	0.8929						
1.62	0.8932						
1.81	0.8933						
2.02	0.8935						
2.27	0.8935						
2.54	0.8937						
2.84	0.8938						
3.18	0.8940						
3.57	0.8941						
4.00	0.8943						
4.5	0.8944						

Comments

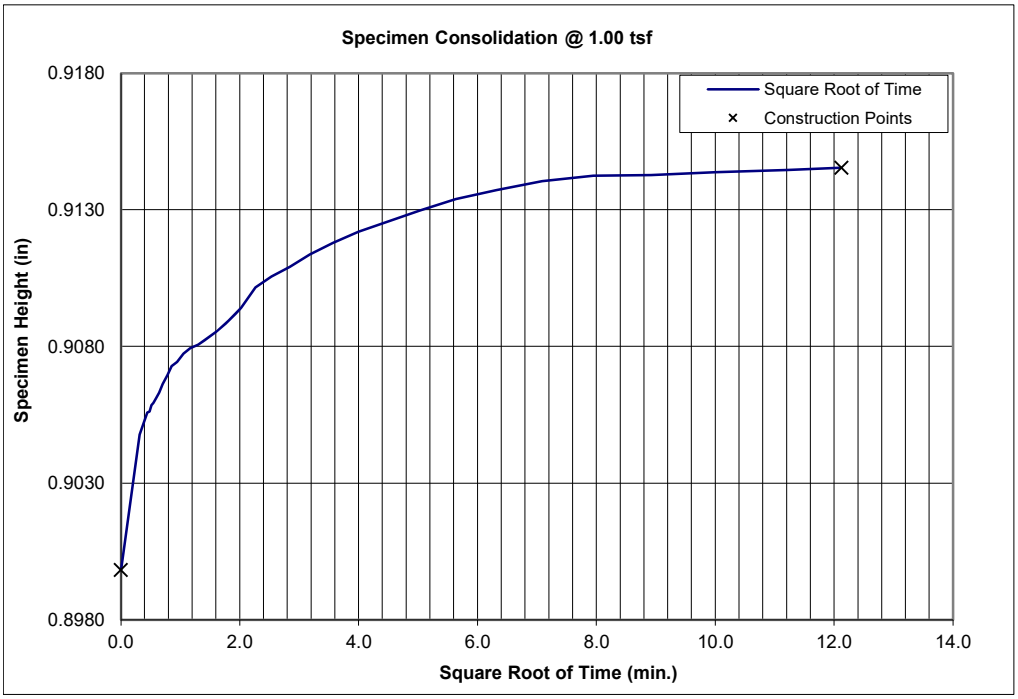
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	1
Actual Load (tsf)	1.02
Cycle	Unload
Start Date	11/02/2021
Start Time	10:13
End Date	11/02/2021
End Time	12:40



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8998
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	146.9	0.9145

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8998	5.02	0.9130				
0.32	0.9048	5.63	0.9134				
0.45	0.9056	6.32	0.9137				
0.48	0.9056	7.09	0.9141				
0.52	0.9059	7.95	0.9142				
0.55	0.9059	8.92	0.9143				
0.59	0.9061	10.01	0.9144				
0.65	0.9063	11.23	0.9145				
0.71	0.9066	12.12	0.9145				
0.79	0.9070						
0.86	0.9073						
0.95	0.9074						
1.06	0.9077						
1.17	0.9079						
1.30	0.9081						
1.45	0.9083						
1.62	0.9086						
1.81	0.9089						
2.02	0.9094						
2.27	0.9102						
2.54	0.9106						
2.84	0.9109						
3.18	0.9114						
3.57	0.9118						
4.00	0.9122						
4.5	0.9127						

Comments

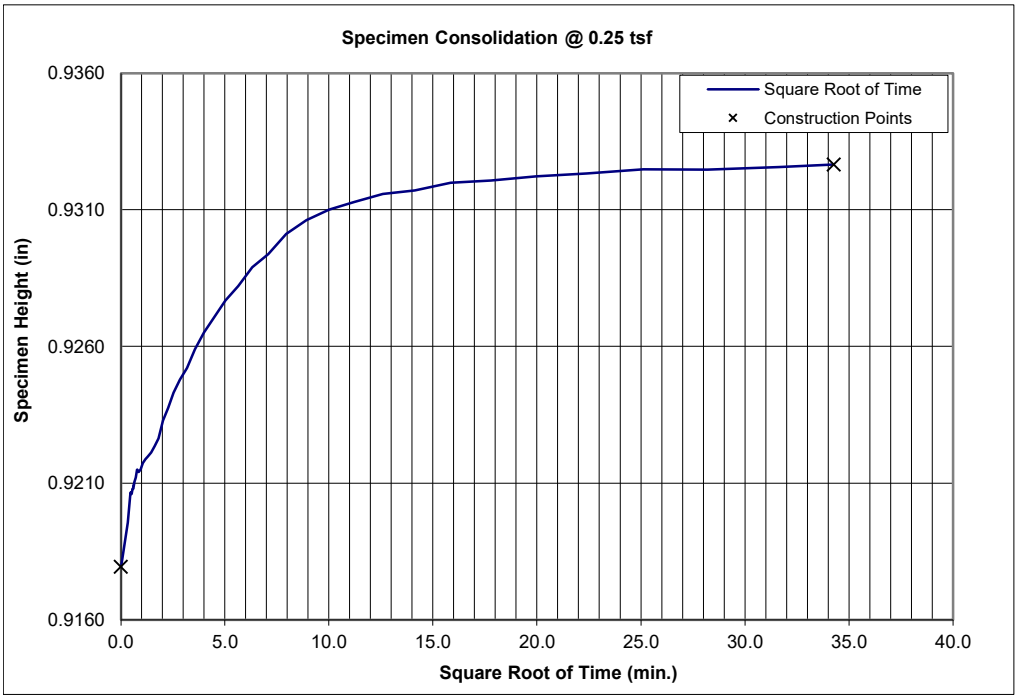
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	0.25
Actual Load (tsf)	0.27
Cycle	Unload
Start Date	11/02/2021
Start Time	12:40
End Date	11/03/2021
End Time	8:14



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9179
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	1174.0	0.9327

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9179	5.03	0.9277				
0.34	0.9196	5.64	0.9282				
0.47	0.9206	6.32	0.9289				
0.48	0.9207	7.09	0.9294				
0.52	0.9206	7.95	0.9301				
0.56	0.9208	8.92	0.9306				
0.61	0.9208	10.01	0.9310				
0.66	0.9210	11.23	0.9313				
0.72	0.9212	12.60	0.9316				
0.79	0.9215	14.13	0.9317				
0.87	0.9214	15.85	0.9320				
0.96	0.9215	17.79	0.9321				
1.06	0.9217	19.96	0.9322				
1.18	0.9219	22.39	0.9323				
1.31	0.9220	25.12	0.9325				
1.45	0.9221	28.19	0.9325				
1.63	0.9224	31.63	0.9326				
1.82	0.9226	34.26	0.9327				
2.03	0.9233						
2.27	0.9238						
2.54	0.9243						
2.84	0.9248						
3.18	0.9252						
3.57	0.9259						
4.00	0.9265						
4.5	0.9271						

Comments

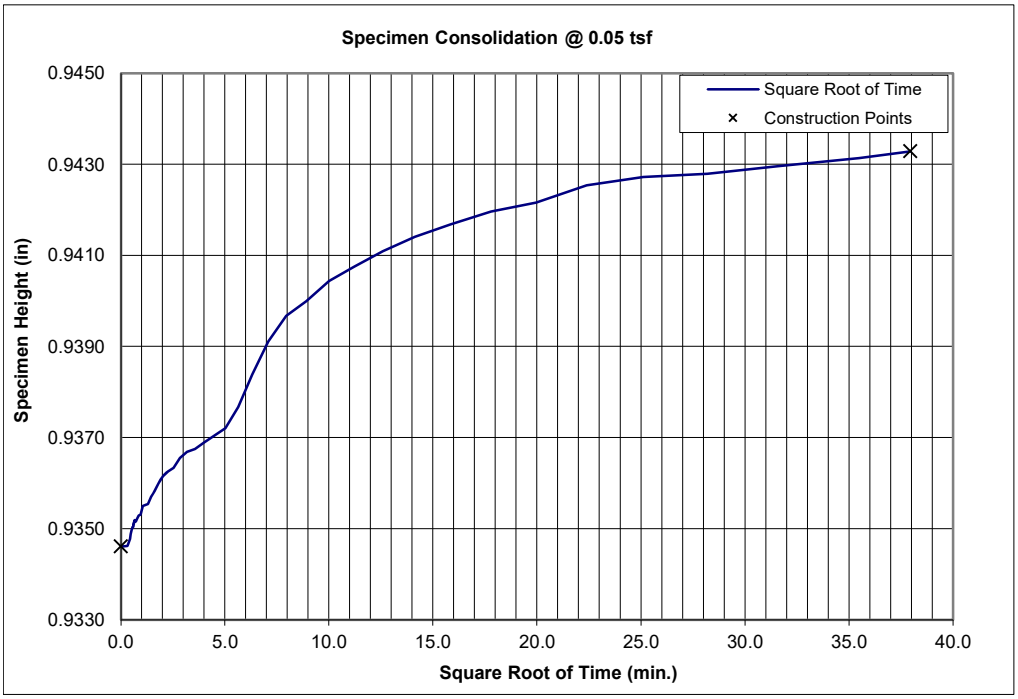
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 16.2'-16.5'
Description: Lean Clay with Sand (CL), brown and gray, moist, firm, Mn

Project No.	178568003
Lab ID	1341
Nominal Load (tsf)	0.05
Actual Load (tsf)	0.07
Cycle	Final
Start Date	11/03/2021
Start Time	8:14
End Date	11/04/2021
End Time	8:14



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9346
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	1440.1	0.9433

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9346	5.02	0.9372				
0.32	0.9346	5.64	0.9377				
0.45	0.9348	6.32	0.9384				
0.48	0.9349	7.09	0.9391				
0.52	0.9350	7.95	0.9397				
0.56	0.9350	8.92	0.9400				
0.61	0.9350	10.01	0.9404				
0.66	0.9352	11.23	0.9408				
0.72	0.9352	12.59	0.9411				
0.79	0.9352	14.13	0.9414				
0.87	0.9353	15.85	0.9417				
0.96	0.9353	17.79	0.9420				
1.06	0.9355	19.96	0.9422				
1.18	0.9355	22.39	0.9425				
1.31	0.9355	25.12	0.9427				
1.45	0.9357	28.19	0.9428				
1.62	0.9358	31.63	0.9430				
1.81	0.9360	35.48	0.9431				
2.03	0.9362	37.95	0.9433				
2.27	0.9363						
2.54	0.9363						
2.84	0.9366						
3.18	0.9367						
3.57	0.9368						
4.00	0.9369						
4.5	0.9370						

Comments

Stantec

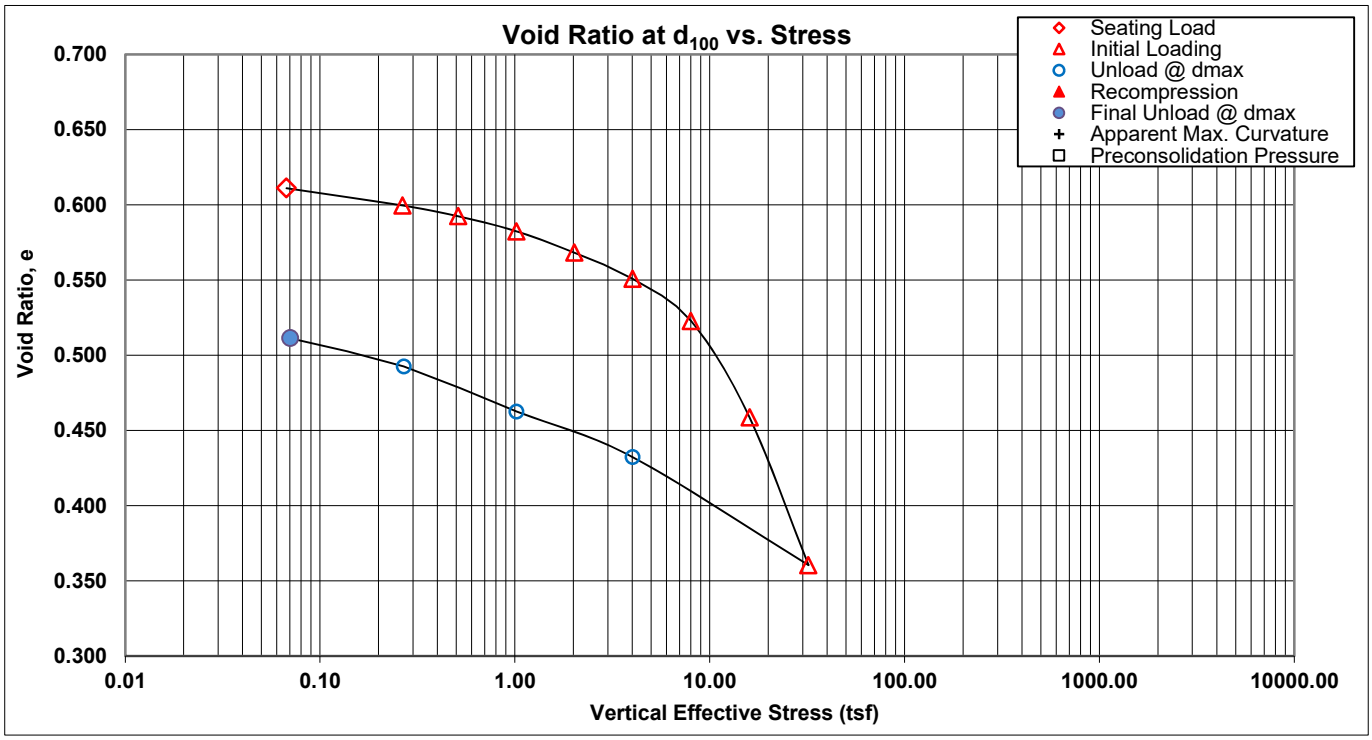
One Dimensional Consolidation of Soils Using Incremental Loading

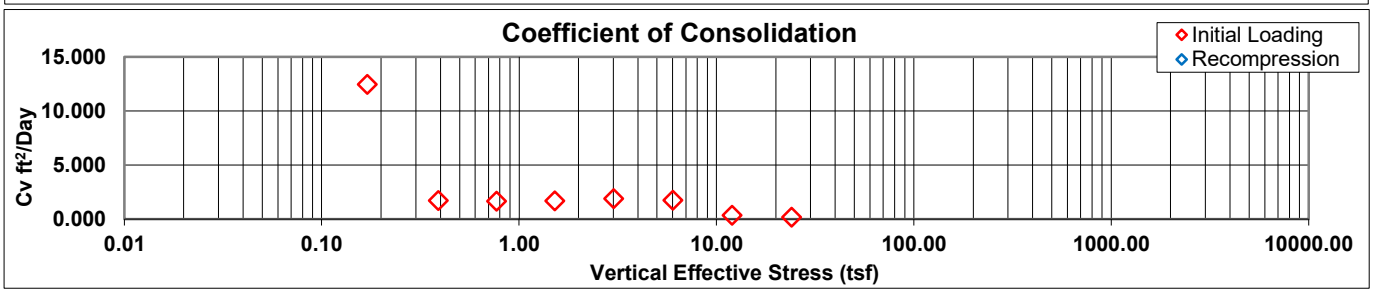
ASTM D 2435

Project Name	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-2, 26.4'-26.7'	Lab ID	1342
Description	Lean Clay (CL), brown, moist, firm, Mn	Date Received	10/25/2021
Specimen Type	Undisturbed		

LL	36	Specific Gravity	2.69 ASTM D 854, Dry	Prepared	Using Cutting Ring
PL	18			Test Method	B - for 30 min.
PI	18			Test Condition	Inundated at 0.05 tsf

Initial Specimen Conditions		Final Specimen Conditions	
Moisture Content (%)	22.6	Moisture Content (%)	20.5
Dry Unit Weight (pcf)	104.0	Dry Unit Weight (pcf)	110.9
Void Ratio	0.611	Void Ratio	0.511
Degree of Saturation (%)	99.6	Degree of Saturation (%)	107.8
Initial Specimen Height (in)	0.9984	Final Specimen Height (in)	0.9365
Equivalent Height of Solids (in)	0.620	Preconsolidation Pressure* (tsf)	
		Void Ratio @ Preconsolidation Pressure	





Comments

Reviewed By KG

Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Project No.: 178568003
Source: 054B00009N-2, 26.4'-26.7'
Lab ID: 1342
Description: Lean Clay (CL), brown, moist, firm, Mn
Date Received: 10/25/2021
Specimen Type: Undisturbed

Load Increment tsf σ_v	Specimen Height (in) @ d_0	Specimen Height (in) @ d_{100}	Void Ratio e @ d_{100}	Specimen Height (in) @ d_{max}	Void Ratio e @ d_{max}	Load At Cv tsf	Specimen Height (in) @ d_{50}	Fitting Time** (min) @ t_{50}	Fitting Time** (min) @ t_{90}	Cv ft^2/day
0.07	0.9984	----	----	----	----	----	----	----	----	----
0.27	0.9945	0.9912	0.599	0.9910	0.599	0.17	0.9928		0.2	12.431
0.51	0.9875	0.9868	0.592	0.9863	0.592	0.39	0.9871		1.2	1.707
1.02	0.9821	0.9805	0.582	0.9796	0.581	0.77	0.9813		1.3	1.627
2.02	0.9742	0.9717	0.568	0.9708	0.567	1.52	0.9730		1.2	1.659
4.02	0.9640	0.9610	0.551	0.9597	0.549	3.02	0.9625		1.0	1.888
8.01	0.9500	0.9436	0.523	0.9393	0.516	6.01	0.9468		1.1	1.724
16.02	0.9250	0.9039	0.459	0.9008	0.454	12.01	0.9144		5.4	0.329
32.07	0.8720	0.8430	0.360	0.8365	0.350	24.04	0.8575		9.0	0.173
4.03	0.8705			0.8875	0.432					
1.02	0.8922			0.9063	0.463					
0.27	0.9087			0.9249	0.493					
0.07	0.9269			0.9365	0.511					

Testing Details:

Consolidation Press ID: CON-6
Trimming Ring ID: GS-82
Initial MC from Trimmings (%): 22.3
Final Differential Height (in): -0.022
Test Start Date: 11/01/2021
Technician: KG
Test End Date: 11/05/2021
Technician: KG

When available, all other tests performed in association with this specimen are reported separately.
* When presented, The preconsolidation pressure evaluated using the Casagrande Method, as per ASTM D 2435.
** Cv Computation Methods:

@ t_{50}, Cv calculated using Log Time Method.

@ t_{90}, Cv calculated using Square Root of Time Method.

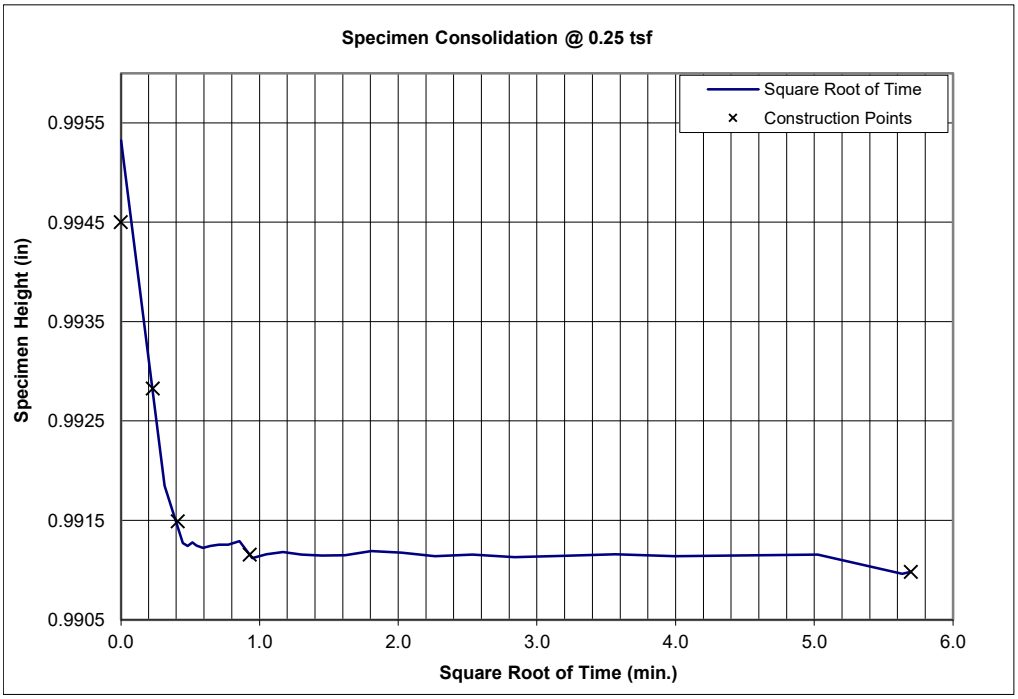
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	0.25
Actual Load (tsf)	0.27
Cycle	Load
Start Date	11/01/2021
Start Time	11:17
End Date	11/01/2021
End Time	11:50



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9945
@ t_{50}	0.1	0.9928
@ t_{90}	0.2	0.9915
@ t_{100}	0.9	0.9912
@ t_{max}	32.4	0.9910

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9953	5.02	0.9912				
0.32	0.9918	5.63	0.9910				
0.45	0.9913	5.70	0.9910				
0.48	0.9912						
0.52	0.9913						
0.55	0.9912						
0.59	0.9912						
0.65	0.9912						
0.71	0.9913						
0.77	0.9913						
0.86	0.9913						
0.95	0.9911						
1.05	0.9912						
1.17	0.9912						
1.30	0.9912						
1.45	0.9911						
1.62	0.9912						
1.81	0.9912						
2.02	0.9912						
2.27	0.9911						
2.54	0.9912						
2.84	0.9911						
3.18	0.9911						
3.56	0.9912						
4.00	0.9911						
4.5	0.9911						

Comments

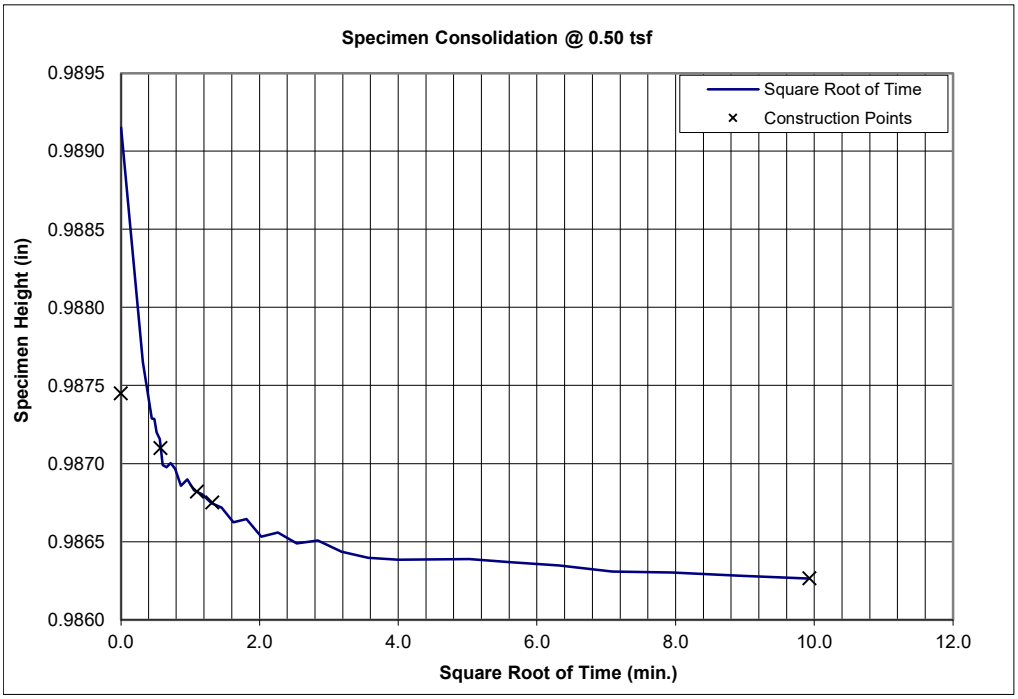
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	0.5
Actual Load (tsf)	0.51
Cycle	Load
Start Date	11/01/2021
Start Time	11:50
End Date	11/01/2021
End Time	13:28



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9875
@ t_{50}	0.3	0.9871
@ t_{90}	1.2	0.9868
@ t_{100}	1.7	0.9868
@ t_{max}	98.6	0.9863

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9892	5.02	0.9864				
0.32	0.9877	5.63	0.9864				
0.45	0.9873	6.32	0.9863				
0.48	0.9873	7.09	0.9863				
0.52	0.9872	7.95	0.9863				
0.56	0.9872	8.92	0.9863				
0.61	0.9870	9.93	0.9863				
0.66	0.9870						
0.72	0.9870						
0.79	0.9870						
0.87	0.9869						
0.96	0.9869						
1.06	0.9868						
1.18	0.9868						
1.30	0.9867						
1.45	0.9867						
1.62	0.9866						
1.81	0.9866						
2.02	0.9865						
2.27	0.9866						
2.54	0.9865						
2.84	0.9865						
3.18	0.9864						
3.57	0.9864						
4.00	0.9864						
4.5	0.9864						

Comments

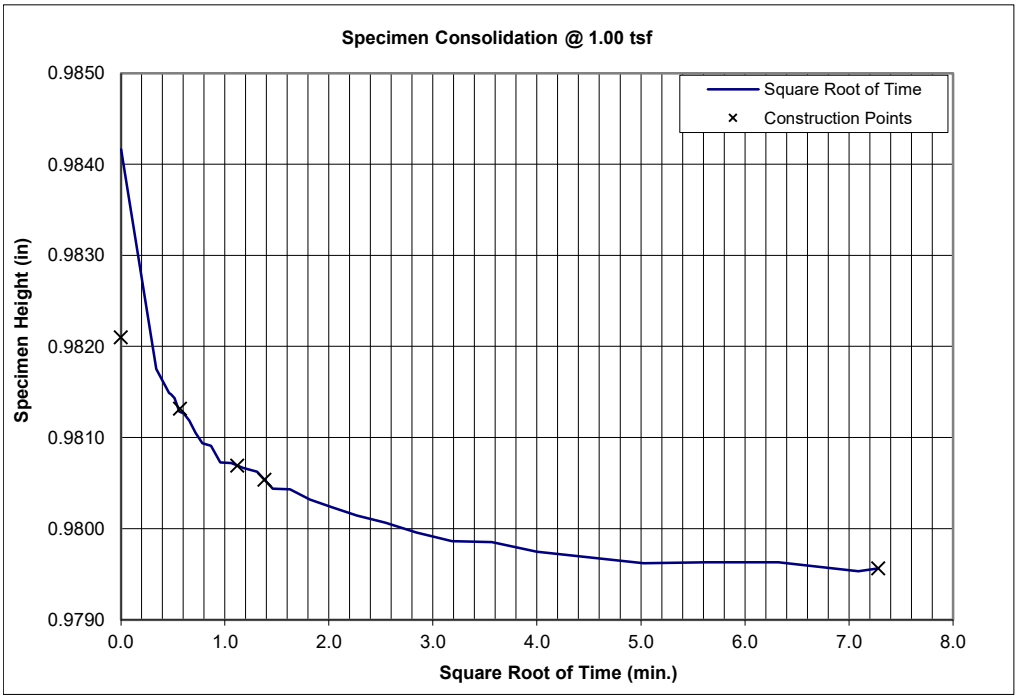
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	1
Actual Load (tsf)	1.02
Cycle	Load
Start Date	11/01/2021
Start Time	13:28
End Date	11/01/2021
End Time	14:21



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9821
@ t_{50}	0.3	0.9813
@ t_{90}	1.3	0.9807
@ t_{100}	1.9	0.9805
@ t_{max}	53.0	0.9796

