BOARD OF CONTRACT AND SUPPLY
CITY OF PROVIDENCE, RHODE ISLAND

REQUEST FOR PROPOSALS

Item Description: Construction Services related to Sims Ave Pedestrian Bridge

Date to be opened: October 11, 2022

Issuing Department: **Providence Redevelopment Agency**

QUESTIONS

- Please direct questions relative to the bidding process, how to fill out forms, and how to submit a bid (Pages 1-8) to Purchasing Agent Francis Gomez.
    - Phone: (401) 680-5265
    - Email: fgomez@providenceri.gov
        - Please use the subject line "**RFP Question**"
- Please direct questions relative to the Minority and Women's Business Enterprise Program and the corresponding forms (Pages 9-13) to the MBE/WBE Outreach Director for the City of Providence, Grace Diaz
    - Phone: (401) 680-5766
    - Email: gdiaz@providenceri.gov
        - Please use subject line "**MBE WBE Forms**"
- Please direct questions relative to the specifications outlined (beginning on page 14) to the issuing department's subject matter expert:
    - Amanda DeGrace, Director of Real Estate, City of Providence, adegrace@providenceri.gov
    - Please cc: Ben Boyton, Project Manager, BETA Email: bboynton@BETA-Inc.com

Pre-bid Conference

A required pre-bid walkthrough with sign-in will be held on Wednesday, September 28, 2022 at 3:00pm, at the proposed pedestrian bridge location on the intersection of Sims Ave + Kinsley Ave in Providence, RI. This location is across the street from address 10 Sims Ave. in Providence, RI.

BOARD OF CONTRACT AND SUPPLY
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INSTRUCTIONS FOR SUBMISSION

Bids may be submitted up to **2:15 P.M.** on the above meeting date at the **Department of the City Clerk. Room 311, City Hall. 25 Dorrance Street, Providence.** At 2:15 P.M. all bids will be publicly opened and read at the Board of Contract Meeting in the City Council Chambers, on the 3rd floor of City Hall.

- Bidders must submit **2 copies** of their bid in sealed envelopes or packages labeled with the captioned **Item Description** and the **City Department to which the RFP and bid are related and must include the company name and address on the envelope as well**. (On page 1).
- If required by the Department, please keep the original bid bond and check in only one of the envelopes.
- Communications to the Board of Contract and Supply that are not competitive sealed bids (i.e. product information/samples) should have "**NOT A BID**" written on the envelope or wrapper.
- Only use form versions and templates included in this RFP. If you have an old version of a form do not recycle it for use in this bid.
- The bid envelope and information relative to the bid must be addressed to:

Board of Contract and Supply
Department of the City Clerk – City Hall, Room 311
25 Dorrance Street
Providence, RI 02903

****PLEASE NOTE: This bid may include details regarding information that you will need to provide (such as proof of licenses) to the issuing department before the formalization of an award.**

This information is NOT requested to be provided in your initial bid by design.

All bids submitted to the City Clerk become public record. Failure to follow instructions could result in information considered private being posted to the city's Open Meetings Portal and made available as a public record. The City has made a conscious effort to avoid the posting of sensitive information on the City's Open Meetings Portal, by requesting that such sensitive information be submitted to the issuing department only at their request.

BOARD OF CONTRACT AND SUPPLY
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BID PACKAGE CHECKLIST

Digital forms are available in the City of Providence Purchasing Department Office or online at **http://www.providenceri.gov/purchasing/how-to-submit-a-bid/**

The bid package **MUST** include the following, in this order:

- Bid Form 1: Bidder's Blank as the cover page/ 1st page (s*ee page **6** of this document*)
- Bid Form 2: Certification of Bidder as 2nd page (s*ee page **7** of this document*)
- Bid Form 3: Certificate Regarding Public Records (s*ee page **8** of this document)*
- Forms from the Minority and Women Business Enterprise Program: Based on Bidder Category. S*ee forms and instructions enclosed (pages **9-13**) or on: https://www.providenceri.gov/purchasing/minority-women-owned-business-mbewbe-procurement-program/*

***Please note: MBE/WBE forms must be completed for EVERY bid submitted and must be inclusive of ALL required signatures. Forms without all required signatures will be considered incomplete.**

- Bidder's Proposal/Packet: Formal response to the specifications outlined in this RFP, including pricing information and details related to the good(s) or service(s) being provided. Please be mindful of formatting responses as requested to ensure clarity.
- Financial Assurance, *if requested* (a*s indicated on page 5 of this document under "Bid Terms")*

All of the above listed documents are REQUIRED. (With the exception of financial assurances, which are only required if specified on page 5.)

******Failure to meet specified deadlines, follow specific submission instructions, or enclose all required documents with all applicable signatures will result in disqualification, or in an inability to appropriately evaluate bids.***

BOARD OF CONTRACT AND SUPPLY
CITY OF PROVIDENCE, RHODE ISLAND

NOTICE TO VENDORS

1. The Board of Contract and Supply will make the award to the lowest qualified and responsible bidder.
2. In determining the lowest responsible bidder, cash discounts based on preferable payment terms will not be considered.
3. Where prices are the same, the Board of Contract and Supply reserves the right to award to one bidder, or to split the award.
4. No proposal will be accepted if the bid is made in collusion with any other bidder.
5. Bids may be submitted on an "equal in quality" basis. The City reserves the right to decide equality. Bidders must indicate brand or the make being offered and submit detailed specifications if other than brand requested.
6. A bidder who is an out-of-state corporation shall qualify or register to transact business in this State, in accordance with the Rhode Island Business Corporation Act, RIGL Sec. 7-1.2-1401, et seq.
7. The Board of Contract and Supply reserves the right to reject any and all bids.
8. Competing bids may be viewed in person at the Department of the City Clerk, City Hall, Providence, immediately upon the conclusion of the formal Board of Contract and Supply meeting during which the bids were unsealed/opened. Bids may also be accessed electronically on the internet via the City's Open Meetings Portal.
9. As the City of Providence is exempt from the payment of Federal Excise Taxes and Rhode Island Sales Tax, prices quoted are not to include these taxes.
10. In case of error in the extension of prices quoted, the unit price will govern.
11. The contractor will **NOT** be permitted to: a) assign or underlet the contract, or b) assign either legally or equitably any monies or any claim thereto without the previous written consent of the City Purchasing Director.
12. Delivery dates must be shown in the bid. If no delivery date is specified, it will be assumed that an immediate delivery from stock will be made.
13. A certificate of insurance will normally be required of a successful vendor.
14. For many contracts involving construction, alteration and/or repair work, State law provisions concerning payment of prevailing wage rates apply (RIGL Sec. 37-13-1 et seq.)
15. No goods should be delivered, or work started without a Purchase Order.
16. **Submit 3 copies of the bid to the City Clerk, unless the specification section of this document indicates otherwise.**
17. Bidder must certify that it does not unlawfully discriminate on the basis of race, color, national origin, gender, gender identity or expression, sexual orientation and/or religion in its business and hiring practices and that all of its employees are lawfully employed under all applicable federal, state and local laws, rules and regulations. (See Bid Form 2.)

BOARD OF CONTRACT AND SUPPLY
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BID TERMS

1. Financial assurances may be required in order to be a successful bidder for Commodity or Construction and Service contracts. If either of the first two checkboxes below is checked, the specified assurance **must accompany** a bid, or the bid will not be considered by the Board of Contract and Supply. The third checkbox indicates the lowest responsible bidder will be contacted and required to post a bond to be awarded the contract.

   a) ☐ A certified check for **$_____** must be deposited with the City Clerk as a guarantee that the Contract will be signed and delivered by the bidder.

   b) ☐ A bid bond in the amount of **_____** per centum (%) of the proposed total price, must be deposited with the City Clerk as a guarantee that the contract will be signed and delivered by the bidder; and the amount of such bid bond shall be retained for the use of the City as liquidated damages in case of default.

   c) ☐ A performance and payment bond with a satisfactory surety company will be posted by the bidder in a sum equal to one hundred per centum (100%) of the awarded contract.

   d) ☐ No financial assurance is necessary for this item.

2. Awards will be made within **sixty (60) days of bid opening**. All bid prices will be considered firm, unless qualified otherwise. Requests for price increases will not be honored.
3. Failure to deliver within the time quoted or failure to meet specifications may result in default in accordance with the general specifications. It is agreed that deliveries and/or completion are subject to strikes, lockouts, accidents and Acts of God.

The following entry applies only for COMMODITY BID TERMS:

4. Payment for partial delivery will not be allowed except when provided for in blanket or term contracts.

The following entries apply only for CONSTRUCTION AND SERVICE BID TERMS:

5. Only one shipping charge will be applied in the event of partial deliveries for blanket or term contracts.
6. Prior to commencing performance under the contract, the successful bidder shall attest to compliance with the provisions of the Rhode Island Worker’s Compensation Act, RIGL 28-29-1, et seq. If exempt from compliance, the successful bidder shall submit a sworn Affidavit by a corporate officer to that effect, which shall accompany the signed contract.
7. Prior to commencing performance under the contract, the successful bidder shall, submit a certificate of insurance, in a form and in an amount satisfactory to the City.

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BID FORM 1: Bidders Blank

1. Bids must meet the attached specifications. Any exceptions or modifications must be noted and fully explained.
2. Bidder's responses must be in ink or typewritten, and all blanks on the bid form should be completed.
3. The price or prices proposed should be stated both in **WRITING** and in **FIGURES**, and any proposal not so stated may be rejected. **Contracts exceeding twelve months must specify annual costs for each year.**
4. Bids **SHOULD BE TOTALED** so that the final cost is clearly stated (unless submitting a unit price bid), however **each item should be priced individually**. Do not group items. Awards may be made on the basis of ***total*** bid or by ***individual items***.
5. All bids **MUST BE SIGNED IN INK.**

Name of Bidder (Firm or Individual): ____

Contact Name: ____

Business Address: ____

Business Phone #: ____

Contact Email Address: ____

Agrees to bid on (Write the "Item Description" here): ____

If the bidder's company is based in a state *other than Rhode Island*, list name and contact information for a local agent for service of process that ***is located within Rhode Island*** ____

Delivery Date (if applicable): ____

Name of Surety Company (if applicable): ____

Total Amount in Writing*: ____

Total Amount in Figures*: ____

**** If you are submitting a unit price bid, please insert "Unit Price Bid"***

Use additional pages if necessary for additional bidding details.

____
Signature of Representation

____
Title

BOARD OF CONTRACT AND SUPPLY
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BID FORM 2: Certification of Bidder
(Non-Discrimination/Hiring)

Upon behalf of____ (Firm or Individual Bidding),

I,____(Name of Person Making Certification),

being its____(Title or "Self"), hereby certify that:

1. Bidder does not unlawfully discriminate on the basis of race, color, national origin, gender, sexual orientation and/or religion in its business and hiring practices.
2. All of Bidder's employees have been hired in compliance with all applicable federal, state and local laws, rules and regulations.

I affirm by signing below that I am duly authorized on behalf of Bidder, on

this________________day of____________________20____.

____
Signature of Representation

____
Printed Name

BOARD OF CONTRACT AND SUPPLY
CITY OF PROVIDENCE, RHODE ISLAND

BID FORM 3: Certificate Regarding Public Records

Upon behalf of____ (Firm or Individual Bidding),

I,____(Name of Person Making Certification),

being its____(Title or "Self"), hereby certify an understanding that:

1. All bids submitted in response to Requests for Proposals (RFP's) and Requests for Qualification (RFQ's), documents contained within, and the details outlined on those documents become public record upon receipt by the City Clerk's office and opening at the corresponding Board of Contract and Supply (BOCS) meeting.
2. The Purchasing Department and the issuing department for this RFP/RFQ have made a conscious effort to request that sensitive/personal information be submitted directly to the issuing department and only at request if verification of specific details is critical the evaluation of a vendor's bid.
3. The requested supplemental information may be crucial to evaluating bids. Failure to provide such details may result in disqualification, or an inability to appropriately evaluate bids.
4. If sensitive information that has not been requested is enclosed or if a bidder opts to enclose the defined supplemental information prior to the issuing department's request in the bidding packet submitted to the City Clerk, the City of Providence has no obligation to redact those details and bears no liability associated with the information becoming public record.
5. The City of Providence observes a public and transparent bidding process. Information required in the bidding packet may not be submitted directly to the issuing department at the discretion of the bidder in order to protect other information, such as pricing terms, from becoming public. Bidders who make such an attempt will be disqualified.

I affirm by signing below that I am duly authorized on behalf of Bidder, on

this________________day of____________________20____.

____
Signature of Representation

____
Printed Name

BOARD OF CONTRACT AND SUPPLY
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WBE/MBE Form Instructions

The City of Providence actively seeks Minority and Women business enterprises to participate in bids to meet the City's procurement needs. Pursuant to the City of Providence Code of Ordinances, Chapter 21, Article II, Sec. 21-52 (Minority and Women's Business Enterprise) and Rhode Island General Laws (as amended), Chapter 31-14, et seq. (Minority Business Enterprise), Minority Business Enterprise (MBE) and Women's Business Enterprise (WBE) participation goals apply to contracts.

The goal for Minority Business Enterprise (MBE) participation is **10%** of the total bid value.
The goal for Women's Business Enterprise (WBE) participation is **10%** of the total bid value.
The goal for combined MBE/WBE participation is **20%** of the total bid value.

Only businesses certified with the State of Rhode Island as minority and/or women business enterprises are counted towards the City's goals. Eligible minority or women-owned businesses are encouraged to seek certification from the State of Rhode Island Minority Business Enterprise Compliance Office at: http://odeo.ri.gov/offices/mbeco/

Note: MBE certification with the State of Rhode Island on the basis of Portuguese heritage is not currently recognized by the City of Providence's MBE program.

Bid Requirements:

All Bidders: All bidders **must complete and submit the *MBE/WBE Participation Affidavit*** indicating whether or not they are a state-certified MBE/WBE and acknowledging the City's participation goals. Submission of this form is **required with every bid**. **Your bid will not be accepted without an affidavit**.

Bidders who will be subcontracting: In addition to the MBE/WBE Participation Affidavit, Bidders who will be subcontracting must submit the ***Subcontractor Disclosure Form*** as part of their bid submission. All subcontractors, regardless of MBE/WBE status, must be listed on this form. Business NAICS codes can be found at https://www.naics.com/search/. Awarded bidders are required to submit

Subcontractor Utilization and Payment Reports with each invoice.

Waiver Requests:

a) If the percentage of the total amount of the bid being awarded to MBE or WBE vendors is less than 20% (Box F on the Subcontractor Disclosure Form) and the prime contractor is not a Rhode Island State-certified MBE or WBE, the Bidder must complete the *MBE/WBE Waiver Request Form* for review.

b) If the prime contractor company has the capacity to perform the whole project, the City of Providence requires the contractor to meet the city's goal of a combined 20% of MBE and WBE participation.

c) If the contractor is a nonprofit organization, the City of Providence requires the nonprofit organization to provide the *MBE/WBE Participation Affidavit Form* and proof of its nonprofit status.

d) If the contractor has researched the RI Certified minority list (http://odeo.ri.gov/offices/mbeco/mbe-wbe.php) and the state does not have any companies in the desired trade, the City of Providence requires the contractor to provide the *MBE/WBE Participation Affidavit Form*.

e) Waivers will be considered for approval on a case-by-case basis.

Verifying MBE/WBE Certification

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It is the responsibility of the bidder to confirm that every MBE or WBE named in a proposal and included on a contract is certified by the Rhode Island Minority Business Enterprise Compliance Office. The current MBE/WBE directory is available at the State of RI MBE Office, One Capitol Hill, 2nd Floor, Providence, RI, or online at http://odeo.ri.gov/offices/mbeco/mbe-wbe.php. You can also call (401) 574-8670 to verify certification, expiration dates, and services that the MBE/WBE is certified to provide. Note: MBE certification with the State of Rhode Island on the basis of Portuguese heritage is not currently recognized by the City of Providence's MBE program.

Form Instructions:

Access all bid forms from http://www.providenceri.gov/oeo/ or http://www.providenceri.gov/purchasing/minority-women-owned-business-mbewbe-procurement-program/. Download the forms as blank PDFs. Once saved on your computer, fill them out using the Adobe program. The fillable PDFs must be completed in Adobe in order to be saved property. Google Chrome and similar platforms do not allow for the forms to be saved as filled PDFs. Therefore, please download the blank forms to your computer, then fill them out and save.

Assistance with Form Requirements

Examples of completed forms can be found on the City of Providence website at http://www.providenceri.gov/oeo/ or http://www.providenceri.gov/purchasing/minority-women-owned-business-mbewbe-procurement-program/.

Contract Requirements:

Prime contractors engaging subcontractors must submit the ***Subcontractor Utilization and Payment Report*** to the City Department's Fiscal Agent with every invoice and request for final payment. A copy of all forms should be sent to the MBE/WBE Outreach Director Office, Grace Diaz at gdiaz@providenceri.gov. This form is not submitted as a part of the initial bid package.

For contracts with durations of less than 3 months, this form must be submitted along with the contractor's request for final payment. The form must include all subcontractors utilized on the contract, both MBE/WBE and non- MBE/WBE, the total amount paid to each subcontractor for the given period and to date, A copy of all forms should be sent to the MBE/WBE Outreach Director Office, Grace Diaz at gdiaz@providenceri.gov. During the term of the contract, any unjustified failure to comply with the MBE/WBE participation requirements is a material breach of contract.

Questions?

For more information or for assistance with MBE/WBE Forms, contact the City of Providence MBE/WBE Outreach Director, Grace Diaz, at gdiaz@providenceri.gov or (401) 680-5766.

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<u>MBE/WBE PARTICIPATION AFFIDAVIT</u>

Project /Item Description (as seen on RFP):

____

____

____

Prime Bidder: ___________________________________Contact Email and Phone____

Company Name, Address and Trade: ____

____

____

Which one of the following describes your business' status in terms of Minority and/or Woman-Owned Business Enterprise certification with the State of Rhode Island? _____MBE _____WBE _____Neither MBE nor WBE

By initialing the following sections and signing the bottom of this document in my capacity as the contractor or an authorized representative of contractor, I make this Affidavit:
It is the policy of the City of Providence that minority business enterprises (MBEs) and women business enterprises (WBEs) should have the maximum opportunity to participate in procurements and projects as prime contractors and vendors. Pursuant to Sec. 21-52 of the Providence Code of Ordinances and Chapter 31-14 *et seq*. of the Rhode Island General Laws (as amended), MBE and WBE participation goals apply to contracts.

The goal for Minority Business Enterprise (MBE) participation is 10% of the total bid value.
The goal for Women's Business Enterprise (WBE) participation is 10% of the total bid value.
The goal for combined MBE/WBE participation is 20% of the total bid value.

<u>I acknowledge the City of Providence's goals of supporting MBE/WBE certified businesses.</u> Initial ___________
If awarded the contract, I understand that my company must submit to the Minority and Women's Business Coordinator at the City of Providence (MBE/WBE Office), copies of all executed agreements with the subcontractor(s) being utilized to achieve the participation goals and other requirements of the RI General Laws. **<u>I understand that these documents must be submitted prior to the issuance of a notice to proceed</u>**. Initial ___________

<u>I understand that, if awarded the contract, my firm must submit to the MBE/WBE Office canceled checks and reports required by the MBE/WBE Office on a quarterly basis verifying payments to the subcontractors(s) utilized on the contract.</u>
Initial ___________

If I am awarded this contract and find that I am unable to utilize the subcontractor(s) identified in my Statement of Intent, I understand that I must substitute another certified MBE and WBE firm(s) to meet the participation goals. **<u>I understand that I may not make a substitution until I have obtained the written approval of the MBE/WBE Office</u>**.
Initial ___________
<u>If awarded this contract, I understand that authorized representatives of the City of Providence may examine the books, records and files of my firm from time to time, to the extent that such material is relevant to a determination of whether my firm is complying with the City's MBE/WBE participation requirements.</u>
Initial ___________
I do solemnly declare and affirm under the penalty of perjury that the contents of the foregoing Affidavit are true and correct to the best of my knowledge, information, and belief.

________________________________	________________________________
Signature of Bidder	Printed Name
________________________________	____________________
Company Name	Date

BOARD OF CONTRACT AND SUPPLY
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SUBCONTRACTOR DISCLOSURE FORM

Fill out this form only if you WILL SUBCONTRACT with other parties. If you will not subcontract any portion of the proposed bid, do not fill out this form.

Prime Bidder: ____ Primary NAICS____________________________________
Code:_____________________________________

Item Description (as seen on RFP): ____
____

Please list all Subcontractors below. Include the total dollar value that you propose to share with each subcontractor and the dollar amount to be subcontracted. Please check off MBE and WBE where applicable. The directory of all state-certified MBE/WBE firms is located at www.mbe.ri.gov. Business NAICS codes can be found at https://www.naics.com/search/

Proposed Subcontractor	**MBE**	**WBE**	**Primary NAICS Code**	**Date of Mobilization**	**$ Value of Subcontract**
					$
					$
					$
					$
					$
					$
A. MBE SUBCONTRACTED AMOUNT:					**$**
B. WBE SUBCONTRACTED AMOUNT:					**$**
C. NON-MBE WBE SUBCONTRACTED AMOUNT:					**$**
D. DOLLAR AMOUNT OF WORK DONE BY THE PRIME CONTRACTOR:					**$**
E. TOTAL AMOUNT OF BID (SUM OF A, B, C, & D):					**$**
F. PERCENTAGE OF BID SUBCONTRACTED TO MBEs AND WBEs. (Divide the sum of A and B by E and multiply result by 100).					**%**

Please read and initial the following statement acknowledging you understand. If the percentage of the total amount of the bid being awarded to MBE or WBE vendors is less than 20% (Box (F) and the prime contractor is NOT a Rhode Island State-certified MBE or WBE, **you must fill out the MBE/WBE WAIVER REQUEST FORM for consideration by City of Providence MBE/WBE Outreach Director**. Initial ________Required

_________________________________ _________________________________
Signature of Bidder Printed Name

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MBE/WBE Waiver Request Form

Fill out this form only if you did not meet the 20% MBE/WBE participation goal.
State-certified MBE or WBE Prime Bidders are NOT REQUIRED to fill out this form.

Submit this form to the City of Providence MBE/WBE Outreach Director, Grace Diaz, at mbe-wbe@providenceri.gov, for review **prior to bid submission.** This waiver applies only to the current bid which you are submitting to the City of Providence and does not apply to other bids your company may submit in the future. **In case a waiver is need it City Department Directors should not** recommend a bidder for award if this form is not included, absent or is not signed by the city of Providence MBE/WBE director**.**

Prime Bidder: ____ Contact Email and Phone_________________________________
Company Name, Address: ____ Trade __________________________________
Project /Item Description (as seen on RFP):
____
____

To receive a waiver, you must list the certified MBE and/or WBE companies you contacted, the name of the primary individual with whom you interacted, and the reason the MBE/WBE company could not participate on this project.

MBE/WBE Company Name	Individual's Name	Company Name	Why did you choose not to work with this company?

I acknowledge the City of Providence's goal of a combined MBE/WBE participation is 20% of the total bid value. I am requesting a waiver of _______ % MBE/WBE (20% minus the value of **Box F** on the Subcontractor Disclosure Form). If an opportunity is identified to subcontract any task associated with the fulfillment of this contract, a good faith effort will be made to select MBE/WBE certified businesses as partners.

__________________________________ __________________________________ ____________________
Signature of Prime Contractor / or Duly Authorized Representative Printed Name
Date Signed

__________________________________ __________________________________ ____________________
Signature of City of Providence (or Designee (Only) Printed Name of City of Providence Date Signed
MBE/WBE Outreach Director MBE/WBE Outreach Director

BOARD OF CONTRACT AND SUPPLY
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BID PACKAGE SPECIFICATIONS

The Sims Ave Pedestrian Bridge over the Woonasquatucket River is located at the intersection of Sims Ave and Kinsely Ave, to create a walkable pathway between two districts. This project involves the assembly and installation of a prefabricated steel truss bridge, pre-purchased by the Agency. Scope of work is found within Appendix 1- General Conditions. ***This project will require weekly on-site meetings with development team in attendance.***

****PLEASE NOTE: This project will be in compliance with prevailing wage standards and determinations found in Appendix 3- Wages & Determinations.***

BOARD OF CONTRACT AND SUPPLY
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UNIT BID FORM

Please clarify bid per unit below

ITEM	QUANTITY	ITEMS AND UNIT PRICES	UNIT PRICES ($)	AMOUNT ($)
201.0321	300	CLEARING AND GRUBBING AT PER SQUARE YARD		
201.0401	60	REMOVE AND DISPOSE GRANITE CURB AT PER FOOT		
201.0403	200	REMOVE AND DISPOSE SIDEWALKS AT PER SQUARE YARD		
201.0424	16	REMOVE AND DISPOSE EXISTING STRUCTURES AT PER CUBIC YARD		
201.9903	1	REMOVE AND STOCKPILE BENCH AT PER EACH		
201.9904	1	REMOVE AND RESET BENCH AT PER EACH		
202.0100	40	EARTH EXCAVATION AT PER CUBIC YARD		
202.0700	23	COMMON BORROW AT PER CUBIC YARD		
202.9901	120	MANAGEMENT OF EXCESS SOIL AT PER TON		
203.0100	40	STRUCTURAL EXCAVATION EARTH AT		

		PER CUBIC YARD		

ITEM	QUANTITY	ITEMS AND UNIT PRICES	UNIT PRICES ($)	AMOUNT ($)
203.0440	150	STRUCTURAL EXCAVATION UNCLASSIFIED IN COFFERDAMS AT PER CUBIC YARD		
203.0650	30	CRUSHED STONE FILL UNDER STRUCTURES AT PER CUBIC YARD		
204.0100	300	TRIMMING AND FINE GRADING AT PER SQUARE YARD		
206.0301	100	COMPOST FILTER SOCK AT PER FOOT		
209.0200	5	SACK INSERT CATCH BASIN INLET PROTECTION AT PER EACH		
212.2100	1	MAINTENANCE AND CLEANING OF EROSION AND POLLUTION CONTROLS AT PER LUMP SUM		
301.0300	10	CRUSHED STONE OR CRUSHED GRAVEL BASE MODIFIED AT PER CUBIC YARD		
302.0100	100	GRAVEL BORROW SUBBASE COURSE AT PER CUBIC YARD		
601.0300	10	CLASS A PORTLAND CEMENT CONCRETE AT PER CUBIC YARD		

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800.9901	1	SIMS AVENUE PEDESTRIAN BRIDGE AT PER LUMP SUM		

ITEM	QUANTITY	ITEMS AND UNIT PRICES	UNIT PRICES ($)	AMOUNT ($)
805.9901	1	TEMPORARY EARTH RETAINING SYSTEMS AND COFFERDAMS AT PER LUMP SUM		
805.9902	1	CONTROL OF WATER AT PER LUMP SUM		
805.9903	2070	DRILLED MICROPILES AT PER FOOT		
805.9904	1	MICROPILE VERIFICATION LOAD TEST AT PER EACH		
805.9905	2	MICROPILE PROOF LOAD TEST AT PER EACH		
805.9906	1	REMOVE, MODIFY, AND RESET STEEL RAILING AT PER LUMP SUM		
905.0110	20	PORTLAND CEMENT SIDEWALK MONOLITHIC STANDARD 43.1.0 AT PER CUBIC YARD		
905.9901	30	CONCRETE PAVERS AT PER SQUARE YARD		
905.9902	45	REMOVE AND RESET CONCRETE PAVERS AT		

		 PER SQUARE YARD		
906.0112	20	GRANITE CURB PROVIDENCE STANDARD 7" STRAIGHT AT PER FOOT		

ITEM	QUANTITY	ITEMS AND UNIT PRICES	UNIT PRICES ($)	AMOUNT ($)
906.0250	4	PRECAST CONCRETE WHEELCHAIR RAMP CURB STANDARDS 7.1.3, 43.3.0 AND 43.3.1 AT PER EACH		
906.0700	80	REMOVE, HANDLE, HAUL TRIM RESET CURB EDGING, STRAIGHT, CIRCULAR ALL TYPES AT PER FOOT		
907.0100	50	WATER FOR DUST CONTROL AT PER MGL		
907.0200	1	CALCIUM CHLORIDE FOR DUST CONTROL (PROJECT WIDE) AT PER TON		
916.9901	1	TEMPORARY TRAFFIC CONTROL FOR SIMS AVENUE PEDESTRIAN BRIDGE AT PER LUMP SUM		
920.0025	45	PLACED STONE RIPRAP R-3, R-4, R-5 STANDARD 8.3.0 AT PER TON		
920.9902	105	GEOTEXTILE FABRIC FOR PERVIOUS AREAS AT PER SQUARE YARD		

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932.0200	75	FULL-DEPTH SAWCUT OF BITUMINOUS PAVEMENT AT PER FOOT		
936.0100	1	MOBILIZATION AND DEMOBILIZATION AT PER LUMP SUM		

ITEM	QUANTITY	ITEMS AND UNIT PRICES	UNIT PRICES ($)	AMOUNT ($)
942.0200	25	DETECTABLE WARNING PANEL STANDARD 48.1.0 AT PER SQUARE FOOT		
L01.0102	200	LOAM BORROW 4 INCHES DEEP AT PER SQUARE YARD		
L02.0102	20	RESIDENTIAL SEEDING (TYPE 2) AT PER SQUARE YARD		
L05.0506	30	JUTE MESH AT PER SQUARE YARD		
L08.0109	5	TREE TRIMMING AT PER MAN HRS		
T20.2412	100	12 INCH WHITE FINAL EPOXY RESIN PAVEMENT MARKINGS AT PER FOOT		

TOTAL OF BID:

____

____dollars

and ________________ cents $__________________

BOARD OF CONTRACT AND SUPPLY
CITY OF PROVIDENCE, RHODE ISLAND

SUPPLEMENTAL INFORMATION

If the issuing department for this RFP determines that your firm's bid is best suited to accommodate their need, you will be asked to provide proof of the following prior to formalizing an award.

An inability to provide the outlined items at the request of the department may lead to the disqualification of your bid.

This information is NOT requested to be provided in your initial bid that you will submit to the City Clerk's office by the "date to be opened" noted on page 1. This list only serves as a list of items that your firm should be ready to provide on request.

All bids submitted to the City Clerk become public record. Failure to follow instructions could result in information considered private being posted to the city's Open Meetings Portal and made available as a public record.

You must be able to provide:

- Business Tax ID will be requested after an award is approved by the Board of Contract and Supply.
- Sam.gov account name
- Proof of Insurance, listing Agency and City of Providence as additionally insured
- Bid Bond with surety in the amount of 5% of total proposed bid price
- Contractor's Qualifications Statement

BOARD OF CONTRACT AND SUPPLY
CITY OF PROVIDENCE, RHODE ISLAND

CITY OF PROVIDENCE STANDARD TERMS & CONDITIONS

1. The terms "you" and "your" contained herein refer to the person or entity that is a party to the agreement with the City of Providence ("the City") and to such person's or entity's employees, officers, and agents.
2. The Request For Proposals ("RFP") and these Standard Terms and Conditions together constitute the entire agreement of the parties ("the Agreement") with regard to any and all matters. By your submission of a bid proposal or response to the City's RFP, you accept these Standard Terms & Conditions and agree that they supersede any conflicting provisions provided by bid or in any terms and conditions contained or linked within a bid and/or response. Changes in the terms and conditions of the Agreement, or the scope of work thereunder, may only be made by a writing signed by the parties.
3. You are an independent contractor and in no way does this Agreement render you an employee or agent of the City or entitle you to fringe benefits, workers' compensation, pension obligations, retirement or any other employment benefits. The City shall not deduct federal or state income taxes, social security or Medicare withholdings, or any other taxes required to be deducted by an employer, and this is your responsibility to yourself and your employees and agents.
4. You shall not assign your rights and obligations under this Agreement without the prior written consent of the City. Any assignment without prior written consent of the City shall be voidable at the election of the City. The City retains the right to refuse any and all assignments in the City's sole and absolute discretion.
5. Invoices submitted to the City shall be payable sixty (60) days from the time of receipt by the City. Invoices shall include support documentation necessary to evidence completion of the work being invoiced. The City may request any other reasonable documentation in support of an invoice. The time for payment shall not commence, and invoices shall not be processed for payment, until you provide reasonably sufficient support documentation. In no circumstances shall the City be obligated to pay or shall you be entitled to receive interest on any overdue invoice or payment. In no circumstances shall the City be obligated to pay any costs associated with your collection of an outstanding invoice.
6. For contracts involving construction, alteration, and/or repair work, the provisions of applicable state labor law concerning payment of prevailing wage rates (R.I. Gen. Laws §§ 37-13-1 et seq., as amended) and the City's First Source Ordinance (Providence Code of Ordinances §§ 21-91 et seq., as amended) apply.
7. With regard to any issues, claims, or controversies that may arise under this Agreement, the City shall not be required to submit to dispute resolution or mandatory/binding arbitration. Nothing prevents the parties from mutually agreeing to settle any disputes using mediation or non-binding arbitration.
8. To the fullest extent permitted by law, you shall indemnify, defend, and hold harmless the City, its employees, officers, agents, and assigns from and against any and all claims, damages, losses, allegations, demands, actions, causes of action, suits, obligations, fines, penalties, judgments, liabilities, costs and expenses, including but not limited to attorneys' fees, of any nature whatsoever arising out of, in connection with, or resulting from the performance of the work provided in the Agreement.
9. You shall maintain throughout the term of this Agreement the insurance coverage that is required by the RFP or, if none is required in the RFP, insurance coverage that is considered in your industry to be commercially reasonable, and you agree to name the City as an additional insured on your general liability policy and on any umbrella policy you carry.
10. The City shall not subject itself to any contractual limitations on liability. The City shall have the time permitted within the applicable statute of limitations, and no less, to bring or assert any and all causes of action, suits, claims or demands the City may have arising out of, in connection with, or resulting from the performance of the work provided in the Agreement, and in no event does the City agree to limit your liability to the price of the Agreement or any other monetary limit.
11. The City may terminate this Agreement upon five (5) days' written notice to you if you fail to observe any of the terms and conditions of this Agreement, or if the City believes your ability to perform the

terms and conditions of this Agreement has been materially impaired in any way, including but in no way limited to loss of insurance coverage, lapsing of a surety bond, if required, declaration of bankruptcy, or appointment of a receiver. In the event of termination by the City, you shall be entitled to just and equitable compensation for any satisfactory work completed and expenses incurred up to the date of termination.

12. Written notice hereunder shall be deemed to have been duly served if delivered in person to the individual or member of the firm or entity or to an officer of the entity for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known by the party providing notice.
13. In no event shall the Agreement automatically renew or be extended without a writing signed by the parties.
14. You agree that products produced or resulting from the performance of the Agreement are the sole property of the City and may not be used by you without the express written permission of the City.
15. For any Agreement involving the sharing or exchange of data involving potentially confidential and/or personal information, you shall comply with any and all state and/or federal laws or regulations applicable to confidential and/or personal information you receive from the City, including but not limited to the Rhode Island Identity Theft Protection Act, R.I. Gen. Laws § 11-49.3-1, during the term of the Agreement. You shall implement and maintain appropriate physical, technical, and administrative security measures for the protection of, and to prevent access to, use, or disclosure of, confidential and/or personal information. In the event of a breach of such information, you shall notify the City of such breach immediately, but in no event later than twenty-four (24) hours after discovery of such breach.
16. The Agreement is governed by the laws of the State of Rhode Island. You expressly submit yourself to and agree that any and all actions arising out of, in connection with, or resulting from the performance of the Agreement or relationship between the parties shall occur solely in the venue and jurisdiction of the State of Rhode Island or the federal court located in Rhode Island.
17. The failure of the City to require performance of any provision shall not affect the City's right to require performance at any time thereafter, nor shall a waiver of any breach or default of this Agreement constitute a waiver of any subsequent breach or default or a waiver of the provision itself.
18. If any term or provision of this Agreement, or the application thereof to any person or circumstance shall, in any extent, be invalid or unenforceable, the remainder of this Agreement shall not be affected thereby, and each term and provision shall be valid and enforceable to the fullest extent permitted by law.

APPENDIX 1:

GENERAL CONDITIONS

GENERAL PROVISIONS/CONTRACT SPECIFIC

Contents

1. BRIEF SCOPE OF WORK

This project is for the construction of a pedestrian bridge over the Woonasquatucket River in Providence, Rhode Island.

The bridge superstructure will be a prefabricated steel truss bridge

Other roadway and bridge items shall include; cast-in-place slope paving, new pavement structure to the bridge approaches, milling and overlaying of the existing roadway structure, curbing, installation of lighting, guardrail, concrete median barrier, cutting and matching pavement, plantable soil, loam and seed, signing and striping, traffic control and all other incidentals necessary to complete the work to the satisfaction of the Engineer.

2. SPECIFICATIONS

Work on this project shall be in conformance with the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, 2004 Edition (Amended March 2018), including Compilations of Approved Specifications Nos. 19, 20, and 21; the plans; and these Contract Specific and Job Specific Specifications.

References within the Rhode Island Department of Transportation Standard Specifications to the Rhode Island Department of Transportation or the Engineer shall for the purposes of this Contract be construed to mean the Providence Redevelopment Authority or its representative.

3. UTILITY AND MUNICIPAL NOTIFICATION AND COORDINATION

Existing utilities have been shown on the plans using the best available information. The Contractor shall verify the location of all existing drainage and utilities both underground and overhead before excavation begins in accordance with Chapter 39-1.2 of the Rhode Island General Laws, and, when necessary, by contacting the individual utility companies. Excavation shall be in accordance with all statutes, ordinances, rules and regulations of any applicable city, town, state or federal agency. The Contractor should be aware that not all utility companies subscribe to the DigSafe Program. It is the Contractor's responsibility to notify all utility companies and ensure that all utilities have been marked prior to commencing their work. Any damage to existing utilities marked in the field or as a result of failing to contact the appropriate utility company shall be repaired or replaced at no additional cost to the State. The Contractor shall contact DigSafe (1-888-344-7233) prior to commencing with construction.

4. CONTRACTOR'S RESPONSIBILITY FOR DAMAGED STORM DRAINS

The Contractor shall use care when working within or in the vicinity of existing drainage structures. Any drainage structures, pipes, or culverts damaged during the disposing of, cleaning of, installation of, or while making repairs to drainage structures/pipes or culverts or while carrying out any other work on this contact shall be the Contractor's responsibility. Any drainage structures, pipes, or culverts damaged by the Contractor, while carrying out this Contract shall be replaced or repaired by the Contractor to the satisfaction of the Engineer at no additional charge to the State of Rhode Island.

5. DAMAGE TO EXISTING UTILITY STRUCTURES

The Contractor shall use care when working within or in the vicinity of existing electric handholes/structures. Any utility equipment, conduit, wire, cable or appurtenances damaged while carrying out any work on this contract shall be the Contractor's responsibility. Any utility equipment, conduit, and relative appurtenance damaged by the Contractor while carrying out this Contract shall be replaced or repaired by the contractor to the satisfaction of the Engineer at no additional charge.

The Contractor will be responsible for any damage to any existing structures or equipment in the roadway.

The Contractor shall make every effort to avoid debris from falling into catch basins. Should any debris fall inside a structure, it shall be removed immediately.

6. UNIT BID ITEM AND LUMP SUM BID ITEM PAYMENTS

For requirements and work described in the Contract Documents but not expressly identified to be measured separately for payment, the costs thereof shall be included in the contract bid prices of the items of work to which they pertain as listed in the Proposal.

JOB SPECIFIC

CODE 201.0424

REMOVE AND DISPOSE EXISTING STRUCTURES

DESCRIPTION: Work under these items shall consist of the partial removal of the existing railing foundations and steel railing at locations indicated on the Plans or as directed by the Engineer, and in conformance with Section 803 of the RIDOT Standard Specifications, as amended by this Specification.

Within the limits and at the locations indicated on the contract drawings, the “REMOVE & DISPOSE EXISTING STRUCTURES” item shall include: the removal and disposal of railing foundation. This item shall also include the removal and disposal of associated reinforcing steel, steel hardware, and other structural steel components embedded in the concrete (joint assembly, anchorage, pull boxes, etc.), including all embedded conduits, and other utility carrier components and wiring, all within the limits indicated on the Drawings or as directed by the Engineer. Removal and resetting of sidewalks, granite curb, railing, and benches shall be paid separately.

CONSTRUCTION METHODS: The Contractor shall submit to the Engineer for approval a complete description of the method of operations for the various items to be removed, including detailed sequence of removal and disposal operations, in accordance with Section 105.02.

The Contractor shall phase and/or perform this work in accordance with the Sequence of Construction, the Maintenance and Protection of Traffic Plans found in the Contract Drawings.

All work performed under this item shall be done in a cautious and professional manner. Except as noted herein, the exact method used to dismantle or break-up and remove the various portions of the existing bridge is optional.

Care shall be taken during removal operations so as not to damage those portions of the structures required to support traffic for the remaining phases of construction. Any damage to such portions of the structures which ensues due to the Contractor’s operations shall be repaired or replaced to the satisfaction of the Engineer at the sole expense of the Contractor.

The Contractor shall ensure that his removal and disposal operations do not cause damage to any existing structures or properties. Any resulting damages will be repaired to the satisfaction of the Engineer and property owner(s) at the expense of the Contractor.

The methods and equipment to be used for the removal and disposal, as described in this Special Provision, and the disclosure of the Contractor’s proposed disposal area(s), shall be submitted by the Contractor to the Engineer for approval prior to the commencement of work. Said approval(s) shall in no way relieve the Contractor of sole liability for damages resulting from his operations.

All removed materials shall be taken from the site as the work progresses. No storing or burying of material or debris on site will be permitted.

METHOD OF MEASUREMENT: This Item will measured for payment by the “Cubic Yard” of concrete removed and disposed.

BASIS OF PAYMENT: Item 201.0424 “REMOVE AND DISPOSE EXISTING STRUCTURES” will be paid for at the contract unit price per cubic yard as listed in the Bid. The price so stated shall constitute full and complete compensation for all labor, materials, tools and equipment, and all other incidentals required to complete the work as described in the Special Provisions and elsewhere in the Contract Documents, complete in place and accepted by the Engineer.

JOB SPECIFIC

CODE 201.9903

REMOVE AND STOCKPILE BENCH

DESCRIPTION. This work consists of removing and stockpiling benches as indicated on the Plans or as directed by the Engineer.

MATERIALS. Not applicable

CONSTRUCTION METHOD. The existing bench located at Station 1+50 shall be removed, cleaned of any foreign substances, and stockpiled in a manner so as not to be damaged, and stored outside the roadway and pedestrian route. Care should be exercised so that the materials are not damaged during removal. The Contractor will be responsible for protecting all stockpiled materials from damage, theft, and vandalism until installation and acceptance by the Owner.

The foundations shall be removed and disposed of legally off the project site to a minimum depth of one (1) foot below the final grade of the new sidewalk. Any backfill required shall be gravel borrow in accordance with Subsection M.01.02 of the RIDOT Standard Specifications for Road and Bridge Construction, latest edition.

All improvements, equipment, and existing surfaces disturbed, damaged or removed in the performance of this item of work, unless indicated on the Plans, shall be replaced to the satisfaction of the Engineer at no expense to the Owner.

METHOD OF MEASUREMENT. This item does not require a measurement for payment.

BASIS OF PAYMENT. “Remove and Stockpile Bench” will be paid for at the contract unit price per each as listed in the Bid. The price so-stated shall constitute full and complete compensation for all labor, materials, equipment, and other incidentals required to finish the work, complete and accepted by the Engineer.

JOB SPECIFIC

CODE 201.9904

REMOVE AND RESET BENCH

DESCRIPTION. This work consists of removing and resetting the bench located at Station 1+50 as indicated on the Plans or as directed by the Engineer.

MATERIALS. Not applicable

CONSTRUCTION METHOD. The existing bench located at Station 1+50 approximately 13’ left shall be removed, cleaned of any foreign substances, and stockpiled in a manner so as not to be damaged, and stored outside the roadway and pedestrian route. Care should be exercised so that the materials are not damaged during removal or installation at the proposed location. The Contractor will be responsible for protecting all stockpiled materials from damage, theft, and vandalism until installation and acceptance by the Owner.

The foundations shall be removed and disposed of legally off the project site to a minimum depth of one (1) foot below the final grade of the new sidewalk. Any backfill required shall be gravel borrow in accordance with Subsection M.01.02 of the RIDOT Standard Specifications for Road and Bridge Construction, latest edition.

All improvements, equipment, and existing surfaces disturbed, damaged or removed in the performance of this item of work, unless indicated on the Plans, shall be replaced to the satisfaction of the Engineer at no expense to the Owner.

METHOD OF MEASUREMENT. This item does not require a measurement for payment.

BASIS OF PAYMENT. “Remove and Reset Bench” will be paid for at the contract unit price per each as listed in the Bid. The price so-stated shall constitute full and complete compensation for all labor, materials, equipment, and other incidentals required to finish the work, complete and accepted by the Engineer.

Benches damaged by the Contractor’s operations will be replaced by the Contractor at no additional cost to the Owner.

JOB SPECIFIC

CODE 202.9901

MANAGEMENT OF EXCESS SOIL

DESCRIPTION. The work under this Item shall be in accordance with the applicable provisions of the Standard Specifications and the following. This section includes the requirements for stockpiling, characterizing, hauling, and disposing of Excess Soil from the site.

1. In general, Work under this Section shall include all labor, materials, equipment, supervision and supplies necessary for the handling, transportation, and off-site disposal of Excess Soil.
2. "Excess Soil" is defined as the material that will be excavated from either side of the river for the bridge abutments that cannot be reused as backfill. Soil that can be re-used needs to be returned to areas proximate to the point of generation.
3. Previous sampling (see Appendix 3) had determined that Excess Soil shall be defined as non-hazardous with concentrations of various substances above Rhode Island's Method 1 Residential Direct Exposure Criteria identified in Table 1 of the Rhode Island Department of Environmental Management's (RIDEM's) Remediation Regulations.
4. The Contractor is responsible for coordinating all off-site disposal of the Excess Soil at an appropriately licensed disposal facility.

Sampling

To determine the appropriate disposal facility for Excess Soil, stockpiles of each material shall be sampled by a Qualified Environmental Professional (QEP) retained by the Contractor at a minimum frequency of one composite sample per 250 cubic yards. Samples shall be analyzed for the following parameters by a laboratory certified by the State Rhode Island:

- Volatile Organic Compounds (EPA Method 8260);
- Semi-Volatile Organic Compounds (EPA Method 8270);
- Total Petroleum Hydrocarbons (EPA Method 8100 Modified);
- 13 Priority Pollutant Metals (EPA Method 6010 C-D);
- TCLP for any metal at a concentration greater than 20 times its TCLP threshold;
- Polychlorinated Biphenyls (EPA Method 8082);
- pH;
- Flashpoint (EPA Method 1010A); and
- Conductivity (EPA Method SM21-22-2510).

Characterization requirements may vary, depending on the disposal facility's acceptance policies. The Contractor is responsible for determining the disposal facility(is) characterization needs in advance to facilitate timely disposal and to adequately estimate the disposal costs.

Qualified Environmental Professional (QEP) Services

The Qualified Environmental Professional (QEP) shall be responsible for soil sampling, obtaining approvals from licensed disposal facilities, and preparing all Material Shipping Records and Bills of Lading. The Engineer will assist the Contractor's QEP with the preparation of disposal facility applications.

The Owner has notified RIDEM of the presence of contaminants above RIDEM's standards. Engineer has prepared a Short-Term Response Action Plan (STRAP) that has been submitted to RIDEM (see Appendix 2). Contractor is responsible for adhering to the procedures outlined in the STRAP.

Applicable Laws and Regulations

1. Work under this Section shall be performed in strict compliance with all applicable Federal, State and local laws, rules, and regulations, including Rhode Island's Remediation Regulations, related to the handling and off-site management of contaminated wastes and regulated soil.

2. Pertinent Federal and State Authorities having jurisdiction over this project include:
   a. Occupational Safety and Health Administration (OSHA)
   b. Rhode Island Department of Environmental Management (RIDEM)

3. The following OSHA regulations will apply:
   a. Occupational Safety and Health Standards, Hazardous Waste Operations and Emergency Response - 29 CFR 1910.120.
   b. Safety and Health Regulations for Construction - 29 CFR 1926.

Submittals

1. Submittals shall be made in compliance with the requirements of Section 105.02 except as provided for herein.
2. No Work will be permitted to proceed until the required submittals have been received and approved by the Engineer. In the event the Engineer requests additional information, it shall be the Contractor's responsibility to provide such additional information in a complete and timely manner, so that construction can proceed by the date stipulated in the Notice to Proceed.

3. Prior to the commencement of work, the Contractor shall submit the following documents for approval:

   a. Submittal of all required certifications demonstrating that personnel are properly trained and qualified to perform the Work in accordance with applicable OSHA regulations and all laws governing the Work.

b. Names and qualifications of all proposed subcontractors, if any, identifying the tasks to be performed by each proposed Subcontractor.

c. The Contractor's Site-Specific Health & Safety Plan (HASP) pursuant to OSHA 1910.120 requirements.

d. Soil Management Plan developed by the Contractor which describes the means and methods that will be used to handle, stockpile, characterize, transport and dispose of Excess Soil as described in this specification.

e. Completed disposal facility application(s) prior to submittal to the facility.

4. Approval of submittals by the Owner shall not impose any liability upon the Owner, nor shall any such approval relieve the Contractor of his/her responsibilities to meet all of the requirements and comply with all applicable laws, regulations and other applicable requirements under this Contract.

<u>Existing Environmental Conditions</u>

1. Previous sampling (see Appendix 3) had determined that Excess Soil shall be defined as non-hazardous with concentrations of various substances above Rhode Island's Method 1 Residential Direct Exposure Criteria identified in Table 1 of RIDEM's Remediation Regulations
2. The Contractor shall satisfy himself/herself as to the conditions existing at the site, the type of equipment required to perform this Work, and the quality and quantity of the materials to be removed.
3. Failure of the Contractor to become fully acquainted with the available information will not relieve him/her of the responsibility to perform the work completely and properly in full compliance with the Contract Documents. The Owner assumes no responsibility for any conclusion or interpretation made by the Contractor on the basis of information made available by the Owner.

CONSTRUCTION METHOD.

<u>General</u>

1. The Contractor will take appropriate means to prevent a release or the spread of hazardous wastes or contaminated materials as a result of the Contractor's operations.

<u>Site Health & Safety</u>

1. The Contractor is solely responsible for controlling Site health and safety, including the provision of a Site Health and Safety Officer. In the performance of its Work, the Contractor shall provide for the safety of all Contractor personnel, other Contractor's personnel, regulatory agency personnel, and the public for the duration of the Contract.
2. The Contractor is solely responsible for his/her construction means and methods.

3. The Contractor shall provide a Health and Safety Plan (HASP) which addresses contaminants of concern (typical urban fill – metals, polynuclear aromatic hydrocarbons) for the Work under this Contract. Such plan shall conform to the requirements of OSHA 1910.120 and all other applicable federal, state, and local laws, regulations, ordinances, and procedures. The HASP shall be developed and implemented by the Contractor's Safety Officer experienced with the health and safety requirements of OSHA 1910.120. The HASP shall be revised, as needed, whenever new information about site hazards is obtained.
4. All personnel performing Work in contaminated or hazardous areas shall be fully trained in accordance with the OSHA 1910.120 and the HASP and shall be thoroughly briefed on anticipated hazards, safety equipment to be employed, safety practices to be followed, and emergency procedures and communications. The Contractor shall have a medical monitoring surveillance program in place for all personnel in accordance with all applicable laws and regulations.

<u>Miscellaneous Provisions</u>

1. The Contractor shall be responsible for securing all necessary and applicable permits, certificates, licenses, and approvals required for the performance of this Work and shall be responsible for the payment of all associated fees.

2. The Contractor shall comply with all required reporting and record keeping requirements in accordance with the provisions of this Contract and all applicable federal, state, and local laws, regulations, ordinances, and procedures.

3. Material Shipping Records and/or Bills of Lading, as appropriate, will be provided and coordinated by the QEP, as requested by the Engineer. The Owner will be responsible for signing all waste manifests and bills of lading. For Contractor's operations to proceed without interruption, complete and accurate information shall be provided by the Contractor during the Submittals process. Contractor shall be responsible for preparing applications to disposal facilities.

<u>Dust Monitoring & Control Measures</u>

1. The Contractor is responsible for visually monitoring the Work for evidence of airborne particulates (dusts) emanating from the Work area. It shall be the Contractor's responsibility to continuously monitor the work area for dust levels.

2. The Contractor shall take appropriate measures to substantially eliminate the generation of dusts within the Work Area, including use of water provided by the Contractor and covering all stockpiled wastes and/or soil, except in the immediate vicinity of the excavation, where water may be required to control dust emissions.
3. In the event that visible emissions of dust are observed by the Engineer, the Contractor shall be directed to take appropriate measures to mitigate the condition. Failure of the Contractor to implement measures that reduce dust levels may be cause for suspension of the Work, until otherwise directed by the Engineer.

Excavation of Soil

1. Excavation activities performed by the Contractor or Subcontractors within the Project Limits shall be performed in a manner which considers the health and safety of all Contractor and Subcontractor personnel, support personnel, the Owner and its representatives, and the surrounding environment.
2. Excavation beyond the vertical and horizontal limits shown on the Contract Drawings will not be allowed unless otherwise directed by the Engineer.
3. During the course of excavation, the Contractor shall continually evaluate soil conditions to determine if contaminants other than those previously identified are present, work shall stop and the Owner shall be notified so that further assessment can be made.
4. The Contractor shall segregate boulders, asphalt, construction debris and other deleterious materials from excavated soil to the extent practicable and as directed by the Engineer. This segregation shall occur at the point of excavation, prior to the transport of soil.

Temporary Soil Stockpiling

1. Excess Soil shall be temporarily stockpiled separately on the project site in a location agreed to by the Contractor and the Engineer. The following provisions shall apply to the stockpiling:
   a. Excess Soil shall be stockpiled separately in the designated area on 6-mil polyethylene sheeting. When the stockpiles are not actively being used or at the end of each working day, the stockpile shall be covered with 6-mil polyethylene sheeting. Sheeting shall be properly secured such that it remains fully intact during inclement weather conditions.
   b. Excess Soil from each side of the river will be stockpiled on the same side of the river as the soil is generated. Mixing of stockpiles will not be allowed.
   b. No individual stockpile may exceed 250 cubic yards.
   c. In no case shall Excess Soil remain stockpiled for more than 45 days from its excavation.
2. Sampling and characterization of Excess Soil shall be performed in accordance with the provisions of this specification.

Off-Site Disposal of Excess Soil

1. Off-site disposal of Excess Soil will meet Subsection “Off-Site Management of Contaminated Soil” of this specification.
2. Excess Soil shall be hauled away and disposed of by the Contractor, at his expense, at appropriate approved locations, and in accordance with arrangements made by him/her.

Off-Site Management of Contaminated Soil

1. The Contractor shall be responsible for the off-site transportation and disposal of Excess Soil at an appropriate disposal facility.

2. The Contractor will be responsible for additional sampling and analyses as may be required by the receiving disposal facility(ies) for off-site disposal of Excess Soil.

3. Vehicles used for transportation of Excess Soil shall be properly labeled and placarded, as required for off-site transportation for conformance with federal, state, and local laws, regulations, ordinances, and procedures.

4. The Contractor shall be responsible for coordination with all transporters and the receiving facility. Transporter vehicles used for the transportation of Excess Soil shall be covered, substance compatible, licensed, insured, and permitted pursuant to federal, state, and local laws, regulations, ordinances, and procedures.

5. Vehicles departing the site shall be properly logged to show the vehicle identification, driver's name, time of departure, destination, and approximate volume and content of material carried.

6. No Excess Soil shall leave the site until the designated receiving facility has agreed in writing to accept the type and quantity of waste/soil to be shipped.

7. The Contractor shall complete required facility applications and other pertinent forms for proper transportation and disposal. The Owner shall review and will sign the applications, as necessary. The Contractor shall be held accountable for ensuring that requirements of the transporter and receiving disposal facility(ies) and federal, state, and local laws, regulations, ordinances, and procedures are complied with and properly documented.

8. Documentation shall be maintained indicating that applicable laws have been satisfied and that Excess Soil has been successfully transported and received at the disposal facility(ies).

9. Actual quantities will be measured by the documented scale weights at the disposal facility. The Contractor will not be reimbursed for work performed without the prior approval by the Owner.

Site Cleanup

During the course of the Work, the Contractor shall keep the Site and his operations clean and neat at all times. The Contractor shall dispose of all residue resulting from the site operations; and at the conclusion for the day's Work, he shall remove and haul away surplus materials, lumber, equipment, temporary structures, and any other refuse remaining from the site operations and shall leave the site in a neat and orderly condition.

<u>Documentation</u>
Within 21 days after substantial completion of the excavation Work, the Contractor shall submit to the Owner one (1) original copy of all manifests, certified weigh slips (tons), bills-of-lading, and records of final waste disposition from the accepting disposal facility(ies).

METHOD OF MEASUREMENT. "MANAGEMENT OF EXCESS SOIL" shall be measured by the ton as disposed at the receiving facility on certified weight slips provided by the disposal facility.

BASIS OF PAYMENT. "Management of Excess Soil" will be paid for at the stated unit price as listed and will be paid for under the Bid Item. The price shall constitute full compensation for all labor, tools, materials, equipment, submittals, sampling, laboratory fees, disposal facility tipping fees, transportation, disposal, and all incidentals required to finish the work as described in this Section and elsewhere in the Contract Documents.

JOB SPECIFIC

CODE 203.9901

EARTHWORK

PART 1 GENERAL

1.1 WORK INCLUDED

A. This section covers the work necessary for the earthwork, complete.

1.2 DEFINITIONS

A. Relative Compaction: The ratio, in percent, of the as-compacted field dry density to the laboratory maximum dry density as determined by ASTM D1557. Corrections for oversize material may be applied to either the as-compacted field dry density or the maximum dry density, as determined by the Engineer.

B. Optimum Moisture Content: Determined by the ASTM standard specified to determine the maximum dry density for relative compaction.

C. Relative Density: As defined by ASTM D4253 or D4254.

D. Prepared Ground Surface: The ground surface after clearing, grubbing, stripping, excavation, and scarification and/or compaction.

E. Completed Course: A course or layer that is ready for the next layer or next phase of the work.

F. Well-Graded: A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes. Well-graded does not define any numerical value that must be placed on the coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters. Well-graded is used to define a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.

G. Influence Area: The area within planes sloped downward and outward at an angle of 60 degrees from the horizontal from (a) 1 foot outside the outermost edge at the base of foundations or slabs; or (b) 1 foot outside the outermost edge at the surface of roadways or shoulder: or (c) 0.5 foot outside the exterior edge at the spring line of pipes and culverts.

H. Unclassified Excavation: The nature of materials to be encountered has not been identified or described herein.

I. Imported Material: Material obtained by the Contractor from sources off the site.

J. Excess Material: Material generated during this project that is not suitable for reuse as determined by the Owner/Engineer.

K. Boulder: Rock material greater than 1 cubic yard in volume that cannot be removed with a standard backhoe or excavator without significant effort.

L. Rock: Rock material in beds, ledges, un-stratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cubic yards that cannot be removed by rock excavating equipment and systematic drilling, ram hammering, ripping or hydraulic splitting.

M. Unsuitable Material: Unsatisfactory soils directed to be removed by the Owner/Engineer.

1.3 EXISTING UTILITIES

A. Call Dig Safe **1-888-DIG-SAFE (1-888-344-7233)** a minimum of three (3) business days before commencing with any excavation, in order that all pertinent utility companies become informed of such work. Coordinate with the Owner for locating their onsite utilities.

B. If active utilities existing on the site are encountered, they shall be carefully protected from damage. When an active utility line is exposed during construction, its location and elevation shall be documented, and both the Engineer and the Owner notified in writing.

C. Active utility lines damaged in the course of construction operations shall be repaired or replaced as determined by the Owner/Engineer, without additional cost to the Owner.

1.4 SUBMITTALS

A. Provide the following submittals:

1. Certification, test results, source, and samples for all imported earth materials.

2. Catalog and manufacturer's data sheets for compaction equipment.

3. Manufacturer's certificate of compliance attesting that filter fabric meets the requirements of these specifications. Provide mill certificates stating the length and width of fabric/geogrid contained on each roll.

1.5 IMPORTED MATERIAL ACCEPTANCE

A. All imported earth materials specified in this section are subject to the following requirements:

1. All tests necessary for the Contractor to locate acceptable sources of imported material shall be made by the Contractor. Certification that the material conforms to the Specification requirements along with copies of the test results from a qualified commercial testing laboratory shall be submitted to the Owner/Engineer for approval at least 14 calendar days before the material is required for use. All material samples shall be a minimum mass required by ASTM D75 and furnished by the Contractor at the Contractor's sole expense. Samples shall be representative and be clearly marked to show the source of the material and the intended use on the project. Sampling of the material source shall be done by the Contractor in accordance with ASTM D75. Tentative acceptance of the material shall be based on an inspection of the source by the Owner/Engineer and/or the certified test results submitted by the Contractor to the Owner/Engineer at the Owner’s/Engineer's discretion. No imported materials shall be delivered to the site until the proposed source and materials tests have been tentatively accepted in writing by the Owner/Engineer. Final acceptance will be based on Quality Control and Quality Assurance tests made on samples of material taken from the completed and compacted course.

2. Gradation tests by the Contractor shall be made on samples taken at the place of production prior to shipment. Samples of the finished product for gradation testing shall be taken as specified in the Contract Documents, or more often as directed by the Owner/Engineer if variation in gradation is occurring, or if the material appears to depart from the Specifications. Verbal test results shall be forwarded to the Owner/Engineer within 72 hours of testing, and written results within 120 hours.

3. If tests conducted by the Contractor or the Owner/Engineer indicate that the material does not meet Specification requirements, material placement will be terminated until corrective measures are taken. Material that does not conform to the Specification requirements and is placed in the work shall be removed and replaced at the Contractor's sole expense. Retesting of material that does not meet specification requirements shall be performed at the Contractor's sole expense.

1.6 EXCAVATION SAFETY

A. The Contractor shall be solely responsible for making all excavations in a safe manner, in accordance with any Federal, State, local, and/or Owner safety standards. Provide appropriate measures to retain excavation side slopes and prevent earth slides to ensure that persons working in or near the excavation are protected.

1.7 CODES, ORDINANCES, AND STATUS

A. The Contractor shall familiarize itself with, and comply with, all applicable codes, ordinances, statues, and bear sole responsibility for the penalties imposed for noncompliance.

1.8 TOLERANCES

A. All material limits shall be constructed within a vertical tolerance of 0.1 foot and a horizontal tolerance of 1 foot except where dimensions or grades are shown or specified as minimum. All grading shall be performed to maintain slopes and drainage as shown. No reverse slopes will be permitted.

PART 2 PRODUCTS

2.1 MATERIALS

A. Select Backfill Material shall be excavated onsite granular material with less than 15 percent passing a No. 200 sieve, free from stones, roots, and organic material and of suitable gradation for satisfactory compaction. If excavated material at a particular location is not satisfactory, as determined by the Owner/Engineer, use imported Gravel Borrow.

B. Filter Stone shall be imported angular stone conforming to Item M.01.07 of the Standard Specifications.

C. Bedding Stone for Riprap shall be imported angular stone conforming to Item M.10.03.1, Type S-3 of the Standard Specifications.

D. Riprap shall be imported stone conforming to Item M.10.03.2, Type R-6 of the Standard Specifications.

E. Water for compaction shall be furnished by the Contractor. Water for compaction from sources other than potable sources shall be as approved by the Owner/Engineer.

F. Filter Fabric for Riprap shall be nonwoven, and needle punched pervious sheets of polyester, polyethylene, nylon, or polypropylene filaments formed into a uniform pattern. Filter Fabric for Riprap shall be Style 1160N as manufactured by Mirafi. The filter fabric shall have the following minimum properties when measured in accordance with the referenced standards.

Test	**Method**	**Specified**
Mass per Unit Area (oz/yd^2)	ASTM D-3776	16
Grab Tensile Strength (lbs)	ASTM D-4632	380
Puncture Strength (lbs)	Modified ASTM D-6241	1,000

Test	**Method**	**Specified**
Trapezoid Tear (lbs/in^2)	ASTM D-4533	140
Elongation at Required Strength (%)	ASTM D-4642	50
UV Resistance	ASTM D-4355	70% at 500 hr.
Equivalent Opening (US Standard Sieve)	ASTM D-4751	100
Permittivity (sec^{-1})	ASTM D-4491 with 60 mm Falling Head	0.8
Water Flow Rate ($gal/min/ft^2$) at 50 mm Constant Head	See Note 2	50

Notes:

1. All numerical values represent minimum/maximum average roll values (i.e., the average of minimum test results on any roll in a lot should meet or exceed the minimum specified values).

2. Water flow rate in $gal/min/ft^2$ shall be determined by multiplying permittivity in sec^{-1} as determined by ASTM D-4491 by a conversion factor of 74.

G. Geotextile Fabric used to cap underlying soil beneath disturbed pervious areas shall be Mirafi 140N or equal and shall have a minimum grab tensile strength of 120 pounds and a minimum puncture strength of 310 pounds.

H. Foam insulation shall be 2 inches thick, Type EPS 19, conforming to ASTM D6817 as manufactured by Geofoam or approved equal.

a. PART 3 EXECUTION

3.1 GENERAL

A. Unsuitable or excess materials shall be stripped from areas of new construction or re-grading. Materials suitable for reuse shall be stored onsite in approved locations near the work in progress that will not interfere with construction operations. All excess and unsuitable earth materials shall be transported and disposed of offsite in accordance with all local, State, and Federal rules and regulations.

B. In general, earth excavation is unclassified and shall include the excavation, removal, and satisfactory disposal of all materials of whatever nature encountered from within the limits indicated or specified or as directed in writing. It shall include, but not be limited to, earth materials such as peats, organic or inorganic silts, clay, sand and gravel, cobbles and boulders less than or equal to 1 cubic yards in volume, soft or disintegrated rock which, in the opinion of the Owner/Engineer, can be removed without drilling and splitting, pavement, and all obstructions not specifically included in another section.

C. All excavations shall be backfilled as specified.

3.2 REMOVAL OF WATER

A. Dewater as specified and shown in the Plans.

B. Provide adequate sedimentation controls prior to discharge into a nearby watercourse.

3.3 STOCKPILE OPERATION

A. As specified and shown in the Plans.

3.4 SUBGRADE COMPACTION

A. Prior to backfilling, the Contractor shall compact the existing sub-grade to 95 percent relative compaction.

3.5 BACKFILL (GENERAL)

A. The Contractor shall inform the Owner/Engineer in writing a minimum of 48 hours prior to starting any backfill operation. The information shall include the location to be filled, the amount of fill to be placed, and the material to be placed.

B. Prior to placing any backfill, remove all trash, debris, and/or any other unsuitable material from areas where backfill is to be placed. Do not place frozen backfill. Do not place backfill on frozen ground or in areas where standing water is present.

C. Backfill around and adjacent to concrete structures only after the concrete has attained 2/3 of the specified compressive strength or as approved by the Owner/Engineer.

D. Do not operate earth-moving or other heavy equipment within a distance that will cause damage to new or existing structures. Compact backfill adjacent to and on top of existing and new structures, utilities, and concrete walls with hand-operated vibratory compactors or other acceptable equipment. Compaction shall be performed in a manner which will not damage new or existing structures and utilities.

3.6 SELECT BACKFILL

A. Place Select Backfill at the locations shown on the Drawings. Do not exceed loose lifts of 10 inches. Compact each lift to not less than 95 percent relative compaction.

3.7 FILTER STONE

A. Place Filter Stone as shown on the Drawings. Do not exceed loose lifts of 12 inches. Compact each lift with at least three (3) passes of a vibratory plate compactor until there is no apparent stone settlement. The plate compactor shall have a minimum base plate width of 20 inches, provide a minimum force of 5,400 lb., and achieve 4,980 VPM (min.).

3.8 FILTER FABRIC

A. The area shall be graded smooth and all stones, roots, sticks, or other foreign material which would interfere with the fabric/grid being completely in contact with the soil shall be removed prior to placing the fabric/grid. The surfaces to accept filter fabric shall be compacted to not less than 95 percent relative compaction.

B. The fabric shall be placed loosely with the machine direction of the fabric laid perpendicular with the concrete pile caps. Pinning or stapling may be required to hold the filter fabric in place. Separate pieces of fabric shall be joined by overlapping or sewing. The fabric in the overlapped jointed shall be placed with a minimum overlap of 24 inches. When required, overlaps in the downstream direction shall be laid (i.e., shingled) to shed water. After placement, the fabric shall be exposed no longer than 48 hours prior to covering.

C. Damaged areas shall be covered with a patch of fabric using a 36-inch overlap in all directions.

3.9 BEDDING AND RIPRAP STONE PLACEMENT

A. Place Bedding for Riprap and Riprap as shown on the Drawings. The bed shall be properly trimmed and shaped. Riprap shall be place by mechanical means that will produce a completed job within reasonable tolerances of the typical sections shown on the Drawings. The top surface of the Riprap shall conform to a true and even plane with a tolerance of plus or minus 2 inches. The Contractor shall hand work riprap, placing tightly together, filling large voids, and correcting segregated areas to minimize movement.

B. Placement of Riprap shall be from the base of the slope upward. The Owner/Engineer shall determine height of free fall of riprap, but in no case shall this height exceed one foot.

C. The Contractor shall use care so as not to damage existing structures during riprap placement, including foam insulation.

3.10 MOISTURE CONTROL

A. During the compacting operations, the moisture content of the material shall be within the range necessary to obtain the specified compaction, as determined by laboratory testing.

B. Maintain moisture content throughout the lift. Insofar as practicable, add water to the material at the site of exaction. Supplement, if required, by sprinkling the material.

C. Do not compact material that contains excessive moisture. Aerate material by blading, discing, harrowing, or as approved, to hasten the drying process.

3.11 COMPACTION TESTING

A. The Contractor shall make all necessary excavations and preparations for testing in accordance with the Contract Documents. Excavations for density tests shall be backfilled with material similar to that excavated and compacted to the specified density by the Contractor. Failure of the backfill material to achieve the specified density will be just cause for rejection of any or all portions of the excavation section tested. The Contractor shall not be granted an extension of time or additional compensation for testing or repair of backfill ordered by the Owner/Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:
The work performed under CODE 203.9901 “EATHWORK” will be measured and paid for in accordance with the Method of Measurement and Basis of Payment provisions in the Standard Specifications that are associated with the applicable Items included in the Proposal covered by this work.

JOB SPECIFIC

CODE 212.2100

MAINTENANCE AND CLEANING OF EROSION AND POLLUTION CONTROLS

DESCRIPTION. Subsection 212.03.3; Failure to Maintain Erosion and Pollution Controls, of the Standard Specifications, requires that a daily charge be deducted from monies due the Contractor in the event the Engineer decides that erosion and pollution controls are not in place or have not been adequately maintained.

The contractor shall be held responsible for any and all cost associated with fines and cleanup activities, over and above the penalty assessed herein resulting from contractor failure in this regard.

For each violation the charge for this Contract will be: $1,000.00 per day.

JOB SPECIFIC

CODE 800.9901

SIMS AVENUE PEDESTRIAN BRIDGE

DESCRIPTION.
The work under this Item shall consist of assembling and installing the new Sims Avenue Pedestrian Bridge in its entirety. This shall comprise all work pertaining to the construction of all bridge and wall components from the bottom of the concrete footings to the top of the premanufactured truss, abutments, and walls, inclusive of any and all embedded or attached components, including waterproofing, dampproofing, and insulation. The work includes assembling and installing a Continental Connector Bridge prefabricated steel truss fabricated by Contech Engineered Solutions purchased directly by the City. The work includes all materials, equipment and labor needed to construct the bridge, as shown on the Plans and in the relevant provisions of Section 824 of the RIDOT Standard Specification and/or as directed by the Engineer. All of the work shall be complete in place and accepted in accordance with the Contract Documents except that the Method of Measurement and Basis of Payment will be in accordance with these Special Provisions.

SUBMITTALS

Erection Procedures

The Contractor shall submit detailed descriptions of the proposed lifting, erection and assembly procedures. The Erection Plan shall include, but not be limited to, the following requirements: Lifting and installation procedure conforming to the manufacturer’s recommendations. Detailed method of rigging, lifting and placing, including crane size(s), crane location(s) and relocations if required, shall be submitted including all applicable design calculations. All plans and computations shall be stamped by a Professional Structural Engineer registered in the State of Rhode Island. It is expressly understood and agreed that approval by the Engineer, or a designated representative, will not relieve the Contractor of any or all responsibility resulting from improper assembly and erection of the prefabricated pedestrian bridge.

The erection procedure shall be in accordance with Section 824.03.10 of the Standard Specifications.

CONSTRUCTION METHODS.

Construction methods shall conform to the applicable paragraphs of Subsection 824.03 of the RIDOT Standard Specifications for Road and Bridge Construction, latest edition, and the following additions.

PREFABRICATED STEEL TRUSS

The City has independently begun the purchase of a prefabricated steel truss bridge. The bridge is a Continental Connector Pedestrian Steel Truss fabricated by Contech Engineered Solutions. General overall dimensions of the bridge are shown on the plan. The truss will be constructed with unpainted weathering steel. The deck will be shop-installed ipe hardwood.

The preliminary assembled weight of the bridge is estimated to be approximately 28,000. This weight will be finalized by Contech during their final design.

Contech estimates that the fabrication of the bridge will be complete and ready to ship in March 2023, but subject to change.

ANCHOR BOLTS

The contractor shall provide anchor bolts as shown on the plans. Anchor bolts shall be template set at the time of placing abutment concrete.

BEARINGS

Bridge bearings will be provided by the manufacturer and consist of a steel setting or slide plate placed on the substructure or grout pad. The bridge bearing plate which is welded to the bridge structure shall bear on this setting plate. One end of the bridge will be fixed by fully tightening the nuts on the anchor bolts at that end. The opposite end will have finger tight only nuts to allow movement under thermal expansion or contraction.

Length of bridge beyond the centerline of bearing shall be coordinated with the bridge manufacturer, and approved by the Engineer, prior to construction of the abutment stem. The step height (from top of bridge seat to top-of-deck) shall be determined by the bridge manufacturer.

DELIVERY AND ERECTION

The Contractor will be responsible for coordinating with the bridge manufacturer for the delivery of the bridge.

The bridge will be shipped to the site (by others) in two sections. The contractor will be responsible for unloading the sections, assembling, and erection.

The loads will be delivered as close to the project location as trucks can reasonably access and be driven under their own power without specialized equipment. Oversized loads warrant additional consideration and providing suitable access shall be the responsibility of the contractor. The driver(s) will leave hard surface public roads only at their discretion but is not obligated to do so. If driver agrees to access a site under any other conditions, the contractor may be subject to additional costs. Due to curfews and other travel time restrictions on over dimensional loads, the contractor shall be responsible for additional costs associated with weekend, holiday or Monday delivery requests. Cancellation of scheduled delivery loads requiring permits within 48hrs may result in additional permits and will be the responsibility of the contractor. Specialized haulers and or equipment are utilized in the shipping of bridge components (ie “trailer rental”), costs incurred by CONTECH due to cancellation and or postponement of the delivery of bridge components will be the responsibility of the contractor. Staging/Jockeying of trailers can be provided upon request for an additional fee.

Allowable unloading time for delivery trucks is two (2) hours. Contractor will be responsible for demurrage charges of $100.00 per hour thereafter.

The contractor is responsible for inspecting all bridge components for damage prior to unloading. Any damage shall be noted and immediately reported to both the engineer and manufacturer to determine course of action. The expense of such delays due to bridge component damage will not be accepted by the Engineer.

Tree removal beyond that shown on the plans to facilitate erection of the bridge will not be permitted. Erection may require a crane that can lift the bridge over the trees alongside the Woonasquatucket River.

METHOD OF MEASUREMENT. This Item will not be measured for payment.

BASIS OF PAYMENT. Sims Avenue Pedestrian Bridge will be paid for under Lump Sum Item 800.9901

JOB SPECIFIC

CODE 805.9901

TEMPORARY EARTH RETAINING SYSTEMS AND COFFERDAMS

PART 1 GENERAL

1.1 WORK INCLUDED

A. The work covered in this section includes the installation, maintenance, and removal of temporary earth retaining systems and cofferdams as required.

1.2 RESPONSIBILITY

A. Temporary earth retaining systems and cofferdams shall be of sufficient strength to safely sustain all loads from the sides of the excavations together with all water pressure and reasonable surcharge.

1. Types and/or limits shown on the Drawings are for information only and the Contractor shall be responsible for the final selection, layout, and design of the temporary earth retaining and cofferdam systems required to perform the work.

2. The Contractor shall, at all times, be entirely responsible for the adequacy of temporary earth retaining and cofferdam systems used to permit the satisfactory and safe installation and construction of the work.

3. The Contractor shall, at all times, provide adequate protection against damage to all existing utilities, structures and completed portions of the work, and shall prevent injury to persons.

1.3 SUBMITTALS

A. Temporary Earth Retaining Systems and Cofferdams Drawings:

1. At least fourteen (14) calendar days prior to the start of installation submit for review by the Engineer:

a. Drawings
b. Sections
c. Details and other pertinent information

2. The data shown shall include:

a. An overall time schedule for construction.

b. A description of the anticipated sequence of construction.
c. Complete details of methods, equipment and materials proposed to be used at each work location.
d. Any other pertinent data required for review by the Engineer.

B. Design Computations:

1. The Contractor shall also submit complete computations for the design of the temporary earth retaining systems and cofferdams proposed to be installed. The design shall be in accordance with sound engineering practice and modern accepted principles of soil mechanics. It shall include the effects of all surcharge which may be reasonably anticipated.

2. The minimum factor of safety for temporary earth retaining systems and cofferdams shall be 1.5. This includes but is not limited to rotational stability and piping/heave.

3. All drawings and computations shall be made and sealed by a registered Professional Engineer licensed to practice in the State of Rhode Island.

C. Submittal Review by Engineer:

1. The design and layout will be reviewed by the Engineer as to type and suitability, providing that the arrangements presented by the Contractor are satisfactory, but such review will not relieve the Contractor of the sole responsibility for the adequacy of the systems nor shall it be construed as a guarantee that the Contractor's proposed equipment, materials, and methods will be adequate for the work required at the locations of and for the work required by this contract.

PART 2 PRODUCTS

2.1 PILES

A. The shapes, sizes, and lengths of piles to be utilized are at the Contractor's discretion, unless otherwise shown on the Drawings. Piles shall be satisfactory to withstand all driving and construction stresses.

2.2 SHEETING

B. The shapes, sizes, and lengths of steel sheeting to be utilized are at the Contractor's discretion, unless otherwise shown on the Drawings. Sheets shall be satisfactory to withstand all driving and construction stresses. Sheeting shall be driven in continuous interlock and adhere to ASTM A328.

2.2 WATER-INFLATED DAMS

A. The shapes, sizes and lengths of water-inflated dams to be utilized are at the Contractor's discretion, unless otherwise shown on the Drawings. Water inflated dams shall be satisfactory for the intended purpose as manufactured by Aqua-Barrier or approved equal (Contact 800-245-0199) or approved equal.

2.3 PORT-A-DAMS

A. The shapes, sizes and lengths of Port-A-Dams to be utilized are at the Contractor's discretion unless otherwise shown on the Drawings. Port-A-Dams shall be satisfactory for the intended purpose as manufactured by Port-A-Dam (Contact 800-346-4793) or approved equal.

2.4 SAND BAGS

A. Sandbags, if utilized to construct temporary cofferdams, shall be 35-inch x 35-inch x 38-inch jumbo sandbags suitable for reuse and constructed to maintain their shape after filling. Completely fill sandbags with well graded sand suitable for the intended application. The in-situ unit weight of the sand fill shall be 111 pcf (min) for a total bag weight of 3,000 pounds (min).

2.5 PLASTIC LINER

A. Plastic liner shall be 10 mil polyethylene liner (min). Overlap liner a minimum of 4 feet at all seams and secure with standard sandbags.