Square Root of Time (min)	Spec. Height (in)
0.00	0.9842
0.34	0.9818
0.47	0.9815
0.48	0.9815
0.52	0.9814
0.56	0.9813
0.61	0.9813
0.66	0.9812
0.72	0.9811
0.79	0.9809
0.87	0.9809
0.96	0.9807
1.06	0.9807
1.18	0.9807
1.31	0.9806
1.46	0.9804
1.63	0.9804
1.82	0.9803
2.03	0.9802
2.27	0.9801
2.54	0.9801
2.84	0.9800
3.18	0.9799
3.57	0.9799
4.00	0.9797
4.5	0.9798

Square Root of Time (min)	Spec. Height (in)
5.03	0.9796
5.64	0.9796
6.32	0.9796
7.09	0.9795
7.28	0.9796

Square Root of Time (min)	Spec. Height (in)

Square Root of Time (min)	Spec. Height (in)

Comments

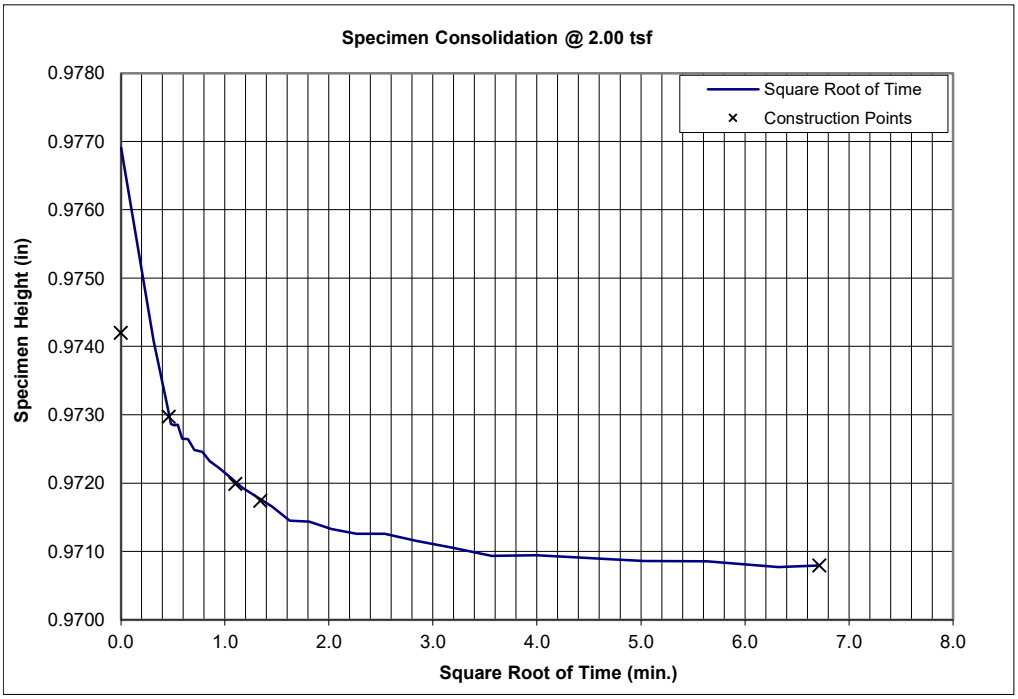
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	2
Actual Load (tsf)	2.02
Cycle	Load
Start Date	11/01/2021
Start Time	14:21
End Date	11/01/2021
End Time	15:06



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9742
@ t_{50}	0.2	0.9730
@ t_{90}	1.2	0.9720
@ t_{100}	1.8	0.9717
@ t_{max}	45.1	0.9708

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9769	5.02	0.9709				
0.32	0.9741	5.63	0.9709				
0.45	0.9731	6.32	0.9708				
0.48	0.9729	6.71	0.9708				
0.52	0.9728						
0.55	0.9729						
0.59	0.9726						
0.65	0.9726						
0.71	0.9725						
0.79	0.9725						
0.86	0.9723						
0.95	0.9722						
1.06	0.9721						
1.17	0.9719						
1.30	0.9718						
1.45	0.9717						
1.62	0.9714						
1.81	0.9714						
2.02	0.9713						
2.27	0.9713						
2.54	0.9713						
2.84	0.9712						
3.18	0.9711						
3.57	0.9709						
4.00	0.9709						
4.5	0.9708						

Comments

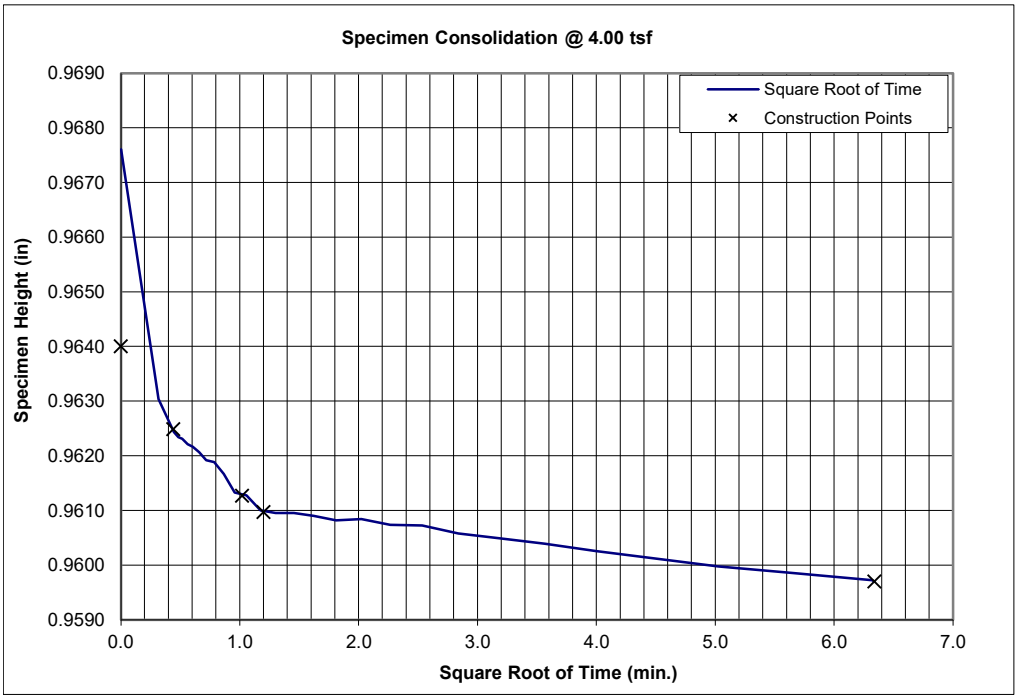
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	4
Actual Load (tsf)	4.02
Cycle	Load
Start Date	11/01/2021
Start Time	15:06
End Date	11/01/2021
End Time	15:47



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9640
@ t_{50}	0.2	0.9625
@ t_{90}	1.0	0.9613
@ t_{100}	1.4	0.9610
@ t_{max}	40.2	0.9597

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9676	5.02	0.9600				
0.32	0.9630	5.63	0.9599				
0.45	0.9624	6.32	0.9597				
0.48	0.9623	6.34	0.9597				
0.52	0.9623						
0.56	0.9622						
0.61	0.9622						
0.66	0.9621						
0.72	0.9619						
0.79	0.9619						
0.87	0.9617						
0.96	0.9613						
1.06	0.9613						
1.18	0.9610						
1.30	0.9610						
1.45	0.9610						
1.62	0.9609						
1.81	0.9608						
2.02	0.9608						
2.27	0.9607						
2.54	0.9607						
2.84	0.9606						
3.18	0.9605						
3.57	0.9604						
4.00	0.9603						
4.5	0.9601						

Comments

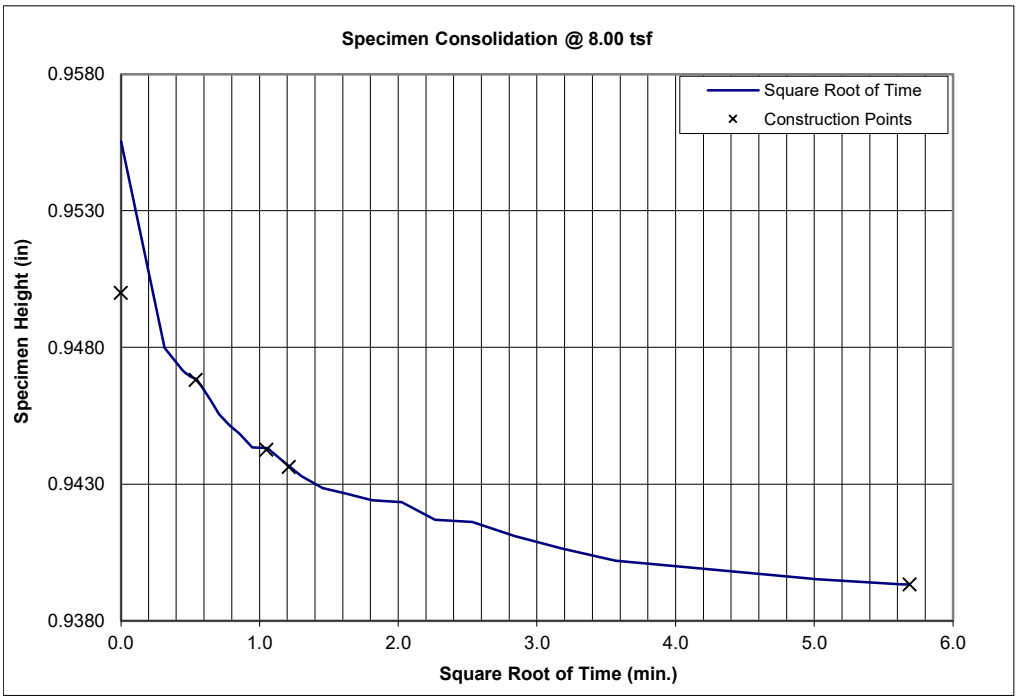
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	8
Actual Load (tsf)	8.01
Cycle	Load
Start Date	11/01/2021
Start Time	15:47
End Date	11/01/2021
End Time	16:19



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9500
@ t_{50}	0.3	0.9468
@ t_{90}	1.1	0.9443
@ t_{100}	1.5	0.9436
@ t_{max}	32.4	0.9393

Square Root of Time (min)	Spec. Height (in)
0.00	0.9556
0.32	0.9480
0.45	0.9472
0.47	0.9471
0.50	0.9469
0.55	0.9468
0.59	0.9465
0.65	0.9461
0.71	0.9456
0.79	0.9451
0.86	0.9448
0.95	0.9443
1.06	0.9443
1.17	0.9438
1.30	0.9433
1.45	0.9429
1.62	0.9427
1.81	0.9424
2.02	0.9423
2.27	0.9417
2.54	0.9416
2.84	0.9411
3.18	0.9406
3.57	0.9402
4.00	0.9400
4.5	0.9396
5.02	0.9395
5.63	0.9393
5.69	0.9393

Comments

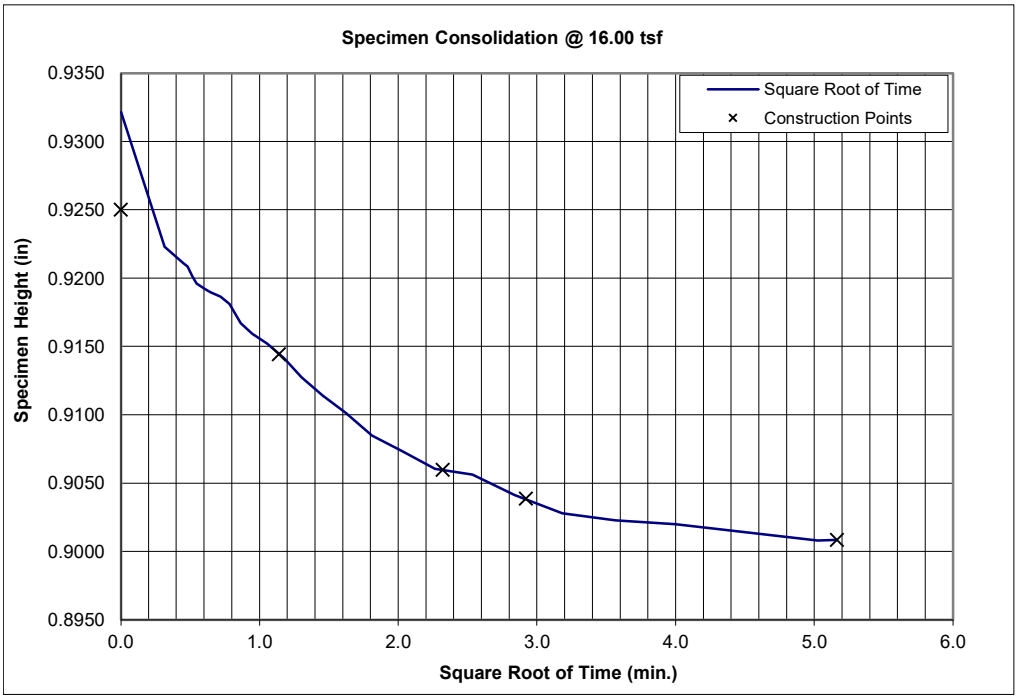
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	16
Actual Load (tsf)	16.02
Cycle	Load
Start Date	11/01/2021
Start Time	16:19
End Date	11/01/2021
End Time	16:46



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9250
@ t_{50}	1.3	0.9144
@ t_{90}	5.4	0.9060
@ t_{100}	8.5	0.9039
@ t_{max}	26.6	0.9008

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9322	5.02	0.9008				
0.32	0.9223	5.16	0.9008				
0.45	0.9211						
0.48	0.9208						
0.52	0.9201						
0.55	0.9196						
0.61	0.9192						
0.65	0.9190						
0.72	0.9186						
0.79	0.9181						
0.87	0.9167						
0.95	0.9159						
1.06	0.9152						
1.18	0.9141						
1.30	0.9127						
1.45	0.9114						
1.62	0.9101						
1.81	0.9085						
2.02	0.9073						
2.27	0.9060						
2.54	0.9056						
2.84	0.9041						
3.18	0.9028						
3.57	0.9023						
4.00	0.9020						
4.5	0.9016						

Comments

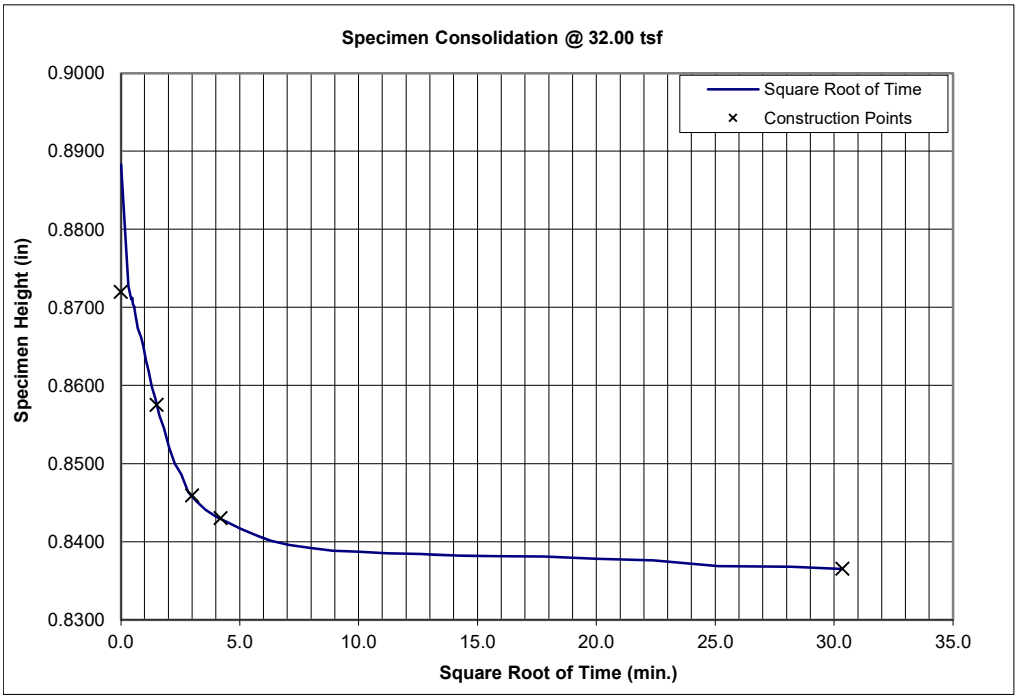
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	32
Actual Load (tsf)	32.07
Cycle	Load
Start Date	11/01/2021
Start Time	16:46
End Date	11/02/2021
End Time	8:07



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8720
@ t_{50}	2.3	0.8575
@ t_{90}	9.0	0.8459
@ t_{100}	17.6	0.8430
@ t_{max}	920.9	0.8365

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8883	5.03	0.8417				
0.32	0.8727	5.64	0.8409				
0.45	0.8710	6.32	0.8401				
0.48	0.8712	7.09	0.8396				
0.52	0.8704	7.95	0.8392				
0.56	0.8701	8.92	0.8388				
0.61	0.8692	10.01	0.8387				
0.66	0.8684	11.23	0.8385				
0.72	0.8673	12.60	0.8384				
0.79	0.8668	14.13	0.8382				
0.87	0.8661	15.85	0.8381				
0.96	0.8649	17.79	0.8381				
1.06	0.8632	19.96	0.8378				
1.18	0.8619	22.39	0.8376				
1.31	0.8598	25.12	0.8369				
1.45	0.8584	28.19	0.8368				
1.62	0.8561	30.35	0.8365				
1.82	0.8545						
2.03	0.8521						
2.27	0.8500						
2.54	0.8486						
2.84	0.8463						
3.19	0.8451						
3.57	0.8441						
4.00	0.8432						
4.5	0.8424						

Comments

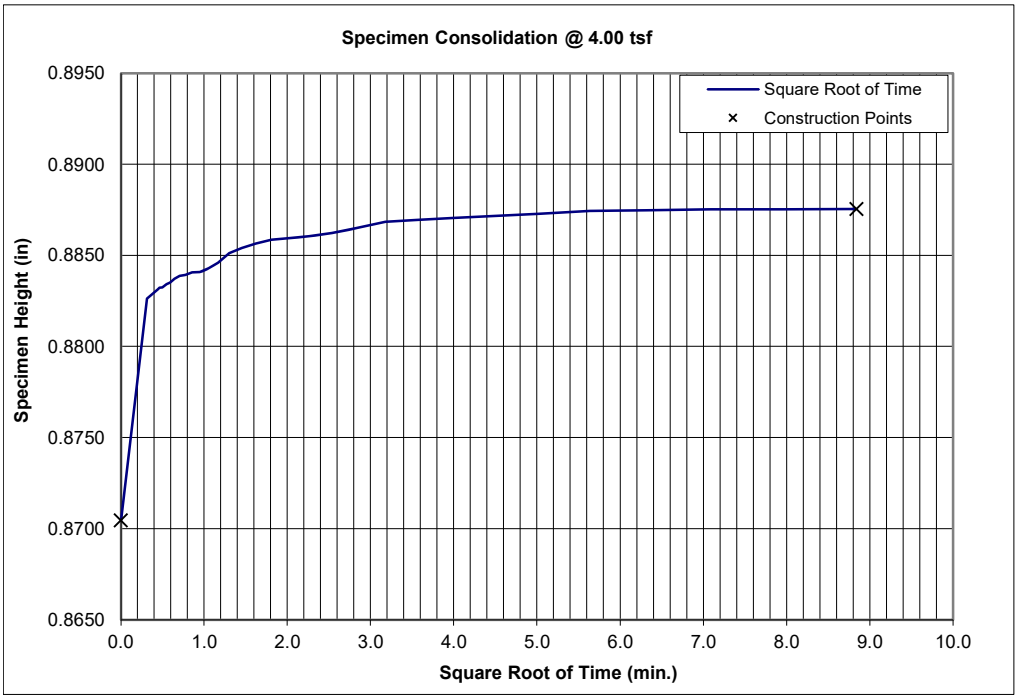
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	4
Actual Load (tsf)	4.03
Cycle	Unload
Start Date	11/02/2021
Start Time	9:23
End Date	11/02/2021
End Time	10:41



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8705
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	78.1	0.8875

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8705	5.02	0.8873				
0.32	0.8826	5.63	0.8874				
0.45	0.8831	6.32	0.8875				
0.47	0.8832	7.09	0.8875				
0.50	0.8832	7.95	0.8875				
0.55	0.8834	8.84	0.8875				
0.59	0.8835						
0.65	0.8837						
0.71	0.8839						
0.77	0.8839						
0.86	0.8841						
0.95	0.8841						
1.06	0.8843						
1.17	0.8846						
1.30	0.8851						
1.45	0.8854						
1.62	0.8856						
1.81	0.8859						
2.02	0.8859						
2.27	0.8860						
2.54	0.8862						
2.84	0.8865						
3.18	0.8868						
3.57	0.8869						
4.00	0.8871						
4.5	0.8871						

Comments

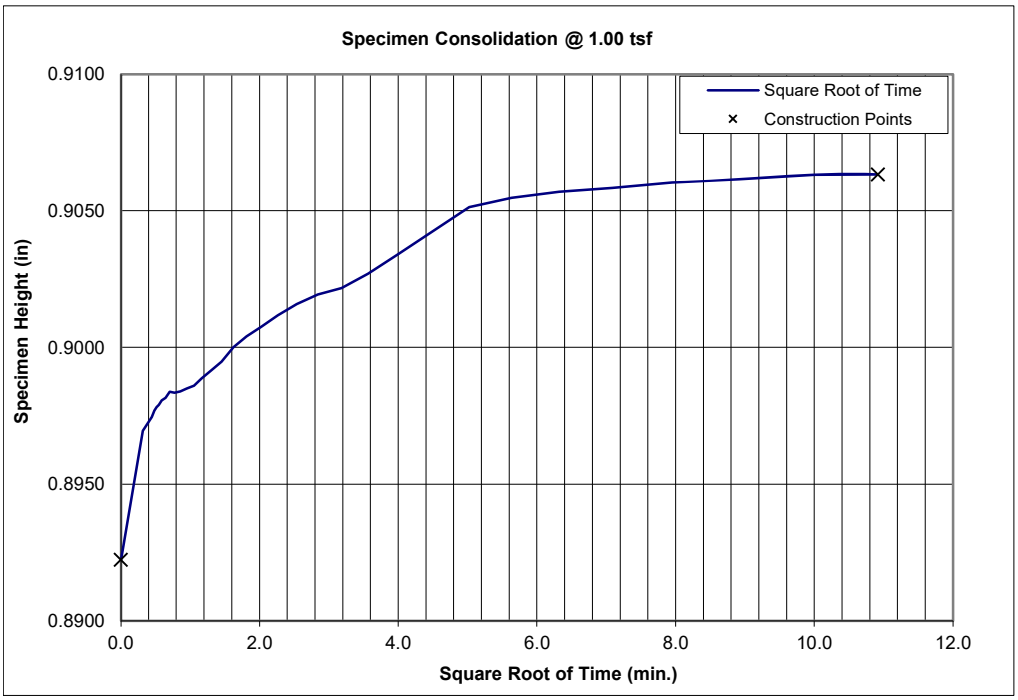
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	1
Actual Load (tsf)	1.02
Cycle	Unload
Start Date	11/02/2021
Start Time	10:41
End Date	11/02/2021
End Time	12:40



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8922
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	119.2	0.9063

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8922	5.02	0.9051				
0.32	0.8970	5.63	0.9055				
0.45	0.8975	6.32	0.9057				
0.48	0.8977	7.09	0.9058				
0.52	0.8978	7.95	0.9060				
0.55	0.8979	8.92	0.9062				
0.59	0.8981	10.01	0.9063				
0.65	0.8982	10.92	0.9063				
0.71	0.8984						
0.77	0.8983						
0.86	0.8984						
0.95	0.8985						
1.06	0.8986						
1.17	0.8989						
1.30	0.8992						
1.45	0.8995						
1.62	0.9000						
1.81	0.9004						
2.02	0.9008						
2.27	0.9012						
2.54	0.9016						
2.84	0.9019						
3.18	0.9022						
3.57	0.9027						
4.00	0.9034						
4.5	0.9041						

Comments

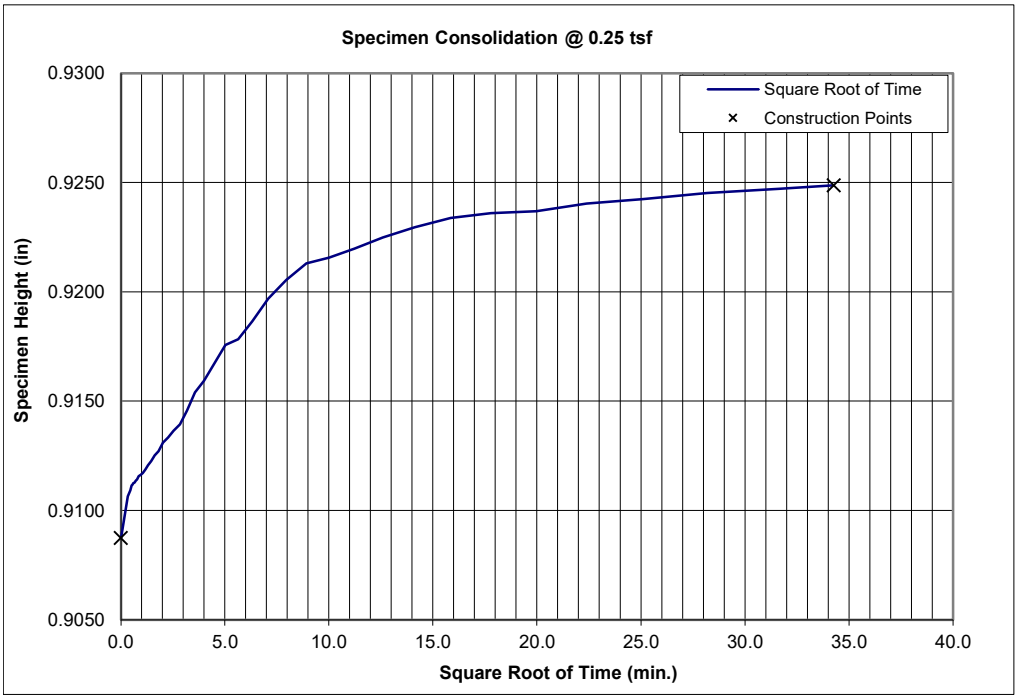
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	0.25
Actual Load (tsf)	0.27
Cycle	Unload
Start Date	11/02/2021
Start Time	12:40
End Date	11/03/2021
End Time	8:14



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9087
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	1173.9	0.9249

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9087	5.03	0.9176				
0.34	0.9106	5.64	0.9178				
0.47	0.9109	6.32	0.9186				
0.48	0.9110	7.09	0.9197				
0.52	0.9111	7.95	0.9205				
0.56	0.9112	8.92	0.9213				
0.61	0.9112	10.01	0.9216				
0.66	0.9113	11.23	0.9220				
0.72	0.9114	12.60	0.9225				
0.79	0.9114	14.13	0.9230				
0.87	0.9116	15.85	0.9234				
0.96	0.9116	17.79	0.9236				
1.06	0.9117	19.96	0.9237				
1.18	0.9119	22.39	0.9240				
1.31	0.9121	25.12	0.9242				
1.46	0.9123	28.19	0.9245				
1.63	0.9125	31.63	0.9247				
1.82	0.9127	34.26	0.9249				
2.03	0.9131						
2.27	0.9133						
2.54	0.9136						
2.84	0.9139						
3.18	0.9146						
3.57	0.9154						
4.00	0.9159						
4.5	0.9170						