2.6 SUPPORTS

A. Bracing and other supports whether of steel, timber, or other materials shall be of the strength and dimensions necessary to satisfactorily withstand the loads to which they will be subjected. All bracing and other supports shall be free from any defects which might impair this strength.

2.7 OTHER MATERIALS

A. The Contractor may propose other suitable materials for construction including but not limited to plastic lined concrete block enclosures and shall provide all necessary hardware and fastenings necessary for the satisfactory installation.

PART 3 EXECUTION

3.1 GENERAL

A. The Contractor shall take all precautions necessary to prevent lateral or inward movement of material along the sides or the bottoms of excavations.

1. It is expressly understood and agreed that whenever temporary earth retaining systems and cofferdams are used, it shall not relieve the Contractor of the sole responsibility for any damages or injury due to the installation or failure of the systems or the settling of the backfill, utilities, or of the adjacent ground, structures, utilities, or other work.

3.2 INSTALLATION

A. Where temporary earth retaining systems and cofferdams are used, they shall be installed ahead of all excavation operations.

1. Install to maintain sufficient restraint of the adjacent soil and to prevent movement, excessive inflow of water, and intrusion of soils into or instability of the bottom of the excavations.

2. If voids occur, they shall be filled immediately with selected materials from the earth excavation to the satisfaction of the Engineer.

3.3 OBSTRUCTIONS DURING DRIVING

A. Where obstructions are encountered that result in a sudden, unexpected increase in penetration resistance and deviation from acceptable tolerances, the Contractor may be required to perform one of the following options:

1. Removal of the obstruction.
2. Extraction, repositioning, and re-driving.
3. Addition of extra piling.

B. Pursue the course of action selected by the Engineer. If, in the Engineer's opinion, the obstruction could not have been reasonably anticipated by the Contractor, work done under this Section, will be considered for payment in accordance with the Contract Documents.

3.4 INSPECTION

A. The Contractor shall provide inspection prior to and during its operations of all existing utilities, structures and other facilities which might be disturbed by temporary earth retaining, cofferdam, and utility support system installation.

1. The Contractor shall monitor and control its construction operations to prevent damage to the existing adjacent utilities, structures, and completed portions of the work.

3.5 REMOVAL

A. Temporary earth retaining systems and cofferdams shall be removed when backfilling is done, and removal shall be conducted in such a manner so as to avoid any damage to the permanent structure or to other members of the systems. Impact loading on the permanent structure or on members of the systems will not be allowed.

B. During backfilling, temporary support elements shall not be removed until alternative support is available, such as substituted struts, backfill, or ability of the temporary earth retaining system/cofferdam to act as a cantilever without detrimental deflection. All voids left by removal of said systems shall be immediately filled.

C. All temporary earth retaining systems and cofferdams shall be removed at completion unless otherwise shown on the Drawings.

METHOD OF MEASUREMENT. This item does not require a measurement for payment.

BASIS OF PAYMENT. “Temporary Earth Retaining Systems and Cofferdams” will be paid for at the contract Lump Sum prices as listed in the Bid. The price so-stated shall constitute full and complete compensation for all labor, materials, equipment, and other incidentals required to finish the work, complete and accepted by the Engineer.

JOB SPECIFIC

CODE 805.9902

CONTROL OF WATER

PART 1 GENERAL

1.1 WORK INCLUDED

A. Work covered under this section consists of the Dewatering, Control, and Diversion of Water as required to perform the work.

1.2 SUBMITTALS

A. Drawings:

1. At least fourteen (14) calendar days prior to the start of dewatering, submit a Water Control Plan for review by the Engineer that includes:

   a. Drawings
   b. Sections
   c. Details and other pertinent information

2. The data show shall include:

   a. An overall schedule for dewatering, control, and diversion of water.
   b. The location and proposed installation details for pumps and/or bypass equipment.
   c. Complete details of methods, equipment, and materials proposed to be used.
   d. Erosion and Sediment Controls.
   e. Any other pertinent data required for review by the Engineer.

D. Submittal Review by Engineer:

2. The Water Control Plan will be reviewed by the Engineer as to type and suitability, providing that the arrangements presented by the Contractor are satisfactory, but such review will not relieve the Contractor of the sole responsibility for the adequacy of the system nor shall it be construed as a guarantee that the Contractor's proposed equipment, materials, and water control methods will be adequate for the work required at the locations of and for the work required by this contract.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. The Contractor shall provide all materials and equipment including, but not limited to pipe, fittings, valves, pumps, tools, fuel, and other appurtenances in suitable and adequate quantities as required to control water.

PART 3 EXECUTION

3.1 SURFACE DRAINAGE

A. The Contractor shall intercept and divert surface drainage away from the work sites by the use of dikes, curb walls, ditches, sumps or other means. The Contractor shall design surface drainage systems so that they do not cause erosion on or off the site. Surface runoff shall be controlled to prevent entry of water into excavations. The Contractor shall remove drainage systems when no longer needed.

3.2 WATER CONTROL IN EXCAVATIONS

A. The Contractor shall use water control methods, which are appropriate to the ground conditions, the construction operations, and the requirements of these Contract Documents. The methods shall involve the removal of water within the excavation and may involve the removal of water outside the excavation or construction of facilities to control water movement into the excavation.

B. Water control measures shall minimize adverse effects of elevated or reduced water pressure on the work, the surrounding ground, and adjacent facilities and structures. The water control measures shall be designed and operated so as to prevent the removal of in-situ materials, or loosening or softening of in-situ materials within the excavation. The Contractor shall control groundwater and surface water such that construction operations will be performed without adverse effects of water, and to prevent hydrostatic uplift pressures until construction has been completed.

C. Unless otherwise shown on the Drawings, water shall be controlled and maintained 2 feet below the lowest working elevation during periods when the sub-grade is being compacted, when earth materials are being placed, when geotextiles, geo-grids, grout, and/or concrete (except tremie concrete) are being placed, and at such other times as is necessary for the safe execution of the work. If the Contractor encounters large amounts of water entering the excavation, immediate action shall be taken to control the water inflow. A large amount of inflow requiring control shall be defined as that which adversely affects the performance of the work or has the potential of causing loss or damage to adjacent property or structures.

3.3 PROPERTY LOSSES FROM REMOVAL OR DISTURBANCE OF GROUNDWATER

A. Any structure, including but not limited to buildings, bridges, streets, and utilities that become unstable or vulnerable to settlement due to removal or disturbance of groundwater will be supported immediately by the Contractor. Support shall include but not be limited to bracing, underpinning, or compaction grouting.

B. All loss or damage arising from removal or disturbance of groundwater, including but not limited to claims for subsidence and the loss of structure support, that may occur in the prosecution of the work shall be sustained and borne by the Contractor.

C. If the Contractor needs to correct the damage resulting from its operations, the Owner may, 30 days after notifying the Contractor in writing, proceed to repair, rebuild or otherwise restore such damaged property as may be deemed necessary, and the cost thereof shall be deducted from compensation which may be or become due the Contractor under this Contract.

3.4 TEMPORARY FLOW BYPASSING

A. The Contractor shall bypass storm water and other flows around its work zone as required during the performance of the work.

B. The Contractor shall be responsible for the design of the temporary flow bypass systems, including but not limited to pump selection, the installation of diversion structures, and erosions and sedimentation controls as required.

METHOD OF MEASUREMENT. This item does not require a measurement for payment.

BASIS OF PAYMENT. “Control of Water” will be paid for at the contract Lump Sum prices as listed in the Bid. The price so-stated shall constitute full and complete compensation for all labor, materials, equipment, and other incidentals required to finish the work, complete and accepted by the Engineer.

JOB SPECIFIC

CODE 805.9903
DRILLED MICROPILES

CODE 805.9904
PILE VERIFICATION LOAD TESTS

CODE 805.9905
PILE PROOF LOAD TESTS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Work covered under this section, without limiting the generality thereof, consists of furnishing all plant, labor, equipment, appliances and materials and performing all operations in connection with the design and installation of **138-kip** allowable design capacity, cement-grouted, drilled-in piles at the locations and to the grades as shown on the Drawings and includes, but is not limited to the following:

1. The design of the piles in order to achieve the specified design capacity of 138 kips in compression based on the technical criteria presented herein. Submission of design calculations and shop drawings shall be required for review by the Engineer.

2. Piles shall be uncased within the grouted bond zone with a minimum outside diameter of 10.75 inches. Each pile shall be designed with inner reinforcement as specified herein. A permanent outer steel casing shall be provided from the pile cutoff to a depth of at least four feet below the top of the Very Stiff to Hard Silt.

3. Drilling equipment and methods used by the Contractor shall permit advancement of the outer steel casing through soils such as gravel, cobbles, and rock/boulder fill, if encountered. The Contractor may need to expose and remove obstructions from the Fill layer prior to pile installation.

4. The piles shall be advanced through the Fill, Sand and Gravel, Silt and Sand, Very Soft to Soft Silt, Silt and Sand, Very Stiff to Hard Silt, and Glacial Till and terminate about 1 foot above Bedrock.

5. Splicing of the inner reinforcement shall be permitted as approved by the Engineer.

6. Comply with all rules, regulations, laws and ordinances of the State of Rhode Island Standard Specifications, and all other authorities having jurisdiction.

7. Provide survey control, layout of design pile locations, and as-built plans by a Professional Land Surveyor or Professional Engineer registered in the State of Rhode Island.

1.2 DEFINITIONS AND REFERENCE STANDARDS

A. ASTM: Specifications of the American Society for Testing and Materials.
B. AWS: Standard Code for Welding in Building Construction, of the American Welding Society.
C. AISC: Specification of the American Institute of Steel Construction.
D. ACI: American Concrete Institute.
E. Engineer: BETA and/or its designee.
F. EPA: U.S. Environmental Protection Agency.
G. RIDEM: Rhode Island Department of Environmental Management.
H. Owner: Providence Redevelopment Agency.

1.3 QUALITY ASSURANCE

A. Comply with all rules, regulations, laws and ordinances of the State of Rhode Island, City of Providence, and that of all other authorities having jurisdiction. All labor, materials, equipment, and services necessary to make the work comply with such requirements shall be provided without additional cost to the Owner. Pile design and installation shall comply with the latest version of the Code.

B. All welding shall be performed by operators who have been previously qualified by tests as prescribed in the AWS. Evidence that welders meet qualification requirements shall be submitted to the Engineer before welding is begun.

C. Field Monitoring and Testing:

1. Field monitoring of the drilled pile installation and pile load test operations will be provided by the Engineer. No piles shall be installed except in the presence of the Engineer.

2. The Engineer will provide on-site monitoring of cement grout placement. No piles shall be grouted except in the presence of the Engineer. Cement grout test cylinders shall be taken and tested by the Contractor, who shall also facilitate storing samples. The Contractor shall provide a minimum of one (1) seven-day and three (3) twenty-eight-day compressive strength tests per 9 CY of grout placed.

3. From time to time, monitoring of welding and welds may be performed by an independent testing agency employed by the Engineer. The Contractor shall fully cooperate with the agency to facilitate inspection, notifying it in advance when welding operations are to be performed. Welds which do not conform to applicable specifications shall be repaired as directed by the Engineer.

4. Certification of the quality of the pile materials to be used in the Work shall be furnished, in a form acceptable to the Engineer, at the time of delivery of materials to the site. Pile materials shall also be subject to on-site observation for conformance with specifications.

5. Approvals and acceptance given by the Engineer shall not relieve the Contractor of responsibility for performing the Work in accordance with the Contract Documents and the Code.

D. LINES AND GRADES

1. The Contractor shall be responsible for the correct location of piles and keeping a record of the piles installed.

2. The Contractor shall establish, maintain, and record all locations and elevations required, including the elevation of the top of the pile and casing, the bottom of the pile and casing, and other location and elevation information required regarding the piles.

E. QUALIFICATIONS

1. The Contractor shall have a minimum of 5 years of experience in the work specified in this Contract and shall have successfully completed a minimum of 5 similar projects.

1.4 SUBMITTALS

A. General:

1. The Contractor shall submit the information specified herein to the Engineer for review. Unless otherwise specified, submittals shall be made not less than fourteen (14) calendar days prior to the start of the Work. Pile installation shall not commence until all required submittals have been reviewed and accepted, and approval to proceed is provided by the Engineer.

2. Submit qualifications to satisfy the requirements of Article 1.5.E, including resumes.

3. Submit proposed splice details, as applicable.

B. The Drilled Micro Pile Construction Submittal shall include:

1. The Construction Procedures.

2. The stamped micro pile shop drawings (e.g., micro pile installation details, reinforcing, centralizers), including supporting calculations.

3. The cement grout mix (e.g., mix design, previous test reports, product data sheets).

4. The Quality Control/Quality Assurance Program.

5. The stamped load test frame drawings and procedures, including supporting calculations. The load test frame shall be capable of resisting 110 percent of the maximum test load.

6. The equipment resources (e.g., drills, grout mixer/pumps).

7. Certificate of calibration for both the pressure gage and the hydraulic jack. The pressure gage and hydraulic jack shall have been calibrated together as a unit within 30 days prior to the load test.

C. Installation:

1. Details of equipment and procedures to be used for pile installation including those to be used to drill through obstructions.

2. Planned construction and drilling sequence and platform elevation of drill rig and drill hole.

D. Before Work is begun, the Contractor shall prepare and submit a coordination drawing showing the size and location of equipment relevant to complete the pile installation. Included on the drawing shall be shown the areas planned to use for staging, access areas, pile locations, and any other element of the installation.

E. A written Drill Spoils Management Plan detailing the means and methods proposed to manage, contain, collect, and dispose of all drilling spoils. The Plan shall also address procedures for the uncontrolled release of drill fluid/slurry into the excavation or nearby water courses.

F. As-Built Data: Actual pile location data shall be submitted within two (2) working days after a pile is installed. The Contractor shall provide the Engineer with a written tabulation indicating the following information:

1. Pile number.

2. Elevation of pile cutoff and top of cap plate after installation (measured to the nearest 0.05 ft.).

3. Deviation from design plan location (measured to the nearest 0.01 ft.).

1.5 MINIMUM PILE INSTALLATION CRITERIA

A. General: Design and installation details of the piles shall be in accordance with previously accepted and approved submittals.

B. Subsurface Conditions:

1. Site and subsurface investigation data are available as shown on the Drawings.

2. For the purposes of estimating the pile lengths, the Engineer assumed an ultimate bond strength of 1,620 psf, 2,232 psf, and 2,988 psf for the Very Stiff/Hard Silt Layer, Silt/Sand Layer, and Glacial Till layers, respectively.

3. The assumed ultimate bond strengths are subject to confirmation by load test and the pile lengths shown on the drawings are considered the minimum required to achieve the specified ultimate capacity. The actual pile lengths may be adjusted to reflect the confirmed bond strengths, and the strata breaks between different soil layers observed during the installation of each pile. The actual length of pile will be measured, and the Contractor will be paid in accordance with this specification.

C. Pile Length:

1. Pile lengths will be determined in accordance with Part 4, Measurement and Payment.

D. Pile Diameter:

1. Each pile shall have a minimum outside diameter of 10.75 inches, to bear, uncased, in the identified bearing strata.

2. The design pile diameter within the bearing strata shall be taken as the outside diameter of the permanent outer steel casing or the diameter of the drill bit attached to the bottom of the casing.

E. Permanent Casing for Piles:

1. Each pile shall be installed with a permanent outer steel casing from the final top of the pile downward to about one (1) ft above Bedrock.

F. Pile installations shall be designed in accordance with the following criteria:

1. Piles shall be constructed with inner reinforcement and grout encasement to transfer load to the bearing strata.

2. The maximum allowable stress in the inner reinforcement shall be forty-seven (47) percent of 87 ksi (max) in compression and fifty-five (55) percent of the inner reinforcements minimum specified yield stress in tension. The allowable stress on the cement grout shall be forty (40) percent of the twenty-eight (28) day unconfined compressive strength.

3. The minimum thickness of grout cover over the inner reinforcement shall be three (3) inches.

4. The inner reinforcement shall be centered in the pile and shall extend from the top of the pile through the grout to the bottom of the pile. Centralizers shall be used at 10 ft intervals.

5. The mating ends of the permanent outer steel casing shall be threaded so as to safely withstand the stresses to which they may be subjected.

6. No end bearing shall be assumed.

7. Piles may not be loaded until the cement grout has achieved design compressive strength.

8. Minimum pile center-to-center spacing shall be 3 feet.

1.6 CONDUCT OF THE WORK

A. The piles shall be installed from grade in close proximity to masonry walls, sidewalks, utilities, and adjacent buildings. The design, materials, equipment, and installation procedures developed shall avoid any detrimental effects to these structures, unnecessary noise or vibrations, and damage to the property.

B. The Contractor will be completely and solely responsible for job safety, and security.

C. The Contractor shall have the known utility locations in the vicinity of proposed pile locations marked in the field by utility companies and/or the Owner, prior to commencing work. The Contractor is responsible for all Dig-Safe calls and utility coordination. In addition, the Contractor shall be responsible for completing pile installation without damage to any utilities or other substructures.

D. The Contractor shall provide provisions to control exhaust from equipment, the flow of water/cuttings and disposal of same, and shall keep the premises clean and free of water and debris from the drilling/pile installation work, such that activities in the adjacent buildings are not interrupted.

E. The Contractor shall repair any damage to existing structures or property caused from performing the Work as described herein.

PART 2 PRODUCTS

2.1 CEMENT GROUT

A. Cement grout for piles shall conform to the requirements of ASTM Specification C94 for Ready Mixed Concrete, Third Edition.

B. The cement grout mixture shall have a minimum 28-day compressive strength, f'c, of 5,000 psi.

2.2 INNER REINFORCEMENT

A. Inner reinforcement as a minimum shall be standard deformed steel conforming to the requirements of ASTM A615, Grade 100 or equivalent. Nuts and couplers shall conform to ASTM A108. The threaded bars, nuts, and couplers for the permanent production piles shall be epoxy coated.

2.3 BEARING PLATES

A. Bearing plates shall conform to ASTM A36 and shall be epoxy coated.

2.4 PERMANENT OUTER STEEL CASING

A. Permanent outer steel casing shall have a minimum wall thickness of 0.50 inches. Steel casing shall conform to one of the following ASTM designations: A53, A500, A501 or A618.

PART 3 EXECUTION

3.1 GENERAL

A. Piles shall be installed to the line and grades specified in drawings.

3.2 METHOD OF INSTALLATION

A. The method of pile installation shall be determined by the Contractor, subject to review by the Engineer. Pile installation shall be made by non-displacement, low vibration methods such as rotary drilling. Wet rotary drilling methods shall employ sufficient fluid pressure to provide complete removal of the drill cuttings from the hole. Driving of casing is prohibited.

B. Drilling shall be made in such a manner to prevent loss of ground beyond the specified pile diameter. A polymer drilling mud or other methods shall be employed as required to stabilize the hole and prevent loss of ground. Drilling mud in the hole shall be sufficiently fluid such that it is readily and fully displaced by the cement grout.

C. All excavation and drilling spoils shall be controlled to minimize disturbances to site conditions and hindrances to pile installation procedures and requirements. The drilling water, spoils or other resulting by-products shall not be allowed to enter into any municipal drainage system without prior written approval from the controlling agency (RIDEM, City of Providence) and the Owner.

D. The Contractor is responsible for controlling the amount of dust and dirt created by the pile installation process using whatever methods are most appropriate.

E. All piles shall be installed at locations shown on the Drawings. Pile location shall be checked during installation and appropriate measures taken as necessary to maintain the correct pile location.

F. Each pile shall be drilled to achieve the foundation support within the identified bearing strata and shall be capable of supporting the specified design load.

G. Grouting of the piles shall provide complete filling of the pile with a minimum of segregation. Grout shall be placed under pressure by means of a tremie pipe and grout pump from the bottom of the pile upward in one continuous operation until the pile is filled and suitable, and undiluted cement grout returns at the top of the pile. The cement grout shall not be allowed to fall freely through slurry or water.

H. Inner reinforcement shall be centered in the hole with appropriate centering devices. Place inner reinforcement after initial grouting and before commencing extraction of the permanent outer steel casing.

I. The permanent outer steel casing shall be withdrawn in a controlled manner with the grout level maintained at the top of the pile, to ensure that the grout completely fills the drill hole. During withdrawal of the casing, the grout level inside the casing shall be periodically y monitored to check that the flow of grout inside the casing is not obstructed.

J. Sequence of pile installation shall be such that adjacent piles, piles located less than 8 ft from the pile to be drilled, are not installed prior to 12 hours after initial grouting of previously installed piles.

3.3 PILE LOAD TESTING

A. General:

1. One (1) verification load test shall be performed on a non-production micro pile prior to the installation of the permanent production micro piles.

2. One (1) proof load test shall be performed on a production micro pile during the installation of the permanent production micro piles. The proof test shall be performed on the opposite side of the river as the verification load test.

3. The Contractor shall provide all labor, materials, and equipment required to set up, conduct and dismantle the load tests.

4. The test piles shall be installed by the methods and equipment specified for production piles.

5. The load tests shall be made at the location designated on the drawings and shall be completed and accepted before production piles are installed.

6. Grout in the test piles shall have attained a minimum compressive strength of 5,000 psi prior to load testing. The Contractor shall provide substantiating compressive strength test data prior to load testing.

B. Pile Instrumentation

1. The Contractor shall embed two ½ inch I.D. steel pipes in the test pile to permit the installation of telltale rods or as noted in the approved Drilled Micro Pile Construction Submittal.

2. The Contractor shall furnish and install instrumentation to monitor settlement of the pile during the load test.

C. Test Procedures

1. Load shall be applied to the test pile by means of a hydraulic jack operated by the Contractor which reacts against a pile supported reaction beam. Pile support shall be at least 10 feet away from the test pile. Temporary piles for support of the reaction and reference beam systems shall be removed to a depth of at least 5 ft below finished grade.

2. The hydraulic jack shall have a capacity of at least 2.5 times the allowable design load and shall be capable of moving the pile a minimum of 6 inches.

3. The top of the test pile shall be level and capped to provide a horizontal bearing surface.

4. The Contractor shall furnish and install up to three micrometer dial indicators (range of 2 inches, graduated in 0.001-inch divisions).

5. Micrometer dials shall be mounted by the Contractor to one or more steel reference beams provided by the Contractor. The beam(s) shall be rigid and supported by piles extending at least 10 feet below existing grade at a distance of at least 10 feet from the test pile. The reference beams shall be fixed at one end and shall be free to move horizontally at the other end to allow for expansion and contraction of the reference beam without vertical deflection at points where dials are mounted. Wood or other materials subject to variations in moisture content shall not be used in reference beams, crossbeams, shims, or for any other means of dial support.

6. The Contractor shall protect the entire measuring apparatus against disturbances which may affect the reliability of the settlement observations. The Contractor shall provide suitable heaters and suitable enclosures to maintain the temperature around the test apparatus at a minimum of 40°F, and shall provide temporary lighting as necessary.

7. Loading and unloading of the test pile shall be performed only in the presence of the Engineer, and in accordance with the requirements shown on the Drawings.

3.4 TOLERANCES AND CRITERIA FOR ACCEPTANCE

A. Piles shall be installed as close as practicable to the required locations. A maximum lateral deviation from the correct location at cut-off elevation permitted will be 3.0 inches. A maximum deviation from design cut-off elevation equal to 1.0 inch will be permitted.

B. Piles which are believed to have collapsed, based on the grout take volume, or which are otherwise unsatisfactory as specified above and which cannot be removed or repaired, shall be abandoned, and filled with cement grout.

C. Piles that are rejected because of damage, mis location or misalignment, or failure to meet other installation criteria, shall be cut off below the design cut-off grade and abandoned. Additional pile(s) shall be installed as necessary subject to review by the Engineer. Whenever, in the judgment of the Engineer, misalignment or rejection of a pile is caused by the Contractor's violation of the specifications or other error on the Contractor's part, and installation of one or more replacement piles is necessitated, the cost of such re-installation shall be borne by the Contractor.

3.5 DISPOSAL OF EXCAVATED MATERIAL

A. All excavated material, slurry and slurry contaminated materials shall be removed and legally disposed of off-site by the Contractor. Prior to drill water discharge, the excess water shall pass through a sedimentation basin to remove soil fines. Additional treatment of water or slurry shall be performed as necessary to comply with any and all permits issued for dewatering and discharging of water and with all applicable regulatory requirements.

PART 4 MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Pile installation includes all services, permits, labor, equipment, transportation, material, and supplies to complete the work. Payment for these items shall include furnishing, installing, and grouting the piles for the completion of the work. No other payments for any specified or indicated work nor for any work implied therefrom shall be made.

4.2 PILE INSTALLATION

A. Final payment shall be on a unit price basis, based upon the total length of piles installed and accepted in accordance with the criteria presented herein. The unit price shall also include any adjustments in length to reflect the results of the pile load tests and the observed stratigraphy, and all other incidental costs. The length of pile shall be measured from the top of the permanent casing after grouting to the bottom of the core reinforcing steel. Length shall be measured to the nearest tenth of a foot.

B. No change in unit prices shall be made if the total footage or number of piles differs from the estimated quantities or that shown on the Drawings.

C. No separate payment will be made for removing obstructions.

D. Whenever, in the judgment of the Engineer, misalignment or rejection of a pile or piles, caused by the Contractor’s violation of the specification or other error, necessitates structural redesign, the cost of such redesign shall be deducted from sums otherwise due to the Contractor under the Contract. If the redesigned pile cap requires greater quantities of concrete and reinforcing steel, as compared with the quantities required for the pile cap as originally designed, the additional cost for pie cap concrete, reinforcing steel, and form work shall also be deducted from the contract price.

4.3 MOBILIZATION AND DEMOBILIZATION

A. No separate measurement or payment will be made for mobilization and demobilization. Payment for mobilization and demobilization shall be included in the unit price for pile installation.

4.4 PILE LOAD TESTS

A. The pile load tests (verification and proof) will be measured and paid per each test The payment includes any and all equipment, setup, removal, and other incidental services to the pile load tests.

JOB SPECIFIC

CODE 805.9906

REMOVE, MODIFY, AND RESET STEEL RAILING

DESCRIPTION. This work consists of removing, storing, refurbishing, modifying, and resetting the railing as indicated on the Plans or as directed by the Engineer.

MATERIALS. Not applicable

CONSTRUCTION METHOD. The existing railing located at the southeast side of the premanufactured shall be removed, sandblasted, cleaned of any foreign substances, modified to match the dimensions on the plans, galvanized, stockpiled in a manner so as not to be damaged, and reinstalled per the layout on the plans. Care should be exercised so that the materials are not damaged during removal or installation at the proposed location.

The existing railing located at the southwest side of the premanufactured shall be removed and properly disposed as indicated on the plans. Replacement railing shall be fabricated and installed to the dimensions and requirements on the plans and the acceptance by the owner.

The contractor will be required to modify the lengths of specific horizontal rail sections by both shortening and lengthening, along with providing an end of railing return detail as shown on the plans. All dimensions shall be field verified prior to commencing modifications and fabrication to the railings. Rails and handrails shall be bent in an even and uniform manner as indicated on Plans. All welds to be ground smooth and brushed to match finish of rail components. Discoloration from welding process shall be removed. All surfaces marred during fabrication and installation shall be refinished.

The work also includes providing and installing horizontal field splices to reconnect the refurbished and supplemental railings to the remaining existing rail. The work shall include furnishing and installing anchor bolts and preformed bearing pads.

The Contractor will be responsible for protecting all stockpiled materials from damage, theft, and vandalism until installation and acceptance by the Owner. Any railing materials not reused shall be removed and disposed of legally off the project site

Railings shall be erected square, plumb and true, and accurately fitted to the vertical and horizontal alignment of the bridges and wingwalls. Railing is to be plumb with a tolerance within 1/16” in 3 feet.

SUBMITTALS

Submittal Drawings

The Contractor shall submit detailed shop drawings of the supplemental railing to the Engineer in sufficient time to allow for review and approval prior to commencement of construction/fabrication of the railing. It is expressly understood and agreed that approval by the Engineer, or a designated representative, will not relieve the Contractor of any or all responsibility resulting from improper fabrication and installation of the railing.

Shop drawings prepared in such detail and completeness that all fabrication and installation at the site can be accomplished without the use of the Contract Drawings. The drawings shall include, but not be limited to, the following: all dimensions, member sizes, material specifications, connection details, splice details, weld details, bearing details, anchor bolt details, joint details, railing layout, railing attachment details, bill of materials and hardware schedule, quantities, etc., and all other details as required for fabrication and installation.

METHOD OF MEASUREMENT. This item does not require a measurement for payment.

BASIS OF PAYMENT. “Remove, Modify, and Reset Steel Railing” will be paid for at the at their respective contract Lump Sum prices as listed in the Bid. The price so-stated shall constitute full and complete compensation for all labor, materials, equipment, and other incidentals required to finish the work, complete and accepted by the Engineer.

Railings damaged by the Contractor’s operations will be replaced by the Contractor at no additional cost to the Owner.

JOB SPECIFIC

CODE 905.9901

CONCRETE PAVERS

DESCRIPTION.

The work under this item shall conform to the requirements of Section 201, 202 and 301 of the Rhode Island Standard Specifications for Road and Bridge Construction, latest edition. References include ASTM C 936 Material and Physical Properties, ASTM C 140 Absorption, ASTM C 1645 Freeze-Thaw resistance, and ASTM C 979 Color Pigmentation American Concrete Institute (ACI). This work consists of constructing a new path using concrete pavers as shown on the Plans.

MATERIALS.

<u>CONCRETE PAVERS</u>

Contractor shall identify the manufacturer and model of the existing pavers just south of the proposed pavers location and shall provide manufacturer's data to the Engineer for review and approval.

Final discretion will fall to the Engineer as to whether or not paver matches existing. Shall it be determined that the pavers cannot be matched, the Concrete Paver shall be Holland Stone by Belgard, 400 Perimeter Center Terrace, Suite 1000, Atlanta, GA 30346 or approved equal. Color shall be Silex Blend.

Paver shall be rectangular brick-like in proportion and appearance. Size shall be 3 15/16"x 7 7/8"x 2 3/8" thick. Installed paving patten shall be running bond and shall match the existing pavers adjacent.

Pavers must exceed ASTM C 936 compressive strength requirements and have an average compressive strength of 12,000 psi. The paver shall have a height aspect ratio of 4:1 and shall be rated for pedestrian traffic.

Concrete pavers shall meet the minimum material and physical properties set forth in ASTM C 936, Standard Specification for Interlocking Concrete Paving Units. Average compressive strength shall be 10,000 psi. Average absorption shall be 5% with no unit greater than 7% when tested according to ASTM C 140. Units shall have resistance to 50 freeze-thaw cycles, when tested according to ASTM C1645, with no breakage greater than 1.0% loss in dry weight of any individual unit. Testing by this method shall be conducted not more than 12 months prior to delivery of units.

<u>JOINT MATERIAL</u>

Polymeric Joint Sand shall be G2 by Alliance or approved equal. Color shall be black.

<u>SETTING BED SAND</u>

Setting Bed Sand shall be as follows; washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock. Do not use limestone screenings, stone dust, or sand material that does not conform to the grading requirements of ASTM C 33. Do not use mason sand or sand conforming to ASTM C 144. Conform to the grading requirements of ASTM C 33 with modification as shown in the table below:

SETTING BED SAND
GRADATION REQUIREMENTS FOR SETTING BED SAND

ASTM C 33	
Sieve Size	Percent Passing
3/8 in (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	10 to 30
No. 100 (0.150 mm)	2 to 10
No. 200 (0.075)	0 to 1

PAVER EDGE RESTRAINT

Paver Edge Restraint shall be Gator Edge Flex by Gator or approved equal. Install per manufacturer’s specification. Restraint shall be installed using a 6” min. steel spike, every 36” o.c.

CONSTRUCTION METHODS. Construction methods shall conform to the applicable paragraphs of Subsection 905.03 of the RIDOT Standard Specifications for Road and Bridge Construction, latest edition, and the following additions.

PREPARATION

Verify gravel borrow bed is installed per Section 301 – Aggregate and Gravel Base Courses and is well compacted, meeting material, installation, and grade specifications.

Stockpile Setting Bed Sand and Joint Sand such that they are free from standing water, uniformly graded, free of any organic material or sediment, debris, and ready for placement.

INSTALLATION

SETTING BED SAND

Provide and spread Setting Bed Sand evenly over compacted sub-grade and screed to a nominal thickness of 1 in. (25 mm).

Protect screeded Setting Bed Sand from being disturbed by either pedestrian or vehicular traffic.

Screed only the area which can be covered by pavers in one day.

Do not use Setting Bed Sand material to fill depressions greater than depths showing the drawings in the base surface.

Keep moisture content constant and density loose and constant until Concrete Pavers are set and compacted.

Screed the Setting Bed Sand using either an approved mechanical spreader (e.g.: an asphalt paver) or by the use of screed rails and boards.

Carefully maintain spread Setting Bed Sand in a loose condition, and protected against incidental compaction, both prior to and following screeding. Loosen any incidentally compacted sand or screeded sand left overnight before further paving units are placed.

Provide lightly screeded Setting Bed Sand in a loose condition to the predetermined depth, only slightly ahead of the paving units.

Fully protect screed Setting Bed Sand against incidental compaction, including compaction by rain. Remove any screeded Setting Bed Sand that is incidentally compacted prior to laying of the paving units. Do not permit either pedestrian or vehicular traffic on the screeded Setting Bed Sand.

Inspect the Setting Bed Sand course prior to commencing the placement of the Concrete Pavers. Acceptance of the Setting Bed Sand occurs with the initiation of Concrete Paver placement.

CONCRETE PAVERS

Replace Concrete Pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.

Exercise care in handling face mix concrete pavers to prevent surfaces from contacting backs or edges of other units.

Provide Concrete Pavers using laying pattern as indicated. Adjust laying pattern at pavement edges such that cutting of edge pavers is minimized. Cut all pavers exposed to vehicular tires no smaller than one-third of a whole paver.

Use string lines or chalk lines on Setting Bed Sand to hold all pattern lines true.

Set surface elevation of pavers 1/8 in. (3 mm) above adjacent drainage inlets, concrete collars or channels.

Place units hand tight against spacer bars. Adjust horizontal placement of laid pavers to align straight.

When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.

Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.

Prevent joint (bond) lines from shifting more than ±1/2 in. (±13 mm) over 50 ft. (15 m) from string lines.

Fill gaps between units or at edges of the paved area that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers.

Prevent all traffic on installed Concrete Pavers until Joint Sand has been vibrated into joints. Keep skid steer and forklift equipment off newly laid Concrete Pavers that have not received initial compaction and Joint Sand material.

Vibrate Concrete Pavers into leveling course with a low-amplitude plate vibrator capable of a to 5000-lbf (22-kN) compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate under the following conditions:

After edge pavers are installed and there is a completed surface or before surface is exposed to rain.

Compact installed Concrete Pavers to within 6 feet (2 meters) of the laying face before ending each day's work. Cover Concrete Pavers that have not been compacted and leveling course on which pavers have not been placed, with nonstaining plastic sheets to prevent Setting Bed Sand from becoming disturbed.

Protect face mix Concrete Paver surface from scuffing during compaction by utilizing a urethane pad.

Remove any cracked or structurally damaged Concrete Pavers and replace with new units prior to installing Joint Sand material.

POLYMERIC JOINT SAND

Install Polymeric Joint Sand per manufacturers recommended instructions.Protect surfaces from pedestrian and vehicular traffic for a minimum of 24 hours.

PAVER EDGE RESTRAINT

Install Paver Edge Restraint per Manufacturer’s recommended instructions.Protect surfaces from pedestrian and vehicular traffic for a minimum of 24 hours.

FIELD QUALITY CONTROL

Verify final elevations for conformance to the drawings after sweeping the surface clean. Prevent final Concrete Paver finished grade elevations from deviating more than ±3/8 in. (±10 mm) under a 10 ft (3 m) straightedge or indicated slope, for finished surface of paving.

Lippage: No greater than 1/32 in. (0.8 mm) difference in height between Concrete Pavers and adjacent paved surfaces.

REPAIRING, CLEANING AND SEALING

Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed paver surfaces; wash and scrub clean.

Clean Concrete Pavers in accordance with the manufacturer’s written recommendations.
Clean pavers discolored and stained by concrete cutters slurry immediately. Do not let pavers sit with foreign materials on the surface.

METHOD OF MEASUREMENT. "Concrete Pavers" shall be measured for payment by the “Square Yard” of pavers installed in accordance with the Plans and/or directed by the Engineer.

BASIS OF PAYMENT. "Concrete Pavers" will be paid for at the contract unit price per square yard as listed in the Bid. The price so-stated constitutes full and complete compensation for all labor, materials, and equipment, excavation with tools, hand tools, and light machinery, and for all other incidentals required to finish the work, complete and accepted by the Engineer.

JOB SPECIFIC

CODE 905.9902

REMOVE AND RESET CONCRETE PAVERS

DESCRIPTION. The work under this item shall conform to the requirements of Section 201 of the Rhode Island Standard Specifications for Road and Bridge Construction, latest edition. This work consists of the removal, stockpile, and resetting of concrete pavers as shown on the Plans.

MATERIALS. Polymeric Joint Sand shall be G2 by Alliance or approved equal. Color shall be black.
Setting Bed Sand shall be as follows; washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock. Do not use limestone screenings, stone dust, or sand material that does not conform to the grading requirements of ASTM C 33. Do not use mason sand or sand conforming to ASTM C 144. Conform to the grading requirements of ASTM C 33 with modification as shown in the table below:

SETTING BED SAND
GRADATION REQUIREMENTS FOR SETTING BED SAND

ASTM C 33	
Sieve Size	Percent Passing
3/8 in (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	10 to 30
No. 100 (0.150 mm)	2 to 10
No. 200 (0.075)	0 to 1

Paver Edge Restraint shall be Gator Edge Flex by Gator or approved equal. Install per manufacturer’s specification. Restraint shall be installed using a 6” min. steel spike, every 36” o.c.

CONSTRUCTION METHODS. Construction methods shall conform to the applicable paragraphs of Subsection 905.03 of the RIDOT Standard Specifications for Road and Bridge Construction, latest edition, and the following additions.

Concrete pavers to be removed and reset shall be accomplished by using hand tools and light power equipment only. Pavement breakers, saws, and backhoes shall not be used for this operation. Any damage caused by careless excavation deemed so by the Engineer shall be replaced by the Contractor at its own expense. No machinery shall be put on top of the existing concrete pavers.

Concrete pavers shall be excavated with care so that the materials are not damaged and may be reset. The Contractor shall remove and dispose of any broken or damaged pavers rejected by the Engineer and is considered incidental to the respective item. Care must be taken while removing and storing the existing pavers. The Contractor shall protect removed pavers from damage and store them in a safe manner. The stockpile location is to be an approved area as directed by the Engineer. Existing pavers specified for reuse which are disturbed, damaged, or removed in performing the work, shall be replaced with equivalent, new equipment and materials acceptable to the Engineer, at no expense to the Owner.

PREPARATION

Verify gravel borrow bed is installed per Section 301 – Aggregate and Gravel Base Courses and is well compacted, meeting material, installation and grade specifications.

Stockpile Setting Bed Sand and Joint Sand such that they are free from standing water, uniformly graded, free of any organic material or sediment, debris, and ready for placement.

INSTALLATION

SETTING BED SAND

Provide and spread Setting Bed Sand evenly over compacted sub-grade and screed to a nominal thickness of 1 in. (25 mm).

Protect screeded Setting Bed Sand from being disturbed by either pedestrian or vehicular traffic.

Screed only the area which can be covered by pavers in one day.

Do not use Setting Bed Sand material to fill depressions greater than depths showing the drawings in the base surface.

Keep moisture content constant and density loose and constant until Concrete Pavers are set and compacted.

Screed the Setting Bed Sand using either an approved mechanical spreader (e.g.: an asphalt paver) or by the use of screed rails and boards.

Carefully maintain spread Setting Bed Sand in a loose condition, and protected against incidental compaction, both prior to and following screeding. Loosen any incidentally compacted sand or screeded sand left overnight before further paving units are placed.

Provide lightly screeded Setting Bed Sand in a loose condition to the predetermined depth, only slightly ahead of the paving units.

Fully protect screed Setting Bed Sand against incidental compaction, including compaction by rain. Remove any screeded Setting Bed Sand that is incidentally compacted prior to laying of the paving units. Do not permit either pedestrian or vehicular traffic on the screeded Setting Bed Sand.

Inspect the Setting Bed Sand course prior to commencing the placement of the Concrete Pavers. Acceptance of the Setting Bed Sand occurs with the initiation of Concrete Paver placement.

CONCRETE PAVERS

Replace Concrete Pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.

Exercise care in handling face mix concrete pavers to prevent surfaces from contacting backs or edges of other units.

Provide Concrete Pavers using laying pattern as indicated. Adjust laying pattern at pavement edges such that cutting of edge pavers is minimized. Cut all pavers exposed to vehicular tires no smaller than one-third of a whole paver.

Use string lines or chalk lines on Setting Bed Sand to hold all pattern lines true.

Set surface elevation of pavers 1/8 in. (3 mm) above adjacent drainage inlets, concrete collars or channels.

Place units hand tight against spacer bars. Adjust horizontal placement of laid pavers to align straight.

When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.

Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.

Prevent joint (bond) lines from shifting more than ±1/2 in. (±13 mm) over 50 ft. (15 m) from string lines.

Fill gaps between units or at edges of the paved area that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers.

Prevent all traffic on installed Concrete Pavers until Joint Sand has been vibrated into joints. Keep skid steer and forklift equipment off newly laid Concrete Pavers that have not received initial compaction and Joint Sand material.

Vibrate Concrete Pavers into leveling course with a low-amplitude plate vibrator capable of a to 5000-lbf (22-kN) compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate under the following conditions:

After edge pavers are installed and there is a completed surface or before surface is exposed to rain.

Compact installed Concrete Pavers to within 6 feet (2 meters) of the laying face before ending each day's work. Cover Concrete Pavers that have not been compacted and leveling course on which pavers have not been placed, with nonstaining plastic sheets to prevent Setting Bed Sand from becoming disturbed.

Protect face mix Concrete Paver surface from scuffing during compaction by utilizing a urethane pad.

Remove any cracked or structurally damaged Concrete Pavers and replace with new units prior to installing Joint Sand material.

POLYMERIC JOINT SAND

Install Polymeric Joint Sand per manufacturers recommended instructions.Protect surfaces from pedestrian and vehicular traffic for a minimum of 24 hours.

PAVER EDGE RESTRAINT

Install Paver Edge Restraint per Manufacturer’s recommended instructions. Protect surfaces from pedestrian and vehicular traffic for a minimum of 24 hours.

METHOD OF MEASUREMENT. "Remove and Reset Concrete Pavers" shall be measured for payment by the “Square Yard” of pavers removed and reset in accordance with the Plans and/or directed by the Engineer.

BASIS OF PAYMENT. "Remove and Reset Concrete Pavers" will be paid for at the contract unit price per square yard as listed in the Bid. The price so-stated constitutes full and complete compensation for all labor, materials, and equipment, including removing and resetting of pavers, excavation with tools, hand tools, and light machinery, and for all other incidentals required to finish the work, complete and accepted by the Engineer.

Any pavers deemed unacceptable for reuse as determined by the Engineer shall be replaced in kind and shall be paid for under Item 905.9901 Concrete Pavers.

JOB SPECIFIC

CODE 916.9901

TEMPORARY TRAFFIC CONTROL FOR SIMS AVENUE PEDESTRIAN BRIDGE

DESCRIPTION. This item of work consists of several standard RIDOT bid items of work and job specific items of work required to provide the necessary detour routes, temporary traffic control setup, associated devices, and the maintenance and movement of traffic protection during the construction work for the Sims Avenue Pedestrian Bridge as shown on Traffic Control Plan Nos. 1-5 to the satisfaction of the Engineer and are listed below:

- Item Code 914.5010 Flagpersons
- Item Code 922.0100 Temporary Construction Signs Standard 29.1.0 and 27.1.1
- Item Code 923.0105 Drum Barricade Standard 26.2.0
- Item Code 923.0125 Plastic Pipe Type III Barricade Standard 26.3.1
- Item Code 923.0200 Fluorescent Traffic Cones Standard 26.1.0
- Item Code 926.0210 Unanchored Barrier for Temporary Traffic Control Standard 40.5.0
- Item Code 937.0200 Maintenance and Movement of Traffic Protection
- 6.0-foot-high temporary chain-link fence

MATERIALS. Materials shall be in conformance with the applicable sections of the Rhode Island Standard Specifications for Road and Bridge Construction, Amended May 2018, with all revisions.

- Section 903 Fences
- Section 914 Flagpersons
- Section 922 Temporary Construction Signs
- Section 923 Portable Channelizing Devices and Barricades
- Section 926 Anchored and Unanchored Precast Concrete Barrier for Temporary Traffic Control
- Section 937 Maintenance and Movement of Traffic Protective Devices

The 6’ high temporary chain link fence shall be provided in the locations indicated on the Plans and/or as required by the Engineer. The fence shall be used to close off the construction area from adjacent properties and for protection of pedestrians whose use may conflict with the construction activities.

CONSTRUCTION METHODS. Construction shall be in accordance with the applicable sections of the Rhode Island Standard Specifications for Road and Bridge Construction, Amended May 2018, with all revisions and are listed below:

- Section 903 Fences
- Section 914 Flagpersons
- Section 922 Temporary Construction Signs

- Section 923 Portable Channelizing Devices and Barricades
- Section 926 Anchored and Unanchored Precast Concrete Barrier for Temporary Traffic Control
- Section 937 Maintenance and Movement of Traffic Protective Devices

METHOD OF MEASUREMENT. This item does not require a measurement for payment.

BASIS OF PAYMENT. "TEMPORARY TRAFFIC CONTROL FOR SIMS AVENUE PEDESTRIAN BRIDGE"
will be paid for at the contract unit price per lump sum as listed in the Bid. The price so stated constitute full and complete compensation for all the RIDOT standard items and job specific items listed previously in this specification, and all other incidentals required to finish the work, complete in place and accepted be Engineer. The limit of traffic control for this item is shown on Traffic Control Plan Nos. 1-5.

APPENDIX 2

SITE CONDITIONS

Short-Term Response Action Plan

Providence Redevelopment Authority
Pedestrian Bridge Project
Plat Map 27 / Lot 295 &
Right-of-Way between Kinsley Avenue and Sims Avenue
Providence, Rhode Island

May 2022

Prepared For:

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TABLE OF CONTENTS

1.0 INTRODUCTION

On behalf of the Providence Redevelopment Authority (PRA), BETA Group, Inc. (BETA) has prepared this Short-Term Response Action Plan (STRAP) for the construction of a pedestrian bridge over the Woonasquatucket River. The work outlined in this STRAP will occur on Lot 295 of Plat Map 27 and within the public Right-of-Way between Kinsley Avenue and Sims Avenue (the Site). Site Investigation activities that have been conducted at the Site have identified the following:

- **Soil**: Three of the four soil samples collected and analyzed from the Site contained at least one concentration of a polynuclear aromatic hydrocarbon (PAH) or arsenic at concentrations exceeding the Rhode Island Department of Environmental Management's (RIDEM's) Residential Direct Exposure Criteria (RDEC). No exceedances of the GB Leachability Criteria were identified. Soil containing contaminants of concern at concentrations in excess of the RDEC was observed at depths of up to eight feet below grade within a layer of fill material.

- **Groundwater**: Groundwater samples collected from two monitoring wells at the Site did not contain contaminants of concern at concentrations exceeding RIDEM's GB Groundwater Objectives.

This STRAP details the procedures that will be taken to meet Section 1.7.9 of the Remediation Regulations.

2.0 PROJECT DESCRIPTION

The project involves the construction of a pedestrian bridge over the Woonasquatucket River, as shown on the plans included in Appendix A. The project includes, but is not limited to, the following construction activities:

- Mobilization, including micro pile and steel sheet pile work;
- Installation and maintenance of erosion control measures;
- Site preparation activities: removal of trees, sidewalk, railing, and railing foundation;
- Installation of micro piles and sheet piling cofferdams;
- Soil management activities: limited excavation, stockpiling, sampling and disposal;
- Excavation of soil from within sheet piling cofferdams;
- Dewatering of excavation within cofferdams, including dewatering;
- Construction of concrete bridge abutments within cofferdams;
- Backfill of bridge abutments within cofferdams;
- Cut off cofferdams below finish grade;
- Installation of crushed stone and riprap embankment protection;
- Installation of prefabricated steel bridge superstructure;
- Installation of railing and foundation;
- Installation of sidewalks; and
- Loaming, seeding, and restoration of surfaces.

The project requires approval and authorization from the RI Coastal Resources Management Council (CRMC) and the Federal Emergency Management Agency (FEMA).

- FEMA Conditional Letter of Map Revision obtained on January 1, 2022
- CRMC File No. 2022-03-089 (under review)

Work is anticipated to begin in the summer of 2022 and be complete by the end of the same year.

3.0 PREVIOUS INVESTIGATIONS

This section summarizes investigations BETA has undertaken during the planning stages of this project.

3.1 RIDEM File Review

On August 22, 2019, BETA conducted a file review at RIDEM for known release sites at the American Locomotive (formerly Microfin) property on Valley Street and the Farm Fresh property at the corner of Kinsley and Sims Avenues. The proposed pedestrian bridge will span the Woonasquatucket River from the greenway on the Valley Street side of the river to Kinsley Avenue. Construction will include excavation for footings on both sides of the river. The focus of our file review was to determine the environmental condition of soil in these areas. The following summarizes the results of our review followed by recommendations to support construction of the bridge.

American Locomotive (Formerly Microfin)

This facility occupied an approximately 17-acre property north of the river and south of Valley Street. As part of the redevelopment of the property it was divided into several lots with the Providence Assessor's office. The proposed foundation will be located on Lot 295 (formerly Lot 261) on Providence Assessor's Map 27.

A March 2006 "Site Investigation Report" by Fuss & O'Neill (F&O) for the entire property included borings near the planned foundation on the north side of the river. Soil sampling from these borings identified concentrations of metals (lead and thallium), semi-volatile organic compounds (SVOCs), and total petroleum hydrocarbons (TPH) in shallow (less than 2 feet below grade) above RIDEM's Residential Direct Exposure Criteria.

An October 2006 "Remedial Action Work Plan" (RAWP) by F&O for Lot 261 proposed "Site-wide soil capping" and the implementation of an Environmental Land Use Restriction (ELUR) for the entire lot as the preferred alternative to address the soil contamination at this property. The RAWP included several different capping units including Concrete Foundation Slab and Concrete Pavers, Paved Areas, and Landscaped Areas. The RAWP included a "Soil Management Plan" (SMP) for Lot 261 and two other lots that were part of the redevelopment. This plan documents how soil should be handled and capped and how the ELUR will be maintained at this property. The following documents how each of the capping units should be constructed:

- **Concrete Foundation Slab and Concrete Pavers**: "Any native soil from the remediation site that is left beneath the foundation slab or concrete pavers for a proposed building or walkway will be effectively capped by six inches of clean fill plus the overlying concrete slab or pavers."
- **Paved Areas**: "Native soil located beneath paved areas will be capped beneath a minimum of ten inches of material comprised of at least three inches of asphalt pavement overlying seven inches of clean fill base material."
- **Landscaped Areas**: "Native soil beneath landscaped areas will be capped with two feet of clean soil or one foot of clean soil and a geotextile fabric. The geotextile fabric will be set on top of the native soil and beneath the clean material soil cap to act as a visual indicator of the soil cap/native soil interface."

Additionally, the SMP states, "excavated native soil that is not situated beneath the soil cap at the conclusion of construction activities on the developed portion of the remediation site, if any, will be disposed of at an appropriate off-site receiving facility under bill of lading or manifest. Prior to the transport, re-location, or disposal of soil from on-site, the soil will be characterized to confirm that soil quality is in conformance with the requirements of the receiving facility. The transport and disposal of contaminated soil from the site is subject to the review and approval of a qualified environmental professional to certify compliance with the SMP and to assure compliance with RIDEM's anti-degradation guidance."

RIDEM approved the RAWP in a September 20, 2017 letter. RIDEM's records and Providence's deed records do not include any information to indicate that the ELUR has been filed for this property. Furthermore, RIDEM's project manager confirmed that, to his knowledge, the ELUR has yet to be recorded for this property.

Farm Fresh

This facility is located southeast of the intersection of Kinsley and Sims Avenues. This property had a leaking underground storage tank and impacted soil and groundwater from historic use. Investigations for the Farm Fresh property did not extend into Kinsley Avenue or towards the river. A September 20, 2017 "Remedial Approval Letter" from RIDEM approved a Remedial Action Work Plan (RAWP) for this property that included an engineered barrier and the imposition of an Environmental Land Use Restriction (ELUR) to maintain the barrier. Contamination at this property included urban fill, petroleum, and volatile organic compounds (VOCs). RIDEM's records and Providence's deed records do not include any information to indicate that the ELUR has been recorded for this property.

3.2 Subsurface Investigation

In order to determine if the proposed work areas at the Site had been impacted by releases discussed above, BETA conducted a subsurface investigation consisting of the following:

- **Preparation**

  BETA conducted the following activities in preparation of the implementation of the field work:

  - Marked proposed boring and monitoring well locations in the field for utility locations purposes;
  - At least 72 hours prior to the start of the drilling activities, notified "Digsafe" to mark utilities in the vicinity of the proposed boring locations; and
  - Re-located any borings that conflict with existing utilities.

- **Soil Borings and Groundwater Well Installation**

  BETA oversaw the advancement of two (2) soil borings (SB-03 and SB-04) and the installation of a groundwater monitoring well in each of the borings. Figure 1 depicts these locations. Please note the numbering of these borings was based on a continuation of previous geotechnical borings. The borings were located on each side of the Woonasquatucket River in the locations of the footings for the planned pedestrian bridge and associated ramps.

  On the north side of the river, boring SB-03 was advanced with the hollow-stem auger rig to a depth of approximately 180 feet below grade for both environmental and geotechnical assessment. This boring was advanced as follows:

  1. Set-up Terra Drilling Mats to help minimize damage to the existing sidewalks;
  2. Performed continuous sampling in the upper 10 feet for environmental sampling;
  3. Blind drilled from below the environmental sampling depth using driven casing and wash methods to El. -65 feet and collect two (2) Shelby Tubes of Very Soft Silt;
  4. Blind drilled from El. -65 feet to El. -107 feet and collect one (1) Shelby Tube of Very Soft Silt;
  5. Completed SPT tests in accordance with ASTM D 1586 at 5' intervals from the bottom of the Shelby Tube Interval to El. -120 feet;
  6. Continue SPT tests at 5' intervals from El. -120 feet to refusal; and
  7. Upon refusal, complete a 10-foot-long rock core.

On the south side of the river, boring SB-04 was advanced with the hollow-stem auger rig to approximately fifteen feet below grade with continuous sampling.

Both borings were completed as groundwater monitoring wells to a depth of fifteen feet below grade. Soil samples were screened in the field for the presence of volatile organic compounds (VOCs) using headspace testing with a photoionization detector (PID). PID readings ranged from 0.0 to 7.9 part per million by volume.

Four (4) soil samples (one from each boring at depths of 0-2 feet and 6-8 feet) were submitted to a state-certified environmental testing laboratory for analysis of fifteen metals by various EPA methods, polychlorinated biphenyls (PCBs) by EPA Method 8082, total petroleum hydrocarbons (TPH) by EPA Method 8015M, volatile organic compounds (VOCs) by EPA Method 8260, and semi-volatile organic compounds (SVOCs) by EPA Method 8270. Additionally, two composite soil samples (one from each side of river) were submitted for analysis of herbicides by EPA Method 8151, pesticides by EPA Method 8081, pH, reactivity, free liquid, flash point, and specific conductance. These analyses were determined based on the potential sources (urban fill) of contamination at the Site and to pre-characterize soil for off-site disposal.

Table 1, attached, summarizes the soil analytical results. As can be seen in Table 1, the two 0-2 foot samples contained PAHs above the RIDEM RDEC standards and the 6-8 foot sample from SB-03 contained arsenic above the RIDEM RDEC standard.

- **Monitoring Well Development**

  In accordance with RIDEM and U.S. EPA practices, each monitoring well was developed appropriately to remove fine silt and sand. This develops a proper connection between the well and the surrounding aquifer prior to the collection of groundwater samples.

- **Groundwater Well Sampling and Analysis**

  The depth to groundwater was measured in the two monitoring wells. After the wells were developed and allowed to come to equilibrium, groundwater samples were collected from each well using standard RIDEM sampling protocol. Groundwater samples were submitted to a state-certified environmental testing laboratory for analysis of TPH by EPA Method 8100M, SVOCs by EPA Method 8270, fifteen metals by various EPA methods, and VOCs by EPA Method 8260. These analyses were determined based on the potential source (urban fill) of contamination at the Site.

  Table 2, attached, summarizes the groundwater analytical results. As can be seen in Table 2, the only detected compounds included arsenic and barium, neither of which have a GB standard.

4.0 RESPONSE OBJECTIVES

The primary remedial objectives for this site are to appropriately manage the excess soil that may be generated during the course of the work and to reduce the potential for direct exposure to impacted soil via capping. Along with soil, this Section also specifies the remedial objectives for other potentially impacted media at the Site.

4.1 Soil

Since this project involves a recreational use of the Site area (bike path), soil objectives that apply are the RDEC found in Table 1 of the Remediation Regulations. As such, direct contact with soil is the primary long-term exposure pathway of concern.

Based on analytical data obtained to date, soil contaminants representative of typical "urban fill" (arsenic and various PAHs) are prevalent on both sides of the river at concentrations exceeding RDECs. Therefore, to eliminate health and environmental risks associated with direct soil contact, encapsulation of site soil is the proposed remedial alternative.

To the extent feasible, excavated soil will be reused on-site as backfill under the cap or bridge abutments. Any excess soil will be appropriately managed on-site (covered stockpiles, etc.), transported and disposed at an appropriately licensed disposal facility.

4.2 Groundwater

Groundwater sampling and analytical data collected at the Site has not identified any contaminants of concern at concentrations above their respective GB Groundwater Objectives. As such, no remedial actions for groundwater are warranted.

4.3 Surface Water and Sediments

The Site is on both sides of the Woonasquatucket River. Sampling of surface water or sediment from the River has not been conducted as no work is proposed within the river. Therefore, no direct remedial efforts related to surface water or sediments are proposed.

However, entrainment of impacted soil in stormwater runoff has the potential to impact adjacent surface water/sediment. Erosion runoff controls will be implemented during construction to prevent the migration of sediments into the River.

4.4 Air

Dust control measures will be required during earthwork activities to prevent the off-site migration of contaminants of concern.

5.0 Short-Term Response Elements (Section 1.7 of the Remediation Regulations)

- **1.7.1 Emergency or Short-Term Response Actions**

  Emergency or Short-Term Response Actions undertaken by the Responsible Party shall be conducted in a manner which is protective of human health and the environment.

- **1.7.2 Treatment Actions**

  Not Applicable. No treatment of Hazardous Materials is proposed. Response Actions are discussed in Section 5.

- **1.7.3 Duration**

  It is expected that the project, including the Short-Term Response Action, will take 6-months to complete.

- **1.7.4 Emergency Permits**

  Not Applicable. No on-site treatment of Hazardous Waste is proposed.

- **1.7.5 Emergency Permit Duration**

  Not Applicable. No Emergency Permit is required.

- **1.7.6 Public Notice Requirements**

  The remedial option was approved in the Voluntary Procedure Letter – Short-Term Response issued by RIDEM on March 30, 2022. Public Notification of all findings and completed response actions will be made to abutters and other stakeholders once the STRAP is completed.

- **1.7.7 Cessation Orders**

  Not Applicable.

- **1.7.8 Monitoring and Evaluation**

  Throughout the implementation of the Short-Term Response Action, progress will be monitored and evaluated by a qualified environmental professional. An operating log will be maintained to document actions taken.

- **1.7.9 Emergency or Short-Term Response Report**

  Following the completion of the Short-Term Response Action, a Short-Term Response Report providing a detailed summary of all investigations and activities undertaken will be submitted to RIDEM in both hard copy and electronic format within thirty days of completion of the Emergency or Short-Term Response Action. The report will include:

  1. The design specifications of any physical structures built or installed as part of the response;
  2. A site plan showing the limits of the response;
  3. Manifests, receipts and/or bills of lading for any excess soil disposed at an appropriate off-site disposal facility;
  4. The nature, concentrations and extent of residual contamination; and
  5. Required certifications.

6.0 RESPONSE ACTIONS

6.1 Description of the Proposed Remedy

Remedial actions that will be undertaken during the implementation of this project are incidental to the work associated with the installation of the pedestrian bridge. On each side of the river, soil will be excavated to allow for the installation of a concrete bridge abutment and associated walkways. To the maximum extent possible, excavated soil will be re-used as backfill.

Any disturbed surface will be encapsulated using one of the following methods to prevent direct exposure to contaminants of concern:

- **Abutments –** Where the bridge abutments will be installed, the soil will be covered with a monolithic concrete abutment.
- **Landscaped Cap –** Where vegetated surfaces will be re-established, the cap will consist of either two feet of imported clean soil overlying existing soil or a geotextile over existing soil covered with one foot of imported clean soil.
- **Hardscape Cap –** Where paved walking paths need to be established, the cap will consist of a minimum of 4-inches of bituminous asphalt or concrete overlying a minimum of 6-inches of structural sub-base fill over existing soil.

6.2 Proposed Schedule for Remediation

Construction of the pedestrian bridge is expected to commence in July and be completed by the end of 2022. A Closure Report will be submitted within 30 days following the completion of the work.

6.3 Contractors and/or Consultants

The remedial contractor has not been determined at the time of this submission. The firm's name and qualifications will be provided to RIDEM as soon as the company is selected.

The PRA shall be represented by a Qualified Environmental Professional (BETA) to oversee and document remedial activities outlined in this STRAP. The environmental professional will prepare a closure report at the conclusion of the remedial action.

6.4 Design Standards and Technical Specifications

Soil used to construct the cap shall be determined to be "clean" before it is imported to the Site. The definition of "clean" shall be compliance with the Residential Direct Exposure Criteria. For this project, both gravel and loam brought to the site shall be sampled at a rate of one sample per 500 yd^3 and analyzed for VOCs, TPH, Semi Volatile Organic Compounds, polychlorinated biphenyls (PCBs) and priority 13 metals to verify that it is "clean" before it is placed and compacted.

Where it is necessary to limit the cap depth to 1-foot, a geotextile shall be placed over existing soil prior to placing any fill. The fabric (Mirafi 140N, or equal) shall have a minimum Grab Tensile Strength of 120 pounds and a minimum Puncture Strength of 310 pounds.

6.5 Dust Control

Work at the site must comply with applicable federal, state, and local regulations, including the RIDEM Air Pollution Control Regulation No. 5 regarding control of fugitive dust. Dust is not only considered a general nuisance to neighboring properties, but it could allow contaminants of concern to migrate from the Site. Reasonable precautions will be taken to prevent the excessive generation of dust during soil excavation, stockpiling, loading, and other soil handling activities. Dust control measures, including wetting and the application of calcium chloride, shall be implemented if there is visual evidence of airborne dust being generated.

6.6 Soil Management

Soil excavated during construction shall be temporarily stockpiled in a designated area on each side of the River within the project area. No off-site stockpiling will be allowed. Stockpiled soil shall be placed on one layer of 6-mil polyethylene sheeting and covered with 6-mil polyethylene sheets whenever there is no active excavation being conducted. Stockpiles shall also be secured with appropriate controls to protect against storm-water and wind erosion. No regulated soil will be stockpiled on-site for greater than 60 days without prior RIDEM approval.

To the extent possible, soil will be re-used to backfill excavations. Soil that cannot be re-used on site shall be characterized by a Qualified Environmental Professional to determine the appropriate disposal and/or management options. Composite soil samples from the stockpile shall be collected and laboratory analyzed for contaminants at the frequency required by the disposal facility. Samples will be analyzed for the full suite of substances required by the disposal facility.

Shipping manifests for vehicles transporting soil and receipts from the disposal facility shall be logged and maintained on file.

In the event that contamination of an undetermined nature is encountered during the course of the work, the contractor shall stop work immediately and notify the owner and the owner's representative. The owner or his representative shall notify the RIDEM and take the necessary actions to characterize the nature and extent of the unknown contamination.

7.0 CONTINGENCY PLAN

Prior to the commencement of work, contractors involved in implementing the STRAP will be required to prepare a Contingency Plan or Health and Safety Plan (HASP) for their site personnel. The HASP shall summarize potential constituents of concern and describe appropriate protective measures to be followed during work. A copy of the working HASP must be available on-site during all remediation activities.

The HASP shall also incorporate an "Emergency Response/Contingency Plan" including the names and numbers of emergency coordinators and emergency responders.

As previously stated, PAHs and arsenic are the primary contaminants of concern on the Site. PAHs are broadly classified as Coal Tar Pitch Volatiles. The National Institute of Occupational Safety and Health (NIOSH) considers coal tar products (i.e., coal tar, coal tar pitch, or creosote) to be potential occupational carcinogens; the NIOSH REL (10-hour TWA) for coal tar products is 0.1 mg/m3 (cyclohexane-extractable fraction).

The OSHA Permissible Exposure Limit (8-hour TWA) for coal tar pitch volatiles is 0.2 mg/m3 (benzene-soluble fraction). OSHA defines "coal tar pitch volatiles" in 29 CFR 1910.1002 as the fused polycyclic hydrocarbons that volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter and includes substances such as anthracene, benzo(a)pyrene, phenanthrene, acridine, chrysene, pyrene, etc.

8.0 OPERATING LOG

The Qualified Environmental Professional will clearly and completely record all activities on-site in an Operating Log. Key parameters that will be recorded in the Operating Log include the thickness of the cap, construction details and the locations of each capping method. It will also document subcontractors and equipment used on-site, hours worked, summary of work performed, waste disposal information (e.g., volume of waste taken offsite, disposal location, and a description of problems identified and response actions taken. A sample Operating Log template is included as Appendix B. The Operating Log will be readily available at the Site during construction and shall be kept by the PRA for three years following completion of work.

9.0 COMPLIANCE DETERMINATION

Compliance with the STRAP will be demonstrated by the successful completion of the various capping elements of the project and the appropriate disposal of excess soil. A report documenting the construction activities performed will be submitted to RIDEM within 15 days of the completion of work.

TABLES

Table 1
Soil Analytical Data
Providence Pedestrian Bridge
Providence, Rhode Island

Sample Designation	SB-03 0-2	SB-03 6-8	SB-03 Comp	SB-04 0-2	SB-04 6-8	SB-04 Comp	RIDEM RESDEC	RIDEM I/C DEC
Sample Date	08/31/2020	08/31/2020	08/31/2020	09/04/2020	09/04/2020	09/04/2020		
Volatile Organic Compounds, milligrams per kilogram (mg/kg)								
Acetone	0.0393 U	**0.115**	---	**0.105**	**0.0494**	---	7,800	10,000
Semi-Volatile Organic Compounds, mg/kg								
Benzo(a)anthracene	**1.07**	0.545 U	---	**1.22**	0.443 U	---	0.9	7.8
Benzo(a)pyrene	**1.12**	0.273 U	---	**1.24**	0.222 U	---	0.4	0.8
Benzo(b)fluoranthene	**1.01**	0.545 U	---	**1.32**	0.443 U	---	0.9	7.8
Benzo(g,h,i)perylene	0.719 U	0.545 U	---	**0.654**	0.443 U	---	0.8	10,000
Benzo(k)fluoranthene	**0.796**	0.545 U	---	**1.02**	0.443 U	---	0.9	78
Chrysene	**1.03**	0.273 U	---	**1.3**	0.222 U	---	0.4	780
Dibenzo(a,h)Anthracene	0.361 U	0.273 U	---	**0.254**	0.222 U	---	0.4	0.8
Fluoranthene	**1.94**	0.545 U	---	**2.03**	0.443 U	---	20	10,000
Indeno(1,2,3-cd)Pyrene	0.719 U	0.545 U	---	**0.603**	0.443 U	---	0.9	7.8
Phenanthrene	**1.16**	0.545 U	---	**1.11**	0.443 U	---	40	10,000
Pyrene	**1.87**	0.545 U	---	**2.16**	0.443 U	---	13	10,000
Total SVOCs	**10.0**	ND	---	**12.9**	ND	---	NE	NE
Total Petroleum Hydrocarbons, mg/kg								
Total Petroleum Hydrocarbons	**378**	**115**	---	**193**	51.8 U	---	500	2,500
Total Metals, mg/kg								
Antimony	4.85 U	7.43 U	---	5.26 U	6.46 U	---	10	820
Arsenic	**4.97**	**10.1**	---	**4.56**	**5.38**	---	**7**	**7**
Barium	**40**	**13.9**	---	**53.8**	**11.6**	---	5,500	10,000
Beryllium	**0.25**	**0.41**	---	**0.36**	**0.21**	---	1.5	1.5
Cadmium	0.48 U	0.74 U	---	0.53 U	0.65 U	---	39	1,000
Chromium	**13.4**	**19.6**	---	**35.7**	**9.04**	---	1,400	10,000
Copper	**35.1**	**13.6**	---	**74.7**	**190**	---	3,100	10,000
Lead	**85.1**	**76.4**	---	**60.6**	**17.9**	---	150	500
Mercury	**0.152**	**0.311**	---	**0.172**	0.041 U	---	23	610
Nickel	**14.9**	**5.6**	---	**15**	**19.3**	---	1,000	10,000
Selenium	4.85 U	7.43 U	---	5.26 U	6.46 U	---	390	10,000
Silver	**3.66**	0.74 U	---	**0.8**	0.65 U	---	200	10,000
Thallium	4.85 U	0.74 U	---	5.26 U	0.65 U	---	5.5	140
Vanadium	**18.7**	**12**	---	**16**	**8.79**	---	550	10,000
Zinc	**118**	**23**	---	**172**	**44.5**	---	6,000	10,000
Pesticides, mg/kg								
Total Pesticides			ND			ND		
Polychlorinated Biphenyls, mg/kg								
Aroclor 1260	**0.04**	0.04 U	---	0.05 U	0.07 U	---	10	10
Herbicides, mg/kg								
Total Herbicides			ND			ND		
Classical Chemistry								
Conductivity	---	---	**196**	---	---	**184**	NE	NE
Corrosivity (pH)	---	---	**6.7**	---	---	**6.81**	NE	NE
Flashpoint	---	---	>200	---	---	>200	NE	NE
Free Liquid	---	---	0.3 U	---	---	0.3 U	NE	NE
Reactive Cyanide	---	---	2 U	---	---	2 U	NE	NE
Reactive Sulfide	---	---	2 U	---	---	2 U	NE	NE

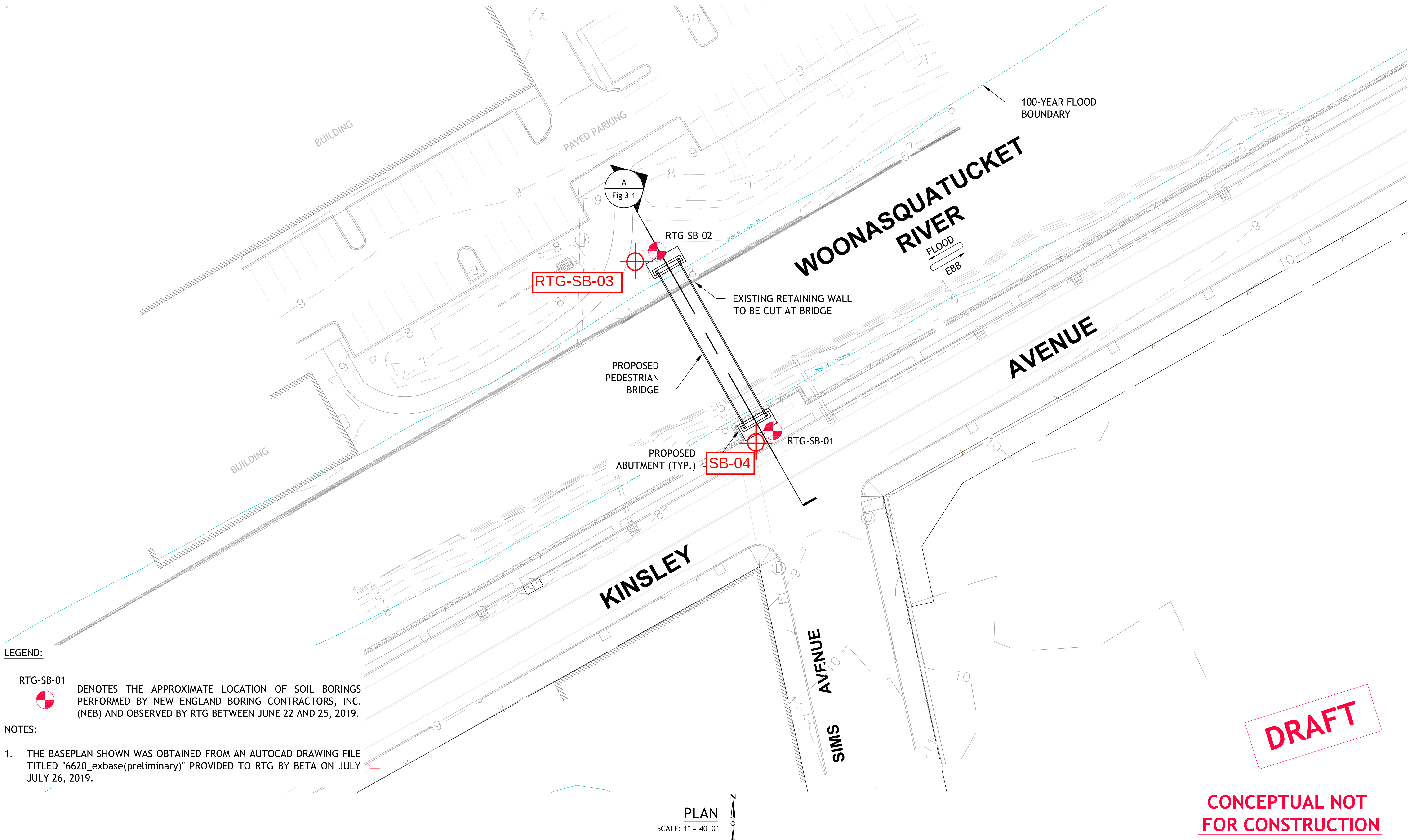
Notes
BOLD - compound detected
BOLD and Shaded - compound detected above regulatory standard
ND - Not detected above the laboratory method detection limits
U - Not detected above listed detection limit.
--- - Not analyzed for this compound
NE - Standard not established

Table 2
Groundwater Analytical Data
Providence Pedestrian Bridge
Providence, Rhode Island

Sample Designation	**MW-03**		**MW-04**		**RIDEM GB Criteria**
Sample Date	**10/08/2020**		**10/08/2020**		
Volatile Organic Compounds (VOCs), milligrams per liter (mg/L)					
Total VOCs	ND		ND		--
Semi-Volatile Organic Compounds (SVOCs), mg/L					
Total SVOCs	ND		ND		--
Total Petroleum Hydrocarbons, mg/L					
Total Petroleum Hydrocarbons	0.19	U	0.19	U	NE
Total Metals, mg/L					
Antimony	1	U	1	U	NE
Arsenic	2.5	U	**3.4**	-	NE
Barium	**25.4**	-	**69.7**	-	NE
Beryllium	0.5	U	0.5	U	NE
Cadmium	2.5	U	2.5	U	NE
Chromium	10	U	10	U	NE
Copper	10	U	10	U	NE
Lead	10	U	10	U	NE
Mercury	0.2	U	0.2	U	NE
Nickel	25	U	25	U	NE
Selenium	25	U	25	U	NE
Silver	5	U	5	U	NE
Thallium	1	U	1	U	NE
Vanadium	10	U	10	U	NE
Zinc	25	U	25	U	NE

Notes
BOLD - compound detected
ND - Not detected above the laboratory method detection limits
U - Not detected above listed detection limit.
NE - Standard not established

FIGURES



LEGEND:

RTG-SB-01 — DENOTES THE APPROXIMATE LOCATION OF SOIL BORINGS PERFORMED BY NEW ENGLAND BORING CONTRACTORS, INC. (NEB) AND OBSERVED BY RTG BETWEEN JUNE 22 AND 25, 2019.

NOTES:

1. THE BASEPLAN SHOWN WAS OBTAINED FROM AN AUTOCAD DRAWING FILE TITLED "6620_exbase(preliminary)" PROVIDED TO RTG BY BETA ON JULY JULY 26, 2019.

CONCEPTUAL NOT FOR CONSTRUCTION

Graphic Scale 1"=40'

40' 20' 0 40' 80'

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RT Group, Inc.
Engineered from the Ground Up[SM]
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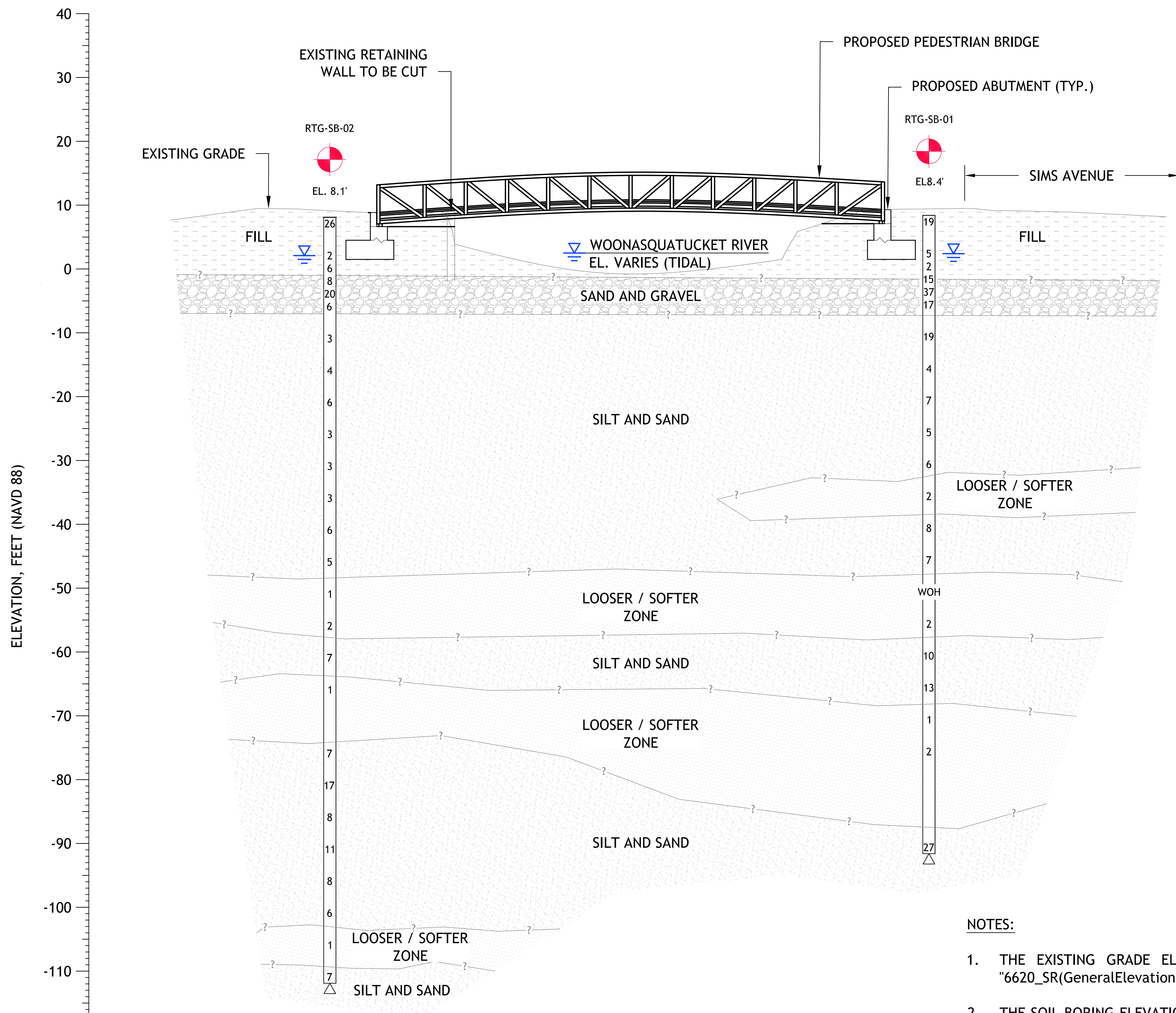
GEOTECHNICAL DATA AND DESIGN BASIS REPORT
SIMS AVE PEDESTRIAN BRIDGE OVER THE WOONASQUATUCKET RIVER
Providence Redevelopment Agency
Providence, Rhode Island

FIGURE 1-2
BORING LOCATION PLAN

SHEET 2 of 6
DATE AUG 2019
PROJ No. 19104.00



SUBSURFACE PROFILE (A / Fig 1-2)

SCALE: 1" = 20'-0"

DRAFT

CONCEPTUAL NOT FOR CONSTRUCTION

LEGEND:

RTG-SB-01 — DENOTES THE APPROXIMATE LOCATION OF SOIL BORINGS PERFORMED BY NEW ENGLAND BORING CONTRACTORS, INC. (NEB) AND OBSERVED BY RTG BETWEEN JUNE 22 AND 25, 2019.

BOTTOM OF SOIL BORING

15 — STANDARD PENETRATION NUMBER ("N" VALUE)

APPROXIMATE GROUNDWATER

FILL

SAND AND GRAVEL

SILT AND SAND

LOOSER / SOFTER ZONE

NOTES:

1. THE EXISTING GRADE ELEVATION DATA SHOWN WAS OBTAINED FROM AN AUTOCAD DRAWING FILE TITLED "6620_SR(GeneralElevation)" PROVIDED TO RTG BY BETA ON JULY JULY 26, 2019.

2. THE SOIL BORING ELEVATION DATA SHOWN ON THIS FIGURE WAS SURVEYED IN THE FIELD BY RTG ON JUNE 20, 2019 USING A LEICA GNSS RTK GPS AND TOTAL STATION (SUB-INCH ACCURACY).

3. THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTIONS WERE GENERALIZED FROM AND INTERPOLATED BETWEEN SOIL BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE SPECIFIC LOCATION AND ON THE DATES INDICATED. SOIL AND ROCK CONDITIONS, AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THE BORING LOCATIONS. ALSO THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE CONDITIONS AT THE SOIL BORING LOCATIONS.

Graphic Scale 1"=20'

20' 10' 0 20' 40'

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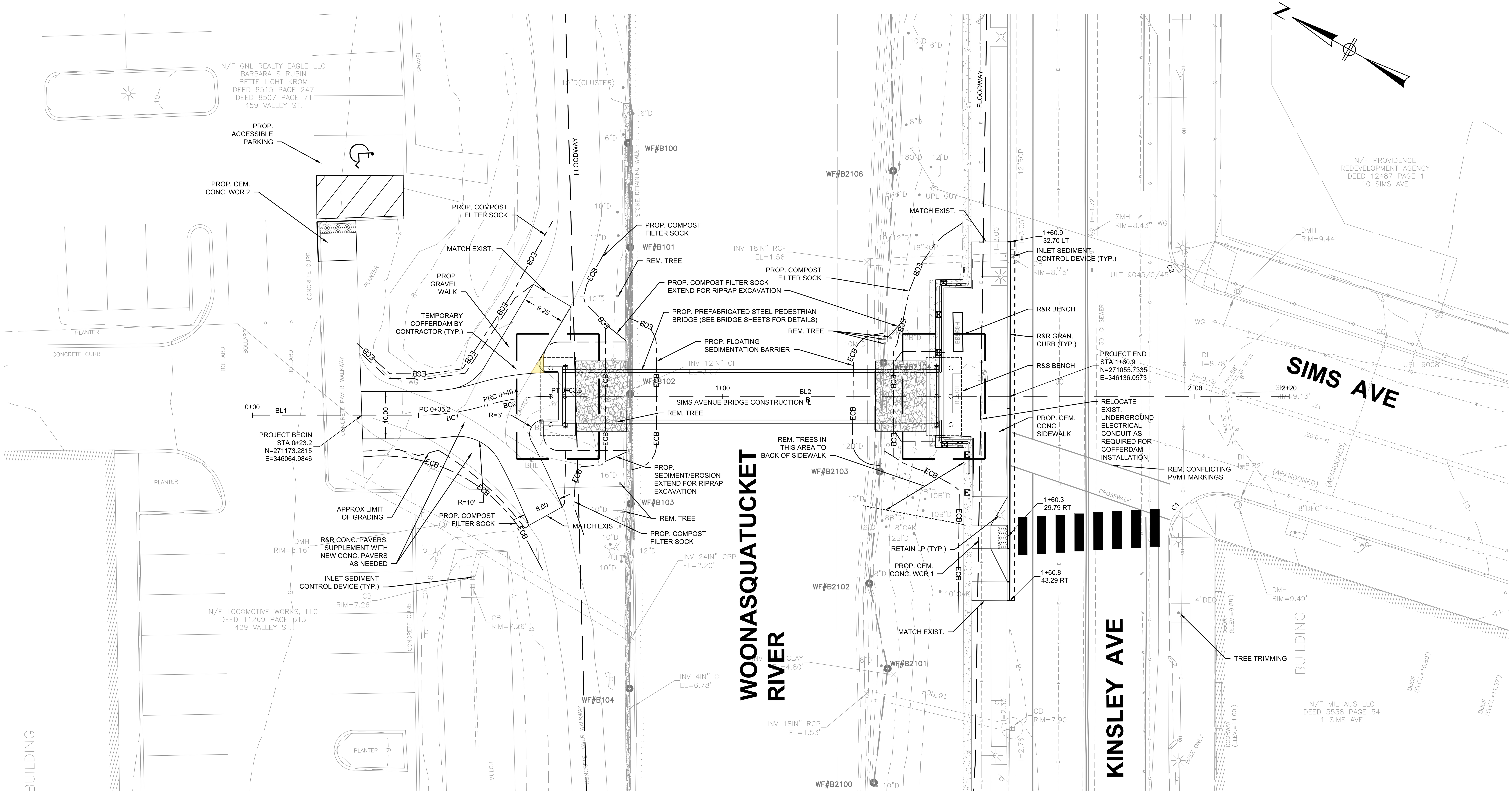
GEOTECHNICAL DATA AND DESIGN BASIS REPORT
SIMS AVE PEDESTRIAN BRIDGE OVER THE WOONASQUATUCKET RIVER
Providence Redevelopment Agency
Providence, Rhode Island

FIGURE 3-1
SUBSURFACE PROFILE

SHEET 3 of 6
DATE AUG 2019
PROJ No. 19104.00

APPENDIX A: Project Plans

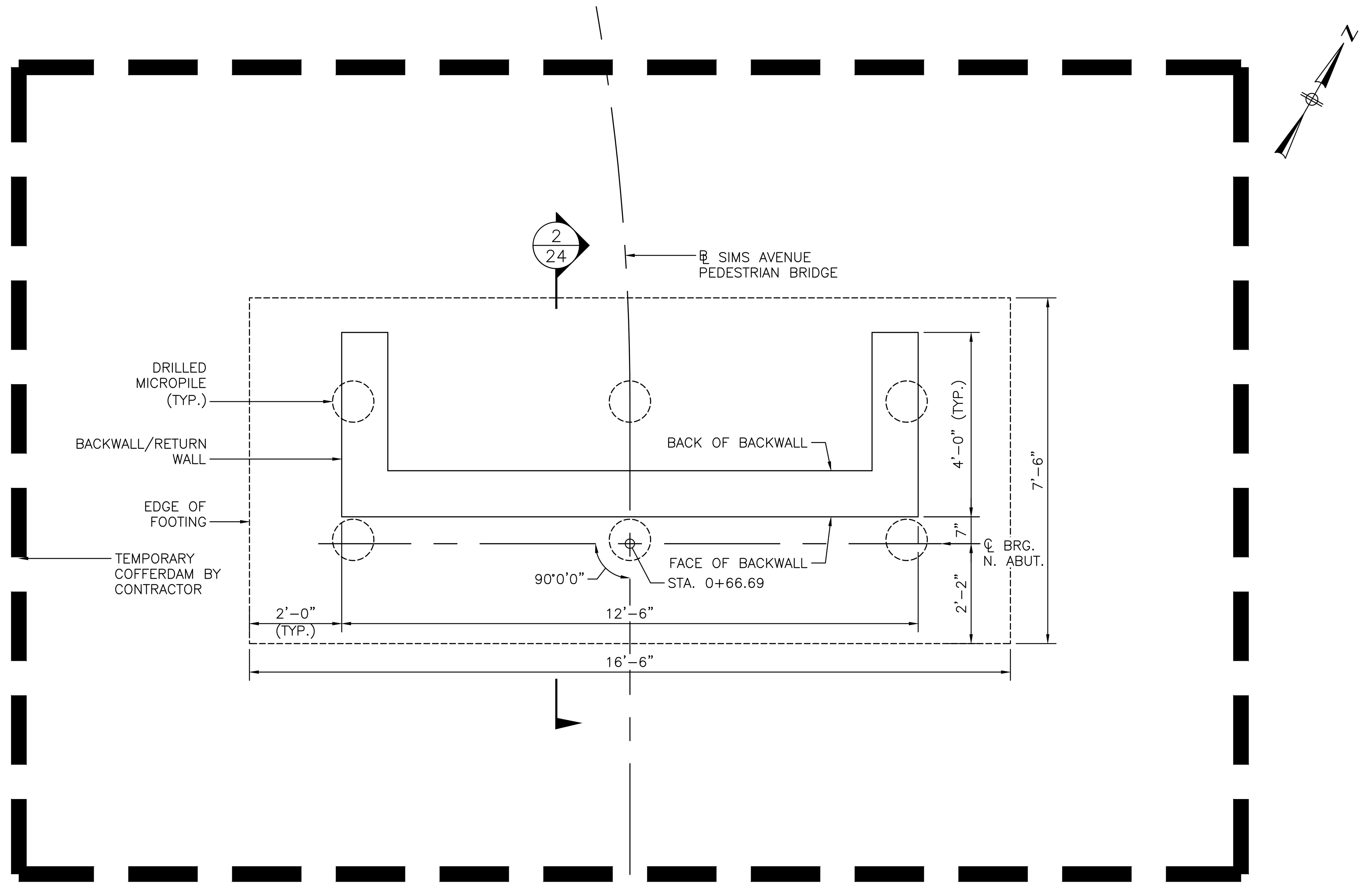


SIMS AVENUE BRIDGE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
BL1	0+00.00	271193.4609	346053.5725		S29°29'23"E 35.18'	0+35.18	271162.8416	346070.8888
BC1	0+35.18	271162.8416	346070.8888	R=50.00' Δ=16°15'37" L=14.19' T=7.14'		0+49.37	271151.6399	346079.5214

SIMS AVENUE BRIDGE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
BC2	0+49.37	271151.6399	346079.5214	R=50.00' Δ=16°15'37" L=14.19' T=7.14'		0+63.56	271140.4382	346088.1540
BL2	0+63.56	271140.4382	346088.1540		S29°29'23"E 156.44'	2+20.00	271004.2623	346165.1660

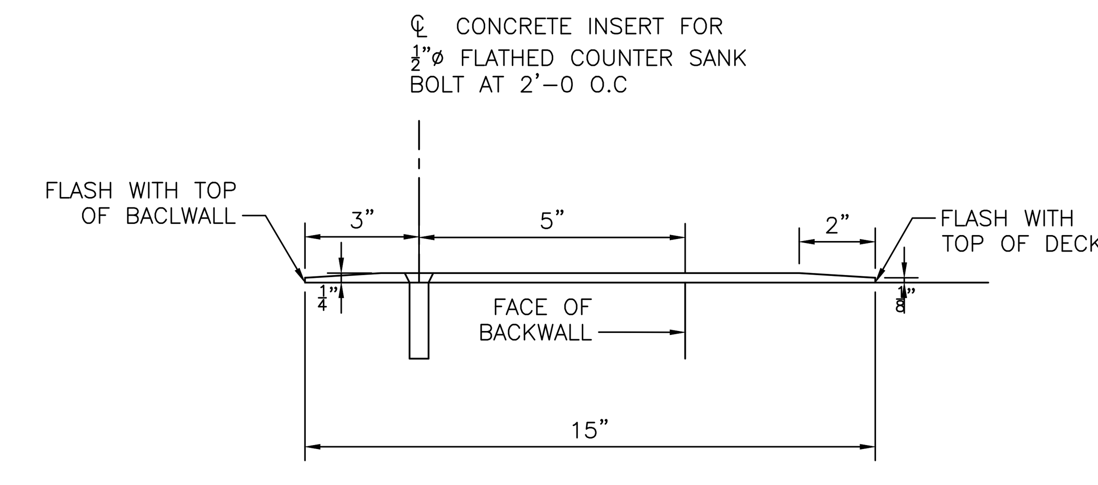
NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: BB
DESIGNED BY: BB
CHECKED BY: CWJ
REGISTERED PROFESSIONAL
PREPARED BY
BETA www.BETA-Inc.com
SUBCONSULTANT
SCALE
SCALE IN FEET: 1"=10'
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION
TITLE
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
CONSTRUCTION PLAN
BETA JOB NO. 6620
ISSUE DATE ##/##/####
SHEET NO. 6 OF 26



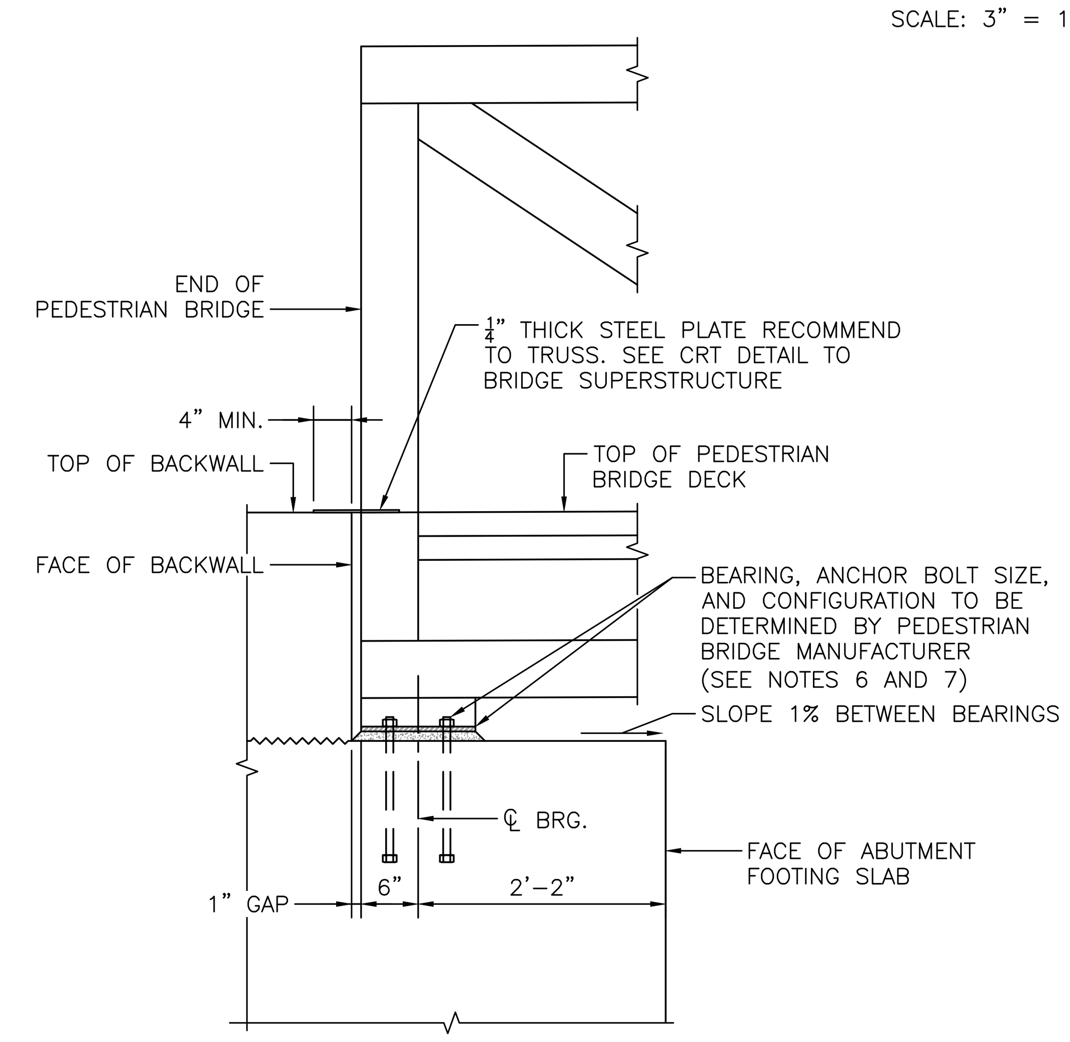
NORTH ABUTMENT PLAN

SCALE: 1/2" = 1'-0"



DIAMOND PLATE DETAIL

SCALE: 3" = 1'-0"



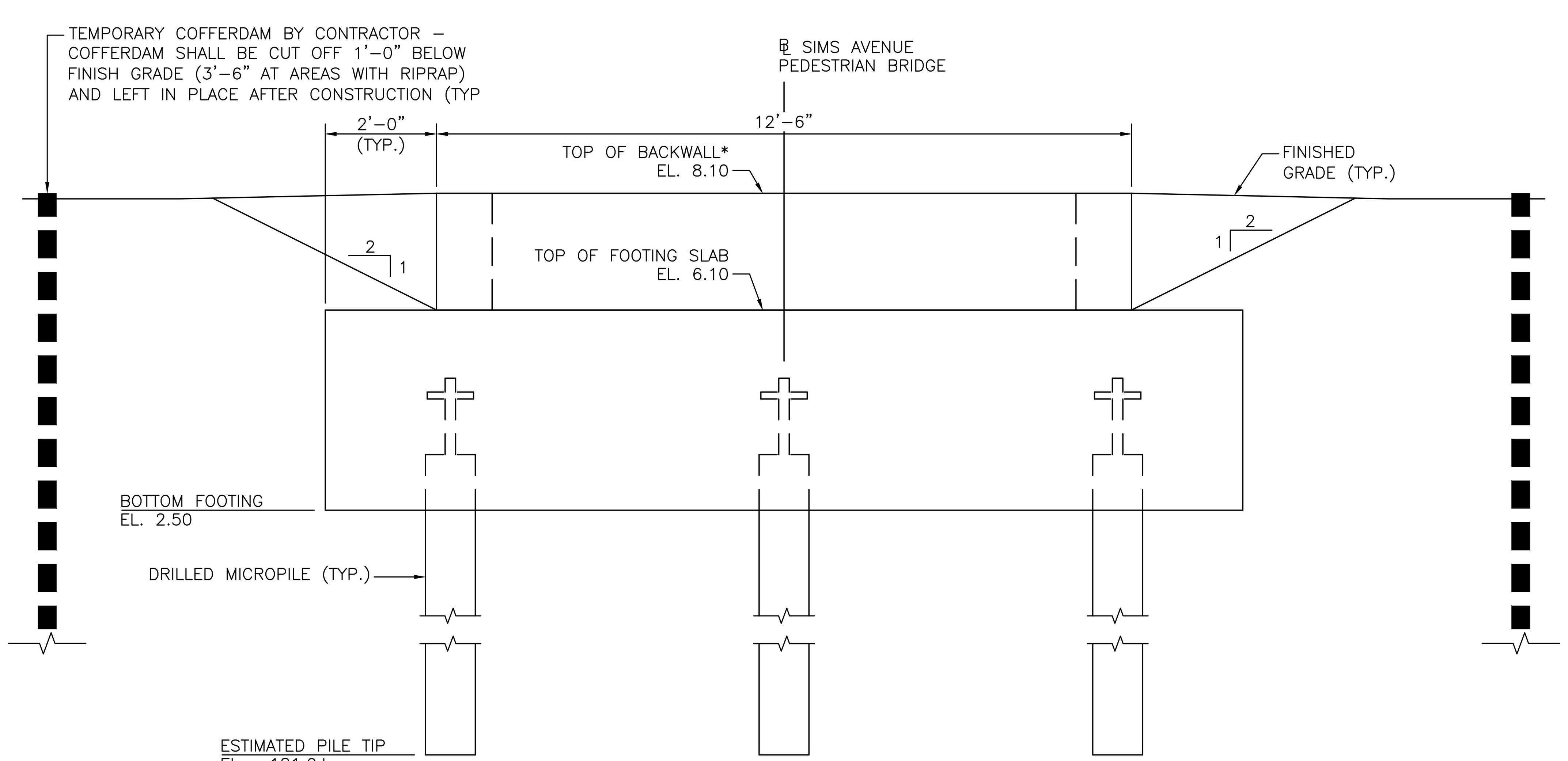
END OF BRIDGE DETAIL

SCALE: 3/4" = 1'-0"

ABUTMENT NOTES:

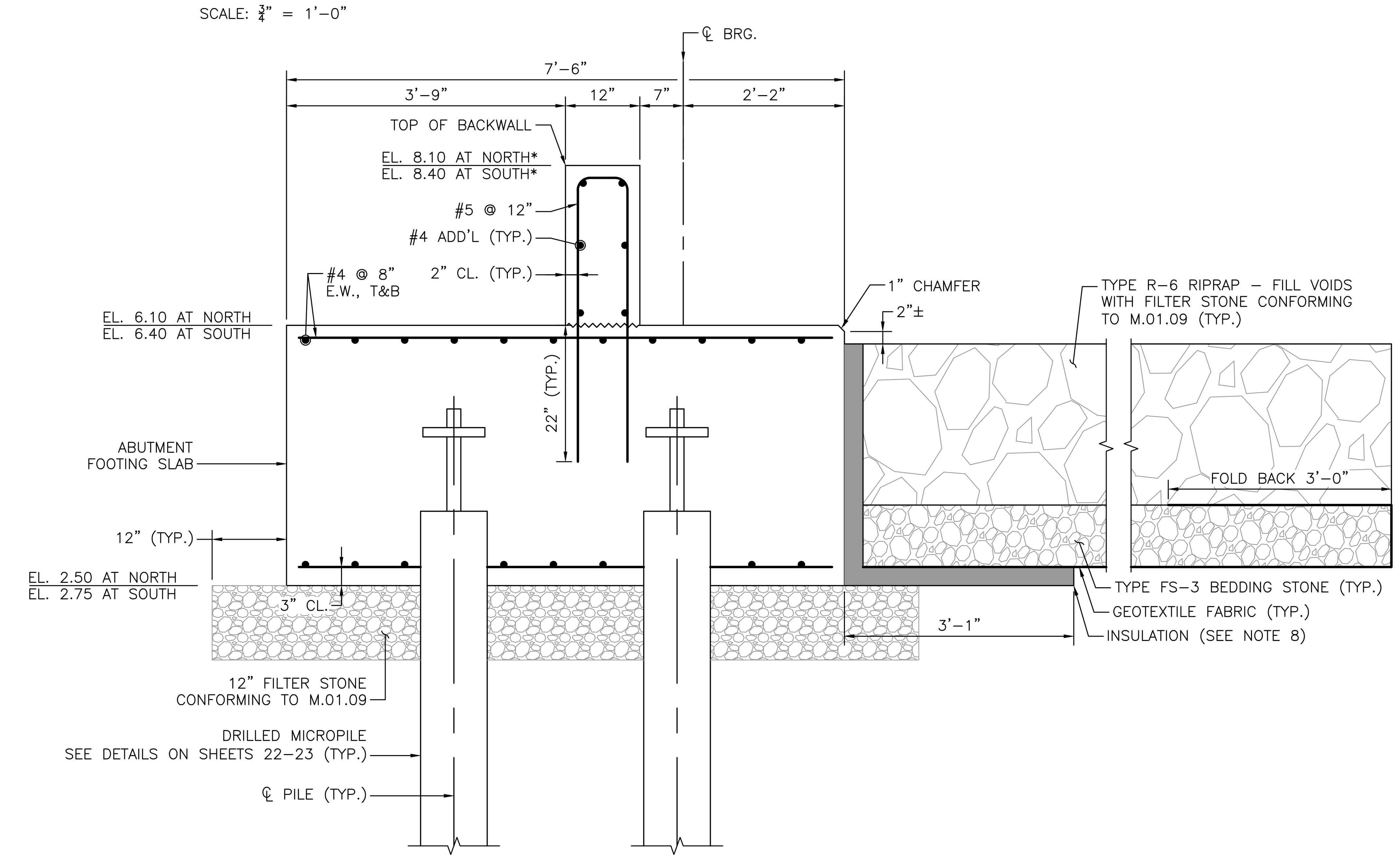
1. ALL REINFORCEMENT SHOWN IN THESE DETAILS SHALL BE GALVANIZED.
2. ALL CONCRETE SHALL BE CLASS HP 3/4", EXCEPT THE ABUTMENT FOOTING, WHICH SHALL BE CLASS XX 3/4".
3. CONSTRUCTION JOINT FOR BACKWALL SHALL BE GIVEN A RAKE FINISH WITH A 1/4" MINIMUM AMPLITUDE.
4. TOP OF BACKWALL SHALL BE TROWELED SMOOTH PARALLEL TO THE PROFILE GRADE.
5. PROVIDE 4"ø WEEPHOLES AT 10'-0" O.C. THROUGH BACKWALL. PROVIDE 1 CUBIC YARD OF FILTER STONE CONFORMING TO M.01.09 WRAPPED WITH GEOTEXTILE FABRIC AT THE RETAINED SIDE OF WEEPHOLE.
6. CONTRACTOR TO COORDINATE SIZE AND CONFIGURATION OF EXPANSION BEARING ASSEMBLY WITH PREFABRICATED BRIDGE MANUFACTURER. BEARING ASSEMBLY AND ANCHORAGE MUST BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.
7. BEARING ASSEMBLY TO BE DESIGNED IN ACCORDANCE WITH THE 2009 AASHTO GUIDE SPECIFICATIONS FOR PEDESTRIAN BRIDGES INCLUDING THE LATEST INTERIM REVISIONS.
8. INSULATION TO HAVE A MINIMUM THICKNESS OF 3" AND CONFORM TO ASTM C578 TYPE IX OR TYPE IV WITH A MINIMUM R-VALUE OF 6.1.

* COORDINATE WITH BRIDGE MANUFACTURER



NORTH ABUTMENT ELEVATION

SCALE: 1/2" = 1'-0"



SECTION 2 – TYPICAL ABUTMENT SECTION

SCALE: 3/4" = 1'-0"

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: DW

DESIGNED BY: DW

CHECKED BY: CWJ

REGISTERED PROFESSIONAL

PREPARED BY: BETA www.BETA-Inc.com

SUBCONSULTANT

SCALE: AS SHOWN

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE: SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
NORTH ABUTMENT PLAN, ELEVATION, & DETAILS

BETA JOB NO. 6620

ISSUE DATE ##/##/####

SHEET NO. 24 OF 26

APPENDIX B: Operating Log

Short Term Response Action Plan - OPERATING LOG

PROJECT:	Providence Pedestrian Bridge Kinsley and Sims Avenue Providence, Rhode Island	DATE:	PAGE: 1 of
CONTRACTOR:		WEATHER: WIND:	
CONTRACTOR'S HOURS OF WORK:	to	INSPECTOR: HOURS ON-SITE:	to

SUBCONTRACTORS WORKING ON-SITE:	
(1)	
(2)	
(3)	

VISITORS TO JOB SITE:	Arrival	Departure

LIST OF EQUIPMENT ON-SITE

DESCRIPTION OF WORK PERFORMED:

MATERIALS AND QUANTITIES BROUGHT TO SITE:

SOIL DISPOSAL (Number of Trucks, Volume, Disposal Location):

DUST MONITORING:

NEW ISSUES:

CONTINGENCY PLAN IMPLEMENTED? Yes ☐ No ☐

Actions Undertaken:

PHOTOGRAPHIC LOG: (Attach Photos)

INSPECTOTR'S SIGNATURE:

 | Issue Date: January 21, 2022 | Case No.: 21-01-1173R | CLOMR-APP

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT

COMMUNITY INFORMATION		PROPOSED PROJECT DESCRIPTION	BASIS OF CONDITIONAL REQUEST
COMMUNITY	**City of Providence** **Providence County** **Rhode Island** **COMMUNITY NO.: 445406**	BRIDGE	1D HYDRAULIC ANALYSIS FLOODWAY UPDATED TOPOGRAPHIC DATA
IDENTIFIER	Sims Avenue Pedestrian Bridge - Providence, RI	**APPROXIMATE LATITUDE AND LONGITUDE:** 41.827, -71.434 **SOURCE:** OTHER **DATUM:** NAD 83	

AFFECTED MAP PANEL	
TYPE: FIRM* NO.: 44007C0308J DATE: October 2, 2015	* FIRM - Flood Insurance Rate Map

FLOODING SOURCE AND REACH DESCRIPTION

Woonasquatucket River – From approximately 1,040 feet upstream of North Acorn Street to approximately 370 downstream of Eagle Street

PROPOSED PROJECT DESCRIPTION

Flooding Source	Proposed Project	Location of Proposed Project
Woonasquatucket River	New Bridge	At approximately 580 feet downstream of Eagle Street

SUMMARY OF IMPACTS TO FLOOD HAZARD DATA

Flooding Source	Effective Flooding	Proposed Flooding	Increases	Decreases
Woonasquatucket River	BFEs*	BFEs	Yes	Yes
	Floodway	Floodway	Yes	None
	Zone AE	Zone AE	Yes	Yes

* BFEs - Base (1-percent-annual-chance) Flood Elevations

COMMENT

This document provides the Federal Emergency Management Agency's (FEMA's) comment regarding a request for a CLOMR for the project described above. This document is not a final determination; it only provides our comment on the proposed project in relation to the flood hazard information shown on the effective National Flood Insurance Program (NFIP) map. We reviewed the submitted data and the data used to prepare the effective flood hazard information for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. Your community is responsible for approving all floodplain development and for ensuring that all permits required by Federal or State/Commonwealth law have been received. State/Commonwealth, county, and community officials, based on their knowledge of local conditions and in the interest of safety, may set higher standards for construction in the Special Flood Hazard Area (SFHA), the area subject to inundation by the base flood). If the State/Commonwealth, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

To determine the changes in flood hazards that will be caused by the proposed project, we compared the hydraulic modeling reflecting the proposed project (referred to as the proposed conditions model) to the hydraulic modeling used to prepare the Flood Insurance Study (FIS) (referred to as the effective model). If the effective model does not provide enough detail to evaluate the effects of the proposed project, an existing conditions model must be developed to provide this detail. This existing conditions model is then compared to the effective model and the proposed conditions model to differentiate the increases or decreases in flood hazards caused by more detailed modeling from the increases or decreases in flood hazards that will be caused by the proposed project.

The table below shows the changes in the BFEs:

BFE Comparison Table

Flooding Source: Woonasquatucket River		BFE Change (feet)	Location of maximum change
Existing vs. Effective	Maximum increase	None	Not Applicable
	Maximum decrease	0.1	From approximately 560 feet downstream of Eagle Street
Proposed vs. Existing	Maximum increase	0.04	From approximately 450 feet downstream of Eagle Street
	Maximum decrease	None	Not Applicable
Proposed vs. Effective	Maximum increase	0.04	From approximately 450 feet downstream of Eagle Street
	Maximum decrease	0.01	From approximately 580 feet downstream of Eagle Street

Increases due to the proposed project that exceed those permitted under Paragraphs (c)(10) or (d)(3) of Section 60.3 of the NFIP regulations must adhere to Section 65.12 of the NFIP regulations. With this request, your community has complied with all requirements of Paragraph 65.12(a) of the NFIP regulations. Compliance with Paragraph 65.12(b) also is necessary before FEMA can issue a Letter of Map Revision when a community proposes to permit encroachments into the effective floodplain/regulatory floodway that will cause BFE increases in excess of those permitted under Paragraph 60.3(d)(3)/60.3(c)(10).

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

DATA REQUIRED FOR FOLLOW-UP LOMR

Upon completion of the project, your community must submit the data listed below and request that we make a final determination on revising the effective FIRM and FIS report. If the project is built as proposed and the data below are received, a revision to the FIRM and FIS report would be warranted.

• Detailed application and certification forms must be used for requesting final revisions to the maps. Therefore, when the map revision request for the area covered by this letter is submitted, Form 1, entitled "Overview and Concurrence Form," must be included. A copy of this form may be accessed at https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-2.

• The detailed application and certification forms listed below may be required if as-built conditions differ from the proposed plans. If required, please submit new forms, which may be accessed at https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-2, or annotated copies of the previously submitted forms showing the revised information.

Form 2, entitled “Riverine Hydrology and Hydraulics Form.” Hydraulic analyses for as-built conditions of the base flood and the regulatory floodway must be submitted with Form 2.

Form 3, entitled “Riverine Structures Form.”

• A certified topographic work map showing the revised and effective base floodplain and floodway boundaries. Please ensure that the revised information ties in with the current effective information at the downstream and upstream ends of the revised reach and any tributaries.

• An annotated copy of the FIRM, at the scale of the effective FIRM, that shows the revised base floodplain and floodway boundary delineations shown on the submitted work map and how they tie into the base floodplain and floodway boundary delineations shown on the current effective FIRM at the downstream and upstream ends of the revised reach, as well as any tributaries.

• As-built plans, certified by a registered Professional Engineer, of all proposed project elements.

• A copy of the public notice distributed by your community stating its intent to revise the regulatory floodway, or a signed statement by your community that it has notified all affected property owners and affected adjacent jurisdictions.

• Documentation of the individual legal notices sent to property owners who will be affected by any widening or shifting of the base floodplain and/or any BFE increases along Woonasquatucket River.

Patrick “Rick” F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

DATA REQUIRED FOR FOLLOW-UP LOMR (continued)

• FEMA's fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps may be accessed at https://www.fema.gov/flood-maps/change-your-flood-zone/status/flood-map-related-fees. The fee at the time of the map revision submittal must be received before we can begin processing the request. Payment of this fee can be made through a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card (Visa or MasterCard only). Please either forward the payment, along with the revision application, to the following address:

LOMC Clearinghouse
Attention: LOMR Manager
3601 Eisenhower Avenue, Suite 500
Alexandria, Virginia 22304-6426

or submit the LOMR and fee using the Online LOMC portal at: https://hazards.fema.gov/femaportal/onlinelomc/signin

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM and FIS report. Because the flood hazard information (i.e., base flood elevations, base flood depths, SFHAs, zone designations, and/or regulatory floodways) will change as a result of the project, a 90-day appeal period will be initiated for the revision, during which community officials and interested persons may appeal the revised flood hazard information based on scientific or technical data.

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

COMMUNITY REMINDERS

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Kerry Bogdan
Chief, Risk Analysis Branch
U.S. Department of Homeland Security
Federal Emergency Management Agency, Region I
99 High Street
Boston, MA 02110
(617) 956-7576

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Geotechnical Data and Design Basis Report

Sims Avenue Pedestrian Bridge Over the Woonasquatucket River
Providence, Rhode Island

Soil Boring being completed at the Project site, photo taken by RTG on June 17, 2019.

Submitted: September 24, 2021

Prepared By:

BETA Group, Inc.
Engineers•Planners•Landscape Architects•Scientists

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Prepared For:

Providence Redevelopment Agency
City of Providence
444 Westminster St., Ste. 3A
Providence, RI 02903

Tighe & Bond Project No. 25-5061-001

Geotechnical Data and Design Basis Report

Sims Avenue Pedestrian Bridge Over the Woonasquatucket River
Providence, Rhode Island

This Report was prepared under the direction of:

JAMES B. RUSSELL
No. 6552
REGISTERED
PROFESSIONAL ENGINEER
CIVIL

Date: 9-29-21

Submitted: September 24, 2021

Prepared By:

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APPENDICES

Executive Summary

A geotechnical investigation was completed by Tighe & Bond (formerly RT Group, Inc. {RTG}) for the proposed Sims Avenue Pedestrian Bridge (the Bridge) that will span over the Woonasquatucket River in Providence, Rhode Island (Figures 1-1 and 1-2). Tighe & Bond completed the investigation for Beta Group, Inc. (BETA), who is under Contract with the City of Providence Redevelopment Agency (PRA).

The investigation revealed that the site of the proposed Bridge is underlain by about 195 feet of unconsolidated material. This includes Fill, Sand & Gravel, Silt & Sand, and Glacial Till, which overlies weathered Bedrock. Within the Silt & Sand Stratum there are at least four (4) distinct layers of very soft Silt that range from about 5- to 20-feet-thick (Figure 3-1). These layers are fine grained, normally consolidated, and compressible.

The Silt is characteristic of the Providence River Silt formation, which is a "Sensitive" deposit that loses shear strength upon disturbance. Disturbance can be induced by construction activities such as pile driving, sheet pile installation, and compaction operations. It can also occur as a result of a seismic event, which has the potential to liquify the Silt layers and the loose granular soils located above them.

While a seismic analysis is not required for the foundations of a single span bridge such as this, the PRA indicated they would prefer that the proposed Bridge be designed to address the potential for liquefaction to occur as a result of a seismic event, which could cause the bridge abutments to settle. This necessitated that deep foundation systems be considered to support the bridge abutments. Accordingly, H-, Pipe-, Timber-, Pre-Cast Concrete, and drilled Micro-Piles were evaluated.

Based on our evaluation, drilled Micro-Piles would result in the least amount of disturbance to the underlying "Sensitive" Silt, thus reducing the potential for existing structures/utilities to settle and become damaged as a result of construction activities, which is a common problem when working in the Providence River Silt deposit. The drilled Micro-Piles would also reduce the likelihood that the bridge abutments would settle as a result of liquefaction during a seismic event.

While the use of drilled Micro-Piles is advantageous in some respects, this foundation alterative (Figure 4-2) has an estimated cost of about $1.4 Million, which is about $0.60 Million greater than the estimated cost to install shallow spread footings (Figure 4-1) (Tables E-1 and E-2). The estimates provided do not include the cost of the bridge superstructure or other site improvements, so the total cost of the project will be even greater.

Even if the number of micro-piles could be reduced from 6 to 4 per abutment during final design, which may be possible, the cost differential between the deep and shallow foundation alternatives is still expected to be about $0.40 Million. Accordingly, we recommend that the PRA consider the use of shallow spread footings. While shallow spread footings, if selected, would be expected to settle during a seismic event, this is a non-critical single span pedestrian bridge, which could be repaired if required.

1. Introduction

This report presents the results of a geotechnical investigation completed by Tighe & Bond (formerly RT Group, Inc. {RTG}) for the proposed Sims Avenue Pedestrian Bridge (the Bridge) that will span over the Woonasquatucket River in Providence, Rhode Island (Figures 1-1 and 1-2). Tighe & Bond completed the investigation for Beta Group, Inc. (BETA), who is under Contract with the City of Providence Redevelopment Agency (PRA).

1.1 Purpose and Scope

The purpose of this report was to investigate and characterize the subsurface conditions and provide recommendations for the design and construction of the proposed Bridge abutments. The scope of work included:

- Collecting and reviewing available geologic and geotechnical data;
- Drilling three (3) soil borings;
- Performing laboratory testing on selected soil samples;
- Evaluating both shallow and deep foundation alternatives;
- Developing construction considerations and recommendations; and
- Preparing this Report.

This report was not prepared to characterize the environmental conditions at the site. We understand that environmental sampling and testing, including an assessment of environmental impacts, is being performed by BETA.

1.2 Project Description

The proposed Bridge will provide pedestrian access over the Woonasquatucket River at the intersection of Kinsley and Sims Avenues. The proposed Bridge will consist of a single span supported by two (2) abutments. The final layout and design for the proposed Bridge is currently being performed by BETA.

1.3 Datum for Elevations

Elevations stated in this Report reference the North American Vertical Datum of 1988 (NAVD 88). All soil boring locations and elevations were surveyed in the field by Tighe & Bond using a Leica GS-14 GNSS Global Positioning Survey (GPS) Rover upon completion.

1.4 Limitations

Interpretations summarized in this Report are based on subsurface information obtained from soil borings that reflect subsurface conditions only at specific locations; thus, variations in subsurface conditions may not be reflected. In addition, time may alter the conditions observed during the exploration (e.g., groundwater levels). If significant variations become apparent during construction, the adequacy of the design should be reviewed.

variations become apparent during construction, the adequacy of the design should be reviewed.

This Report was prepared in accordance with generally accepted geotechnical engineering practice as an aid to the design and construction of the project. No other warranties either express or implied are made. Interpretations contained herein were based on the applicable standards of the consulting profession at the time and place this Report was prepared, and additional limitations are summarized in Appendix A.

Information from previous subsurface investigations is presented in the Reference Reports contained in Appendix B. This information was obtained from local/state agencies. No responsibility is assumed by Tighe & Bond for the correctness or accuracy of subsurface information provided by or under the direction of others.

2. Subsurface Investigation

This Section summarizes the Subsurface Investigation that was completed.

2.1 Geology

The United States Geological Survey (USGS) Surficial Geology Map for the Providence Quadrangle, dated 1956, indicates that the proposed Bridge is located in an area of Fill in which the existing soil has been altered by filling or excavation. The USGS Bedrock Geology Map for the same area, dated 1959, indicates that bedrock in the vicinity of the proposed Bridge is primarily the Rhode Island Formation. This formation consists of sedimentary rocks including greenish, gray, dark-gray to black graywacke, conglomerate, sandstone, shale, and meta-anthracite, and may include Pondvillle conglomerate in covered areas.

2.2 Seismic

A seismic review for the proposed Bridge was performed in accordance with the AASHTO LRFD Bridge Design Specifications (AASHTO 2017). Refer to Section 4.1 for more detail.

2.3 Previous Investigations

The State of Rhode Island Department of Public Works, Divisions of Roads and Bridges, completed five (5) soil borings for the construction of the Pleasant Valley Parkway Bridge No. 777 (RIDPW, 1972), which is located approximately 2,000 feet downstream of the proposed Bridge. The soil borings were completed in March and April of 1967 and included soil borings B-24 through B-28.

Starting from the ground surface, the 1967 soil boring logs indicate about 5 to 12 feet of loose sand fill, 2 to 4 feet of peat (B-24, B-25, and B-27), 7 to 10 feet of medium dense sand and gravel, 70 to 90 feet of medium dense sand and silt, 55 feet of dense sand and gravel, and bedrock. The boring logs from the 1967 investigation are provided in Appendix B.

2.4 Subsurface Investigation

New England Boring Contractors, Inc. (NEB) of Brockton, Massachusetts completed two (2) soil borings (RTG-SB-01 and RTG-SB-02) between June 17 and 20, 2019 (Figure 1-2). Following the completion of these soil borings, a supplemental deep soil boring (RTG-SB-03) was completed between August 31 and September 8, 2020. The soil boring logs are presented in Appendix C.

The soil borings were completed using a truck-mounted drill rig and were advanced to depths ranging from 100 to 210 feet below grade utilizing driven casing and wash drilling methods. Standard Penetration Test data (i.e., "N" values) was obtained in accordance with the procedures outlined in ASTM D 1586 using a 140-pound auto hammer with a free fall of 30 inches.

In general, soil samples were taken continuously for the first 10 feet and at 5-foot intervals thereafter, unless otherwise shown. The "N" values were determined at each sample interval by counting the number of blows required to drive the split spoon sampler through the 6 to 18-inch run.

The soil borings were logged and representative split spoon soil samples were collected by Tighe & Bond personnel. A Tighe & Bond geotechnical engineer visually classified the soil in accordance with the Unified Soil Classification System (USCS). Following completion of the soil borings, soil cuttings from the soil borings were utilized to backfill them, and an observation well as install in RTG-SB-03.

2.5 Laboratory Investigation

Sieve and hydrometer analyses, Atterberg Limits, pocket penetrometer, torvane, and consolidation tests were performed on selected soil samples to help classify the soils and establish their engineering and design properties. The testing program was developed by Tighe & Bond and performed by Thielsch Engineering (THIELSCH) of Cranston, RI. The laboratory test results are summarized in Table 2-1 and provided in Appendix D.

3. Site and Subsurface Conditions

This Section summarizes the site and subsurface conditions.

3.1 Site Conditions

The Woonasquatucket River is approximately 70-feet-wide at the proposed Bridge location. The embankments on each side of the river are vegetated with mature trees and undergrowth. At the south embankment, there is a concrete sidewalk with sitting benches that parallel Kinsley Avenue. At the north embankment, there is a retaining wall and a brick sidewalk located adjacent to an existing paved parking lot (Figure 1-2).

3.2 Subsurface Soils

The soil boring logs were simplified and combined to develop a generalized soil profile at the project site. The location of the soil profile is shown in Figure 1-2 and the profile is shown in Figure 3-1. The general stratigraphy, from top to bottom, consists of the following strata:

- Stratum 1-Fill;
- Stratum 2-Sand and Gravel;
- Stratum 3-Silt and Sand;
- Stratum 4-Silty Gravel with Sand; and
- Stratum 5-Presumed Bedrock.

Stratum 1 is Fill that generally consists of poorly graded sand and silty sand. The Fill was encountered along both embankments of the river. Based on the soil borings completed, the Fill extends from the ground surface to about 11 feet below grade. Standard Penetration Tests completed in this deposit indicate that the Fill is very loose to medium dense.

Stratum 2 is Sand and Gravel that generally consists of well graded sand with gravel to well graded gravel with sand. This stratum extends from directly below Stratum 1 to a depth up to about 18 feet below grade. Standard Penetration Tests completed in this deposit indicate that the material is generally medium dense.

Stratum 3 is Silt and Sand that generally consists of silt to silty sand. This stratum extends from directly below Stratum 2 to a depth of about 180 feet below grade. Standard Penetration Tests completed in this deposit indicate that the material generally ranges from medium dense to dense, except as indicated below.

Within Stratum 3 there are at least four (4) distinct layers of very soft silt that range from about 5- to 20-feet-thick. These layers are fine grained (i.e., little to no sand), are normally consolidated, and compressible. This non-plastic silt is characteristic of the Providence River Silt formation, which is a “Sensitive” deposit that tends to lose shear strength upon disturbance (e.g., due to pile driving, compaction operations, a seismic event, etc.). This can cause structures or utilities to settle and become damaged, which is a common problem when working in or near the Providence River Silt deposit.

Stratum 4 is silty gravel with sand. This stratum extends from directly below Stratum 3 to about 195 feet below grade. Standard Penetration Tests completed in this deposit indicate that the material is generally dense to very dense, which is characteristic of glacial till.

Stratum 5 is bedrock that is located directly below Stratum 4. A single 5-foot-long bedrock core was taken that indicates that the bedrock is weathered Graywacke with a Rock Quality Designation (RQD) of 8.6 percent. The roller bit was advanced an additional 15 feet to confirm the continued presence of this bedrock.

3.3 Groundwater

Groundwater was encountered approximately 6 feet below grade in both soil borings during the subsurface investigation and about 7 to 8 feet below grade in the observation well installed at RTG-SB-03 and MW-3 (By BETA). Groundwater at the site is tidal, and is also expected to vary due to precipitation, season, temperature, local construction activities, and other factors, and could be different at the time of construction.

4. Geotechnical Design Basis-Foundations

This Section presents the design basis for the proposed foundations.

4.1 Seismic

A seismic review for the proposed Bridge was performed in accordance with the AASHTO LRFD Bridge Design Specifications (AASHTO 2017). In accordance with Section 3.10.3.1 of these specifications, the site for the proposed Bridge is classified as Site Class E and the design spectra response are summarized in Table 4-1.

Table 4-1
Recommended Seismic Design Spectra Response

Design Parameter	Design Response Spectra (g)
A_S	0.148
S_{DS}	0.313
S_{D1}	0.119

In accordance with Section 3.10.6 of the above subject specifications, the proposed Bridge is within Seismic Zone 1. In addition, and in accordance with Section 3.10.5 of the subject specifications, the operational classification for the proposed Bridge is "Other Bridges" (i.e., not Critical or Essential).

Based on the above, and in accordance with Section 4.7.4 of the subject specifications, a seismic analysis is not required for the foundations of this single span bridge. However, the minimum requirements of Section 4.7.4.4 (Minimum Support Length Requirements) and Section 3.10.9 (Calculation of Design Forces) will apply.

While seismic analyses beyond those mentioned above are not required per AASHTO, the saturated silts and sands (Stratum 3) located below the proposed Bridge abutments are generally loose/soft. Therefore, these soils will be susceptible to liquefaction during a seismic event. Accordingly, settlement and/or damage to the proposed Bridge could occur due to a seismic event unless a pile foundation system is utilized, and the piles are driven to bedrock or into a dense bearing stratum.

4.2 Frost Protection

Except where erected upon solid rock or otherwise protected from frost, the proposed foundations should extend to the frost line. In accordance with Section 10.5.1 of the Rhode Island LRFD Bridge Design Manual, the specified frost depth for Providence is 4 feet.

4.3 Flood and Scour Protection

Based on review of the local Flood Insurance Rate Map (FIRM), the site of the proposed Bridge is located within a Federal Emergency Management Agency (FEMA) AE Flood Zone and will be inundated during the 100-year flood. The 100-year flood elevation is estimated to be about El. 9.5 feet (about 1 to 2 feet above existing grade).

Based on the above, the foundations for the proposed Bridge abutments could be subject to scour during a flood, and a detailed scour analysis should be completed to determine the need for and extent of armor protection (e.g., riprap). This should include, but would not be limited to the existing masonry retaining walls, which we understand will remain.

4.4 Foundation Alternatives

Several foundation alternatives were evaluated for supporting the proposed Bridge abutments. These alternatives included (1) Shallow Spread Footings, (2) Mat Foundations, and (3) Deep Foundations. Each of these alternatives are described in more detail below.

4.4.1 Shallow Spread Footings

Spread footings founded at frost depth are expected to experience considerable settlement (total and differential) due to the variable composition and density of the Fill (Stratum 1). Based on this, over excavation and replacement of the unsuitable Fill materials would be necessary. This would require that cofferdams be installed at each proposed abutment and that the excavation be dewatered in order to allow unsuitable materials to be excavated/removed and Structural/Granular Fill to be placed and compacted in the “dry”.

4.4.2 Mat Foundations

Mat foundations are commonly used to minimize the total and differential settlement of structures founded above loose and compressible soils. The depth and width of the mat are selected so that the structural load to the underlying soils is partially compensated by an equal or greater weight of removed soil. By doing this, the additional load transmitted to the underlying soils is minimized. However, this generally applies to structures such as buildings with basements, and is not the case for the proposed Bridge abutments.

Based on the above, a mat foundation could be utilized and would be expected to better tolerate settlements (total and differential) compared to spread footings. However, excavation and replacement of unsuitable materials would still be necessary. Similar to spread footings, this would require that cofferdams be installed at each proposed abutment, and that the excavation be dewatered in order to allow unsuitable materials to be excavated/removed and Structural/Granular Fill to be placed and compacted in the “dry”.

4.4.3 Deep Foundations

Based on the thickness and density of the Fill (Stratum 1), as well as the presence of very soft to soft compressible soils at depth (Stratum 3), deep foundations were also considered for supporting the proposed Bridge. This is consistent with past precedent along the Woonasquatucket River, including the recently rehabilitated Pleasant Valley Parkway Bridge No. 777, which is located about 2,000 feet downstream. For this rehabilitation project, 115-foot-long closed ended pipe piles were reportedly driven to support the widened bridge abutments.

Based on the above, we evaluated several driven pile types to support the proposed bridge abutments, including H-Piles, Pipe-Piles, Timber-Piles, and Pre-Cast Concrete Piles. Because Stratum 3 contains layers of “Sensitive” silt, we also evaluated drilled Micro-Piles in order to minimize the potential for vibration induced disturbance/damage during construction.

4.4.3.1 Steel H-Piles

Steel H-Piles are commonly used in New England. The pile segments are typically spliced together using a full penetration groove weld or by using mechanical splices and fillet welds. H-Piles are typically used to support allowable loads of up to about 150 tons and were carried forward for further evaluation.

4.4.3.2 Steel Pipe-Piles

Concrete Filled Steel Pipe-Piles are also commonly used in New England. The pile segments are typically spliced together using a full penetration groove weld or by a drive fit steel collar and fillet weld. Pipe-Piles are typically used to support allowable loads of up to about 200 tons and were carried forward for further evaluation.

4.4.3.3 Timber-Piles

Timber-Piles are also used in the area and typically support allowable loads of up to about 30 tons. However, potential obstructions in the Fill (Stratum 1) could damage the timber during driving. In addition, the vertical and uplift capacity of the pile would be limited, due to order length limitations and the inability to splice timber. Based on these factors, Timber-Piles were not carried forward for further consideration, but could be reevaluated on a case-by-case basis depending on the required pile capacity.

4.4.3.4 Pre-Cast Concrete Piles

Pre-Cast Concrete Piles are sometimes used in New England, but they are not as common as H-, Pipe-, or Timber-Piles. They are typically used to support allowable loads of up to about 200 tons. However, excessive vibrations can sometimes result from driving these high displacement piles and they are difficult to splice, which makes them unattractive should they need to be driven deeper to achieve capacity. Based on these factors, Pre-Cast Concrete Piles were not carried forward for further evaluation.

4.4.3.5 Drilled Micro-Piles

Drilled Micro-Piles up to about 12 inches in diameter are commonly used in New England to support allowable loads of up to 200 tons. These piles are drilled and result in very little vibration, which is beneficial when trying to minimize disturbance and impacts to adjacent structures. Based on this, and because there are layers of “Sensitive” silt that could experience a loss of shear strength and settlement as a result of pile driving, this pile type was carried forward for further evaluation.

4.5 Estimated Allowable Capacities for Piles

Based on the preliminary abutment loads provided by BETA (Table 4-2), and assuming that a total of six (6) piles are utilized at each abutment location, the total maximum vertical load is estimated at about 145 kips and the total maximum horizontal load is estimated about 17 kips. Accordingly, the vertical and horizontal pile design loads are estimated at about 24 and 3 kips, respectively.

<table>
<tr><th colspan="3">Table 4-2
Preliminary Abutment Loads (Unfactored, Per Abutment)</th></tr>
<tr><th>Direction/Orientation</th><th>Type</th><th>Load (kips)</th></tr>
<tr><td rowspan="5">Vertical Downward</td><td>Dead Load (DC)</td><td>86.1</td></tr>
<tr><td>WA</td><td>4.57</td></tr>
<tr><td>WS</td><td>17.91</td></tr>
<tr><td>Pedestrian Live Load (PL)</td><td>36.0</td></tr>
<tr><td>Total</td><td>144.58</td></tr>
<tr><td rowspan="5">Horizontal
(Longitudinal Controls)</td><td>WS</td><td>3.48</td></tr>
<tr><td>TU</td><td>4.88</td></tr>
<tr><td>EH</td><td>5.11</td></tr>
<tr><td>EQ</td><td>3.48</td></tr>
<tr><td>Total</td><td>16.94</td></tr>
</table>

Based on the above, H-Piles, Pipe-Piles, and Drilled Mirco-Piles were carried forward for further evaluation. For the purposes of preparing this report an HP12x53 (ASTM A572, Grade 50), PP12x0.375 (ASTM A252, Grade 3), and a PP10.75x0.50 Drilled Micro-Pile (Grade 80) were considered (additional pile types could be considered as part of final design).

4.5.1 Allowable Vertical Capacity

In addition to the pile design load of 24 kips, the piles will need to resist the estimated downdrag forces that could develop in the soil deposits located above the “Sensitive” silt layers (e.g., due to their disturbance and/or raising site grade). These downdrag forces are estimated at about 80 kips, which are about four (4) times higher than the estimated pile design load.

Based on the above, the piles will need to develop an allowable vertical capacity far in excess of the estimated pile design load in order to resist the estimated downdrag forces and maintain pile settlements within tolerable levels. In order to achieve this capacity, it was assumed that the pile tips would need to terminate within the dense to very dense glacial till layer (Stratum 4), or at about El. -170 feet.

Using the subsurface profile shown in Figure 3-1, a static pile analysis was performed to estimate the allowable vertical capacity for each pile type listed above. These analyses, accounted for the estimated downdrag forces, and utilized appropriate Factors of Safety (FOS) at this preliminary stage. In general, the allowable vertical capacities were estimated based on the sum of the shaft resistances for each stratum that the piles would penetrate, plus end bearing, if applicable.

Based on the static analyses completed, the estimated allowable vertical capacity for HP12x53, PP12x0.375, and PP10.75x0.50 piles that are installed to about El. -170 feet is about 130, 130, and 110 kips, respectively. While much greater than the pile design load of 24 kips, this or a comparable capacity is recommended in order to resist the estimated downdrag forces.

4.5.2 Allowable Uplift Capacity

Using the soil profile shown in Figure 3-1, a static pile analysis was also performed to estimate the allowable uplift capacity for each pile type listed above. The allowable capacities were estimated based on the sum of the shaft resistances for each stratum that the piles would penetrate. Based on the static analyses completed, the estimated allowable uplift capacity for HP12x53, PP12x0.375, and PP10.75x0.50 piles that are installed to about El. -170 feet are about 90, 70, and 110 kips, respectively.

4.5.3 Allowable Lateral Capacity

Using the soil profile shown in Figure 3-1, an LPILE analysis was performed to estimate the allowable lateral capacity for each pile type listed above (no batter assumed). The allowable lateral capacities were estimated based on the assumption that the tops of the piles translate laterally and mobilize the passive soil resistance from the ground surface to the estimated point of fixity.

Based on the LPILE analysis, and assuming a maximum allowable deflection of about 1-inch, the estimated lateral capacity for the HP12x53, PP12x0.375, and PP10.75x0.50 piles is about 9, 7, and 9 kips, respectively. Along the weak axis of the HP12x53, the estimated lateral capacity is about 5 kips.

The estimated lateral capacities assume that the piles are subject to shear and vertical load only. Because the piles are expected to be embedded in a cast-in-place concrete pile cap, a detailed pile group analysis, including an evaluation of the combined axial compression and bending due to the lateral loads, is recommended as part of final design. Following this group analysis, the allowable lateral pile capacities and final number of piles (including the potential use of batters) would be determined.

4.5.4 Corrosion

For steel piles located below the groundwater table and in contact with undisturbed soil, steel corrosion rates are expected to be less than about 1 mil (0.001 inches) per year. This assumes that no stray electrical currents exist, that a galvanic reaction does not take place, and that the soil is not corrosive. Based on this, the estimated structural capacities for the piles evaluated at year 50 are expected to be greater than the required capacities presented above.

4.6 Foundation Alternative Evaluation

An evaluation of the shallow spread footing and deep foundation alternatives, using allowable stress design, follows.

4.6.1 Shallow Spread Footing Alternative

Based on the preliminary abutment loads provided in Table 4-2, the maximum estimated vertical reaction is expected to be about 145 kips per abutment. Assuming that shallow spread footings were utilized, we estimate the applied footing pressure at about 1,200 pounds per square foot (psf) (145,000 pounds/ (7.5 ft. x 16 ft.)).

Assuming that the unsuitable Fill materials were removed to about El. -3.0 feet and replaced with Structural Fill back to about El. +1.5 feet (assumed bottom of footing) (Figure 4-1), we estimate the allowable bearing capacity to be about 1,700 psf, which is greater than the applied footing pressure of 1,200 psf.

Providing that the unsuitable Fill materials are removed and replaced as noted above, and site grades are not raised, the total and differential settlements are estimated at about 1.0 and 0.50 inches, respectively. It is recommended that the total settlement not exceed 1.0 inch and that the differential settlement not exceed ½ inch for structures such as this. Accordingly, the estimated settlements are within tolerable limits.

4.6.2 Deep Foundation Alternative

Steel H-Piles, Pipe-Piles, and Drilled Micro-Piles are considered viable, and the estimated allowable vertical, uplift, lateral, and structural capacities are summarized in Table 4-3.

Table 4-3
Estimated Allowable Pile Capacities

Pile Type	Estimated Length (ft)	Estimated Allowable Capacity (kips)[1]			
		Vertical	Uplift	Lateral[2]	Structural[3]
HP12x53	175 -180	130	90	9 (5 weak axis)	210
PP12x0.375	175 -180	130	70	7	160
PP10.75x0.50 (Drilled Micro-Pile)	175 -180	110	110	9	260[4]

Table Footnotes:
[1]The estimated allowable vertical and uplift capacities are based on a FOS of 3.0.
[2]The estimated lateral capacity presented does not account for combined axial compression and bending due to lateral loads and may be adjusted downward pending final design.
[3]The structural capacity is the axial compression capacity of the pile section itself based on an assumed corrosion rate of 1 mil/year over 50 years.
[4]The lower cased section (i.e., grout and rebar) of the micro-pile controls.

As mentioned previously, these or comparable vertical capacities are recommended in order to resist the estimated downdrag forces, which are much greater than the estimated pile design load.

4.7 Advantages and Disadvantages

There are advantages and disadvantages associated with the shallow and deep foundation alternatives. With respect to the shallow foundation alternative, the advantages include the following:

1. Construction techniques required for construction are considered "conventional";

2. Overall costs to construct the proposed Bridge abutments are expected to be significantly less than the deep foundation alternative; and

3. It should be possible to reduce the estimated settlements by utilizing light-weight backfill, if required.

The disadvantages associated with the shallow spread footing alternative include:

1. Temporary cofferdams will need to be constructed at each abutment in order to allow unsuitable Fill materials to be removed to about El. -3.0 feet (11-foot $\pm$ cut);

2. A portion of these Fill materials will need to be removed from within the cofferdams and disposed of offsite;

3. Dewatering will need to be performed within the temporary cofferdams in order to allow a compacted Structural Fill to be placed up to the proposed footing elevation;

4. Temporary cofferdam installation and dewatering may result in vibrations/disturbance that could cause the underlying silt layers to settle, resulting in structure/utility damage (this risk is considered manageable based on the anticipated sheet pile embedment depths);

5. It may be necessary to abandon the temporary cofferdams in-place in order to minimize the potential for vibration induced settlement as a result of their extraction[1]; and

6. Settlement and/or damage to the proposed Bridge could occur due to a seismic event[2].

---

[1] While this is presented as a disadvantage, this could provide a convenient means to help prevent scour and undermining of the shallow foundation alternative (i.e., it could be advantageous).

[2] While a seismic analysis is not technically required for this single span bridge, the Stratum 3 soils are suspectable to liquefaction.

With respect to the deep foundation alternative, the advantages include the following:

1. Overall Bridge settlements are expected to be less compared to the shallow foundation alternative;

2. Settlement and/or damage to the proposed bridge would be mitigated as a result of a seismic event; and

3. Temporary cofferdams and dewatering will be less extensive compared to the shallow foundation alternative (assuming the bottom of the pile cap is raised).

The disadvantages associated with the deep foundation alternative include the following:

1. Overall costs to furnish and install the pile foundation systems at each abutment will be significantly greater than the shallow foundation alternative;

2. The overall schedule for construction will be longer compared to the shallow foundation alternative, which would also increase costs;

3. Similar to the shallow foundation alternative, temporary cofferdams will need to be constructed at each abutment in order to allow unsuitable Fill materials to be removed to about El. 0.5 feet (8-foot $\pm$ cut);

4. A portion of these Fill materials will need to be removed from within the cofferdams and disposed of offsite;

5. Dewatering will need to be performed within the temporary cofferdams in order to allow a compacted Filter Stone to be placed up to the bottom of the proposed pile cap;

6. Temporary cofferdam installation and dewatering may result in vibrations/disturbance that could cause the underlying silt layers to settle, resulting in structure/utility damage (this risk is considered manageable based on the anticipated sheet pile embedment depths); and

7. A specialty Contractor will need to furnish and install the pile foundations.

If the PRA wishes to minimize the potential for Bridge damage as a result of a seismic event, then a deep foundation system is recommended. Of the three (3) pile types evaluated, drilled Micro-Piles would result in the least amount of disturbance to the underlying “Sensitive” Silt, thus reducing the potential for settlement or structure/utility damage during construction.

However, and as mentioned above, the cost to furnish and install drilled Micro-Piles will be much greater than shallow spread footings. In order to assess this further, budget-level cost estimates were prepared for both foundation types, not including the bridge superstructure or other site improvements. Based on these estimates, the drilled Micro-

Pile alternative has an estimate cost about $0.60 Million greater than the cost to furnish and install shallow spread footings (Appendix E, Tables E-1 and E-2).

Even if the number of micro-piles could be reduced from 6 to 4 per abutment during final design, which may be possible, the cost differential between the deep and shallow foundation alternatives is still expected to be about $0.40 Million. Accordingly, we recommend that the PRA consider the use of shallow spread footings. While shallow spread footings, if selected, would be expected to settle during a seismic event, this is a non-critical single span pedestrian bridge, which could be repaired if required.

4.8 Calculating Loads on Buried Walls

Below grade foundations and earth retaining structures should be designed based on the maximum anticipated earth and groundwater pressures. The lateral earth pressure diagram provided in Figure 4-3 may be utilized for the design of these walls. Recommended earth pressure and friction coefficients for use with Figure 4-2 are presented in Table 4-4.

Table 4-4
Recommended Earth Pressure and Friction Coefficients

Material	Active Coefficient	At-Rest Coefficient	Passive Coefficient
Imported Pervious Fill or Gravel Borrow	0.30	0.50	3.3
	Friction Coefficient		
Concrete Poured on Structural Fill/Filter Stone	0.55		
Pre-Cast Concrete on Structural Fill/Filter Stone	0.40		

The project Structural Engineer may make additional adjustments to the pressure diagram presented in Figure 4-3 and the recommended coefficients presented in Table 4-4 as he/she deems appropriate. For design purposes, it is recommended that the passive resistance in front of any proposed abutments/walls be ignored.

5. Construction Considerations/Recommendations

Presented below are construction considerations/recommendations for the construction of the abutment foundations.

5.1 Site Preparation

The site should be cleared of vegetation, grubbed, and reusable topsoil stripped as required. If there are existing structures and foundations located within the footprints of the proposed structures, they should be demolished and removed in accordance with all local, State, and Federal regulations. Voids resulting from demolition should be filled with compacted Structural Fill.

If cofferdams are installed at each proposed abutment in order to allow unsuitable materials to be excavated and the abutments to be constructed in the dry, it is recommended that any pre-excavation required to install the cofferdams be completed during site preparation activities, and that any potential obstructions be removed prior to installing the timber/steel sheeting that will comprise the cofferdams.

The site soils are expected to contain a high percentage of moisture sensitive silt. When saturated, these soils will be easily disturbed by construction equipment and vibrations, which could make working within the cofferdams difficult. Accordingly, a 12-inch-thick (min) layer of compacted Filter Stone should be placed directly on the exposed subgrade following excavation and subgrade compaction. This material will act as a clean working surface for forming and pouring the abutments, and will also aid dewatering.

5.2 Use of Onsite Materials

Based on the visual classifications and grain size analyses completed, the site soils may contain a high percentage of fines. In accordance with the RIDOT Standard Specifications, the fines content for Common Borrow should be limited to 17 percent or less. Based on this, if excavated soils are to be reused on site as a Select Backfill, then blending with imported granular material may be required in order to yield a gradation that is suitable for placement and compaction. However, blended soil should not be utilized for Structural Fill below footings and careful observation and quality control testing will be required.

5.3 Imported Materials

Imported earth materials are expected to include Structural Fill for replacing unsuitable Fill materials, Filter Stone for providing a clean working surface, and Pervious Fill for backfilling along retaining structures where drainage is a concern as summarized in Table 5-1.

Table 5-1 Recommended Imported Earth Materials per the RIDOT Standard Specifications	
Material	**Specification**
Structural Fill	Gravel Borrow per Item M.01.02, Column I, Material I(a)
	Crushed Stone per Item M.01.09, Column II
	Lightweight Backfill to reduce settlements (to be determined during final design)
Working Surface	Filter Stone per Item M.01.07, Column V
Backfill along Retaining Structures	Pervious Fill per Item M.01.03, Column IV
Backfill outside the influence zone of footings	Mix Imported Gravel Borrow (see above) with onsite excavated material as required to produce a Select Backfill Material

5.4 Compaction

Backfill placed beneath abutments should be compacted to a minimum of 95 percent of the Modified Proctor maximum dry density (ASTM D 1557). Backfill placed against abutment and other walls should be compacted to a minimum of 90 percent of the Modified Proctor maximum dry density.

In general, compaction should be accomplished by placing backfill in 10-inch–thick (max) loose lifts and mechanically compacting each lift with a heavy reversible plate compactor to the minimum specified dry density. Field density testing should be performed at a pre-determined frequency using a nuclear density gauge to confirm that adequate compaction is being achieved.

Prior to any compaction, it is recommended that the sub-grade be visually inspected, and hand probed by qualified personnel. Frozen, wet, or loose soils and other undesirable material should be removed. Any resulting voids should be filled with Structural Fill and compacted as described previously.

5.5 Construction Dewatering

Excavations for subgrade compaction and the placement of backfill should be completed in the dry and the groundwater elevation maintained at least 2 feet below the bottom of the excavation. Dewatering of about 2 to 3 feet of groundwater can often be accomplished by pumping from sumps constructed at the low points within the excavation. Lowering the groundwater table by more than 3 feet may require deeper wells or well points to depressurize the underlying water bearing strata and maintain bottom stability.

The Project Specifications should specify that the Contractor is responsible for providing a Dewatering/Water Control Plan prior to construction. In addition, the Project Specifications should specify that all surface water runoff be diverted away from the excavations so that backfill materials and the foundations are not undermined. Surface water diversion from the site should be minimal during periods of low rainfall. However, if construction occurs during periods when heavy rainfall is expected, the diversion of surface water could be a more significant problem. Likewise, dewatering during such flood conditions could be more complicated and extensive.

5.6 Excavation Support

Excavations up to about 11-feet-deep ± (measured from existing grade) could be required depending on the foundation alternative selected. These excavations will be completed immediately adjacent to the Woonasquatucket River. Accordingly, cofferdams are expected to be required. We recommend that continuous interlocking steel sheet piles be utilized to construct the cofferdams, which may also need to be internally braced to support the anticipated loads.

It is assumed that the cofferdam systems for this project will be a Contractor designed element, and it is recommended that they be designed by a RI Registered Professional Engineer. The Project Specifications should address this requirement, including any required experience qualifications for the both the Contractor who will install it and the Engineer who will design it.

It is recommended that the Project Specifications require that the cofferdam sheeting be installed using an impact hammer and that installation using a vibratory hammer be allowed only if the sheet piles are not expected to penetrate the soft silt layers. In addition, it is recommended that the cofferdam sheeting be abandoned in place to minimize the potential for settlement/ground disturbance as a result of its extraction.

Should it be decided that the cofferdams will become an integral part of the selected alternative (e.g., for scour and undermining protection of shallow spread footings), it is recommended that consideration be given to having the Project Geotechnical Engineer design them. This will help to minimize the potential for claims and also allow Contractors to bid this project component “apples to apples”.

5.7 Pile Installation and Testing

Should the deep foundation alternative be selected, the Project Specifications should specify that the Contractor is responsible for installing indicator piles, prior to the installation of the remaining production piles. The indicator piles will provide an opportunity to make modifications to the remaining production piles, if necessary, based on the results of their installation.

For H- and Pipe-Piles, the indicator piles should be dynamically tested using a Pile Driving Analyzer (PDA) system during their initial drive and a re-strike drive, which is recommended to be performed about 48 hours after the initial drive. CAPWAP analyses should be completed following the dynamic testing to confirm that the specified capacities were achieved. Both the dynamic testing and CAPWAP analyses should be performed by a RI Registered Professional Engineer.

For drilled Micro-Piles, verification testing should be performed on at least one (1) indicator pile in accordance with FHWA requirements. This is expected to include a tension test, and the Specialty Contractor should be responsible for performing this testing, including the design of the load test frame, and submitting the results to the Project Geotechnical Engineer.

Regardless of the pile type selected, the indicator piles would be installed to the specified pile tip elevation established in the Contract Documents. If the PDA/verification test results indicated that additional capacity is required beyond what is obtained at the specified tip elevation, the indicator piles would need to be installed deeper to meet the required resistance. Following this, the final pile acceptance criteria would be established by the Project Geotechnical Engineer.

5.8 Protection of Existing Structures

Pre- and Post-Construction Condition Surveys should be performed for existing structures that could be at risk prior to and following construction of the proposed Bridge. Performing these surveys will allow pre-existing damage to be differentiated from damage that may have been caused by construction activities, thus helping to minimize the potential for disputes/claims.

In addition, vibration monitoring should be performed during construction activities that could cause excessive vibrations. It is recommended that the Project Site/Civil Engineer determine which structures should be surveyed, establish the permissible Peak Particle Velocity (PPV) for these structures, and determine the location of seismographs based on the construction activities that are expected to be performed.

5.9 Contract Document Review and Construction Phase Services

Construction at this site will be challenging due to its proximity to the Woonasquatucket River, the fine-grained nature of the onsite soils and their density, and the proximity of existing structures to the proposed structures. The Project Specifications should be written to specifically address these and other relevant site conditions and the possible complications they may have on construction.

In addition, specific properties of the backfill such as gradation limits should be provided in the Project Specifications. Also, compaction criteria for the various imported earth materials should be developed and included. During construction, representative samples of materials to be used as backfill should be tested for conformance with the specified material properties.

Over-excavation, subgrade compaction, and the placement of backfill materials, when specified, should be monitored by the Project Geotechnical Engineer or his/her designee to check conformance with the specified criteria. Likewise, pile installation and testing should also be observed by the Project Geotechnical Engineer or his/her designee, as it will not be possible to inspect the piles after they are installed.

6. References

AASHTO, 2017. *AASHTO LRFD 2017 Bridge Design Specifications, 8th Ed,* published by the American Association of State Highway and Transportation Officials, 2017.

RIDOT, 2007. *Rhode Island LRFD Bridge Design Manual, 2007 Ed,* published by the Rhode Island Department of Transportation, 2007.

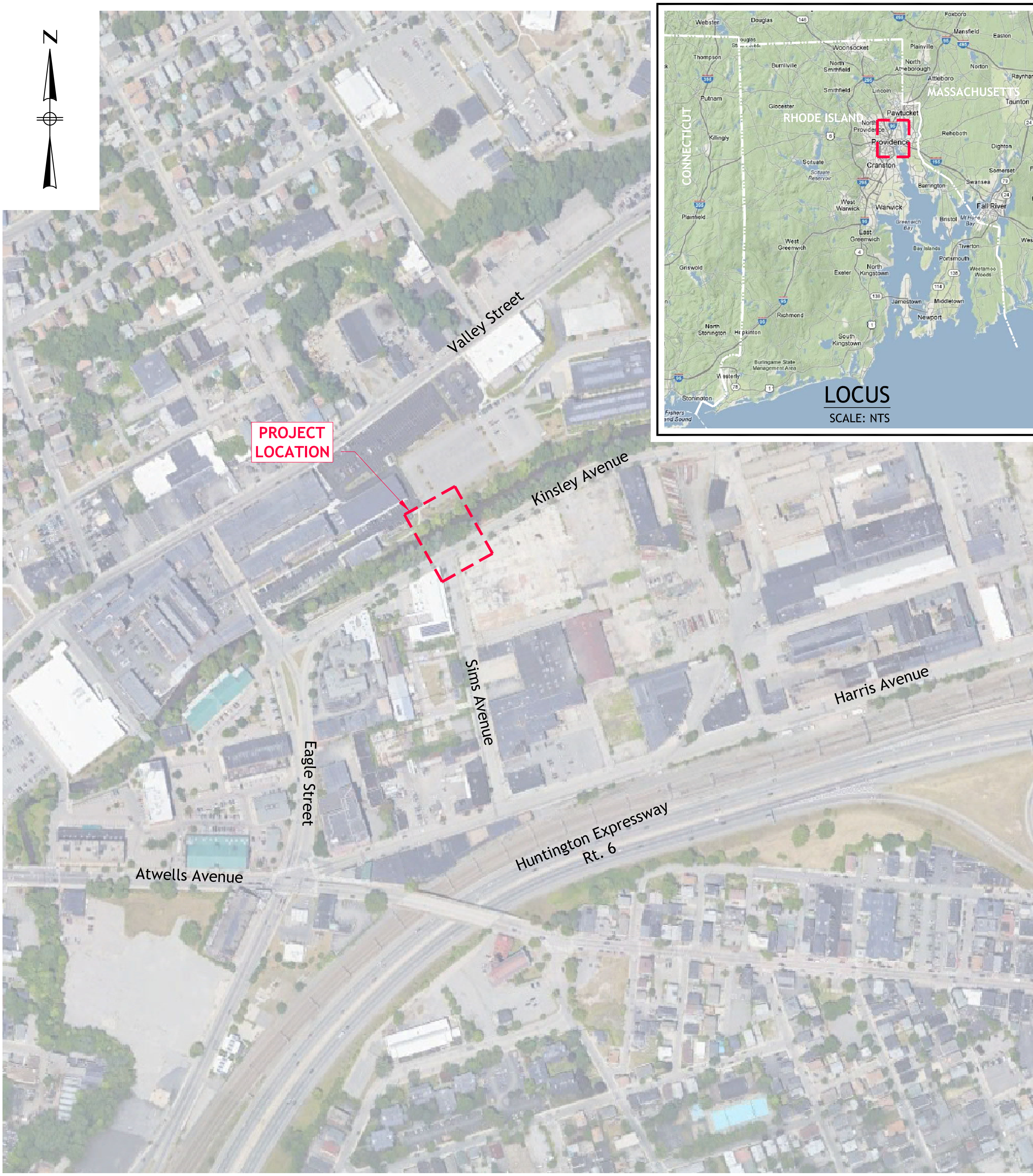
RIDOT 2013. *Standard Specifications for Road and Bridge Construction*, published by the Rhode Island Department of Transportation, 2013.

RIDPW, 1972. *Plan, Profile and Sections of Proposed State Highway Bridge No. 777, Pleasant Valley Parkway Bridge,* published by the State of Rhode Island Department of Public Works, Division of Roads and Bridges, 1972.

USGS, 1956. *Surficial Geology of the Providence Quadrangle, Rhode Island,* by J. Hiram Smith, 1956.

USGS, 1959. *Bedrock Geology of the Providence Quadrangle, Rhode Island,* by Alonzo W. Quinn, 1959.