Comments

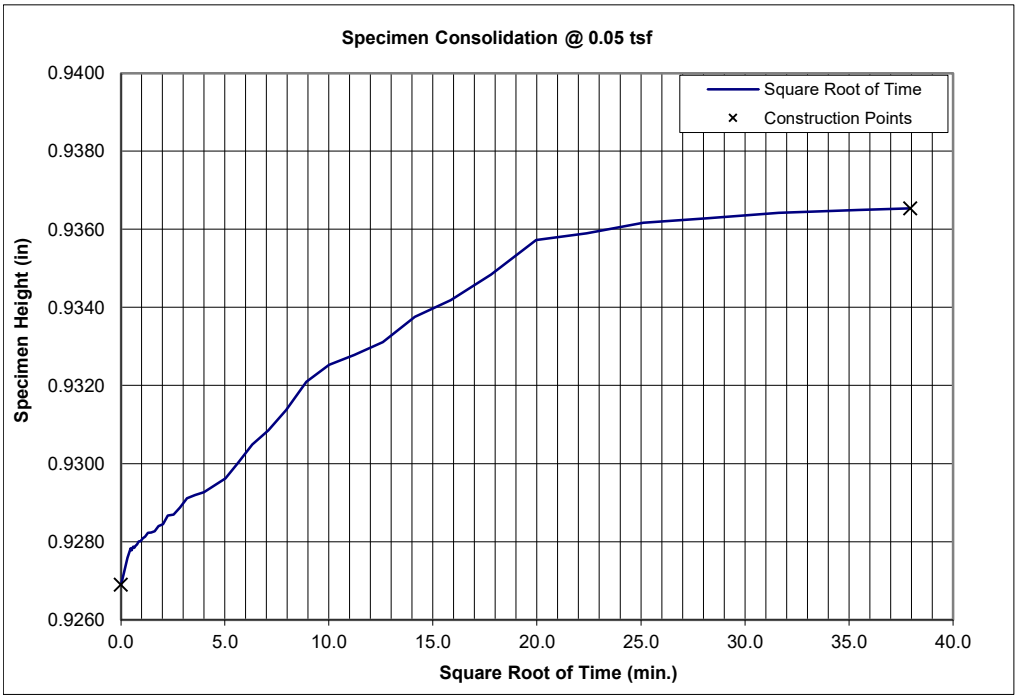
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 26.4'-26.7'
Description: Lean Clay (CL), brown, moist, firm, Mn

Project No.	178568003
Lab ID	1342
Nominal Load (tsf)	0.05
Actual Load (tsf)	0.07
Cycle	Final
Start Date	11/03/2021
Start Time	8:14
End Date	11/04/2021
End Time	8:14



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9269
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	1440.1	0.9365

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9269	5.02	0.9296				
0.32	0.9276	5.63	0.9300				
0.45	0.9278	6.32	0.9305				
0.48	0.9278	7.09	0.9308				
0.52	0.9278	7.95	0.9314				
0.55	0.9278	8.92	0.9321				
0.59	0.9279	10.01	0.9325				
0.65	0.9278	11.23	0.9328				
0.71	0.9279	12.59	0.9331				
0.79	0.9279	14.13	0.9338				
0.86	0.9280	15.85	0.9342				
0.95	0.9280	17.79	0.9348				
1.06	0.9281	19.96	0.9357				
1.17	0.9281	22.39	0.9359				
1.30	0.9282	25.12	0.9362				
1.45	0.9282	28.19	0.9363				
1.62	0.9283	31.63	0.9364				
1.81	0.9284	35.48	0.9365				
2.02	0.9284	37.95	0.9365				
2.27	0.9287						
2.54	0.9287						
2.84	0.9289						
3.18	0.9291						
3.57	0.9292						
4.00	0.9293						
4.5	0.9294						

Comments

Stantec

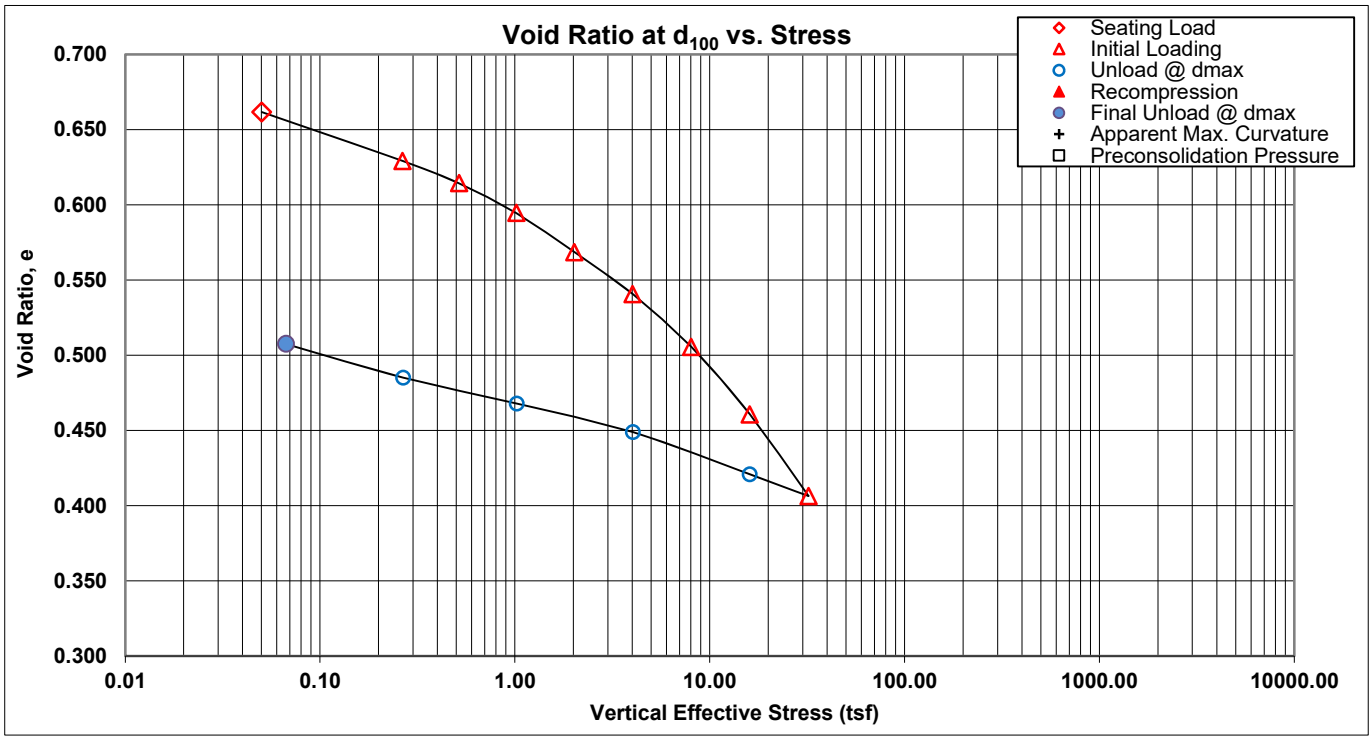
One Dimensional Consolidation of Soils Using Incremental Loading

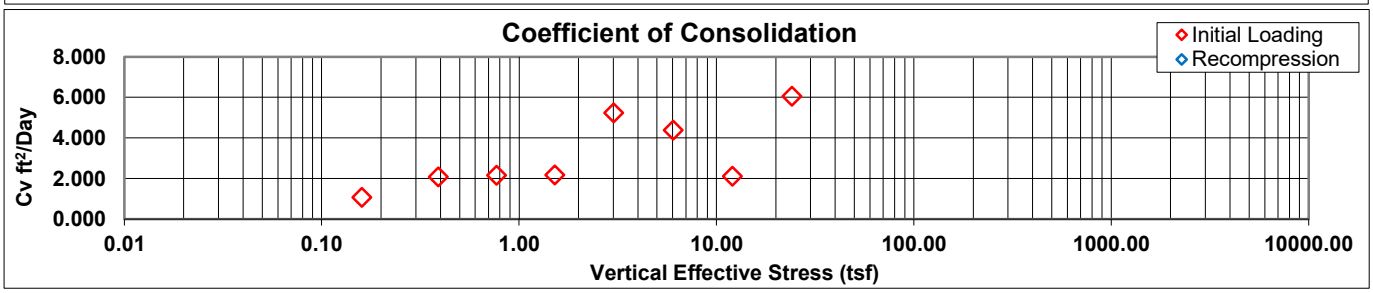
ASTM D 2435

Project Name	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-2, 46.4'-46.7'	Lab ID	1344
Description	Silt with Sand (ML), gray, moist, soft	Date Received	10/25/2021
Specimen Type	Undisturbed		

LL	NP	Specific Gravity	2.67 ASTM D 854, Dry	Prepared	Using Cutting Ring
PL	NP			Test Method	B - for 30 min.
PI	NP			Test Condition	Inundated at 0.05 tsf

Initial Specimen Conditions		Final Specimen Conditions	
Moisture Content (%)	24.6	Moisture Content (%)	20.0
Dry Unit Weight (pcf)	100.1	Dry Unit Weight (pcf)	110.3
Void Ratio	0.662	Void Ratio	0.508
Degree of Saturation (%)	99.1	Degree of Saturation (%)	105.3
Initial Specimen Height (in)	0.9956	Final Specimen Height (in)	0.9033
Equivalent Height of Solids (in)	0.599	Preconsolidation Pressure* (tsf)	
		Void Ratio @ Preconsolidation Pressure	





Comments

Reviewed By KG

Template: tmp_cons_input.xlsm
Version: 20170216
Approved By: RJ

Stantec Consulting Services Inc.
Lexington, Kentucky

Reported By: KG
Report Date: 11/22/2021

Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft
Specimen Type: Undisturbed

Project No.: 178568003
Lab ID: 1344
Date Received: 10/25/2021

Load Increment tsf σ_v	Specimen Height (in) @ d_0	Specimen Height (in) @ d_{100}	Void Ratio e @ d_{100}	Specimen Height (in) @ d_{max}	Void Ratio e @ d_{max}	Load At Cv tsf	Specimen Height (in) @ d_{50}	Fitting Time** (min) @ t_{50}	Fitting Time** (min) @ t_{90}	Cv ft^2/day
0.05	0.9956	----	----	----	----	----	----	----	----	----
0.27	0.9850	0.9761	0.629	0.9752	0.627	0.16	0.9806		1.9	1.070
0.52	0.9712	0.9673	0.614	0.9652	0.611	0.39	0.9692		1.0	2.074
1.02	0.9592	0.9554	0.595	0.9530	0.590	0.77	0.9573		0.9	2.153
2.02	0.9440	0.9398	0.568	0.9375	0.565	1.52	0.9419		0.9	2.175
4.02	0.9296	0.9231	0.541	0.9195	0.535	3.02	0.9263		0.3	5.226
8.04	0.9100	0.9021	0.506	0.8989	0.500	6.03	0.9060		0.4	4.385
16.07	0.8820	0.8752	0.461	0.8702	0.452	12.06	0.8786		0.8	2.113
32.13	0.8480	0.8427	0.406	0.8385	0.399	24.10	0.8453		0.3	6.060
16.07	0.8443			0.8513	0.421					
4.03	0.8579			0.8682	0.449					
1.02	0.8721			0.8795	0.468					
0.27	0.8821			0.8899	0.485					
0.07	0.8932			0.9033	0.508					

Testing Details:

Consolidation Press ID: CON-9
Trimming Ring ID: GS-85

Initial MC from Trimmings (%): 24.3
Final Differential Height (in): -0.024

Test Start Date: 11/01/2021
Technician: KG

Test End Date: 11/05/2021
Technician: KG

When available, all other tests performed in association with this specimen are reported separately.
* When presented, The preconsolidation pressure evaluated using the Casagrande Method, as per ASTM D 2435.
** Cv Computation Methods:

@ t_{50}, Cv calculated using Log Time Method.

@ t_{90}, Cv calculated using Square Root of Time Method.

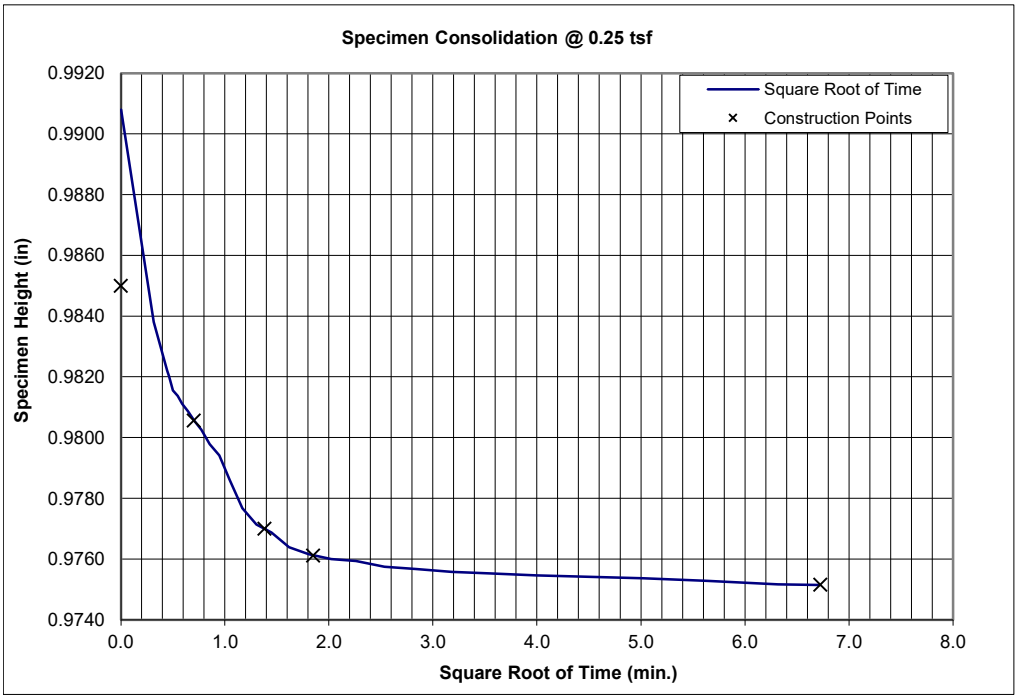
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	0.25
Actual Load (tsf)	0.27
Cycle	Load
Start Date	11/01/2021
Start Time	12:42
End Date	11/01/2021
End Time	13:28



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9850
@ t_{50}	0.5	0.9806
@ t_{90}	1.9	0.9770
@ t_{100}	3.4	0.9761
@ t_{max}	45.2	0.9752

Square Root of Time (min)	Spec. Height (in)
0.00	0.9908
0.32	0.9838
0.45	0.9822
0.47	0.9820
0.50	0.9816
0.55	0.9814
0.59	0.9811
0.65	0.9809
0.71	0.9806
0.77	0.9803
0.86	0.9798
0.95	0.9794
1.05	0.9786
1.17	0.9777
1.30	0.9771
1.45	0.9769
1.62	0.9764
1.81	0.9762
2.02	0.9760
2.26	0.9759
2.53	0.9757
2.84	0.9757
3.18	0.9756
3.56	0.9755
4.00	0.9755
4.5	0.9753
5.02	0.9754
5.63	0.9753
6.32	0.9752
6.72	0.9752

Comments

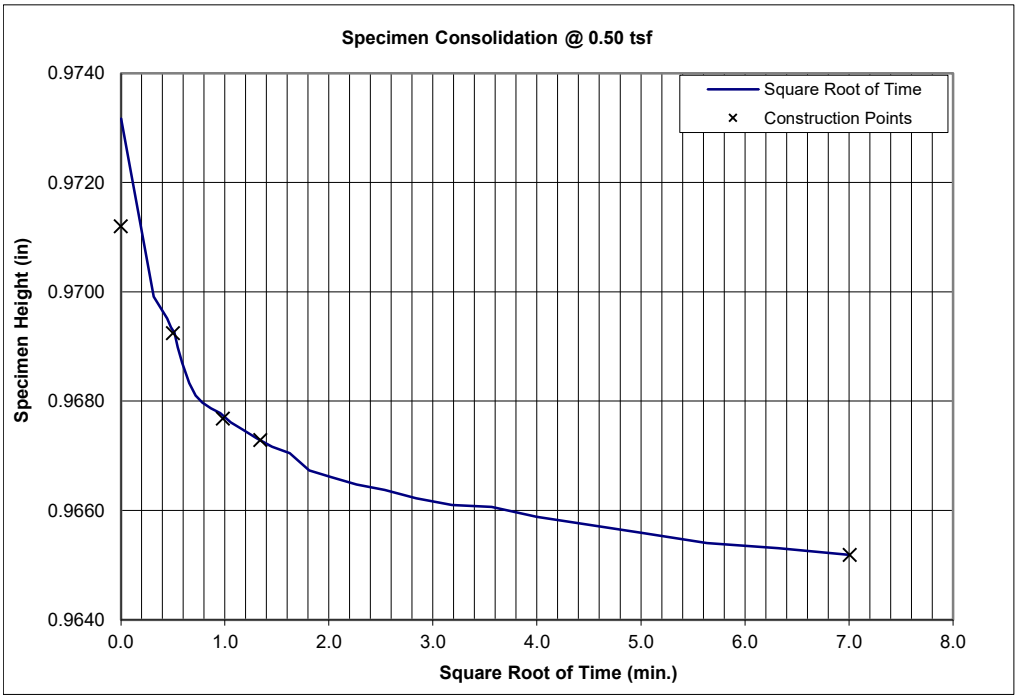
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	0.5
Actual Load (tsf)	0.52
Cycle	Load
Start Date	11/01/2021
Start Time	13:28
End Date	11/01/2021
End Time	14:17



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9712
@ t_{50}	0.3	0.9692
@ t_{90}	1.0	0.9677
@ t_{100}	1.8	0.9673
@ t_{max}	49.1	0.9652

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9732	5.02	0.9656				
0.32	0.9699	5.64	0.9654				
0.45	0.9695	6.32	0.9653				
0.48	0.9693	7.01	0.9652				
0.52	0.9692						
0.55	0.9690						
0.59	0.9687						
0.66	0.9683						
0.72	0.9681						
0.79	0.9680						
0.87	0.9679						
0.96	0.9678						
1.06	0.9676						
1.18	0.9675						
1.30	0.9673						
1.45	0.9672						
1.62	0.9670						
1.81	0.9667						
2.02	0.9666						
2.27	0.9665						
2.54	0.9664						
2.84	0.9662						
3.18	0.9661						
3.57	0.9661						
4.00	0.9659						
4.5	0.9657						

Comments

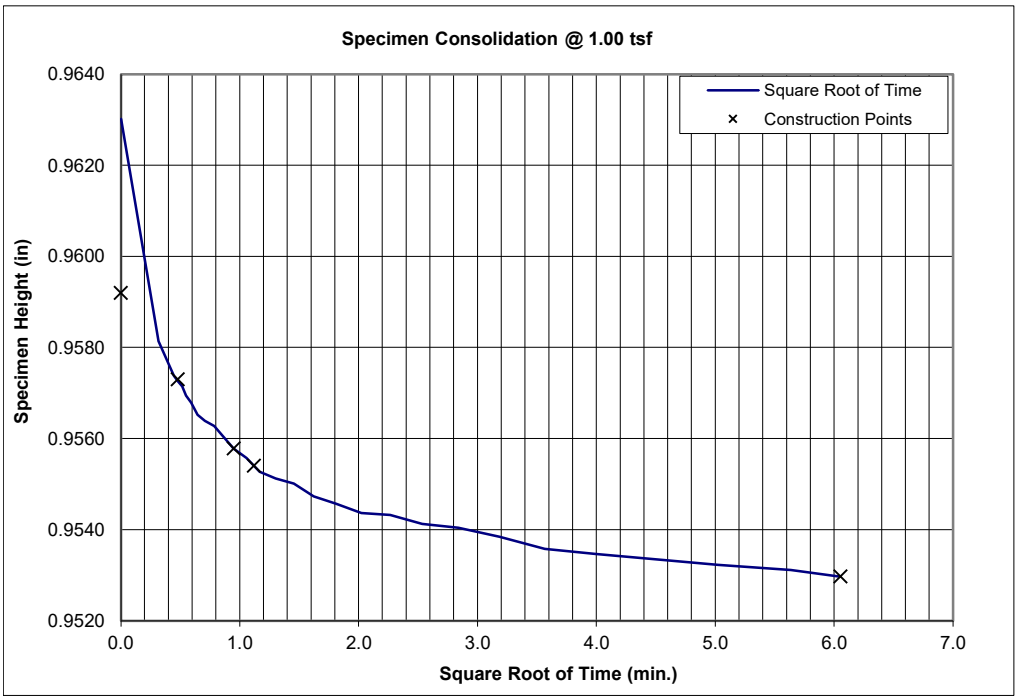
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	1
Actual Load (tsf)	1.02
Cycle	Load
Start Date	11/01/2021
Start Time	14:17
End Date	11/01/2021
End Time	14:53



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9592
@ t_{50}	0.2	0.9573
@ t_{90}	0.9	0.9558
@ t_{100}	1.3	0.9554
@ t_{max}	36.6	0.9530

Square Root of Time (min)	Spec. Height (in)
0.00	0.9630
0.32	0.9581
0.45	0.9574
0.48	0.9572
0.52	0.9571
0.55	0.9569
0.59	0.9568
0.65	0.9565
0.71	0.9564
0.79	0.9563
0.87	0.9560
0.95	0.9558
1.06	0.9556
1.17	0.9553
1.30	0.9551
1.45	0.9550
1.62	0.9547
1.81	0.9546
2.02	0.9544
2.27	0.9543
2.54	0.9541
2.84	0.9540
3.18	0.9538
3.57	0.9536
4.00	0.9535
4.5	0.9533
5.02	0.9532
5.63	0.9531
6.05	0.9530

Comments

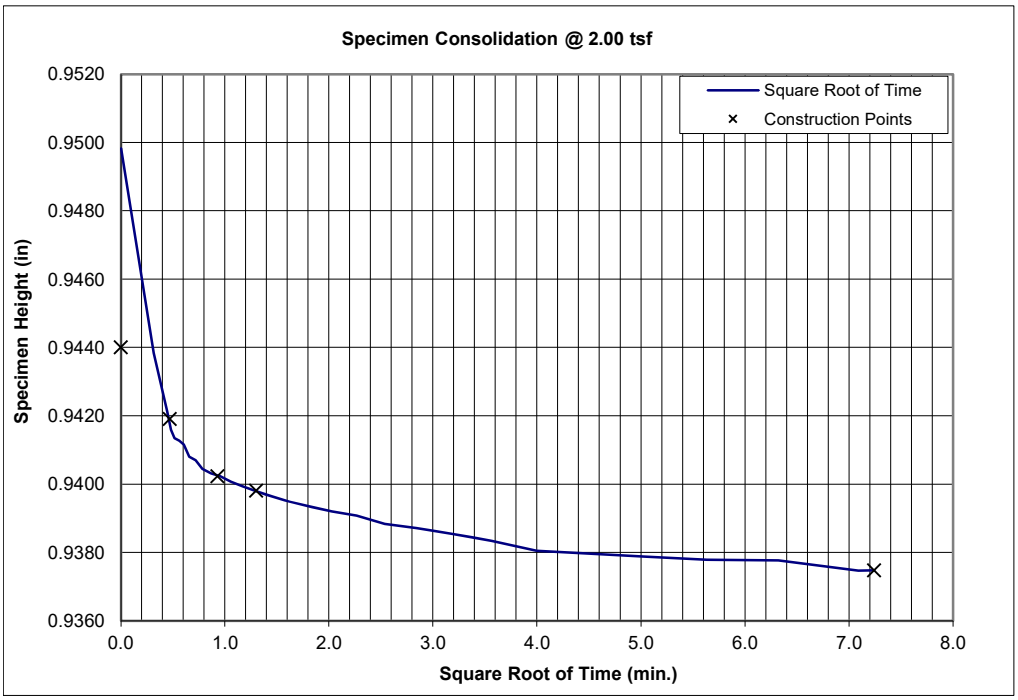
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	2
Actual Load (tsf)	2.02
Cycle	Load
Start Date	11/01/2021
Start Time	14:53
End Date	11/01/2021
End Time	15:46



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9440
@ t_{50}	0.2	0.9419
@ t_{90}	0.9	0.9402
@ t_{100}	1.7	0.9398
@ t_{max}	52.5	0.9375

Square Root of Time (min)	Spec. Height (in)
0.00	0.9498
0.32	0.9438
0.45	0.9421
0.48	0.9416
0.52	0.9413
0.56	0.9413
0.61	0.9412
0.66	0.9408
0.72	0.9407
0.79	0.9404
0.87	0.9403
0.96	0.9402
1.06	0.9401
1.18	0.9399
1.30	0.9398
1.45	0.9396
1.62	0.9395
1.81	0.9394
2.03	0.9392
2.27	0.9391
2.54	0.9388
2.84	0.9387
3.18	0.9385
3.57	0.9383
4.00	0.9380
4.5	0.9380

Square Root of Time (min)	Spec. Height (in)
5.02	0.9379
5.64	0.9378
6.32	0.9378
7.09	0.9375
7.24	0.9375

Square Root of Time (min)	Spec. Height (in)

Square Root of Time (min)	Spec. Height (in)

Comments

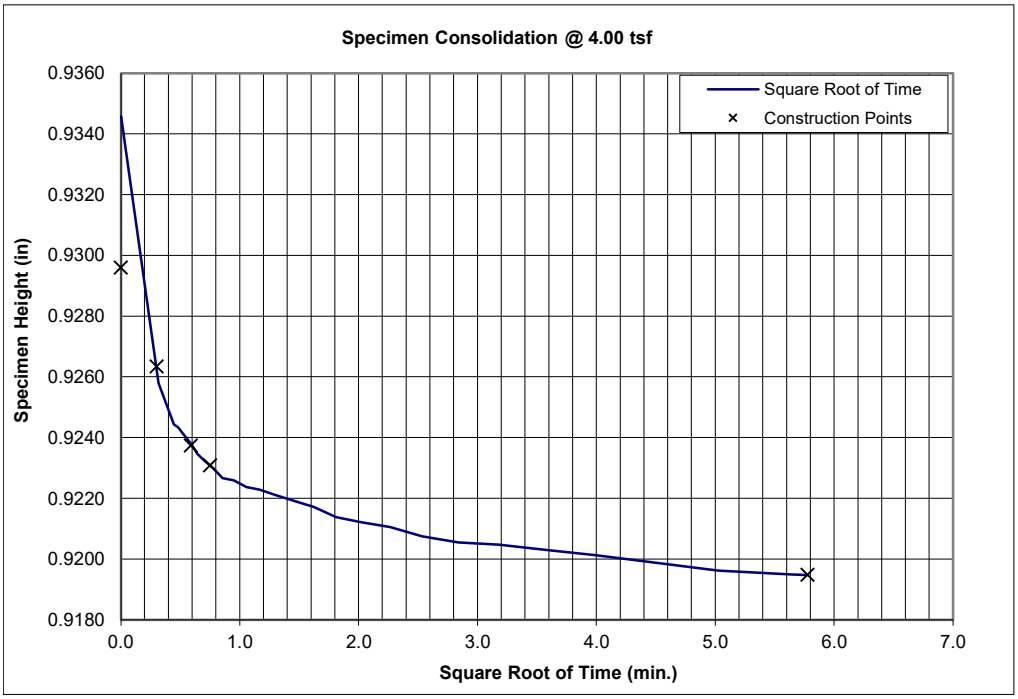
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	4
Actual Load (tsf)	4.02
Cycle	Load
Start Date	11/01/2021
Start Time	15:46
End Date	11/01/2021
End Time	16:19



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9296
@ t_{50}	0.1	0.9263
@ t_{90}	0.3	0.9237
@ t_{100}	0.6	0.9231
@ t_{max}	33.4	0.9195

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9346	5.02	0.9196				
0.32	0.9258	5.63	0.9195				
0.45	0.9244	5.77	0.9195				
0.48	0.9243						
0.52	0.9242						
0.55	0.9240						
0.59	0.9238						
0.65	0.9235						
0.71	0.9232						
0.77	0.9230						
0.86	0.9227						
0.95	0.9226						
1.06	0.9224						
1.17	0.9223						
1.30	0.9221						
1.45	0.9219						
1.62	0.9217						
1.81	0.9214						
2.02	0.9212						
2.27	0.9211						
2.54	0.9207						
2.84	0.9205						
3.18	0.9205						
3.57	0.9203						
4.00	0.9201						
4.5	0.9198						

Comments

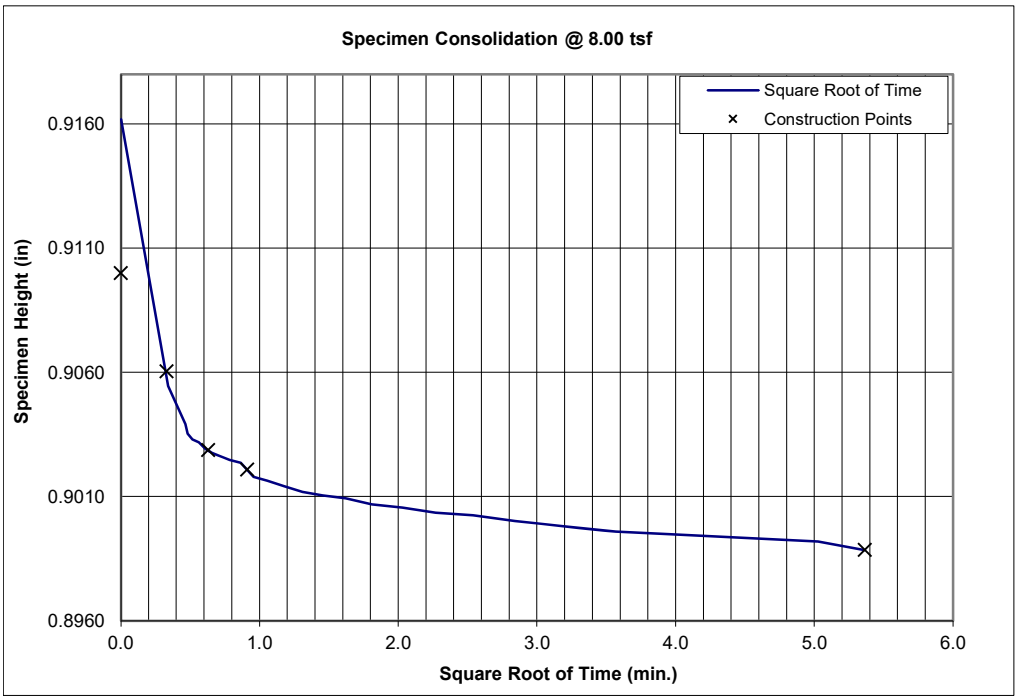
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	8
Actual Load (tsf)	8.04
Cycle	Load
Start Date	11/01/2021
Start Time	16:19
End Date	11/01/2021
End Time	16:48



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9100
@ t_{50}	0.1	0.9060
@ t_{90}	0.4	0.9029
@ t_{100}	0.8	0.9021
@ t_{max}	28.8	0.8989

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9162	5.03	0.8992				
0.34	0.9054	5.36	0.8989				
0.47	0.9039						
0.48	0.9035						
0.52	0.9033						
0.56	0.9032						
0.61	0.9029						
0.66	0.9028						
0.72	0.9026						
0.79	0.9025						
0.87	0.9024						
0.96	0.9018						
1.06	0.9016						
1.18	0.9014						
1.31	0.9012						
1.45	0.9010						
1.62	0.9009						
1.81	0.9007						
2.03	0.9006						
2.27	0.9003						
2.54	0.9002						
2.84	0.9000						
3.18	0.8998						
3.57	0.8996						
4.00	0.8995						
4.5	0.8994						

Comments

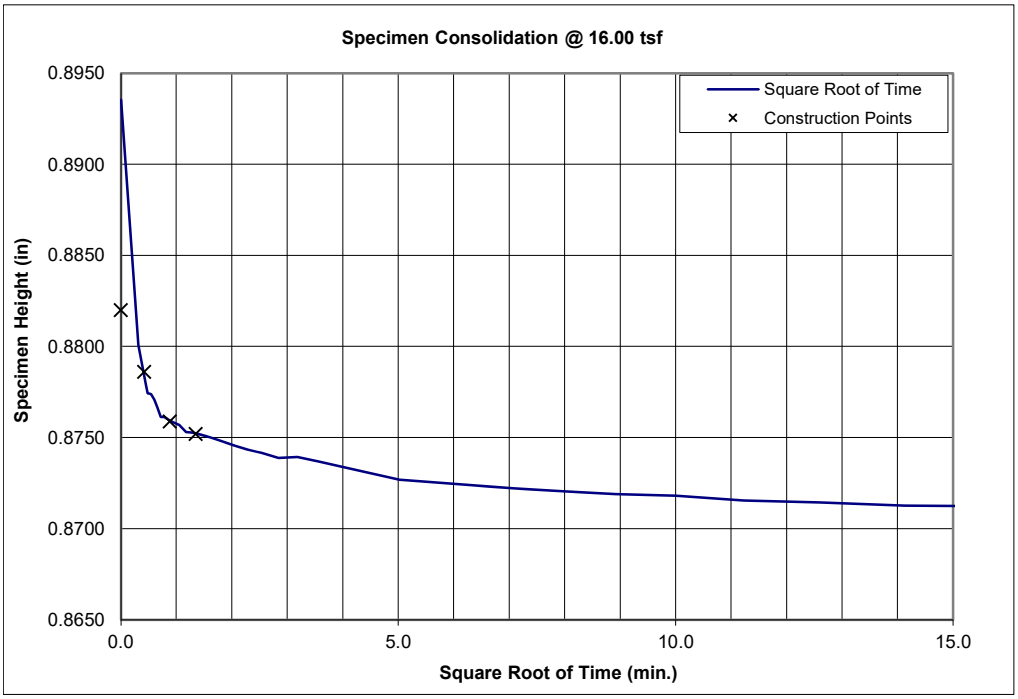
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	16
Actual Load (tsf)	16.07
Cycle	Load
Start Date	11/01/2021
Start Time	16:48
End Date	11/02/2021
End Time	8:06



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8820
@ t_{50}	0.2	0.8786
@ t_{90}	0.8	0.8759
@ t_{100}	1.8	0.8752
@ t_{max}	917.7	0.8702

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8936	5.02	0.8727				
0.32	0.8801	5.63	0.8725				
0.45	0.8779	6.32	0.8724				
0.48	0.8774	7.09	0.8722				
0.52	0.8774	7.95	0.8721				
0.55	0.8774	8.92	0.8719				
0.61	0.8771	10.01	0.8718				
0.66	0.8767	11.23	0.8715				
0.72	0.8761	12.59	0.8714				
0.79	0.8761	14.13	0.8713				
0.87	0.8760	15.85	0.8712				
0.95	0.8758	17.79	0.8710				
1.06	0.8757	19.96	0.8708				
1.18	0.8753	22.39	0.8706				
1.30	0.8753	25.12	0.8702				
1.45	0.8751	28.19	0.8706				
1.62	0.8750	30.29	0.8702				
1.81	0.8748						
2.02	0.8746						
2.27	0.8743						
2.54	0.8742						
2.84	0.8739						
3.18	0.8739						
3.57	0.8737						
4.00	0.8734						
4.5	0.8728						

Comments

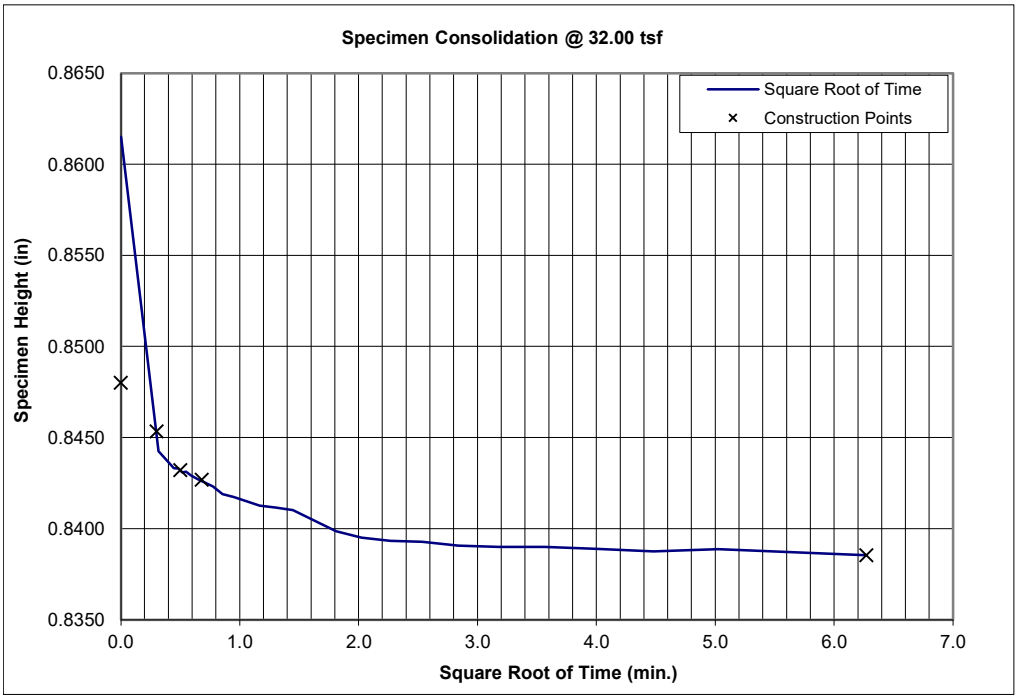
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	32
Actual Load (tsf)	32.13
Cycle	Load
Start Date	11/02/2021
Start Time	8:06
End Date	11/02/2021
End Time	8:45



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8480
@ t_{50}	0.1	0.8453
@ t_{90}	0.3	0.8432
@ t_{100}	0.5	0.8427
@ t_{max}	39.3	0.8385

Square Root of Time (min)	Spec. Height (in)
0.00	0.8615
0.32	0.8442
0.45	0.8433
0.48	0.8433
0.52	0.8431
0.55	0.8431
0.59	0.8429
0.65	0.8427
0.71	0.8425
0.77	0.8423
0.86	0.8419
0.95	0.8417
1.17	0.8413
1.30	0.8411
1.45	0.8410
1.81	0.8399
2.02	0.8395
2.27	0.8393
2.54	0.8393
2.84	0.8391
3.18	0.8390
3.57	0.8390
4.00	0.8389
4.48	0.8387
5.02	0.8389
5.6	0.8386
6.27	0.8385

Comments

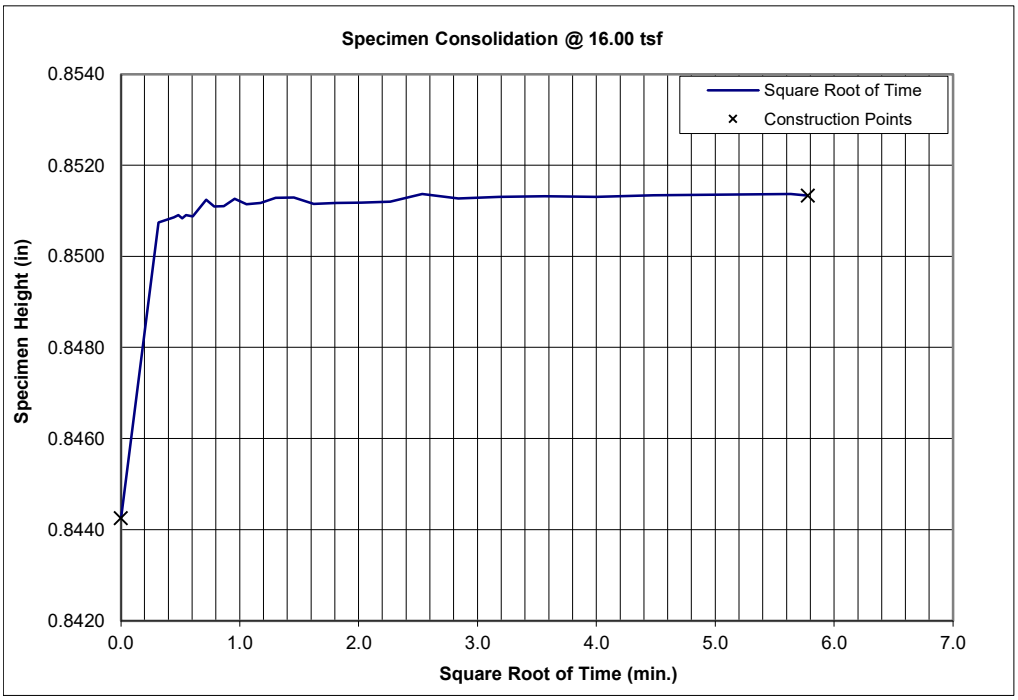
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	16
Actual Load (tsf)	16.07
Cycle	Unload
Start Date	11/02/2021
Start Time	8:45
End Date	11/02/2021
End Time	9:18



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8443
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	33.4	0.8513

Square Root of Time (min)	Spec. Height (in)
0.00	0.8443
0.32	0.8507
0.45	0.8509
0.48	0.8509
0.52	0.8508
0.55	0.8509
0.61	0.8509
0.72	0.8512
0.79	0.8511
0.87	0.8511
0.96	0.8513
1.06	0.8511
1.18	0.8512
1.30	0.8513
1.45	0.8513
1.62	0.8512
1.81	0.8512
2.02	0.8512
2.27	0.8512
2.54	0.8514
2.84	0.8513
3.18	0.8513
3.57	0.8513
4.00	0.8513
4.48	0.8513
5.0	0.8513

Square Root of Time (min)	Spec. Height (in)
5.64	0.8514
5.78	0.8513

Square Root of Time (min)	Spec. Height (in)

Square Root of Time (min)	Spec. Height (in)

Comments

Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

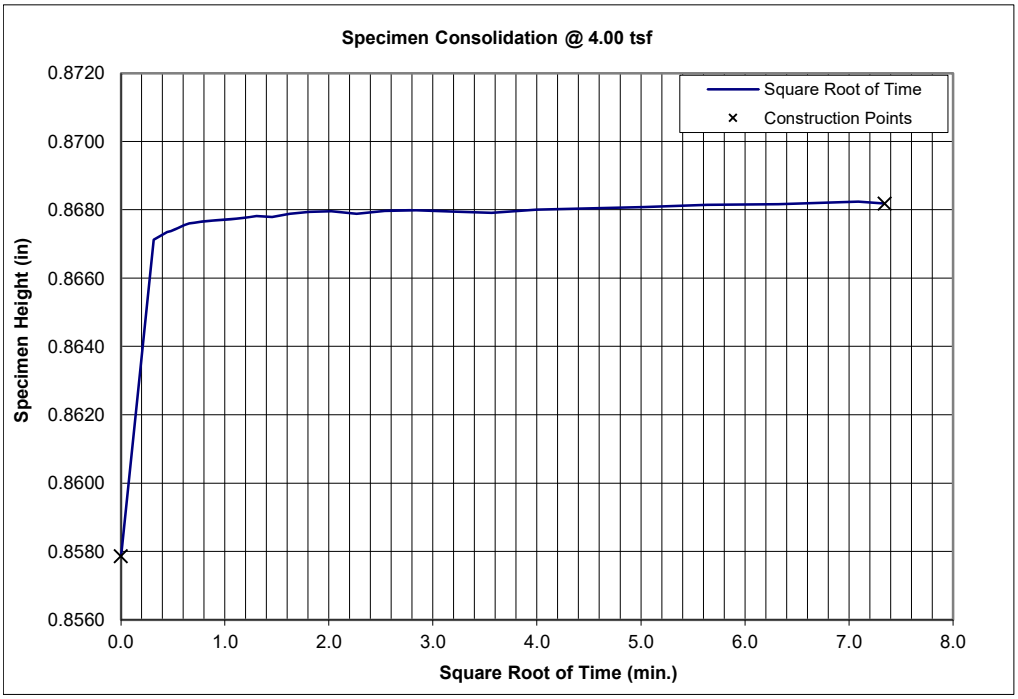
ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.: 178568003
Lab ID: 1344
Nominal Load (tsf): 4
Actual Load (tsf): 4.03
Cycle: Unload

Start Date: 11/02/2021
Start Time: 9:18

End Date: 11/02/2021
End Time: 10:12



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8579
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	53.9	0.8682

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8579	5.02	0.8681				
0.32	0.8671	5.63	0.8681				
0.45	0.8673	6.32	0.8682				
0.48	0.8674	7.09	0.8682				
0.52	0.8674	7.34	0.8682				
0.55	0.8675						
0.61	0.8675						
0.66	0.8676						
0.71	0.8676						
0.79	0.8677						
0.87	0.8677						
0.96	0.8677						
1.06	0.8677						
1.18	0.8678						
1.30	0.8678						
1.45	0.8678						
1.62	0.8679						
1.81	0.8679						
2.02	0.8680						
2.27	0.8679						
2.54	0.8680						
2.84	0.8680						
3.18	0.8680						
3.57	0.8679						
4.00	0.8680						
4.5	0.8681						

Comments

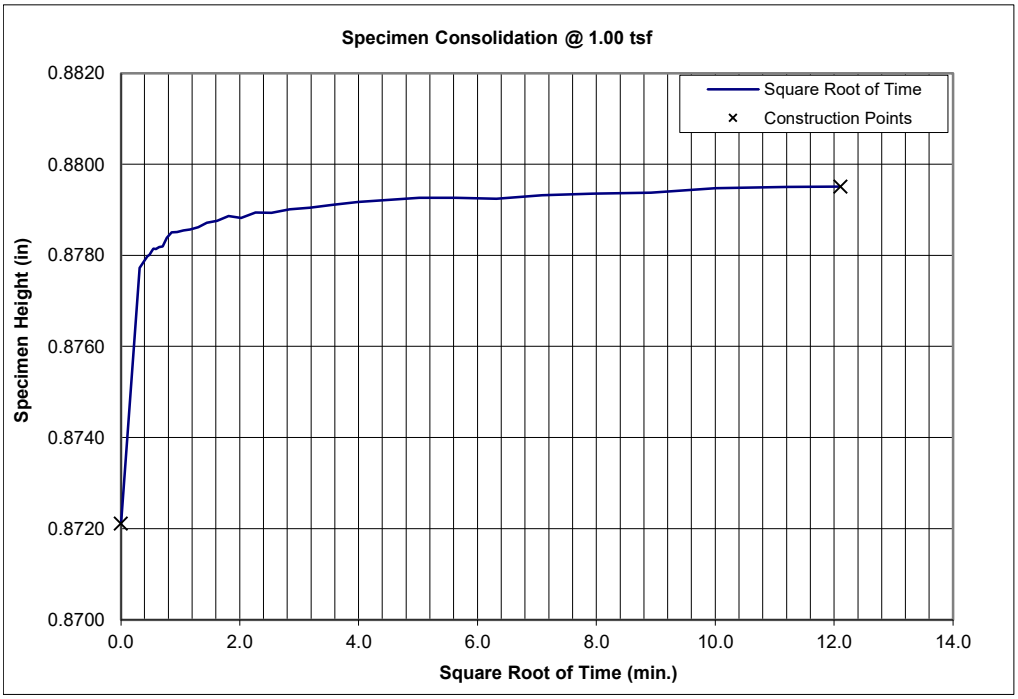
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	1
Actual Load (tsf)	1.02
Cycle	Unload
Start Date	11/02/2021
Start Time	10:12
End Date	11/02/2021
End Time	12:39



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8721
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	146.5	0.8795

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8721	5.02	0.8793				
0.32	0.8777	5.63	0.8793				
0.45	0.8780	6.32	0.8792				
0.48	0.8780	7.09	0.8793				
0.52	0.8781	7.95	0.8794				
0.55	0.8781	8.92	0.8794				
0.59	0.8781	10.01	0.8795				
0.65	0.8782	11.23	0.8795				
0.71	0.8782	12.10	0.8795				
0.77	0.8784						
0.86	0.8785						
0.95	0.8785						
1.06	0.8785						
1.17	0.8786						
1.30	0.8786						
1.45	0.8787						
1.62	0.8788						
1.81	0.8789						
2.02	0.8788						
2.27	0.8789						
2.53	0.8789						
2.84	0.8790						
3.18	0.8790						
3.56	0.8791						
4.00	0.8792						
4.5	0.8792						

Comments

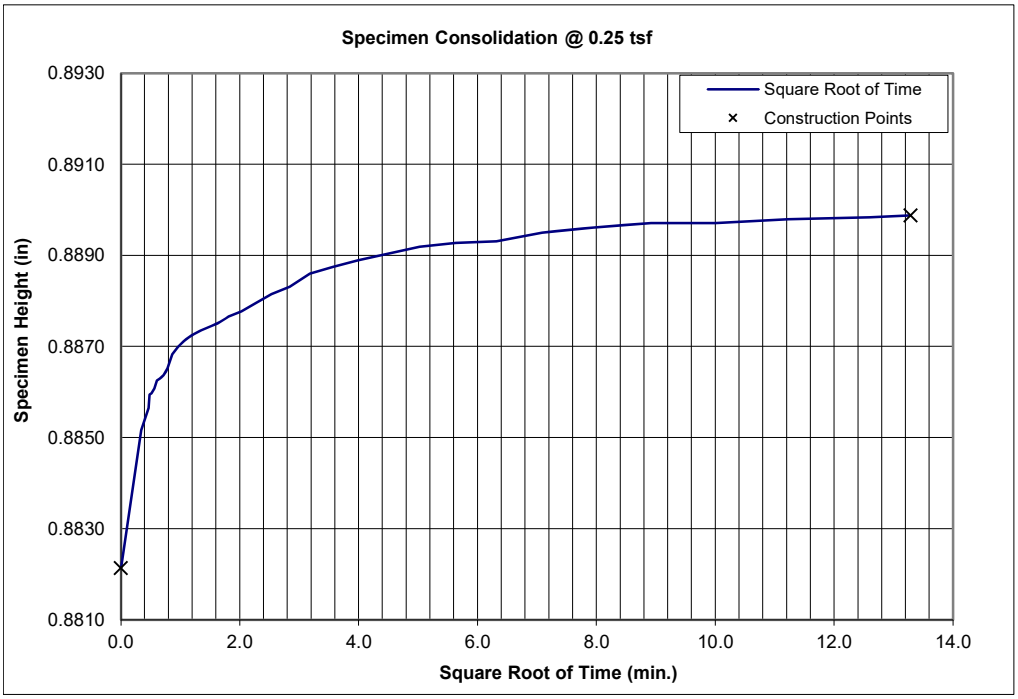
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	0.25
Actual Load (tsf)	0.27
Cycle	Unload
Start Date	11/02/2021
Start Time	12:39
End Date	11/02/2021
End Time	15:35



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8821
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	176.6	0.8899

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8821	5.02	0.8892				
0.34	0.8852	5.64	0.8893				
0.47	0.8857	6.32	0.8893				
0.48	0.8859	7.09	0.8895				
0.52	0.8860	7.95	0.8896				
0.56	0.8861	8.92	0.8897				
0.61	0.8863	10.01	0.8897				
0.66	0.8863	11.23	0.8898				
0.72	0.8864	12.59	0.8898				
0.79	0.8865	13.29	0.8899				
0.87	0.8868						
0.96	0.8870						
1.06	0.8871						
1.18	0.8872						
1.31	0.8873						
1.45	0.8874						
1.62	0.8875						
1.81	0.8877						
2.03	0.8878						
2.27	0.8880						
2.54	0.8881						
2.84	0.8883						
3.18	0.8886						
3.57	0.8887						
4.00	0.8889						
4.5	0.8891						

Comments

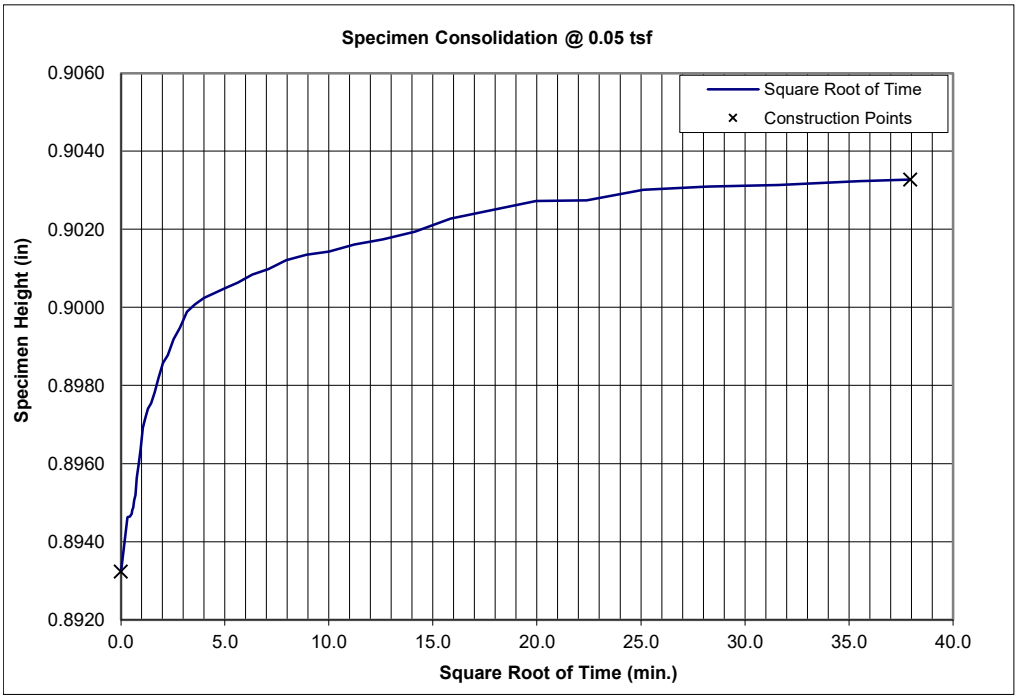
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 46.4'-46.7'
Description: Silt with Sand (ML), gray, moist, soft

Project No.	178568003
Lab ID	1344
Nominal Load (tsf)	0.05
Actual Load (tsf)	0.07
Cycle	Final
Start Date	11/02/2021
Start Time	15:35
End Date	11/03/2021
End Time	15:35



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8932
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	1440.0	0.9033

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8932	5.02	0.9005				
0.32	0.8946	5.63	0.9006				
0.45	0.8946	6.32	0.9008				
0.48	0.8947	7.09	0.9010				
0.52	0.8947	7.95	0.9012				
0.55	0.8948	8.92	0.9013				
0.59	0.8949	10.01	0.9014				
0.65	0.8951	11.23	0.9016				
0.71	0.8952	12.59	0.9017				
0.77	0.8956	14.13	0.9019				
0.86	0.8960	15.85	0.9023				
0.95	0.8964	17.79	0.9025				
1.06	0.8969	19.96	0.9027				
1.17	0.8971	22.39	0.9027				
1.30	0.8974	25.12	0.9030				
1.45	0.8975	28.19	0.9031				
1.62	0.8978	31.63	0.9031				
1.81	0.8982	35.50	0.9032				
2.02	0.8986	37.95	0.9033				
2.27	0.8988						
2.54	0.8992						
2.84	0.8995						
3.18	0.8999						
3.57	0.9001						
4.00	0.9002						
4.5	0.9004						