Figures



LOCUS
SCALE: NTS

PLAN
SCALE: NTS

BETA Group, Inc.
Engineers Planners Landscape Architects Scientists

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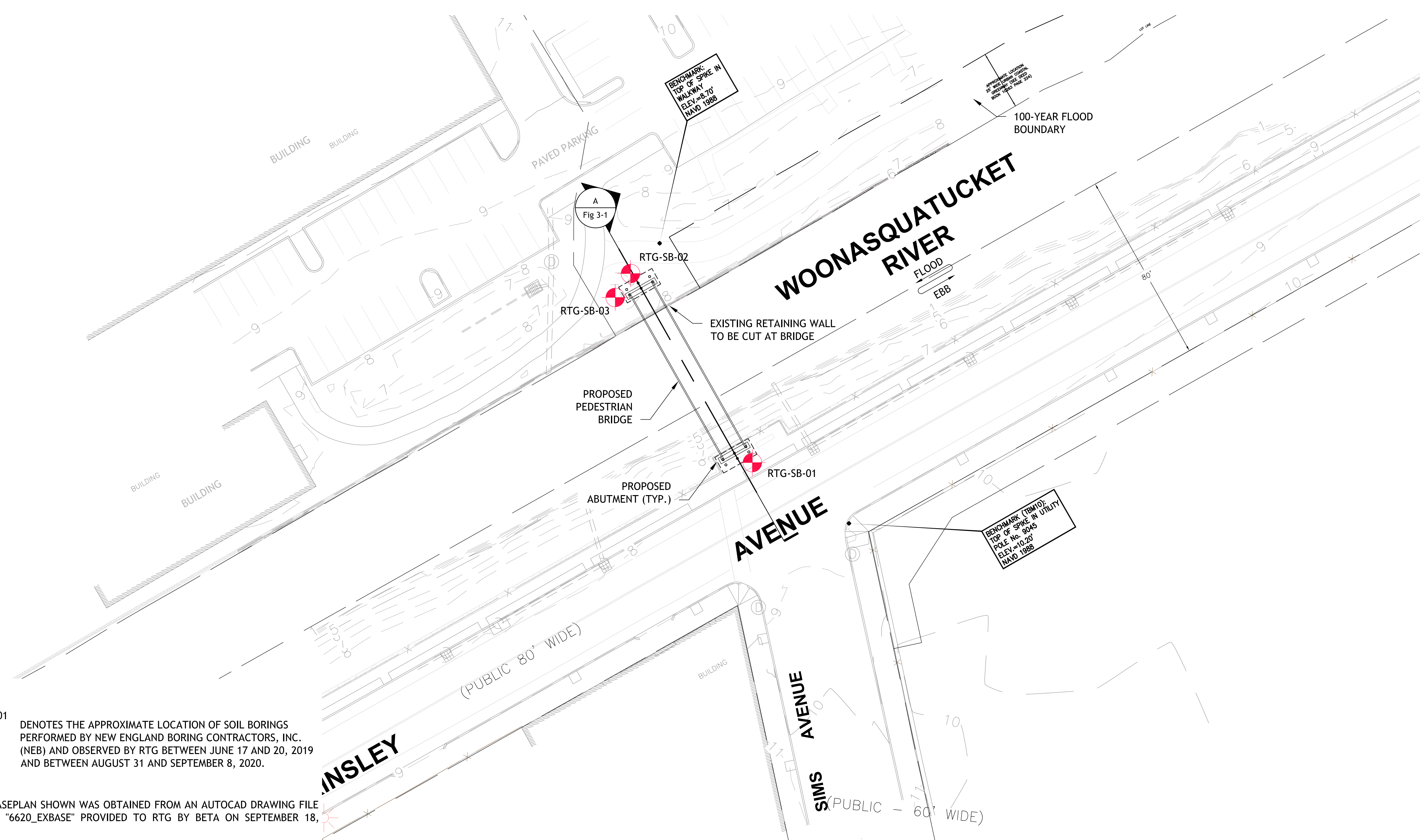
GEOTECHNICAL DATA AND DESIGN BASIS REPORT
SIMS AVE PEDESTRIAN BRIDGE OVER THE WOONASQUATUCKET RIVER
Providence Redevelopment Agency
Providence, Rhode Island

FIGURE 1-1
LOCUS MAP

SHEET 1 of 6
DATE OCT 2020
PROJ No. 19104.00



PLAN

N

CONCEPTUAL NOT FOR CONSTRUCTION

LEGEND:

RTG-SB-01 — DENOTES THE APPROXIMATE LOCATION OF SOIL BORINGS PERFORMED BY NEW ENGLAND BORING CONTRACTORS, INC. (NEB) AND OBSERVED BY RTG BETWEEN JUNE 17 AND 20, 2019 AND BETWEEN AUGUST 31 AND SEPTEMBER 8, 2020.

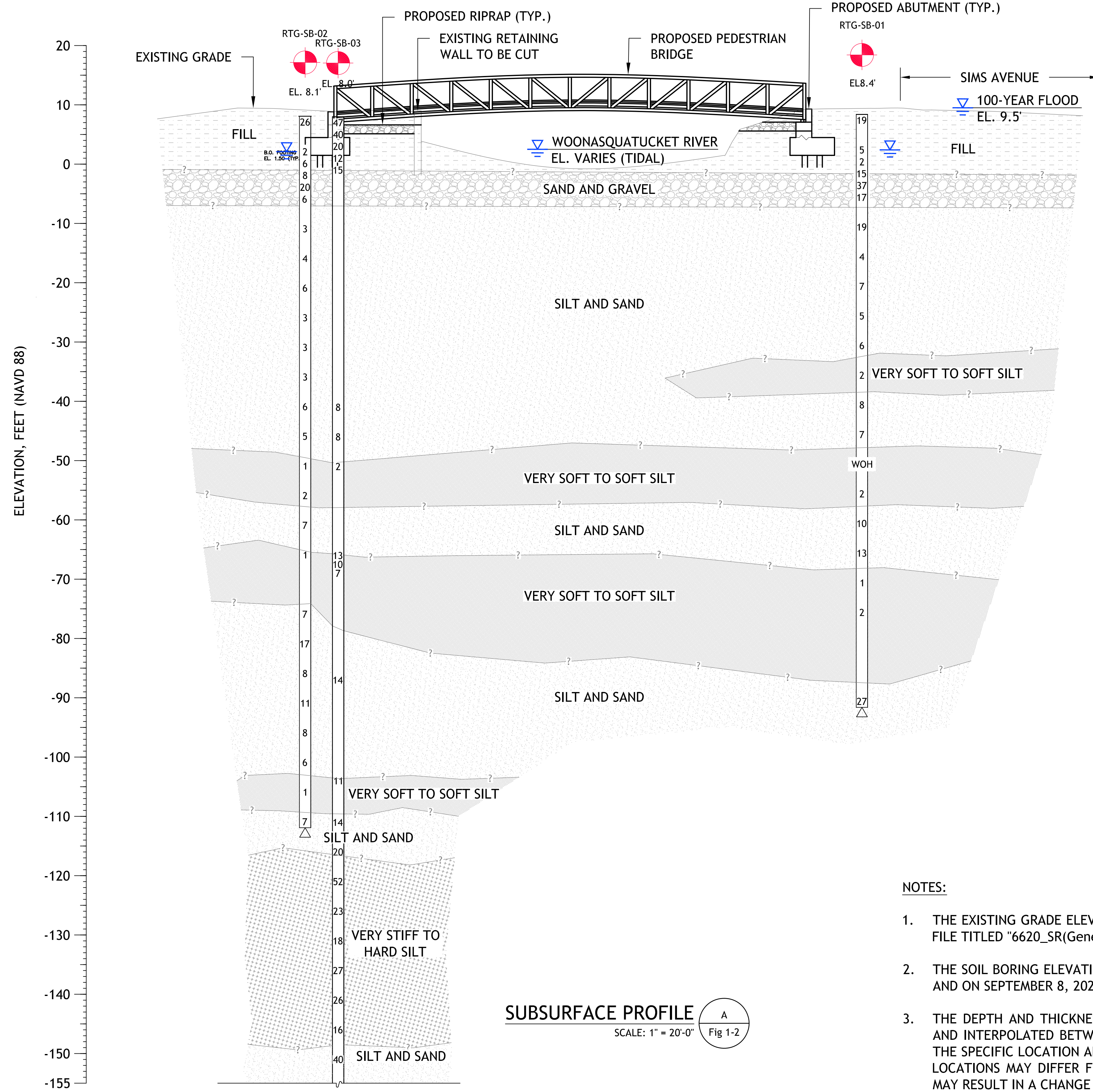
NOTES:

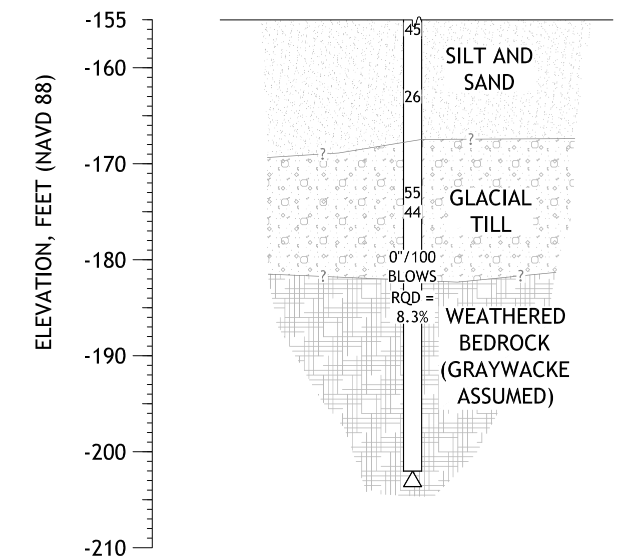
1. THE BASEPLAN SHOWN WAS OBTAINED FROM AN AUTOCAD DRAWING FILE TITLED "6620_EXBASE" PROVIDED TO RTG BY BETA ON SEPTEMBER 18, 2020.
2. THE PROPOSED PEDESTRIAN BRIDGE SHOWN WAS OBTAINED FROM AN AUTOCAD DRAWING FILE TITLED "6620_SR(MasterBridgePlan)" PROVIDED TO RTG BY BETA ON SEPTEMBER 18, 2020.

Graphic Scale 1"=40'

40' 20' 0 40' 80'

BETA Group, Inc. Engineers Planners Landscape Architects Scientists	Tighe&Bond 70 Romano Vineyard Way, Ste 134 North Kingstown, RI 02852 (401) 438-3100	SEAL OF THE CITY OF PROVIDENCE	GEOTECHNICAL DATA AND DESIGN BASIS REPORT SIMS AVE PEDESTRIAN BRIDGE OVER THE WOONASQUATUCKET RIVER Providence Redevelopment Agency Providence, Rhode Island	FIGURE 1-2 BORING LOCATION PLAN	SHEET 2 of 6 DATE OCT 2020 PROJ No. 19104.00





SUBSURFACE PROFILE (A / Fig 1-2)

SCALE: 1" = 20'-0"

LEGEND:

RTG-SB-01 — DENOTES THE APPROXIMATE LOCATION OF SOIL BORINGS PERFORMED BY NEW ENGLAND BORING CONTRACTORS, INC. (NEB) AND OBSERVED BY RTG BETWEEN JUNE 17 AND 20, 2019, AND BETWEEN AUGUST 31 AND SEPTEMBER 8, 2020.

BOTTOM OF SOIL BORING

15 — STANDARD PENETRATION NUMBER ("N" VALUE)

APPROXIMATE GROUNDWATER ELEVATION

FILL

SAND AND GRAVEL

SILT AND SAND

SOFT TO VERY SOFT SILT

VERY STIFF TO HARD SILT

GLACIAL TILL

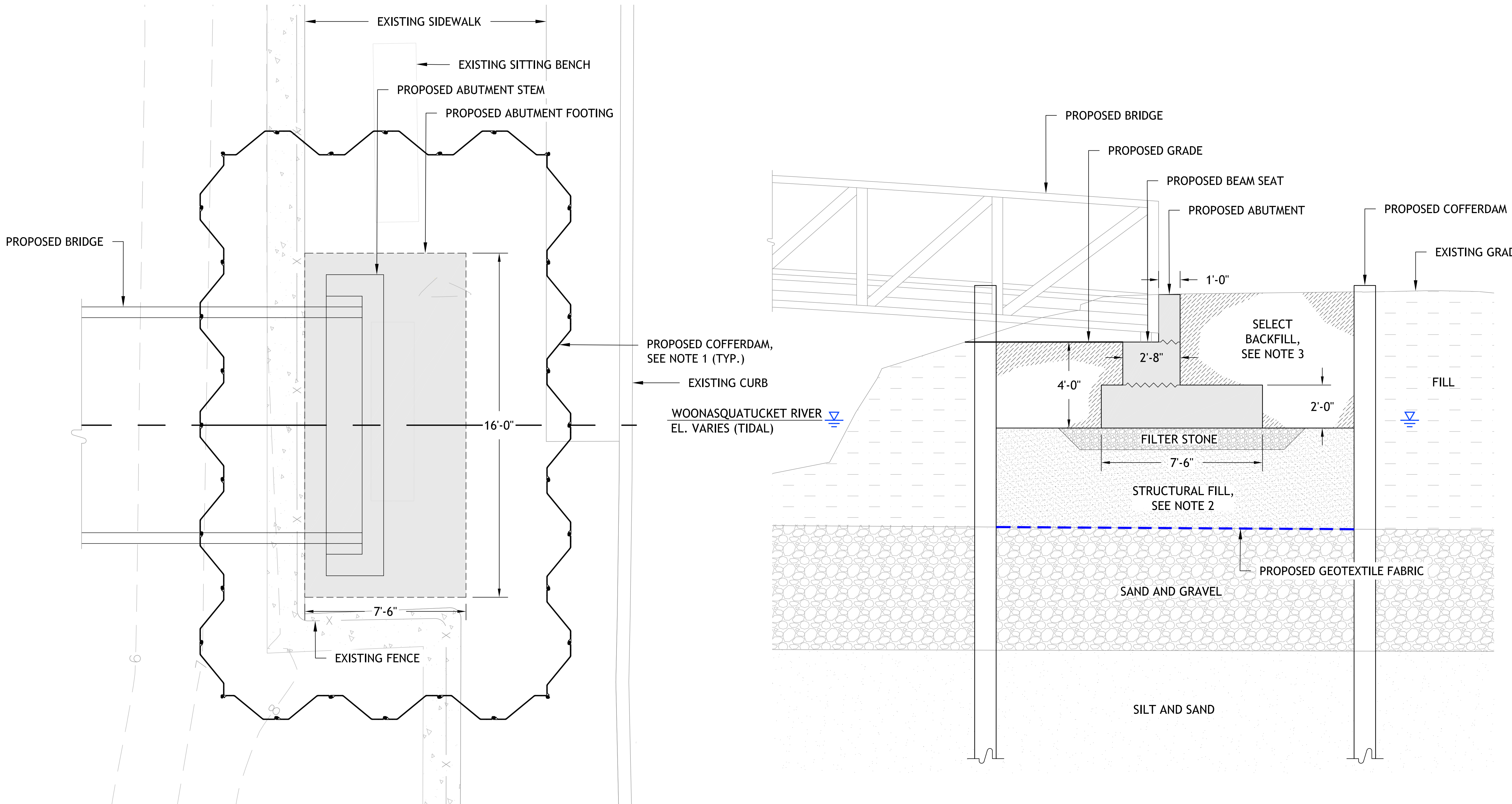
BEDROCK (GRAYWACKE)

CONCEPTUAL NOT FOR CONSTRUCTION

NOTES:

1. THE EXISTING GRADE ELEVATION DATA AND BRIDGE ELEVATION SHOWN WAS OBTAINED FROM AN AUTOCAD DRAWING FILE TITLED "6620_SR(GeneralElevation)" PROVIDED TO RTG BY BETA ON SEPTEMBER 18, 2020.
2. THE SOIL BORING ELEVATION DATA SHOWN ON THIS FIGURE WAS SURVEYED IN THE FIELD BY RTG ON JUNE 20, 2019, AND ON SEPTEMBER 8, 2020 USING A LEICA GNSS RTK GPS AND TOTAL STATION (SUB-INCH ACCURACY).
3. THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTIONS WERE GENERALIZED FROM AND INTERPOLATED BETWEEN SOIL BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE SPECIFIC LOCATION AND ON THE DATES INDICATED. SOIL AND ROCK CONDITIONS, AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THE BORING LOCATIONS. ALSO THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE CONDITIONS AT THE SOIL BORING LOCATIONS.

BETA Group, Inc. Engineers Planners Landscape Architects Scientists	Tighe&Bond 70 Romano Vineyard Way, Ste 134 North Kingstown, RI 02852 (401) 438-3100	SEAL OF THE CITY OF PROVIDENCE	GEOTECHNICAL DATA AND DESIGN BASIS REPORT SIMS AVE PEDESTRIAN BRIDGE OVER THE WOONASQUATUCKET RIVER Providence Redevelopment Agency Providence, Rhode Island	FIGURE 3-1 SUBSURFACE PROFILE	SHEET 3 of 6 DATE OCT 2020 PROJ No. 19104.00



PLAN

ELEVATION

NOTES:

1. COFFERDAM SHEETING MAY NEED TO BE IMPACT DRIVEN AND ABANDONED IN PLACE TO HELP MINIMIZE VIBRATIONS AND DISTURBANCE TO THE SILT (PENDING FINAL DESIGN).
2. STRUCTURAL FILL IS EXPECTED TO CONSIST OF GRAVEL BORROW, CRUSHED STONE, FILTER STONE, AND/OR LIGHTWEIGHT BACKFILL (PENDING FINAL DESIGN).
3. SELECT BACKFILL IS EXPECTED TO CONSIST OF EXCAVATED ONSITE MATERIAL, SUITABLE FOR COMPACTION, AND WITH LESS THAN 15 PERCENT FINES.
4. RIPRAP SCOUR PROTECTION NOT SHOWN FOR CLARITY.

SHALLOW SPREAD FOOTING ABUTMENT DETAILS

SCALE: 1" = 5'-0"

CONCEPTUAL NOT FOR CONSTRUCTION

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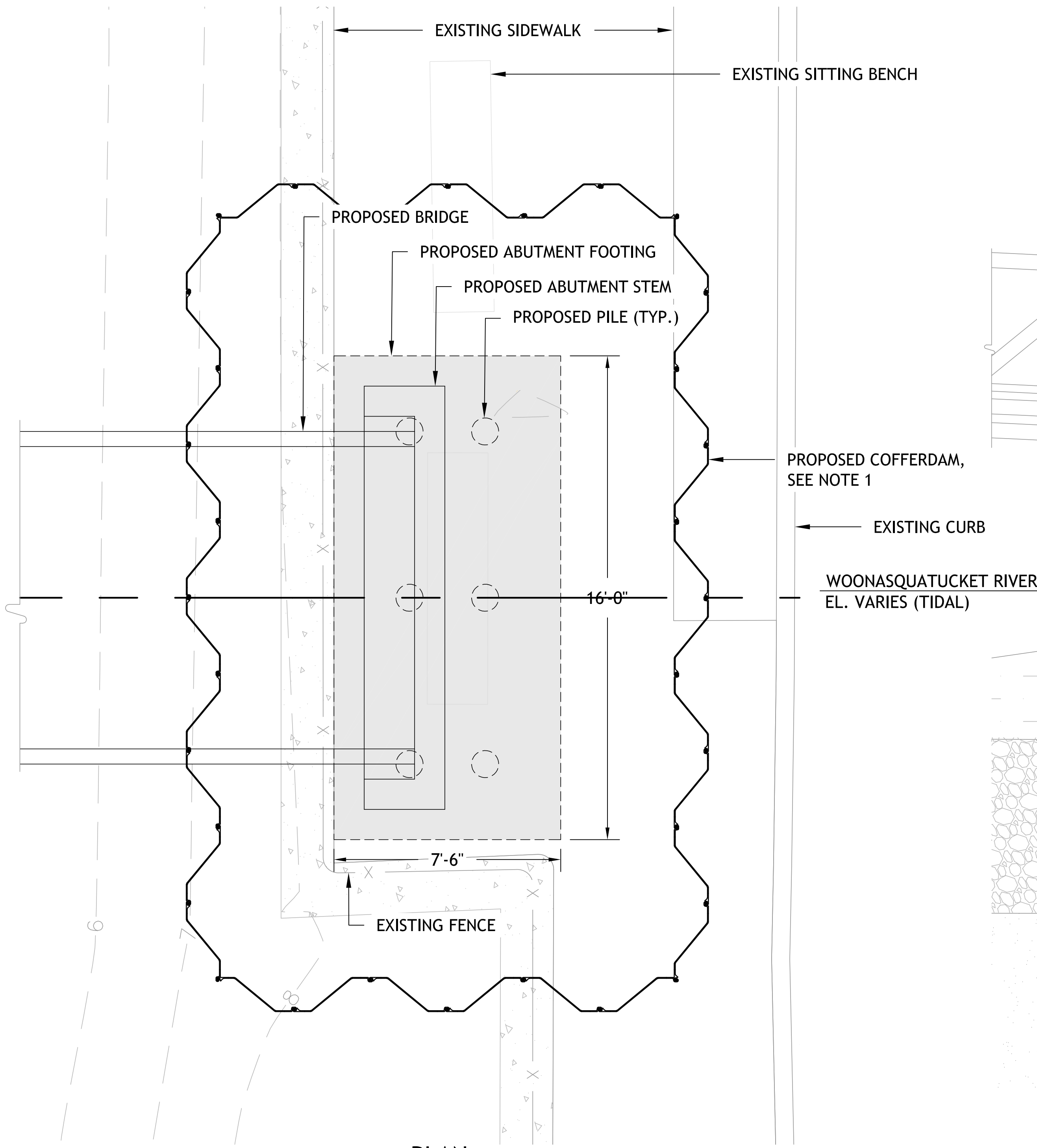
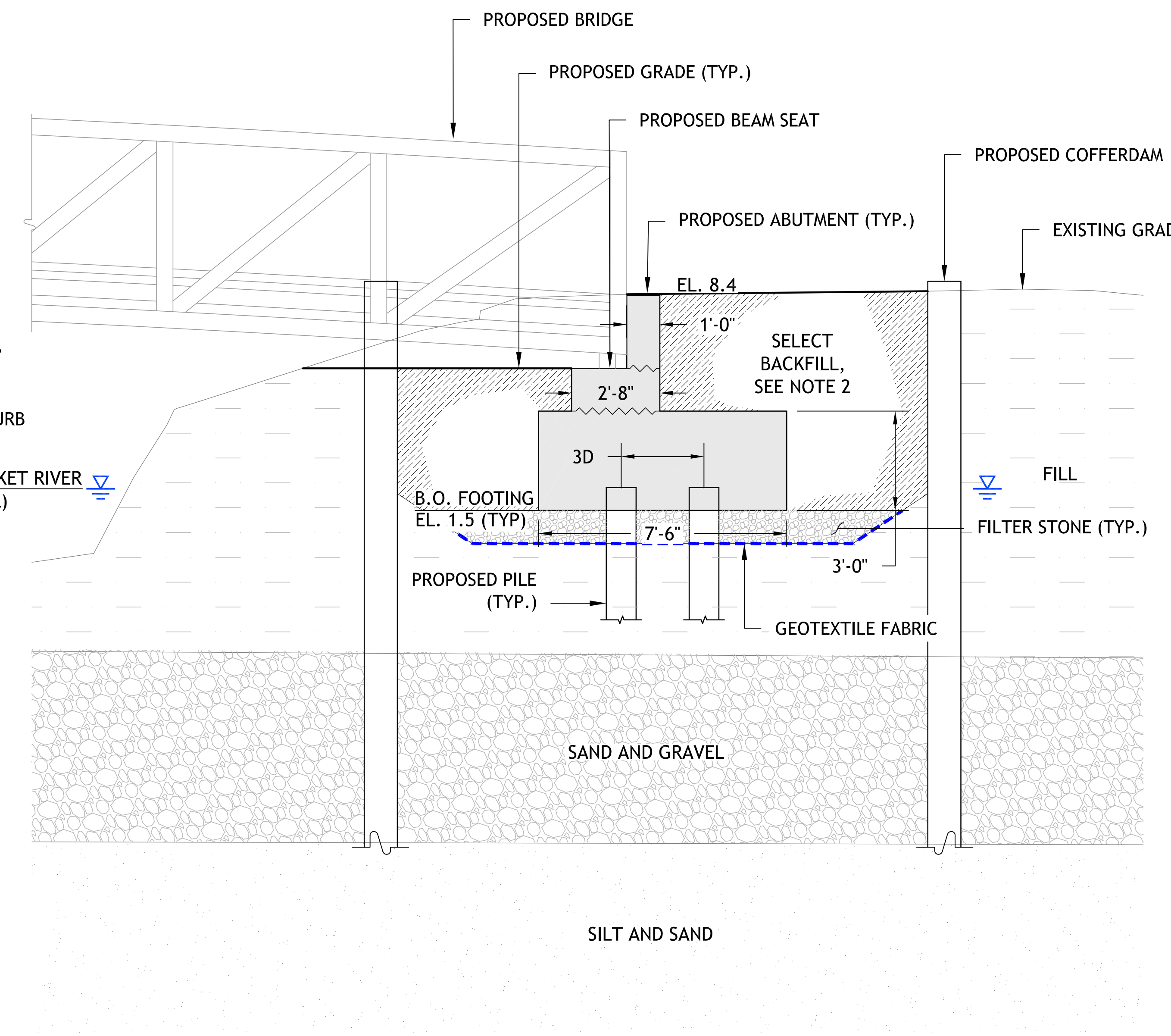
GEOTECHNICAL DATA AND DESIGN BASIS REPORT
SIMS AVE PEDESTRIAN BRIDGE OVER THE WOONASQUATUCKET RIVER
Providence Redevelopment Agency
Providence, Rhode Island

FIGURE 4-1
SHALLOW SPREAD FOOTING ABUTMENT PLAN AND ELEVATION

SHEET 4 of 6
DATE OCT 2020
PROJ No. 19104.00



PLAN



ELEVATION

DEEP FOUNDATION ABUTMENT DETAILS

SCALE: 1" = 5'-0"

NOTES:

1. COFFERDAM SHEETING MAY NEED TO BE IMPACT DRIVEN AND ABANDONED IN PLACE TO HELP MINIMIZE VIBRATIONS AND DISTURBANCE TO THE SILT (PENDING FINAL DESIGN).
2. SELECT BACKFILL IS EXPECTED TO CONSIST OF EXCAVATED ONSITE MATERIAL, SUITABLE FOR COMPACTION, AND WITH LESS THAN 15 PERCENT FINES.
3. RIPRAP SCOUR PROTECTION NOT SHOWN FOR CLARITY.

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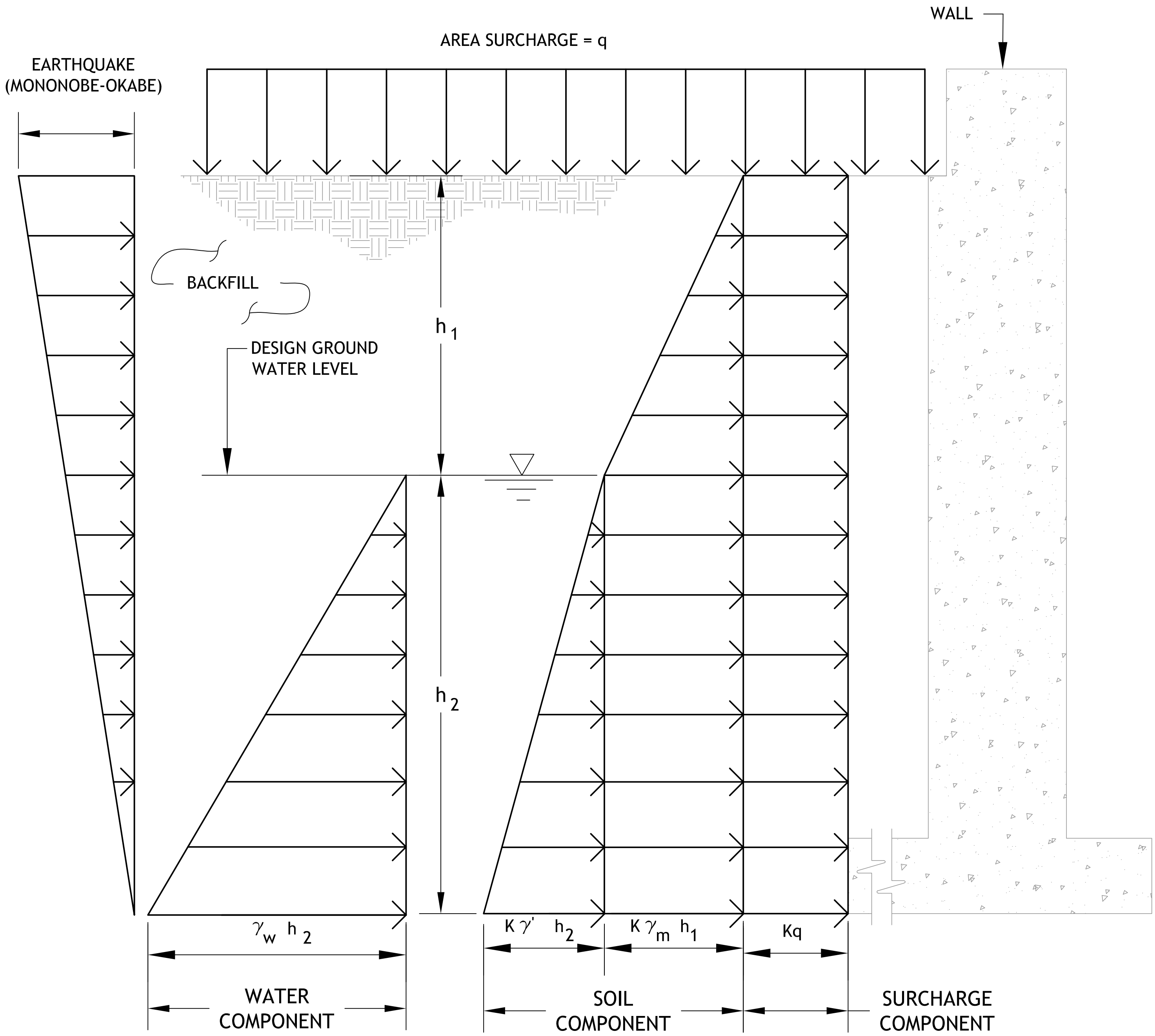
FIGURE 4-2
DEEP FOUNDATION ABUTMENT PLAN AND ELEVATION

SHEET 5 of 6
DATE OCT 2020
PROJ No. 19104.00



ABBREVIATIONS

K	COEFFICIENT OF LATERAL EARTH PRESSURE; K_o, K_a, OR K_p
γ_m	MOIST UNIT WEIGHT OF GRAVEL BORROW. USE γ_m = 135 PCF
γ'	SUBMERGED UNIT WEIGHT OF GRAVEL BORROW. USE γ' = 72.6 PCF
γ_{m2}	MOIST UNIT WEIGHT OF PERVIOUS BACKFILL. USE γ_{m2} = 120 PCF
γ'_2	SUBMERGED UNIT WEIGHT OF PERVIOUS BACKFILL. USE γ'_2 = 57.6 PCF
γ_w	UNIT WEIGHT OF WATER = 62.4 PCF
h_1	BACKFILL HEIGHT ABOVE GROUNDWATER
h_2	BACKFILL HEIGHT BELOW GROUNDWATER
q	AREA SURCHARGE LOAD (VARIES) PSF

NOTE:

LOAD FACTORS AND LOAD COMBINATIONS SHALL BE UTILIZED IN ACCORDANCE THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL.

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SIMS AVE PEDESTRIAN BRIDGE OVER THE WOONASQUATUCKET RIVER
Providence Redevelopment Agency
Providence, Rhode Island

FIGURE 4-3
LATERAL EARTH PRESSURE DIAGRAM FOR BURIED WALL

SHEET 6 of 6
DATE OCT 2020
PROJ No. 19104.00

Appendix A
Limitations

GEOTECHNICAL REPORT LIMITATIONS

USE OF REPORT

1. Tighe & Bond prepared this report on behalf of, and for the exclusive use of the Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. RTG does not accept any liability or responsibility for the consequences of the partial or full use of this report at other locations or for other purposes. In addition, reliance by any party not expressly identified in the Report and/or Contract Documents, for any use, without Tighe & Bond's prior written permission, shall be at that party's sole risk and liability.

STANDARD OF CARE

1. Tighe & Bond's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Proposal for Services and/or Report, and reflect our professional judgment. These findings and conclusions are not considered scientific or engineering certainties, but rather as Tighe & Bond's professional opinion concerning the limited data gathered for the purpose of preparing this Report. If conditions other than those described in this Report are discovered at the subject location(s), or the design has been altered in any way, Tighe & Bond shall be notified and given the opportunity to revise the Report, as appropriate, to reflect the changed conditions.

2. In preparing this report, Tighe & Bond relied upon certain information made available by public agencies, the Client, and/or others. Tighe & Bond did not attempt to independently verify the accuracy or completeness of said information. Inconsistencies in the information that have been identified by Tighe & Bond, if any, are discussed in the Report.

SUBSURFACE CONDITIONS

1. The generalized soil profile(s) provided in the Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on Tighe & Bond's assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and complex than indicated. For more specific information on soil conditions at a specific location refer to the soil boring logs. The nature and extent of variations between these explorations may not become evident until further exploration is completed or during construction. If variations or other dissimilar conditions become evident, it will be necessary to reevaluate the conclusions and recommendations provided in this Report.

2. Water level readings that have been made in soil borings and/or monitoring wells were done at specified times and under the stated conditions. Interpretations based on this data have been presented in this Report. However, fluctuations in groundwater levels at the site may occur due to variations in groundwater recharge rates and soil matrices, as well as the presence of subsurface utilities, natural or artificially induced changes to the site conditions, and/or other factors (e.g., flood, tide conditions). As a result, groundwater behavior may differ from that indicated in the Report.

3. Tighe & Bond's services did not include an environmental assessment of the subsurface conditions at the site. Consequently, Tighe & Bond did not evaluate the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use/functions of structures on the property.

4. Recommendations for foundation drainage, waterproofing, and/or moisture control are intended to address conventional geotechnical engineering considerations for seepage control. These recommendations may not preclude an environment that allows the growth of mold or other biological pollutants.

COMPLIANCE WITH CODES AND REGULATIONS

1. Tighe & Bond used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with and interpretation of codes and regulations by other parties is beyond Tighe & Bond's control.

COST ESTIMATES

1. Tighe & Bond's cost estimates are for comparative and general planning purposes only, and may be based on approximate estimates of quantities, costs, and schedule. These estimates are not intended to be sufficiently accurate to develop construction bids, or to predict the actual cost of the subject work. Further, since we have no control over when the work will take place or the labor and material costs required to plan and execute the subject work, Tighe & Bond's cost estimates were made by relying on our experience, the experience of others, and other sources of readily available information. Actual costs may vary from those presented and could be significantly more, or less, than stated.

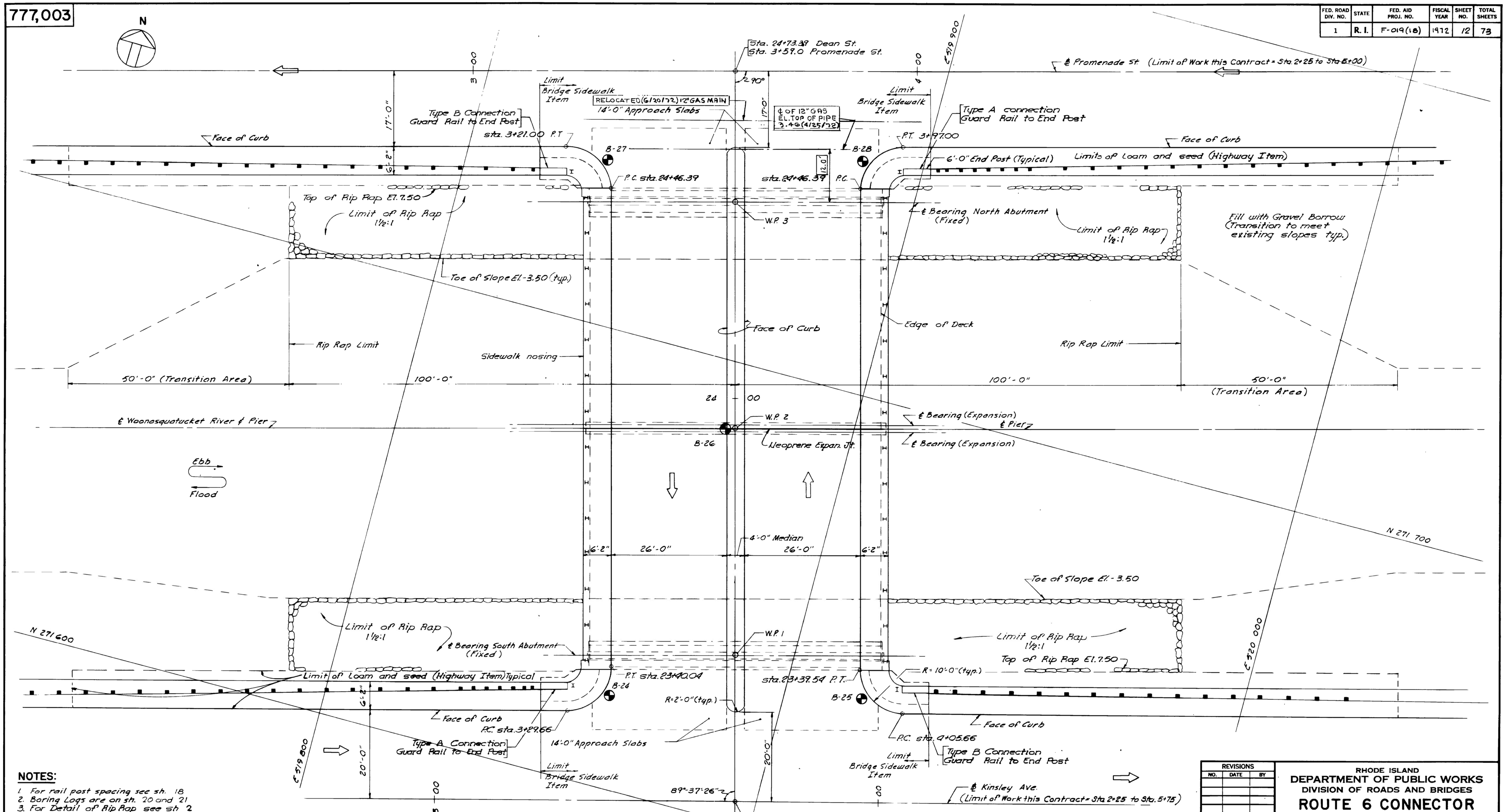
ADDITIONAL SERVICES

1. Tighe & Bond recommends that we be retained to provide services during any future site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to:
    i. observe conditions and compliance with our design concepts and opinions;
    ii. allow for changes in the event that conditions are other than anticipated;
    iii. provide modifications to our design; and
    iv. assess the consequences of changes in technologies and/or regulations.

Appendix B
Reference Reports

777,003

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	R. I.	F-019(18)	1972	12	73



NOTES:

1. For rail post spacing see sh. 18
2. Boring Logs are on sh. 20 and 21
3. For Detail of Rip Rap see sh. 2
4. For Loam and Seed limits see Highway Plans.
5. For Guard Rail Attachment to End Post see sh. 8
6. See Highway Plans for limits of new and existing Highway Guard Rail.
7. Dumped and placed Rip-Rap 998 S.Y.
8. Prior to adding fill to river channel for construction purposes, the Contractor shall submit his plans, for such, to the Engineer for review.

WORKING POINT COORDINATES

W.P.	Station	Coordinates North	Coordinates East
1	23+42.422	271636.464	519887.196
2	23+93.089	271685.430	520064.178
3	24+43.756	271734.396	519861.159

LEGEND

- I Rail Post
- Bore Hole
- Traffic Flow
- Guard Rail

REVISIONS		
NO.	DATE	BY

RHODE ISLAND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ROADS AND BRIDGES

ROUTE 6 CONNECTOR

DEAN STREET INTERCHANGE

PROVIDENCE RHODE ISLAND

PLEASANT VALLEY PARKWAY BRIDGE LOCATION PLAN

CHARLES A. MAGUIRE & ASSOCIATES INC.
ENGINEERS — ARCHITECTS
PROVIDENCE, R.I. WETHERSFIELD, CONN. BOSTON, MASS. TROY, N.Y.

DATE NOV. 1971 DESIGNED BY
SCALE 1" = 10' SHEET 12 OF 73

APPROVED ________ SUPERVISING CIVIL ENGINEER (BRIDGE)
APPROVED ________ CHIEF ENGINEER
FINAL DATE
SET NO. PRINTED ISSUED TO

777,003

777,011

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	R.I.	F-019(18)	1972	20	73

B-24

Elevation	Sample	Description of Strata	Blows	Depth
6.0'	(1)	Brown fine to medium SAND, little fine gravel, little silt (FILL)	2	1
			3	2
			6	3
			6	4
			7	5
	(2)		6	6
			10	7
S. Abut. El. -2.0		Brown fine to medium SAND and PEAT, trace fine gravel and silt (FILL)	10	8
			7	9
			8	10
	(3)		4	11
-6.0'			6	12
		Brown fine to coarse SAND and GRAVEL, trace silt (water level -5.0)	18	13
			20	14
			21	15
	(4)		16	16
			22	17
			24	18
			26	19
-14.0'			26	20
	(5)	Gray fine SAND, some silt	5	21
			6	22
			8	23
			8	24
			7	25
	(6)		7	26
			9	27
			10	28
			11	29
			11	30
	(7)		10	31
			13	32
			14	33
			15	34
			16	35
	(8)		11	36
			15	37
			17	38
			16	39
			18	40
	(9)		28	41
			40	42
			35	43
			35	44
			38	45
	(10)		30	46
			38	47
			40	48
			45	49
			46	50
	(11)		36	51
			50	52
			55	53
			50	54
			48	55
	(12)		32	56
			40	57
			42	58
			44	59
			46	60
	(13)		36	61
			40	62
			44	63
			50	64
			55	65
	(14)		36	66
			54	67
			56	68
			60	69
-64.0			72	70
	(15)	Gray fine SAND, trace silt	40	71
			70	72
			82	73
			84	74
			86	75
	(16)		79	76
			74	77
			82	78
			86	79
-74.0			88	80
	(17)	Gray fine to medium SAND, trace silt	54	81
			72	82
			76	83
			80	84
			84	85
	(18)		60	86
			92	87
			98	88
			130	89
			138	90

B-24

MATCH LINE

Elevation	Sample	Description of Strata	Blows	Depth
	(19)		80	91
			110	92
			120	93
			129	94
			134	95
	(20)		96	96
			120	97
			140	98
			152	99
-94.0			168	100
	(21)	Gray fine to coarse SAND, some fine gravel, trace silt	140	101
			170	102
			178	103
			180	104
			182	105
	(RR)		120	106
			184	107
			210	108
			220	109
			240	110
	(22)		180	111
			290	112
			240	113
			292	114
			280	115
	(23)		185	116
			220	117
			246	118
-114.0	(24)		110/6	119
				120

Bottom of Boring 120'-0"
Date Completed 3-28-67

B-25

Elevation	Sample	Description of Strata	Blows	Depth
7.0'	(1)	Gray-brown fine to medium SAND, and fine to coarse GRAVEL	2	1
			3	2
			7	3
4.0'		Brown fine to medium SAND, little fine gravel (FILL)	5	4
			7	5
	(2)		5	6
			7	7
-1.0			6	8
S. Abut. El. -2.0		Brown PEAT	8	9
			2	10
	(3)		1	11
-5.0'		(water level -5.0)	1	12
		Gray fine to medium SAND, trace fine gravel and silt	17	13
			23	14
			26	15
	(4)		9	16
			17	17
			23	18
			36	19
-12.0'			17	20
	(5)	Gray fine SAND and SILT	17	21
			12	22
			17	23
			20	24
			20	25
	(6)		17	26
			15	27
			13	28
			15	29
			14	30
	(7)		19	31
			22	32
			21	33
			21	34
			19	35
	(8)		24	36
			20	37
-31.0'			25	38
		Gray coarse to fine SAND, little medium to fine gravel and silt	46	39
			46	40
	(9)		50	41
			50	42
			54	43
			55	44
			60	45
	(10)		55	46
			55	47
			50	48
			50	49
			60	50
*	(11)		55	51
			55	52
			60	53
			65	54
-48.0'			75	55
	(12)	Gray fine to coarse SAND, little fine to medium gravel, trace silt	32	56
			40	57
			42	58
			38	59
-53.0'			36	60
	(13)	Gray SILT, little fine sand	14	61
			20	62
			24	63
-57.0'			26	64
		Gray fine SAND, some silt	22	65
	(14)		12	66
			16	67
			20	68
			24	69
			29	70
	(15)		16	71
			28	72
			30	73
			32	74
			34	75
	(16)		19	76
			28	77
			34	78
			36	79
-73.0'			38	80
	(17)		16	81
			20	82
			22	83
			20	84
			24	85
	(18)		17	86
			24	87
			20	88
			23	89
			28	90

B-25

MATCH LINE

Elevation	Sample	Description of Strata	Blows	Depth
	(19)	Gray fine to medium SAND, trace silt	15	91
			18	92
			20	93
			22	94
			26	95
	(20)		16	96
			24	97
			28	98
			30	99
			32	100
	(21)		20	101
			33	102
			36	103
			38	104
			40	105
	(22)		30	106
			42	107
			44	108
			56	109
-103.0'			62	110
	(23)	Gray fine to coarse SAND, little fine to medium gravel, trace silt	50	111
			62	112
			70	113
			72	114
			74	115
	(24)		38	116
			48	117
			50	118
			52	119
			56	120
	(25)		42	121
			54	122
			60	123
			62	124
			68	125
	(26)		52	126
			70	127
			73	128
			74	129
			78	130
	(RR)		68	131
			82	132
			120	133
			150	134
-128.0'			168	135
	(27)	Gray fine SAND, little silt	52	136
			68	137
			74	138
			73	139
			68	140
	(28)		62	141
			78	142
			110	143
			120	144
			138	145
	(29)		120	146
			170	147
			146	148
			158	149
			248	150
	(30)		89	151
			120	152
			140	153
			148	154
			152	155
	(31)		89	156
			120	157
			136	158
			140	159
* -153.0'			148	160
	(32)	Gray fine to coarse SAND and fine to medium GRAVEL, trace silt	100	161
			168	162
			172	163
			180	164
			186	165
	(33)	Gray weathered rock	210	166
			240	167
** -160.7'		Top of Rock 167'-8"	300/4	168
	(C)	4 Min/Ft. Gray		169
		4 SANDSTONE and SHALE		170
		5 with quartz seams,		171
		4 medium hard		172
-164.7'		4 88% Recovery		173

Bottom of Boring 172'-8"
Date Completed 3-22-67
Note: Used 600 lb. weight on casing from 115'0" to 167'8"

NOTES:

1. Borings were done by American Drilling & Boring Co. Inc. on the dates indicated.
2. Datum is mean high water.

LEGEND

Sample Number — Boring Number — Depth

Elevation — 55.5 W/H P (1) Description of Strata 10 1; 35 2; 35 3; 4; etc.

(2) Water Level

Blows per 6 inches on standard 2 inch O.D. sampling spoon using 140 lb. weight falling 30 inches, unless otherwise noted

Blows per foot on $2\frac{1}{2}$ inch pipe casing using 300 lb weight falling 24 inches, unless otherwise noted

NR — (No recovery) 33 14; 36 15; 35 16; 37 17

Rock drilling minutes per foot

Top of Rock 17'-0"

1, 3, 3 etc. Description of Rock 18; 19; 20

Bottom of Boring 20'-1"
Date Completed 12-28-60

P Indicates push by the Driller on sampling spoon or casing.

W/H Indicates weight of hammer on sampling spoon or casing

* Indicates blows per 6 inches on open end "A" rod $1\frac{5}{8}$ inch O.D. using 140 lb. weight falling 30 inches.

** Indicates blows per 6 inches on open end "A" rod $1\frac{5}{8}$ inch O.D. using 300 lb weight falling 24 inches.

NOTES

1. Ground water levels indicated on the drawings are those existing at the time subsurface investigations were made and do not necessarily represent permanent ground water levels. It shall be the Contractors responsibility to determine annual and seasonal variations in ground water level which may affect his work. Variations in existing ground water levels from those indicated on the drawings shall under no conditions constitute grounds for revision in contract price or completion date.
2. Borings, probings, soundings, etc. were taken for the purpose of design and indicate subsurface conditions only at the locations shown. The Contractor shall be aware that subsurface conditions encounted during construction may vary from those shown on the Plans.

REVISIONS		
NO.	DATE	BY

RHODE ISLAND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ROADS AND BRIDGES

ROUTE 6 CONNECTOR

DEAN STREET INTERCHANGE
PROVIDENCE — RHODE ISLAND

PLEASANT VALLEY PARKWAY BRIDGE BORING LOGS 24 & 25

CHARLES A. MAGUIRE & ASSOCIATES
ENGINEERS
PROVIDENCE, R.I. — BOSTON, MASS. — WETHERSFIELD, CONN.
DATE — DESIGNED BY
SCALE — SHEET 20 OF 73

APPROVED ______ SUPERVISING CIVIL ENGINEER (BRIDGE) — SET NO. — PRINTED
APPROVED ______ CHIEF ENGINEER — ISSUED TO
FINAL DATE

777,011

777,012

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	R.I.	F-019(18)	1972	21	73

B-26

- -3.5 — (1) Black CINDERS and fine to coarse SAND, GRAVEL, (FILL)
- -8.5 — (2)(3) Gray SILT, trace fine sand
- -18.5 — (4)(5)(6) Gray fine SAND, little silt
- -33.5 — (7)(8) Gray fine to medium SAND, little silt, trace fine gravel
- -43.5 — (9)(10)(11)(12) Gray fine to medium SAND, trace fine gravel and silt
- -63.5 — (13)(14)(15)(16) Gray fine SAND, little silt
- -83.5 — (17)(NR)

MATCH LINE

- (18)(19)(20)(21) Gray fine to coarse SAND, little fine to coarse gravel, trace silt
- -113.5 — (22) Gray fine to coarse SAND, some fine to medium gravel, trace silt. (TILL)
- (23) Shale fragments @ 116'-6"
- -120.0

Refusal at 116'-6"
Date Completed 4-4-67

Note
Watersurface 3.5' above top of boring at M.H.W.

Depth (ft)	Blows per foot									
1–10	3	6	7	7	8	7	10	10	11	11
11–20	8	11	12	16	17	10	18	18	19	20
21–30	12	19	20	21	22	17	22	24	26	28
31–40	18	24	26	27	28	20	28	30	31	32
41–50	26	36	42	44	48	42	63	70	77	79
51–60	52	52	80	62	54	56	46	57	60	67
61–70	68	56	86	100	98	130	70	78	92	86
71–80	87	62	89	120	150	148	70	150	162	170
81–90	192	64	82	96	110	120	68	92	120	210
91–100	72	150	158	210	230	67	148	169	205	215
101–110	82	158	210	214	250	92	187	260	268	270
111–116	120	268	292	310	360					

B-27

- 8.0 — (1) Gray-brown fine to medium SAND, trace silt and roots
- 5.0 — (2) Brown fine to coarse SAND, trace fine gravel and silt
- -0.5 — M.A.El. -2.0 — (NR) Brown PEAT (cobble)
- -3.5 / -5.0 — (3) Gray-brown fine to coarse SAND, some fine to coarse gravel, trace silt
- -11.0 — (4)(5) Gray SILT, trace very fine sand
- -20.0 — (6)(7)(8)(9)(10) Gray fine SAND, little silt
- -46.0 — (11)(12) Gray SILT, trace very fine sand
- -55.0 — (13)(14) Gray fine SAND and SILT
- -64.0 — (15)(16)(17) Gray fine to medium SAND, trace silt
- -80.0

MATCH LINE

- (18) Gray fine SAND, little silt
- -86.0 — (19) Gray fine to medium SAND, trace fine gravel and silt
- -93.0 — (20)(21)(22)(23) Gray fine to coarse SAND, little fine gravel, trace silt
- -112.0 — (24)(25) Gray coarse to fine SAND, trace fine gravel and silt
- -121.0 — (26) Gray fine to coarse SAND and GRAVEL trace silt, (cobbles and boulders)
- (27)
- -129.0 — (28) Gray fine SAND, little silt
- -137.0 — (29) Gray fine to coarse SAND, some fine to medium gravel, little silt, (shale fragments), (cobbles and boulders)
- -145.0 — Top of Rock 153'-0"
- (C) 3 Min./Ft. Gray SANDSTONE 4 soft to medium hard 4 seamy 5 88% Recovery 4
- -150.0

Bottom of Boring 158'-0"
Date Completed 3-30-67

Depth (ft)	Blows per foot									
1–10	2	2	3	6	10	7	7	7	6	5
11–20	5	13	32	44	37	14	14	19	18	13
21–30	13	14	29	28	22	18	20	22	27	26
31–40	21	23	28	30	31	16	27	28	30	35
41–50	22	33	25	36	41	33	41	44	46	51
51–60	55	70	67	63	69	48	59	63	62	66
61–70	49	54	61	79	84	66	73	84	88	90
71–80	13	17	18	21	23	8	13	15	23	25
81–90	25	25	26	31	33	27	38	34	40	41
91–100	32	50	39	37	44	34	50	44	40	39
101–110	31	40	49	46	55	44	65	77	77	80
111–120	60	70	71	90	98	58	76	80	91	98
121–130	61	83	87	103	105	79	160	148	120	187
131–140	160	179	304	421	490	131	267	390	461	504
141–150	230	326	380	326	395	—	—	—	—	—
151–158	—	—	—							

B-28

- 8.0 — (1) Black TOPSOIL
- 6.0 — (2) Brown fine SAND, some fine to medium gravel, trace silt, (FILL)
- M.A.El. -2.0 — (3) Brown fine SAND, with fibers
- -6.0 — (4) Brown-gray fine to coarse SAND, little fine to medium gravel, trace silt (water at -5.0)
- -12.0 — (5)–(10) Gray fine SAND and SILT
- -42.0 — (11) Gray fine SAND, trace silt
- -46.0 — (12) Gray fine SAND, some silt
- -52.0 — (13)(14) Gray fine to coarse SAND, trace silt
- -62.0 — (15)(16) Gray fine SAND and SILT
- -72.0 — (17) Gray fine SAND, trace silt
- -77.0 — (18)

MATCH LINE

- (19)(20) Gray fine to medium SAND, trace silt
- -92.0 — (21)(22)(23)(24) Gray fine to coarse SAND, some fine to medium gravel trace silt
- -112.0 — (25)

Bottom of Boring 120'-0"
Date Completed 3-29-67

Depth (ft)	Blows per foot									
1–10	4	5	6	7	8	5	8	10	12	12
11–20	4	7	8	9	16	14	18	18	20	21
21–30	10	11	12	12	11	10	12	13	14	15
31–40	8	11	12	10	11	8	10	11	12	14
41–50	11	14	15	16	19	16	20	21	22	23
51–60	18	26	28	30	31	28	42	48	53	54
61–70	46	62	68	72	76	42	68	72	84	86
71–80	52	72	82	94	96	46	72	84	78	82
81–90	68	70	107	150	120	135	165	161	170	174
91–100	86	120	148	162	174	105	162	178	190	196
101–110	86	152	170	182	110	186	178	210	248	160
111–120	230	248	260	272	182	268	300	154/6		

NOTE:
For Notes and Legend see sheet No. 20

REVISIONS		
NO.	DATE	BY

RHODE ISLAND
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ROADS AND BRIDGES
ROUTE 6 CONNECTOR
DEAN STREET INTERCHANGE
PROVIDENCE RHODE ISLAND

PLEASANT VALLEY PARKWAY BRIDGE
BORING LOGS 26, 27 & 28

CHARLES A. MAGUIRE & ASSOCIATES
ENGINEERS
PROVIDENCE, R.I. – BOSTON, MASS. – WETHERSFIELD, CONN.
DATE — DESIGNED BY
SCALE — SHEET 21 OF 73

APPROVED — SUPERVISING CIVIL ENGINEER (BRIDGE) — SET NO. — PRINTED
APPROVED — CHIEF ENGINEER — ISSUED TO
FINAL DATE

777,012

Appendix C
Soil Boring Logs

Tighe&Bond

70 Romano Vineyard Way, Suite 134,
N. Kingstown, RI 02852
o. 401.438.3100
w: tighebond.com | halvorsondesign.com

SOIL BORING LOG

BORING NUMBER: RTG-SB-01

DATE(S): 6/17/2019-6/18/2019

PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge

LOCATION: N:271062.9, E:346137.3 (RI State Plane)

ELEVATION: 8.4' (NAVD 88)

DRILLING CONTRACTOR: New England Boring Contractors, Inc.

DRILLING METHOD AND EQUIPMENT: Driven casing and wash, truck mounted CME-75 drill rig

WATER LEVEL AND DATE: 6' below grade (tidal) 6/20/2019

START: 8:00AM 6/17/19

FINISH: 12:50PM 6/18/19

LOGGER: A. Ahearn

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0						
	0-2	SS S-1	0.9	9-10-9-9	WELL GRADED SAND WITH SILT AND GRAVEL, (SW-SM), olive gray, dry, medium dense, f-c gravel	Gravel may be from sidewalk sub-base
5.0						4" casing to 5'
	5-7	SS S-2	0.4	3-3-2-1	POORLY GRADED SAND WITH SILT, (SP-SM), dark gray, moist, loose, f-m sand	4" casing to 7'
	7-9	SS S-3	1.0	WOH-1-1-1	A:SILTY SAND, (SM), dark gray, wet B: POORLY GRADED SAND WITH SILT, (SP-SM), olive gray, moist, very loose	Individual recovery length not recorded 4" casing to 9'
10.0	9-11	SS S-4	1.2	1-3-12-12	SILTY SAND, (SM), dark gray, wet, (top 6") POORLY GRADED SAND WITH SILT, (SP-SM), gray, moist, medium dense, (bottom 8")	4" casing to 11'
	11-13	SS S-5	0.3	16-19-18-11	WELL GRADED GRAVEL WITH SAND, (GP), gray, wet, dense, f-c gravel	Rock prevented recovery, 3" spoon used for better recovery 4" casing to 13'
15.0	13-15	SS S-6	0.1	13-8-9-6	WELL GRADED GRAVEL WITH SAND, (GP), gray, wet, medium dense, coarse gravel	Rock prevented recovery, 3" spoon used for better recovery, 4" recovery with 3" spoon
						4" casing to 18'
20.0	18-20	SS S-7	1.3	7-8-11-11	SILTY SAND, (SM), gray, moist, medium dense	
						4"casing to 23'
25.0	23-25	SS S-8*	1.2	3-2-2-3	SILTY SAND, (SM), dark gray, wet, very loose, fine sand	
						4"casing to 28'
30.0	28-30	SS S-9	1.3	2-2-5-6	SILTY SAND, (SM), dark gray, wet, loose, fine sand	
						4" casing to 33'
35.0	33-35	SS S-10	1.3	2-2-3-3	SILTY SAND, (SM), dark gray, wet, loose, fine sand	

Tighe&Bond

70 Romano Vineyard Way, Suite 134,
N. Kingstown, RI 02852
o. 401.438.3100
w: tighebond.com | halvorsondesign.com

SOIL BORING LOG

BORING NUMBER: **RTG-SB-01**

DATE(S): **6/17/2019-6/18/2019**

PROJECT NUMBER: **19104.00**

PROJECT: Sims Ave. Pedestrian Bridge | **LOCATION:** N:271062.9, E:346137.3 (RI State Plane)

ELEVATION: 8.4' (NAVD 88) | **DRILLING CONTRACTOR:** New England Boring Contractors, Inc.

DRILLING METHOD AND EQUIPMENT: Driven casing and wash, truck mounted CME-75 drill rig

WATER LEVEL AND DATE: 6' below grade (tidal) 6/20/2019 | **START:** 8:00AM 6/17/19 | **FINISH:** 12:50PM 6/18/19 | **LOGGER:** A. Ahearn

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
35.0						
						4" casing to 38'
40.0	38-40	SS S-11	1.3	2-3-3-4	POORLY GRADED SAND WITH SILT, (SP-SM), dark gray, wet, loose	
						4" casing to 43'
45.0	43-45	SS S-12*	1.0	WOR-WOH-2-2	SILT WITH SAND, (ML), dark gray, wet, soft	
						4" casing to 48'
50.0	48-50	SS S-13	1.3	3-3-5-5	SILT, (ML), dark gray, wet, firm	
						4" casing to 53'
55.0	53-55	SS S-14*	1.2	4-3-4-5	SILTY SAND, (SM), dark gray, wet, loose	
						4" casing to 58'
60.0	58-60	SS S-15	1.0	WOR-WOR-WOH-2	SILT, (ML), dark gray, wet, very soft	
						4" casing to 63'
65.0	63-65	SS S-16	1.0	WOR-WOH-2-3	SANDY SILT, (ML), dark gray, wet, soft	
						4" casing to 68'
70.0	68-70	SS S-17	1.3	1-5-5-4	SILT, (ML), olive gray, wet, stiff	
						4" casing to 73'
75.0	73-75	SS S-18	1.4	3-6-7-6	SILT, (ML), olive gray, wet, stiff (top 12") SANDY SILT, (ML), olive gray, wet, (bottom 5")	Some light brown material observed in the bottom 5" of recovery

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SOIL BORING LOG

BORING NUMBER: **RTG-SB-01**

DATE(S): **6/17/2019-6/18/2019**

PROJECT NUMBER: **19104.00**

PROJECT: Sims Ave. Pedestrian Bridge | **LOCATION:** N:271062.9, E:346137.3 (RI State Plane)

ELEVATION: 8.4' (NAVD 88) | **DRILLING CONTRACTOR:** New England Boring Contractors, Inc.

DRILLING METHOD AND EQUIPMENT: Driven casing and wash, truck mounted CME-75 drill rig

WATER LEVEL AND DATE: 6' below grade (tidal) 6/20/2019 | **START:** 8:00AM 6/17/19 | **FINISH:** 12:50PM 6/18/19 | **LOGGER:** A. Ahearn

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
75.0						
80.0	78-80	SS S-19	1.4	WOR-WOR-1-4	SILT, (ML), olive gray, wet, very soft	4" casing to 78' Switched to 3" casing
85.0	83-85	SS S-20	1.0	WOR-WOR-2-4	SILT, (ML), olive gray, wet, soft	3" casing to 83'
90.0	88-90	SS S-21*	1.3	--	SILT, (ML), olive gray, wet, very soft	3" casing to 88' 3" casing sunk to 94', unable to collect undisturbed sample or blow counts
95.0	93-95	--	--	--	No recovery	Casing sunk to 94', unable to collect undisturbed sample or blow counts
100.0	98-100	SS S-22	1.3	25-13-14-14	SILT WITH SAND, (ML), olive gray, wet, very stiff	3" casing to 98' Sampled after 1.25 hour break for drill rig repair
105.0					END BORING AT 100' BELOW GRADE An asterisk (*) next to a sample number denotes a sample on which a laboratory grain size analysis was performed.	End drilling at 12:50 PM, 6/18/19 Backfilled boring hole with soil cuttings, and finished with a concrete plug to the top of the concrete sidewalk.
110.0						
115.0						

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SOIL BORING LOG

BORING NUMBER: **RTG-SB-02**

DATE(S): **6/19/2019-6/20/2019**

PROJECT NUMBER: **19104.00**

PROJECT: Sims Ave. Pedestrian Bridge | **LOCATION:** N:271142.0, E:346086.4 (RI State Plane)

ELEVATION: 8.1' (NAVD 88) | **DRILLING CONTRACTOR:** New England Boring Contractors, Inc.

DRILLING METHOD AND EQUIPMENT: Driven casing and wash, truck mounted CME-75 drill rig

WATER LEVEL AND DATE: 6' below grade (tidal) 6/20/2019 | **START:** 7:53 AM 6/19/2019 | **FINISH:** 2:30 PM 6/20/2019 | **LOGGER:** A.Ahearn

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0						
	0-2	SS S-1	1.2	4-13-13-22	POORLY GRADED SAND, (SP), black, dry, medium dense	Top 4" topsoil, 2" of asphalt at 10"
5.0						4" casing to 5'
	5-7	SS S-2	0.9	4-1-1-1	SILTY SAND, (SM), olive gray, moist, very loose, fine	4" casing to 7'
	7-9	SS S-3	1.3	1-3-3-2	POORLY GRADED SAND WITH SILT, (SP-SM), dark gray, moist, loose	4" casing to 9'
10.0	9-11	SS S-4	1.0	1-1-7-10	SILTY SAND, (SM), dark gray, moist, loose	Trace org. mtl. (top 9"), trace gravel (bottom 3") 4" casing to 11'
	11-13	SS S-5	0.3	8-11-9-18	WELL GRADED SAND WITH GRAVEL, (GP-GM), olive gray, moist, medium dense, f-c gravel	4" casing to 13'
15.0	13-15	SS S-6	0.3	5-3-3-3	WELL GRADED GRAVEL WITH SAND, (GW), olive gray, moist, medium dense	
						4" casing to 18'
20.0	18-20	SS S-7	0.3	5-1-2-3	SANDY SILT, (ML), dark gray, wet, soft	
						4"casing to 23'
25.0	23-25	SS S-8*	1.2	3-2-2-3	SANDY SILT, (ML), dark gray, wet, soft	
						4"casing to 28'
30.0	28-30	SS S-9	1.1	2-3-3-5	SILT WITH SAND, (ML), dark gray, wet, firm	
						4" casing to 33'
35.0	33-35	SS S-10*	1.3	3-1-2-3	SANDY SILT, (ML), dark gray, wet, soft	
						4" casing to 38'
40.0	38-40	SS S-11	1.1	2-1-2-3	SANDY SILT, (ML), dark gray, wet, soft	

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SOIL BORING LOG

BORING NUMBER: RTG-SB-02

DATE(S): 6/19/2019-6/20/2019

PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge

LOCATION: N:271142.0, E:346086.4 (RI State Plane)

ELEVATION: 8.1' (NAVD 88)

DRILLING CONTRACTOR: New England Boring Contractors, Inc.

DRILLING METHOD AND EQUIPMENT: Driven casing and wash, truck mounted CME-75 drill rig

WATER LEVEL AND DATE: 6' below grade (tidal) 6/20/2019

START: 7:53 AM 6/19/2019

FINISH: 2:30 PM 6/20/2019

LOGGER: A.Ahearn

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
40.0						
45.0	43-45	SS S-12	1.1	1-2-1-2	SILTY SAND, (SM), dark gray, wet, very loose	4" casing to 43'
50.0	48-50	SS S-13	1.3	2-3-3-3	POORLY GRADED SAND WITH SILT, (SP-SM), dark gray, wet, loose	4" casing to 48'
55.0	53-55	SS S-14	1.2	1-3-2-3	POORLY GRADED SAND, (SP), dark gray, wet, loose, fine sand	4" casing to 53' One piece of 1" gravel found in sample
60.0	58-60	SS S-15	1.6	2-1-WOH-WOH	SILT WITH SAND, (ML), dark gray, wet, very soft, fine sand	4" casing to 58' Bottom 6" more dense than remaining material
65.0	63-65	SS S-16*	1.3	WOH-WOH- 2-2	SILT WITH SAND, (ML), dark gray, wet, soft, fine sand	4" casing to 63'
70.0	68-70	SS S-17	1.1	WOH-WOH-7-7	SILT, (ML), light gray, wet, firm	4" casing to 68' Stop for day at 2:30 PM 6/19/19
75.0	73-75	SS S-18	1.3	WOR-WOH-1-2	SILT, (ML), light gray, wet, very soft	4" casing to 73' Drilling resumes at 7:20 AM 6/20/19 Switched to 3" casing
80.0	78-80	--	--	--	No recovery	3" casing to 78' 3" casing sunk to 83'

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SOIL BORING LOG

BORING NUMBER: RTG-SB-02

DATE(S): 6/19/2019-6/20/2019

PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge | **LOCATION:** N:271142.0, E:346086.4 (RI State Plane)

ELEVATION: 8.1' (NAVD 88) | **DRILLING CONTRACTOR:** New England Boring Contractors, Inc.

DRILLING METHOD AND EQUIPMENT: Driven casing and wash, truck mounted CME-75 drill rig

WATER LEVEL AND DATE: 6' below grade (tidal) 6/20/2019 | **START:** 7:53 AM 6/19/2019 | **FINISH:** 2:30 PM 6/20/2019 | **LOGGER:** A.Ahearn

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
80.0						
						3" casing to 83'
85.0	83-85	SS S-19	1.8	WOH-3-4-9	SILT, (ML), light gray, wet, firm	
						3" casing to 88'
90.0	88-90	SS S-20*	1.3	8-7-10-8	SILT WITH SAND, (ML), light gray, wet, very stiff	Slight light brown color change observed at 10"
						3" casing to 93'
95.0	93-95	SS S-21	1.5	3-4-4-6	POORLY GRADED SAND, (SP), dark gray, moist, loose, fine sand	
						3" casing to 98'
100.0	98-100	SS S-22	1.7	6-4-7-7	SANDY SILT, (ML), light gray, wet, stiff	
						3" casing to 103'
105.0	103-105	SS S-23	1.2	8-4-4-3	SILTY SAND, (SM), light gray, wet, loose	
						3" casing to 108'
110.0	108-110	SS S-24*	0.8	8-3-3-3	SILT WITH SAND, (ML), light gray, wet, firm	
						3" casing to 113'
115.0	113-115	SS S-25	1.4	WOH-1-WOH-2	SILT, (ML), light gray, wet, very soft	
						3" casing to 118'
120.0	118-120	SS S-26	1.3	8-4-3-5	SILT, (ML), light gray, wet, firm	
					END BORING AT 120' BELOW GRADE	End drilling at 2:30PM, 6/20/2019

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SOIL BORING LOG

BORING NUMBER: RTG-SB-02

DATE(S): 6/19/2019-6/20/2019

PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge	**LOCATION:** N:271142.0, E:346086.4 (RI State Plane)
ELEVATION: 8.1' (NAVD 88)	**DRILLING CONTRACTOR:** New England Boring Contractors, Inc.
DRILLING METHOD AND EQUIPMENT: Driven casing and wash, truck mounted CME-75 drill rig	

WATER LEVEL AND DATE: 6' below grade (tidal) 6/20/2019	**START:** 7:53 AM 6/19/2019	**FINISH:** 2:30 PM 6/20/2019	**LOGGER:** A.Ahearn

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
				6"- 6"- 6"- 6"	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					An asterisk (*) next to a sample number denotes a sample on which a laboratory grain size analysis was performed.	Backfilled boring hole with soil cuttings to grade

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SOIL BORING LOG

BORING NUMBER: RTG-SB-03

DATE(S): 8/31/2020 - 9/8/2020

PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge | **LOCATION:** N: 271132.0, E: 346079.9 (RI State Plane)

ELEVATION: 8.0' (NAVD 88) | **DRILLING CONTRACTOR:** New England Boring Contractors, Inc.

DRILLING METHOD AND EQUIPMENT: Driven Casing & Wash, Truck Mounted CME-75 Drill Rig, Autohammer

WATER LEVEL AND DATE: 8.5' B.G. (tidal) 9/2/2020 at 6:50AM | **START:** 9:15 AM 8/31/2020 | **FINISH:** 4:15 PM 9/8/2020 | **LOGGER:** A. Gilmore

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0.0					3" Topsoil	Start boring at 9:15 AM on 8/31/2020
	0' - 2'	SS-1	1.5'	7-20-27-21	POORLY GRADED SAND, (SP), light brown, dry, dense	2" of asphalt at 12" B.G. 3"Ø split spoon
	2' - 4'	SS-2	1.3'	21-24-16-13	POORLY GRADED SAND WITH GRAVEL, (SP), light brown, dry, dense	3"Ø split spoon
5.0	4' - 6'	SS-3	1.5'	11-11-9-8	POORLY GRADED SAND WITH SILT, (SP-SM), dark brown, tan, and reddish-brown, moist, medium dense	3"Ø split spoon
	6' - 8'	SS-4	1.9'	3-4-8-10	SILTY SAND, (SM), dark brown, moist, medium dense	Organic odor and roots noted in sample 3"Ø split spoon
10.0	8' - 10'	SS-5	1.6'	8-8-7-6	POORLY GRADED SAND, (SP), brown, wet, medium dense	Organic odor and roots noted in sample 3"Ø split spoon
15.0						
20.0						
25.0						
30.0						
35.0						

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SOIL BORING LOG

BORING NUMBER: RTG-SB-03

DATE(S): 8/31/2020 - 9/8/2020

PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge	**LOCATION:** N: 271132.0, E: 346079.9 (RI State Plane)
ELEVATION: 8.0' (NAVD 88)	**DRILLING CONTRACTOR:** New England Boring Contractors, Inc.

DRILLING METHOD AND EQUIPMENT: Driven Casing & Wash, Truck Mounted CME-75 Drill Rig, Autohammer

WATER LEVEL AND DATE: 8.5' B.G. (tidal) 9/2/2020 at 6:50AM	**START:** 9:15 AM 8/31/2020	**FINISH:** 4:15 PM 9/8/2020	**LOGGER:** A. Gilmore

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
35.0						
40.0						
45.0						5" casing to 48 ft. B.G.
	48' - 49.5'	SS-6	0.5'	6-4-4	POORLY GRADED SAND WITH SILT, (SP-SM), gray, wet, loose	2"Ø split spoon used for remainder of split spoon samples
50.0						5" casing to 53 ft. B.G.
	53' - 54.5'	SS-7	0.8'	4-3-5	POORLY GRADED SAND, (SP), gray, wet, loose	
55.0						Stop drilling at 2:15 PM on 8/31/2020 Start drilling at 7:15 AM on 9/1/2020 4" casing to 58 ft. B.G.
	58' - 59.5'	SS-8	1.4'	WOR-WOH-2	SANDY SILT, (ML), dark gray, wet, soft, very fine sand	4" casing to 60 ft. B.G.
60.0	60' - 61.8'	ST-1	0'	1.2 in/sec	No recovery.	Waited 20 mins. prior to recovering sample.
	62.5' - 64.5'	ST-2*	1.3'	0.9 in/sec	SANDY SILT, (ML), dark gray, wet, very fine sand	Waited 20 mins. prior to recovering sample.
65.0						
70.0						4" casing to 73 ft. B.G.
	73' - 74.5'	SS-9	1.2'	2-6-7	SANDY SILT, (ML), brownish gray, wet, firm, fine sand	
75.0						

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SOIL BORING LOG

BORING NUMBER: RTG-SB-03

DATE(S): 8/31/2020 - 9/8/2020

PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge

LOCATION: N: 271132.0, E: 346079.9 (RI State Plane)

ELEVATION: 8.0' (NAVD 88)

DRILLING CONTRACTOR: New England Boring Contractors, Inc.

DRILLING METHOD AND EQUIPMENT: Driven Casing & Wash, Truck Mounted CME-75 Drill Rig, Autohammer

WATER LEVEL AND DATE: 8.5' B.G. (tidal) 9/2/2020 at 6:50AM

START: 9:15 AM 8/31/2020

FINISH: 4:15 PM 9/8/2020

LOGGER: A. Gilmore

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
75.0	74.5' - 76'	SS-10	1.9'	7-5-5	SANDY SILT, (ML), gray, wet, stiff, very fine sand	4" casing to 76 ft. B.G.
	76' - 77.5'	SS-11	1.0'	WOR-3-4	SILT WITH SAND, (ML), light gray, wet, firm, very fine sand	4" casing to 78 ft. B.G.
80.0	78' - 80'	ST-3*	1.4'	0.8 in/sec	SILT, (ML), light gray, wet, very fine sand	Waited 20 mins. prior to recovering sample.
						4" casing to 88 ft. B.G.
85.0						
90.0						Stop drilling at 3:05 PM on 9/1/2020 Start drilling at 7:45 AM on 9/2/2020
95.0	94' - 95.5'	SS-12	1.8'	4-6-8	POORLY GRADED SAND WITH SILT, (SP-SM), dark gray, wet, medium dense, very fine sand	4" casing to 95 ft. B.G.
100.0						
105.0						
110.0						
	111'-112.5'	SS-13	2.0'	8-4-7	SILT, (ML), dark gray, wet, stiff	Used cat head to drive 4" casing to 113 ft. B.G. (End of cased hole)
115.0	113'-115	ST-4	0.1'	0.5 in/sec	SILT, (ML), dark gray, wet, trace of very fine sand	Waited 20 mins. prior to recovering sample.

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SOIL BORING LOG

BORING NUMBER: RTG-SB-03
DATE(S): 8/31/2020 - 9/8/2020
PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge
LOCATION: N: 271132.0, E: 346079.9 (RI State Plane)
ELEVATION: 8.0' (NAVD 88)
DRILLING CONTRACTOR: New England Boring Contractors, Inc.
DRILLING METHOD AND EQUIPMENT: Driven Casing & Wash, Truck Mounted CME-75 Drill Rig, Autohammer
WATER LEVEL AND DATE: 8.5' B.G. (tidal) 9/2/2020 at 6:50AM
START: 9:15 AM 8/31/2020
FINISH: 4:15 PM 9/8/2020
LOGGER: A. Gilmore

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
115.0						Roller bit to 115.5 ft. B.G.
	115.5'-117.5'	ST-5	0.1'	0.5 in/sec	SANDY SILT, (ML), dark gray, wet	Waited 20 mins. prior to recovering sample. Contents of Shelby Tube fell out of the top of tube.
	118'-119.5'	SS-14*	1.8'	4-5-9	CLAYEY SILT, (ML), wet, dark gray, stiff	
120.0						Roller bit to 123 ft. B.G.
	123'-125'	SS-15	1.3'	11-9-11-21	SANDY SILT, (ML), wet, dark gray, very stiff, (top 10") SILT, (ML), wet, dark gray, very stiff, (bottom 5")	
125.0						Stop drilling at 2:53 PM on 9/2/2020 Start drilling at 8:15 AM on 9/3/2020 Roller bit to 128 ft. B.G.
	128'-130'	SS-16	2.0'	25-25-27-26	SILT, (ML), dark gray, wet, hard	
130.0						Mix in BIO-BORE bio-degradable drilling fluid concentrate to maintain open borehole Roller bit to 133 ft. B.G.
	133'-135'	SS-17	2.0'	1-10-13-22	SILT, (ML), dark gray, wet, very stiff	
135.0						Roller bit to 138 ft. B.G.
	138'-140'	SS-18	2.0'	2-8-10-21	SILT, (ML), dark gray, wet, very stiff	
140.0						Roller bit to 143 ft. B.G.
	143'-145'	SS-19*	2.0'	8-12-15-20	CLAYEY SILT, (ML), dark gray, wet, very stiff	
145.0						Roller bit to 148 ft. B.G.
	148'-150'	SS-20	2.0'	7-9-17-21	SILT, (ML), dark gray, wet, very stiff	
150.0						Roller bit to 153 ft. B.G.
	153'-155'	SS-21	2.0'	5-6-10-15	SILT, (ML), dark gray, wet, stiff	
155.0						

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SOIL BORING LOG

BORING NUMBER: **RTG-SB-03**

DATE(S): **8/31/2020 - 9/8/2020**

PROJECT NUMBER: **19104.00**

PROJECT: Sims Ave. Pedestrian Bridge	**LOCATION:** N: 271132.0, E: 346079.9 (RI State Plane)
ELEVATION: 8.0' (NAVD 88)	**DRILLING CONTRACTOR:** New England Boring Contractors, Inc.

DRILLING METHOD AND EQUIPMENT: Driven Casing & Wash, Truck Mounted CME-75 Drill Rig, Autohammer

WATER LEVEL AND DATE: 8.5' B.G. (tidal) 9/2/2020 at 6:50AM | **START:** 9:15 AM 8/31/2020 | **FINISH:** 4:15 PM 9/8/2020 | **LOGGER:** A. Gilmore

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
155.0						Roller bit to 158 ft. B.G.
	158'-160'	SS-22	1.2'	13-18-22-22	SILT WITH SAND, (ML), dark gray, wet, hard, very fine sand	
160.0						Roller bit to 163 ft. B.G.
	163'-165'	SS-23	1.3'	9-21-24-25	SILT, (ML), dark gray, wet, hard	
165.0						Stop drilling at 3:00 PM on 9/3/2020 Start drilling at 7:30 AM on 9/4/2020
170.0						Roller bit to 170 ft. B.G.
	170'-172'	SS-24	1.8'	7-10-16-22	SANDY SILT, (ML), dark gray, wet, very stiff, very fine sand	Sand content increases towards bottom of sample
175.0						
180.0						
	180'-182'	SS-25	1.0'	21-22-33-28	SILTY GRAVEL WITH SAND, (GM), dark gray, wet, very dense, f-c gravel, f-c sand	
	182'-184'	SS-26	0.8'	34-24-20-19	SILTY GRAVEL WITH SAND, (GM), dark gray, wet, dense, f-c gravel, f-c sand	
185.0						
190.0						Roller bit to 190 ft. B.G.
	190'-192'	SS-27	0.0'	0"/100 blows		Rock fragments in tip, Top of bedrock
195.0						Roller bit to 195 ft. B.G.

Tighe&Bond

SOIL BORING LOG

BORING NUMBER: RTG-SB-03

DATE(S): 8/31/2020 - 9/8/2020

PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge

LOCATION: N: 271132.0, E: 346079.9 (RI State Plane)

ELEVATION: 8.0' (NAVD 88)

DRILLING CONTRACTOR: New England Boring Contractors, Inc.