Comments

Stantec

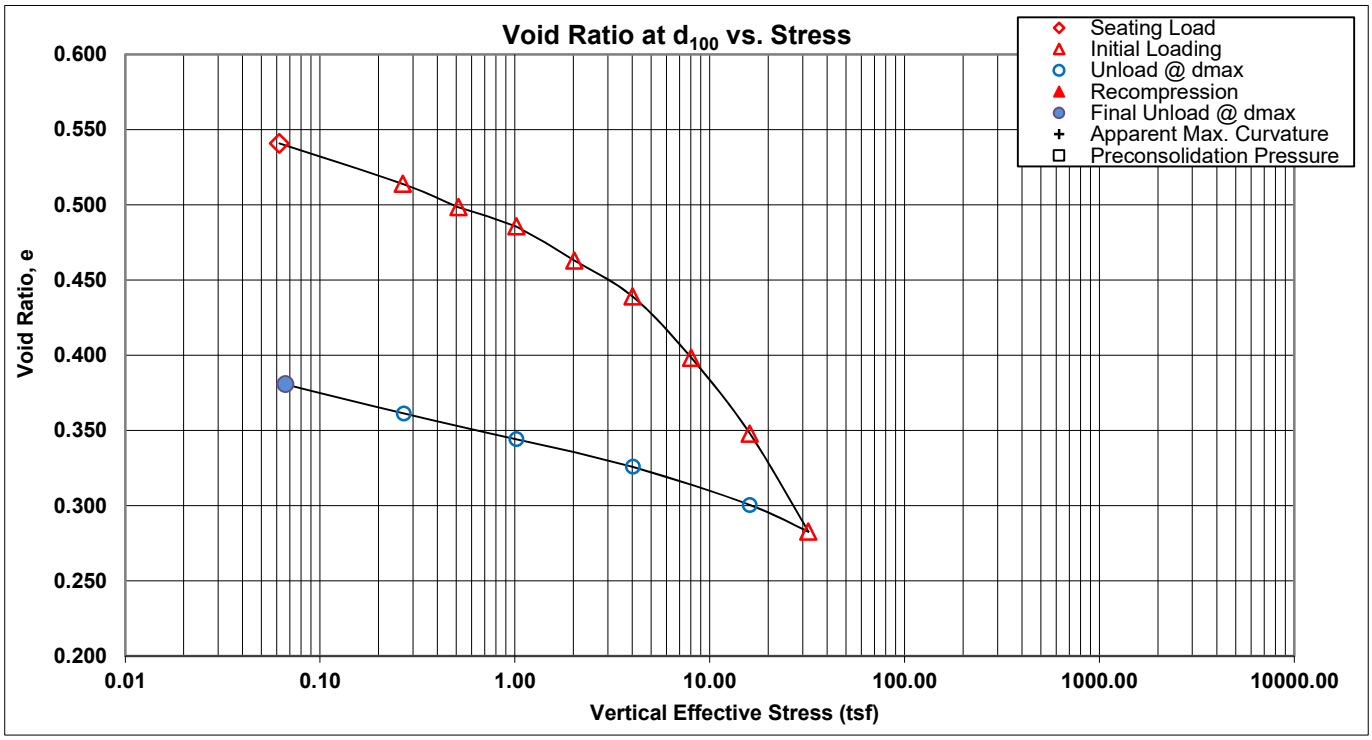
One Dimensional Consolidation of Soils Using Incremental Loading

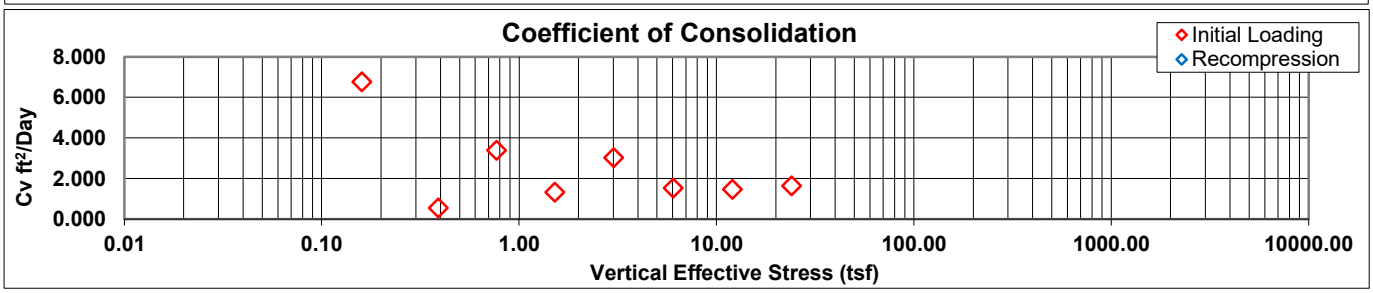
ASTM D 2435

Project Name	Bridging KY - 054B00009N	Project No.	178568003
Source	054B00009N-2, 77.0'-77.3'	Lab ID	1347
Description	Sandy Silty Clay (CL-ML), gray, moist, soft	Date Received	10/25/2021
Specimen Type	Undisturbed		

LL	22	Specific Gravity	2.65 ASTM D 854, Dry	Prepared	Using Cutting Ring
PL	17			Test Method	B - for 30 min.
PI	5			Test Condition	Inundated at 0.05 tsf

Initial Specimen Conditions		Final Specimen Conditions	
Moisture Content (%)	20.7	Moisture Content (%)	16.3
Dry Unit Weight (pcf)	107.1	Dry Unit Weight (pcf)	119.6
Void Ratio	0.541	Void Ratio	0.381
Degree of Saturation (%)	101.4	Degree of Saturation (%)	113.1
Initial Specimen Height (in)	0.9945	Final Specimen Height (in)	0.8911
Equivalent Height of Solids (in)	0.645	Preconsolidation Pressure* (tsf)	
		Void Ratio @ Preconsolidation Pressure	





Comments

Reviewed By KG

Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Project No.: 178568003
Source: 054B00009N-2, 77.0'-77.3'
Lab ID: 1347
Description: Sandy Silty Clay (CL-ML), gray, moist, soft
Date Received: 10/25/2021
Specimen Type: Undisturbed

Load Increment tsf σ_v	Specimen Height (in) @ d_0	Specimen Height (in) @ d_{100}	Void Ratio e @ d_{100}	Specimen Height (in) @ d_{max}	Void Ratio e @ d_{max}	Load At Cv tsf	Specimen Height (in) @ d_{50}	Fitting Time** (min) @ t_{50}	Fitting Time** (min) @ t_{90}	Cv ft^2/day
0.06	0.9945	----	----	----	----	----	----	----	----	----
0.27	0.9870	0.9771	0.514	0.9737	0.509	0.16	0.9821		0.3	6.759
0.51	0.9702	0.9671	0.498	0.9663	0.497	0.39	0.9686		3.6	0.551
1.02	0.9623	0.9588	0.486	0.9572	0.483	0.77	0.9606		0.6	3.387
2.02	0.9500	0.9442	0.463	0.9413	0.458	1.52	0.9471		1.4	1.321
4.03	0.9340	0.9288	0.439	0.9243	0.432	3.02	0.9314		0.6	3.023
8.03	0.9160	0.9025	0.398	0.8979	0.391	6.03	0.9092		1.1	1.531
16.07	0.8850	0.8700	0.348	0.8644	0.339	12.05	0.8775		1.1	1.453
32.09	0.8480	0.8279	0.283	0.8235	0.276	24.08	0.8379		0.9	1.632
16.06	0.8305			0.8393	0.300					
4.03	0.8461			0.8558	0.326					
1.02	0.8592			0.8676	0.344					
0.27	0.8702			0.8786	0.361					
0.07	0.8818			0.8911	0.381					

Testing Details:

Consolidation Press ID: CON-10
Trimming Ring ID: GS-81
Initial MC from Trimmings (%): 19.2
Final Differential Height (in): -0.026
Test Start Date: 11/01/2021
Technician: KG
Test End Date: 11/05/2021
Technician: KG

When available, all other tests performed in association with this specimen are reported separately.
* When presented, The preconsolidation pressure evaluated using the Casagrande Method, as per ASTM D 2435.
** Cv Computation Methods:

@ t_{50}, Cv calculated using Log Time Method.

@ t_{90}, Cv calculated using Square Root of Time Method.

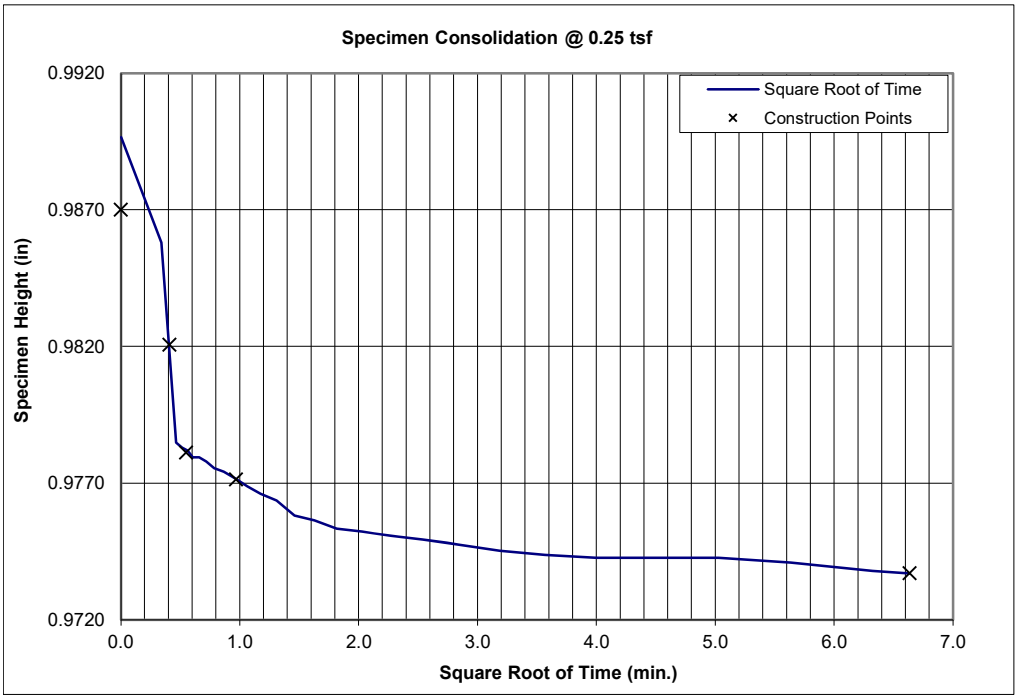
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	0.25
Actual Load (tsf)	0.27
Cycle	Load
Start Date	11/01/2021
Start Time	15:01
End Date	11/01/2021
End Time	15:45



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9870
@ t_{50}	0.2	0.9821
@ t_{90}	0.3	0.9781
@ t_{100}	0.9	0.9771
@ t_{max}	44.0	0.9737

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9897	5.03	0.9743				
0.34	0.9858	5.64	0.9741				
0.47	0.9785	6.32	0.9738				
0.48	0.9784	6.64	0.9737				
0.52	0.9783						
0.56	0.9782						
0.61	0.9779						
0.66	0.9779						
0.72	0.9778						
0.79	0.9775						
0.87	0.9774						
0.96	0.9772						
1.06	0.9769						
1.18	0.9766						
1.31	0.9764						
1.46	0.9758						
1.63	0.9756						
1.82	0.9753						
2.03	0.9752						
2.27	0.9751						
2.54	0.9749						
2.84	0.9747						
3.19	0.9745						
3.57	0.9744						
4.00	0.9743						
4.5	0.9743						

Comments

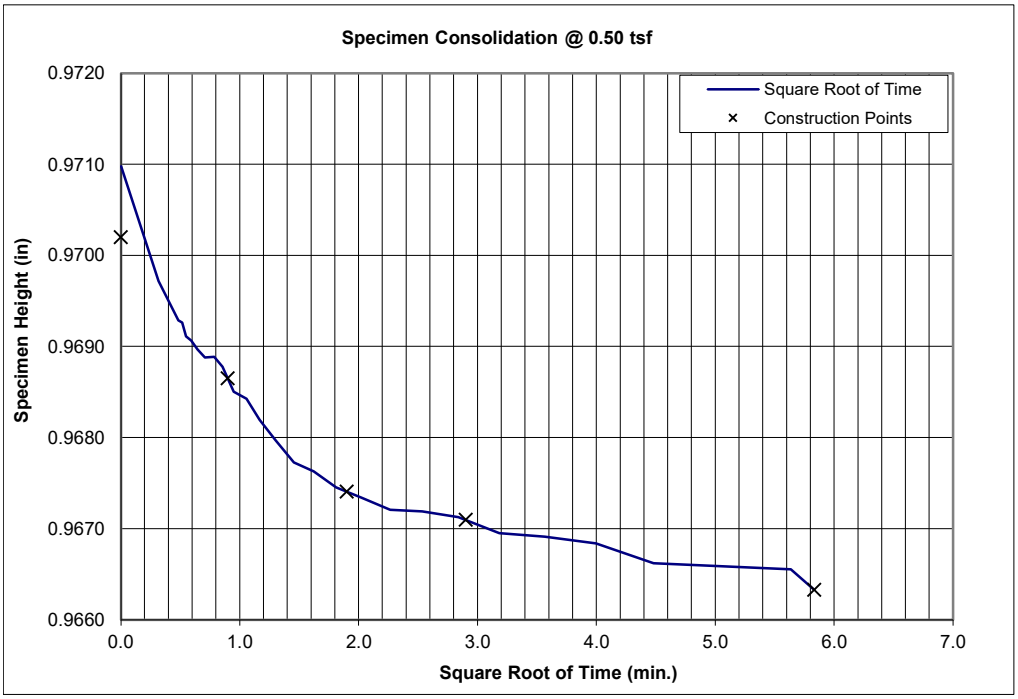
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	0.5
Actual Load (tsf)	0.51
Cycle	Load
Start Date	11/01/2021
Start Time	15:45
End Date	11/01/2021
End Time	16:19



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9702
@ t_{50}	0.8	0.9686
@ t_{90}	3.6	0.9674
@ t_{100}	8.4	0.9671
@ t_{max}	34.0	0.9663

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9710	5.63	0.9666				
0.32	0.9697	5.83	0.9663				
0.48	0.9693						
0.52	0.9693						
0.55	0.9691						
0.59	0.9691						
0.65	0.9690						
0.71	0.9689						
0.79	0.9689						
0.86	0.9688						
0.95	0.9685						
1.06	0.9684						
1.17	0.9682						
1.30	0.9680						
1.45	0.9677						
1.62	0.9676						
1.81	0.9675						
2.02	0.9673						
2.27	0.9672						
2.54	0.9672						
2.84	0.9671						
3.18	0.9669						
3.57	0.9669						
4.00	0.9668						
4.48	0.9666						
5.0	0.9666						

Comments

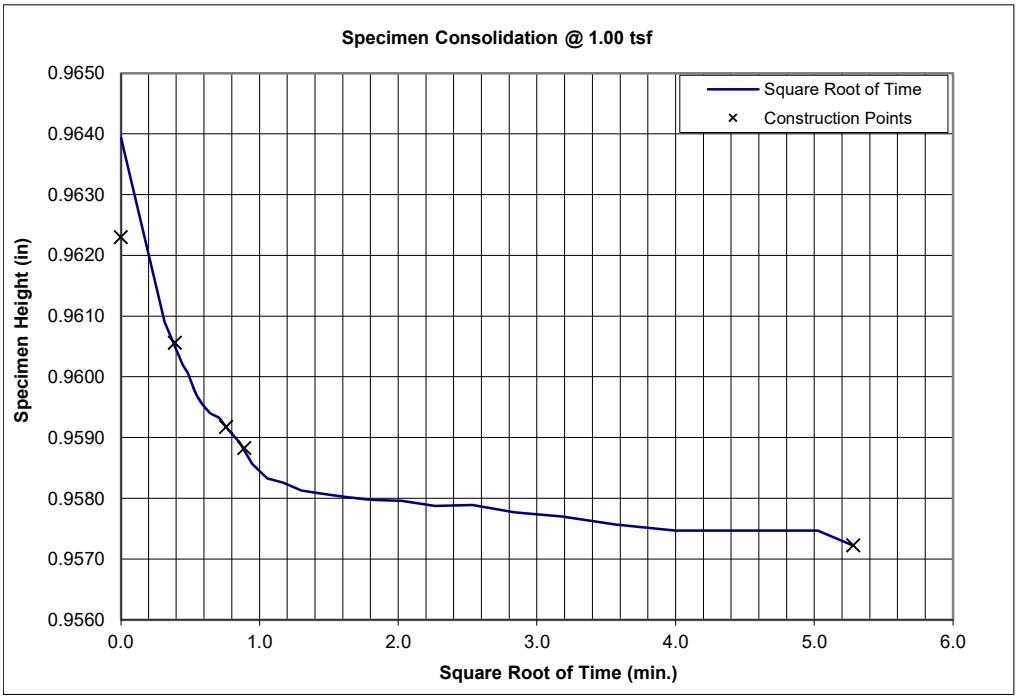
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	1
Actual Load (tsf)	1.02
Cycle	Load
Start Date	11/01/2021
Start Time	16:19
End Date	11/01/2021
End Time	16:47



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9623
@ t_{50}	0.2	0.9606
@ t_{90}	0.6	0.9592
@ t_{100}	0.8	0.9588
@ t_{max}	27.9	0.9572

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9639	5.02	0.9575				
0.32	0.9609	5.28	0.9572				
0.45	0.9602						
0.48	0.9601						
0.52	0.9599						
0.55	0.9597						
0.59	0.9595						
0.65	0.9594						
0.71	0.9593						
0.77	0.9591						
0.86	0.9589						
0.95	0.9586						
1.06	0.9583						
1.17	0.9583						
1.30	0.9581						
1.45	0.9581						
1.62	0.9580						
1.81	0.9580						
2.02	0.9580						
2.27	0.9579						
2.54	0.9579						
2.84	0.9578						
3.18	0.9577						
3.57	0.9576						
4.00	0.9575						
4.5	0.9574						

Comments

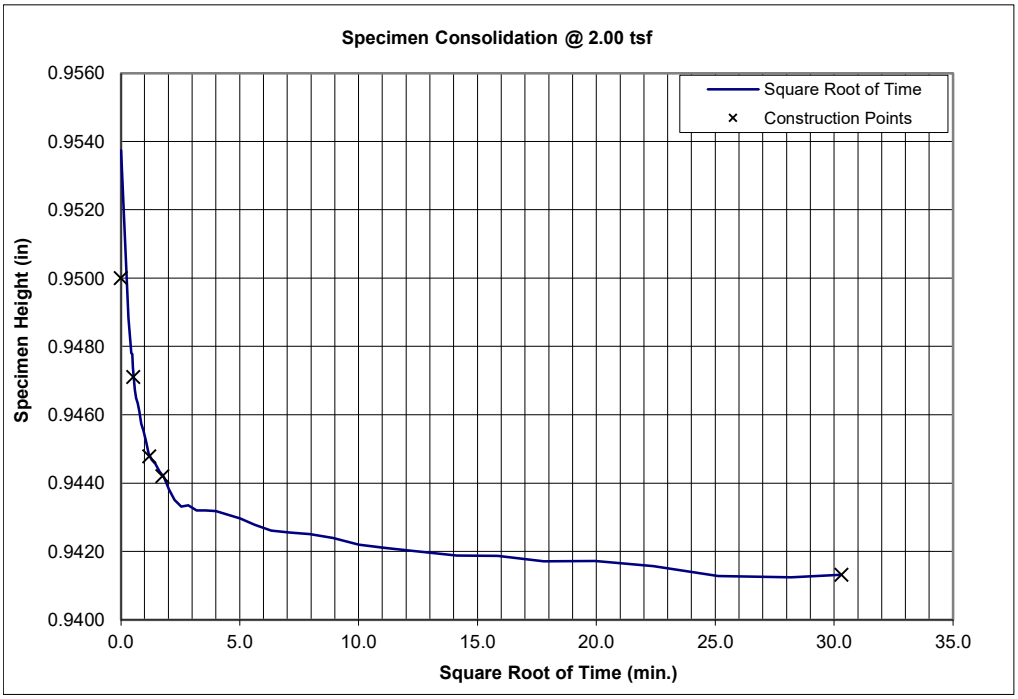
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	2
Actual Load (tsf)	2.02
Cycle	Load
Start Date	11/01/2021
Start Time	16:47
End Date	11/02/2021
End Time	8:06



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9500
@ t_{50}	0.3	0.9471
@ t_{90}	1.4	0.9448
@ t_{100}	3.1	0.9442
@ t_{max}	918.5	0.9413

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9538	5.02	0.9430				
0.32	0.9488	5.63	0.9428				
0.45	0.9478	6.32	0.9426				
0.48	0.9478	7.09	0.9426				
0.52	0.9474	7.95	0.9425				
0.55	0.9471	8.92	0.9424				
0.59	0.9467	10.01	0.9422				
0.65	0.9465	11.23	0.9421				
0.71	0.9463	12.59	0.9420				
0.79	0.9461	14.13	0.9419				
0.86	0.9457	15.85	0.9419				
0.95	0.9455	17.79	0.9417				
1.06	0.9452	19.96	0.9417				
1.17	0.9449	22.39	0.9416				
1.30	0.9447	25.12	0.9413				
1.45	0.9446	28.19	0.9412				
1.62	0.9443	30.31	0.9413				
1.81	0.9442						
2.02	0.9438						
2.27	0.9435						
2.54	0.9433						
2.84	0.9433						
3.18	0.9432						
3.57	0.9432						
4.00	0.9432						
4.5	0.9430						

Comments

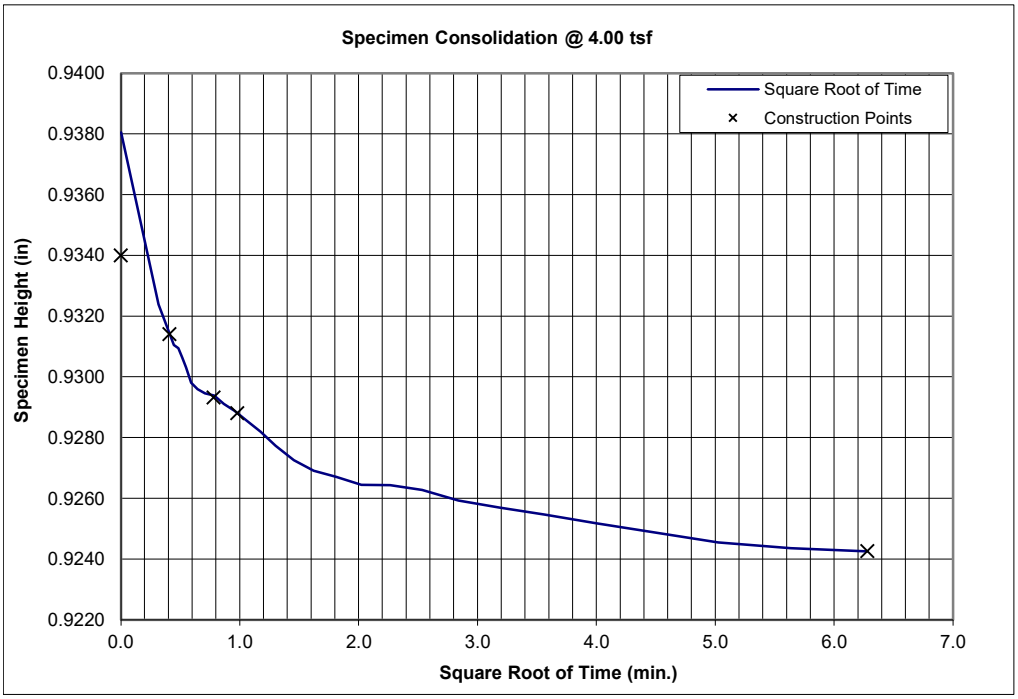
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	4
Actual Load (tsf)	4.03
Cycle	Load
Start Date	11/02/2021
Start Time	8:06
End Date	11/02/2021
End Time	8:45



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9340
@ t_{50}	0.2	0.9314
@ t_{90}	0.6	0.9293
@ t_{100}	1.0	0.9288
@ t_{max}	39.4	0.9243

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9381	5.02	0.9245				
0.32	0.9324	5.63	0.9244				
0.45	0.9310	6.28	0.9243				
0.48	0.9309						
0.52	0.9306						
0.55	0.9303						
0.59	0.9298						
0.65	0.9296						
0.71	0.9295						
0.79	0.9294						
0.87	0.9291						
0.96	0.9289						
1.06	0.9286						
1.18	0.9282						
1.30	0.9277						
1.45	0.9273						
1.62	0.9269						
1.81	0.9267						
2.02	0.9264						
2.27	0.9264						
2.54	0.9263						
2.84	0.9259						
3.18	0.9257						
3.57	0.9255						
4.00	0.9252						
4.5	0.9249						

Comments

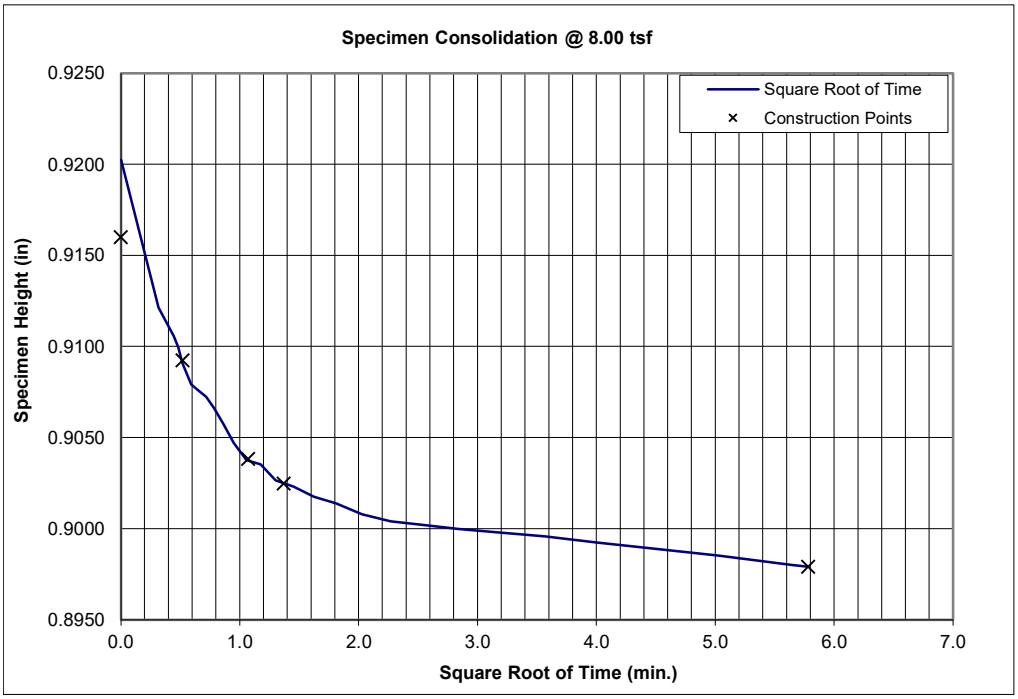
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	8
Actual Load (tsf)	8.03
Cycle	Load
Start Date	11/02/2021
Start Time	8:45
End Date	11/02/2021
End Time	9:19



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.9160
@ t_{50}	0.3	0.9092
@ t_{90}	1.1	0.9038
@ t_{100}	1.9	0.9025
@ t_{max}	33.4	0.8979

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.9203	5.02	0.8985				
0.32	0.9121	5.64	0.8980				
0.45	0.9105	5.78	0.8979				
0.48	0.9099						
0.52	0.9091						
0.55	0.9086						
0.59	0.9079						
0.65	0.9076						
0.72	0.9072						
0.79	0.9066						
0.87	0.9057						
0.95	0.9047						
1.06	0.9038						
1.18	0.9035						
1.30	0.9026						
1.45	0.9023						
1.62	0.9017						
1.81	0.9014						
2.03	0.9008						
2.27	0.9004						
2.54	0.9002						
2.84	0.9000						
3.18	0.8998						
3.57	0.8996						
4.00	0.8992						
4.5	0.8990						