DRILLING METHOD AND EQUIPMENT: Driven Casing & Wash, Truck Mounted CME-75 Drill Rig, Autohammer

WATER LEVEL AND DATE: 8.5' B.G. (tidal) 9/2/2020 at 6:50AM | **START:** 9:15 AM 8/31/2020 | **FINISH:** 4:15 PM 9/8/2020 | **LOGGER:** A. Gilmore

DEPTH BELOW SURFACE (FT)	INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
195.0	195'-200'	C-1	2.6'	5 Min/FT 4 Min/FT 4 Min/FT 4 Min/FT 4 Min/FT	No recovery from initial core sample Recovered sampled material at 1:40PM. Gray weathered and fractured graywacke RQD= 5"/60" = 8.3%	Begin rock core at 12:50 PM End rock core at 1:11 PM
200.0						
205.0						
210.0						2" roller bit to 210 ft. B.G.
					END BORING AT 210' BELOW GRADE	End drilling at 3:15 PM on 9/4/2020 Begin disassembling rod and casing at 7:30 AM on 9/8/2020
215.0						Boring backfilled with drill cuttings from 200 ft to 20 ft B.G. 20 ft. long observation well installed comprised of 20-slot screen at the lower 15 ft. and 2" diameter PVC casing at the upper 5 ft. Holliston 1S sand filter pack was installed around the well to 2 ft B.G., followed by a granular bentonite seal to 6 in. B.G. The well was topped with a 6" diameter road box set in a concrete collar.
220.0					An asterisk (*) next to a sample number denotes a sample on which a laboratory grain size analysis was performed.	
225.0						Excess drill cuttings placed into drums and left at site for BETA representative to label and dispose of.
230.0					B.G. - below grade	
235.0						

Appendix D
Laboratory Test Results

THIELSCH ENGINEERING

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
thielsch.com
Let's Build a Solid Foundation

Client Information:
RT Group, Inc.
North Kingstown, RI
PM: Greg Coren, P.E.
Assigned By: G. Coren
Collected By: Client

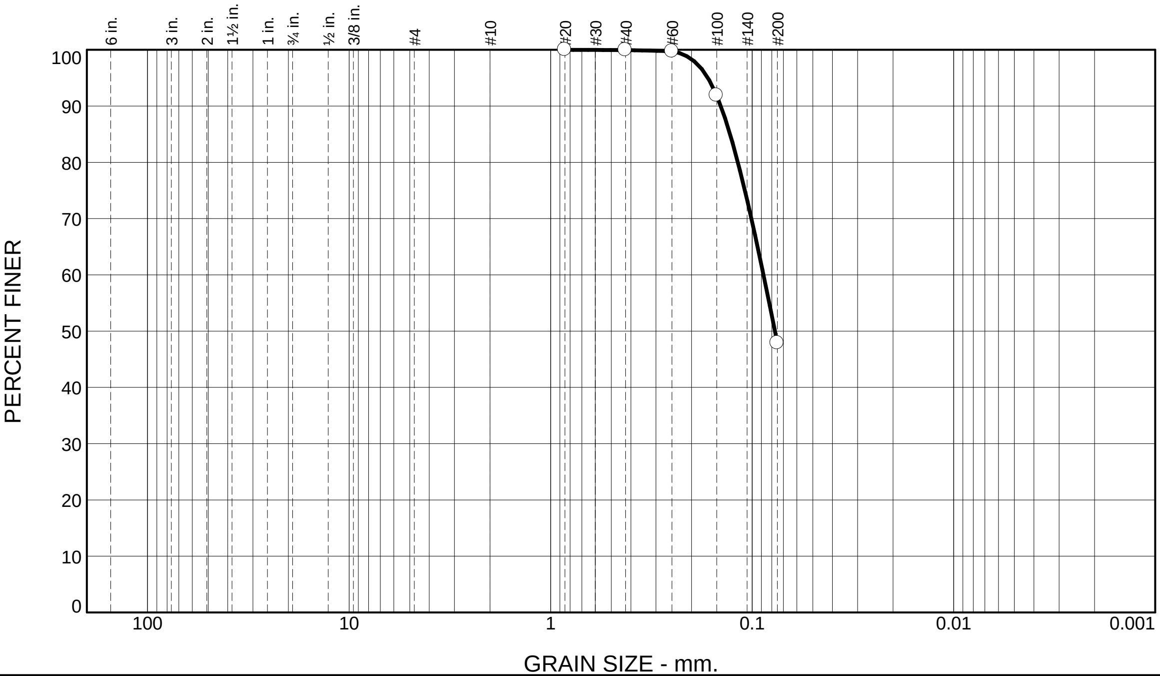
Project Information:
Sims Avenue Pedestrian Bridge
Sims Avenue & Kinsley Avenue
RTG Project Number: 19104.00
Summary Page: 1 of 1
Report Date: 07.02.2019

LABORATORY TESTING DATA SHEET

				Identification Tests								Proctor / CBR / Permeability Tests								
Boring ID	Sample No.	Depth (ft)	Laboratory No.	As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Perme-ability cm/sec	Laboratory Log and Soil Description
				D2216	D4318		D6913/D7928			D2874	D854			D1557						
SB-01	S-8	23-25	19-S-B144				0.0	52.1	47.9											Grey silty sand (SM)
SB-01	S-12	43-45	19-S-B145				0.1	28.1	71.8											Grey silt with sand (ML)
SB-01	S-14	53-55	19-S-B146				0.0	52.8	47.2											Grey silty sand (SM)
SB-01	S-21	88-90	19-S-B147				0.0	10.1	89.9											Grey silt (ML)
SB-02	S-8	23-25	19-S-B148				0.2	48.1	51.7											Grey sandy silt (ML)
SB-02	S-10	33-35	19-S-B149				0.0	30.7	69.3											Grey sandy silt (ML)
SB-02	S-16	63-65	19-S-B150				0.0	17.6	82.4											Grey silt with sand (ML)
SB-02	S-20	88-90	19-S-B151				0.0	15.1	84.9											Grey silt with sand (ML)
SB-02	S-24	108-110	19-S-B152				0.0	19.8	80.2											Grey silt with sand (ML)

Date Received *06.26.2019*   Reviewed By: [signature]   Date Reviewed: *07.02.2019*

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	52.1	47.9	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#20	100.0		
#40	100.0		
#60	99.7		
#100	91.9		
#200	47.9		

* (no specification provided)

Material Description

Grey silty sand (SM)

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.1430 D_{85}= 0.1287 D_{60}= 0.0879
D_{50}= 0.0771 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as non-plastic.

Date Received: 6/26/19 **Date Tested:** 7/2/19
Tested By: RL/GP
Checked By: Matthew Colman P.E.
Title: Laboratory Coordinator

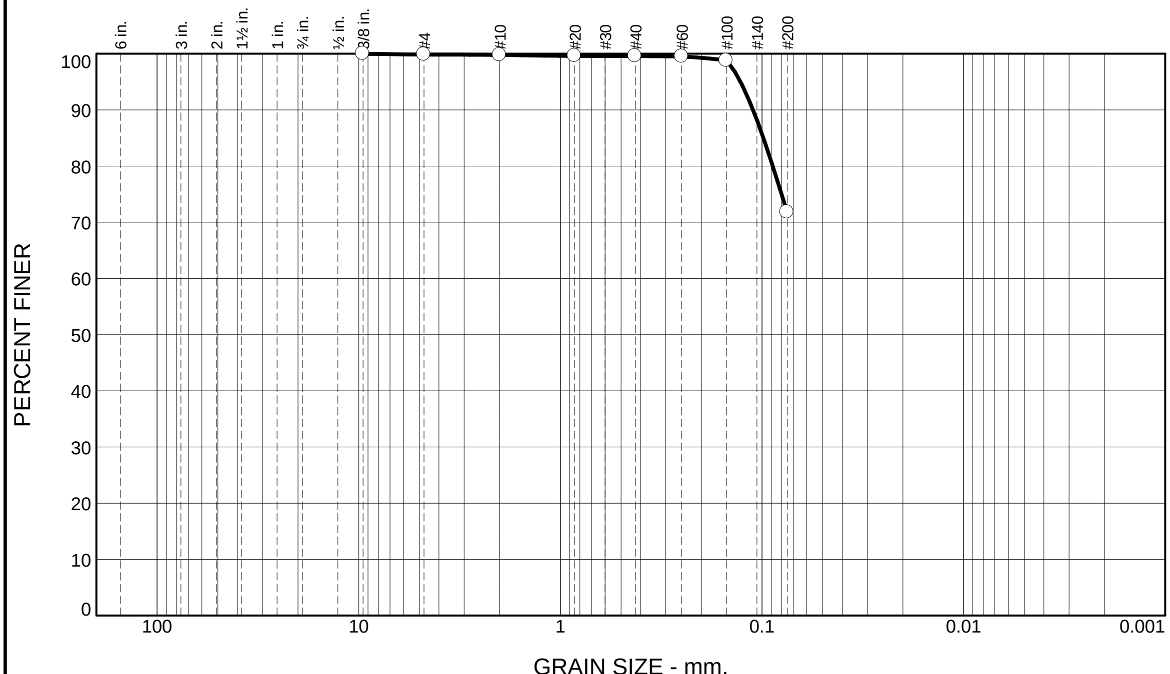
Source of Sample: Borings **Depth:** 23-25' **Date Sampled:** 6/25/19
Sample Number: SB-01 / S-8

Thielsch Engineering Inc.

Cranston, RI

Client: RT Group, Inc.
Project: Sims Avenue Pedestrian Bridge
Sims Avenue @ Kinsley Avenue
Project No: 19104.00 **Figure** 19-S-B144

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.1	0.2	27.8	71.8	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.9		
#10	99.8		
#20	99.6		
#40	99.6		
#60	99.5		
#100	98.8		
#200	71.8		

* (no specification provided)

Material Description

Grey silt with sand (ML)

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.1108	D_{85}= 0.0985	D_{60}=
D_{50}=	D_{30}=	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Sample visually classified as plastic. Sample rolled to 1/8".

Date Received: 6/26/19 **Date Tested:** 7/2/19

Tested By: RL/GP

Checked By: Matthew Colman P.E.

Title: Laboratory Coordinator

Source of Sample: Borings **Depth:** 43-45' **Date Sampled:** 6/25/19

Sample Number: SB-01 / S-12

Thielsch Engineering Inc.

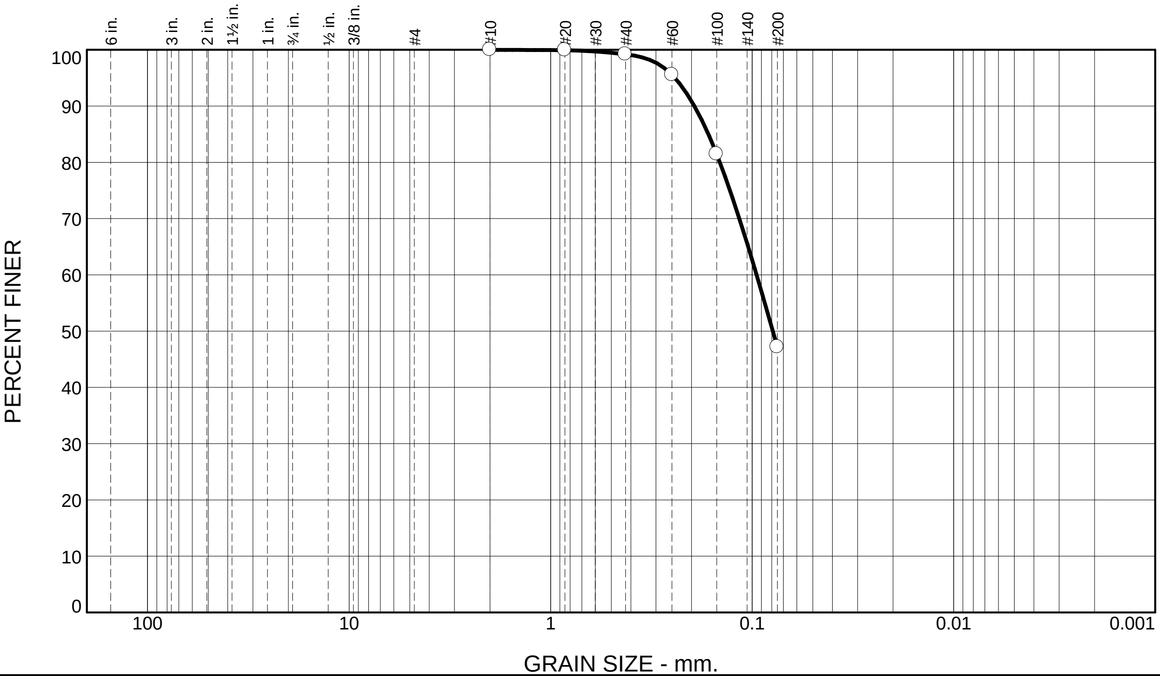
Cranston, RI

Client: RT Group, Inc.

Project: Sims Avenue Pedestrian Bridge
Sims Avenue @ Kinsley Avenue

Project No: 19104.00 **Figure** 19-S-B145

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.8	52.0	47.2	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	99.9		
#40	99.2		
#60	95.6		
#100	81.5		
#200	47.2		

* (no specification provided)

Material Description

Grey silty sand (SM)

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.1935 D_{85}= 0.1650 D_{60}= 0.0951
D_{50}= 0.0790 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as non-plastic.

Date Received: 6/26/19 **Date Tested:** 7/2/19

Tested By: RL

Checked By: Matthew Colman P.E.

Title: Laboratory Coordinator

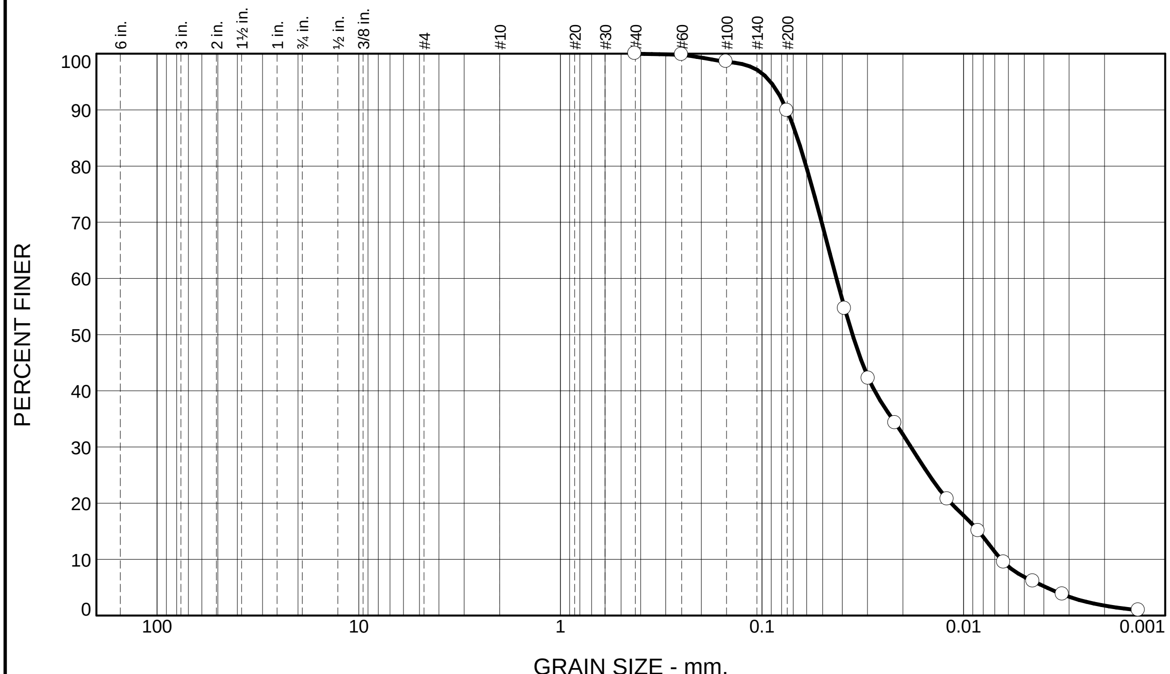
Source of Sample: Borings **Depth:** 53-55' **Date Sampled:** 6/25/19
Sample Number: SB-01 / S-14

Thielsch Engineering Inc.

Cranston, RI

Client: RT Group, Inc.
Project: Sims Avenue Pedestrian Bridge
Sims Avenue @ Kinsley Avenue
Project No: 19104.00 **Figure** 19-S-B146

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	10.1	88.1	1.8

Test Results (D7928 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#40	100.0		
#60	99.8		
#100	98.6		
#200	89.9		
0.0389 mm.	54.6		
0.0296 mm.	42.2		
0.0218 mm.	34.3		
0.0120 mm.	20.7		
0.0084 mm.	15.1		
0.0063 mm.	9.5		
0.0045 mm.	6.1		
0.0032 mm.	3.8		
0.0014 mm.	0.9		

* (no specification provided)

Material Description

Grey silt (ML)

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.0753 D_{85}= 0.0667 D_{60}= 0.0427
D_{50}= 0.0355 D_{30}= 0.0182 D_{15}= 0.0084
D_{10}= 0.0065 C_u= 6.56 C_c= 1.20

Remarks

Sample visually classified as non-plastic. As-recieved moisture content was found to be 21.2%.

Date Received: 6/26/19 **Date Tested:** 7/2/19

Tested By: RL/GP

Checked By: Matthew Colman P.E.

Title: Laboratory Coordinator

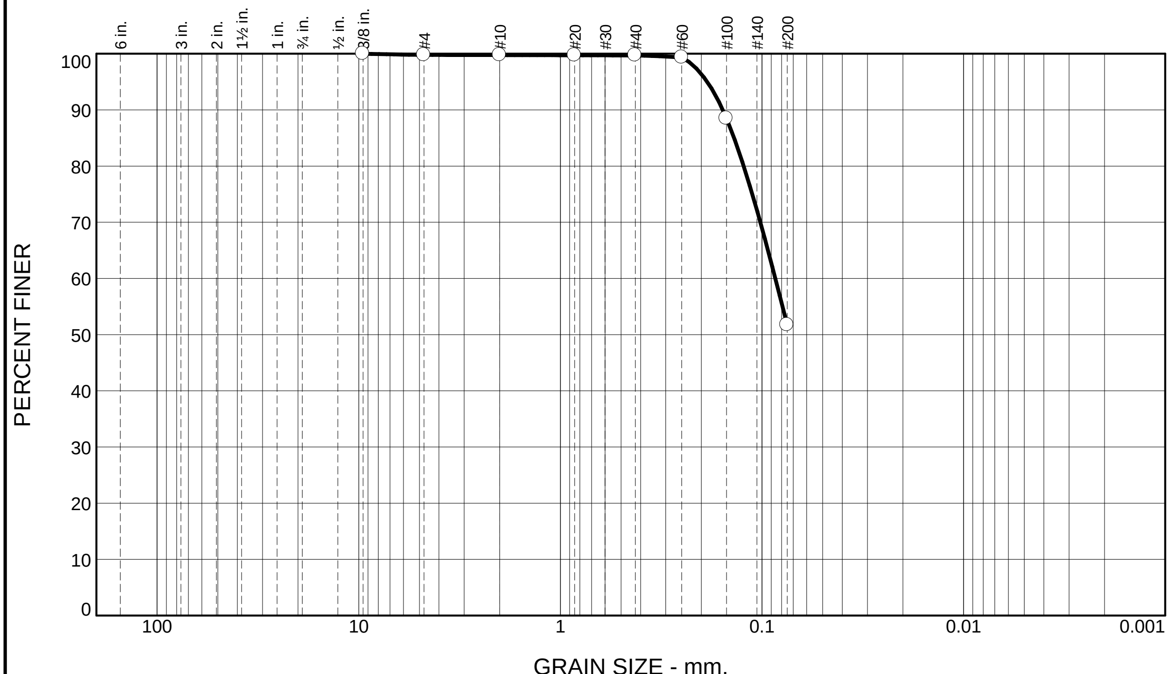
Source of Sample: Borings **Depth:** 88-90' **Date Sampled:** 6/25/19
Sample Number: SB-01 / S-21

Thielsch Engineering Inc.

Cranston, RI

Client: RT Group, Inc.
Project: Sims Avenue Pedestrian Bridge
Sims Avenue @ Kinsley Avenue
Project No: 19104.00 **Figure** 19-S-B147

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.0	0.1	48.0	51.7	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.8		
#10	99.8		
#20	99.7		
#40	99.7		
#60	99.3		
#100	88.5		
#200	51.7		

* (no specification provided)

Material Description

Grey sandy silt (ML)

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.1565 D_{85}= 0.1374 D_{60}= 0.0859
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as plastic. Sample rolled to 1/8".

Date Received: 6/26/19 **Date Tested:** 7/2/19

Tested By: RL/GP

Checked By: Matthew Colman P.E.

Title: Laboratory Coordinator

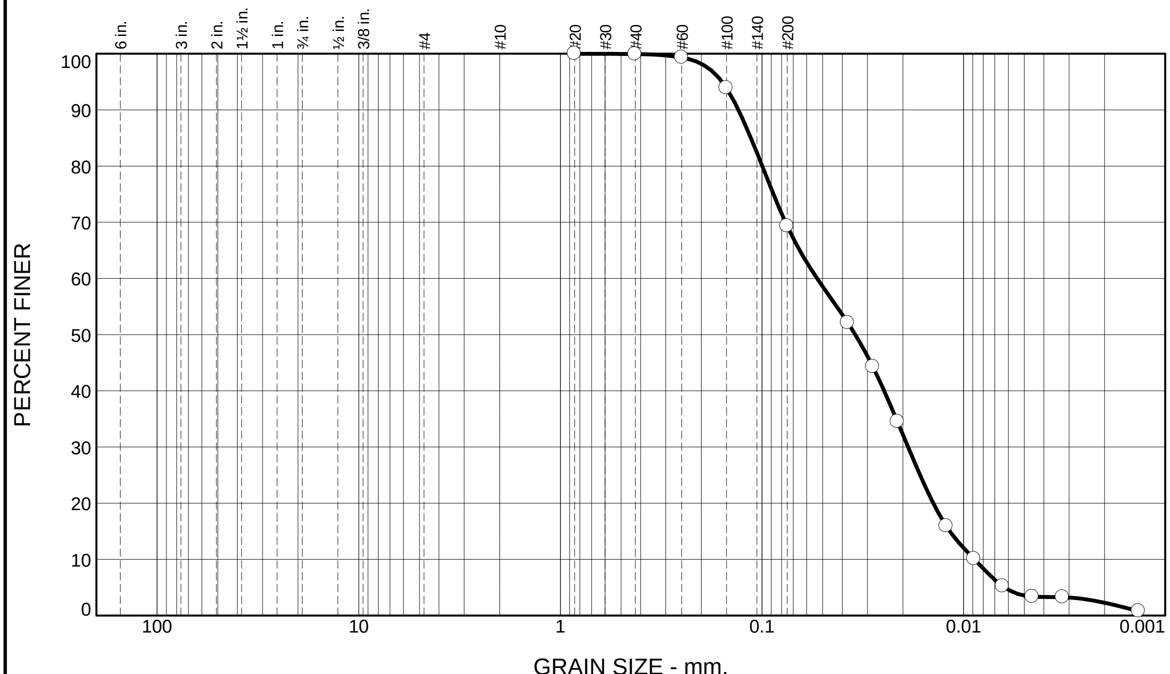
Source of Sample: Borings **Depth:** 23-25' **Date Sampled:** 6/25/19
Sample Number: SB-02 / S-8

Thielsch Engineering Inc.

Cranston, RI

Client: RT Group, Inc.
Project: Sims Avenue Pedestrian Bridge
Sims Avenue @ Kinsley Avenue
Project No: 19104.00 **Figure** 19-S-B148

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	30.6	67.0	2.3

Test Results (D7928 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#20	100.0		
#40	99.9		
#60	99.3		
#100	93.9		
#200	69.3		
0.0375 mm.	52.1		
0.0282 mm.	44.3		
0.0213 mm.	34.5		
0.0122 mm.	15.9		
0.0089 mm.	10.1		
0.0064 mm.	5.2		
0.0046 mm.	3.3		
0.0032 mm.	3.3		
0.0014 mm.	0.8		

* (no specification provided)

Material Description

Grey sandy silt (ML)

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.1308 D_{85}= 0.1135 D_{60}= 0.0533
D_{50}= 0.0345 D_{30}= 0.0189 D_{15}= 0.0117
D_{10}= 0.0088 C_u= 6.04 C_c= 0.76

Remarks

Sample visually classified as plastic. Sample rolled to 1/4".
As-received moisture content was found to be 25.5%.

Date Received: 6/26/19 **Date Tested:** 7/2/19

Tested By: RL/GP

Checked By: Matthew Colman P.E.

Title: Laboratory Coordinator

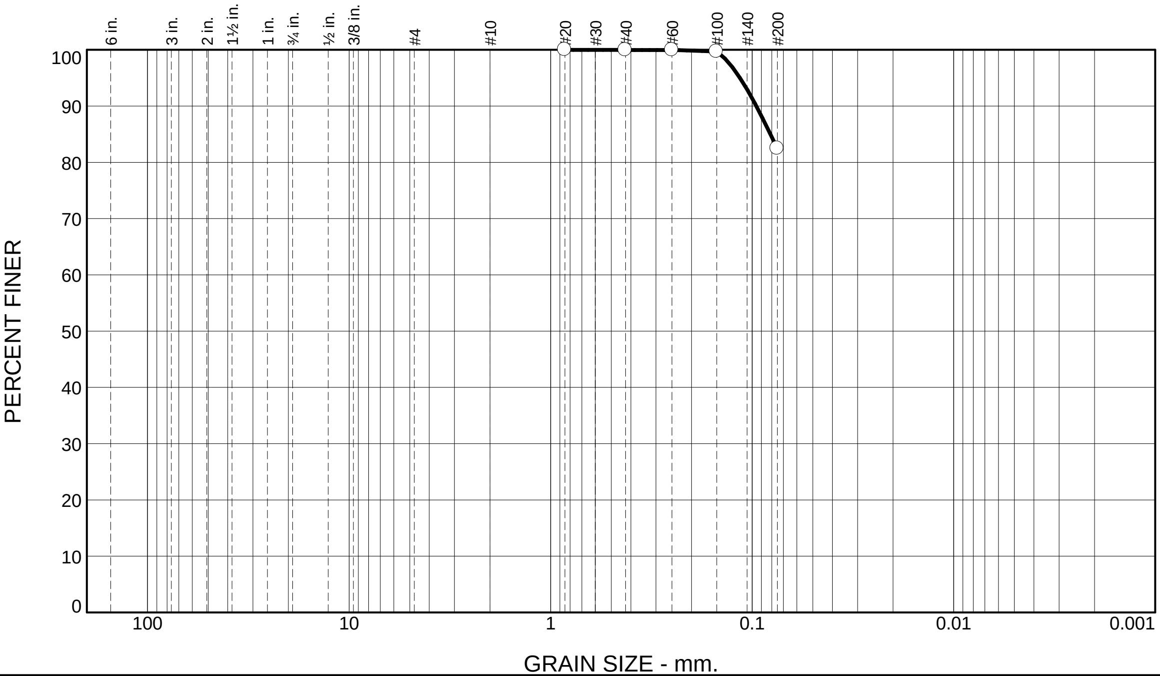
Source of Sample: Borings **Depth:** 33-35' **Date Sampled:** 6/25/19
Sample Number: SB-02 / S-10

Thielsch Engineering Inc.

Cranston, RI

Client: RT Group, Inc.
Project: Sims Avenue Pedestrian Bridge
Sims Avenue @ Kinsley Avenue
Project No: 19104.00 **Figure** 19-S-B149

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	17.6	82.4	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#20	100.0		
#40	100.0		
#60	100.0		
#100	99.7		
#200	82.4		

* (no specification provided)

Material Description

Grey silt with sand (ML)

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.0955 D_{85}= 0.0812 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as non-plastic.

Date Received: 6/26/19 **Date Tested:** 7/2/19

Tested By: RL/GP

Checked By: Matthew Colman P.E.

Title: Laboratory Coordinator

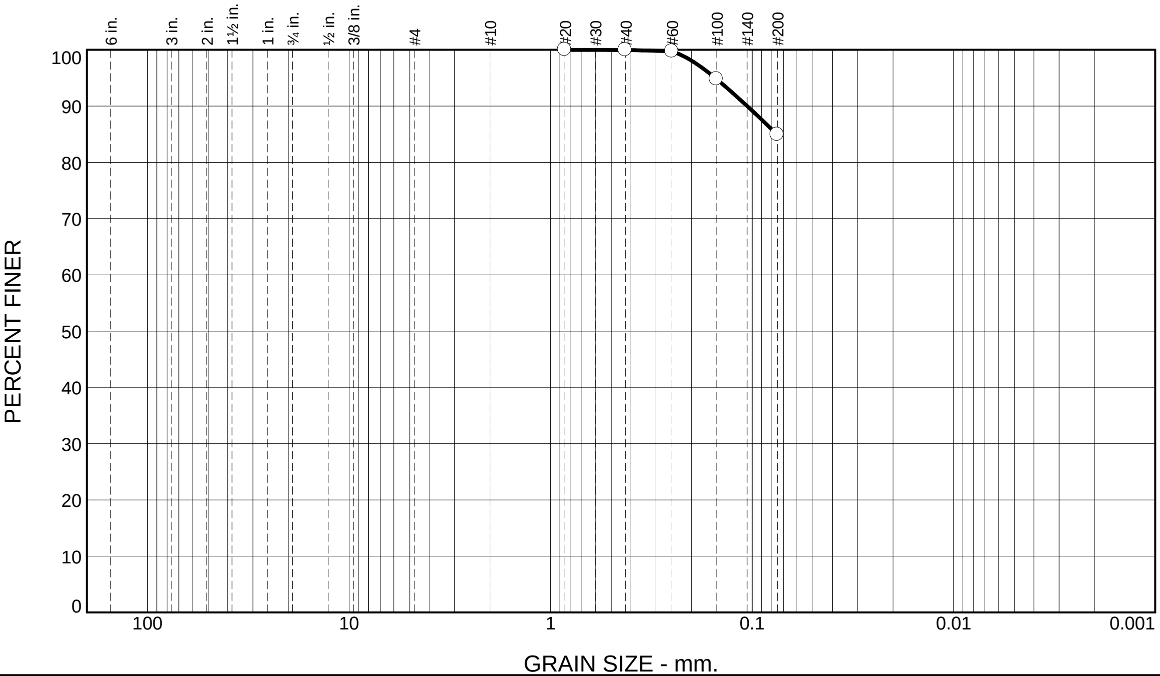
Source of Sample: Borings **Depth:** 63-65' **Date Sampled:** 6/25/19
Sample Number: SB-02 / S-16

Thielsch Engineering Inc.

Cranston, RI

Client: RT Group, Inc.
Project: Sims Avenue Pedestrian Bridge
Sims Avenue @ Kinsley Avenue
Project No: 19104.00 **Figure** 19-S-B150

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	15.1	84.9	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#20	100.0		
#40	100.0		
#60	99.7		
#100	94.8		
#200	84.9		

* (no specification provided)

Material Description

Grey silt with sand (ML)

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.1059	D_{85}= 0.0754	D_{60}=
D_{50}=	D_{30}=	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Sample visually classified as plastic. Sample rolled to 1/8".

Date Received: 6/26/19 **Date Tested:** 7/2/19

Tested By: RL/GP

Checked By: Matthew Colman P.E.

Title: Laboratory Coordinator

Source of Sample: Borings **Depth:** 88-90' **Date Sampled:** 6/25/19

Sample Number: SB-02 / S-20

Thielsch Engineering Inc.

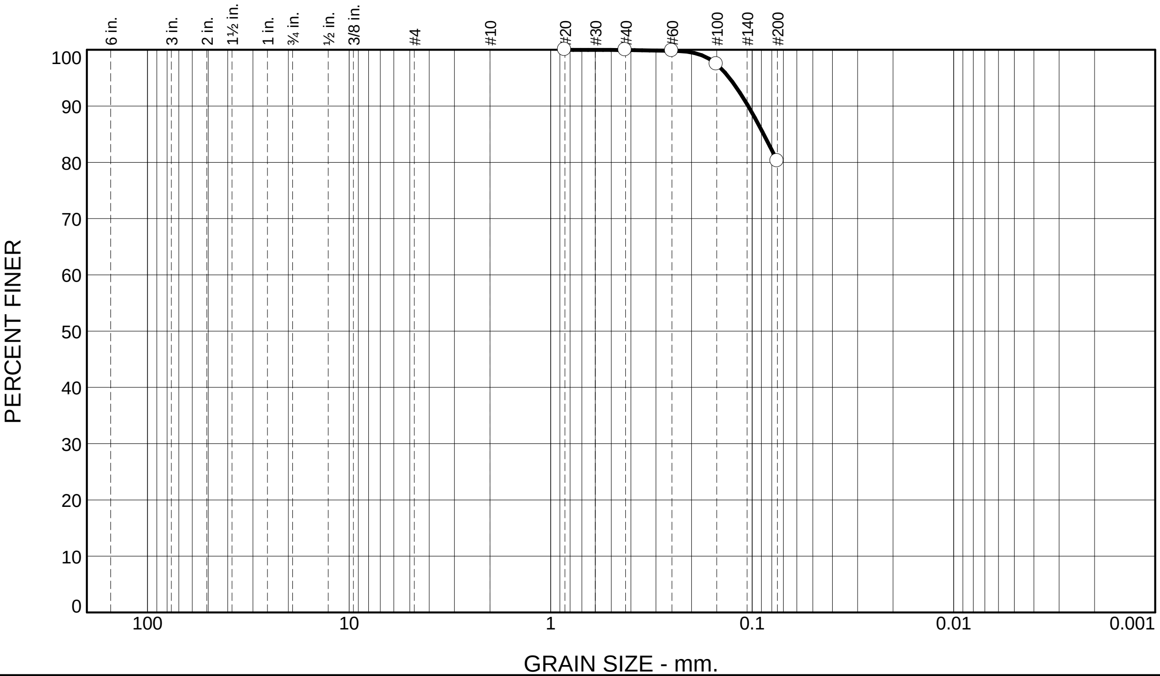
Cranston, RI

Client: RT Group, Inc.

Project: Sims Avenue Pedestrian Bridge
Sims Avenue @ Kinsley Avenue

Project No: 19104.00 **Figure** 19-S-B151

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	19.8	80.2	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#20	100.0		
#40	100.0		
#60	99.8		
#100	97.4		
#200	80.2		

* (no specification provided)

Material Description

Grey silt with sand (ML)

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.1047	D_{85}= 0.0877	D_{60}=
D_{50}=	D_{30}=	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Sample visually classified as non-plastic.

Date Received: 6/26/19 **Date Tested:** 7/2/19

Tested By: RL/GP

Checked By: Matthew Colman P.E.

Title: Laboratory Coordinator

Source of Sample: Borings **Depth:** 108-110' **Date Sampled:** 6/25/19

Sample Number: SB-02 / S-24

Thielsch Engineering Inc.

Cranston, RI

Client: RT Group, Inc.

Project: Sims Avenue Pedestrian Bridge
Sims Avenue @ Kinsley Avenue

Project No: 19104.00 **Figure** 19-S-B152

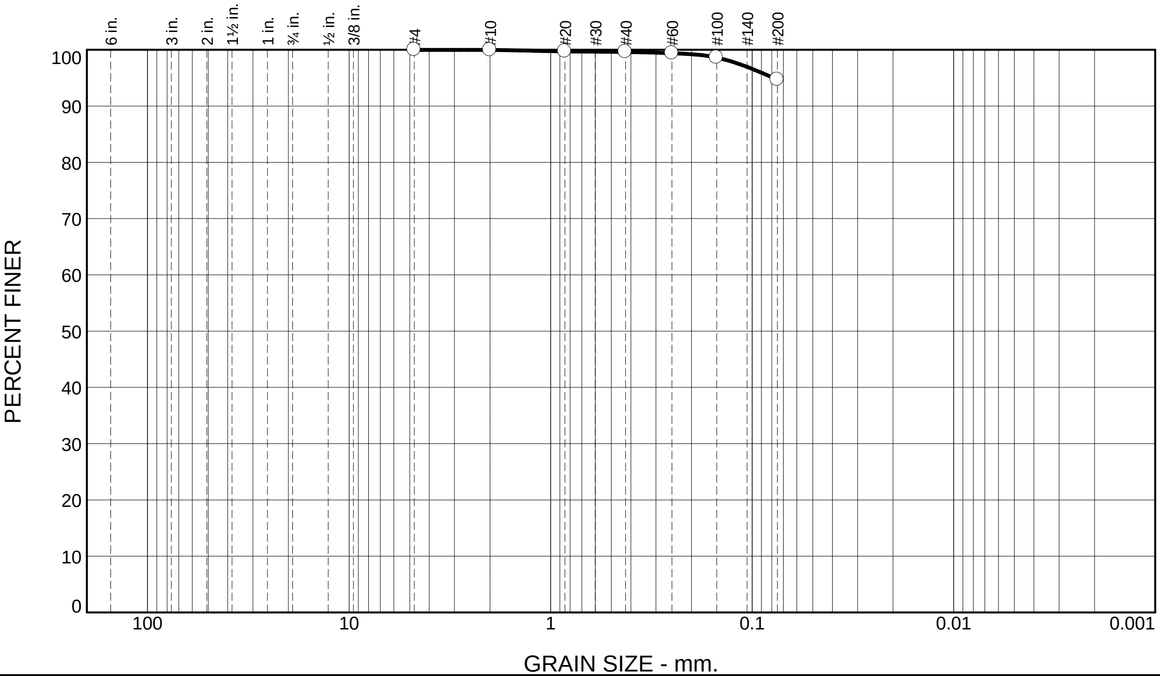
THIELSCH ENGINEERING	195 Frances Avenue Cranston RI, 02910 Phone: (401)-467-6454 Fax: (401)-467-2398 thielsch.com *Let's Build a Solid Foundation*	Client Information: RT Group Inc. North Kingstown, RI PM: Greg Coren Assigned By: Greg Coren Collected By: Allison Gilmore	Project Information: **Sims Ave Pedestrian Bridge** **North Kingstown, RI** TEI Project Number: 74-20-0002.09 Summary Page: 1 of 3 Report Date: 10.02.2020

LABORATORY TESTING DATA SHEET, Report No.: 7420-J-170, Rev.1

Boring No.	Sample No.	Depth (Ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
				D2216	D4318		D6913			D2974	D854			D1557						
SB-03	SS-14	118.0-119.5	20-S-2700				0.0	5.3	94.7											Gray clayey silt
SB-03	SS-19	143.0-145.0	20-S-2701				0.0	0.2	99.8											Gray clayey silt
SB-03	SS-25	180.0-182.0	20-S-2702				52.4	30.9	16.7											Dark Gray silty gravel with sand

Date Received: *09.11.2020*   Reviewed By: Sth Ao   Date Reviewed: *10.07.2020*

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	4.9	94.7	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	100.0		
#20	99.7		
#40	99.6		
#60	99.4		
#100	98.6		
#200	94.7		

* (no specification provided)

Material Description

Gray silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as non-plastic. Sample received with standing water.

Date Received: 09.11.2020 **Date Tested:** 09.18.2020

Tested By: JM / RR

Checked By: Steven Accetta

Title: Laboratory Coordinator

Source of Sample: SB-03 **Depth:** 118.0-119.5' **Date Sampled:**
Sample Number: SS-14

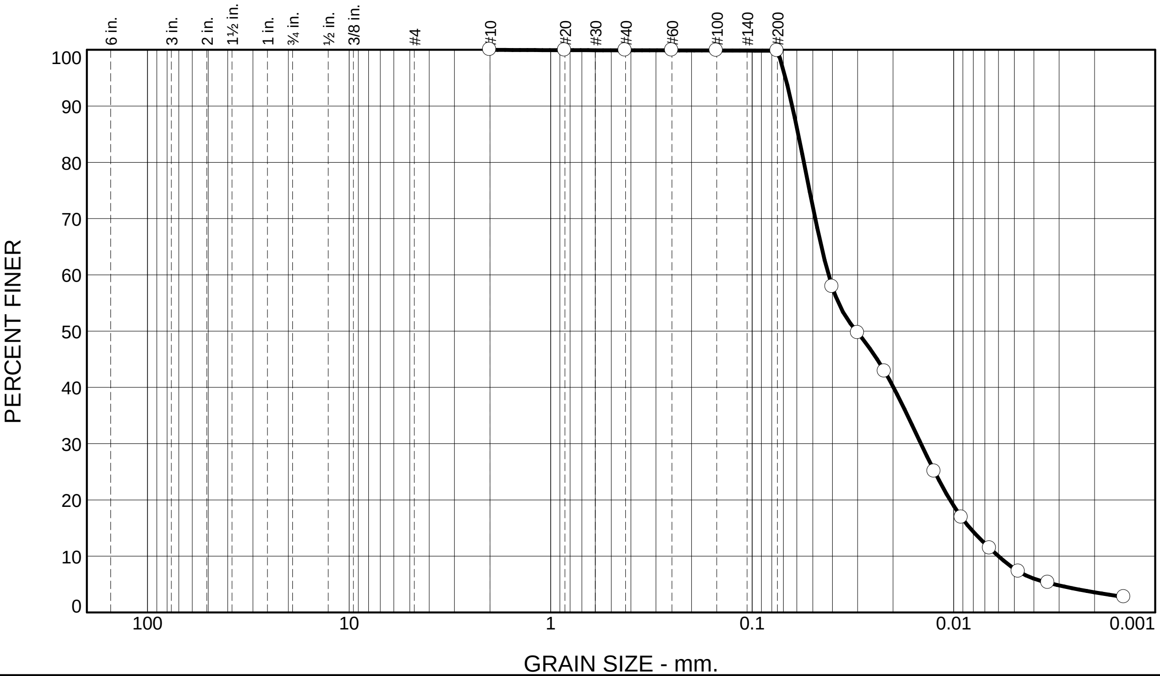
Thielsch Engineering Inc.

Cranston, RI

Client: RT Group Inc.
Project: Sims Ave Pedestrian Bridge
North Kingstown, RI

Project No: 74-20-0002.09 **Figure** 20-S-2700

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	0.1	92.0	7.8

Test Results (D7928 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	99.9		
#40	99.9		
#60	99.9		
#100	99.9		
#200	99.8		
0.0401 mm.	57.9		
0.0299 mm.	49.7		
0.0220 mm.	42.9		
0.0125 mm.	25.1		
0.0091 mm.	16.9		
0.0066 mm.	11.4		
0.0048 mm.	7.3		
0.0034 mm.	5.3		
0.0014 mm.	2.7		

* (no specification provided)

Material Description

Gray silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.0633 D_{85}= 0.0591 D_{60}= 0.0418
D_{50}= 0.0304 D_{30}= 0.0145 D_{15}= 0.0083
D_{10}= 0.0060 C_u= 6.98 C_c= 0.84

Remarks

Sample visually classified as non-plastic. Sample received with standing water.

Date Received: 09.11.2020 **Date Tested:** 09.18.2020

Tested By: JM

Checked By: Steven Accetta

Title: Laboratory Coordinator

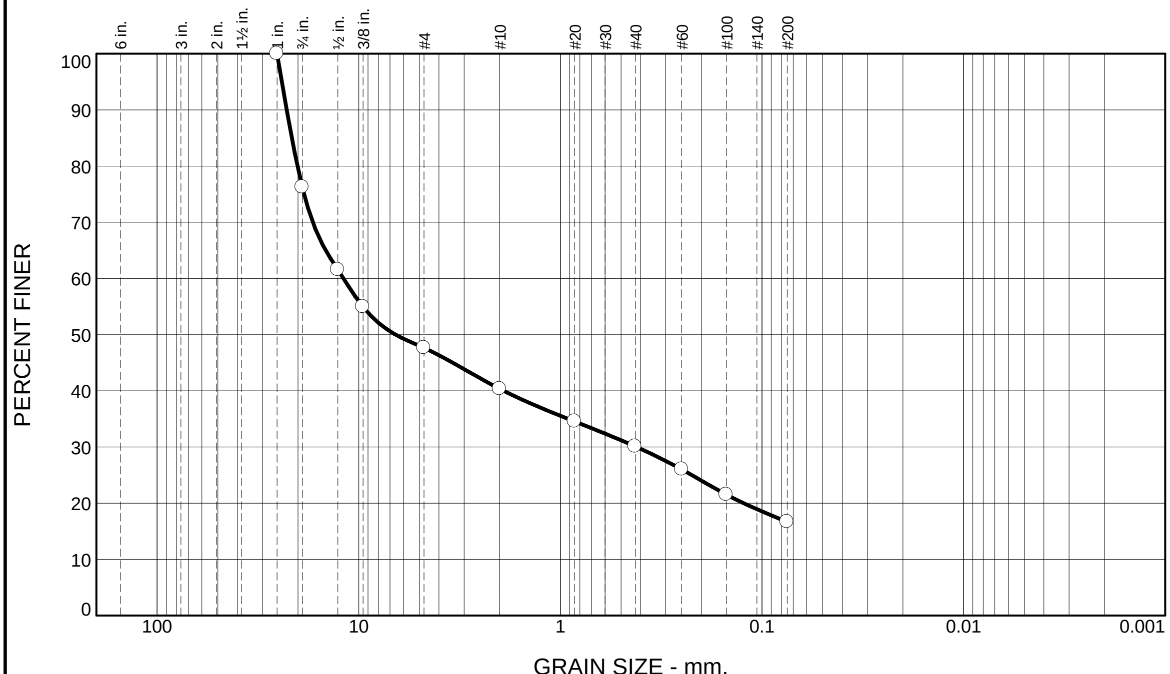
Source of Sample: SB-03 **Depth:** 143.0-145.0' **Date Sampled:**
Sample Number: SS-19

Thielsch Engineering Inc.

Cranston, RI

Client: RT Group Inc.
Project: Sims Ave Pedestrian Bridge
North Kingstown, RI
Project No: 74-20-0002.09 **Figure** 20-S-2701

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	23.8	28.6	7.2	10.3	13.4	16.7	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	76.2		
0.5"	61.6		
0.375"	55.0		
#4	47.6		
#10	40.4		
#20	34.6		
#40	30.1		
#60	26.0		
#100	21.5		
#200	16.7		

* (no specification provided)

Material Description

Dark Gray silty gravel with sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= GM **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 22.7548 D_{85}= 21.4605 D_{60}= 11.9070
D_{50}= 6.5548 D_{30}= 0.4192 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 09.11.2020 **Date Tested:** 09.18.2020

Tested By: JM / RR

Checked By: Steven Accetta

Title: Laboratory Coordinator

Source of Sample: SB-03 **Depth:** 180.0-182.0 **Date Sampled:**
Sample Number: SS-25

Thielsch Engineering Inc.

Cranston, RI

Client: RT Group Inc.
Project: Sims Ave Pedestrian Bridge
North Kingstown, RI
Project No: 74-20-0002.09 **Figure** 20-S-2702

THIELSCH ENGINEERING

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
thielsch.com
Let's Build a Solid Foundation

Client Information:
RT Group Inc.
North Kingstown, RI
PM: Greg Coren
Assigned By: Greg Coren
Collected By: Allison Gilmore

Project Information:
Sims Ave Pedestrian Bridge
North Kingstown, RI
TEI Project Number: 74-20-0002.09

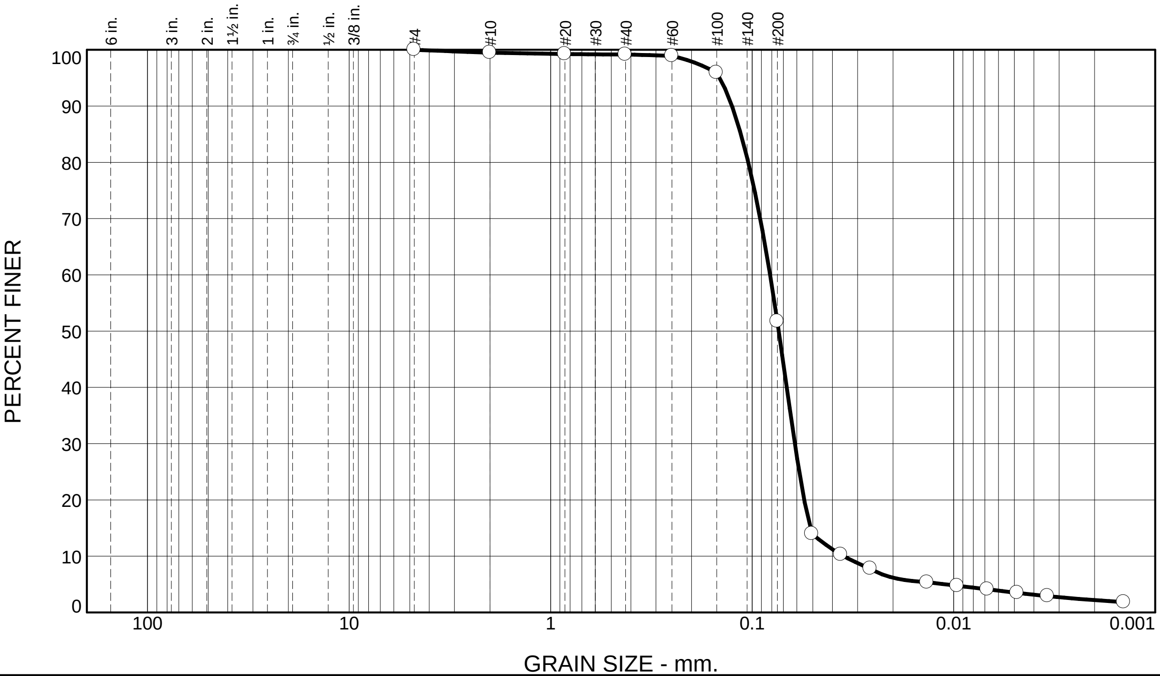
Report Date: 10.02.2020

LABORATORY TESTING DATA SHEET, Report No.: 7420-J-170, Rev.1

				Identification Tests								Shear / Consolidation Tests								
Boring ID	Sample No.	Depth (ft)	Laboratory No.	As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Torvane or Type Test	Pocket Penetrometer	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	EST. Internal Friction Angle	CR / RR	Laboratory Log and Soil Description
SB-03	ST-2	62.5-64.5	20-S-2698		Average Total Unit Weight (61.5-63.5') = 123.4 pcf															
		62.5-62.6											Disturbed							
		62.6-62.7	20-WC-2698a	22.0									Tv = 0.40 tsf	PP = 1.0 tsf						Dark Gray sandy silt
		62.7-62.8	20-S-2698	20.9			0.0	48.3	51.7				Hydro							Dark Gray sandy silt
		62.8-62.9	20-L-2698	23.6	NV	NP							LL/PL							Dark Gray sandy silt
		62.9-63.1	20-C-2698	23.3								97.5	Consol						0.02 / 0.0004	Dark Gray sandy silt
		63.1-63.6											Save							Specimen Saved
		63.6-63.7	20-WC-2698b	21.8									Tv = 0.35 tsf	PP = 1.75 tsf						Dark Gray sandy silt

Date Received: *09.11.2020*   Reviewed By: Date Reviewed: *10.07.2020*

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	0.3	47.5	48.2	3.5

Test Results (D7928 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.5		
#20	99.3		
#40	99.2		
#60	98.9		
#100	95.9		
#200	51.7		
0.0504 mm.	14.0		
0.0363 mm.	10.3		
0.0259 mm.	7.8		
0.0135 mm.	5.4		
0.0096 mm.	4.7		
0.0068 mm.	4.1		
0.0048 mm.	3.5		
0.0034 mm.	2.9		
0.0014 mm.	1.8		

* (no specification provided)

Material Description

Dark Gray sandy silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.1258 D_{85}= 0.1137 D_{60}= 0.0815
D_{50}= 0.0738 D_{30}= 0.0614 D_{15}= 0.0514
D_{10}= 0.0351 C_u= 2.32 C_c= 1.32

Remarks

Date Received: 09.11.2020 **Date Tested:** 09.18.2020

Tested By: JM

Checked By: Steven Accetta

Title: Laboratory Coordinator

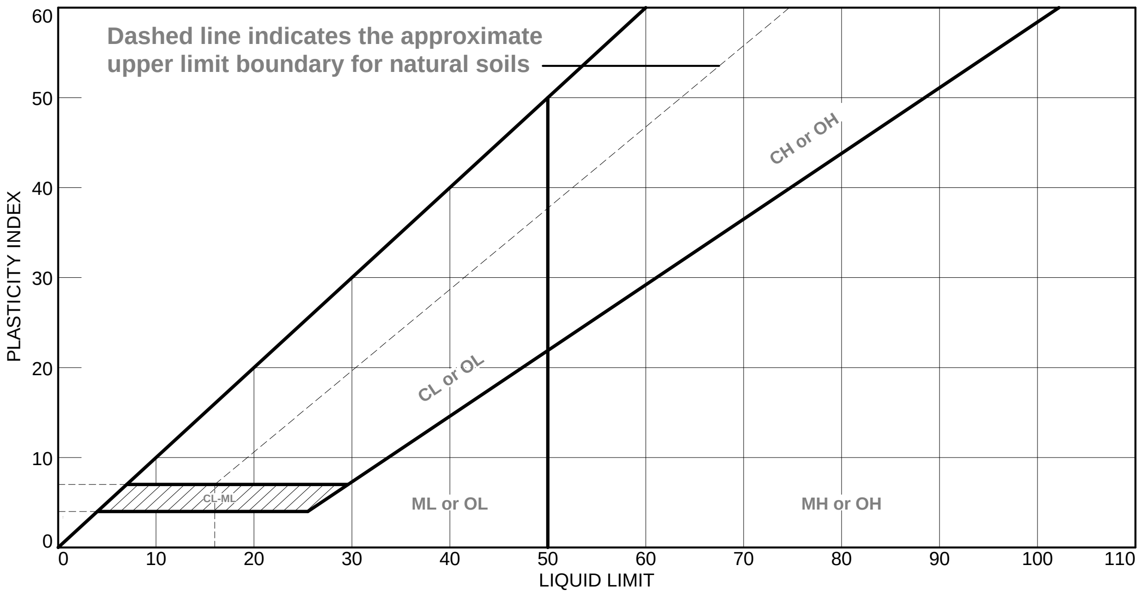
Source of Sample: SB-03 **Depth:** 62.5-64.5' **Date Sampled:**
Sample Number: ST-2

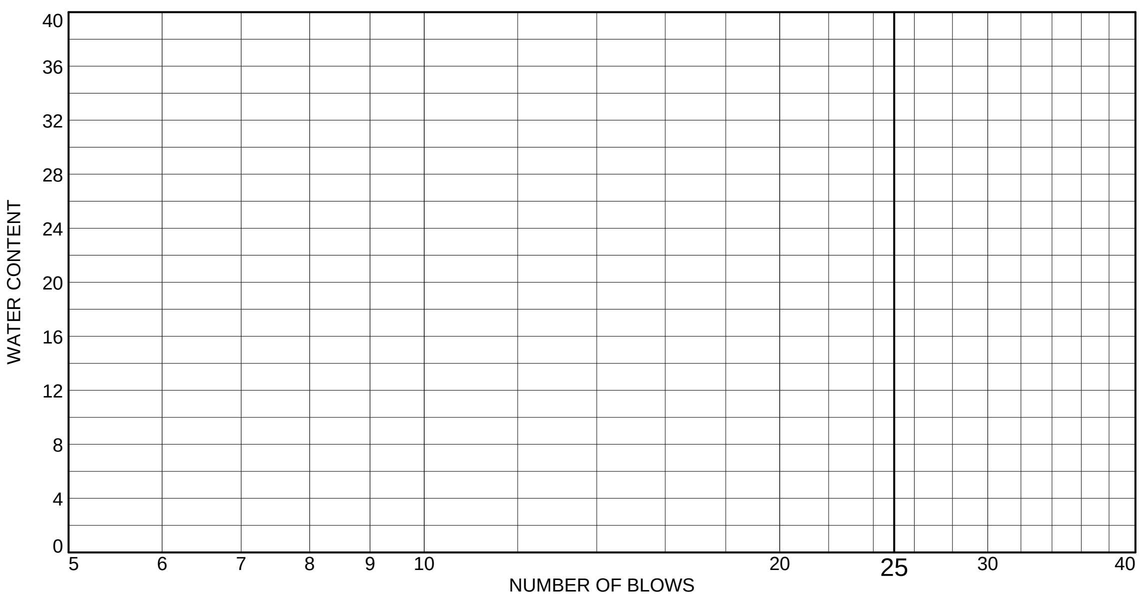
Thielsch Engineering Inc.

Cranston, RI

Client: RT Group Inc.
Project: Sims Ave Pedestrian Bridge
North Kingstown, RI
Project No: 74-20-0002.09 **Figure** 20-S-2698

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark Gray sandy silt	NV	NP	NP	99.2	51.7	ML

Project No. 74-20- **Client:** RT Group Inc.

Project: Sims Ave Pedestrian Bridge

North Kingstown, RI

Source of Sample: SB-03 **Depth:** 62.5-64.5'

Sample Number: ST-2

Thielsch Engineering Inc.

Cranston, RI

Remarks:

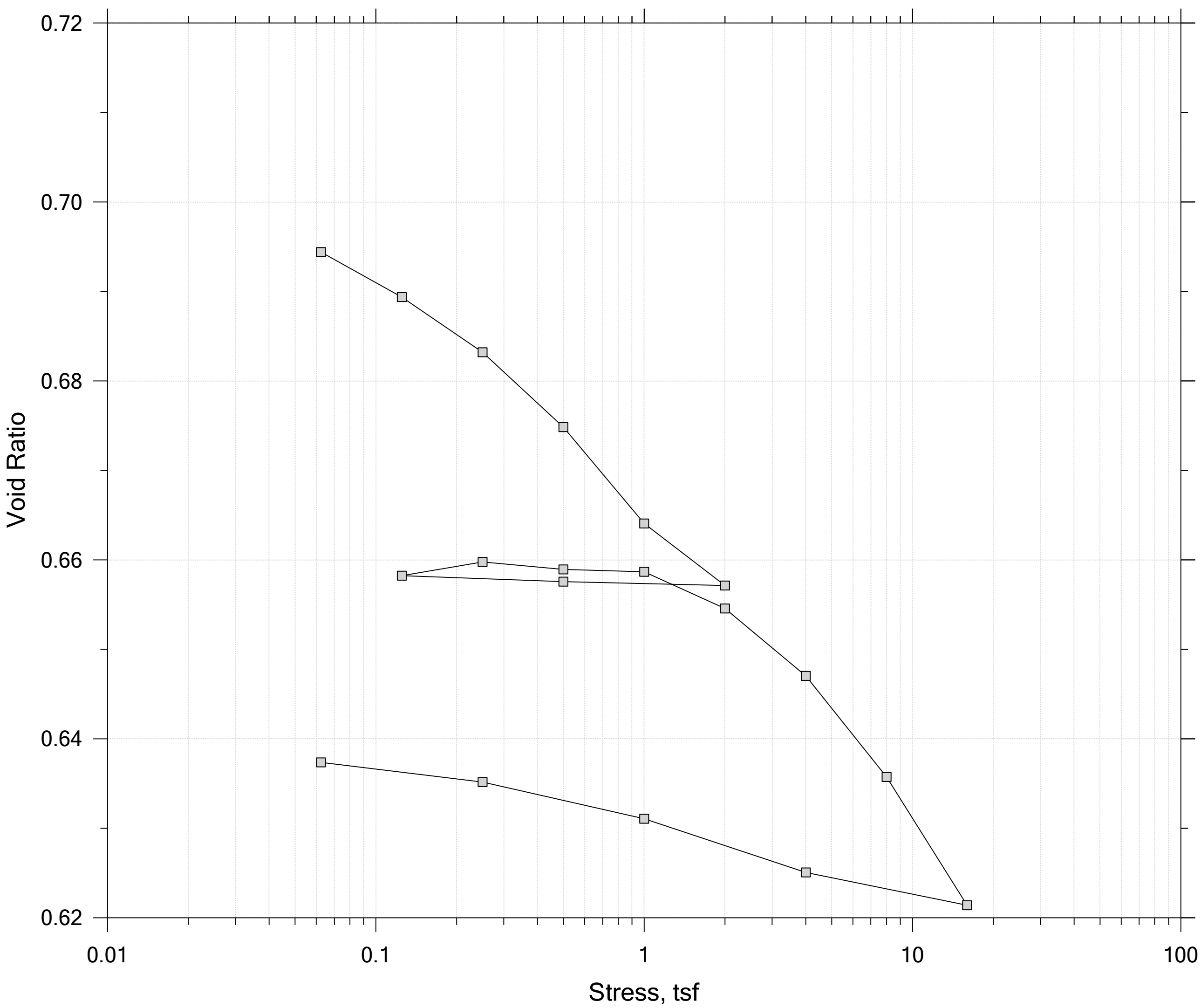
●Sample classified as non-plastic and non-viscous. Sample could not roll past 1/4" and could not achieve more than 25 blows.

Figure 20-L-2698

Tested By: RR **Checked By:** SA

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report



					Before Test	After Test
Current Vertical Effective Stress, tsf: 0				Water Content, %	23.34	23.48
Preconsolidation Stress, tsf: 3.289				Dry Unit Weight, pcf	97.541	108.1
Compression Ratio: 0.02				Saturation, %	88.85	117.28
Specimen Diameter, in: 2.5		Specimen Height, in: 0.973		Void Ratio	0.70	0.53
LL: Non-Plastic	PL: Non-Plastic	PI: Non-Plastic	GS: 2.65			

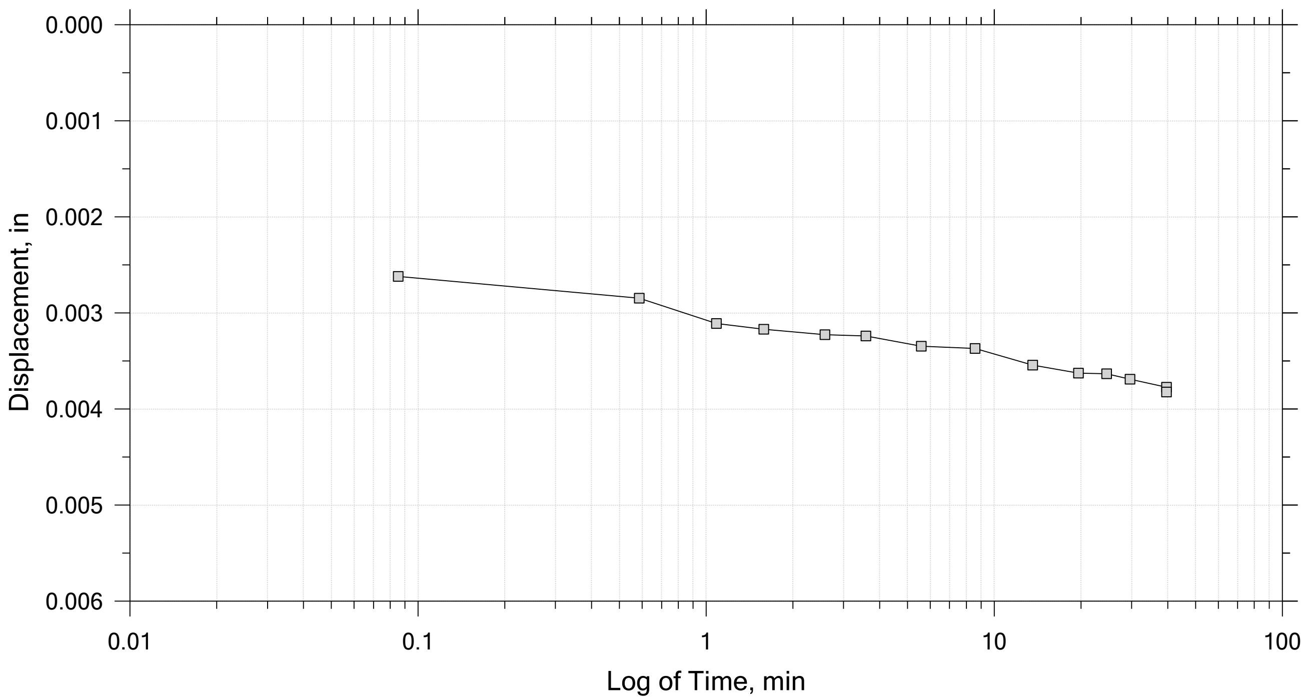
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
	Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
	Description: Gray sandy silt		
	Remarks:		
	Displacement at End of Primary		

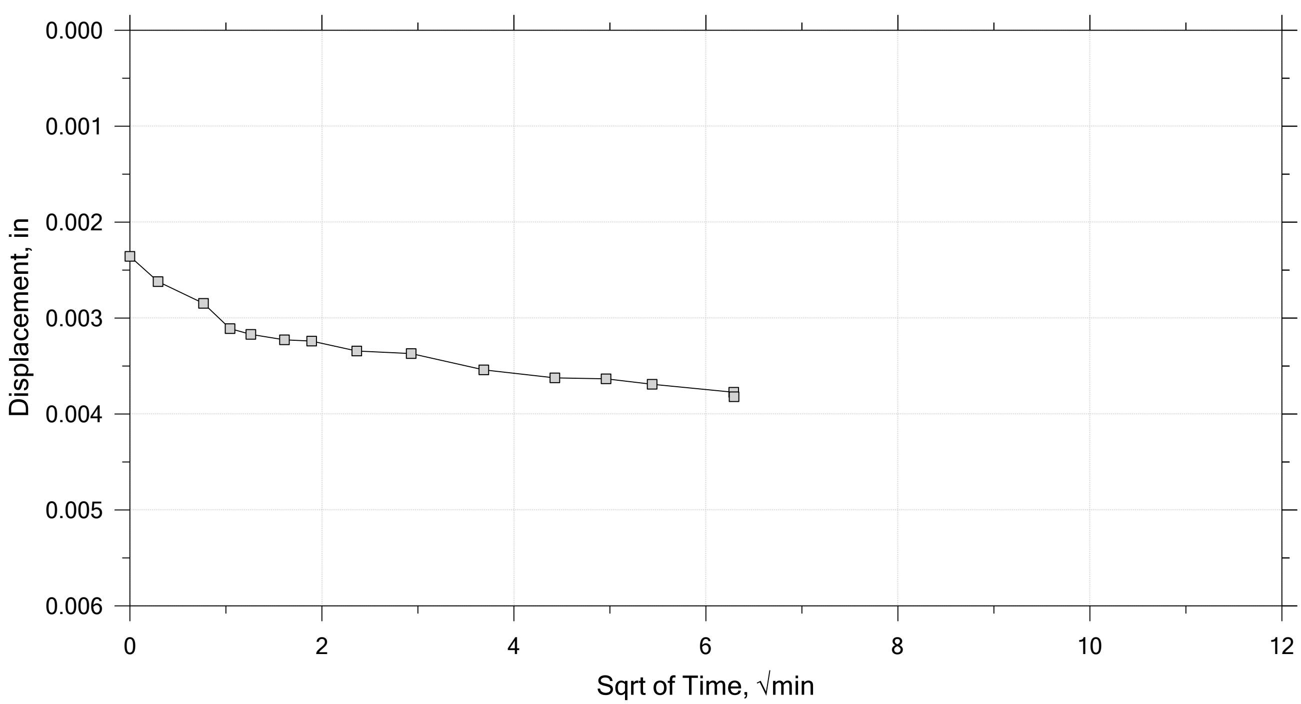
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 19

Constant Load Step

Stress: 0.125 tsf





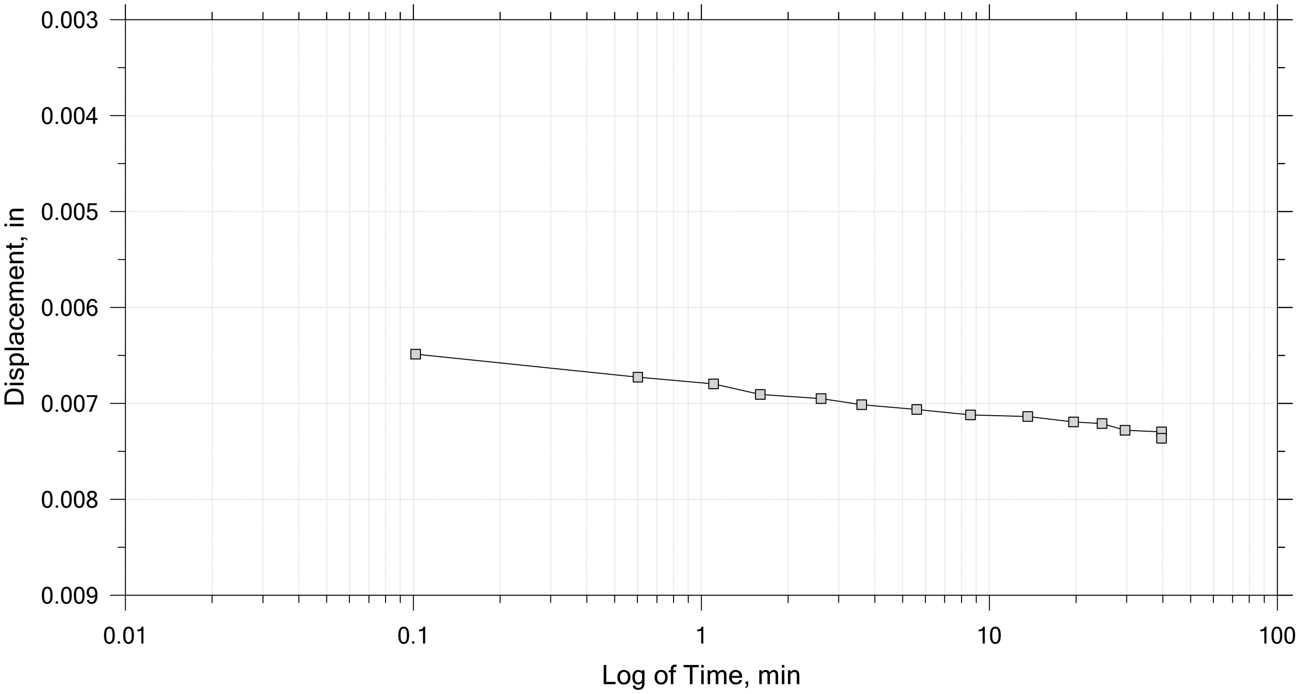
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
	Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
	Description: Gray sandy silt		
	Remarks:		

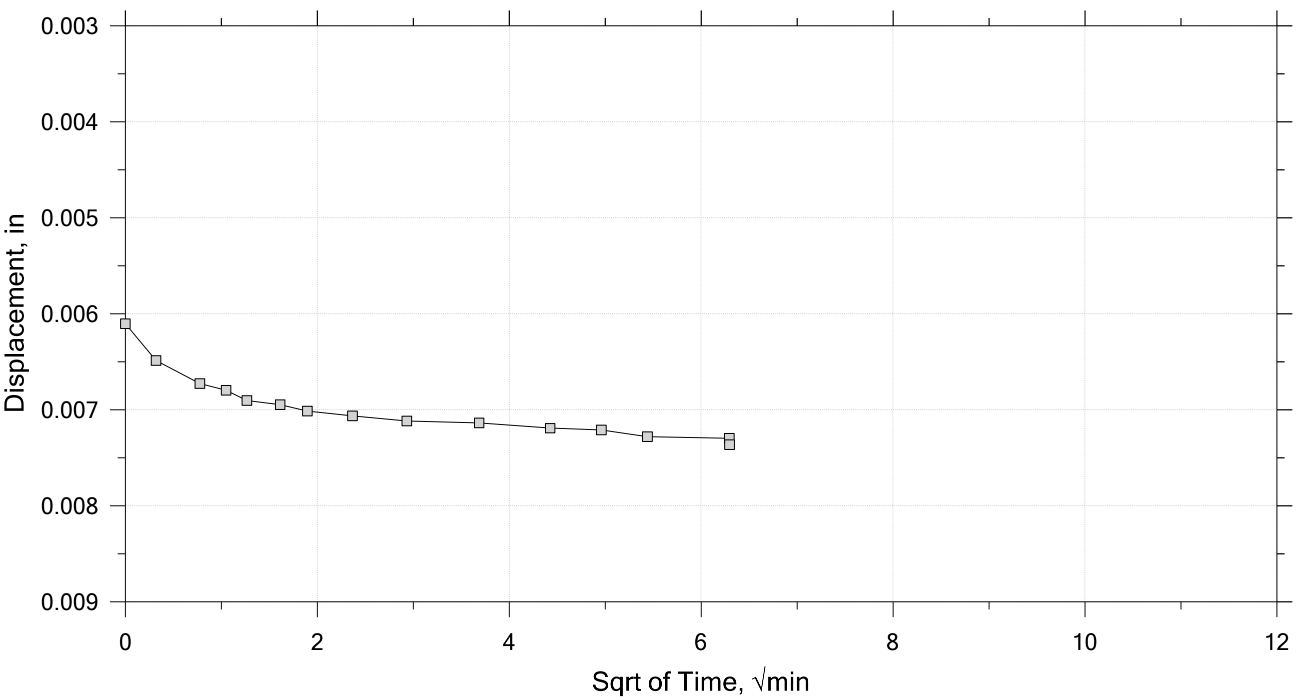
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 19

Constant Load Step

Stress: 0.25 tsf





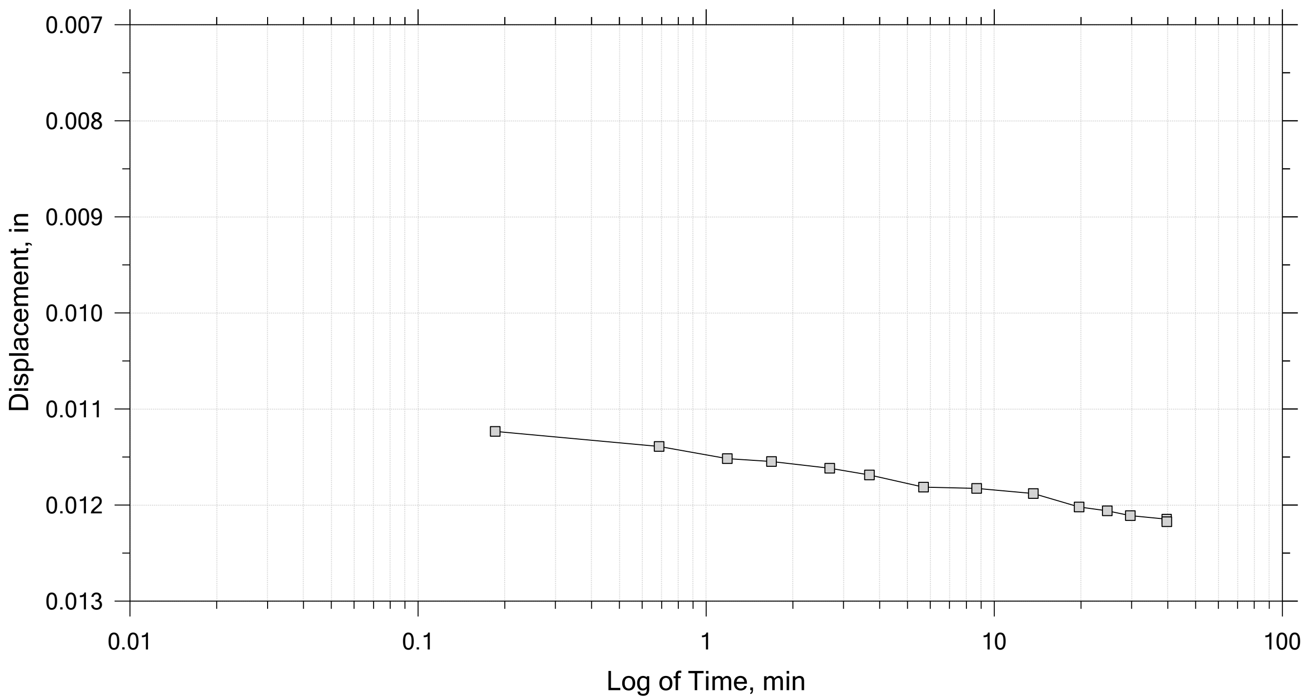
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
	Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
	Description: Gray sandy silt		
	Remarks:		

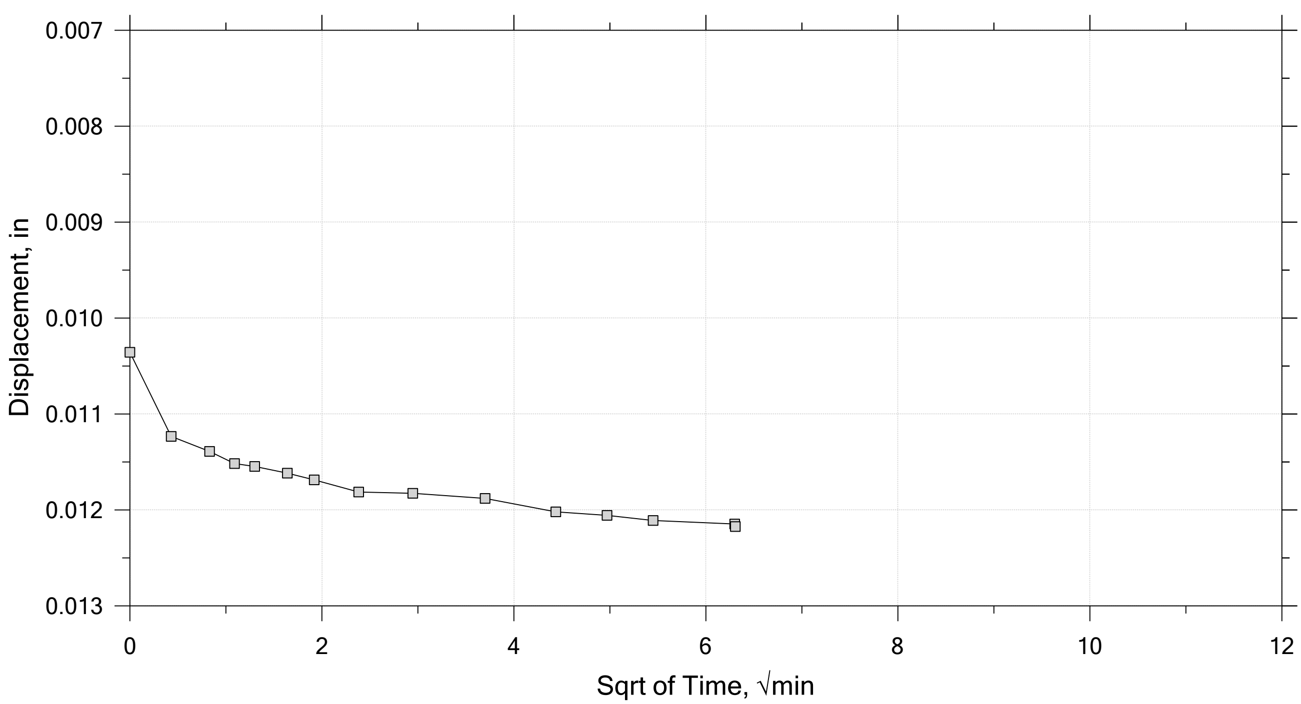
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 19

Constant Load Step

Stress: 0.5 tsf





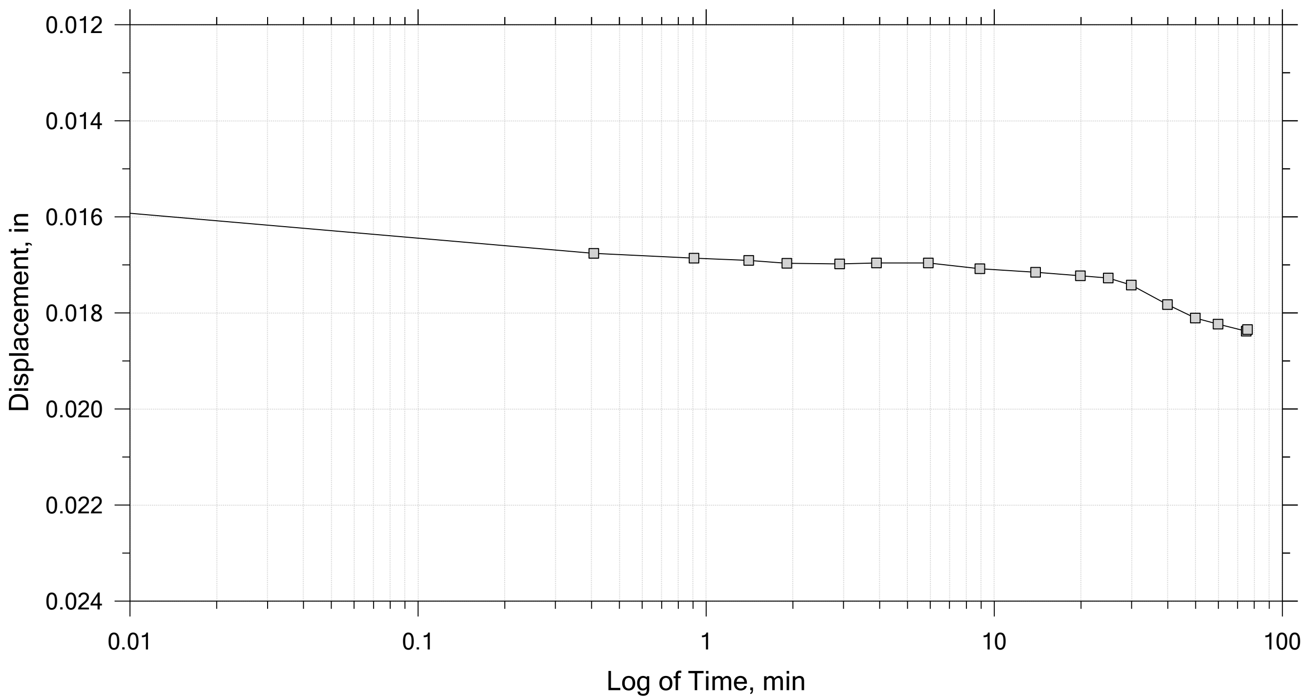
Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
Description: Gray sandy silt		
Remarks:		

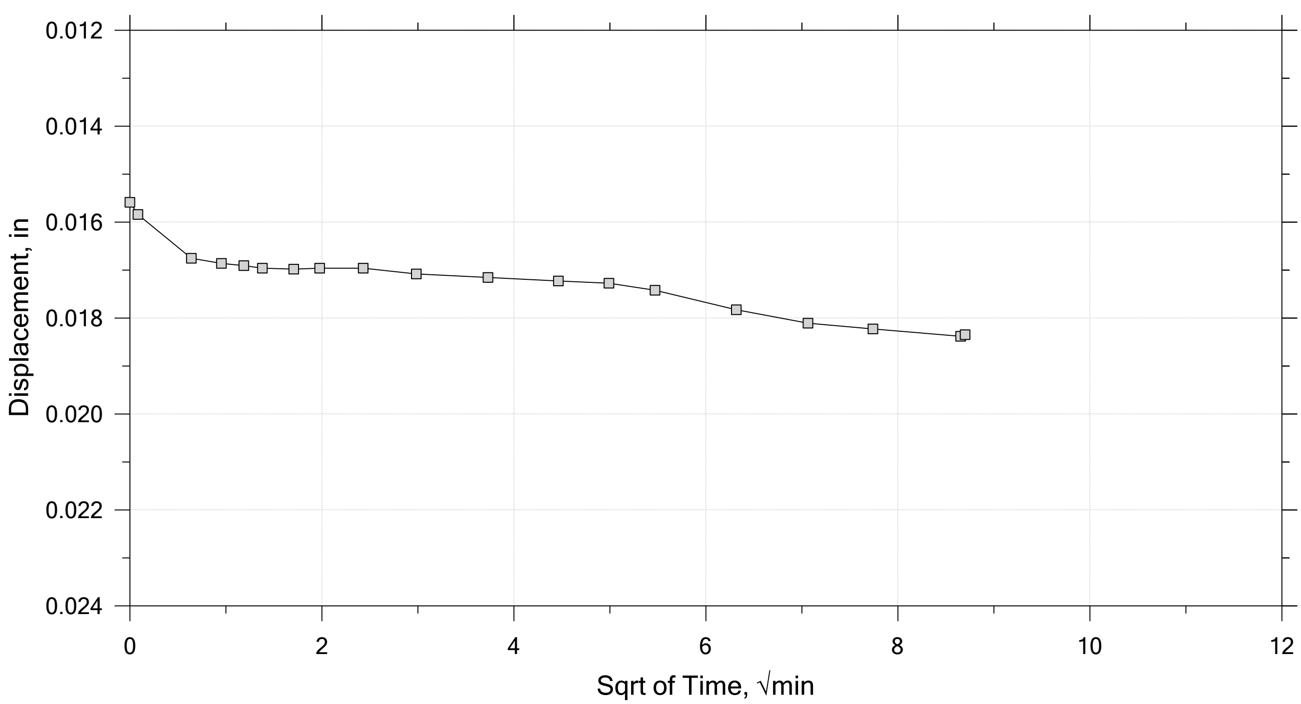
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 19

Constant Load Step

Stress: 1 tsf





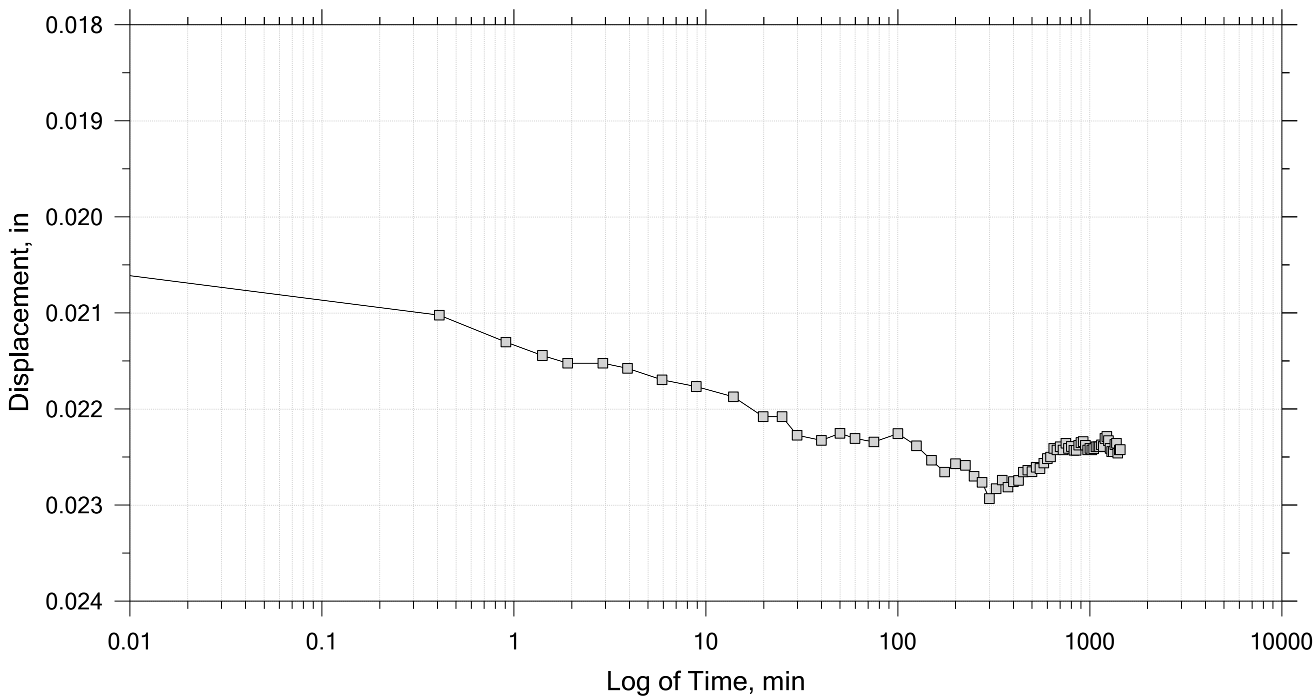
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
	Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
	Description: Gray sandy silt		
	Remarks:		

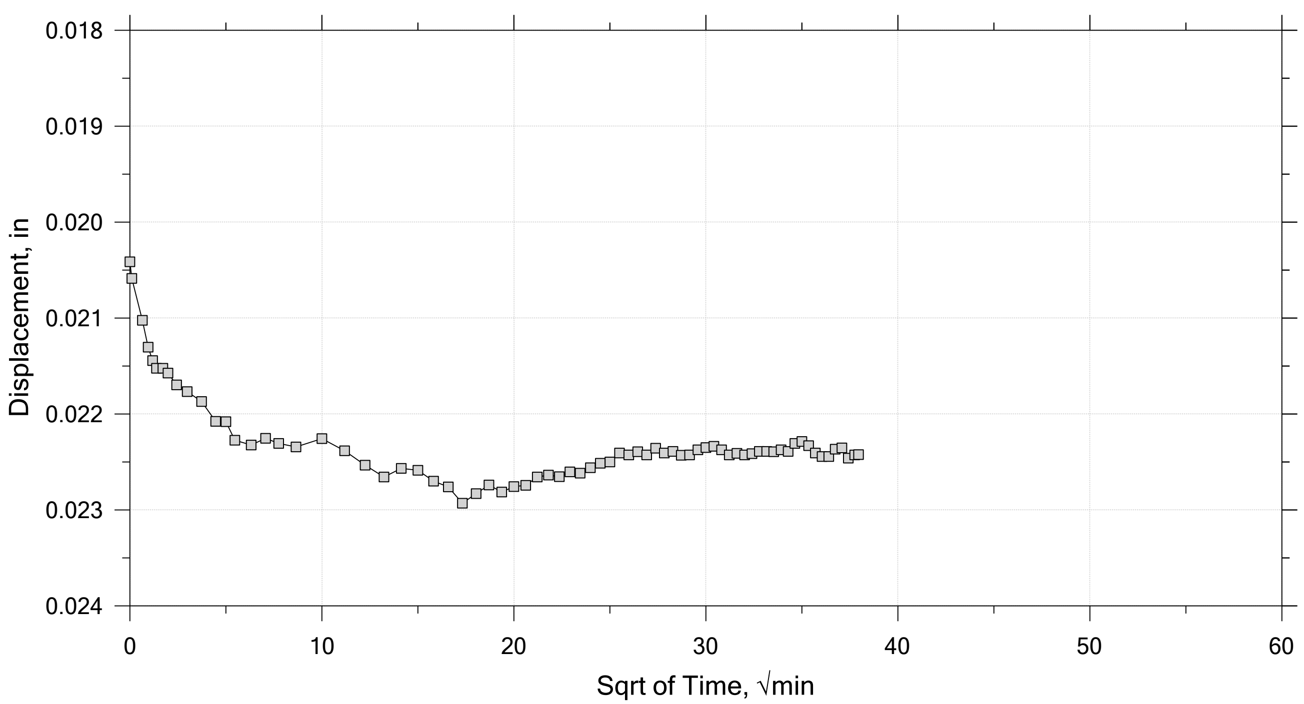
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 19

Constant Load Step

Stress: 2 tsf





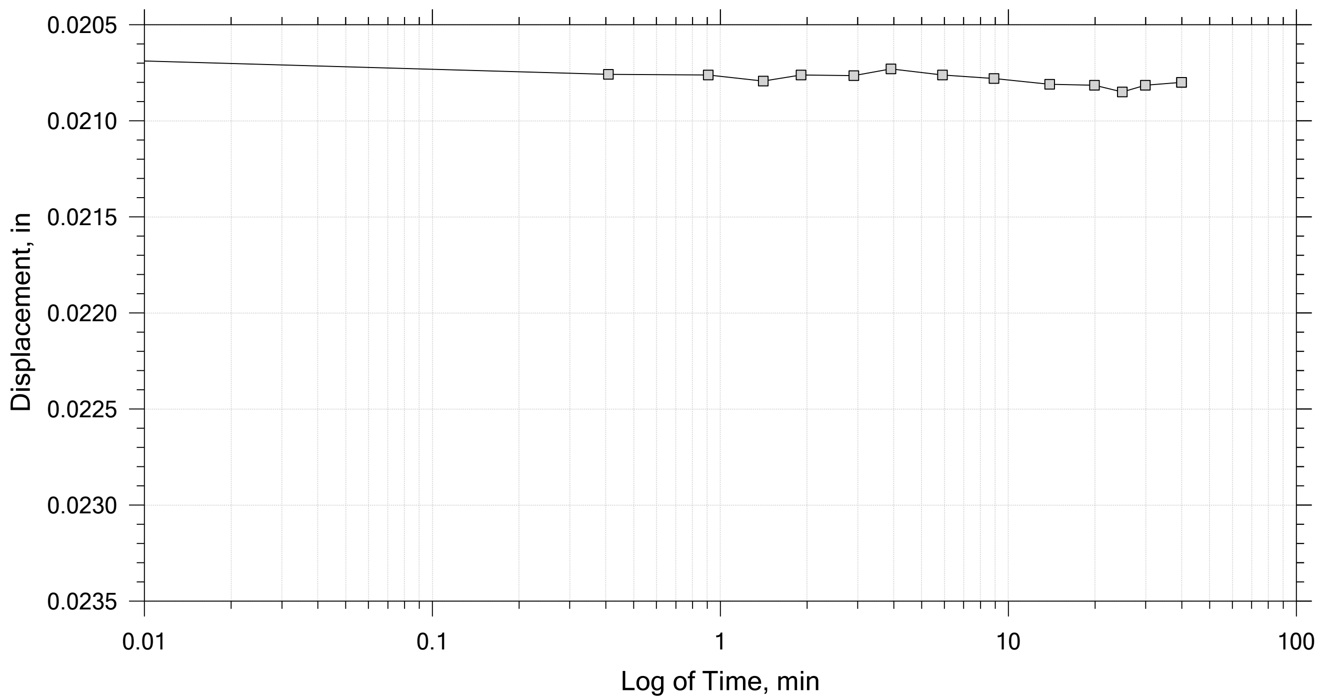
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
	Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
	Description: Gray sandy silt		
	Remarks:		

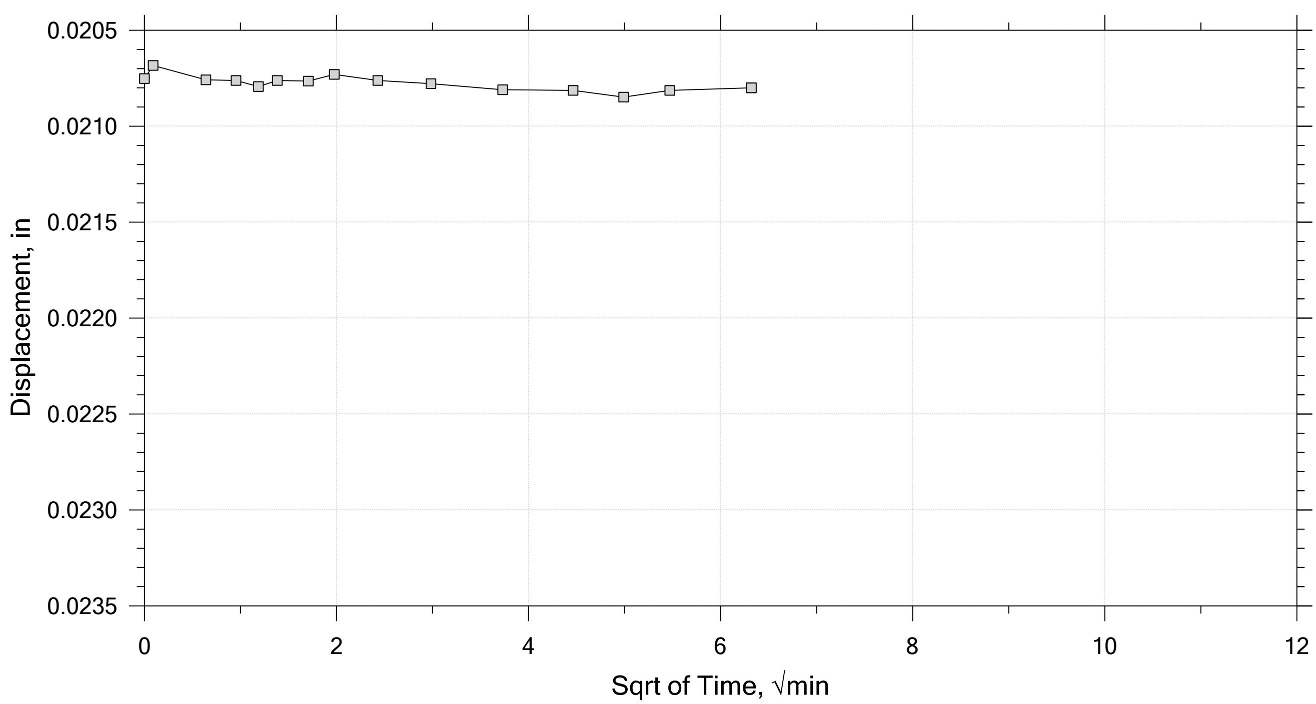
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 19

Constant Load Step

Stress: 0.25 tsf





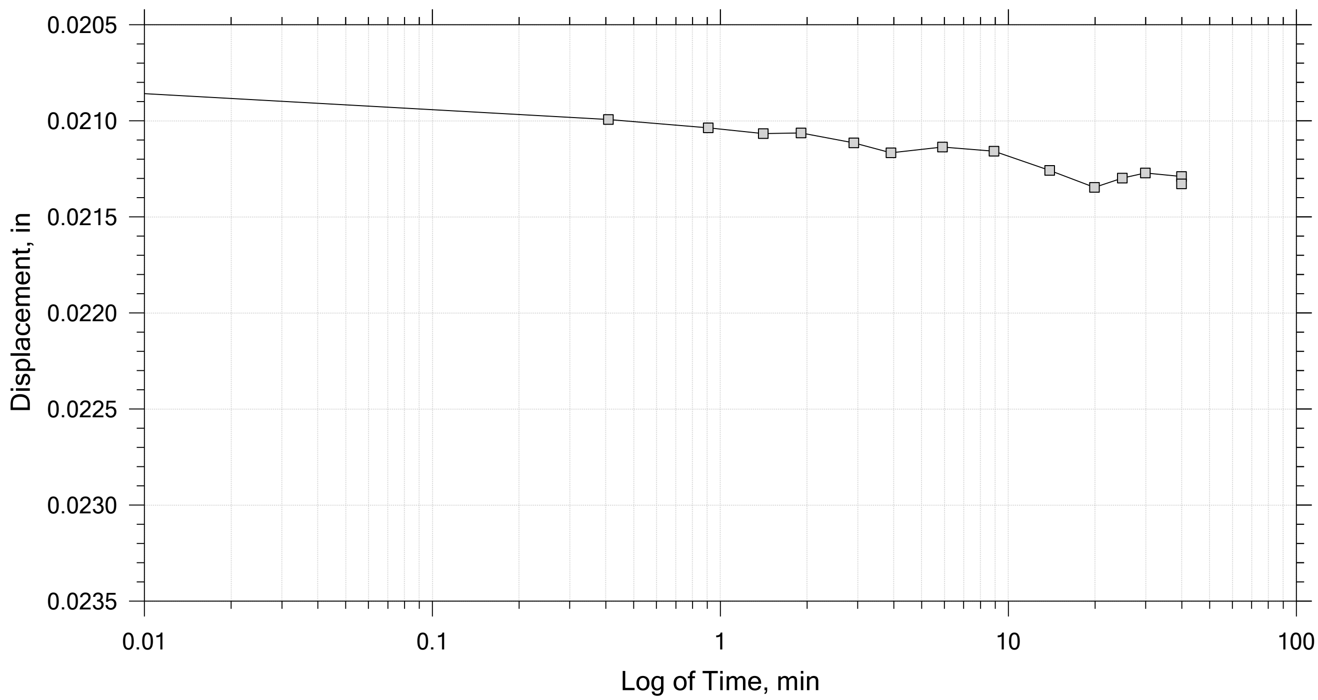
Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
Description: Gray sandy silt		
Remarks:		

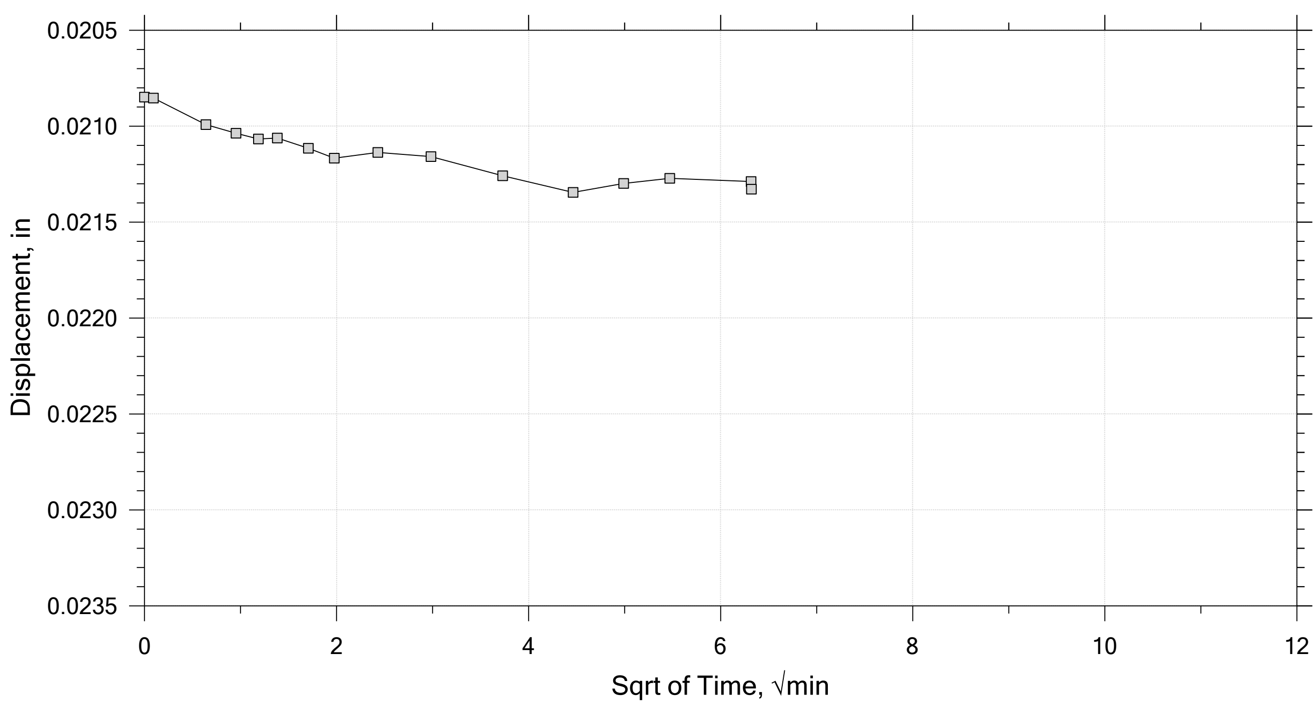
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 19

Constant Load Step

Stress: 0.5 tsf





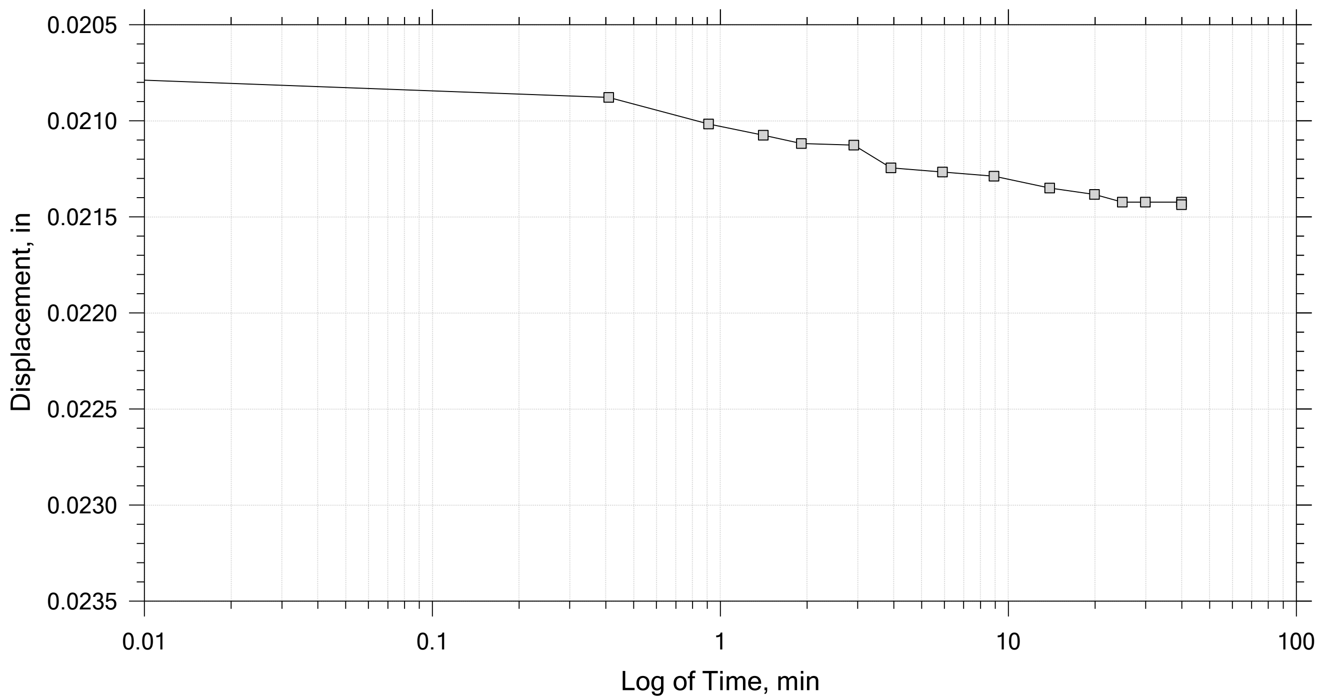
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
	Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
	Description: Gray sandy silt		
	Remarks:		

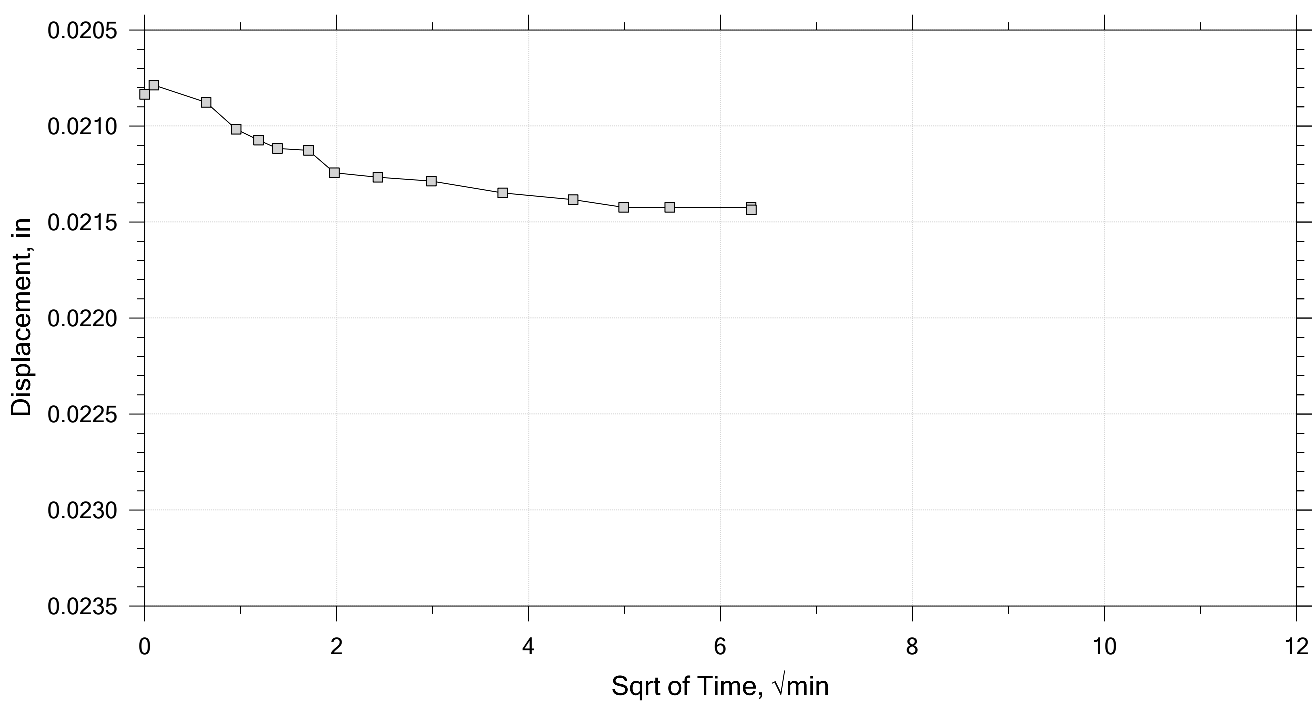
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 19

Constant Load Step

Stress: 1 tsf





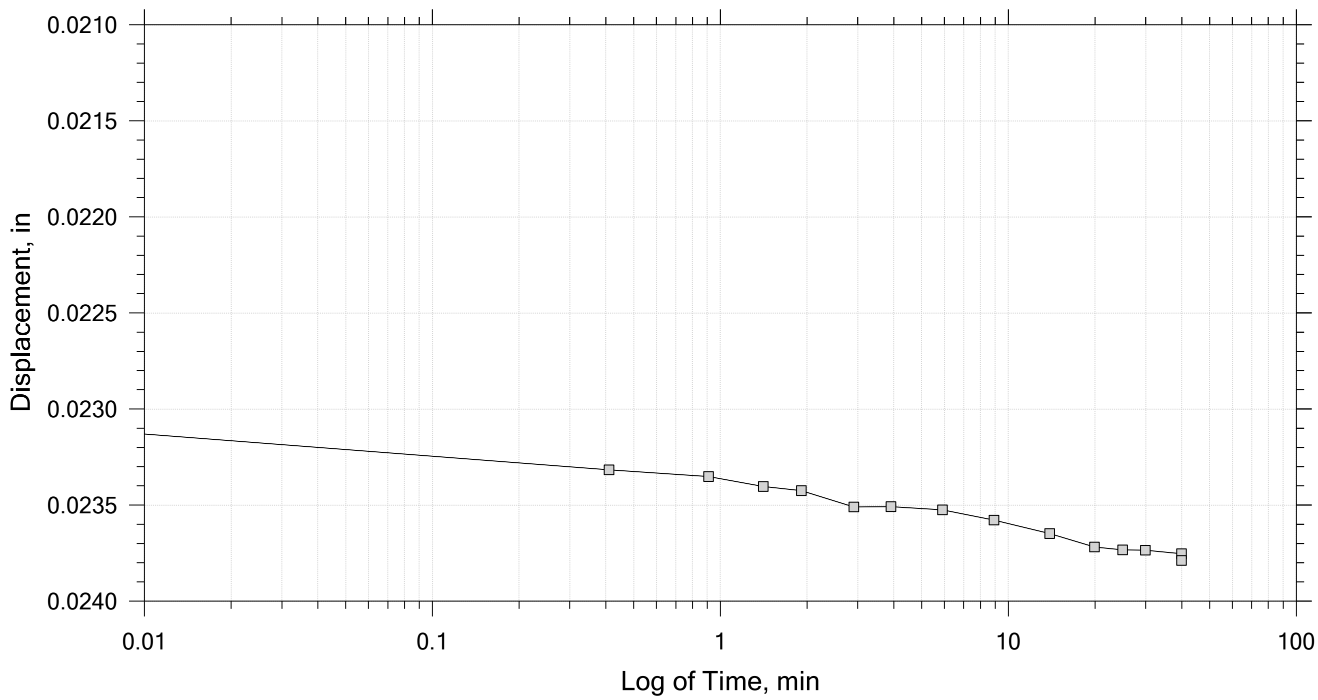
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
	Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
	Description: Gray sandy silt		
	Remarks:		

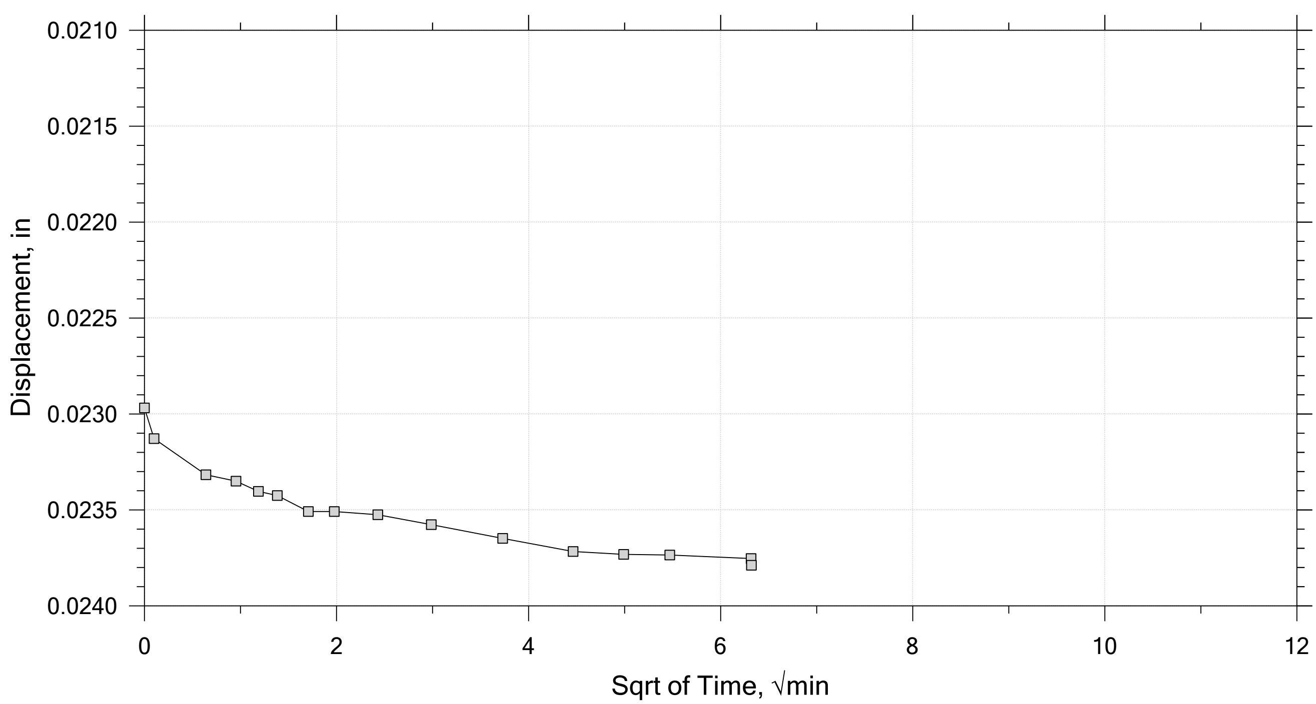
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 19

Constant Load Step

Stress: 2 tsf





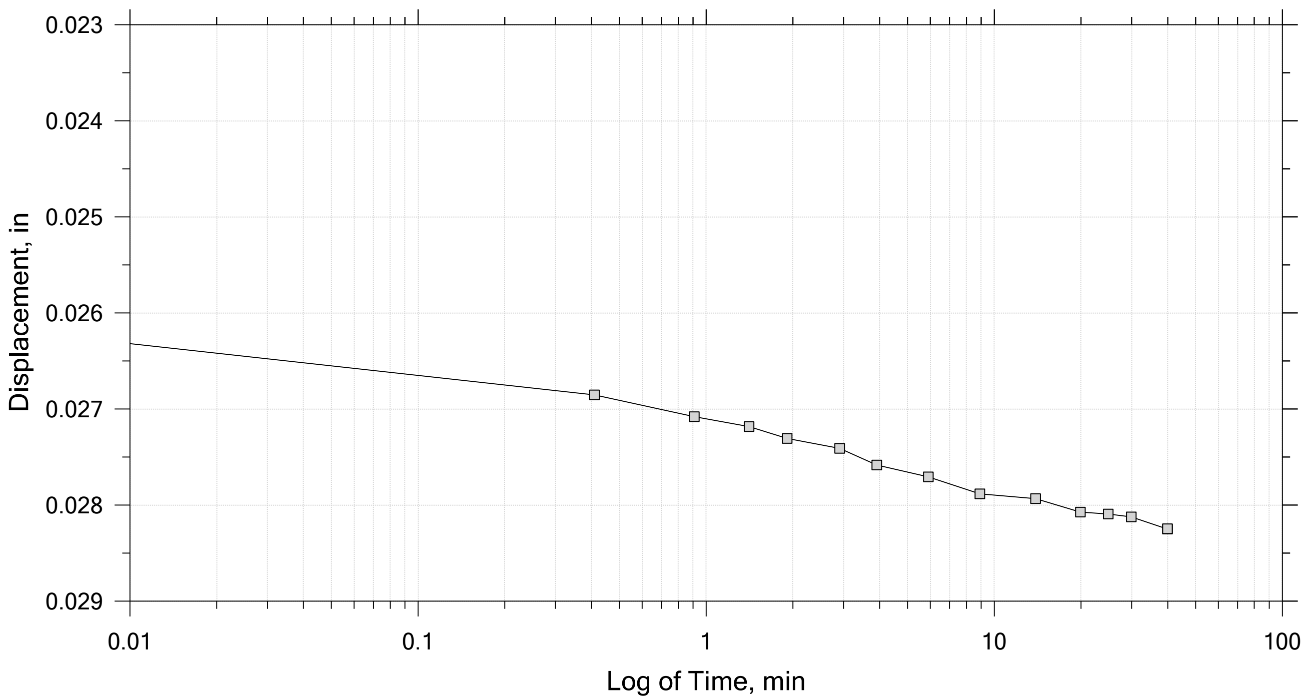
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
	Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
	Description: Gray sandy silt		
	Remarks:		

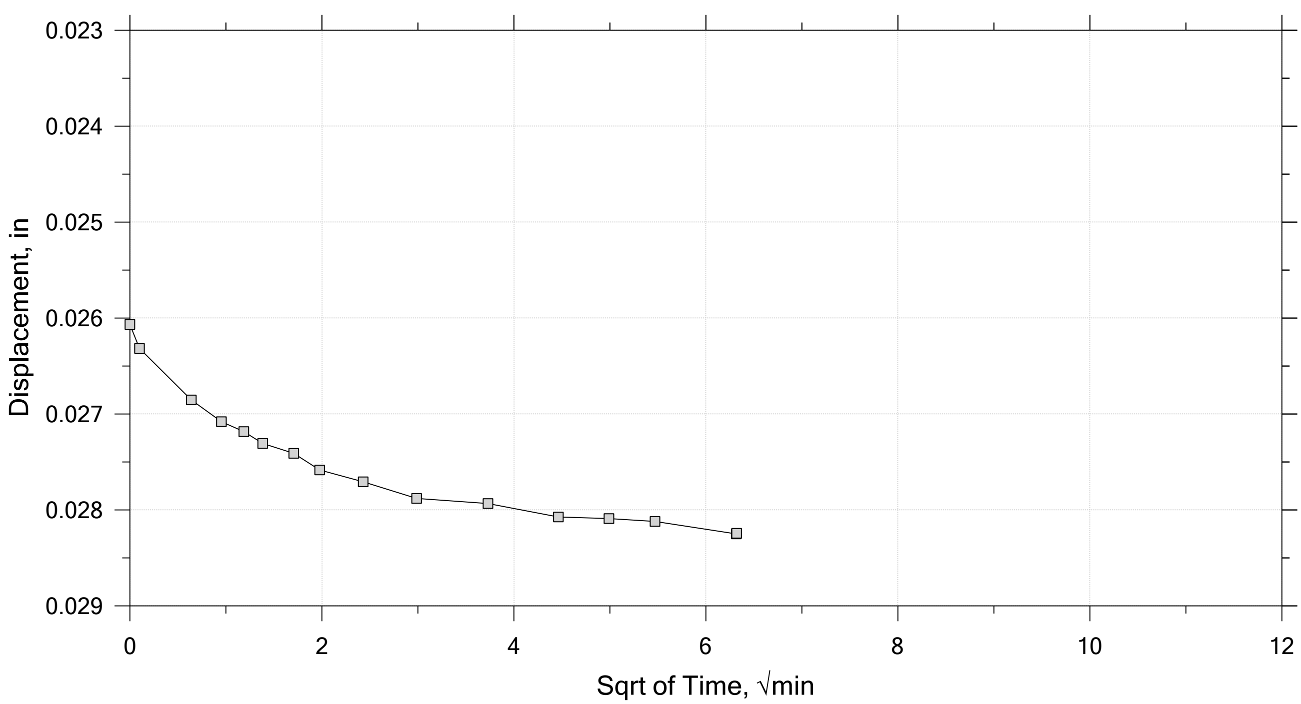
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 19

Constant Load Step

Stress: 4 tsf





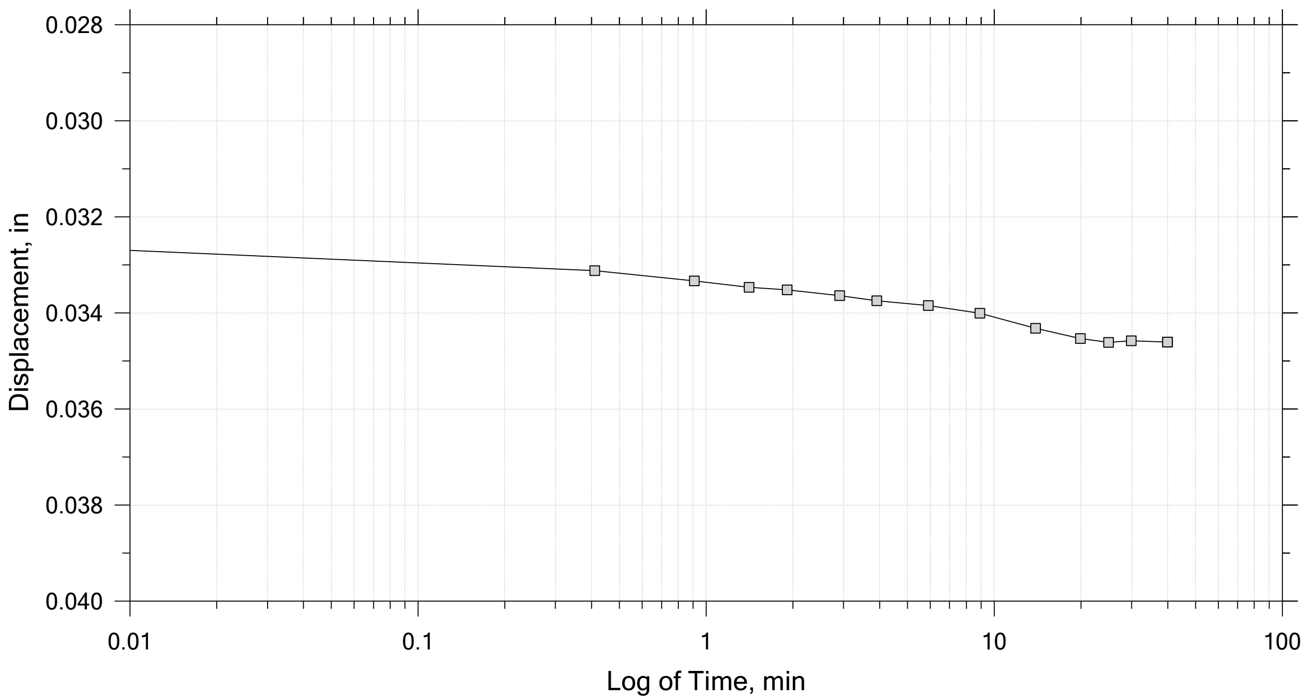
Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
Description: Gray sandy silt		
Remarks:		

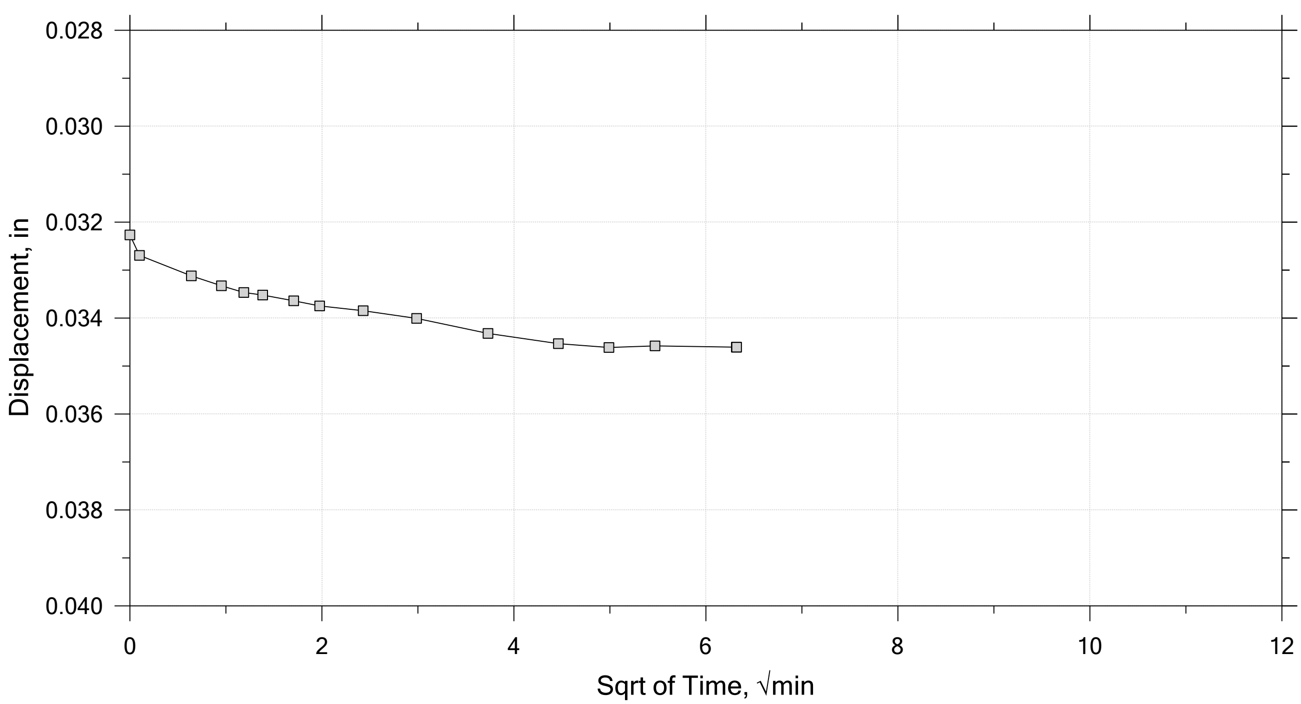
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 19

Constant Load Step

Stress: 8 tsf





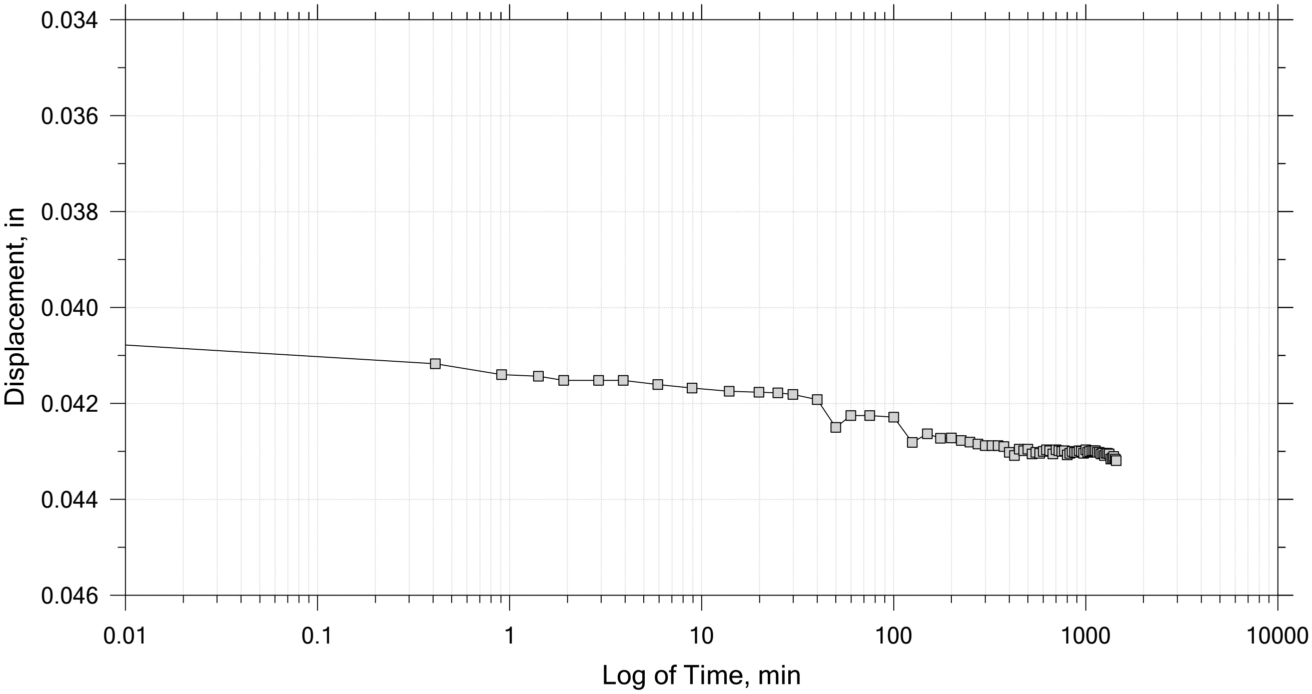
Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
Description: Gray sandy silt		
Remarks:		

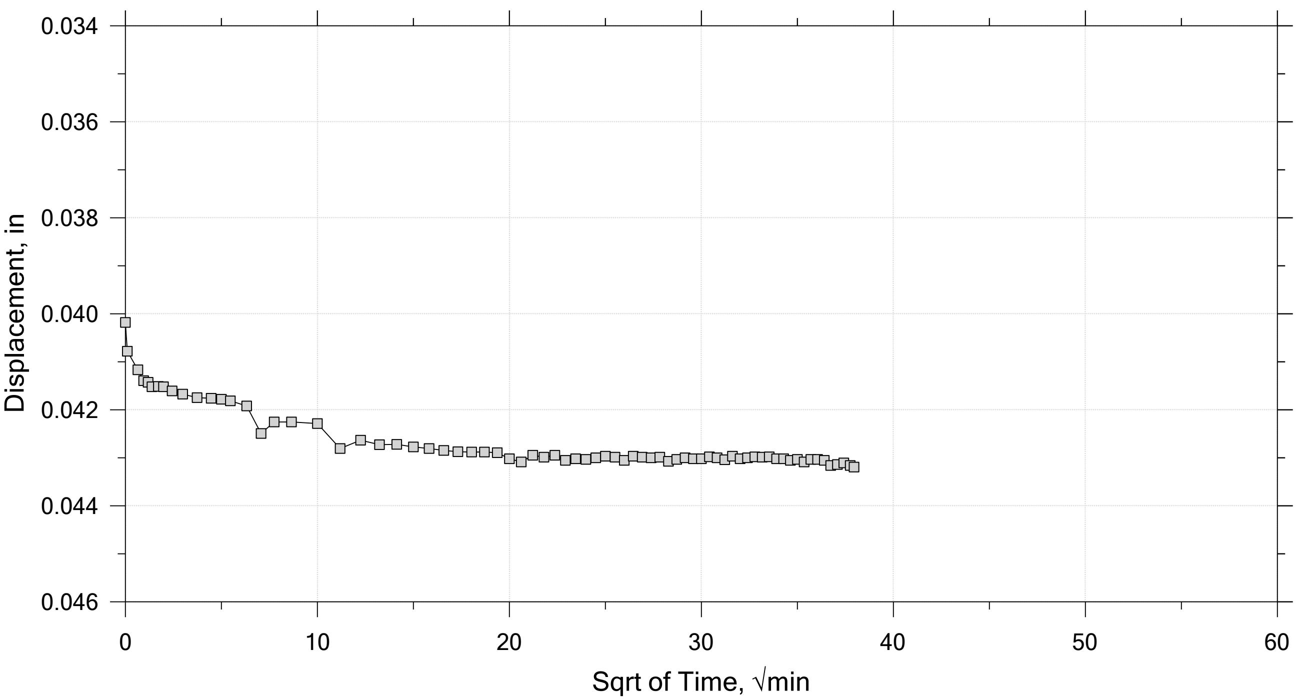
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 19

Constant Load Step

Stress: 16 tsf





	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
	Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
	Description: Gray sandy silt		
	Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter, in: 2.50	Specific Gravity: 2.65 (Estimated)	Liquid Limit: Non-Plastic
Specimen Height, in: 0.97	Initial Void Ratio: 0.696	Plastic Limit: Non-Plastic
Final Height, in: 0.88	Final Void Ratio: 0.53	Plasticity Index: Non-Plastic

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	W-1	---	69	
Mass Container, gm	51.44	109.84	109.84	54.82
Mass Container + Wet Soil, gm	245.97	260.67	260.84	204.93
Mass Container + Dry Soil, gm	211.16	232.13	232.13	176.39
Mass Dry Soil, gm	159.72	122.29	122.29	121.57
Water Content, %	21.79	23.34	23.48	23.48
Void Ratio	---	0.70	0.53	---
Degree of Saturation, %	---	88.85	117.28	---
Dry Unit Weight, pcf	---	97.541	108.1	---

Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
Description: Gray sandy silt		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv ft²/lb	k cm/s	Ca %
1	0.0625	0.0009305	0.694	0.0956	0.000	0.00e+00	7.65e+00	0.00e+00	0.00e+00
2	0.125	0.003821	0.689	0.393	0.000	0.00e+00	2.38e+01	0.00e+00	0.00e+00
3	0.250	0.007363	0.683	0.757	0.000	0.00e+00	1.46e+01	0.00e+00	0.00e+00
4	0.500	0.01217	0.675	1.25	0.000	0.00e+00	9.89e+00	0.00e+00	0.00e+00
5	1.00	0.01835	0.664	1.89	0.000	0.00e+00	6.34e+00	0.00e+00	0.00e+00
6	2.00	0.02231	0.657	2.29	0.000	0.00e+00	2.04e+00	0.00e+00	1.00e-05
7	0.500	0.02208	0.658	2.27	0.000	0.00e+00	8.03e-02	0.00e+00	0.00e+00
8	0.125	0.02170	0.658	2.23	0.000	0.00e+00	5.25e-01	0.00e+00	0.00e+00
9	0.250	0.02080	0.660	2.14	0.000	0.00e+00	-3.68e+00	-0.00e+00	0.00e+00
10	0.500	0.02128	0.659	2.19	0.000	0.00e+00	9.81e-01	0.00e+00	0.00e+00
11	1.00	0.02144	0.659	2.20	1.856	2.78e-06	1.63e-01	8.63e-10	0.00e+00
12	2.00	0.02379	0.655	2.44	0.000	0.00e+00	1.21e+00	0.00e+00	0.00e+00
13	4.00	0.02812	0.647	2.89	1.548	3.30e-06	1.11e+00	6.99e-09	0.00e+00
14	8.00	0.03461	0.636	3.56	0.000	0.00e+00	8.34e-01	0.00e+00	0.00e+00
15	16.0	0.04283	0.621	4.40	0.000	0.00e+00	5.28e-01	0.00e+00	5.00e-04
16	4.00	0.04071	0.625	4.18	0.000	0.00e+00	9.05e-02	0.00e+00	0.00e+00
17	1.00	0.03728	0.631	3.83	0.000	0.00e+00	5.88e-01	0.00e+00	0.00e+00
18	0.250	0.03492	0.635	3.59	0.000	0.00e+00	1.62e+00	0.00e+00	0.00e+00
19	0.0625	0.03366	0.637	3.46	0.000	0.00e+00	3.46e+00	0.00e+00	0.00e+00

Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
Description: Gray sandy silt		
Remarks:		
Displacement at End of Primary		

One-Dimensional Consolidation by ASTM D2435 - Method B

Sqrt of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv ft²/lb	k cm/s
1	0.0625	0.0009305	0.694	0.0956	24.136	9.62e-07	7.65e+00	1.40e-08
2	0.125	0.003821	0.689	0.393	21.921	1.05e-06	2.38e+01	4.77e-08
3	0.250	0.007363	0.683	0.757	32.442	7.08e-07	1.46e+01	1.96e-08
4	0.500	0.01217	0.675	1.25	30.736	7.41e-07	9.89e+00	1.39e-08
5	1.00	0.01835	0.664	1.89	57.222	3.93e-07	6.34e+00	4.75e-09
6	2.00	0.02231	0.657	2.29	37.021	6.02e-07	2.04e+00	2.33e-09
7	0.500	0.02208	0.658	2.27	22.797	9.73e-07	8.03e-02	1.49e-10
8	0.125	0.02170	0.658	2.23	5.533	4.01e-06	5.25e-01	4.01e-09
9	0.250	0.02080	0.660	2.14	0.000	0.00e+00	-3.68e+00	-0.00e+00
10	0.500	0.02128	0.659	2.19	14.766	1.51e-06	9.81e-01	2.81e-09
11	1.00	0.02144	0.659	2.20	24.909	8.92e-07	1.63e-01	2.77e-10
12	2.00	0.02379	0.655	2.44	28.288	7.83e-07	1.21e+00	1.80e-09
13	4.00	0.02812	0.647	2.89	12.826	1.72e-06	1.11e+00	3.63e-09
14	8.00	0.03461	0.636	3.56	24.520	8.87e-07	8.34e-01	1.41e-09
15	16.0	0.04283	0.621	4.40	116.855	1.83e-07	5.28e-01	1.84e-10
16	4.00	0.04071	0.625	4.18	0.000	0.00e+00	9.05e-02	0.00e+00
17	1.00	0.03728	0.631	3.83	4.783	4.47e-06	5.88e-01	5.01e-09
18	0.250	0.03492	0.635	3.59	8.908	2.42e-06	1.62e+00	7.44e-09
19	0.0625	0.03366	0.637	3.46	38.357	5.64e-07	3.46e+00	3.71e-09

Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-2	Test Date: 09.25.2020	Depth: 62.9-63.1'
Test Number: 20-C-2698a	Preparation: Intact Tube	Elevation:
Description: Gray sandy silt		
Remarks:		
Displacement at End of Primary		

THIELSCH ENGINEERING

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Cranston RI, 02910
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Fax: (401)-467-2398
thielsch.com
Let's Build a Solid Foundation

Client Information:
RT Group Inc.
North Kingstown, RI
PM: Greg Coren
Assigned By: Greg Coren
Collected By: Allison Gilmore

Project Information:
Sims Ave Pedestrian Bridge
North Kingstown, RI
TEI Project Number: 74-20-0002.09

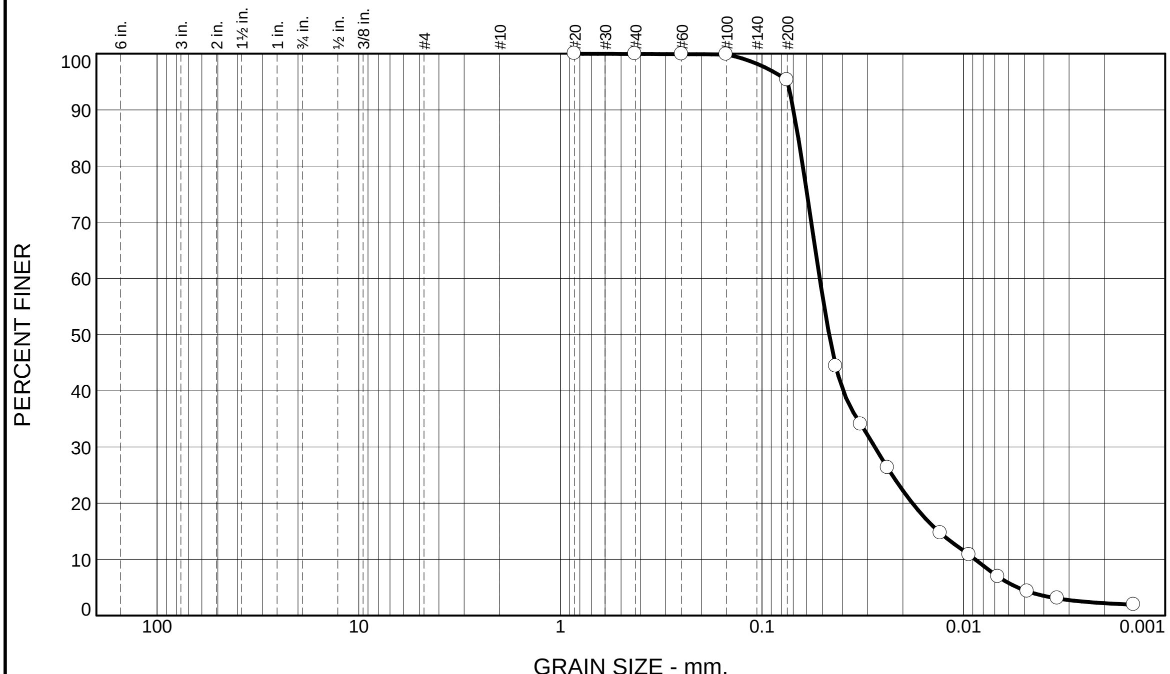
Report Date: 10.02.2020

LABORATORY TESTING DATA SHEET, Report No.: 7420-J-170, Rev.1

				Identification Tests								Shear / Consolidation Tests								
Boring ID	Sample No.	Depth (ft)	Laboratory No.	As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Torvane or Type Test	Pocket Penetrometer	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	EST. Internal Friction Angle	CR / RR	Laboratory Log and Soil Description
SB-03	ST-3	78-80	20-S-2699		Average Total Unit Weight (78-80') = 120.3 pcf															
		78.0-78.1											Disturbed							
		78.1-78.2	20-WC-2699a	25.4									Tv = 0.45 tsf	PP = 1.0 tsf						Gray silt
		78.2-78.3	20-S-2699	27.4			0.0	4.7	95.3				Hydro							Gray silt
		78.3-78.4	20-L-2699	28.8	NV	NP							LL/PL							Gray silt
		78.4-78.9											Discarded							
		78.9-79.1	20-C-2699	31.2								98.9	Consol						0.04 / 0.01	Gray silt
		79.1-79.6											Save							Specimen Saved
		79.6-79.7	20-WC-2699b	25.0									Tv = 0.4 tsf	PP = 3.0 tsf						Gray silt

Date Received: *09.11.2020* Reviewed By: Date Reviewed: *10.07.2020*

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	4.7	90.8	4.5

Test Results (D7928 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#20	100.0		
#40	100.0		
#60	99.9		
#100	99.9		
#200	95.3		
0.0430 mm.	44.4		
0.0323 mm.	34.0		
0.0238 mm.	26.3		
0.0130 mm.	14.7		
0.0094 mm.	10.8		
0.0067 mm.	6.9		
0.0048 mm.	4.3		
0.0034 mm.	3.0		
0.0014 mm.	1.9		

* (no specification provided)

Material Description

Gray silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.0699 D_{85}= 0.0660 D_{60}= 0.0517
D_{50}= 0.0464 D_{30}= 0.0276 D_{15}= 0.0133
D_{10}= 0.0088 C_u= 5.90 C_c= 1.68

Remarks

Date Received: 09.11.2020 **Date Tested:** 09.18.2020

Tested By: JM

Checked By: Steven Accetta

Title: Laboratory Coordinator

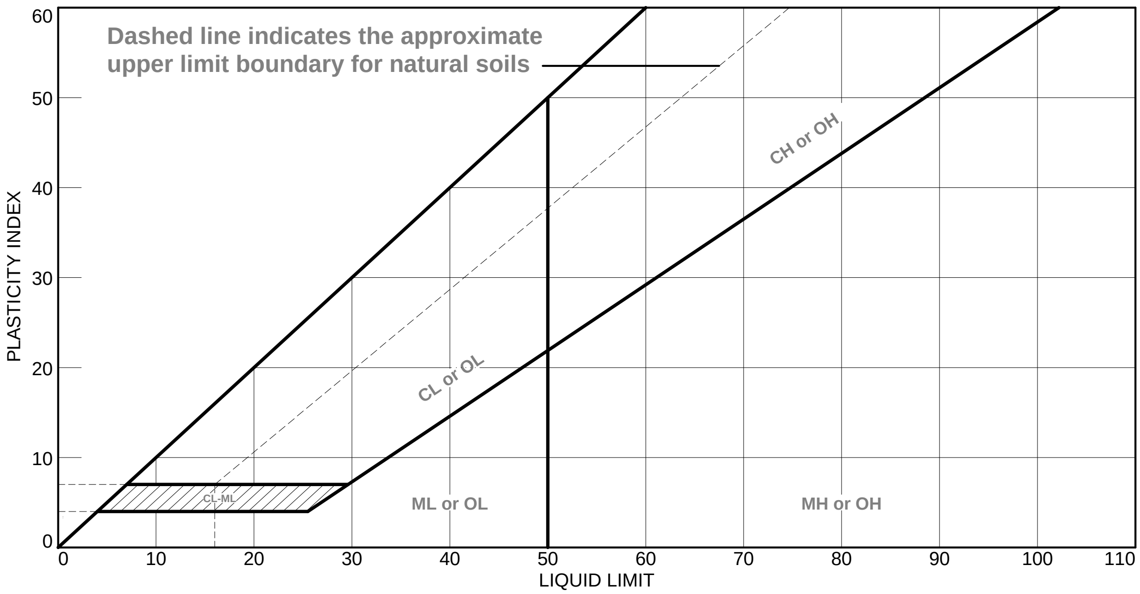
Source of Sample: SB-03 **Depth:** 78.0-80.0' **Date Sampled:**
Sample Number: ST-3

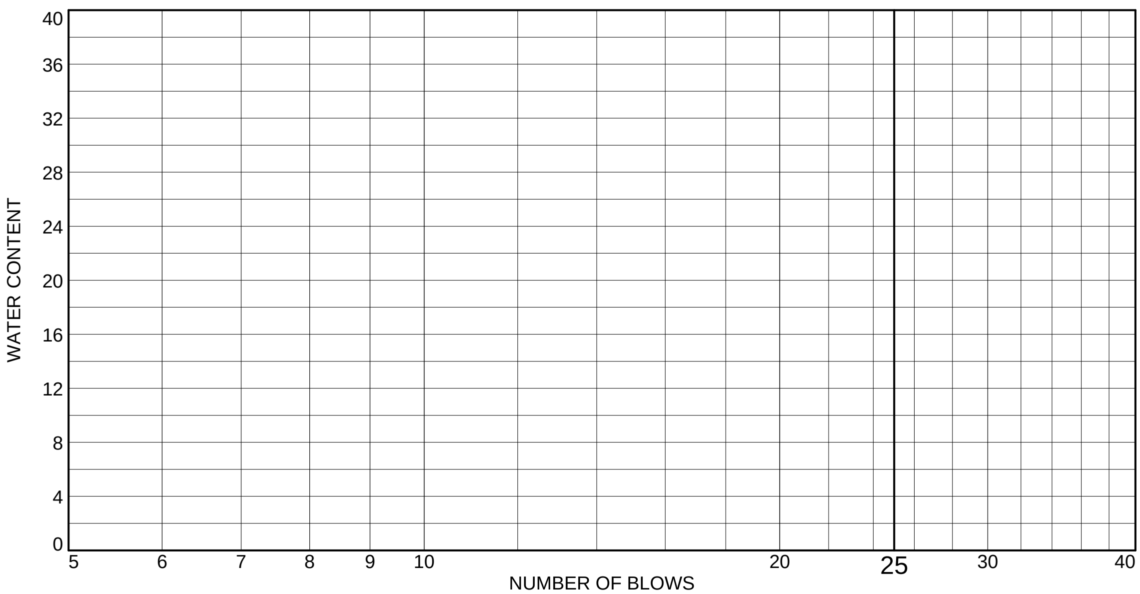
Thielsch Engineering Inc.

Cranston, RI

Client: RT Group Inc.
Project: Sims Ave Pedestrian Bridge
North Kingstown, RI
Project No: 74-20-0002.09 **Figure** 20-S-2699

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray silt	NV	NP	NP	100.0	95.3	ML

Project No. 74-20- **Client:** RT Group Inc.

Project: Sims Ave Pedestrian Bridge

North Kingstown, RI

Source of Sample: SB-03 **Depth:** 78.0-80.0'

Sample Number: ST-3

Thielsch Engineering Inc.

Cranston, RI

Remarks:

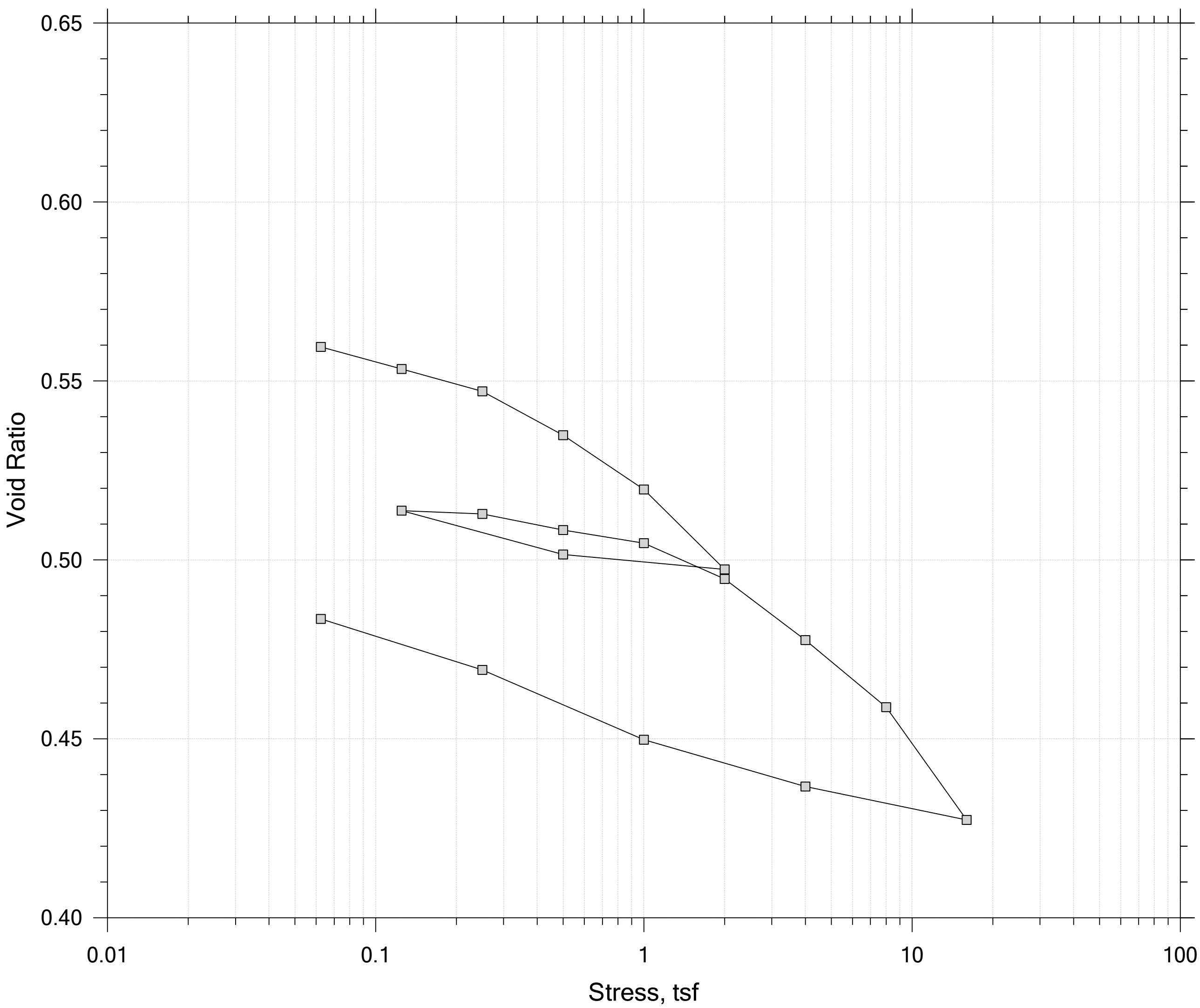
●Sample classified as non-plastic and non-viscous. Sample could not roll past 1/4" and could not achieve more than 25 blows.