Comments

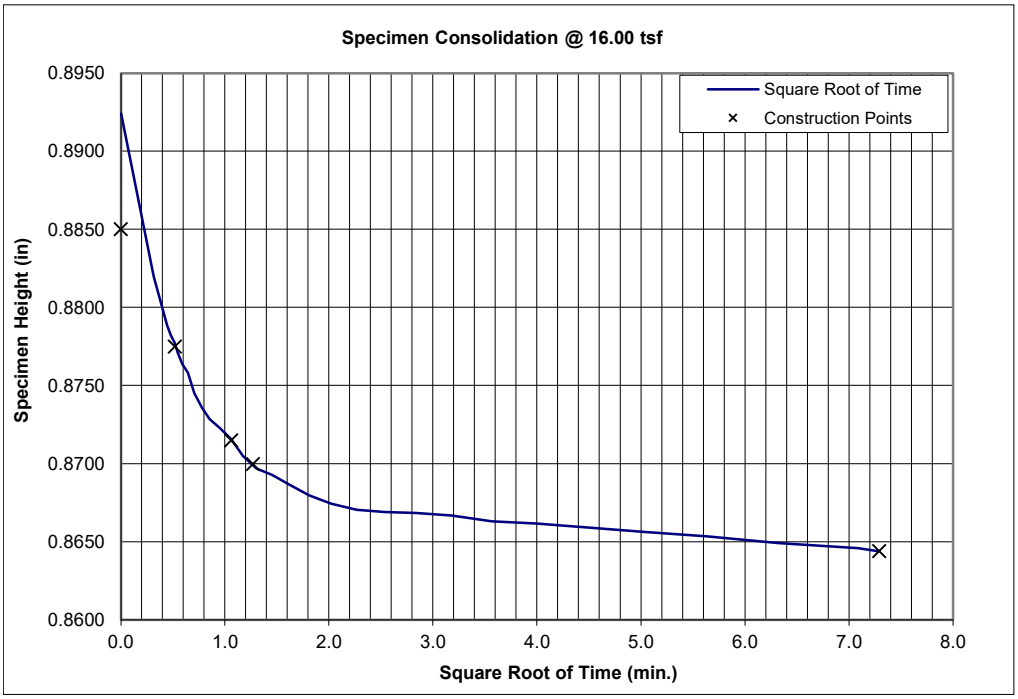
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	16
Actual Load (tsf)	16.07
Cycle	Load
Start Date	11/02/2021
Start Time	9:19
End Date	11/02/2021
End Time	10:12



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8850
@ t_{50}	0.3	0.8775
@ t_{90}	1.1	0.8715
@ t_{100}	1.6	0.8700
@ t_{max}	53.1	0.8644

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8924	5.02	0.8656				
0.32	0.8820	5.64	0.8653				
0.45	0.8788	6.32	0.8649				
0.48	0.8782	7.09	0.8646				
0.52	0.8778	7.29	0.8644				
0.55	0.8771						
0.59	0.8764						
0.65	0.8758						
0.71	0.8745						
0.79	0.8735						
0.86	0.8728						
0.95	0.8723						
1.06	0.8716						
1.18	0.8705						
1.30	0.8697						
1.45	0.8693						
1.62	0.8686						
1.81	0.8680						
2.02	0.8674						
2.27	0.8670						
2.54	0.8669						
2.84	0.8668						
3.18	0.8667						
3.57	0.8663						
4.00	0.8662						
4.5	0.8659						

Comments

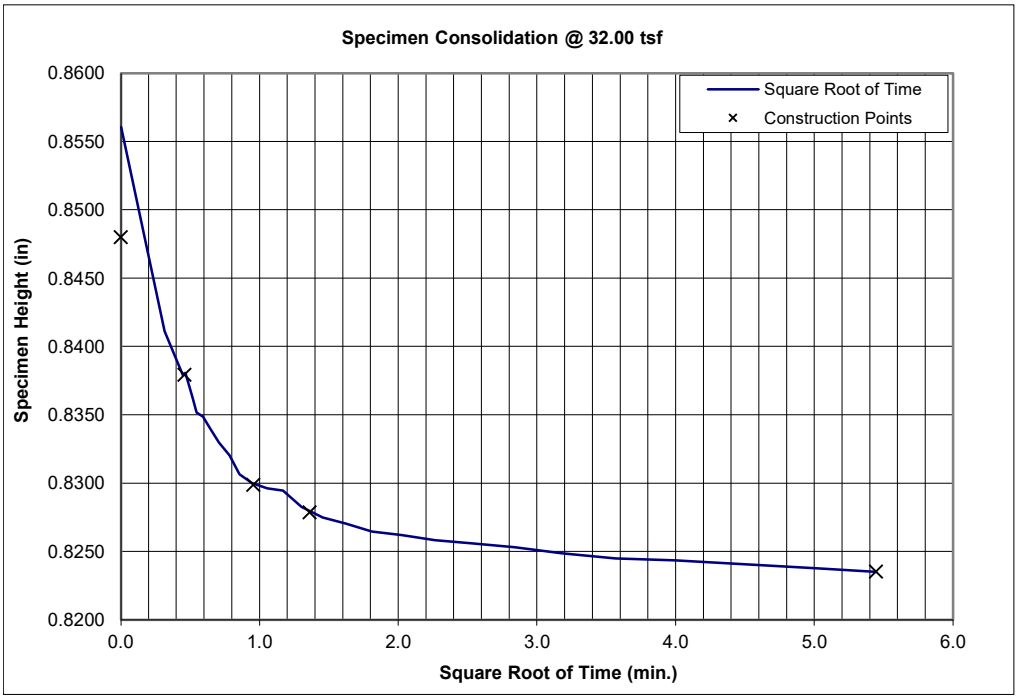
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name	Bridging KY - 054B00009N
Source	054B00009N-2, 77.0'-77.3'
Description	Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	32
Actual Load (tsf)	32.09
Cycle	Load
Start Date	11/02/2021
Start Time	10:12
End Date	11/02/2021
End Time	10:41



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8480
@ t_{50}	0.2	0.8379
@ t_{90}	0.9	0.8299
@ t_{100}	1.8	0.8279
@ t_{max}	29.6	0.8235

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8561	5.02	0.8237				
0.32	0.8411	5.45	0.8235				
0.45	0.8379						
0.47	0.8381						
0.52	0.8363						
0.55	0.8352						
0.59	0.8349						
0.65	0.8340						
0.71	0.8330						
0.79	0.8320						
0.86	0.8306						
0.95	0.8300						
1.06	0.8296						
1.17	0.8294						
1.30	0.8282						
1.45	0.8275						
1.62	0.8270						
1.81	0.8265						
2.02	0.8262						
2.27	0.8258						
2.54	0.8256						
2.84	0.8253						
3.18	0.8249						
3.57	0.8245						
4.00	0.8243						
4.5	0.8240						

Comments

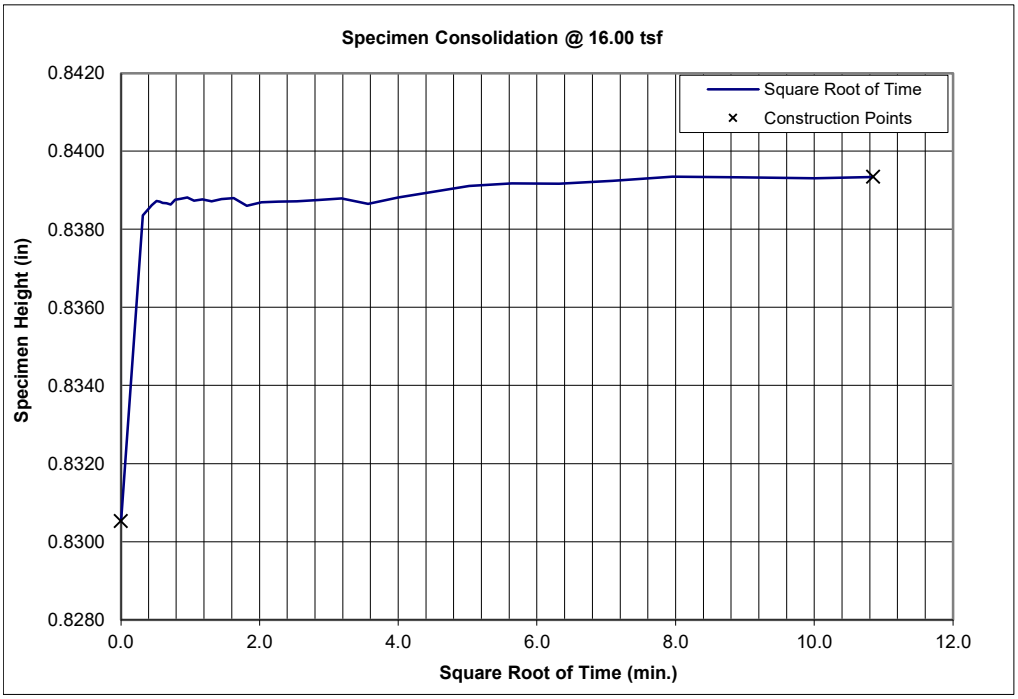
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	16
Actual Load (tsf)	16.06
Cycle	Unload
Start Date	11/02/2021
Start Time	10:41
End Date	11/02/2021
End Time	12:39



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8305
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	117.7	0.8393

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8305	5.03	0.8391				
0.32	0.8384	5.64	0.8392				
0.45	0.8386	6.32	0.8392				
0.48	0.8387	7.09	0.8392				
0.52	0.8387	7.95	0.8393				
0.56	0.8387	8.92	0.8393				
0.61	0.8387	10.01	0.8393				
0.66	0.8387	10.85	0.8393				
0.72	0.8386						
0.79	0.8388						
0.87	0.8388						
0.96	0.8388						
1.06	0.8387						
1.18	0.8388						
1.31	0.8387						
1.45	0.8388						
1.63	0.8388						
1.82	0.8386						
2.03	0.8387						
2.27	0.8387						
2.54	0.8387						
2.84	0.8388						
3.18	0.8388						
3.57	0.8387						
4.00	0.8388						
4.5	0.8389						

Comments

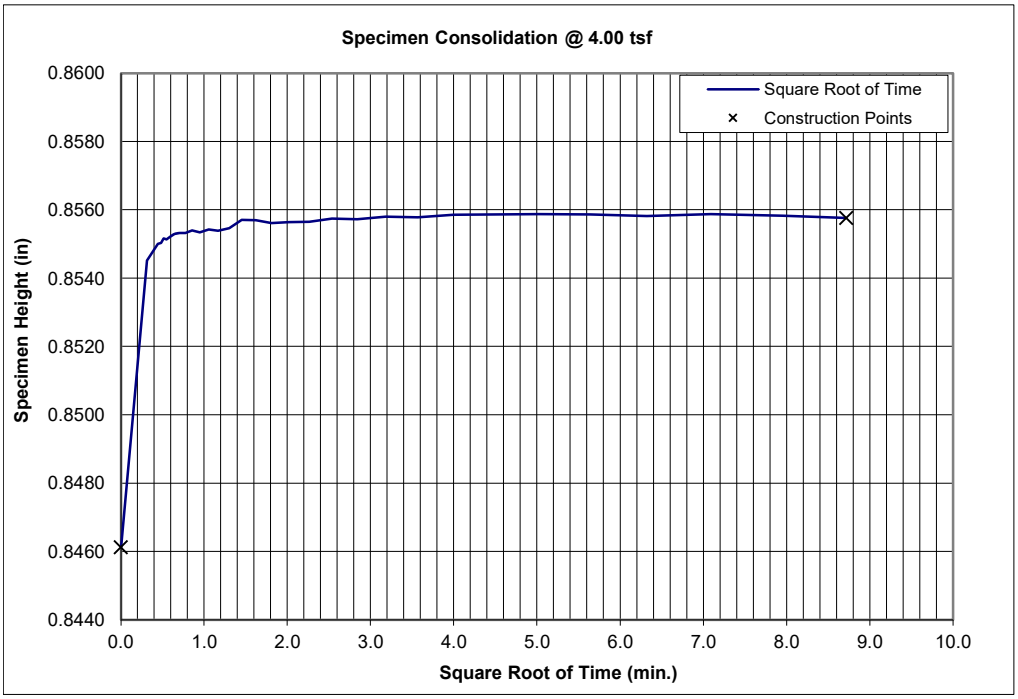
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	4
Actual Load (tsf)	4.03
Cycle	Unload
Start Date	11/02/2021
Start Time	12:39
End Date	11/02/2021
End Time	13:55



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8461
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	76.0	0.8558

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8461	5.02	0.8559				
0.32	0.8545	5.63	0.8559				
0.45	0.8550	6.32	0.8558				
0.48	0.8550	7.09	0.8559				
0.52	0.8552	7.95	0.8558				
0.55	0.8551	8.72	0.8558				
0.59	0.8552						
0.65	0.8553						
0.71	0.8553						
0.77	0.8553						
0.86	0.8554						
0.95	0.8553						
1.06	0.8554						
1.17	0.8554						
1.30	0.8555						
1.45	0.8557						
1.62	0.8557						
1.81	0.8556						
2.02	0.8556						
2.27	0.8556						
2.54	0.8557						
2.84	0.8557						
3.18	0.8558						
3.57	0.8558						
4.00	0.8559						
4.5	0.8558						

Comments

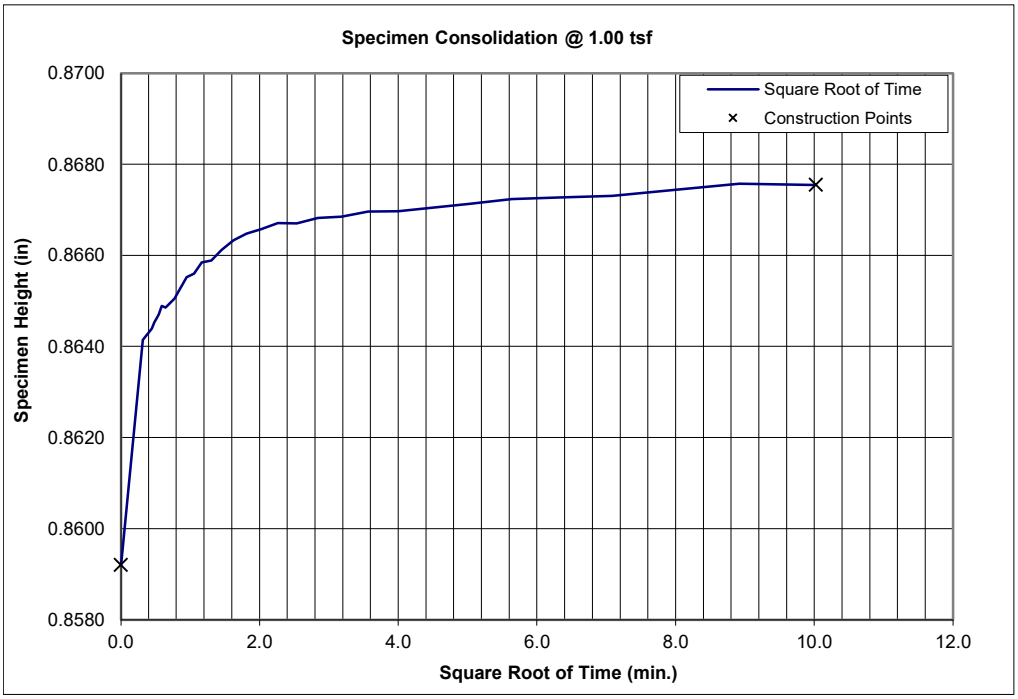
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	1
Actual Load (tsf)	1.02
Cycle	Unload
Start Date	11/02/2021
Start Time	13:55
End Date	11/02/2021
End Time	15:35



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8592
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	100.4	0.8676

Square Root of Time (min)	Spec. Height (in)
0.00	0.8592
0.32	0.8641
0.45	0.8644
0.48	0.8645
0.52	0.8646
0.55	0.8647
0.59	0.8649
0.65	0.8649
0.71	0.8649
0.77	0.8651
0.86	0.8653
0.95	0.8655
1.06	0.8656
1.17	0.8658
1.30	0.8659
1.45	0.8661
1.62	0.8663
1.81	0.8665
2.02	0.8666
2.27	0.8667
2.54	0.8667
2.84	0.8668
3.18	0.8668
3.57	0.8670
4.00	0.8670
4.5	0.8670

Square Root of Time (min)	Spec. Height (in)
5.02	0.8671
5.64	0.8672
6.32	0.8673
7.09	0.8673
7.95	0.8674
8.92	0.8676
10.01	0.8675
10.02	0.8676

Square Root of Time (min)	Spec. Height (in)

Square Root of Time (min)	Spec. Height (in)

Comments

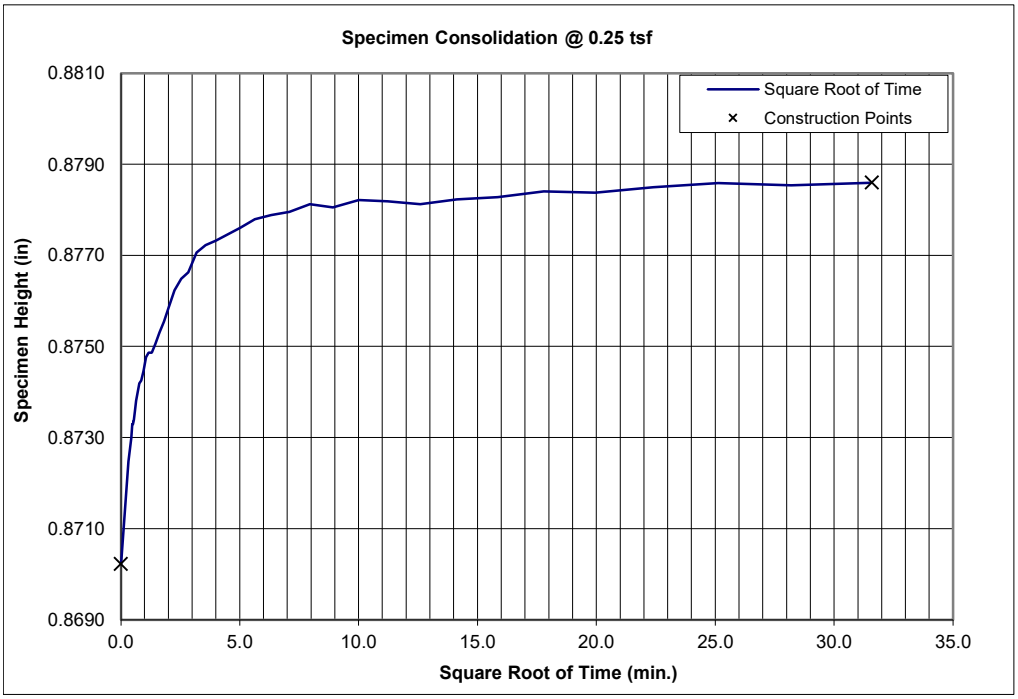
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	0.25
Actual Load (tsf)	0.27
Cycle	Unload
Start Date	11/02/2021
Start Time	15:35
End Date	11/03/2021
End Time	8:13



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8702
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	997.2	0.8786

Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8702	5.02	0.8776				
0.32	0.8725	5.63	0.8778				
0.45	0.8730	6.32	0.8779				
0.48	0.8733	7.09	0.8780				
0.52	0.8733	7.95	0.8781				
0.55	0.8734	8.92	0.8781				
0.59	0.8736	10.01	0.8782				
0.65	0.8738	11.23	0.8782				
0.71	0.8740	12.59	0.8781				
0.79	0.8742	14.13	0.8782				
0.86	0.8742	15.85	0.8783				
0.95	0.8745	17.79	0.8784				
1.06	0.8748	19.96	0.8784				
1.18	0.8749	22.39	0.8785				
1.30	0.8749	25.12	0.8786				
1.45	0.8750	28.19	0.8785				
1.62	0.8753	31.58	0.8786				
1.81	0.8755						
2.02	0.8759						
2.27	0.8762						
2.54	0.8765						
2.84	0.8766						
3.18	0.8771						
3.57	0.8772						
4.00	0.8773						
4.5	0.8775						

Comments

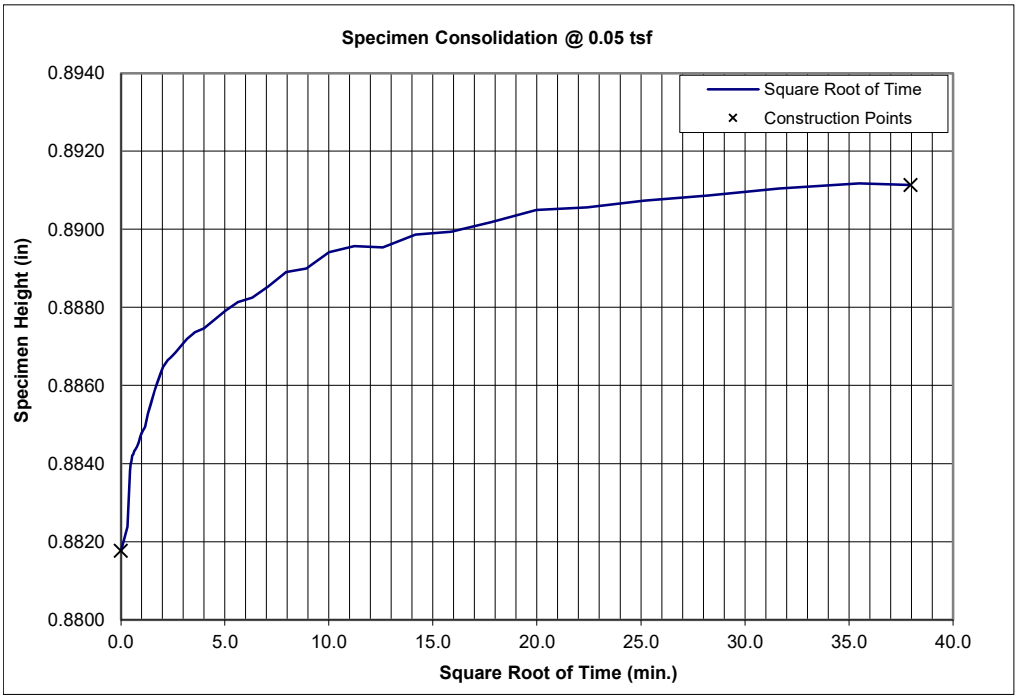
Stantec

One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name: Bridging KY - 054B00009N
Source: 054B00009N-2, 77.0'-77.3'
Description: Sandy Silty Clay (CL-ML), gray, moist, soft

Project No.	178568003
Lab ID	1347
Nominal Load (tsf)	0.05
Actual Load (tsf)	0.07
Cycle	Final
Start Date	11/03/2021
Start Time	8:13
End Date	11/04/2021
End Time	8:13



Time VS Deformation Results

	Elapsed Time (min)	Spec. Height (in)
@ t_0	0.0	0.8818
@ t_{50}		
@ t_{90}		
@ t_{100}		
@ t_{max}	1440.2	0.8911

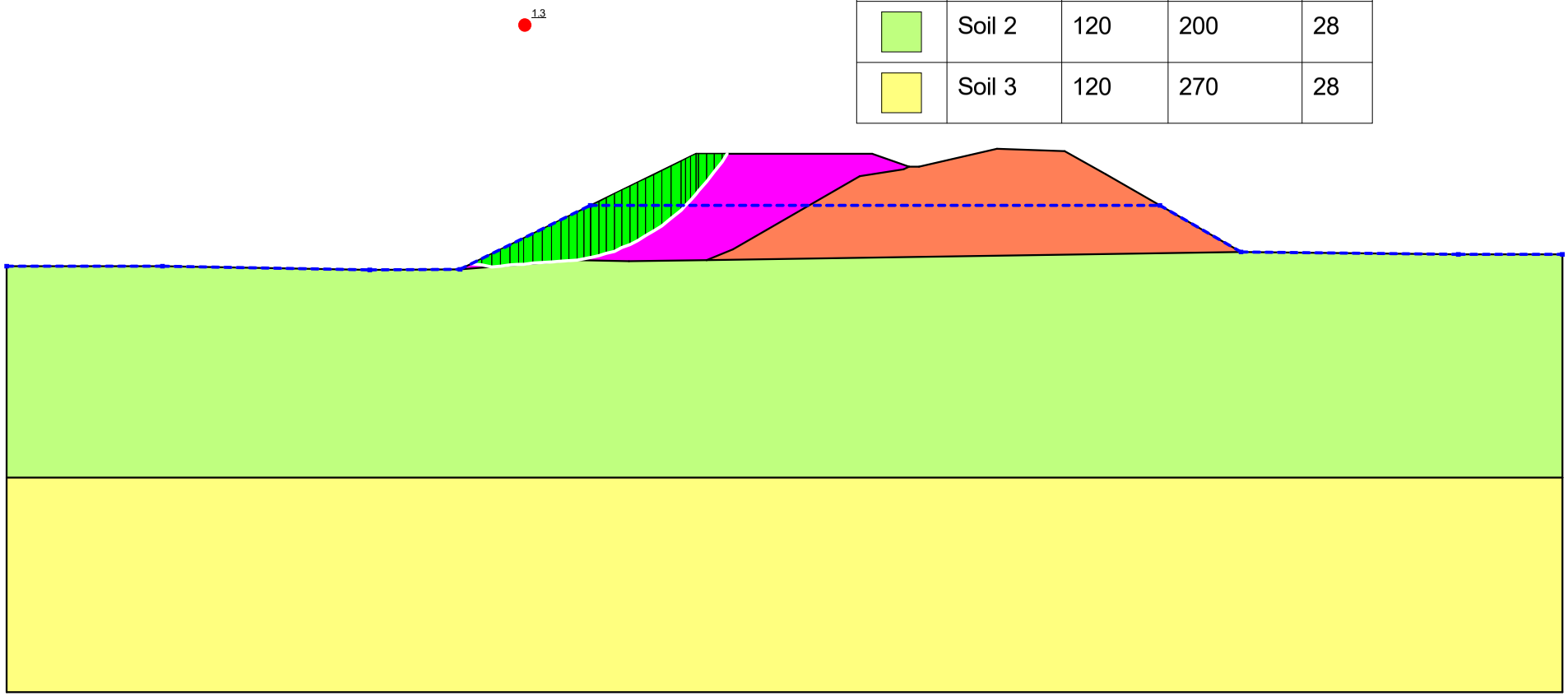
Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)	Square Root of Time (min)	Spec. Height (in)
0.00	0.8818	5.02	0.8879				
0.32	0.8824	5.63	0.8881				
0.45	0.8838	6.32	0.8883				
0.48	0.8840	7.09	0.8885				
0.50	0.8840	7.95	0.8889				
0.55	0.8842	8.92	0.8890				
0.59	0.8842	10.01	0.8894				
0.65	0.8843	11.23	0.8896				
0.71	0.8844	12.59	0.8895				
0.77	0.8844	14.17	0.8899				
0.86	0.8845	15.89	0.8899				
0.95	0.8847	17.82	0.8902				
1.06	0.8848	19.98	0.8905				
1.17	0.8849	22.41	0.8906				
1.30	0.8853	25.14	0.8907				
1.45	0.8855	28.20	0.8909				
1.62	0.8859	31.64	0.8910				
1.81	0.8862	35.50	0.8912				
2.02	0.8865	37.95	0.8911				
2.27	0.8866						
2.54	0.8868						
2.84	0.8870						
3.18	0.8872						
3.57	0.8874						
4.00	0.8875						
4.5	0.8877						