Figure 20-L-2699

Tested By: RR **Checked By:** SA

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report

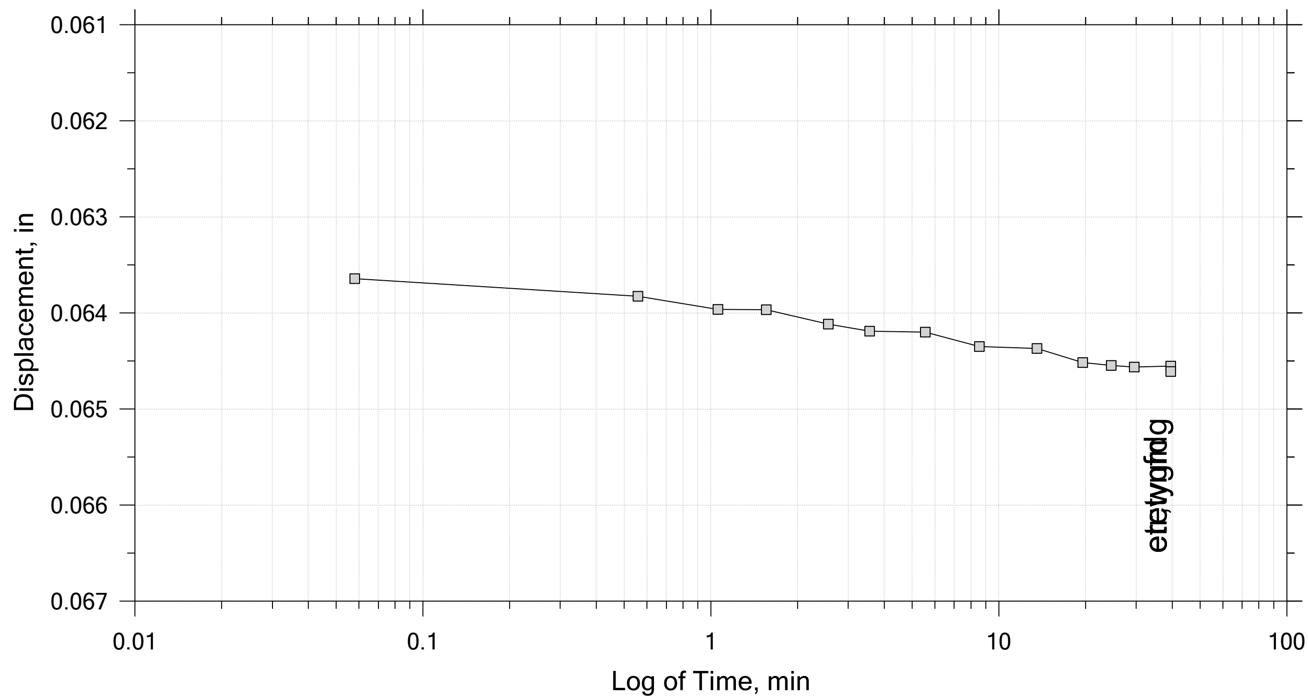


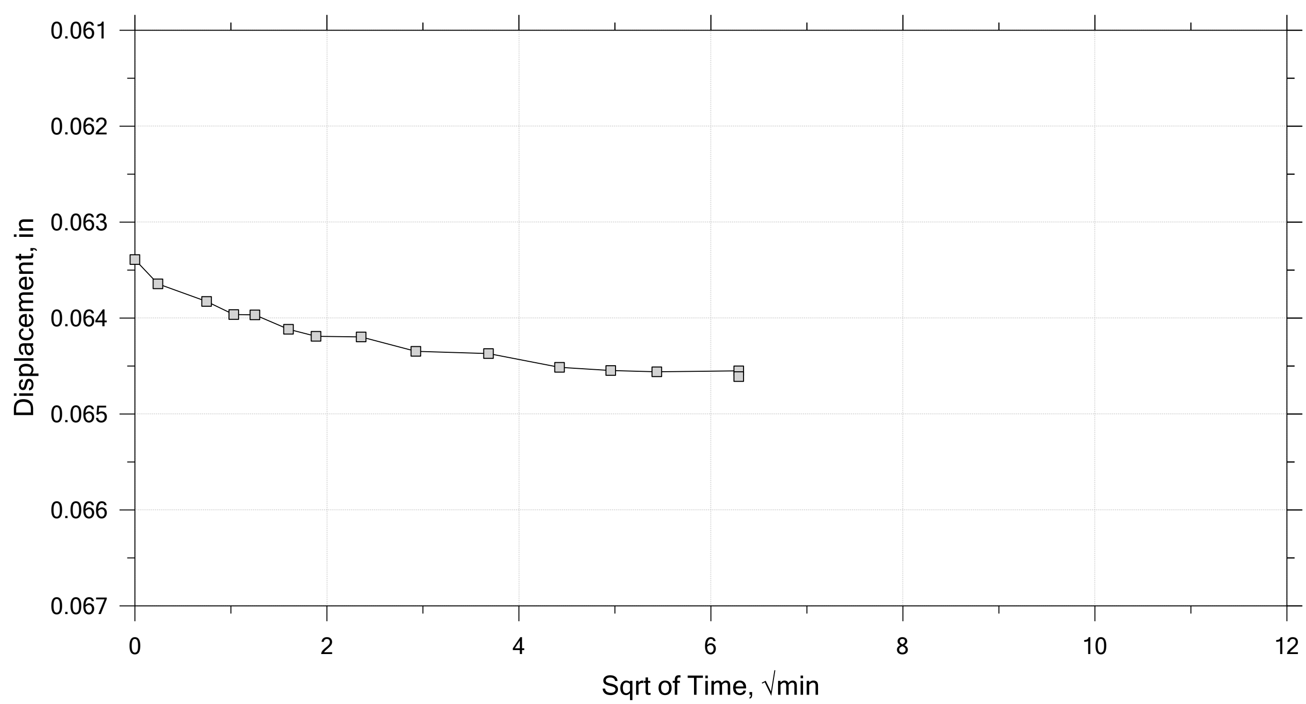
					Before Test	After Test
Current Vertical Effective Stress, tsf: 0				Water Content, %	31.21	25.98
Preconsolidation Stress, tsf: 0				Dry Unit Weight, pcf	98.949	111.51
Compression Ratio: 0.04				Saturation, %	123.09	142.37
Specimen Diameter, in: 2.5		Specimen Height, in: 0.911		Void Ratio	0.67	0.48
LL: Non-Plastic	PL: Non-Plastic	PI: Non-Plastic	GS: 2.65			

	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
	Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
	Description: Gray silt		
	Remarks:		
	Displacement at End of Primary		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 19
Constant Load Step
Stress: 0.125 tsf





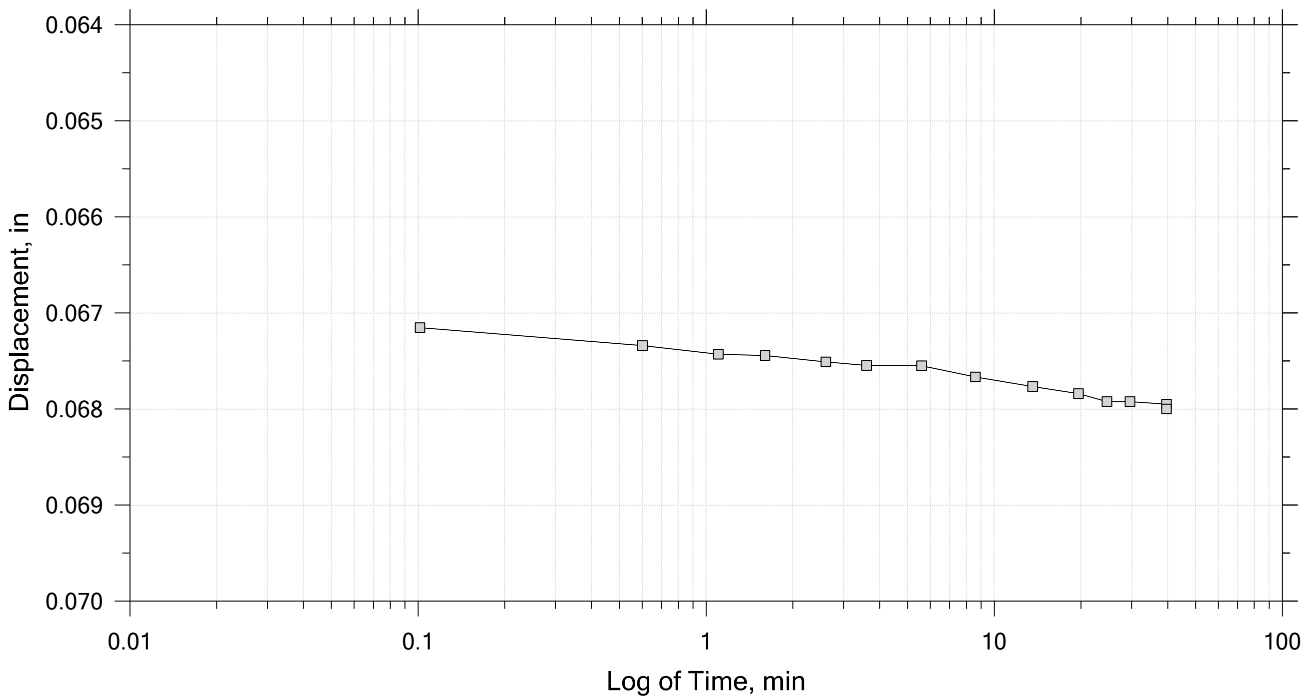
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
	Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
	Description: Gray silt		
	Remarks:		

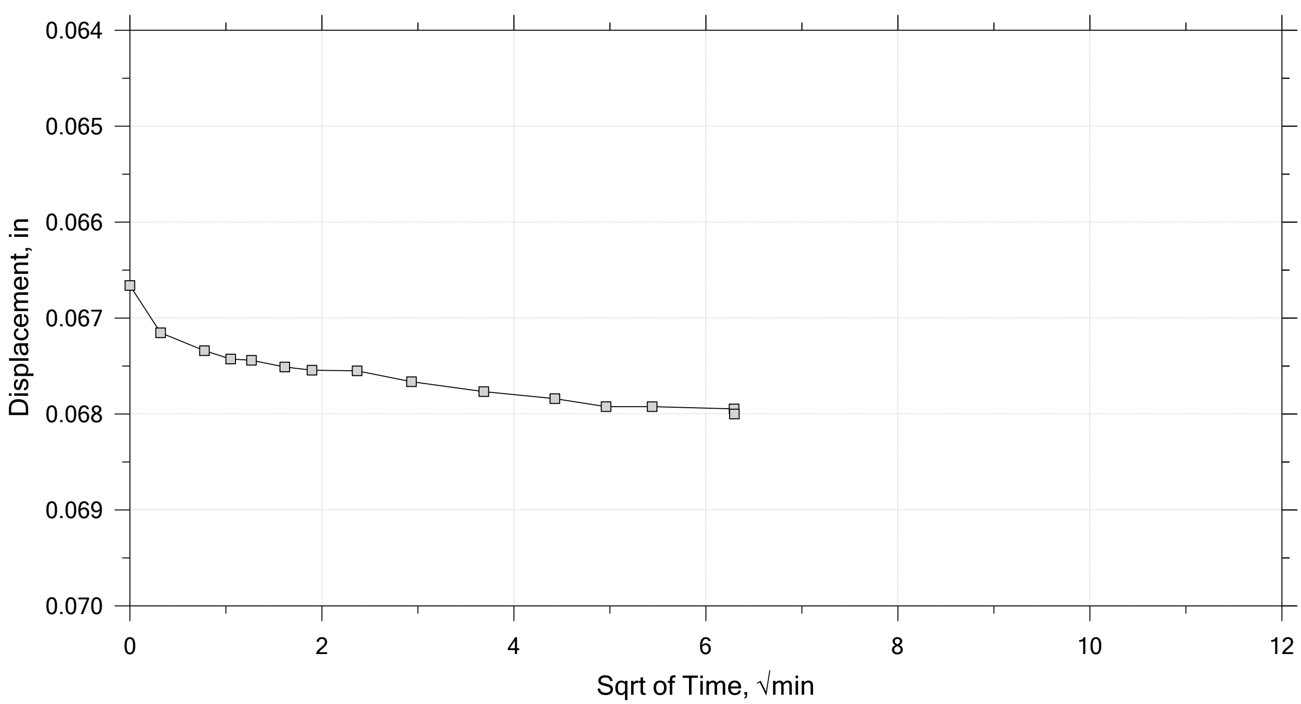
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 19

Constant Load Step

Stress: 0.25 tsf





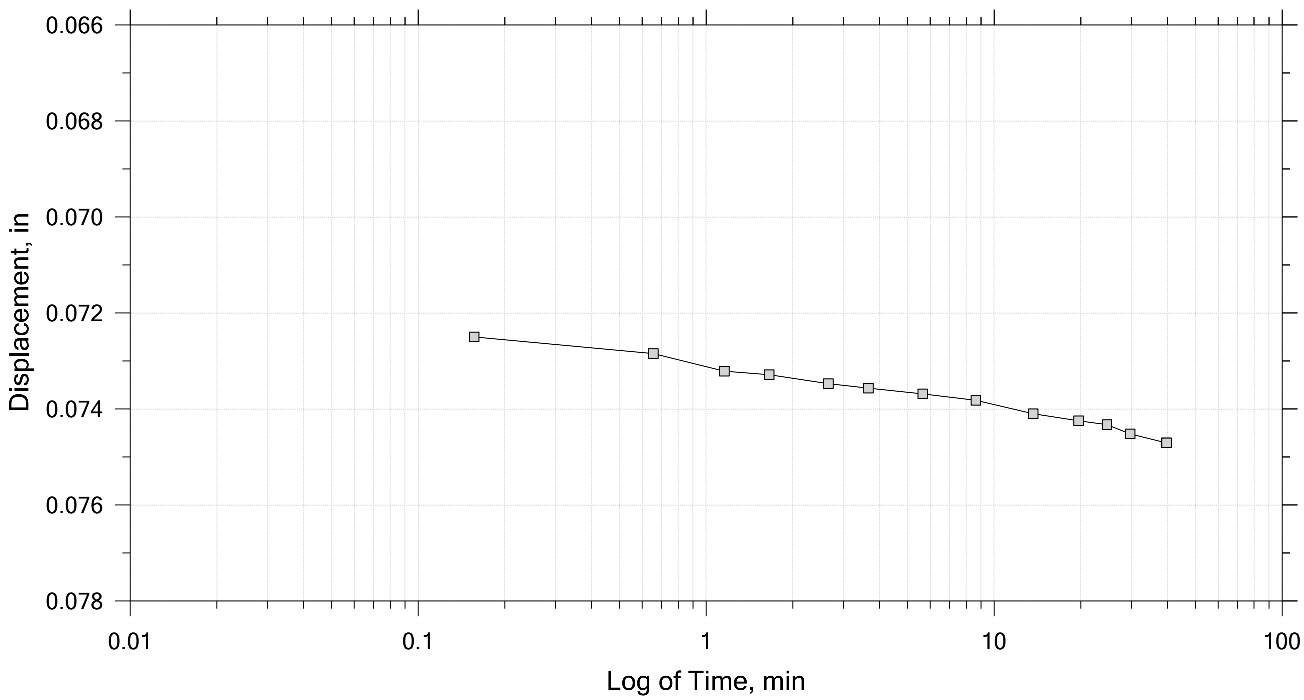
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
	Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
	Description: Gray silt		
	Remarks:		

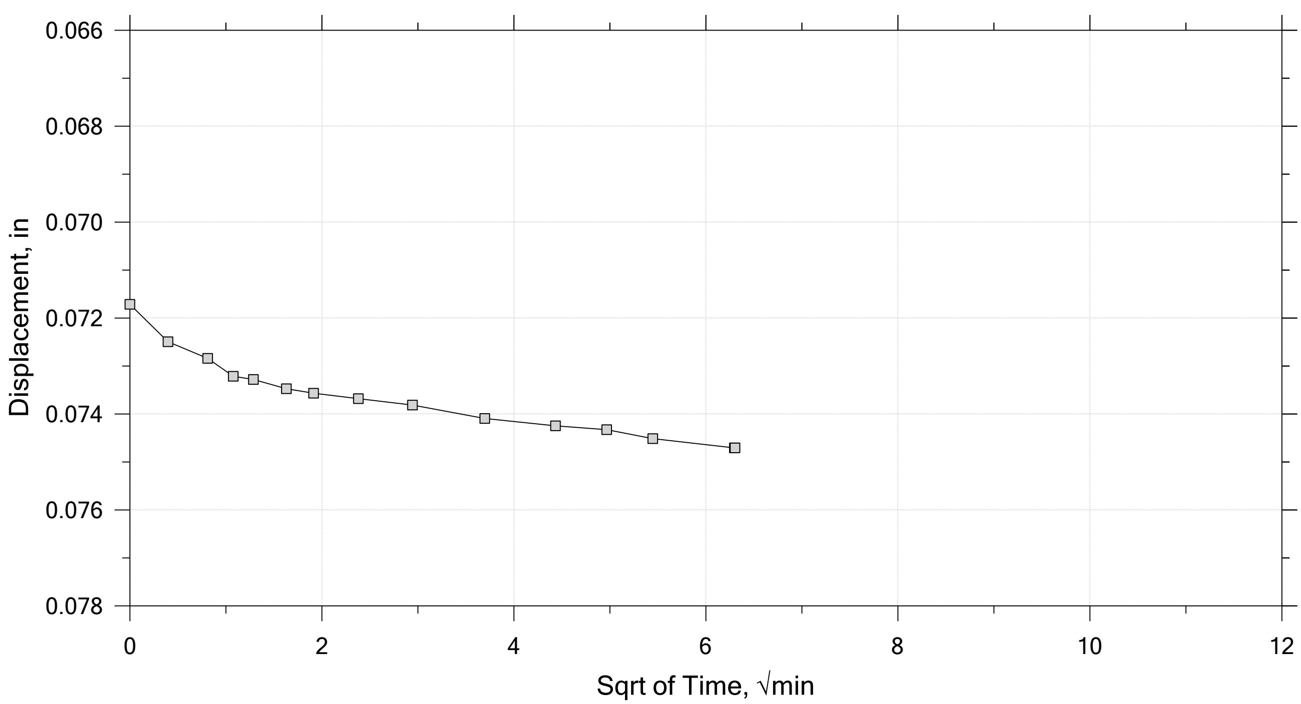
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 19

Constant Load Step

Stress: 0.5 tsf





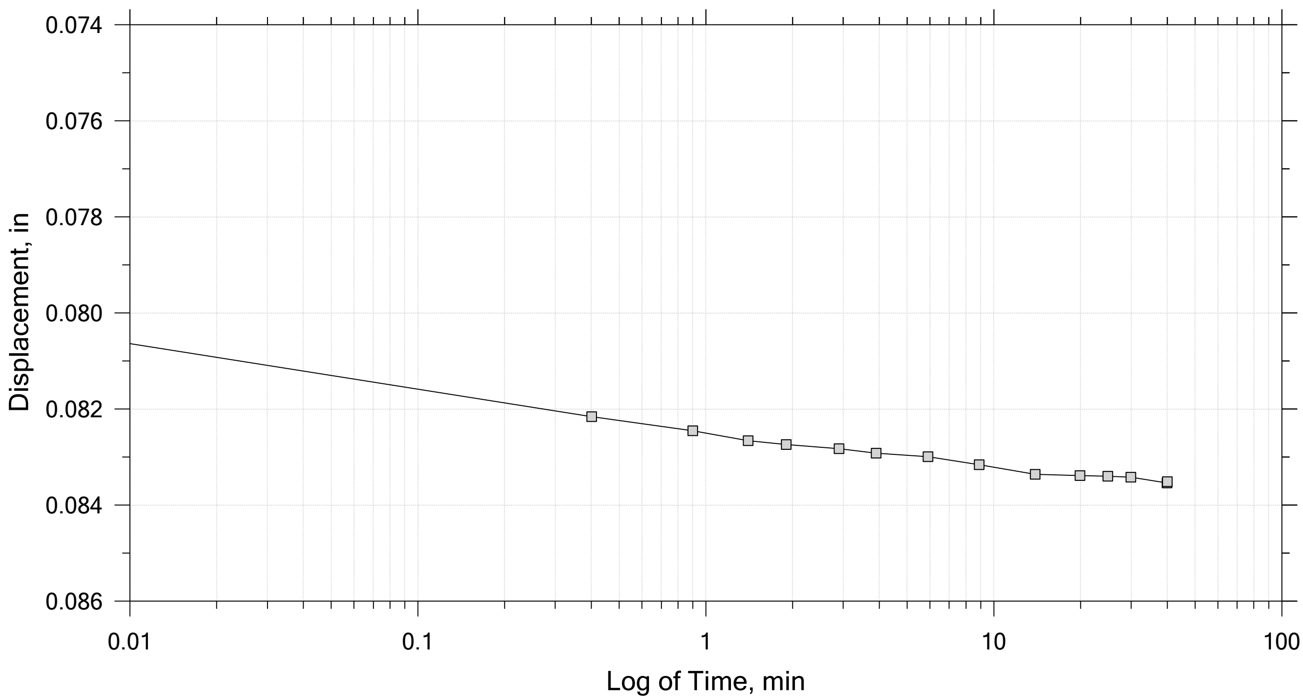
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
	Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
	Description: Gray silt		
	Remarks:		

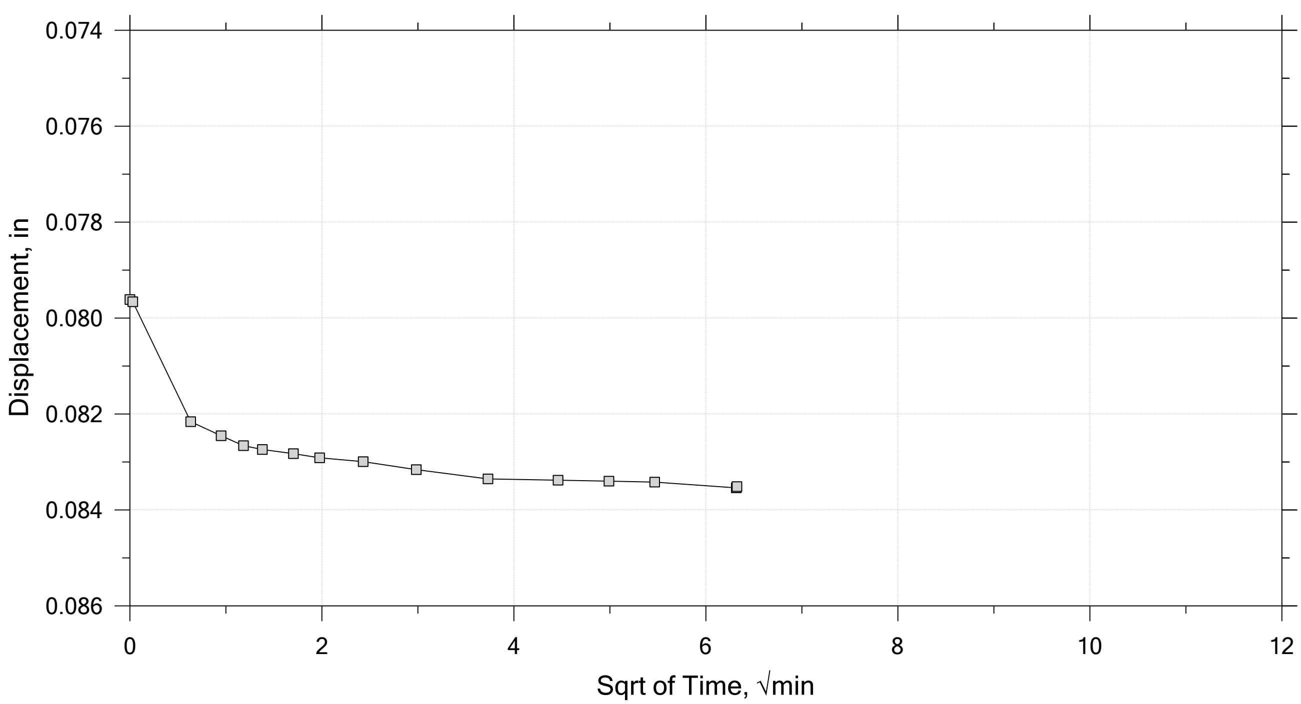
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 19

Constant Load Step

Stress: 1 tsf





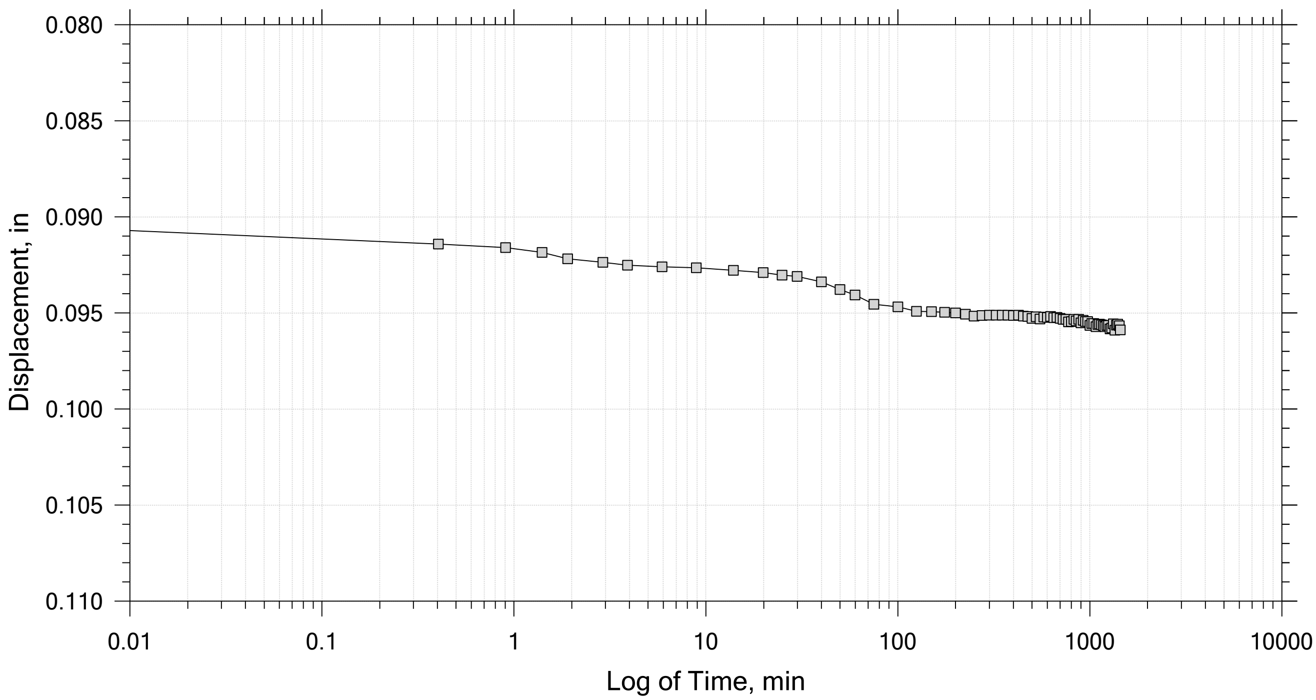
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
	Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
	Description: Gray silt		
	Remarks:		

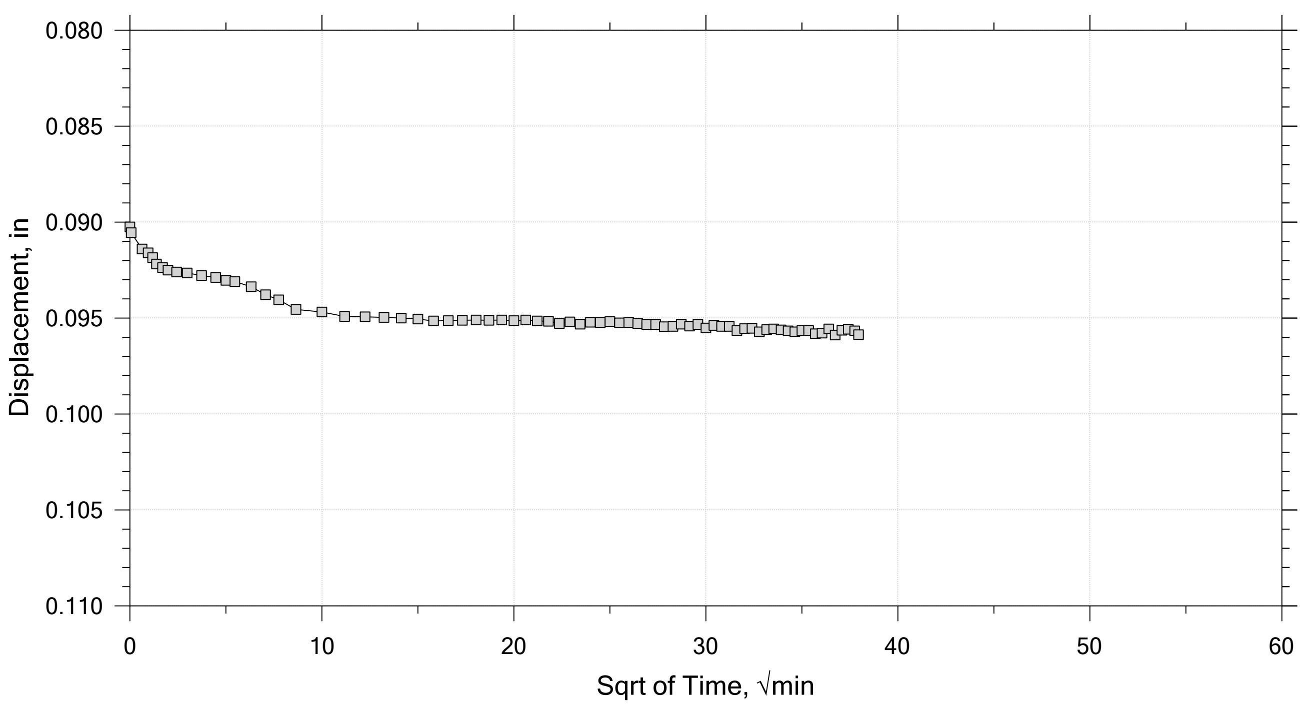
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 19

Constant Load Step

Stress: 2 tsf





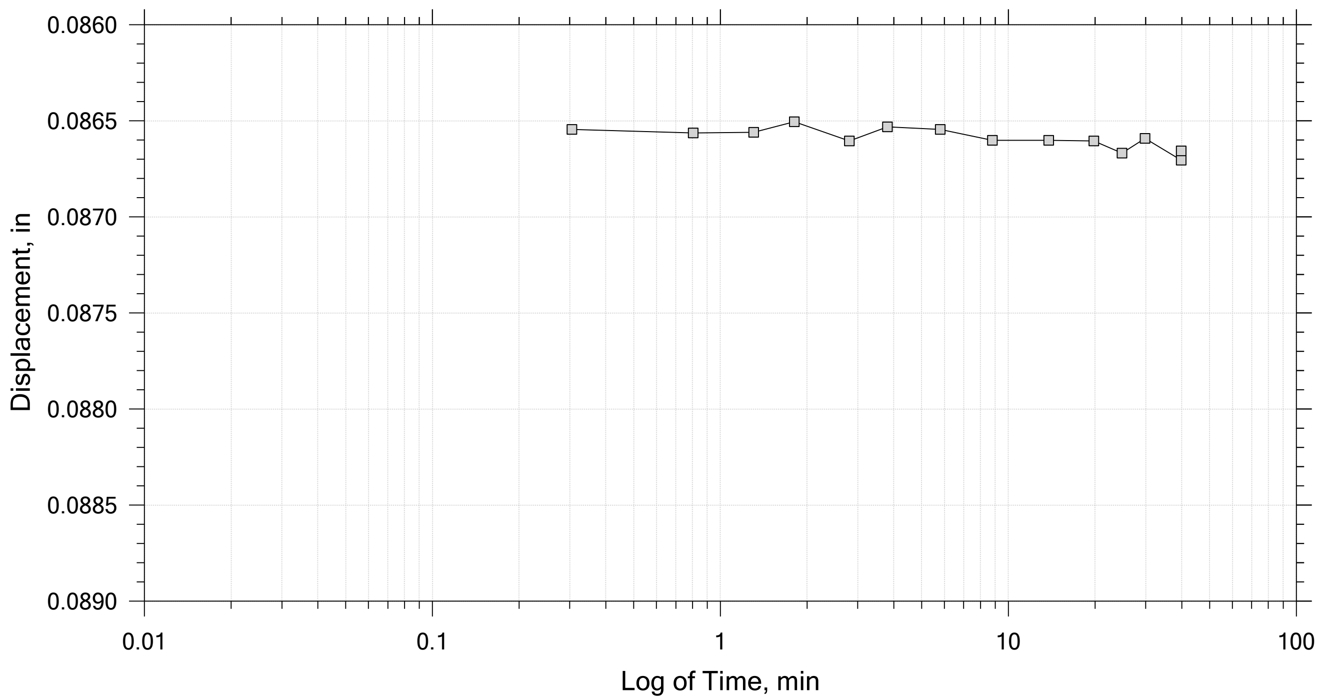
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
	Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
	Description: Gray silt		
	Remarks:		

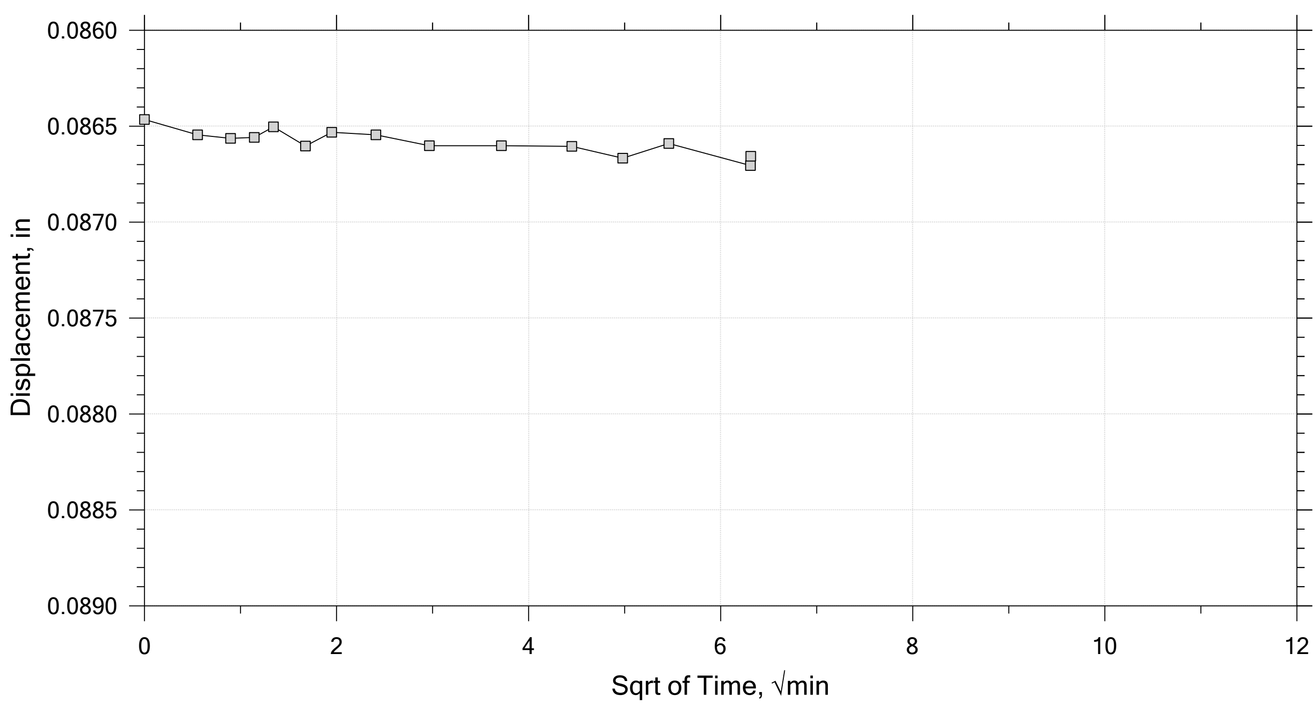
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 19

Constant Load Step

Stress: 0.25 tsf

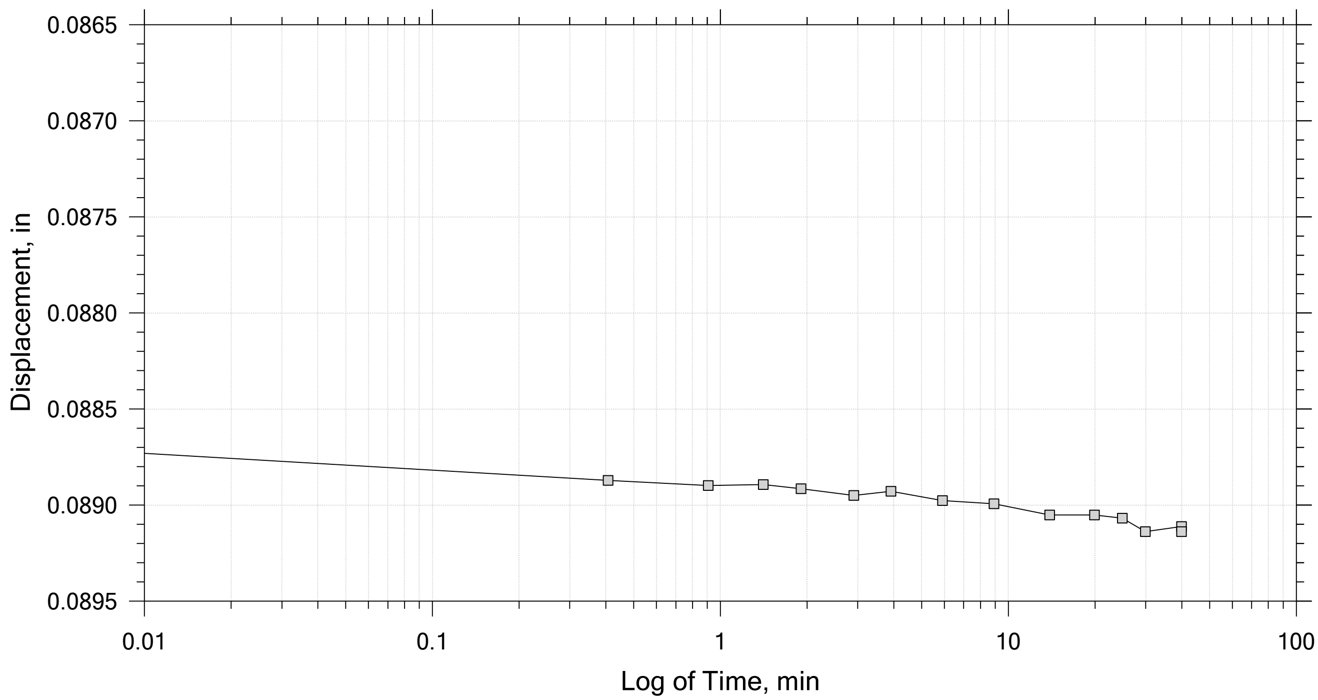


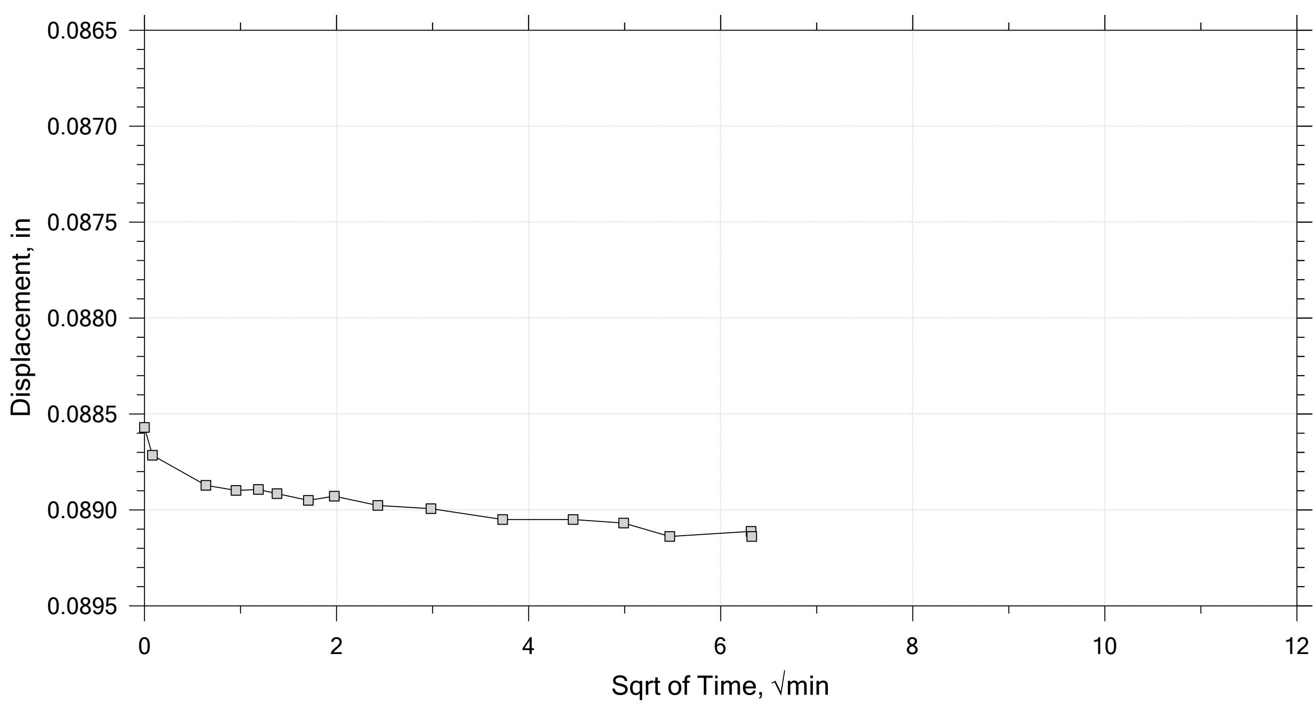


	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
	Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
	Description: Gray silt		
	Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 19
Constant Load Step
Stress: 0.5 tsf





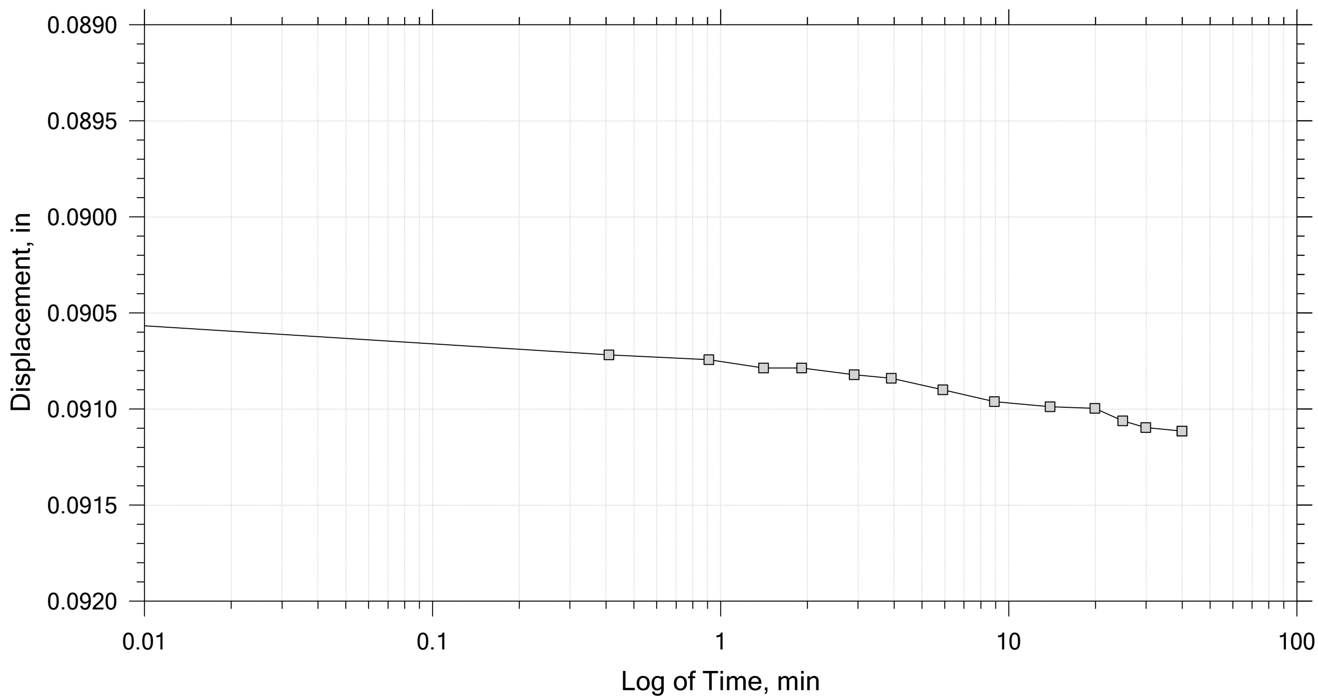
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
	Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
	Description: Gray silt		
	Remarks:		

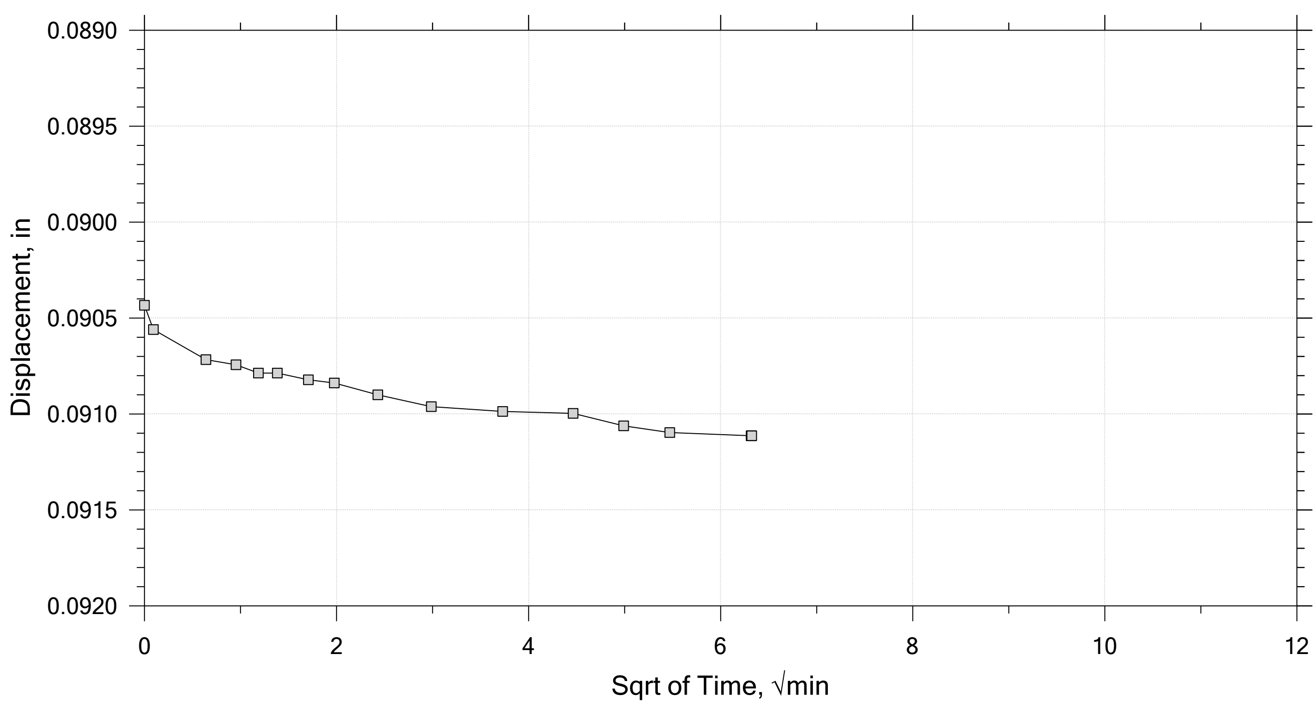
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 19

Constant Load Step

Stress: 1 tsf





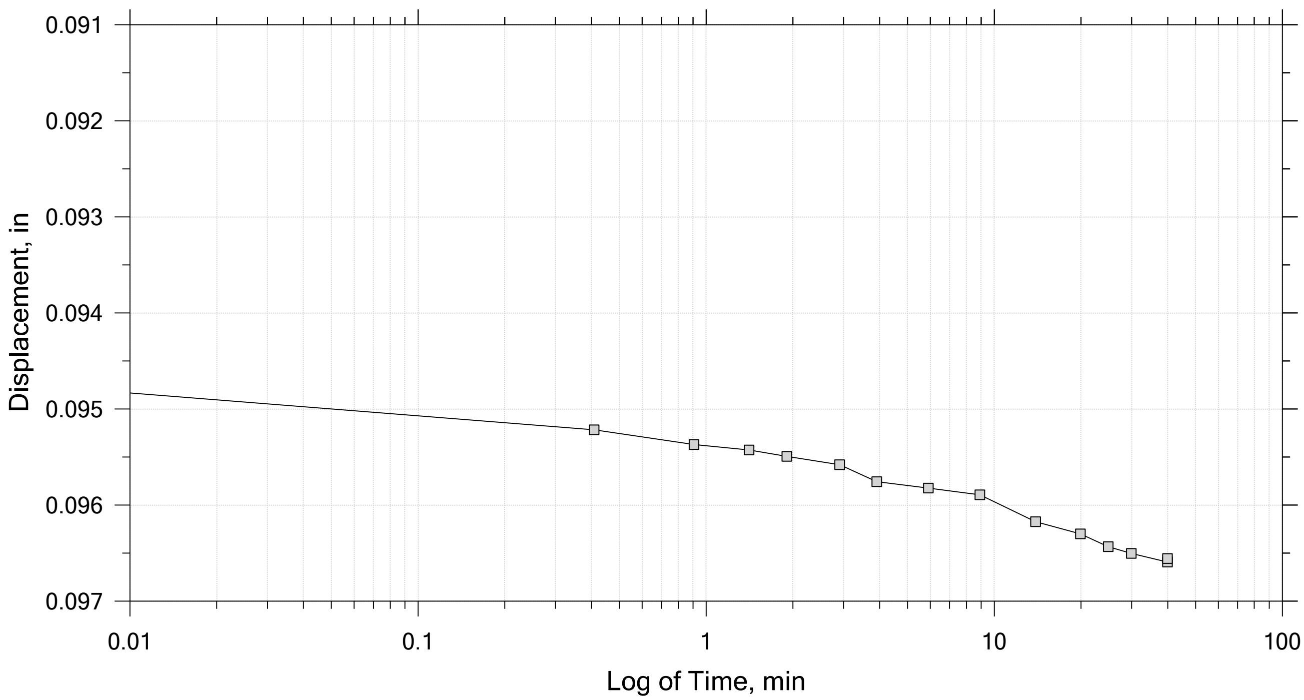
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
	Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
	Description: Gray silt		
	Remarks:		

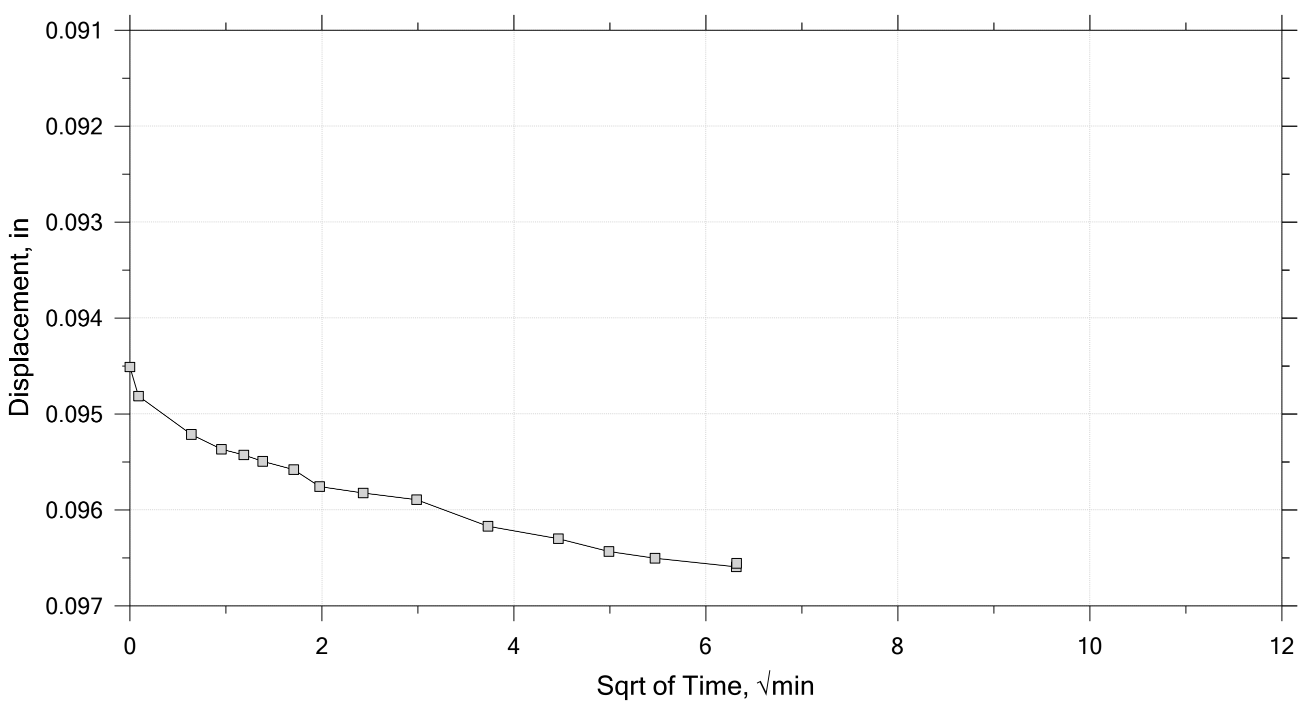
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 19

Constant Load Step

Stress: 2 tsf





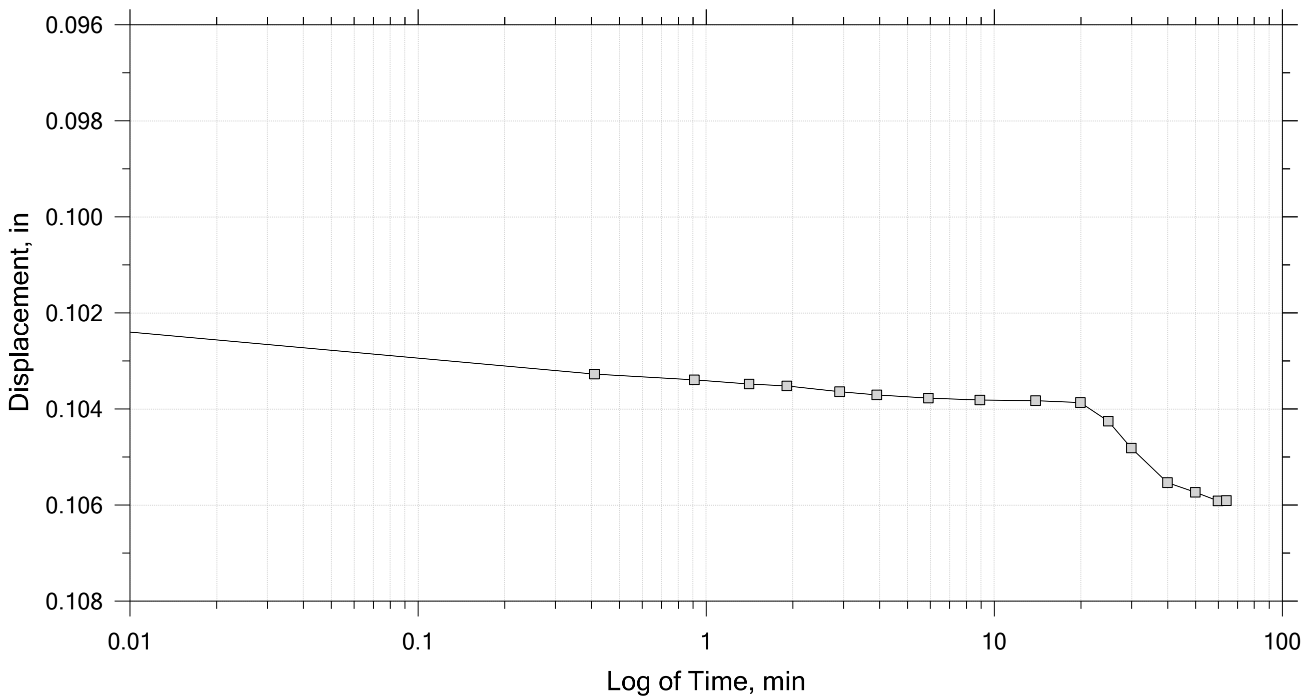
Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
Description: Gray silt		
Remarks:		

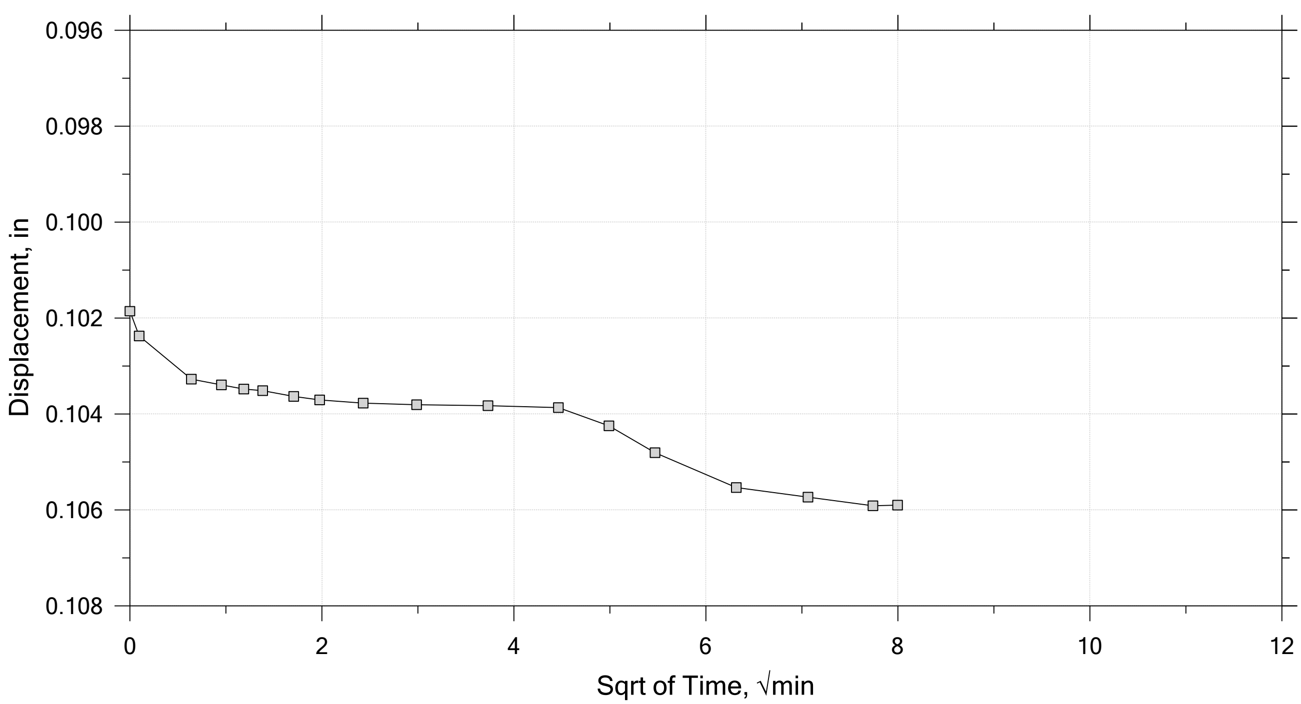
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 19

Constant Load Step

Stress: 4 tsf





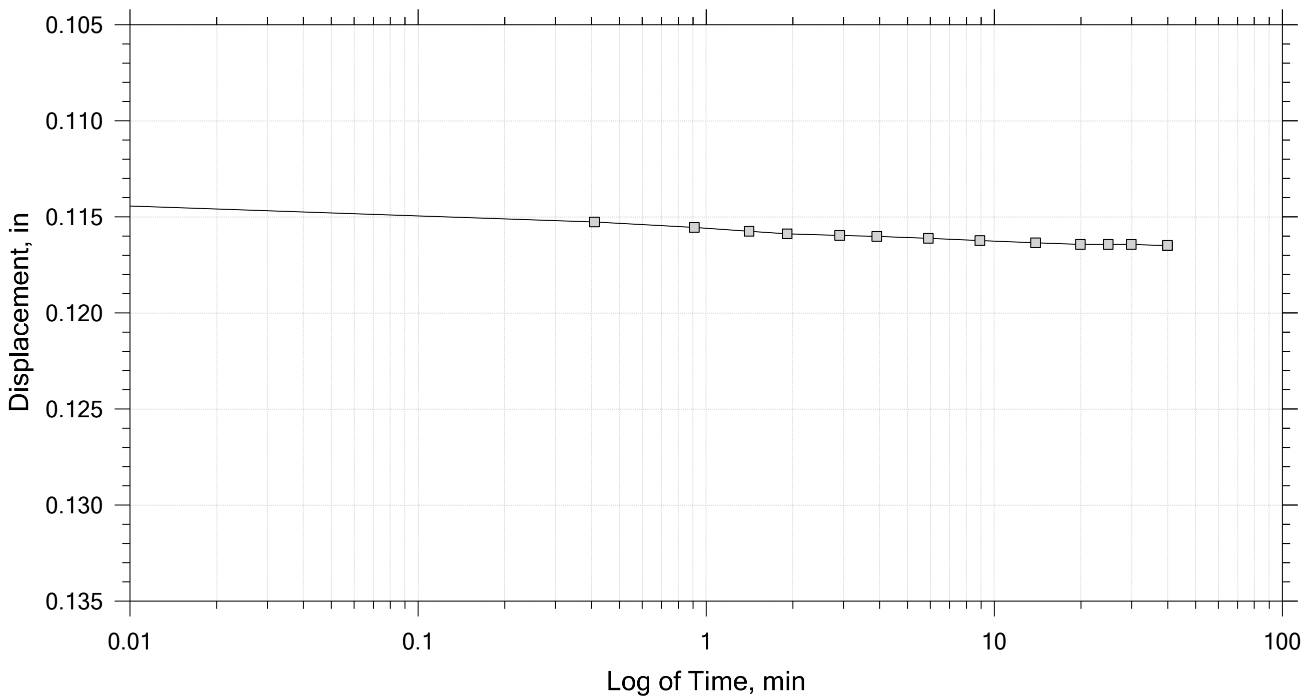
	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
	Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
	Description: Gray silt		
	Remarks:		

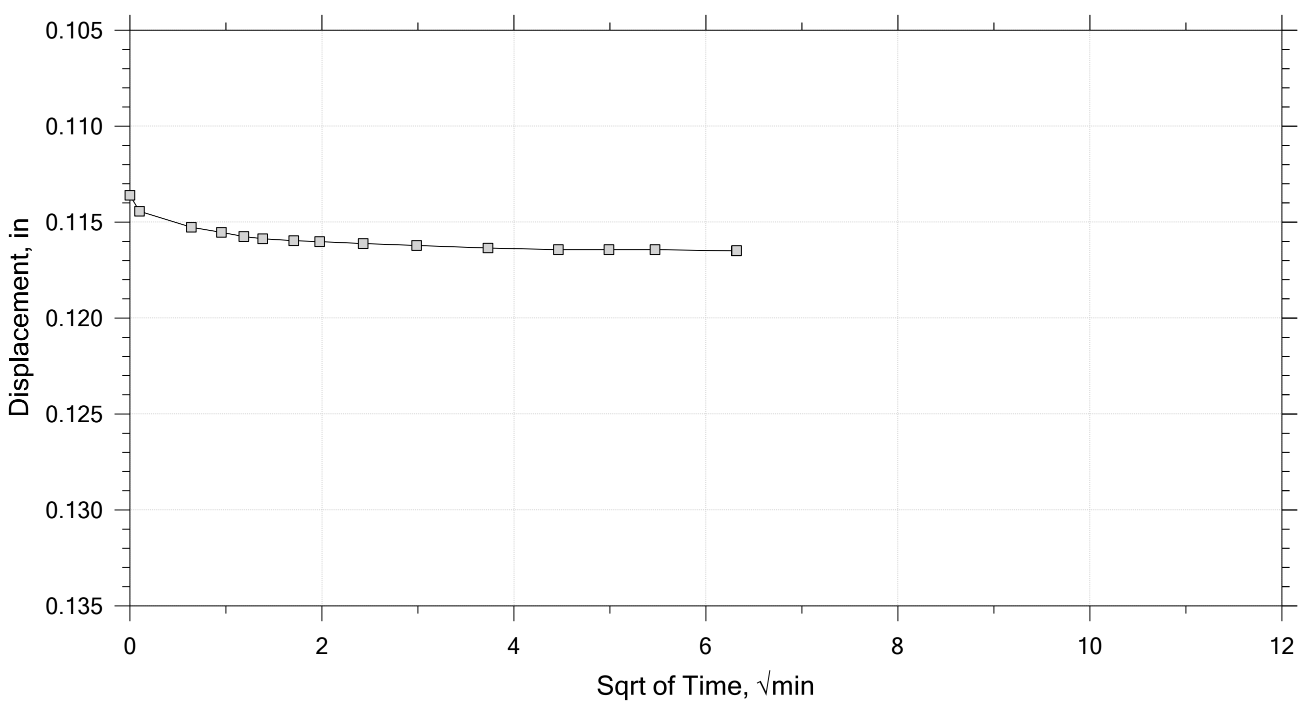
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 19

Constant Load Step

Stress: 8 tsf





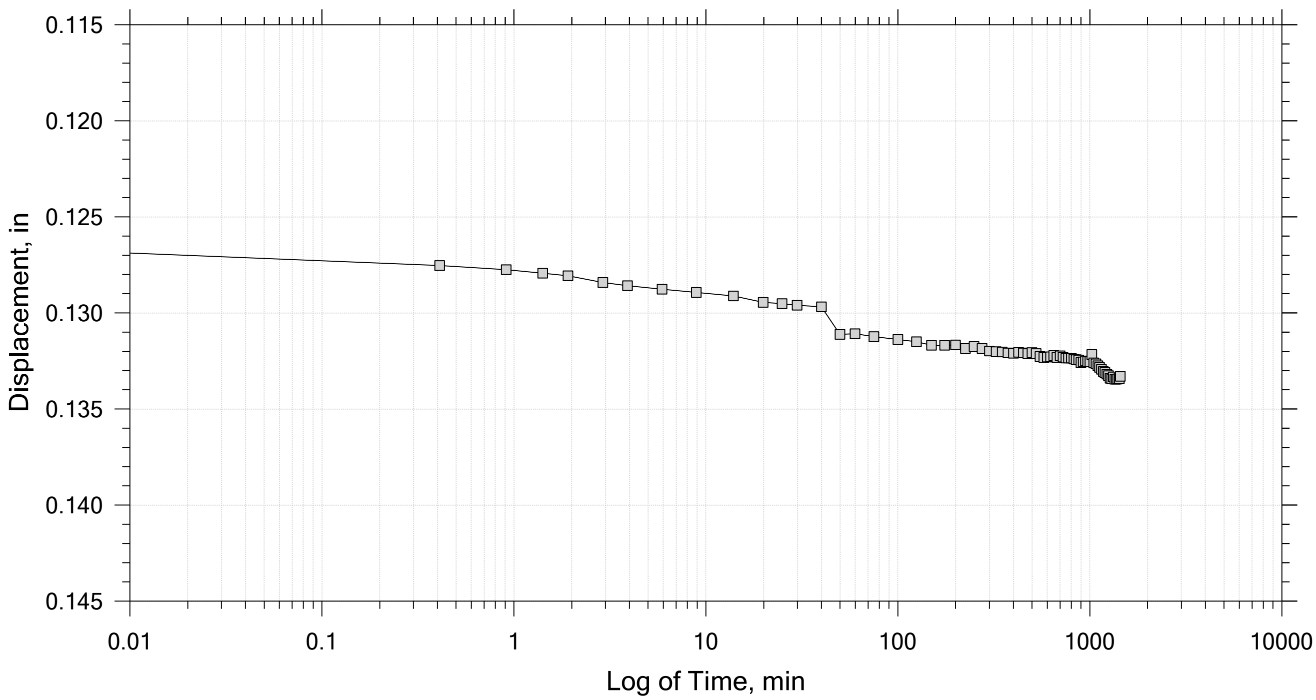
Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
Description: Gray silt		
Remarks:		

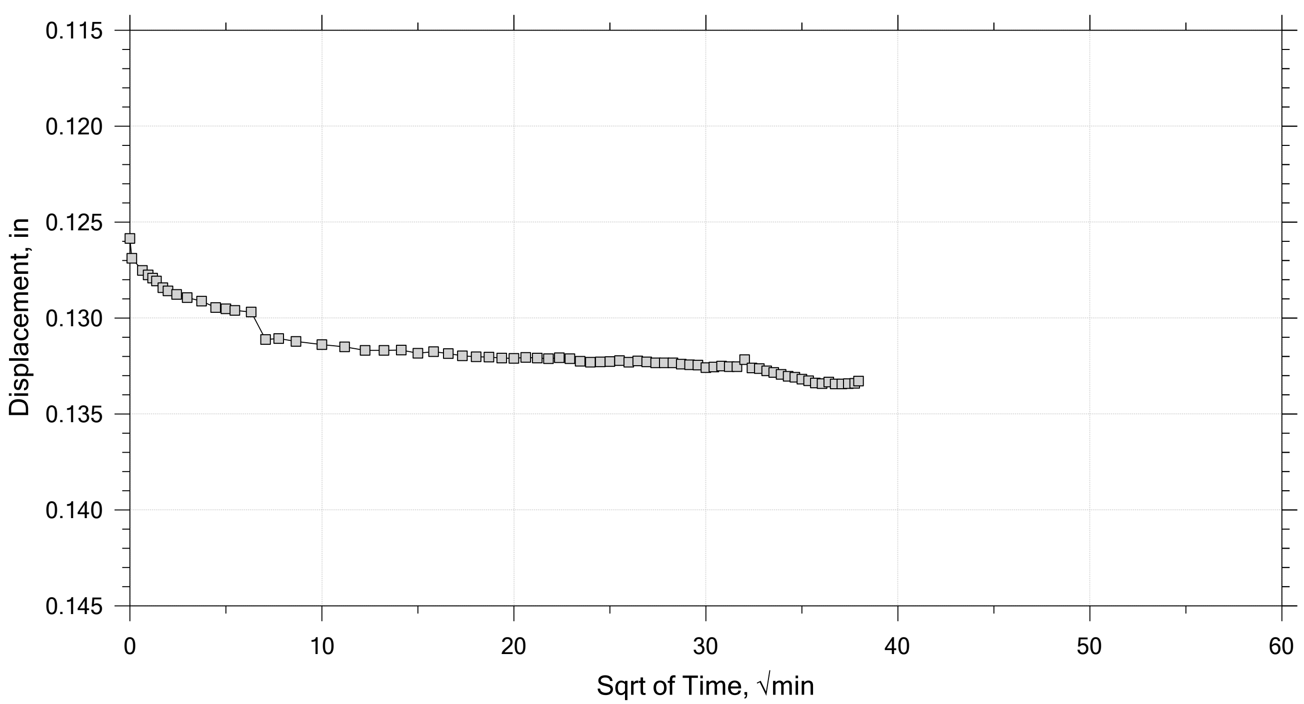
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 19

Constant Load Step

Stress: 16 tsf





	Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
	Boring Number: SB-03	Tester: JM	Checker: sa
	Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
	Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
	Description: Gray silt		
	Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter, in: 2.50	Specific Gravity: 2.65 (Estimated)	Liquid Limit: Non-Plastic
Specimen Height, in: 0.91	Initial Void Ratio: 0.672	Plastic Limit: Non-Plastic
Final Height, in: 0.81	Final Void Ratio: 0.484	Plasticity Index: Non-Plastic

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	19	---	69	
Mass Container, gm	50.53	109.31	109.31	51.12
Mass Container + Wet Soil, gm	219.44	261.71	255.64	194.06
Mass Container + Dry Soil, gm	177.24	225.46	225.46	164.58
Mass Dry Soil, gm	126.71	116.15	116.15	113.46
Water Content, %	33.30	31.21	25.98	25.98
Void Ratio	---	0.67	0.48	---
Degree of Saturation, %	---	123.09	142.37	---
Dry Unit Weight, pcf	---	98.949	111.51	---

Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
Description: Gray silt		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv ft²/lb	k cm/s	Ca %
1	0.0625	0.06124	0.560	6.72	0.000	0.00e+00	5.38e+02	0.00e+00	0.00e+00
2	0.125	0.06461	0.553	7.09	0.000	0.00e+00	2.96e+01	0.00e+00	0.00e+00
3	0.250	0.06800	0.547	7.46	0.000	0.00e+00	1.49e+01	0.00e+00	0.00e+00
4	0.500	0.07471	0.535	8.20	0.000	0.00e+00	1.47e+01	0.00e+00	0.00e+00
5	1.00	0.08296	0.520	9.11	0.000	0.00e+00	9.06e+00	0.00e+00	0.00e+00
6	2.00	0.09511	0.497	10.4	0.000	0.00e+00	6.67e+00	0.00e+00	1.00e-03
7	0.500	0.09284	0.502	10.2	0.000	0.00e+00	8.30e-01	0.00e+00	0.00e+00
8	0.125	0.08618	0.514	9.46	0.000	0.00e+00	9.76e+00	0.00e+00	0.00e+00
9	0.250	0.08666	0.513	9.51	0.000	0.00e+00	2.11e+00	0.00e+00	0.00e+00
10	0.500	0.08914	0.508	9.78	0.000	0.00e+00	5.45e+00	0.00e+00	0.00e+00
11	1.00	0.09111	0.505	10.0	0.000	0.00e+00	2.17e+00	0.00e+00	0.00e+00
12	2.00	0.09656	0.495	10.6	0.000	0.00e+00	2.99e+00	0.00e+00	0.00e+00
13	4.00	0.1059	0.478	11.6	23.013	1.62e-07	2.57e+00	7.93e-10	0.00e+00
14	8.00	0.1161	0.459	12.7	0.000	0.00e+00	1.40e+00	0.00e+00	0.00e+00
15	16.0	0.1333	0.427	14.6	0.000	0.00e+00	1.18e+00	0.00e+00	1.00e-03
16	4.00	0.1282	0.437	14.1	0.000	0.00e+00	2.33e-01	0.00e+00	0.00e+00
17	1.00	0.1211	0.450	13.3	0.000	0.00e+00	1.31e+00	0.00e+00	0.00e+00
18	0.250	0.1104	0.469	12.1	0.000	0.00e+00	7.79e+00	0.00e+00	0.00e+00
19	0.0625	0.1026	0.484	11.3	0.000	0.00e+00	2.27e+01	0.00e+00	0.00e+00

Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
Description: Gray silt		
Remarks:		
Displacement at End of Primary		

One-Dimensional Consolidation by ASTM D2435 - Method B

Sqrt of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv ft²/lb	k cm/s
1	0.0625	0.06124	0.560	6.72	27.923	6.81e-07	5.38e+02	6.97e-07
2	0.125	0.06461	0.553	7.09	39.562	4.46e-07	2.96e+01	2.51e-08
3	0.250	0.06800	0.547	7.46	29.988	5.84e-07	1.49e+01	1.65e-08
4	0.500	0.07471	0.535	8.20	30.060	5.75e-07	1.47e+01	1.61e-08
5	1.00	0.08296	0.520	9.11	2.212	7.68e-06	9.06e+00	1.32e-07
6	2.00	0.09511	0.497	10.4	133.558	1.24e-07	6.67e+00	1.58e-09
7	0.500	0.09284	0.502	10.2	30.215	5.42e-07	8.30e-01	8.56e-10
8	0.125	0.08618	0.514	9.46	7.192	2.30e-06	9.76e+00	4.28e-08
9	0.250	0.08666	0.513	9.51	0.000	0.00e+00	2.11e+00	0.00e+00
10	0.500	0.08914	0.508	9.78	29.840	5.57e-07	5.45e+00	5.78e-09
11	1.00	0.09111	0.505	10.0	31.022	5.33e-07	2.17e+00	2.20e-09
12	2.00	0.09656	0.495	10.6	36.313	4.51e-07	2.99e+00	2.57e-09
13	4.00	0.1059	0.478	11.6	48.362	3.33e-07	2.57e+00	1.62e-09
14	8.00	0.1161	0.459	12.7	2.531	6.20e-06	1.40e+00	1.65e-08
15	16.0	0.1333	0.427	14.6	1122.948	1.35e-08	1.18e+00	3.03e-11
16	4.00	0.1282	0.437	14.1	17.996	8.30e-07	2.33e-01	3.68e-10
17	1.00	0.1211	0.450	13.3	11.591	1.31e-06	1.31e+00	3.25e-09
18	0.250	0.1104	0.469	12.1	1.369	1.13e-05	7.79e+00	1.68e-07
19	0.0625	0.1026	0.484	11.3	9.212	1.72e-06	2.27e+01	7.45e-08

Project Name: Sims Ave Pedestrian Bridge	Location: RI	Project Number: 74-20-0002.09
Boring Number: SB-03	Tester: JM	Checker: sa
Sample Number: ST-3	Test Date: 09.22.2020	Depth: 78.9-79.1'
Test Number: 20-C-2699	Preparation: Intact Tube	Elevation:
Description: Gray silt		
Remarks:		
Displacement at End of Primary		

Appendix E
Budget-Level Cost Estimates (Foundations Only)

Table E-1
Opinion of Probable Construction Cost - Drilled Micro-Pile Deep Foundation
Geotechnical Data and Design Basis Report
Sims Ave Pedestrian Bridge over the Woonasquatucket River

Item	Description	Unit of Payment	Estimated Quantity	Unit Price	Extended Total	Comments
1	**General Requirements**					
1A	**Basic General Requirements**					
	Performance and Payment Bonds	LS	1	$15,947.93	$15,947.93	Assume Bonds at 1.5% of Construction
	Survey Control/Survey Verification	CREW HR	24	$218.75	$5,250.00	Estimator's Judgement
	Micro-Pile Submittals	LS	1	$2,500.00	$2,500.00	Estimator's Judgement
	Earth Material Submittals	LS	1	$1,500.00	$1,500.00	Estimator's Judgement
	Concrete Submittals	LS	1	$1,500.00	$1,500.00	Estimator's Judgement
	Reinforcing Steel Submittals	LS	1	$1,500.00	$1,500.00	Estimator's Judgement
	Safety Activity Plan	LS	1	$2,500.00	$2,500.00	Estimator's Judgement
	Quality Control Plan	LS	1	$1,500.00	$1,500.00	Estimator's Judgement
	Meetings	EA	4	$500.00	$2,000.00	Say 1 Initial and 4 Progress Meetings
	Closeout Related Submittals	LS	1	$2,500.00	$2,500.00	Estimator's Judgement
					$36,697.93	
	Calculate Bid Unit Cost	LS	1		$36,697.93	
1B	**As-Built Drawings**					
	As-Built Drawings	LS	1	$7,500.00	$7,500.00	Estimator's Judgement
					$7,500.00	
	Calculate Bid Unit Cost	LS	1		$7,500.00	
2	**Mobilization**					
	Mobilize Equipment & Materials	LS	1	$38,500.00	$38,500.00	Micropile Subcontractor, Per Quote provided by KELLER
	Mobilize Equipment & Materials	LS	1	$25,000.00	$25,000.00	Estimator's Judgement, For Sheet Pile Cofferdam Subcontractor
	Full-Time Field Supervision During Construct.	MONTH	4	$22,300.00	$89,200.00	Estimator's Judgement
					$152,700.00	
	Calculate Bid Unit Cost	LS	1		$152,700.00	
3	**Quality Control**					
3A	Grain Size Through No. 200 Sieve	EA	2	$150.00	$300.00	Estimator's Judgement
3B	Moisture Density Relationship	EA	2	$250.00	$500.00	Estimator's Judgement
3C	Dry Density and As-Placed Moisture	1/2 DAY	2	$350.00	$700.00	Estimator's Judgement
	Collect and Test Grout Tubes	EA	36	$100.00	$3,600.00	Estimator's Judgement
3E	Collect and Test Grout Cylinders	EA	10	$150.00	$1,500.00	Estimator's Judgement
					$6,600.00	
	Calculate Bid Unit Cost	LS	1		$6,600.00	
4	**Erosion and Sediment Controls**					
	Silt Fence and Baled Hay Erosion Check	LF	200	$8.00	$1,600.00	Estimator's Judgement
					$1,600.00	
	Calculate Bid Unit Cost	LS	1		$1,600.00	
5	**Temporary Cofferdams & Dewatering**					
	Furnish Steel Sheeting	LB	132,480	$1.15	$152,352.00	Assume 24-foot-long sheets x 92 LF x 30 #/SF x 2 Locations = 132,480 LB
	Install Steel Sheeting (Cantilever Assumed)	DAY	6	$7,500.00	$45,000.00	Assume Foreman, Crane Operator, 2 Pile Drivers & Equip.
	Excavate Soil From Within Cofferdams (from around micropiles)	CY	300	$50.00	$15,000.00	Assume 18 ft. x 28 ft. x 8-feet-deep x 2 locations/27 CF/CY = 300 CY
	Furnish Filter Stone Working Surface	TON	68	$25.00	$1,700.00	Assume 18 ft. x 28 ft. x 1-foot-deep x 135 PCF x 2 locations/2,000 LB/TON
	Place and Compact Filter Stone	CY	38	$10.00	$377.78	Assume 1.8 TON/CY
	Furnish & Install Dewatering Sumps and Pumps	EA	6	$2,500.00	$15,000.00	Assume 2 per Cofferdam
	Furnish Dewatering Bags	EA	6	$250.00	$1,500.00	Estimator's Judgement
	Operate Sumps and Pumps	DAY	60	$500.00	$30,000.00	Assume 30 days per Cofferdam
					$260,929.78	
	Calculate Bid Unit Cost	LS	1		$260,929.78	

Table E-1
Opinion of Probable Construction Cost - Drilled Micro-Pile Deep Foundation
Geotechnical Data and Design Basis Report
Sims Ave Pedestrian Bridge over the Woonasquatucket River

Item	Description	Unit of Payment	Estimated Quantity	Unit Price	Extended Total	Comments
6	**Micro-Pile Foundation**					
6A	**Micro-Piles (10.75 OD, Gr 80, No. 18 Bar,Gr 75, 5,000 PSI Grout)**					
	Furnish, Install, and Test Indicator Pile	LS	1	$62,000.00	$62,000.00	Per Quote provided by KELLER
	Furnish and Install Production Piles	EA	12	$38,500.00	$462,000.00	Per Quote provided by KELLER
	Drill Spoil Management/Disposal	LS	1	$50,000.00	$50,000.00	Allowance Item, Estimator's Judgement
					$574,000.00	
	Calculate Bid Unit Cost	LF	2,280		$251.75	
6B	**CIP Concrete Pile Caps**					
	Form and Pour Concrete Pile Caps	CY	34	$800.00	$27,200.00	Assume 7.5 ft. x 16 ft. x 3 ft. + 2.66 ft. x 16 ft. x 1 ft. + 1 ft. x 3 ft. x 16 ft. x 2/27
	Furnish Select Backfill	CY	228	$0.00	$0.00	Assume Excavated Onsite Material Utilized
	Place and Compact Select Backfill	CY	228	$10.00	$2,282.22	Estimator's Judgement
	Trucking of Excess Soil	TRK	7	$500.00	$3,588.89	Estimator's Judgement
	Offsite Disposal of Excess Soil	CY	72	$25.00	$1,794.44	Assume Material Utilized for Daily Cover
					$34,865.56	
	Calculate Bid Unit Cost	EA	2		$17,432.78	
7	**Demobilization and Clean-up**					
	Demobilization and Clean-up	LS	1	$25,000.00	$25,000.00	Estimator's Judgement
					$25,000.00	
	Calculate Bid Unit Cost	LS	1		$25,000.00	
	CONSTRUCTION SUBTOTAL				$1,099,893.26	Sum of Base Bid Items 1 through 7
	SCOPE AND BUDGET CONTINGENCIES @ 20%				$219,978.65	Scope and Budget Contingencies
	TOTAL CONSTRUCTION ESTIMATE (2021 USD)				**$1,400,000.00**	Rounded to the Nearest $100,000.00

Table E-2
Opinion of Probable Construction Cost - Shallow Spread Footing Foundation
Geotechnical Data and Design Basis Report
Sims Ave Pedestrian Bridge over the Woonasquatucket River

Item	Description	Unit of Payment	Estimated Quantity	Unit Price	Extended Total	Comments
1	**General Requirements**					
1A	**Basic General Requirements**					
	Performance and Payment Bonds	LS	1	$8,752.22	$8,752.22	Assume Bonds at 1.5% of Construction
	Survey Control/Survey Verification	CREW HR	16	$218.75	$3,500.00	Estimator's Judgement
	Micro-Pile Submittals	LS	0	$2,500.00	$0.00	Estimator's Judgement
	Earth Material Submittals	LS	1	$1,500.00	$1,500.00	Estimator's Judgement
	Concrete Submittals	LS	1	$1,500.00	$1,500.00	Estimator's Judgement
	Reinforcing Steel Submittals	LS	1	$1,500.00	$1,500.00	Estimator's Judgement
	Safety Activity Plan	LS	1	$2,500.00	$2,500.00	Estimator's Judgement
	Quality Control Plan	LS	1	$1,500.00	$1,500.00	Estimator's Judgement
	Meetings	EA	4	$500.00	$2,000.00	Say 1 Initial and 4 Progress Meetings
	Closeout Related Submittals	LS	1	$2,500.00	$2,500.00	Estimator's Judgement
					$25,252.22	
	Calculate Bid Unit Cost	LS	1		$25,252.22	
1B	**As-Built Drawings**					
	As-Built Drawings	LS	1	$5,000.00	$5,000.00	Estimator's Judgement
					$5,000.00	
	Calculate Bid Unit Cost	LS	1		$5,000.00	
2	**Mobilization**					
	Mobilize Equipment & Materials	LS	1	$25,000.00	$25,000.00	Estimator's Judgement, For Sheet Pile Cofferdam Subcontractor
	Full-Time Field Supervision During Construct.	MONTH	3	$22,300.00	$66,900.00	Estimator's Judgement
					$91,900.00	
	Calculate Bid Unit Cost	LS	1		$91,900.00	
3	**Quality Control**					
3A	Grain Size Through No. 200 Sieve	EA	2	$150.00	$300.00	Estimator's Judgement
3B	Moisture Density Relationship	EA	2	$250.00	$500.00	Estimator's Judgement
3C	Dry Density and As-Placed Moisture	1/2 DAY	2	$350.00	$700.00	Estimator's Judgement
3E	Collect and Test Concrete Cylinders	EA	10	$150.00	$1,500.00	Estimator's Judgement
					$3,000.00	
	Calculate Bid Unit Cost	LS	1		$3,000.00	
4	**Erosion and Sediment Controls**					
	Silt Fence and Baled Hay Erosion Check	LF	200	$8.00	$1,600.00	Estimator's Judgement
					$1,600.00	
	Calculate Bid Unit Cost	LS	1		$1,600.00	
5	**Temporary Cofferdams & Dewatering**					
	Furnish Steel Sheeting	LB	218,960	$1.15	$251,804.00	Assume 34-foot-long sheets x 92 LF x 35 #/SF x 2 Locations = 218,960 LB
	Furnish HP12x63 Steel Wales and Struts	LB	16,128	$1.00	$16,128.00	Assume 128 LF x 63 LB/LF x 2 Locations = 16,128 LB
	Install Steel Sheeting, Wales, and Struts (1 Level of Wales/Struts Assumed)	DAY	10	$7,500.00	$75,000.00	Assume Foreman, Crane Operator, 2 Pile Drivers & Equip.
	Excavate Soil From Within Cofferdams	CY	410	$15.00	$6,150.00	Assume 18 ft. x 28 ft. x 11-feet-deep x 2 locations/27 CF/CY = 410 CY
	Furnish & Install Dewatering Sumps and Pumps	EA	6	$2,500.00	$15,000.00	Assume 2 per Cofferdam
	Furnish Dewatering Bags	EA	6	$250.00	$1,500.00	Estimator's Judgement
	Operate Sumps and Pumps	DAY	40	$500.00	$20,000.00	Assume 20 days per Cofferdam
					$385,582.00	
	Calculate Bid Unit Cost	LS	1		$385,582.00	

Table E-2
Opinion of Probable Construction Cost - Shallow Spread Footing Foundation
Geotechnical Data and Design Basis Report
Sims Ave Pedestrian Bridge over the Woonasquatucket River

Item	Description	Unit of Payment	Estimated Quantity	Unit Price	Extended Total	Comments
6	**Shallow Spread Footing Foundation**					
6A	**CIP Concrete Spread Footings**					
	Form and Pour Concrete Pile Caps	CY	28	$800.00	$22,400.00	Assume 7.5 ft. x 16 ft. x 2 ft. + 2.66 ft. x 16 ft. x 2 ft. + 1 ft. x 3 ft. x 16 ft. x 2/27
	Furnish Structural Fill (Light-Weight Fill Assumed, Type to be Determined)	CY	205	$100.00	$20,500.00	Assume 18 ft. x 28 ft. x 5.5-feet-deep x 2 locations/ 27 CF/CY = 102 CY
	Place and Compact Structural Fill	CY	205	$25.00	$5,125.00	Estimator's Judgement
	Furnish Filter Stone Working Surface	TON	68	$25.00	$1,700.00	Assume 18 ft. x 28 ft. x 1-foot-deep x 135 PCF x 2 locations/2,000 LB/TON
	Place and Compact Filter Stone	CY	122	$15.00	$1,836.00	Estimator's Judgement
	Furnish Select Backfill	CY	139	$0.00	$0.00	Assume Excavated Onsite Material Utilized
	Place and Compact Select Backfill	CY	139	$15.00	$2,088.33	Estimator's Judgement
	Trucking of Excess Soil	TRK	30	$500.00	$15,000.00	Estimator's Judgement
	Offsite Disposal of Excess Soil	CY	310	$25.00	$7,750.00	Assume Material Utilized for Daily Cover
					$76,399.33	
	Calculate Bid Unit Cost	EA	2		$38,199.67	
7	**Demobilization and Clean-up**					
	Demobilization and Clean-up	LS	1	$20,000.00	$20,000.00	Estimator's Judgement, Foundation Contractor Only
					$20,000.00	
	Calculate Bid Unit Cost	LS	1		$20,000.00	
	CONSTRUCTION SUBTOTAL				$608,733.55	Sum of Base Bid Items 1 through 7
	SCOPE AND BUDGET CONTINGENCIES @ 20%				$121,746.71	Scope and Budget Contingencies
	TOTAL CONSTRUCTION ESTIMATE (2021 USD)				**$800,000.00**	Rounded to the Nearest $100,000.00

Table 1
Soil Analytical Data
Providence Pedestrian Bridge
Providence, Rhode Island

Sample Designation	SB-03 0-2	SB-03 6-8	SB-03 Comp	SB-04 0-2	SB-04 6-8	SB-04 Comp	RIDEM	RIDEM
Sample Date	**08/31/2020**	**08/31/2020**	**08/31/2020**	**09/04/2020**	**09/04/2020**	**09/04/2020**	**RESDEC**	**I/C DEC**
Volatile Organic Compounds, milligrams per kilogram (mg/kg)								
Acetone	0.0393 U	**0.115**	---	**0.105**	**0.0494**	---	7,800	10,000
Semi-Volatile Organic Compounds, mg/kg								
Benzo(a)anthracene	**1.07**	0.545 U	---	**1.22**	0.443 U	---	0.9	7.8
Benzo(a)pyrene	**1.12**	0.273 U	---	**1.24**	0.222 U	---	0.4	0.8
Benzo(b)fluoranthene	**1.01**	0.545 U	---	**1.32**	0.443 U	---	0.9	7.8
Benzo(g,h,i)perylene	0.719 U	0.545 U	---	**0.654**	0.443 U	---	0.8	10,000
Benzo(k)fluoranthene	**0.796**	0.545 U	---	**1.02**	0.443 U	---	0.9	78
Chrysene	**1.03**	0.273 U	---	**1.3**	0.222 U	---	0.4	780
Dibenzo(a,h)Anthracene	0.361 U	0.273 U	---	**0.254**	0.222 U	---	0.4	0.8
Fluoranthene	**1.94**	0.545 U	---	**2.03**	0.443 U	---	20	10,000
Indeno(1,2,3-cd)Pyrene	0.719 U	0.545 U	---	**0.603**	0.443 U	---	0.9	7.8
Phenanthrene	**1.16**	0.545 U	---	**1.11**	0.443 U	---	40	10,000
Pyrene	**1.87**	0.545 U	---	**2.16**	0.443 U	---	13	10,000
Total SVOCs	**10.0**	ND	---	**12.9**	ND	---	NE	NE
Total Petroleum Hydrocarbons, mg/kg								
Total Petroleum Hydrocarbons	**378**	**115**	---	**193**	51.8 U	---	500	2,500
Total Metals, mg/kg								
Antimony	4.85 U	7.43 U	---	5.26 U	6.46 U	---	10	820
Arsenic	**4.97**	**10.1**	---	**4.56**	**5.38**	---	**7**	**7**
Barium	**40**	**13.9**	---	**53.8**	**11.6**	---	5,500	10,000
Beryllium	**0.25**	**0.41**	---	**0.36**	**0.21**	---	1.5	1.5
Cadmium	0.48 U	0.74 U	---	0.53 U	0.65 U	---	39	1,000
Chromium	**13.4**	**19.6**	---	**35.7**	**9.04**	---	1,400	10,000
Copper	**35.1**	**13.6**	---	**74.7**	**190**	---	3,100	10,000
Lead	**85.1**	**76.4**	---	**60.6**	**17.9**	---	150	500
Mercury	**0.152**	**0.311**	---	**0.172**	0.041 U	---	23	610
Nickel	**14.9**	**5.6**	---	**15**	**19.3**	---	1,000	10,000
Selenium	4.85 U	7.43 U	---	5.26 U	6.46 U	---	390	10,000
Silver	**3.66**	0.74 U	---	**0.8**	0.65 U	---	200	10,000
Thallium	4.85 U	0.74 U	---	5.26 U	0.65 U	---	5.5	140
Vanadium	**18.7**	**12**	---	**16**	**8.79**	---	550	10,000
Zinc	**118**	**23**	---	**172**	**44.5**	---	6,000	10,000
Pesticides, mg/kg								
Total Pesticides			ND			ND		
Polychlorinated Biphenyls, mg/kg								
Aroclor 1260	**0.04**	0.04 U	---	0.05 U	0.07 U	---	10	10
Herbicides, mg/kg								
Total Herbicides			ND			ND		
Classical Chemistry								
Conductivity	---	---	**196**	---	---	**184**	NE	NE
Corrosivity (pH)	---	---	**6.7**	---	---	**6.81**	NE	NE
Flashpoint	---	---	>200	---	---	>200	NE	NE
Free Liquid	---	---	0.3 U	---	---	0.3 U	NE	NE
Reactive Cyanide	---	---	2 U	---	---	2 U	NE	NE
Reactive Sulfide	---	---	2 U	---	---	2 U	NE	NE

Notes
BOLD - compound detected
BOLD and Shaded - compound detected above regulatory standard
ND - Not detected above the laboratory method detection limits
U - Not detected above listed detection limit.
--- - Not analyzed for this compound
NE - Standard not established

CERTIFICATE OF ANALYSIS

Joe McLoughlin
Beta Engineering
701 George Washington Hwy 2nd FL
Lincoln, RI 02865

RE: Sims Ave Pedestrian Bridge (6620)
ESS Laboratory Work Order Number: 20I0200

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

REVIEWED
By ESS Laboratory at 3:17 pm, Sep 18, 2020

Laurel Stoddard
Laboratory Director

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge

ESS Laboratory Work Order: 20I0200

SAMPLE RECEIPT

The following samples were received on September 04, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by ESS Laboratory on September 4, 2020 at 15:27.