Comments

APPENDIX D
STABILITY ANALYSES

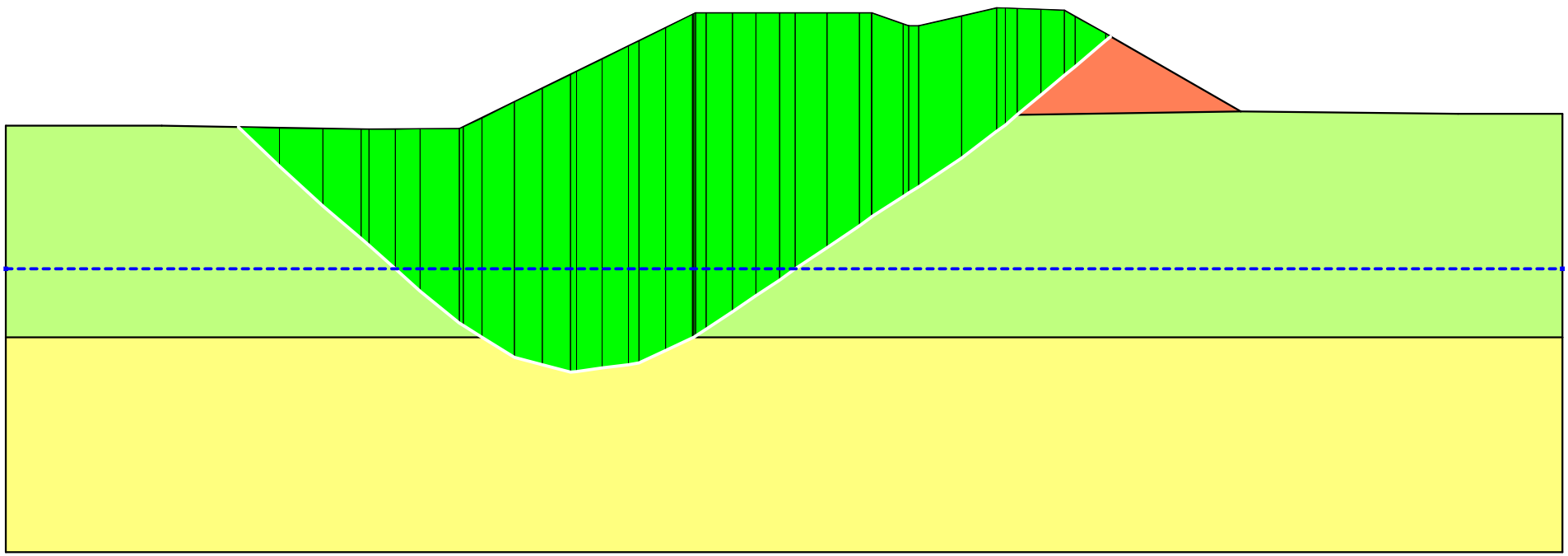
054B00009N
Hopkins Co,
Rapid Drawdown
Factor of Safety: 1.3
Radius: 29.932703 ft
Center: (-50, 423.33333) ft

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	New Embank Material	120	200	19
	Soil 1	120	200	27
	Soil 2	120	200	28
	Soil 3	120	270	28



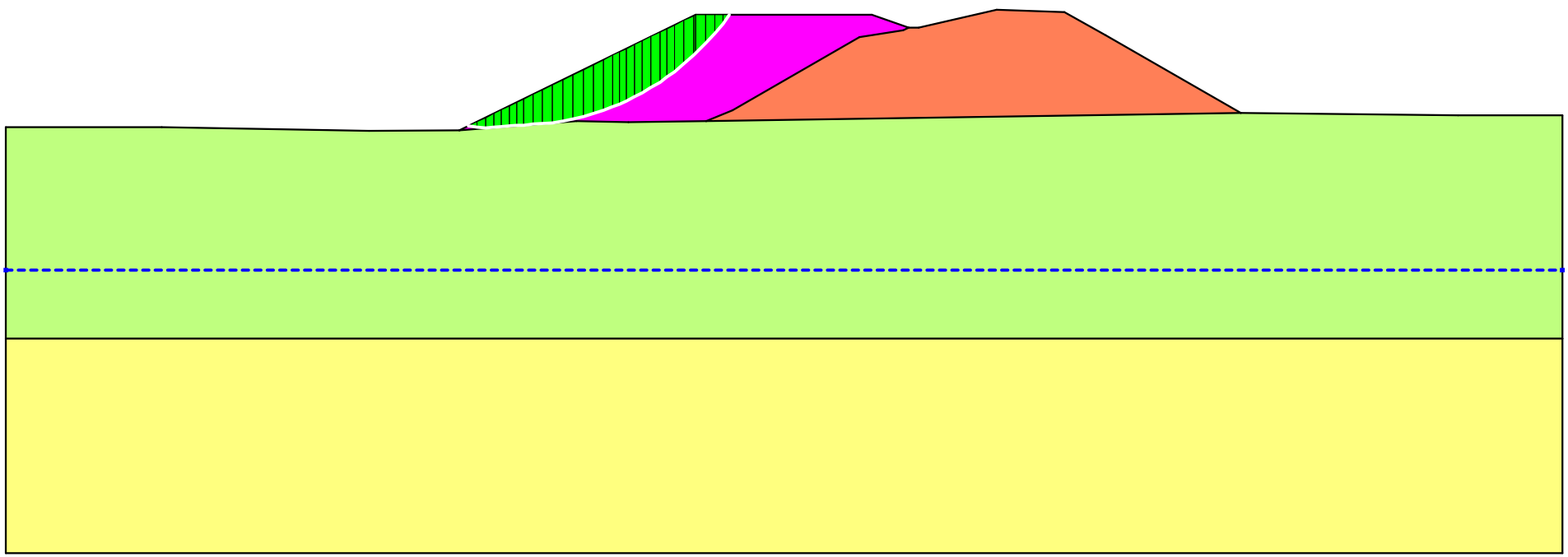
054B00009N
Hopkins Co,
Short-Term
Factor of Safety: 1.8
Radius: 78.423992 ft
Center: (-32, 432.66667) ft

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	New Embank Material	120	1,000	0
	Soil 1/Existing Embankment	120	1,000	0
	Soil 2	124	950	0
	Soil 3	120	1,025	0



054B00009N
Hopkins Co,
Long-Term
Factor of Safety: 1.6
Radius: 30.00126 ft
Center: (-62, 456) ft

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	New Embank Material	120	200	19
	Soil 1/Existing Embankment	120	200	27
	Soil 2	124	200	28
	Soil 3	120	270	28



APPENDIX E
IDEALIZED SOIL PROFILE

Idealized Subsurface Profiles.xls
1/25/2022

GENERAL SOIL PROFILE LEGEND SHEET

KY138 over Pond River

SUMMARY OF PARAMETERS DEVELOPED FOR SOIL PROFILES

Parameter	Units	Description
γ_t	lb/ft^3	Total Unit Weight
γ_e	lb/ft^3	Effective Unit Weight
q_U	lb/ft^2	Unconfined Compressive Strength (soil)
q_U	ton/ft^2	Unconfined Compressive Strength (rock)
C_U	lb/ft^2	Undrained Shear Strength
RQD	%	Rock Quality Designation
ϕ	(^{o})	Angle of Internal Friction
c	lb/ft^2	Effective stress cohesion
K_S	lb/in^3	Soil Secant Modulus - Static (computer program LPILE2016)
Em	ksi	Rock Modulus
ν		Poisson's Ratio
GSI		Geological Strength Index

GENERAL SOIL PROFILE

KY138 over Pond River

Based on Boring 054B00009N-2

Approximate Elevation (ft)	Depth (ft)	Description STRATA Description (USCS Classification)	Parameters	
374.7	0.0			
		Lean Clay	γ_t (lb/ft^3) = 124	above the water table
359.7	15.0	(CL)	$\gamma\varepsilon$ (lb/ft^3) = 61.6	below the water table
			Cu (lb/ft^2) = 950	
			K_S (lb/in^3) = 100	
334.7	40.0		E_{50} = 0.010	
		Silty Clay with Sand	γ_t (lb/ft^3) = 57.6	below the water table
		(CL-ML, CL)	Cu (lb/ft^2) = 1025	
			K_S (lb/in^3) = 100	
			E_{50} = 0.010	
279.7	95.0	Bottom of Hole		
		Silty Sand	γ_t (lb/ft^3) = 57.6	below the water table
		(SM)	ϕ (^{o}) = 34	
			k_s (lb/in^3) = 125	Below water table
275.2	99.5	Bottom of Hole		

GUARDRAIL DELIVERY VERIFICATION SHEET

Contract Id: _____ **Contractor: _____**

Section Engineer: _____ **District & County: _____**

DESCRIPTION	UNIT	QTY LEAVING PROJECT	QTY RECEIVED@BB YARD
GUARDRAIL (Includes End treatments & crash cushions)	LF	_____	_____
STEEL POSTS	EACH	_____	_____
STEEL BLOCKS	EACH	_____	_____
WOOD OFFSET BLOCKS	EACH	_____	_____
BACK UP PLATES	EACH	_____	_____
CRASH CUSHION	EACH	_____	_____
NUTS, BOLTS, WASHERS	BAG/BCKT	_____	_____
DAMAGED RAIL TO MAINT. FACILITY	LF	_____	_____
DAMAGED POSTS TO MAINT. FACILITY	EACH	_____	_____

****Required Signatures before Leaving Project Site***

Printed Section Engineer's Representative_____ & Date_____

Signature Section Engineer's Representative_____& Date_____

Printed Contractor's Representative_____& Date_____

Signature Contractor's Representative_____& Date_____

****Required Signatures after Arrival at Bailey Bridge Yard (All material on truck must be counted & the quantity received column completed before signatures)***

Printed Bailey Bridge Yard Representative_____ & Date_____

Signature Bailey Bridge Yard Representative_____& Date_____

Printed Contractor's Representative_____& Date_____

Signature Contractor's Representative_____& Date_____

**Payment for the bid item remove guardrail will be based upon the quantities shown in the Bailey Bridge Yard received column. Payment will not be made for guardrail removal until the guardrail verification sheets are electronically submitted to the Section Engineer by the Bailey Bridge Yard Representative.

Completed Form Submitted to Section Engineer Date: _____ By: _____

PART II

SPECIFICATIONS AND STANDARD DRAWINGS

STANDARD SPECIFICATIONS

Any reference in the plans or proposal to previous editions of the *Standard Specifications for Road and Bridge Construction* and *Standard Drawings* are superseded by *Standard Specifications for Road and Bridge Construction, Edition of 2019* and *Standard Drawings, Edition of 2020.*

SUPPLEMENTAL SPECIFICATIONS

The contractor shall use the Supplemental Specifications that are effective at the time of letting. The Supplemental Specifications can be found at the following link:
http://transportation.ky.gov/Construction/Pages/Kentucky-Standard-Specifications.aspx

1I

SPECIAL NOTE FOR PORTABLE CHANGEABLE MESSAGE SIGNS

This Special Note will apply when indicated on the plans or in the proposal.

1.0 DESCRIPTION. Furnish, install, operate, and maintain variable message signs at the locations shown on the plans or designated by the Engineer. Remove and retain possession of variable message signs when they are no longer needed on the project.

2.0 MATERIALS.

2.1 General. Use LED Variable Message Signs Class I, II, or III, as appropriate, from the Department's List of Approved Materials.

Unclassified signs may be submitted for approval by the Engineer. The Engineer may require a daytime and nighttime demonstration. The Engineer will make a final decision within 30 days after all required information is received.

2.2 Sign and Controls. All signs must:

1) Provide 3-line messages with each line being 8 characters long and at least 18 inches tall. Each character comprises 35 pixels.
2) Provide at least 40 preprogrammed messages available for use at any time. Provide for quick and easy change of the displayed message; editing of the message; and additions of new messages.
3) Provide a controller consisting of:
   a) Keyboard or keypad.
   b) Readout that mimics the actual sign display. (When LCD or LCD type readout is used, include backlighting and heating or otherwise arrange for viewing in cold temperatures.)
   c) Non-volatile memory or suitable memory with battery backup for storing pre-programmed messages.
   d) Logic circuitry to control the sequence of messages and flash rate.
4) Provide a serial interface that is capable of supporting complete remote control ability through land line and cellular telephone operation. Include communication software capable of immediately updating the message, providing complete sign status, and allowing message library queries and updates.
5) Allow a single person easily to raise the sign to a satisfactory height above the pavement during use, and lower the sign during travel.
6) Be Highway Orange on all exterior surfaces of the trailer, supports, and controller cabinet.
7) Provide operation in ambient temperatures from -30 to + 120 degrees Fahrenheit during snow, rain and other inclement weather.
8) Provide the driver board as part of a module. All modules are interchangeable, and have plug and socket arrangements for disconnection and reconnection. Printed circuit boards associated with driver boards have a conformable coating to protect against moisture.
9) Provide a sign case sealed against rain, snow, dust, insects, etc. The lens is UV stabilized clear plastic (polycarbonate, acrylic, or other approved material) angled to prevent glare.
10) Provide a flat black UV protected coating on the sign hardware, character PCB, and appropriate lens areas.
11) Provide a photocell control to provide automatic dimming.

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12) Allow an on-off flashing sequence at an adjustable rate.
13) Provide a sight to aim the message.
14) Provide a LED display color of approximately 590 nm amber.
15) Provide a controller that is password protected.
16) Provide a security device that prevents unauthorized individuals from accessing the controller.
17) Provide the following 3-line messages preprogrammed and available for use when the sign unit begins operation:

/KEEP/RIGHT/⇒⇒⇒/
/KEEP/LEFT/⇐⇐⇐/
/LOOSE/GRAVEL/AHEAD/
/RD WORK/NEXT/**MILES/
/TWO WAY/TRAFFIC/AHEAD/
/PAINT/CREW/AHEAD/
/REDUCE/SPEED/**MPH/
/BRIDGE/WORK/***0 FT/
/MAX/SPEED/**MPH/
/SURVEY/PARTY/AHEAD/
/MIN/SPEED/**MPH/
/ICY/BRIDGE/AHEAD/ /ONE LANE/BRIDGE/AHEAD/
/ROUGH/ROAD/AHEAD/
/MERGING/TRAFFIC/AHEAD/
/NEXT/***/MILES/
/HEAVY/TRAFFIC/AHEAD/
/SPEED/LIMIT/**MPH/
/BUMP/AHEAD/
/TWO/WAY/TRAFFIC/

*Insert numerals as directed by the Engineer.
Add other messages during the project when required by the Engineer.

2.3 Power.

1) Design solar panels to yield 10 percent or greater additional charge than sign consumption. Provide direct wiring for operation of the sign or arrow board from an external power source to provide energy backup for 21 days without sunlight and an on-board system charger with the ability to recharge completely discharged batteries in 24 hours.

3.0 CONSTRUCTION. Furnish and operate the variable message signs as designated on the plans or by the Engineer. Ensure the bottom of the message panel is a minimum of 7 feet above the roadway in urban areas and 5 feet above in rural areas when operating. Use Class I, II, or III signs on roads with a speed limit less than 55 mph. Use Class I or II signs on roads with speed limits 55 mph or greater.

Maintain the sign in proper working order, including repair of any damage done by others, until completion of the project. When the sign becomes inoperative, immediately repair or replace the sign. Repetitive problems with the same unit will be cause for rejection and replacement.

Use only project related messages and messages directed by the Engineer, unnecessary messages lessen the impact of the sign. Ensure the message is displayed in either one or 2 phases with each phase having no more than 3 lines of text. When no message is needed, but it is necessary to know if the sign is operable, flash only a pixel.

When the sign is not needed, move it outside the clear zone or where the Engineer directs. Variable Message Signs are the property of the Contractor and shall be removed from the project when no longer needed. The Department will not assume ownership of these signs.

4.0 MEASUREMENT. The final quantity of Variable Message Sign will be

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the actual number of individual signs acceptably furnished and operated during the project. The Department will not measure signs replaced due to damage or rejection.

5.0 PAYMENT. The Department will pay for the Variable Message Signs at the unit price each. The Department will not pay for signs replaced due to damage or rejection. Payment is full compensation for furnishing all materials, labor, equipment, and service necessary to, operate, move, repair, and maintain or replace the variable message signs. The Department will make payment for the completed and accepted quantities under the following:

Code	Pay Item	Pay Unit
02671	Portable Changeable Message Sign	Each

Effective June 15, 2012

SPECIAL PROVISION FOR EMBANKMENT AT BRIDGE END BENT STRUCTURES

This Special Provision will apply when indicated on the plans or in the proposal. Section references herein are to the Department's Standard Specifications for Road and Bridge Construction, Current Edition.

1.0 DESCRIPTION. Construct a soil, granular, or rock embankment with soil, granular or cohesive pile core and place structure granular backfill, as the Plans require. Construct the embankment according to the requirements of this Special Provision, the Plans, Standard Drawing RGX 100 and 105, and the Standard Specifications, Current Edition.

2.0 MATERIALS.

2.1 Granular Embankment. Conform to Subsection 805.10. When Granular Embankment materials are erodible or unstable according to Subsection 805.03.04, use the Special Construction Methods found in 3.2 of the Special Provision.

2.2 Rock Embankment. Provide durable rock from roadway excavation that consists principally of Unweathered Limestone, Durable Shale (SDI equal to or greater than 95 according to KM 64-513), or Durable Sandstone.

2.3 Pile Core. Provide a pile core in the area of the embankments where deep foundations are to be installed unless otherwise specified. The Pile Core is the zone indicated on Standard Drawings RGX 100 and 105 designated as Pile Core. Material control of the pile core area during embankment construction is always required. Proper Pile Core construction is required for installation of foundation elements such as drilled or driven piles or drilled shafts. The type of material used to construct the pile core is as directed in the plans or below. Typically, the pile core area will be constructed from the same material used to construct the surrounding embankment. Pile Core can be classified as one of three types:

A) Pile Core - Conform to Section 206 of the Standard Specifications. Provide pile core material consisting of the same material as the adjacent embankment except the material in the pile core area shall be free of boulders or particle sizes larger than 4 inches in any dimension or any other obstructions that may hinder pile driving operations. If the pile core material hinders pile driving operations, take the appropriate means necessary to reach the required pile tip elevation, at no expense to the Department.

B) Granular Pile Core. Granular pile core is required only when specified in the plans. Select a gradation of durable rock to facilitate pile driving that conforms to Subsection 805.11. If granular pile core material hinders pile driving operations, take appropriate means necessary to reach the required pile tip elevation, at no expense to the Department.

C) Cohesive Pile Core. Cohesive Pile Core is required only when specified in the plans. Conform to Section 206 of the Standard Specifications and use soil with at least 50 percent passing a No. 4 sieve having a minimum Plasticity Index (PI) of 10. In addition, keep the cohesive pile core free of boulders, larger than 4 inches in any dimension, or any other obstructions, which would interfere with drilling operations. If cohesive pile core material interferes with drilling operations, take appropriate means necessary to maintain excavation stability, at no expense to the Department.

2.4 Structure Granular Backfill. Conform to Subsection 805.11

2.5 Geotextile Fabric. Conform to Class 1 or Class 2 in Section 214 and 843.

3.0 CONSTRUCTION.

3.1 General. Construct roadway embankments at end bents according to Section 206 and in accordance with the Special Provision, the Plans, and Standard Drawings for the full embankment section. In some instances, granular or rock embankment will be required for embankment construction for stability purposes, but this special provision does not prevent the use of soil when appropriate. Refer to the plans for specific details regarding material requirements for embankment construction.
Place and compact the pile core and structure granular backfill according to the applicable density requirements for the project. If the embankment and pile core are dissimilar materials (i.e., a granular pile core is used with a soil embankment or a cohesive pile core is used with a granular embankment), a Geotextile Fabric, will be required between the pile core and embankment in accordance with Sections 214 and 843 of the Standard Specifications.

When granular or rock embankment is required for embankment construction, conform to the general requirements of Subsection 206.03.02 B. In addition, place the material in no greater than 2-foot loose lifts and compact with a vibrating smooth wheel roller capable of producing a minimum centrifugal force of 15 tons. Apply these requirements to the full width of the embankment for a distance of half the embankment height or 50 feet, whichever is greater, as shown on Standard Drawing RGX-105.

When using granular pile core, install 8-inch perforated underdrain pipe at or near the elevation of the original ground in the approximate locations depicted on the standard drawing, and as the Engineer directs, to ensure positive drainage of the embankment. Wrap the perforated pipe with a fabric of a type recommended by the pipe manufacturer.

After constructing the embankment, excavate for the end bent cap, drive piling, install shafts or other foundation elements, place the mortar bed, construct the end bent, and complete the embankment to finish grade according to the construction sequence shown on the Plans or Standard Drawings and as specified hereinafter.

Certain projects may require widening of existing embankments and the removal of substructures. Construct embankment according to the plans. Substructure removal shall be completed according to the plans and Section 203. Excavation may be required at the existing embankment in order to place the structure granular backfill as shown in the Standard Drawings.
After piles are driven or shafts installed (see design drawings), slope the bottom of the excavation towards the ends of the trench as noted on the plans for drainage. Using a separate pour, place concrete mortar, or any class concrete, to provide a base for forming and placing the cap. Place side forms for the end bent after the mortar has set sufficiently to support workmen and forms without being disturbed.

Install 4-inch perforated pipe in accordance with the plans and Standard Drawings. In the event slope protection extends above the elevation of the perforated pipe, extend the pipe through the slope protection.

After placing the end bent cap and achieving required concrete cylinder strengths, remove adjacent forms and fill the excavation with compacted structure granular backfill material (maximum 1’ loose lifts) to the level of the berm prior to placing beams for the bridge. Place a geotextile fabric between embankment material and structure granular backfill. After completing the end bent backwall, or after completing the span end wall, place the compacted structure granular backfill (maximum 1’

loose lifts) to subgrade elevation. If the original excavation is enlarged, fill the entire volume with compacted structure granular backfill (maximum 1' loose lifts) at no expense to the Department. Do not place backfill before removing adjacent form work. Place structure granular backfill material in trench ditches at the ends of the excavation. Place Geotextile Fabric, over the surface of the compacted structure granular backfill prior to placing aggregate base course.

Tamp the backfill with hand tampers, pneumatic tampers, or other means approved by the Engineer. Thoroughly compact the backfill under the overhanging portions of the structure to ensure that the backfill is in intimate contact with the sides of the structure.

Do not apply seeding, sodding, or other vegetation to the exposed granular embankment.

3.2 Special Construction Methods. Erodible or unstable materials may erode even when protected by riprap or channel lining; use the special construction method described below when using these materials.

Use fine aggregates or friable sandstone granular embankment at "dry land" structures only. Do not use them at stream crossings or locations subject to flood waters.

For erodible or unstable materials having 50 percent or more passing the No. 4 sieve, protect with geotextile fabric. Extend the fabric from the original ground to the top of slope over the entire area of the embankment slopes on each side of, and in front of, the end bent. Cover the fabric with at least 12 inches of non-erodible material.

For erodible or unstable materials having less than 50 percent passing a No. 4 sieve, cover with at least 12 inches of non-erodible material.

Where erodible or unstable granular embankment will be protected by riprap or channel lining, place a geotextile fabric between the embankment and the specified slope protection.

4.0 MEASUREMENT.

4.1 Granular Embankment. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The Department will not measure for payment any Granular Embankment that is not called for in the plans.

The Department will not measure for payment any special construction caused by using erodible or unstable materials and will consider it incidental to the Granular Embankment regardless of whether the erodible or unstable material was specified or permitted.

4.2 Rock Embankment. The Department will not measure for payment any rock embankment and will consider it incidental to roadway excavation or embankment in place, as applicable. Rock embankments will be constructed using granular embankment on projects where there is no available rock present within the excavation limits of the project.

4.3 Pile Core. Pile core will be measured and paid under roadway excavation or embankment in place, as applicable. The Department will not measure the pile core for separate payment. The Department will not measure for payment the 8-inch perforated underdrain pipe and will consider it incidental to the Pile Core.

4.4 Structure Granular Backfill. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The

Department will not measure any additional material required for backfill outside the limits shown on the Plans and Standard Drawings for payment and will consider it incidental to the work.

The Department will not measure for payment the 4-inch perforated underdrain pipe and will consider it incidental to the Structure Granular Backfill.

4.5 Geotextile Fabric. The Department will not measure the quantity of fabric used for separating dissimilar materials when constructing the embankment and pile core and will consider it incidental to embankment construction.

The Department will not measure for payment the Geotextile Fabric used to separate the Structure Granular Backfill from the embankment and aggregate base course and will consider it incidental to Structure Granular Backfill.

The Department will not measure for payment the Geotextile Fabric required for construction with erodible or unstable materials and will consider it incidental to embankment construction.

4.6 End Bent. The Department will measure the quantities according to the Contract. The Department will not measure furnishing and placing the 2-inch mortar or concrete bed for payment and will consider it incidental to the end bent construction.

4.7 Structure Excavation. The Department will not measure structure excavation on new embankments for payment and will consider it incidental to the Structure Granular Backfill or Concrete as applicable.

5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

Code	Pay Item	Pay Unit
02223	Granular Embankment	Cubic Yards
02231	Structure Granular Backfill	Cubic Yards

The Department will consider payment as full compensation for all work required in this provision.

August 5, 2019

PART III

EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

FHWA-1273 – Revised October 23, 2023

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). 23 CFR 633.102(e).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. 23 CFR 633.102(e).

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services) in accordance with 23 CFR 633.102. The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract). 23 CFR 633.102(b).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal Employment Opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (*see* 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140, shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract. 23 CFR 230.409 (g)(4) & (5).

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, sexual orientation, gender identity, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action or are substantially involved in such action, will be made fully cognizant of and will implement the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action

within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs (i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance). In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 23 CFR 230.409. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established thereunder. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors, suppliers, and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:
(1) Withholding monthly progress payments;
(2) Assessing sanctions;
(3) Liquidated damages; and/or
(4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women.

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of more than $10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, the contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location under the contractor's control where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of basic hourly wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act (40 U.S.C. 3141(2)(B)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided,* That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH–1321) must be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in 29 CFR part 1, a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

(i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

(ii) The classification is used in the area by the construction industry; and

(iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is used in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken will be sent by the contracting officer by email to *DBAconformance@dol.gov*. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(4) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer will, by email to *DBAconformance@dol.gov*, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

d. *Fringe benefits not expressed as an hourly rate.* Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. *Unfunded plans.* If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided,* That the Secretary of Labor has found, upon the written request of the contractor, in accordance with the criteria set forth in § 5.28, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

f. *Interest.* In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

2. Withholding (29 CFR 5.5)

a. *Withholding requirements.* The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with paragraph

2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

3. Records and certified payrolls (29 CFR 5.5)

a. *Basic record requirements* (1) *Length of record retention.* All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) *Information required.* Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) *Additional records relating to fringe benefits.* Whenever the Secretary of Labor has found under paragraph 1.e. of this section that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act, the contractor must maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

(4) *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. *Certified payroll requirements* (1) *Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) *Information required.* The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (*e.g.,* the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH–347 or in any other format desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division website at *https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347/.pdf* or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) *Statement of Compliance.* Each certified payroll submitted must be accompanied by a “Statement of Compliance,” signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR part 3; and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) *Use of Optional Form WH–347.* The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 will satisfy the requirement for submission of the “Statement of Compliance” required by paragraph 3.b.(3) of this section.

(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 3729.

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access* (1) *Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under 29 CFR part 6 any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

4. Apprentices and equal employment opportunity (29 CFR 5.5)

a. *Apprentices* (1) *Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeyworkers under this part must be in conformity with

the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

c. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeyworkers shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility. a. By entering into this contract, the contractor certifies that neither it nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, 18 U.S.C. 1001.

11. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or 29 CFR part 1 or 3; or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or 29 CFR part 1 or 3.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchpersons and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. 29 CFR 5.5.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph 1. of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or

mechanic, including watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1. of this section.

* $31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

3. Withholding for unpaid wages and liquidated damages

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

4. Subcontracts. The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

5. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

d. Informing any other person about their rights under CWHSSA or this part.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of $150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;.

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

* * * * *

3. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily

excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

* * * * *

4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B) This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS

EMPLOYMENT REQUIREMENTS
RELATING TO
NONDISCRIMINATION OF EMPLOYEES
(APPLICABLE TO FEDERAL-AID SYSTEM CONTRACTS)

AN ACT OF THE KENTUCKY GENERAL ASSEMBLY TO PREVENT DISCRIMINATION IN EMPLOYMENT

KRS CHAPTER 344
EFFECTIVE JUNE 16, 1972

The contract on this project, in accordance with KRS Chapter 344, provides that during the performance of this contract, the contractor agrees as follows:

1. The contractor shall not fail or refuse to hire, or shall not discharge any individual, or otherwise discriminate against an individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, national origin, sex, disability or age (forty and above); or limit, segregate, or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, national origin, sex, disability or age forty (40) and over. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor shall not print or publish or cause to be printed or published a notice or advertisement relating to employment by such an employer or membership in or any classification or referral for employment by the employment agency, indicating any preference, limitation, specification, or discrimination, based on race, color, religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, except that such a notice or advertisement may indicate a preference, limitation, or specification based on religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, when religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, is a bona fide occupational qualification for employment.

3. If the contractor is in control of apprenticeship or other training or retraining, including on-the-job training programs, he shall not discriminate against an individual because of his race, color, religion, national origin, sex, disability or age forty (40) and over, in admission to, or employment in any program established to provide apprenticeship or other training.

4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment. The contractor will take such action with respect to any subcontract or purchase order as the administrating agency may direct as a means of enforcing such provisions, including sanctions for non-compliance.

Revised: January 25, 2017

Standard Title VI/Non-Discrimination Assurances

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, **Federal Highway Administration**, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the **Federal Highway Administration** to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the **Federal Highway Administration**, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the **Federal Highway Administration** may determine to be appropriate, including, but not limited to:

    a. withholding payments to the contractor under the contract until the contractor complies; and/or
    b. cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the **Federal Highway Administration** may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

Standard Title VI/Non-Discrimination Statutes and Authorities

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21;
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 -- 12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

EXECUTIVE BRANCH CODE OF ETHICS

The Executive Branch Code of Ethics created by Kentucky Revised Statutes (KRS) Chapter 11A, effective July 14, 1992, establishes the ethical standards that govern the conduct of all executive branch employees. The Executive Branch Code of Ethics, which states, in part:

KRS 11A.040 (7) provides:

A present or former public servant listed in KRS 11A.010(9)(a) to (g) shall not, within one (1) year following termination of his or her office or employment, accept employment, compensation, or other economic benefit from any person or business that contracts or does business with, or is regulated by, the state in matters in which he was directly involved during the last thirty-six (36) months of his tenure. This provision shall not prohibit an individual from returning to the same business, firm, occupation, or profession in which he was involved prior to taking office or beginning his term of employment, or for which he received, prior to his state employment, a professional degree or license, provided that, for a period of one (1) year, he or she personally refrains from working on any matter in which he was directly involved during the last thirty-six (36) months of his or her tenure in state government. This subsection shall not prohibit the performance of ministerial functions, including but not limited to filing tax returns, filing applications for permits or licenses, or filing incorporation papers, nor shall it prohibit the former officer or public servant from receiving public funds disbursed through entitlement programs.

KRS 11A.040 (9) states:

A former public servant shall not represent a person or business before a state agency in a matter in which the former public servant was directly involved during the last thirty-six (36) months of his tenure, for a period of one (1) year after the latter of:

a) The date of leaving office or termination of employment; or
b) The date the term of office expires to which the public servant was elected.

This law is intended to promote public confidence in the integrity of state government and to declare as public policy the idea that state employees should view their work as a public trust and not to obtain private benefits.

If you have worked for the executive branch of state government within the past year, you may be subject to the law's prohibitions. The law's applicability may be different if you hold elected office or are contemplating representation of another before a state agency.

Also, if you are affiliated with a firm which does business with the state and which employs former state executive-branch employees, you should be aware that the law may apply to them.

In case of doubt, the law permits you to request an advisory opinion from the Executive Branch Ethics Commission, 1025 Capital Center Drive, Suite 105, Frankfort, Kentucky 40601; telephone (502) 564-7954.

Revised: March 11, 2025

"General Decision Number: KY20250040 05/16/2025

Superseded General Decision Number: KY20240040

State: Kentucky

Construction Type: Highway

Counties: Allen, Ballard, Butler, Caldwell, Calloway, Carlisle, Christian, Crittenden, Daviess, Edmonson, Fulton, Graves, Hancock, Henderson, Hickman, Hopkins, Livingston, Logan, Lyon, Marshall, McCracken, McLean, Muhlenberg, Ohio, Simpson, Todd, Trigg, Union, Warren and Webster Counties in Kentucky.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2025
1	02/28/2025
2	04/04/2025
3	05/16/2025

BRIN0004-002 06/01/2024

BALLARD, BUTLER, CALDWELL, CARLISLE, CRITTENDEN, DAVIESS, EDMONSON, FULTON, GRAVES, HANCOCK, HENDERSON, HICKMAN, HOPKINS, LIVINGSTON, LYON, MARSHALL, MCCRACKEN, MCLEAN, MUHLENBERG, OHIO, UNION, and WEBSTER COUNTIES

	Rates	Fringes
BRICKLAYER		
Ballard, Caldwell, Carlisle, Crittenden, Fulton, Graves, Hickman, Livingston, Lyon, Marshall, and McCracken Counties	$ 33.70	16.57
Butler, Edmonson, Hopkins, Muhlenberg, and Ohio Counties	$ 33.70	16.57
Daviess, Hancock, Henderson, McLean, Union, and Webster Counties	$ 33.70	16.57

BRTN0004-005 06/01/2024

ALLEN, CALLOWAY, CHRISTIAN, LOGAN, SIMPSON, TODD, TRIGG, and WARREN COUNTIES

	Rates	Fringes
BRICKLAYER	$ 33.70	16.57

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* CARP0357-002 04/01/2025

	Rates	Fringes
CARPENTER	$ 33.89	24.02
DIVER	$ 51.21	24.02
PILEDRIVERMAN	$ 34.39	24.02

ELEC0369-006 05/29/2024

BUTLER, EDMONSON, LOGAN, TODD & WARREN COUNTIES:

	Rates	Fringes
ELECTRICIAN	$ 37.88	21.38

ELEC0429-001 06/01/2024

ALLEN & SIMPSON COUNTIES:

	Rates	Fringes
ELECTRICIAN	$ 34.92	14.75

ELEC0816-002 06/01/2024

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON (Except a 5 mile radius of City Hall in Fulton), GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN & TRIGG COUNTIES:

	Rates	Fringes
ELECTRICIAN	$ 35.67	28%+8.60

Cable spicers receive $.25 per hour additional.

ELEC1701-003 07/01/2024

DAVIESS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, MUHLENBERG, OHIO, UNION & WEBSTER COUNTIES:

	Rates	Fringes
ELECTRICIAN	$ 37.10	8.60+30.8%

Cable spicers receive $.25 per hour additional.

ELEC1925-002 01/01/2025

FULTON COUNTY (Up to a 5 mile radius of City Hall in Fulton):

	Rates	Fringes
CABLE SPLICER	$ 28.85	15.50
ELECTRICIAN	$ 28.60	15.49

ENGI0181-017 07/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1	$ 40.05	19.10
GROUP 2	$ 37.19	19.10
GROUP 3	$ 37.64	19.10
GROUP 4	$ 36.87	19.10

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - A-Frame Winch Truck; Auto Patrol; Backfiller; Batcher Plant; Bituminous Paver; Bituminous Transfer Machine; Boom Cat; Bulldozer; Mechanic; Cableway; Carry-All Scoop; Carry Deck Crane; Central Compressor Plant; Cherry Picker; Clamshell; Concrete Mixer (21 cu. ft. or Over); Concrete Paver; Truck-Mounted Concrete Pump; Core Drill; Crane; Crusher Plant; Derrick; Derrick Boat; Ditching & Trenching Machine; Dragline; Dredge Operator; Dredge Engineer; Elevating Grader & Loaders; Grade-All; Gurries; Heavy Equipment Robotics Operator/Mechanic; High Lift; Hoe-Type Machine; Hoist (Two or More Drums); Hoisting Engine (Two or More Drums); Horizontal Directional Drill Operator; Hydrocrane; Hyster; KeCal Loader; LeTourneau; Locomotive; Mechanic; Mechanically Operated Laser Screed;

Mechanic Welder; Mucking Machine; Motor Scraper; Orangepeel Bucket; Overhead Crane; Piledriver; Power Blade; Pumpcrete; Push Dozer; Rock Spreader, attached to equipment; Rotary Drill; Roller (Bituminous); Rough Terrain Crane; Scarifier; Scoopmobile; Shovel; Side Boom; Subgrader; Tailboom; Telescoping Type Forklift; Tow or Push Boat; Tower Crane (French, German & other types); Tractor Shovel; Truck Crane; Tunnel Mining Machines, including Moles, Shields or similar types of Tunnel Mining Equipment

GROUP 2 - Air Compressor (Over 900 cu. ft. per min.); Bituminous Mixer; Boom Type Tamping Machine; Bull Float; Concrete Mixer (Under 21 cu. ft.); Dredge Engineer; Electric Vibrator; Compactor/Self-Propelled Compactor; Elevator (One Drum or Buck Hoist); Elevator (When used to Hoist Building Material); Finish Machine; Firemen & Hoist (One Drum); Flexplane; Forklift (Regardless of Lift Height); Form Grader; Joint Sealing Machine; Outboard Motor Boat; Power Sweeper (Riding Type); Roller (Rock); Ross Carrier; Skid Mounted or Trailer Mounted Conrete Pump; Skid Steer Machine with all Attachments; Switchman or Brakeman; Throttle Valve Person; Tractair & Road Widening Trencher; Tractor (50 H.P. or Over); Truck Crane Oiler; Tugger; Welding Machine; Well Points;& Whirley Oiler

GROUP 3 -All Off Road Material Handling Equipment, including Articulating Dump Trucks; Greaser on Grease Facilities servicing Heavy Equipment

GROUP 4 - Bituminous Distributor; Burlap & Curing Machine; Cement Gun; Concrete Saw; Conveyor; Deckhand Oiler; Grout Pump; Hydraulic Post Driver; Hydro Seeder; Mud Jack; Oiler; Paving Joint Machine; Power Form Handling Equipment; Pump; Roller (Earth); Steerman; Tamping Machine; Tractor (Under 50 H.P.); & Vibrator

CRANES - with booms 150 ft. & Over (Including JIB), and where the length of the boom in combination with the length of the piling equals or exceeds 150 ft. - $1.00 above Group 1 rate

EMPLOYEES ASSIGNED TO WORK BELOW GROUND LEVEL ARE TO BE PAID 10% ABOVE BASIC WAGE RATE. THIS DOES NOT APPLY TO OPEN CUT WORK.

IRON0070-005 06/01/2024

BUTLER COUNTY (Eastern eighth, including the Townships of Decker, Lee & Tilford);
EDMONSON COUNTY (Northern three-fourths, including the Townships of Asphalt, Bee Spring, Brownsville, Grassland, Huff, Kyrock, Lindseyville, Mammoth Cave, Ollie, Prosperity, Rhoda, Sunfish & Sweden)

	Rates	Fringes
IRONWORKER		
Structural; Ornamental; Reinforcing; Precast Concrete Erectors	$ 34.59	25.00

IRON0103-004 08/01/2024

DAVIESS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, OHIO, UNION & WEBSTER COUNTIES
BUTLER COUNTY (Townships of Aberdeen, Bancock, Casey, Dexterville, Dunbar, Elfie, Gilstrap, Huntsville, Logansport, Monford, Morgantown, Provo, Rochester, South Hill & Welchs Creek);
CALDWELL COUNTY (Northeastern third, including the Township of Creswell);
CHRISTIAN COUNTY (Northern third, including the Townships of Apex, Crofton, Kelly, Mannington & Wynns);
CRITTENDEN COUNTY (Northeastern half, including the Townships of Grove, Mattoon, Repton, Shady Grove & Tribune);
MUHLENBERG COUNTY (Townships of Bavier, Beech Creek Junction, Benton, Brennen, Browder, Central City, Cleaton, Depoy, Drakesboro, Eunis, Graham, Hillside, Luzerne, Lynn City, Martwick, McNary, Millport, Moorman, Nelson, Paradise, Powderly, South Carrollton, Tarina & Weir)

	Rates	Fringes
Ironworkers:	$ 35.34	26.4

IRON0492-003 05/01/2024

ALLEN, LOGAN, SIMPSON, TODD & WARREN COUNTIES
BUTLER COUNTY (Southern third, including the Townships of Boston, Berrys Lick, Dimple, Jetson, Quality, Sharer, Sugar Grove & Woodbury);
CHRISTIAN COUNTY (Eastern two-thirds, including the Townships of Bennettstown, Casky, Herndon, Hopkinsville, Howell, Masonville, Pembroke & Thompsonville);
EDMONSON COUNTY (Southern fourth, including the Townships of Chalybeate & Rocky Hill);
MUHLENBERG COUNTY (Southern eighth, including the Townships of Dunnior, Penrod & Rosewood)

	Rates	Fringes
Ironworkers:	$ 33.73	16.38

IRON0782-006 08/01/2024

BALLARD, CALLOWAY, CARLISLE, FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN & TRIGG COUNTIES
CALDWELL COUNTY (Southwestern two-thirds, including the Townships of Cedar Bluff, Cider, Claxton, Cobb, Crowtown, Dulaney, Farmersville, Fredonia, McGowan, Otter Pond & Princeton);
CHRISTIAN COUNTY (Western third, Excluding the Townships of Apex, Crofton, Kelly, Mannington, Wynns, Bennettstown, Casky, Herndon, Hopkinsville, Howell, Masonville, Pembroke & Thompsonville);
CRITTENDEN COUNTY (Southwestern half, including the Townships of Crayne, Dycusburg, Frances, Marion, Mexico, Midway, Sheridan & Told)

	Rates	Fringes
Ironworkers:		
Projects with a total contract cost of $20,000,000.00 or above	$ 35.75	26.34

All Other Work.....$ 34.01 24.83

LABO0189-005 07/01/2024

BALLARD, CALLOWAY, CARLISLE, FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL & MCCRACKEN COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1	$ 23.96	18.58
GROUP 2	$ 24.21	18.58
GROUP 3	$ 24.26	18.58
GROUP 4	$ 24.86	18.58

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Drillers (All Types); Powdermen & Blasters; Troxler & Concrete Tester if Laborer is Utilized

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LABO0189-006 07/01/2024

ALLEN, BUTLER, CALDWELL, CHRISTIAN, DAVIESS, EDMONSON, HANCOCK, HOPKINS, LOGAN, MCLEAN, MUHLENBERG, OHIO, SIMPSON, TODD, TRIGG & WARREN COUNTIES

	Rates	Fringes

Laborers:

GROUP 1	$ 23.96	18.58
GROUP 2	$ 24.26	18.58
GROUP 3	$ 24.21	18.58
GROUP 4	$ 24.86	18.58

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Drillers (All Types); Powdermen & Blasters; Troxler & Concrete Tester if Laborer is Utilized

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LABO0561-001 07/01/2024

CRITTENDEN, HENDERSON, UNION & WEBSTER COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1	$ 25.22	18.10
GROUP 2	$ 25.47	18.10
GROUP 3	$ 25.52	18.10
GROUP 4	$ 26.12	18.10

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines;

Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Drillers (All Types); Powdermen & Blasters; Troxler & Concrete Tester if Laborer is Utilized

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PAIN0032-002 09/01/2024

BALLARD COUNTY

	Rates	Fringes
Painters:		
Bridges	$ 36.77	21.77
All Other Work	$ 34.47	21.77

Spray, Blast, Steam, High & Hazardous (Including Lead Abatement) and All Epoxy - $1.00 Premium

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PAIN0118-003 06/01/2014

EDMONSON COUNTY:

	Rates	Fringes
Painters:		
Brush & Roller	$ 18.50	11.97
Spray, Sandblast, Power Tools, Waterblast & Steam Cleaning	$ 19.50	11.97

PAIN0156-006 04/01/2024

DAVIESS, HANCOCK, HENDERSON, MCLEAN, OHIO, UNION & WEBSTER

COUNTIES

	Rates	Fringes
Painters:		
BRIDGES		
GROUP 1	$ 30.77	20.30
GROUP 3	$ 31.77	20.30
GROUP 4	$ 35.00	20.30
ALL OTHER WORK:		
GROUP 1	$ 29.62	20.30
GROUP 2	$ 30.37	20.30
GROUP 3	$ 30.62	20.30
GROUP 4	$ 31.77	20.30

PAINTER CLASSIFICATIONS

GROUP 1 - Brush & Roller

GROUP 2 - Plasterers

GROUP 3 - Spray; Sandblast; Power Tools; Waterblast; Steamcleaning; Brush & Roller of Mastics, Creosotes, Kwinch Koate & Coal Tar Epoxy

GROUP 4 - Spray of Mastics, Creosotes, Kwinch Koate & Coal Tar Epoxy

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PAIN0500-002 06/01/2024

CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON, GRAVES, HICKMAN, HOPKINS, LIVINGSTON, LYON, MARSHALL, MCCRACKEN & TRIGG COUNTIES:

	Rates	Fringes
Painters:		
Bridges	$ 30.75	15.50
All Other Work	$ 24.50	15.50

Waterblasting units with 3500 PSI and above - $.50 premium
Spraypainting and all abrasive blasting - $1.00 premium
Work 40 ft. and above ground level - $1.00 premium

PLUM0184-002 07/01/2024

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN and TRIGG COUNTIES

	Rates	Fringes
Plumber; Steamfitter	$ 41.01	20.28

PLUM0502-004 08/01/2024

ALLEN, BUTLER, EDMONSON, SIMPSON & WARREN

	Rates	Fringes

Plumber; Steamfitter.....$ 41.90 24.89

PLUM0633-002 08/01/2024

DAVIESS, HANCOCK, HENDERSON, HOPKINS, LOGAN, MCLEAN, MUHLENBERG, OHIO, TODD, UNION & WEBSTER COUNTIES:

	Rates	Fringes
PLUMBER/PIPEFITTER.....	$ 38.41	22.26

TEAM0089-003 03/31/2024

ALLEN, BUTLER, EDMONSON, LOGAN, SIMPSON & WARREN COUNTIES

	Rates	Fringes
Truck drivers:		
Zone 1:		
Group 1.....	$ 23.53	27.39
Group 2.....	$ 23.70	27.39
Group 3.....	$ 23.78	27.39
Group 4.....	$ 23.80	27.39

GROUP 1 - Greaser; Tire Changer

GROUP 2 - Truck Mechanic; Single Axle Dump; Flat Bed; All Terrain Vehicles when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Driver of Distributors

GROUP 3 - Mixer All Types

GROUP 4 - Winch and A-Frame when used in transporting materials; Ross Carrier; Fork Lift when used to transport building materials; Driver on Pavement Breaker; Euclid and Other Heavy Earth Moving Equipment; Low Boy; Articulator Cat; Five Axle Vehicle

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TEAM0215-003 03/31/2024

DAVIESS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, MUHLENBERG, OHIO & WEBSTER COUNTIES

	Rates	Fringes
TRUCK DRIVER		
Group 1.....	$ 25.15	27.39
Group 2.....	$ 25.38	27.39
Group 3.....	$ 25.45	27.39
Group 4.....	$ 25.46	27.39

GROUP 1: Greaser, Tire Changer

GROUP 2: Truck Mechanic

GROUP 3: Single Axle Dump; Flat Bed; All Terrain Vehicle when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Driver of Distributors; Mixer All Types

GROUP 4: Euclid and other heavy earth moving equipment; Low

Boy; Articulator Cat; 5 Axle Vehicle; Winch and A- Frame when used in transporting materials; Ross Carrier; Fork Lift when used to transport building materials; Driver on Pavement Breaker

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TEAM0236-001 03/31/2024

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN,TODD & TRIGG COUNTIES

	Rates	Fringes
TRUCK DRIVER		
Group 1	$ 23.52	27.39
Group 2	$ 23.70	27.39
Group 3	$ 23.70	27.39
Group 4	$ 23.78	27.39
Group 5	$ 23.80	27.39

GROUP 1: Greaser, Tire Changer

GROUP 2: Truck Mechanic

GROUP 3: Single Axle Dump; Flat Bed; All Terrain Vehicle when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Drivers of Distributors

GROUP 4: Euclid and other heavy earth moving equipment; Low Boy; Articulator Cat; Five Axle Vehicle; Winch and A-Frame when used in transporting materials; Ross Carrier

GROUP 5: Mixer All Types

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after

award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal

number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via

email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

Fringe benefit amounts are applicable for all hours worked except when otherwise noted.

No laborer, workman or mechanic shall be paid at a rate less than that of a Journeyman except those classified as bona fide apprentices.

Apprentices or trainees shall be permitted to work as such subject to Administrative Regulations adopted by the Commissioner of Workplace Standards. Copies of these regulations will be furnished upon request from any interested person.

Before using apprentices on the job the contractor shall present to the Contracting Officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U. S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U. S. Bureau of Apprenticeship and Training.

The contractor shall submit to the Contracting Officer, written evidence of the established apprenticeship-journeyman ratios and wage rates in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

TO: EMPLOYERS/EMPLOYEES

PREVAILING WAGE SCHEDULE:

The wages indicated on this wage schedule are the least permitted to be paid for the occupations indicated. When an employee works in more than one classification, the employer must record the number of hours worked in each classification at the prescribed hourly base rate.

OVERTIME:

Overtime is to be paid to an employee at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty (40) hours in such workweek. Wage violations or questions should be directed to the designated Engineer or the undersigned.

Director
Division of Construction Procurement
Frankfort, Kentucky 40622
502-564-3500

PART IV

BID ITEMS

255382

PROPOSAL BID ITEMS

Report Date 7/1/25

255382

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00001		DGA BASE	5,517.00	TON		$	
0020	00020		TRAFFIC BOUND BASE	123.00	TON		$	
0030	00100		ASPHALT SEAL AGGREGATE	49.00	TON		$	
0040	00103		ASPHALT SEAL COAT	8.00	TON		$	
0050	00212		CL2 ASPH BASE 1.00D PG64-22	3,058.00	TON		$	
0060	00301		CL2 ASPH SURF 0.38D PG64-22	575.00	TON		$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0070	01897		ASPHALT WEDGE CURB	87.00	LF		$	
0080	01984		DELINEATOR FOR BARRIER - WHITE	8.00	EACH		$	
0090	01987		DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE	18.00	EACH		$	
0100	02014		BARRICADE-TYPE III	2.00	EACH		$	
0110	02091		REMOVE PAVEMENT	2,083.00	SQYD		$	
0120	02204		SPECIAL EXCAVATION	1,072.00	CUYD		$	
0130	02223		GRANULAR EMBANKMENT	3,058.00	CUYD		$	
0140	02230		EMBANKMENT IN PLACE	20,610.00	CUYD		$	
0150	02351		GUARDRAIL-STEEL W BEAM-S FACE	1,737.50	LF		$	
0160	02360		GUARDRAIL TERMINAL SECTION NO 1	4.00	EACH		$	
0170	02367		GUARDRAIL END TREATMENT TYPE 1	2.00	EACH		$	
0180	02371		GUARDRAIL END TREATMENT TYPE 7	1.00	EACH		$	
0190	02381		REMOVE GUARDRAIL	1,998.00	LF		$	
0200	02391		GUARDRAIL END TREATMENT TYPE 4A	1.00	EACH		$	
0210	02399		EXTRA LENGTH GUARDRAIL POST	25.00	EACH		$	
0220	02429		RIGHT-OF-WAY MONUMENT TYPE 1	13.00	EACH		$	
0230	02432		WITNESS POST	13.00	EACH		$	
0240	02545		CLEARING AND GRUBBING APPROX LESS THAN 1 ACRE	1.00	LS		$	
0250	02555		CONCRETE-CLASS B	200.00	CUYD		$	
0260	02562		TEMPORARY SIGNS	81.00	SQFT		$	
0270	02585		EDGE KEY	93.00	LF		$	
0280	02603		FABRIC-GEOTEXTILE CLASS 2	906.00	SQYD		$	
0290	02625		REMOVE HEADWALL	2.00	EACH		$	
0300	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		$	
0310	02671		PORTABLE CHANGEABLE MESSAGE SIGN	5.00	EACH		$	
0320	02696		SHOULDER RUMBLE STRIPS	4,199.00	LF		$	
0330	02726		STAKING	1.00	LS		$	
0340	02731		REMOVE STRUCTURE	1.00	LS		$	
0350	06511		PAVE STRIPING-TEMP PAINT-6 IN	2,000.00	LF		$	
0360	06540		PAVE STRIPING-THERMO-4 IN W	786.00	LF		$	
0370	06541		PAVE STRIPING-THERMO-4 IN Y	636.00	LF		$	
0380	06542		PAVE STRIPING-THERMO-6 IN W	3,413.00	LF		$	

255382

PROPOSAL BID ITEMS

Report Date 7/1/25

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0390	06543		PAVE STRIPING-THERMO-6 IN Y	4,154.00	LF		$	
0400	06556		PAVE STRIPING-DUR TY 1-6 IN W	750.00	LF		$	
0410	06557		PAVE STRIPING-DUR TY 1-6 IN Y	750.00	LF		$	
0420	06568		PAVE MARKING-THERMO STOP BAR-24IN	36.00	LF		$	
0430	08001		STRUCTURE EXCAVATION-COMMON	60.00	CUYD		$	
0440	10020NS		FUEL ADJUSTMENT	10,829.00	DOLL	$1.00	$	$10,829.00
0450	10030NS		ASPHALT ADJUSTMENT	14,125.00	DOLL	$1.00	$	$14,125.00
0460	20191ED		OBJECT MARKER TY 3	3.00	EACH		$	
0470	20418ED		REMOVE & RELOCATE SIGNS	21.00	EACH		$	
0480	21415ND		EROSION CONTROL	1.00	LS		$	
0490	23649EC		DRAIN POND	1.00	LS		$	
0500	24814EC		PIPELINE INSPECTION	202.00	LF		$	
0510	24970EC		ASPHALT MATERIAL FOR TACK NON-TRACKING	4.90	TON		$	
0520	25078ED		THRIE BEAM GUARDRAIL TRANSITION TL-3	4.00	EACH		$	
0530	26248EC		ELECTRONIC DELIVERY MGMT SYSTEM - AGG	1.00	LS		$	
0540	40033		TURF REINFORCEMENT MAT	815.00	SQYD		$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0550	00462		CULVERT PIPE-18 IN	195.00	LF		$	
0560	01310		REMOVE PIPE	139.00	LF		$	
0570	01450		S & F BOX INLET-OUTLET-18 IN	4.00	EACH		$	
0580	01490		DROP BOX INLET TYPE 1	2.00	EACH		$	
0590	01691		FLUME INLET TYPE 2	4.00	EACH		$	

Section: 0004 - BRIDGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0600	02231		STRUCTURE GRANULAR BACKFILL	180.00	CUYD		$	
0610	03299		ARMORED EDGE FOR CONCRETE	56.00	LF		$	
0620	08003		FOUNDATION PREPARATION	1.00	LS		$	
0630	08019		CYCLOPEAN STONE RIP RAP	1,700.00	TON		$	
0640	08033		TEST PILES	405.00	LF		$	
0650	08051		PILES-STEEL HP14X89	4,570.00	LF		$	
0660	08095		PILE POINTS-14 IN	58.00	EACH		$	
0670	08100		CONCRETE-CLASS A	355.00	CUYD		$	
0680	08104		CONCRETE-CLASS AA	405.00	CUYD		$	
0690	08136		MECHANICAL REINF COUPLER #11	128.00	EACH		$	
0700	08150		STEEL REINFORCEMENT	66,000.00	LB		$	
0710	08151		STEEL REINFORCEMENT-EPOXY COATED	108,689.00	LB		$	
0720	23378EC		CONCRETE SEALING	29,800.00	SQFT		$	
0730	24098EC		PPC I-BEAM TYPE HN 66-49	1,460.00	LF		$	
0740	24877ED		RAIL SYSTEM TYPE C411	733.50	LF		$	
0750	26233EC		MOBILIZATION FOR CONCRETE SURF TREATMENT	1.00	LS		$	

255382

PROPOSAL BID ITEMS

Report Date 7/1/25

Section: 0005 - TRAFFIC

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0760	04844		CABLE-NO. 14/5C	315.00	LF		$	
0770	04885		MESSENGER-10800 LB	89.00	LF		$	
0780	04932		INSTALL STEEL STRAIN POLE	2.00	EACH		$	
0790	20408ES835		INSTALL LED BEACON-12 IN	8.00	EACH		$	
0800	23157EN		TRAFFIC SIGNAL POLE BASE	6.80	CUYD		$	
0810	24526ED		INSTALL-BEACON CONTROLLER-2 CIRCUIT	1.00	EACH		$	
0820	24955ED		REMOVE SIGNAL EQUIPMENT	1.00	EACH		$	

Section: 0006 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0830	02568		MOBILIZATION	1.00	LS		$	
0840	02569		DEMOBILIZATION	1.00	LS		$	