Lab Number	Sample Name	Matrix	Analysis
20I0200-01	SB-04 0-2	Soil	6010C, 7471B, 8082A, 8100M, 8260B Low, 8270D
20I0200-02	SB-04 6-8	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
20I0200-03	SB-04 Comp	Soil	1010A, 7.3.3.2, 7.3.4.1, 8081B, 8151A, 9045, 9050A, 9095A

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

20I0200-01 **Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).**
1,4-Dichlorobenzene-D4 (36% @ 50-200%)

8100M Total Petroleum Hydrocarbons

20I0200-01 **Surrogate recovery(ies) diluted below the MRL (SD).**
O-Terphenyl (% @ 40-140%)

8151A Chlorinated Herbicides

20I0200-03 **Surrogate recovery(ies) above upper control limit (S+).**
DCAA (152% @ 30-150%)

8270D Semi-Volatile Organic Compounds

D0I0126-CCV1 **Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration**
2-Methylphenol (113% @ 80-120%), bis(2-Chloroethyl)ether (109% @ 80-120%), Hexachloroethane (108% @ 80-120%), N-Nitrosodimethylamine (101% @ 80-120%), Phenol (109% @ 80-120%)

D0I0126-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (77% @ 80-120%), Benzoic Acid (89% @ 80-120%)

D0I0126-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
N-Nitroso-Di-n-Propylamine (21% @ 20%)

D0I0126-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
2,4-Dinitrophenol (23% @ 20%)

DI01012-BS1 **Blank Spike recovery is below lower control limit (B-).**
Aniline (38% @ 40-140%), Pyridine (37% @ 40-140%)

DI01012-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Pyridine (39% @ 40-140%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 0-2
Date Sampled: 09/04/20 09:00
Percent Solids: 91

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (5.26)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Arsenic	**4.56** (2.63)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Barium	**53.8** (2.63)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Beryllium	**0.36** (0.12)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Cadmium	ND (0.53)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Chromium	**35.7** (1.05)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Copper	**74.7** (2.63)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Lead	**60.6** (5.26)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Mercury	**0.172** (0.032)		7471B		1	MKS	09/09/20 9:02	0.68	40	DI01172
Nickel	**15.0** (2.63)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Selenium	ND (5.26)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Silver	**0.80** (0.53)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Thallium	ND (5.26)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Vanadium	**16.0** (1.05)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171
Zinc	**172** (2.63)		6010C		1	KJK	09/10/20 1:04	2.09	100	DI01171

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 0-2
Date Sampled: 09/04/20 09:00
Percent Solids: 91
Initial Volume: 6.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,1,1-Trichloroethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,1,2,2-Tetrachloroethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,1,2-Trichloroethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,1-Dichloroethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,1-Dichloroethene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,1-Dichloropropene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,2,3-Trichlorobenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,2,3-Trichloropropane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,2,4-Trichlorobenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,2,4-Trimethylbenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,2-Dibromo-3-Chloropropane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,2-Dibromoethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,2-Dichlorobenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,2-Dichloroethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,2-Dichloropropane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,3,5-Trimethylbenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,3-Dichlorobenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,3-Dichloropropane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,4-Dichlorobenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1,4-Dioxane	ND (0.0860)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
1-Chlorohexane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
2,2-Dichloropropane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
2-Butanone	ND (0.0430)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
2-Chlorotoluene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
2-Hexanone	ND (0.0430)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
4-Chlorotoluene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
4-Isopropyltoluene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
4-Methyl-2-Pentanone	ND (0.0430)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Acetone	**0.105** (0.0430)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Benzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Bromobenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 0-2
Date Sampled: 09/04/20 09:00
Percent Solids: 91
Initial Volume: 6.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Bromodichloromethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Bromoform	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Bromomethane	ND (0.0086)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Carbon Disulfide	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Carbon Tetrachloride	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Chlorobenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Chloroethane	ND (0.0086)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Chloroform	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Chloromethane	ND (0.0086)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
cis-1,2-Dichloroethene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
cis-1,3-Dichloropropene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Dibromochloromethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Dibromomethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Dichlorodifluoromethane	ND (0.0086)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Diethyl Ether	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Di-isopropyl ether	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Ethyl tertiary-butyl ether	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Ethylbenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Hexachlorobutadiene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Isopropylbenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Methyl tert-Butyl Ether	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Methylene Chloride	ND (0.0215)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Naphthalene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
n-Butylbenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
n-Propylbenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
sec-Butylbenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Styrene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
tert-Butylbenzene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Tertiary-amyl methyl ether	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Tetrachloroethene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Tetrahydrofuran	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 0-2
Date Sampled: 09/04/20 09:00
Percent Solids: 91
Initial Volume: 6.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
trans-1,2-Dichloroethene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
trans-1,3-Dichloropropene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Trichloroethene	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Trichlorofluoromethane	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Vinyl Acetate	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Vinyl Chloride	ND (0.0086)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Xylene O	ND (0.0043)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Xylene P,M	ND (0.0086)		8260B Low		1	09/08/20 14:06	D0I0095	DI01005
Xylenes (Total)	ND (0.00860)		8260B Low		1	09/08/20 14:06		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*109 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*78 %*		*70-130*
Surrogate: Dibromofluoromethane	*109 %*		*70-130*
Surrogate: Toluene-d8	*116 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 0-2
Date Sampled: 09/04/20 09:00
Percent Solids: 91
Initial Volume: 20.3
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/8/20 14:00

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.05)		8082A		1	09/09/20 18:08		DI01015
Aroclor 1221	ND (0.05)		8082A		1	09/09/20 18:08		DI01015
Aroclor 1232	ND (0.05)		8082A		1	09/09/20 18:08		DI01015
Aroclor 1242	ND (0.05)		8082A		1	09/09/20 18:08		DI01015
Aroclor 1248	ND (0.05)		8082A		1	09/09/20 18:08		DI01015
Aroclor 1254	ND (0.05)		8082A		1	09/09/20 18:08		DI01015
Aroclor 1260	ND (0.05)		8082A		1	09/09/20 18:08		DI01015
Aroclor 1262	ND (0.05)		8082A		1	09/09/20 18:08		DI01015
Aroclor 1268	ND (0.05)		8082A		1	09/09/20 18:08		DI01015

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*81 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*80 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*74 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*83 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering	
Client Project ID: Sims Ave Pedestrian Bridge	ESS Laboratory Work Order: 20I0200
Client Sample ID: SB-04 0-2	ESS Laboratory Sample ID: 20I0200-01
Date Sampled: 09/04/20 09:00	Sample Matrix: Soil
Percent Solids: 91	Units: mg/kg dry
Initial Volume: 19.9	Analyst: TLW
Final Volume: 1	Prepared: 9/8/20 10:45
Extraction Method: 3546	

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**193** (177)		8100M		20	09/09/20 18:13	D0I0083	DI01025

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*%*	*SD*	*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 0-2
Date Sampled: 09/04/20 09:00
Percent Solids: 91
Initial Volume: 15.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/8/20 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
1,2,4-Trichlorobenzene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
1,2-Dichlorobenzene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
1,3-Dichlorobenzene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
1,4-Dichlorobenzene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2,3,4,6-Tetrachlorophenol	ND (1.79)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2,4,5-Trichlorophenol	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2,4,6-Trichlorophenol	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2,4-Dichlorophenol	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2,4-Dimethylphenol	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2,4-Dinitrophenol	ND (1.79)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2,4-Dinitrotoluene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2,6-Dinitrotoluene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2-Chloronaphthalene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2-Chlorophenol	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2-Methylnaphthalene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2-Methylphenol	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2-Nitroaniline	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
2-Nitrophenol	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
3,3´-Dichlorobenzidine	ND (0.715)		8270D		1	09/08/20 22:15	D0I0126	DI01012
3+4-Methylphenol	ND (0.715)		8270D		1	09/08/20 22:15	D0I0126	DI01012
3-Nitroaniline	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
4,6-Dinitro-2-Methylphenol	ND (1.79)		8270D		1	09/08/20 22:15	D0I0126	DI01012
4-Bromophenyl-phenylether	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
4-Chloro-3-Methylphenol	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
4-Chloroaniline	ND (0.715)		8270D		1	09/08/20 22:15	D0I0126	DI01012
4-Chloro-phenyl-phenyl ether	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
4-Nitroaniline	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
4-Nitrophenol	ND (1.79)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Acenaphthene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Acenaphthylene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Acetophenone	ND (0.715)		8270D		1	09/08/20 22:15	D0I0126	DI01012

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 0-2
Date Sampled: 09/04/20 09:00
Percent Solids: 91
Initial Volume: 15.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/8/20 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.715)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Anthracene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Azobenzene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Benzo(a)anthracene	**1.22** (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Benzo(a)pyrene	**1.24** (0.179)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Benzo(b)fluoranthene	**1.32** (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Benzo(g,h,i)perylene	**0.654** (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Benzo(k)fluoranthene	**1.02** (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Benzoic Acid	ND (1.79)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Benzyl Alcohol	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
bis(2-Chloroethoxy)methane	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
bis(2-Chloroethyl)ether	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
bis(2-chloroisopropyl)Ether	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
bis(2-Ethylhexyl)phthalate	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Butylbenzylphthalate	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Carbazole	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Chrysene	**1.30** (0.179)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Dibenzo(a,h)Anthracene	**0.254** (0.179)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Dibenzofuran	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Diethylphthalate	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Dimethylphthalate	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Di-n-butylphthalate	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Di-n-octylphthalate	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Fluoranthene	**2.03** (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Fluorene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Hexachlorobenzene	ND (0.179)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Hexachlorobutadiene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Hexachlorocyclopentadiene	ND (1.79)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Hexachloroethane	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Indeno(1,2,3-cd)Pyrene	**0.603** (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Isophorone	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Naphthalene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 0-2
Date Sampled: 09/04/20 09:00
Percent Solids: 91
Initial Volume: 15.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/8/20 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
N-Nitrosodimethylamine	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
N-Nitroso-Di-n-Propylamine	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
N-nitrosodiphenylamine	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Pentachlorophenol	ND (1.79)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Phenanthrene	**1.11** (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Phenol	ND (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Pyrene	**2.16** (0.357)		8270D		1	09/08/20 22:15	D0I0126	DI01012
Pyridine	ND (1.79)		8270D		1	09/08/20 22:15	D0I0126	DI01012

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*64 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*82 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*82 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*67 %*		*30-130*
Surrogate: 2-Fluorophenol	*68 %*		*30-130*
Surrogate: Nitrobenzene-d5	*65 %*		*30-130*
Surrogate: Phenol-d6	*88 %*		*30-130*
Surrogate: p-Terphenyl-d14	*94 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 6-8
Date Sampled: 09/04/20 09:30
Percent Solids: 71

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (6.46)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Arsenic	**5.38** (3.23)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Barium	**11.6** (3.23)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Beryllium	**0.21** (0.14)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Cadmium	ND (0.65)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Chromium	**9.04** (1.29)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Copper	**190** (3.23)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Lead	**17.9** (6.46)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Mercury	ND (0.041)		7471B		1	MKS	09/09/20 9:04	0.68	40	DI01172
Nickel	**19.3** (3.23)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Selenium	ND (6.46)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Silver	ND (0.65)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Thallium	ND (0.65)		6020A		1	NAR	09/18/20 10:30	2.18	100	DI01171
Vanadium	**8.79** (1.29)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171
Zinc	**44.5** (3.23)		6010C		1	KJK	09/10/20 1:08	2.18	100	DI01171

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 6-8
Date Sampled: 09/04/20 09:30
Percent Solids: 71
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1,4-Dioxane	ND (0.0892)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
1-Chlorohexane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
2-Butanone	ND (0.0446)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
2-Chlorotoluene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
2-Hexanone	ND (0.0446)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
4-Chlorotoluene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
4-Methyl-2-Pentanone	ND (0.0446)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Acetone	**0.0494** (0.0446)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Benzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Bromobenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 6-8
Date Sampled: 09/04/20 09:30
Percent Solids: 71
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Bromodichloromethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Bromoform	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Bromomethane	ND (0.0089)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Carbon Disulfide	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Chlorobenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Chloroethane	ND (0.0089)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Chloroform	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Chloromethane	ND (0.0089)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Dibromochloromethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Dibromomethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Dichlorodifluoromethane	ND (0.0089)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Diethyl Ether	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Di-isopropyl ether	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Ethylbenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Isopropylbenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Methylene Chloride	ND (0.0223)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Naphthalene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
n-Butylbenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
n-Propylbenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
sec-Butylbenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Styrene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
tert-Butylbenzene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Tetrachloroethene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Tetrahydrofuran	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 6-8
Date Sampled: 09/04/20 09:30
Percent Solids: 71
Initial Volume: 7.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Trichloroethene	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Vinyl Acetate	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Vinyl Chloride	ND (0.0089)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Xylene O	ND (0.0045)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Xylene P,M	ND (0.0089)		8260B Low		1	09/08/20 14:31	D0I0095	DI01005
Xylenes (Total)	ND (0.00892)		8260B Low		1	09/08/20 14:31		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*116 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*100 %*		*70-130*
Surrogate: Dibromofluoromethane	*109 %*		*70-130*
Surrogate: Toluene-d8	*96 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 6-8
Date Sampled: 09/04/20 09:30
Percent Solids: 71
Initial Volume: 19.8
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 9/8/20 14:00

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.07)		8082A		1	09/09/20 18:27		DI01015
Aroclor 1221	ND (0.07)		8082A		1	09/09/20 18:27		DI01015
Aroclor 1232	ND (0.07)		8082A		1	09/09/20 18:27		DI01015
Aroclor 1242	ND (0.07)		8082A		1	09/09/20 18:27		DI01015
Aroclor 1248	ND (0.07)		8082A		1	09/09/20 18:27		DI01015
Aroclor 1254	ND (0.07)		8082A		1	09/09/20 18:27		DI01015
Aroclor 1260	ND (0.07)		8082A		1	09/09/20 18:27		DI01015
Aroclor 1262	ND (0.07)		8082A		1	09/09/20 18:27		DI01015
Aroclor 1268	ND (0.07)		8082A		1	09/09/20 18:27		DI01015

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*88 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*83 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*83 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*87 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 6-8
Date Sampled: 09/04/20 09:30
Percent Solids: 71
Initial Volume: 20.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TLW
Prepared: 9/8/20 10:45

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	ND (51.8)		8100M		1	09/09/20 11:09	D0I0083	DI01025

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*86 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 6-8
Date Sampled: 09/04/20 09:30
Percent Solids: 71
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/8/20 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
1,2,4-Trichlorobenzene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
1,2-Dichlorobenzene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
1,3-Dichlorobenzene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
1,4-Dichlorobenzene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2,3,4,6-Tetrachlorophenol	ND (2.22)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2,4,5-Trichlorophenol	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2,4,6-Trichlorophenol	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2,4-Dichlorophenol	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2,4-Dimethylphenol	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2,4-Dinitrophenol	ND (2.22)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2,4-Dinitrotoluene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2,6-Dinitrotoluene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2-Chloronaphthalene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2-Chlorophenol	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2-Methylnaphthalene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2-Methylphenol	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2-Nitroaniline	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
2-Nitrophenol	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
3,3´-Dichlorobenzidine	ND (0.887)		8270D		1	09/08/20 22:43	D0I0126	DI01012
3+4-Methylphenol	ND (0.887)		8270D		1	09/08/20 22:43	D0I0126	DI01012
3-Nitroaniline	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
4,6-Dinitro-2-Methylphenol	ND (2.22)		8270D		1	09/08/20 22:43	D0I0126	DI01012
4-Bromophenyl-phenylether	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
4-Chloro-3-Methylphenol	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
4-Chloroaniline	ND (0.887)		8270D		1	09/08/20 22:43	D0I0126	DI01012
4-Chloro-phenyl-phenyl ether	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
4-Nitroaniline	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
4-Nitrophenol	ND (2.22)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Acenaphthene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Acenaphthylene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Acetophenone	ND (0.887)		8270D		1	09/08/20 22:43	D0I0126	DI01012

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 6-8
Date Sampled: 09/04/20 09:30
Percent Solids: 71
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/8/20 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (0.887)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Anthracene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Azobenzene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Benzo(a)anthracene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Benzo(a)pyrene	ND (0.222)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Benzo(b)fluoranthene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Benzo(g,h,i)perylene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Benzo(k)fluoranthene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Benzoic Acid	ND (2.22)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Benzyl Alcohol	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
bis(2-Chloroethoxy)methane	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
bis(2-Chloroethyl)ether	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
bis(2-chloroisopropyl)Ether	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
bis(2-Ethylhexyl)phthalate	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Butylbenzylphthalate	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Carbazole	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Chrysene	ND (0.222)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Dibenzo(a,h)Anthracene	ND (0.222)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Dibenzofuran	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Diethylphthalate	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Dimethylphthalate	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Di-n-butylphthalate	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Di-n-octylphthalate	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Fluoranthene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Fluorene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Hexachlorobenzene	ND (0.222)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Hexachlorobutadiene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Hexachlorocyclopentadiene	ND (2.22)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Hexachloroethane	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Indeno(1,2,3-cd)Pyrene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Isophorone	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Naphthalene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 6-8
Date Sampled: 09/04/20 09:30
Percent Solids: 71
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/8/20 10:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
N-Nitrosodimethylamine	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
N-Nitroso-Di-n-Propylamine	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
N-nitrosodiphenylamine	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Pentachlorophenol	ND (2.22)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Phenanthrene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Phenol	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Pyrene	ND (0.443)		8270D		1	09/08/20 22:43	D0I0126	DI01012
Pyridine	ND (2.22)		8270D		1	09/08/20 22:43	D0I0126	DI01012

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*77 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*80 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*92 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*74 %*		*30-130*
Surrogate: 2-Fluorophenol	*78 %*		*30-130*
Surrogate: Nitrobenzene-d5	*73 %*		*30-130*
Surrogate: Phenol-d6	*97 %*		*30-130*
Surrogate: p-Terphenyl-d14	*96 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 Comp
Date Sampled: 09/04/20 10:00
Percent Solids: 74
Initial Volume: 20.9
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 9/8/20 11:15

8081B Organochlorine Pesticides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
4,4′-DDD	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
4,4′-DDE	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
4,4′-DDT	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Aldrin	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
alpha-BHC	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
alpha-Chlordane	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
beta-BHC	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Chlordane (Total)	ND (0.0389)		8081B		1	09/10/20 22:26	D0I0089	DI01030
delta-BHC	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Dieldrin	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Endosulfan I	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Endosulfan II	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Endosulfan Sulfate	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Endrin	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Endrin Aldehyde	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Endrin Ketone	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
gamma-BHC (Lindane)	ND (0.0019)		8081B		1	09/10/20 22:26	D0I0089	DI01030
gamma-Chlordane	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Heptachlor	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Heptachlor Epoxide	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Hexachlorobenzene	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Methoxychlor	ND (0.0032)		8081B		1	09/10/20 22:26	D0I0089	DI01030
Toxaphene	ND (0.162)		8081B		1	09/10/20 22:26	D0I0089	DI01030

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*85 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*86 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*89 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*79 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 Comp
Date Sampled: 09/04/20 10:00
Percent Solids: 74
Initial Volume: 10.3
Final Volume: 4
Extraction Method: 3546

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 9/8/20 15:30

8151A Chlorinated Herbicides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2,4,5-T	ND (0.013)		8151A		1	09/10/20 14:52	D0I0091	DI01034
2,4,5-TP (Silvex)	ND (0.013)		8151A		1	09/10/20 14:52	D0I0091	DI01034
2,4-D	ND (0.248)		8151A		1	09/10/20 14:52	D0I0091	DI01034
2,4-DB	ND (0.250)		8151A		1	09/10/20 14:52	D0I0091	DI01034
Dalapon	ND (0.240)		8151A		1	09/10/20 14:52	D0I0091	DI01034
Dicamba	ND (0.012)		8151A		1	09/10/20 14:52	D0I0091	DI01034
Dichlorprop	ND (0.248)		8151A		1	09/10/20 14:52	D0I0091	DI01034
Dinoseb	ND (0.250)		8151A		1	09/10/20 14:52	D0I0091	DI01034
MCPA	ND (24.5)		8151A		1	09/10/20 14:52	D0I0091	DI01034
MCPP	ND (24.8)		8151A		1	09/10/20 14:52	D0I0091	DI01034

	%Recovery	Qualifier	Limits
Surrogate: DCAA	*152 %*	*S+*	*30-150*
Surrogate: DCAA [2C]	*107 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-04 Comp
Date Sampled: 09/04/20 10:00
Percent Solids: 74

ESS Laboratory Work Order: 20I0200
ESS Laboratory Sample ID: 20I0200-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 184** (5)		9050A		1	EEM	09/08/20 14:40	umhos/cm	DI01125
Corrosivity (pH)	**6.81** (N/A)		9045		1	JLK	09/04/20 20:11	S.U.	DI01109
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 19.9 ºC.**								
Flashpoint	**> 200** (N/A)		1010A		1	JLK	09/08/20 17:20	°F	DI01127
Free Liquid	ND (0.3)		9095A		1	CCP	09/09/20 14:10	ml/5 min	DI01140
Reactive Cyanide	ND (2.0)		7.3.3.2		1	EEM	09/08/20 9:55	mg/kg	DI01130
Reactive Sulfide	ND (2.0)		7.3.4.1		1	EEM	09/08/20 9:55	mg/kg	DI01130

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				Total Metals						
Batch DI01171 - 3050B										
Blank										
Antimony	ND	5.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Barium	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	5.00	mg/kg wet							
Vanadium	ND	1.00	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Blank										
Thallium	ND	0.50	mg/kg wet							
LCS										
Antimony	42.8	15.9	mg/kg wet	42.00		102	80-120			
Arsenic	40.6	7.94	mg/kg wet	43.10		94	80-120			
Barium	625	7.94	mg/kg wet	597.0		105	80-120			
Beryllium	119	0.35	mg/kg wet	117.0		102	80-120			
Cadmium	115	1.59	mg/kg wet	118.0		97	80-120			
Chromium	306	3.17	mg/kg wet	299.0		102	80-120			
Copper	339	7.94	mg/kg wet	330.0		103	80-120			
Lead	148	15.9	mg/kg wet	144.0		103	80-120			
Nickel	179	7.94	mg/kg wet	171.0		104	80-120			
Selenium	148	15.9	mg/kg wet	154.0		96	80-120			
Silver	75.1	1.59	mg/kg wet	73.50		102	80-120			
Vanadium	272	3.17	mg/kg wet	259.0		105	80-120			
Zinc	843	7.94	mg/kg wet	874.0		96	80-120			
LCS										
Thallium	94.9	14.7	mg/kg wet	90.40		105	80-120			
LCS										
Thallium	100	7.35	mg/kg wet	90.40		111	80-120			
LCS Dup										
Antimony	39.5	16.1	mg/kg wet	42.00		94	80-120	8	20	
Arsenic	41.0	8.06	mg/kg wet	43.10		95	80-120	1	20	
Barium	553	8.06	mg/kg wet	597.0		93	80-120	12	20	
Beryllium	116	0.35	mg/kg wet	117.0		99	80-120	3	20	
Cadmium	107	1.61	mg/kg wet	118.0		91	80-120	7	20	
Chromium	285	3.23	mg/kg wet	299.0		95	80-120	7	20	
Copper	329	8.06	mg/kg wet	330.0		100	80-120	3	20	
Lead	141	16.1	mg/kg wet	144.0		98	80-120	4	20	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DI01171 - 3050B										
Nickel	166	8.06	mg/kg wet	171.0		97	80-120	7	20	
Selenium	142	16.1	mg/kg wet	154.0		92	80-120	4	20	
Silver	71.1	1.61	mg/kg wet	73.50		97	80-120	5	20	
Vanadium	255	3.23	mg/kg wet	259.0		98	80-120	6	20	
Zinc	814	8.06	mg/kg wet	874.0		93	80-120	3	20	
LCS Dup										
Thallium	92.4	15.9	mg/kg wet	90.40		102	80-120	3	20	
LCS Dup										
Thallium	93.2	7.94	mg/kg wet	90.40		103	80-120	7	30	
Batch DI01172 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	23.6	2.91	mg/kg wet	26.60		89	80-120			
LCS Dup										
Mercury	23.9	3.25	mg/kg wet	26.60		90	80-120	1	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch DI01005 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DI01005 - 5035										
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DI01005 - 5035										
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0528*		mg/kg wet	*0.05000*		*106*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0499*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0519*		mg/kg wet	*0.05000*		*104*	*70-130*			
Surrogate: Toluene-d8	*0.0475*		mg/kg wet	*0.05000*		*95*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0449	0.0050	mg/kg wet	0.05000		90	70-130			
1,1,1-Trichloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,1,2,2-Tetrachloroethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
1,1,2-Trichloroethane	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
1,1-Dichloroethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
1,1-Dichloroethene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
1,1-Dichloropropene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
1,2,3-Trichlorobenzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
1,2,3-Trichloropropane	0.0415	0.0050	mg/kg wet	0.05000		83	70-130			
1,2,4-Trichlorobenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,2,4-Trimethylbenzene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
1,2-Dibromo-3-Chloropropane	0.0405	0.0050	mg/kg wet	0.05000		81	70-130			
1,2-Dibromoethane	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
1,2-Dichlorobenzene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
1,2-Dichloroethane	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dichloropropane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
1,3,5-Trimethylbenzene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
1,3-Dichlorobenzene	0.0436	0.0050	mg/kg wet	0.05000		87	70-130			
1,3-Dichloropropane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
1,4-Dichlorobenzene	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
1,4-Dioxane	0.964	0.100	mg/kg wet	1.000		96	70-130			
1-Chlorohexane	0.0410	0.0050	mg/kg wet	0.05000		82	70-130			
2,2-Dichloropropane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
2-Butanone	0.280	0.0500	mg/kg wet	0.2500		112	70-130			
2-Chlorotoluene	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
2-Hexanone	0.237	0.0500	mg/kg wet	0.2500		95	70-130			
4-Chlorotoluene	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
4-Isopropyltoluene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130			
4-Methyl-2-Pentanone	0.237	0.0500	mg/kg wet	0.2500		95	70-130			
Acetone	0.299	0.0500	mg/kg wet	0.2500		120	70-130			
Benzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Bromobenzene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
Bromochloromethane	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
Bromodichloromethane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
Bromoform	0.0433	0.0050	mg/kg wet	0.05000		87	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				5035/8260B Volatile Organic Compounds / Low Level						
Batch DI01005 - 5035										
Bromomethane	0.0468	0.0100	mg/kg wet	0.05000		94	70-130			
Carbon Disulfide	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
Carbon Tetrachloride	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Chlorobenzene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130			
Chloroethane	0.0470	0.0100	mg/kg wet	0.05000		94	70-130			
Chloroform	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
Chloromethane	0.0438	0.0100	mg/kg wet	0.05000		88	70-130			
cis-1,2-Dichloroethene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
cis-1,3-Dichloropropene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Dibromochloromethane	0.0446	0.0050	mg/kg wet	0.05000		89	70-130			
Dibromomethane	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
Dichlorodifluoromethane	0.0372	0.0100	mg/kg wet	0.05000		74	70-130			
Diethyl Ether	0.0547	0.0050	mg/kg wet	0.05000		109	70-130			
Di-isopropyl ether	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Ethyl tertiary-butyl ether	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
Ethylbenzene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
Hexachlorobutadiene	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
Isopropylbenzene	0.0442	0.0050	mg/kg wet	0.05000		88	70-130			
Methyl tert-Butyl Ether	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
Methylene Chloride	0.0496	0.0250	mg/kg wet	0.05000		99	70-130			
Naphthalene	0.0411	0.0050	mg/kg wet	0.05000		82	70-130			
n-Butylbenzene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
n-Propylbenzene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
sec-Butylbenzene	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
Styrene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
tert-Butylbenzene	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
Tertiary-amyl methyl ether	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
Tetrachloroethene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Tetrahydrofuran	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
Toluene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
trans-1,2-Dichloroethene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
trans-1,3-Dichloropropene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Trichloroethene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Trichlorofluoromethane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Vinyl Acetate	0.0413	0.0050	mg/kg wet	0.05000		83	70-130			
Vinyl Chloride	0.0456	0.0100	mg/kg wet	0.05000		91	70-130			
Xylene O	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
Xylene P,M	0.0970	0.0100	mg/kg wet	0.1000		97	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0524*		mg/kg wet	*0.05000*		*105*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0509*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0534*		mg/kg wet	*0.05000*		*107*	*70-130*			
Surrogate: Toluene-d8	*0.0478*		mg/kg wet	*0.05000*		*96*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	13	25	
1,1,1-Trichloroethane	0.0575	0.0050	mg/kg wet	0.05000		115	70-130	11	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier

5035/8260B Volatile Organic Compounds / Low Level

Batch DI01005 - 5035

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
1,1,2,2-Tetrachloroethane	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	11	25	
1,1,2-Trichloroethane	0.0590	0.0050	mg/kg wet	0.05000		118	70-130	11	25	
1,1-Dichloroethane	0.0543	0.0050	mg/kg wet	0.05000		109	70-130	11	25	
1,1-Dichloroethene	0.0573	0.0050	mg/kg wet	0.05000		115	70-130	11	25	
1,1-Dichloropropene	0.0576	0.0050	mg/kg wet	0.05000		115	70-130	10	25	
1,2,3-Trichlorobenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	9	25	
1,2,3-Trichloropropane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	11	25	
1,2,4-Trichlorobenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	9	25	
1,2,4-Trimethylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	9	25	
1,2-Dibromo-3-Chloropropane	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	12	25	
1,2-Dibromoethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	15	25	
1,2-Dichlorobenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	10	25	
1,2-Dichloroethane	0.0570	0.0050	mg/kg wet	0.05000		114	70-130	10	25	
1,2-Dichloropropane	0.0579	0.0050	mg/kg wet	0.05000		116	70-130	11	25	
1,3,5-Trimethylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	10	25	
1,3-Dichlorobenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	10	25	
1,3-Dichloropropane	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	13	25	
1,4-Dichlorobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	9	25	
1,4-Dioxane	1.10	0.100	mg/kg wet	1.000		110	70-130	13	20	
1-Chlorohexane	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	11	25	
2,2-Dichloropropane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	11	25	
2-Butanone	0.310	0.0500	mg/kg wet	0.2500		124	70-130	10	25	
2-Chlorotoluene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
2-Hexanone	0.269	0.0500	mg/kg wet	0.2500		108	70-130	12	25	
4-Chlorotoluene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	10	25	
4-Isopropyltoluene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	9	25	
4-Methyl-2-Pentanone	0.269	0.0500	mg/kg wet	0.2500		108	70-130	13	25	
Acetone	0.324	0.0500	mg/kg wet	0.2500		130	70-130	8	25	
Benzene	0.0579	0.0050	mg/kg wet	0.05000		116	70-130	11	25	
Bromobenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	12	25	
Bromochloromethane	0.0561	0.0050	mg/kg wet	0.05000		112	70-130	12	25	
Bromodichloromethane	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	11	25	
Bromoform	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	14	25	
Bromomethane	0.0509	0.0100	mg/kg wet	0.05000		102	70-130	8	25	
Carbon Disulfide	0.0592	0.0050	mg/kg wet	0.05000		118	70-130	10	25	
Carbon Tetrachloride	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	10	25	
Chlorobenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	12	25	
Chloroethane	0.0519	0.0100	mg/kg wet	0.05000		104	70-130	10	25	
Chloroform	0.0559	0.0050	mg/kg wet	0.05000		112	70-130	11	25	
Chloromethane	0.0484	0.0100	mg/kg wet	0.05000		97	70-130	10	25	
cis-1,2-Dichloroethene	0.0566	0.0050	mg/kg wet	0.05000		113	70-130	11	25	
cis-1,3-Dichloropropene	0.0575	0.0050	mg/kg wet	0.05000		115	70-130	12	25	
Dibromochloromethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	13	25	
Dibromomethane	0.0584	0.0050	mg/kg wet	0.05000		117	70-130	11	25	
Dichlorodifluoromethane	0.0399	0.0100	mg/kg wet	0.05000		80	70-130	7	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				5035/8260B Volatile Organic Compounds / Low Level						
Batch DI01005 - 5035										
Diethyl Ether	0.0624	0.0050	mg/kg wet	0.05000		125	70-130	13	25	
Di-isopropyl ether	0.0576	0.0050	mg/kg wet	0.05000		115	70-130	12	25	
Ethyl tertiary-butyl ether	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	13	25	
Ethylbenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	12	25	
Hexachlorobutadiene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	10	25	
Isopropylbenzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	9	25	
Methyl tert-Butyl Ether	0.0600	0.0050	mg/kg wet	0.05000		120	70-130	14	25	
Methylene Chloride	0.0551	0.0250	mg/kg wet	0.05000		110	70-130	11	25	
Naphthalene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	13	25	
n-Butylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	9	25	
n-Propylbenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	9	25	
sec-Butylbenzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	9	25	
Styrene	0.0543	0.0050	mg/kg wet	0.05000		109	70-130	13	25	
tert-Butylbenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	10	25	
Tertiary-amyl methyl ether	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	13	25	
Tetrachloroethene	0.0591	0.0050	mg/kg wet	0.05000		118	70-130	14	25	
Tetrahydrofuran	0.0545	0.0050	mg/kg wet	0.05000		109	70-130	12	25	
Toluene	0.0573	0.0050	mg/kg wet	0.05000		115	70-130	10	25	
trans-1,2-Dichloroethene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	11	25	
trans-1,3-Dichloropropene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	13	25	
Trichloroethene	0.0569	0.0050	mg/kg wet	0.05000		114	70-130	11	25	
Trichlorofluoromethane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	9	25	
Vinyl Acetate	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	13	25	
Vinyl Chloride	0.0496	0.0100	mg/kg wet	0.05000		99	70-130	8	25	
Xylene O	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	12	25	
Xylene P,M	0.109	0.0100	mg/kg wet	0.1000		109	70-130	12	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0528*		mg/kg wet	*0.05000*		*106*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0523*		mg/kg wet	*0.05000*		*105*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0534*		mg/kg wet	*0.05000*		*107*	*70-130*			
Surrogate: Toluene-d8	*0.0485*		mg/kg wet	*0.05000*		*97*	*70-130*			
				8081B Organochlorine Pesticides						
Batch DI01030 - 3546										
Blank										
4,4´-DDD	ND	0.0025	mg/kg wet							
4,4´-DDD [2C]	ND	0.0025	mg/kg wet							
4,4´-DDE	ND	0.0025	mg/kg wet							
4,4´-DDE [2C]	ND	0.0025	mg/kg wet							
4,4´-DDT	ND	0.0025	mg/kg wet							
4,4´-DDT [2C]	ND	0.0025	mg/kg wet							
Aldrin	ND	0.0025	mg/kg wet							
Aldrin [2C]	ND	0.0025	mg/kg wet							
alpha-BHC	ND	0.0025	mg/kg wet							
alpha-BHC [2C]	ND	0.0025	mg/kg wet							
alpha-Chlordane	ND	0.0025	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

8081B Organochlorine Pesticides

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DI01030 - 3546										
alpha-Chlordane [2C]	ND	0.0025	mg/kg wet							
beta-BHC	ND	0.0025	mg/kg wet							
beta-BHC [2C]	ND	0.0025	mg/kg wet							
delta-BHC	ND	0.0025	mg/kg wet							
delta-BHC [2C]	ND	0.0025	mg/kg wet							
Dieldrin	ND	0.0025	mg/kg wet							
Dieldrin [2C]	ND	0.0025	mg/kg wet							
Endosulfan I	ND	0.0025	mg/kg wet							
Endosulfan I [2C]	ND	0.0025	mg/kg wet							
Endosulfan II	ND	0.0025	mg/kg wet							
Endosulfan II [2C]	ND	0.0025	mg/kg wet							
Endosulfan Sulfate	ND	0.0025	mg/kg wet							
Endosulfan Sulfate [2C]	ND	0.0025	mg/kg wet							
Endrin	ND	0.0025	mg/kg wet							
Endrin [2C]	ND	0.0025	mg/kg wet							
Endrin Aldehyde	ND	0.0025	mg/kg wet							
Endrin Aldehyde [2C]	ND	0.0025	mg/kg wet							
Endrin Ketone	ND	0.0025	mg/kg wet							
Endrin Ketone [2C]	ND	0.0025	mg/kg wet							
gamma-BHC (Lindane)	ND	0.0015	mg/kg wet							
gamma-BHC (Lindane) [2C]	ND	0.0015	mg/kg wet							
gamma-Chlordane	ND	0.0025	mg/kg wet							
gamma-Chlordane [2C]	ND	0.0025	mg/kg wet							
Heptachlor	ND	0.0025	mg/kg wet							
Heptachlor [2C]	ND	0.0025	mg/kg wet							
Heptachlor Epoxide	ND	0.0025	mg/kg wet							
Heptachlor Epoxide [2C]	ND	0.0025	mg/kg wet							
Hexachlorobenzene	ND	0.0025	mg/kg wet							
Hexachlorobenzene [2C]	ND	0.0025	mg/kg wet							
Methoxychlor	ND	0.0025	mg/kg wet							
Methoxychlor [2C]	ND	0.0025	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0126*		mg/kg wet	*0.01250*		*101*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0126*		mg/kg wet	*0.01250*		*101*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0123*		mg/kg wet	*0.01250*		*99*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0127*		mg/kg wet	*0.01250*		*101*	*30-150*			
LCS										
4,4´-DDD	0.0136	0.0025	mg/kg wet	0.01250		109	40-140			
4,4´-DDD [2C]	0.0143	0.0025	mg/kg wet	0.01250		115	40-140			
4,4´-DDE	0.0121	0.0025	mg/kg wet	0.01250		97	40-140			
4,4´-DDE [2C]	0.0127	0.0025	mg/kg wet	0.01250		102	40-140			
4,4´-DDT	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
4,4´-DDT [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
Aldrin	0.0117	0.0025	mg/kg wet	0.01250		93	40-140			
Aldrin [2C]	0.0118	0.0025	mg/kg wet	0.01250		95	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

8081B Organochlorine Pesticides

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DI01030 - 3546										
alpha-BHC	0.0126	0.0025	mg/kg wet	0.01250		100	40-140			
alpha-BHC [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140			
alpha-Chlordane	0.0104	0.0025	mg/kg wet	0.01250		83	40-140			
alpha-Chlordane [2C]	0.0117	0.0025	mg/kg wet	0.01250		93	40-140			
beta-BHC	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
beta-BHC [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
delta-BHC	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
delta-BHC [2C]	0.0122	0.0025	mg/kg wet	0.01250		98	40-140			
Dieldrin	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
Dieldrin [2C]	0.0127	0.0025	mg/kg wet	0.01250		102	40-140			
Endosulfan I	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
Endosulfan I [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
Endosulfan II	0.0117	0.0025	mg/kg wet	0.01250		94	40-140			
Endosulfan II [2C]	0.0128	0.0025	mg/kg wet	0.01250		102	40-140			
Endosulfan Sulfate	0.0112	0.0025	mg/kg wet	0.01250		90	40-140			
Endosulfan Sulfate [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140			
Endrin	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
Endrin [2C]	0.0123	0.0025	mg/kg wet	0.01250		99	40-140			
Endrin Aldehyde	0.0108	0.0025	mg/kg wet	0.01250		86	40-140			
Endrin Aldehyde [2C]	0.0117	0.0025	mg/kg wet	0.01250		94	40-140			
Endrin Ketone	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
Endrin Ketone [2C]	0.0127	0.0025	mg/kg wet	0.01250		101	40-140			
gamma-BHC (Lindane)	0.0121	0.0015	mg/kg wet	0.01250		97	40-140			
gamma-BHC (Lindane) [2C]	0.0124	0.0015	mg/kg wet	0.01250		99	40-140			
gamma-Chlordane	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
gamma-Chlordane [2C]	0.0111	0.0025	mg/kg wet	0.01250		89	40-140			
Heptachlor	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
Heptachlor [2C]	0.0118	0.0025	mg/kg wet	0.01250		95	40-140			
Heptachlor Epoxide	0.0114	0.0025	mg/kg wet	0.01250		91	40-140			
Heptachlor Epoxide [2C]	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
Hexachlorobenzene	0.0118	0.0025	mg/kg wet	0.01250		95	40-140			
Hexachlorobenzene [2C]	0.0118	0.0025	mg/kg wet	0.01250		95	40-140			
Methoxychlor	0.0113	0.0025	mg/kg wet	0.01250		90	40-140			
Methoxychlor [2C]	0.0121	0.0025	mg/kg wet	0.01250		97	40-140			
Surrogate: Decachlorobiphenyl	*0.0125*		mg/kg wet	*0.01250*		*100*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0129*		mg/kg wet	*0.01250*		*103*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0120*		mg/kg wet	*0.01250*		*96*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0124*		mg/kg wet	*0.01250*		*99*	*30-150*			
LCS Dup										
4,4´-DDD	0.0136	0.0025	mg/kg wet	0.01250		109	40-140	0.1	30	
4,4´-DDD [2C]	0.0138	0.0025	mg/kg wet	0.01250		110	40-140	4	30	
4,4´-DDE	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	3	30	
4,4´-DDE [2C]	0.0131	0.0025	mg/kg wet	0.01250		105	40-140	3	30	
4,4´-DDT	0.0116	0.0025	mg/kg wet	0.01250		93	40-140	0.5	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8081B Organochlorine Pesticides						
Batch DI01030 - 3546										
4,4´-DDT [2C]	0.0121	0.0025	mg/kg wet	0.01250		97	40-140	1	30	
Aldrin	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	7	30	
Aldrin [2C]	0.0127	0.0025	mg/kg wet	0.01250		101	40-140	7	30	
alpha-BHC	0.0133	0.0025	mg/kg wet	0.01250		107	40-140	6	30	
alpha-BHC [2C]	0.0137	0.0025	mg/kg wet	0.01250		110	40-140	9	30	
alpha-Chlordane	0.0110	0.0025	mg/kg wet	0.01250		88	40-140	6	30	
alpha-Chlordane [2C]	0.0121	0.0025	mg/kg wet	0.01250		97	40-140	4	30	
beta-BHC	0.0126	0.0025	mg/kg wet	0.01250		101	40-140	9	30	
beta-BHC [2C]	0.0127	0.0025	mg/kg wet	0.01250		102	40-140	6	30	
delta-BHC	0.0132	0.0025	mg/kg wet	0.01250		106	40-140	9	30	
delta-BHC [2C]	0.0129	0.0025	mg/kg wet	0.01250		103	40-140	5	30	
Dieldrin	0.0131	0.0025	mg/kg wet	0.01250		105	40-140	5	30	
Dieldrin [2C]	0.0132	0.0025	mg/kg wet	0.01250		105	40-140	3	30	
Endosulfan I	0.0121	0.0025	mg/kg wet	0.01250		97	40-140	4	30	
Endosulfan I [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	4	30	
Endosulfan II	0.0120	0.0025	mg/kg wet	0.01250		96	40-140	3	30	
Endosulfan II [2C]	0.0127	0.0025	mg/kg wet	0.01250		102	40-140	0.6	30	
Endosulfan Sulfate	0.0113	0.0025	mg/kg wet	0.01250		91	40-140	0.8	30	
Endosulfan Sulfate [2C]	0.0123	0.0025	mg/kg wet	0.01250		99	40-140	1	30	
Endrin	0.0123	0.0025	mg/kg wet	0.01250		98	40-140	3	30	
Endrin [2C]	0.0126	0.0025	mg/kg wet	0.01250		100	40-140	2	30	
Endrin Aldehyde	0.0109	0.0025	mg/kg wet	0.01250		87	40-140	2	30	
Endrin Aldehyde [2C]	0.0118	0.0025	mg/kg wet	0.01250		94	40-140	0.2	30	
Endrin Ketone	0.0116	0.0025	mg/kg wet	0.01250		92	40-140	0.6	30	
Endrin Ketone [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	2	30	
gamma-BHC (Lindane)	0.0131	0.0015	mg/kg wet	0.01250		105	40-140	8	30	
gamma-BHC (Lindane) [2C]	0.0134	0.0015	mg/kg wet	0.01250		107	40-140	7	30	
gamma-Chlordane	0.0121	0.0025	mg/kg wet	0.01250		97	40-140	5	30	
gamma-Chlordane [2C]	0.0117	0.0025	mg/kg wet	0.01250		93	40-140	5	30	
Heptachlor	0.0123	0.0025	mg/kg wet	0.01250		98	40-140	6	30	
Heptachlor [2C]	0.0126	0.0025	mg/kg wet	0.01250		101	40-140	6	30	
Heptachlor Epoxide	0.0123	0.0025	mg/kg wet	0.01250		99	40-140	7	30	
Heptachlor Epoxide [2C]	0.0127	0.0025	mg/kg wet	0.01250		102	40-140	6	30	
Hexachlorobenzene	0.0126	0.0025	mg/kg wet	0.01250		101	40-140	6	30	
Hexachlorobenzene [2C]	0.0130	0.0025	mg/kg wet	0.01250		104	40-140	9	30	
Methoxychlor	0.0110	0.0025	mg/kg wet	0.01250		88	40-140	3	30	
Methoxychlor [2C]	0.0118	0.0025	mg/kg wet	0.01250		95	40-140	2	30	
Surrogate: Decachlorobiphenyl	*0.0120*		mg/kg wet	*0.01250*		*96*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0124*		mg/kg wet	*0.01250*		*99*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0122*		mg/kg wet	*0.01250*		*98*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0128*		mg/kg wet	*0.01250*		*102*	*30-150*			
				8082A Polychlorinated Biphenyls (PCB)						
Batch DI01015 - 3540C										

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch DI01015 - 3540C										
Blank										
Aroclor 1016	ND	0.05	mg/kg wet							
Aroclor 1016 [2C]	ND	0.05	mg/kg wet							
Aroclor 1221	ND	0.05	mg/kg wet							
Aroclor 1221 [2C]	ND	0.05	mg/kg wet							
Aroclor 1232	ND	0.05	mg/kg wet							
Aroclor 1232 [2C]	ND	0.05	mg/kg wet							
Aroclor 1242	ND	0.05	mg/kg wet							
Aroclor 1242 [2C]	ND	0.05	mg/kg wet							
Aroclor 1248	ND	0.05	mg/kg wet							
Aroclor 1248 [2C]	ND	0.05	mg/kg wet							
Aroclor 1254	ND	0.05	mg/kg wet							
Aroclor 1254 [2C]	ND	0.05	mg/kg wet							
Aroclor 1260	ND	0.05	mg/kg wet							
Aroclor 1260 [2C]	ND	0.05	mg/kg wet							
Aroclor 1262	ND	0.05	mg/kg wet							
Aroclor 1262 [2C]	ND	0.05	mg/kg wet							
Aroclor 1268	ND	0.05	mg/kg wet							
Aroclor 1268 [2C]	ND	0.05	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0207*		mg/kg wet	*0.02500*		*83*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0196*		mg/kg wet	*0.02500*		*78*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0185*		mg/kg wet	*0.02500*		*74*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0196*		mg/kg wet	*0.02500*		*78*	*30-150*			
LCS										
Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		94	40-140			
Aroclor 1016 [2C]	0.4	0.05	mg/kg wet	0.5000		89	40-140			
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000		104	40-140			
Aroclor 1260 [2C]	0.4	0.05	mg/kg wet	0.5000		88	40-140			
Surrogate: Decachlorobiphenyl	*0.0222*		mg/kg wet	*0.02500*		*89*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0203*		mg/kg wet	*0.02500*		*81*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0204*		mg/kg wet	*0.02500*		*82*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0201*		mg/kg wet	*0.02500*		*80*	*30-150*			
LCS Dup										
Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		95	40-140	1	30	
Aroclor 1016 [2C]	0.4	0.05	mg/kg wet	0.5000		90	40-140	0.9	30	
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000		105	40-140	1	30	
Aroclor 1260 [2C]	0.4	0.05	mg/kg wet	0.5000		89	40-140	1	30	
Surrogate: Decachlorobiphenyl	*0.0226*		mg/kg wet	*0.02500*		*90*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0205*		mg/kg wet	*0.02500*		*82*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0209*		mg/kg wet	*0.02500*		*84*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0205*		mg/kg wet	*0.02500*		*82*	*30-150*			

8100M Total Petroleum Hydrocarbons

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
					8100M Total Petroleum Hydrocarbons					
Batch DI01025 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	8.0	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.61*		mg/kg wet	*5.000*		*92*	*40-140*			
LCS										
Decane (C10)	1.9	0.2	mg/kg wet	2.500		75	40-140			
Docosane (C22)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Dodecane (C12)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Eicosane (C20)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Hexacosane (C26)	2.4	0.2	mg/kg wet	2.500		96	40-140			
Hexadecane (C16)	2.3	0.2	mg/kg wet	2.500		90	40-140			
Nonadecane (C19)	2.7	0.2	mg/kg wet	2.500		108	40-140			
Nonane (C9)	1.6	0.2	mg/kg wet	2.500		65	30-140			
Octacosane (C28)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Octadecane (C18)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Tetracosane (C24)	2.4	0.2	mg/kg wet	2.500		95	40-140			
Tetradecane (C14)	2.2	0.2	mg/kg wet	2.500		87	40-140			
Total Petroleum Hydrocarbons	36.6	37.5	mg/kg wet	35.00		104	40-140			
Triacontane (C30)	2.4	0.2	mg/kg wet	2.500		94	40-140			
Surrogate: O-Terphenyl	*4.62*		mg/kg wet	*5.000*		*92*	*40-140*			
LCS Dup										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		74	40-140	2	25	
Docosane (C22)	2.3	0.2	mg/kg wet	2.500		92	40-140	0	25	
Dodecane (C12)	2.0	0.2	mg/kg wet	2.500		82	40-140	3	25	
Eicosane (C20)	2.3	0.2	mg/kg wet	2.500		93	40-140	4	25	
Hexacosane (C26)	2.4	0.2	mg/kg wet	2.500		95	40-140	1	25	
Hexadecane (C16)	2.2	0.2	mg/kg wet	2.500		88	40-140	2	25	
Nonadecane (C19)	2.6	0.2	mg/kg wet	2.500		105	40-140	3	25	
Nonane (C9)	1.7	0.2	mg/kg wet	2.500		66	30-140	2	25	
Octacosane (C28)	2.4	0.2	mg/kg wet	2.500		96	40-140	0.9	25	
Octadecane (C18)	2.3	0.2	mg/kg wet	2.500		90	40-140	1	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge

ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch DI01025 - 3546										
Tetracosane (C24)	2.3	0.2	mg/kg wet	2.500		94	40-140	1	25	
Tetradecane (C14)	2.1	0.2	mg/kg wet	2.500		84	40-140	4	25	
Total Petroleum Hydrocarbons	35.8	37.5	mg/kg wet	35.00		102	40-140	2	25	
Triacontane (C30)	2.3	0.2	mg/kg wet	2.500		94	40-140	0.6	25	
Surrogate: O-Terphenyl	*4.45*		mg/kg wet	*5.000*		*89*	*40-140*			
8151A Chlorinated Herbicides										
Batch DI01034 - 3546										
Blank										
2,4,5-T	ND	0.010	mg/kg wet							
2,4,5-T [2C]	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex)	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex) [2C]	ND	0.010	mg/kg wet							
2,4-D	ND	0.188	mg/kg wet							
2,4-D [2C]	ND	0.188	mg/kg wet							
2,4-DB	ND	0.190	mg/kg wet							
2,4-DB [2C]	ND	0.190	mg/kg wet							
Dalapon	ND	0.182	mg/kg wet							
Dalapon [2C]	ND	0.182	mg/kg wet							
Dicamba	ND	0.009	mg/kg wet							
Dicamba [2C]	ND	0.009	mg/kg wet							
Dichlorprop	ND	0.188	mg/kg wet							
Dichlorprop [2C]	ND	0.188	mg/kg wet							
Dinoseb	ND	0.190	mg/kg wet							
Dinoseb [2C]	ND	0.190	mg/kg wet							
MCPA	ND	18.6	mg/kg wet							
MCPA [2C]	ND	18.6	mg/kg wet							
MCPP	ND	18.8	mg/kg wet							
MCPP [2C]	ND	18.8	mg/kg wet							
Surrogate: DCAA	*0.166*		mg/kg wet	*0.2000*		*83*	*30-150*			
Surrogate: DCAA [2C]	*0.164*		mg/kg wet	*0.2000*		*82*	*30-150*			
LCS										
2,4,5-T	0.013	0.010	mg/kg wet	0.01900		66	40-140			
2,4,5-T [2C]	0.012	0.010	mg/kg wet	0.01900		64	40-140			
2,4,5-TP (Silvex)	0.013	0.010	mg/kg wet	0.01900		68	40-140			
2,4,5-TP (Silvex) [2C]	0.013	0.010	mg/kg wet	0.01900		70	40-140			
2,4-D	0.118	0.188	mg/kg wet	0.1880		63	40-140			
2,4-D [2C]	0.133	0.188	mg/kg wet	0.1880		71	40-140			
2,4-DB	0.125	0.190	mg/kg wet	0.1900		66	40-140			
2,4-DB [2C]	0.133	0.190	mg/kg wet	0.1900		70	40-140			
Dalapon	0.257	0.182	mg/kg wet	0.4550		56	40-140			
Dalapon [2C]	0.276	0.182	mg/kg wet	0.4550		61	40-140			
Dicamba	0.012	0.009	mg/kg wet	0.01880		64	40-140			

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Client Name: Beta Engineering
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch DI01034 - 3546										
Dicamba [2C]	0.015	0.009	mg/kg wet	0.01880		78	40-140			
Dichlorprop	0.143	0.188	mg/kg wet	0.1880		76	40-140			
Dichlorprop [2C]	0.150	0.188	mg/kg wet	0.1880		80	40-140			
Dinoseb	0.016	0.190	mg/kg wet	0.09500		17	10-100			
Dinoseb [2C]	0.016	0.190	mg/kg wet	0.09500		17	10-100			
MCPA	14.2	18.6	mg/kg wet	18.60		77	40-140			
MCPA [2C]	12.7	18.6	mg/kg wet	18.60		68	40-140			
MCPP	13.7	18.8	mg/kg wet	18.80		73	40-140			
MCPP [2C]	16.1	18.8	mg/kg wet	18.80		85	40-140			
Surrogate: DCAA	*0.188*		mg/kg wet	*0.2000*		*94*	*30-150*			
Surrogate: DCAA [2C]	*0.163*		mg/kg wet	*0.2000*		*82*	*30-150*			
LCS Dup										
2,4,5-T	0.013	0.010	mg/kg wet	0.01900		70	40-140	6	30	
2,4,5-T [2C]	0.013	0.010	mg/kg wet	0.01900		68	40-140	6	30	
2,4,5-TP (Silvex)	0.013	0.010	mg/kg wet	0.01900		70	40-140	3	30	
2,4,5-TP (Silvex) [2C]	0.014	0.010	mg/kg wet	0.01900		72	40-140	3	30	
2,4-D	0.121	0.188	mg/kg wet	0.1880		64	40-140	3	30	
2,4-D [2C]	0.137	0.188	mg/kg wet	0.1880		73	40-140	3	30	
2,4-DB	0.136	0.190	mg/kg wet	0.1900		72	40-140	9	30	
2,4-DB [2C]	0.136	0.190	mg/kg wet	0.1900		72	40-140	3	30	
Dalapon	0.274	0.182	mg/kg wet	0.4550		60	40-140	6	30	
Dalapon [2C]	0.289	0.182	mg/kg wet	0.4550		63	40-140	5	30	
Dicamba	0.012	0.009	mg/kg wet	0.01880		64	40-140	0	30	
Dicamba [2C]	0.015	0.009	mg/kg wet	0.01880		80	40-140	3	30	
Dichlorprop	0.143	0.188	mg/kg wet	0.1880		76	40-140	0	30	
Dichlorprop [2C]	0.160	0.188	mg/kg wet	0.1880		85	40-140	7	30	
Dinoseb	0.018	0.190	mg/kg wet	0.09500		19	10-100	11	30	
Dinoseb [2C]	0.018	0.190	mg/kg wet	0.09500		19	10-100	9	30	
MCPA	14.0	18.6	mg/kg wet	18.60		76	40-140	1	30	
MCPA [2C]	13.1	18.6	mg/kg wet	18.60		71	40-140	3	30	
MCPP	13.6	18.8	mg/kg wet	18.80		72	40-140	1	30	
MCPP [2C]	16.2	18.8	mg/kg wet	18.80		86	40-140	0.8	30	
Surrogate: DCAA	*0.189*		mg/kg wet	*0.2000*		*95*	*30-150*			
Surrogate: DCAA [2C]	*0.164*		mg/kg wet	*0.2000*		*82*	*30-150*			
8270D Semi-Volatile Organic Compounds										
Batch DI01012 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8270D Semi-Volatile Organic Compounds						
Batch DI01012 - 3546										
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.667	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
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Quality Control Data

8270D Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DI01012 - 3546										
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.167	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.21*		mg/kg wet	*3.333*		*66*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.52*		mg/kg wet	*5.000*		*70*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.98*		mg/kg wet	*5.000*		*80*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.18*		mg/kg wet	*3.333*		*65*	*30-130*			
Surrogate: 2-Fluorophenol	*3.72*		mg/kg wet	*5.000*		*74*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.19*		mg/kg wet	*3.333*		*66*	*30-130*			
Surrogate: Phenol-d6	*4.21*		mg/kg wet	*5.000*		*84*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.80*		mg/kg wet	*3.333*		*84*	*30-130*			
LCS										
1,1-Biphenyl	2.33	0.333	mg/kg wet	3.333		70	40-140			
1,2,4-Trichlorobenzene	1.84	0.333	mg/kg wet	3.333		55	40-140			
1,2-Dichlorobenzene	1.90	0.333	mg/kg wet	3.333		57	40-140			
1,3-Dichlorobenzene	1.79	0.333	mg/kg wet	3.333		54	40-140			
1,4-Dichlorobenzene	1.85	0.333	mg/kg wet	3.333		55	40-140			
2,3,4,6-Tetrachlorophenol	2.51	1.67	mg/kg wet	3.333		75	30-130			
2,4,5-Trichlorophenol	2.58	0.333	mg/kg wet	3.333		78	30-130			
2,4,6-Trichlorophenol	2.34	0.333	mg/kg wet	3.333		70	30-130			
2,4-Dichlorophenol	2.17	0.333	mg/kg wet	3.333		65	30-130			
2,4-Dimethylphenol	2.29	0.333	mg/kg wet	3.333		69	30-130			
2,4-Dinitrophenol	2.19	1.67	mg/kg wet	3.333		66	30-130			
2,4-Dinitrotoluene	3.24	0.333	mg/kg wet	3.333		97	40-140			
2,6-Dinitrotoluene	2.77	0.333	mg/kg wet	3.333		83	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8270D Semi-Volatile Organic Compounds						
Batch DI01012 - 3546										
2-Chloronaphthalene	2.06	0.333	mg/kg wet	3.333		62	40-140			
2-Chlorophenol	2.06	0.333	mg/kg wet	3.333		62	30-130			
2-Methylnaphthalene	2.15	0.333	mg/kg wet	3.333		65	40-140			
2-Methylphenol	2.28	0.333	mg/kg wet	3.333		68	30-130			
2-Nitroaniline	3.18	0.333	mg/kg wet	3.333		96	40-140			
2-Nitrophenol	1.98	0.333	mg/kg wet	3.333		59	30-130			
3,3´-Dichlorobenzidine	2.73	0.667	mg/kg wet	3.333		82	40-140			
3+4-Methylphenol	4.64	0.667	mg/kg wet	6.667		70	30-130			
3-Nitroaniline	2.86	0.333	mg/kg wet	3.333		86	40-140			
4,6-Dinitro-2-Methylphenol	2.81	1.67	mg/kg wet	3.333		84	30-130			
4-Bromophenyl-phenylether	2.63	0.333	mg/kg wet	3.333		79	40-140			
4-Chloro-3-Methylphenol	2.91	0.333	mg/kg wet	3.333		87	30-130			
4-Chloroaniline	1.69	0.667	mg/kg wet	3.333		51	40-140			
4-Chloro-phenyl-phenyl ether	2.61	0.333	mg/kg wet	3.333		78	40-140			
4-Nitroaniline	2.97	0.333	mg/kg wet	3.333		89	40-140			
4-Nitrophenol	2.74	1.67	mg/kg wet	3.333		82	30-130			
Acenaphthene	2.26	0.333	mg/kg wet	3.333		68	40-140			
Acenaphthylene	2.18	0.333	mg/kg wet	3.333		66	40-140			
Acetophenone	2.23	0.667	mg/kg wet	3.333		67	40-140			
Aniline	1.26	0.667	mg/kg wet	3.333		38	40-140			B-
Anthracene	2.84	0.333	mg/kg wet	3.333		85	40-140			
Azobenzene	2.89	0.333	mg/kg wet	3.333		87	40-140			
Benzo(a)anthracene	2.90	0.333	mg/kg wet	3.333		87	40-140			
Benzo(a)pyrene	3.21	0.167	mg/kg wet	3.333		96	40-140			
Benzo(b)fluoranthene	3.05	0.333	mg/kg wet	3.333		92	40-140			
Benzo(g,h,i)perylene	2.91	0.333	mg/kg wet	3.333		87	40-140			
Benzo(k)fluoranthene	2.82	0.333	mg/kg wet	3.333		85	40-140			
Benzoic Acid	2.11	1.67	mg/kg wet	3.333		63	40-140			
Benzyl Alcohol	1.93	0.333	mg/kg wet	3.333		58	40-140			
bis(2-Chloroethoxy)methane	2.08	0.333	mg/kg wet	3.333		63	40-140			
bis(2-Chloroethyl)ether	2.06	0.333	mg/kg wet	3.333		62	40-140			
bis(2-chloroisopropyl)Ether	2.03	0.333	mg/kg wet	3.333		61	40-140			
bis(2-Ethylhexyl)phthalate	3.30	0.333	mg/kg wet	3.333		99	40-140			
Butylbenzylphthalate	3.18	0.333	mg/kg wet	3.333		95	40-140			
Carbazole	3.08	0.333	mg/kg wet	3.333		92	40-140			
Chrysene	2.91	0.167	mg/kg wet	3.333		87	40-140			
Dibenzo(a,h)Anthracene	2.96	0.167	mg/kg wet	3.333		89	40-140			
Dibenzofuran	2.40	0.333	mg/kg wet	3.333		72	40-140			
Diethylphthalate	2.89	0.333	mg/kg wet	3.333		87	40-140			
Dimethylphthalate	2.69	0.333	mg/kg wet	3.333		81	40-140			
Di-n-butylphthalate	3.24	0.333	mg/kg wet	3.333		97	40-140			
Di-n-octylphthalate	3.53	0.333	mg/kg wet	3.333		106	40-140			
Fluoranthene	3.04	0.333	mg/kg wet	3.333		91	40-140			
Fluorene	2.71	0.333	mg/kg wet	3.333		81	40-140			
Hexachlorobenzene	2.56	0.167	mg/kg wet	3.333		77	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge

ESS Laboratory Work Order: 20I0200

Quality Control Data

8270D Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DI01012 - 3546										
Hexachlorobutadiene	1.75	0.333	mg/kg wet	3.333		53	40-140			
Hexachlorocyclopentadiene	1.57	1.67	mg/kg wet	3.333		47	40-140			
Hexachloroethane	1.99	0.333	mg/kg wet	3.333		60	40-140			
Indeno(1,2,3-cd)Pyrene	2.93	0.333	mg/kg wet	3.333		88	40-140			
Isophorone	1.90	0.333	mg/kg wet	3.333		57	40-140			
Naphthalene	2.01	0.333	mg/kg wet	3.333		60	40-140			
Nitrobenzene	1.95	0.333	mg/kg wet	3.333		59	40-140			
N-Nitrosodimethylamine	1.79	0.333	mg/kg wet	3.333		54	40-140			
N-Nitroso-Di-n-Propylamine	2.42	0.333	mg/kg wet	3.333		73	40-140			
N-nitrosodiphenylamine	2.66	0.333	mg/kg wet	3.333		80	40-140			
Pentachlorophenol	2.65	1.67	mg/kg wet	3.333		80	30-130			
Phenanthrene	2.82	0.333	mg/kg wet	3.333		85	40-140			
Phenol	2.13	0.333	mg/kg wet	3.333		64	30-130			
Pyrene	2.78	0.333	mg/kg wet	3.333		83	40-140			
Pyridine	1.22	1.67	mg/kg wet	3.333		37	40-140			B-
Surrogate: 1,2-Dichlorobenzene-d4	*1.90*		mg/kg wet	*3.333*		*57*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.11*		mg/kg wet	*5.000*		*82*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.19*		mg/kg wet	*5.000*		*64*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.10*		mg/kg wet	*3.333*		*63*	*30-130*			
Surrogate: 2-Fluorophenol	*2.91*		mg/kg wet	*5.000*		*58*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.02*		mg/kg wet	*3.333*		*60*	*30-130*			
Surrogate: Phenol-d6	*3.49*		mg/kg wet	*5.000*		*70*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.80*		mg/kg wet	*3.333*		*84*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.32	0.333	mg/kg wet	3.333		70	40-140	0.1	30	
1,2,4-Trichlorobenzene	1.96	0.333	mg/kg wet	3.333		59	40-140	6	30	
1,2-Dichlorobenzene	2.03	0.333	mg/kg wet	3.333		61	40-140	7	30	
1,3-Dichlorobenzene	1.92	0.333	mg/kg wet	3.333		58	40-140	7	30	
1,4-Dichlorobenzene	1.98	0.333	mg/kg wet	3.333		59	40-140	7	30	
2,3,4,6-Tetrachlorophenol	2.57	1.67	mg/kg wet	3.333		77	30-130	2	30	
2,4,5-Trichlorophenol	2.63	0.333	mg/kg wet	3.333		79	30-130	2	30	
2,4,6-Trichlorophenol	2.31	0.333	mg/kg wet	3.333		69	30-130	1	30	
2,4-Dichlorophenol	2.15	0.333	mg/kg wet	3.333		64	30-130	1	30	
2,4-Dimethylphenol	2.24	0.333	mg/kg wet	3.333		67	30-130	2	30	
2,4-Dinitrophenol	2.29	1.67	mg/kg wet	3.333		69	30-130	4	30	
2,4-Dinitrotoluene	3.34	0.333	mg/kg wet	3.333		100	40-140	3	30	
2,6-Dinitrotoluene	2.81	0.333	mg/kg wet	3.333		84	40-140	1	30	
2-Chloronaphthalene	2.04	0.333	mg/kg wet	3.333		61	40-140	0.8	30	
2-Chlorophenol	2.17	0.333	mg/kg wet	3.333		65	30-130	5	30	
2-Methylnaphthalene	2.18	0.333	mg/kg wet	3.333		65	40-140	1	30	
2-Methylphenol	2.36	0.333	mg/kg wet	3.333		71	30-130	3	30	
2-Nitroaniline	3.14	0.333	mg/kg wet	3.333		94	40-140	1	30	
2-Nitrophenol	2.10	0.333	mg/kg wet	3.333		63	30-130	6	30	
3,3´-Dichlorobenzidine	2.84	0.667	mg/kg wet	3.333		85	40-140	4	30	
3+4-Methylphenol	4.64	0.667	mg/kg wet	6.667		70	30-130	0.09	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DI01012 - 3546										
3-Nitroaniline	2.87	0.333	mg/kg wet	3.333		86	40-140	0.1	30	
4,6-Dinitro-2-Methylphenol	2.99	1.67	mg/kg wet	3.333		90	30-130	6	30	
4-Bromophenyl-phenylether	2.72	0.333	mg/kg wet	3.333		82	40-140	3	30	
4-Chloro-3-Methylphenol	2.81	0.333	mg/kg wet	3.333		84	30-130	4	30	
4-Chloroaniline	1.66	0.667	mg/kg wet	3.333		50	40-140	2	30	
4-Chloro-phenyl-phenyl ether	2.63	0.333	mg/kg wet	3.333		79	40-140	0.8	30	
4-Nitroaniline	3.00	0.333	mg/kg wet	3.333		90	40-140	1	30	
4-Nitrophenol	2.73	1.67	mg/kg wet	3.333		82	30-130	0.2	30	
Acenaphthene	2.23	0.333	mg/kg wet	3.333		67	40-140	1	30	
Acenaphthylene	2.15	0.333	mg/kg wet	3.333		65	40-140	2	30	
Acetophenone	2.34	0.667	mg/kg wet	3.333		70	40-140	5	30	
Aniline	1.34	0.667	mg/kg wet	3.333		40	40-140	6	30	
Anthracene	2.89	0.333	mg/kg wet	3.333		87	40-140	2	30	
Azobenzene	2.96	0.333	mg/kg wet	3.333		89	40-140	2	30	
Benzo(a)anthracene	3.04	0.333	mg/kg wet	3.333		91	40-140	5	30	
Benzo(a)pyrene	3.38	0.167	mg/kg wet	3.333		101	40-140	5	30	
Benzo(b)fluoranthene	3.23	0.333	mg/kg wet	3.333		97	40-140	6	30	
Benzo(g,h,i)perylene	3.08	0.333	mg/kg wet	3.333		92	40-140	5	30	
Benzo(k)fluoranthene	2.93	0.333	mg/kg wet	3.333		88	40-140	4	30	
Benzoic Acid	2.20	1.67	mg/kg wet	3.333		66	40-140	4	30	
Benzyl Alcohol	1.92	0.333	mg/kg wet	3.333		58	40-140	0.4	30	
bis(2-Chloroethoxy)methane	2.16	0.333	mg/kg wet	3.333		65	40-140	3	30	
bis(2-Chloroethyl)ether	2.21	0.333	mg/kg wet	3.333		66	40-140	7	30	
bis(2-chloroisopropyl)Ether	2.20	0.333	mg/kg wet	3.333		66	40-140	8	30	
bis(2-Ethylhexyl)phthalate	3.52	0.333	mg/kg wet	3.333		106	40-140	6	30	
Butylbenzylphthalate	3.44	0.333	mg/kg wet	3.333		103	40-140	8	30	
Carbazole	3.12	0.333	mg/kg wet	3.333		94	40-140	1	30	
Chrysene	3.03	0.167	mg/kg wet	3.333		91	40-140	4	30	
Dibenzo(a,h)Anthracene	3.09	0.167	mg/kg wet	3.333		93	40-140	4	30	
Dibenzofuran	2.39	0.333	mg/kg wet	3.333		72	40-140	0.6	30	
Diethylphthalate	2.96	0.333	mg/kg wet	3.333		89	40-140	2	30	
Dimethylphthalate	2.74	0.333	mg/kg wet	3.333		82	40-140	2	30	
Di-n-butylphthalate	3.41	0.333	mg/kg wet	3.333		102	40-140	5	30	
Di-n-octylphthalate	3.74	0.333	mg/kg wet	3.333		112	40-140	6	30	
Fluoranthene	3.07	0.333	mg/kg wet	3.333		92	40-140	0.8	30	
Fluorene	2.72	0.333	mg/kg wet	3.333		82	40-140	0.2	30	
Hexachlorobenzene	2.64	0.167	mg/kg wet	3.333		79	40-140	3	30	
Hexachlorobutadiene	1.88	0.333	mg/kg wet	3.333		56	40-140	7	30	
Hexachlorocyclopentadiene	1.66	1.67	mg/kg wet	3.333		50	40-140	6	30	
Hexachloroethane	2.14	0.333	mg/kg wet	3.333		64	40-140	7	30	
Indeno(1,2,3-cd)Pyrene	3.08	0.333	mg/kg wet	3.333		93	40-140	5	30	
Isophorone	1.88	0.333	mg/kg wet	3.333		57	40-140	0.5	30	
Naphthalene	2.12	0.333	mg/kg wet	3.333		63	40-140	5	30	
Nitrobenzene	2.02	0.333	mg/kg wet	3.333		61	40-140	4	30	
N-Nitrosodimethylamine	1.85	0.333	mg/kg wet	3.333		56	40-140	3	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20I0200

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DI01012 - 3546										
N-Nitroso-Di-n-Propylamine	2.51	0.333	mg/kg wet	3.333		75	40-140	4	30	
N-nitrosodiphenylamine	2.74	0.333	mg/kg wet	3.333		82	40-140	3	30	
Pentachlorophenol	2.76	1.67	mg/kg wet	3.333		83	30-130	4	30	
Phenanthrene	2.89	0.333	mg/kg wet	3.333		87	40-140	3	30	
Phenol	2.20	0.333	mg/kg wet	3.333		66	30-130	3	30	
Pyrene	2.97	0.333	mg/kg wet	3.333		89	40-140	7	30	
Pyridine	1.29	1.67	mg/kg wet	3.333		39	40-140	5	30	B-
Surrogate: 1,2-Dichlorobenzene-d4	*2.00*		mg/kg wet	*3.333*		*60*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.14*		mg/kg wet	*5.000*		*83*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.27*		mg/kg wet	*5.000*		*65*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.05*		mg/kg wet	*3.333*		*62*	*30-130*			
Surrogate: 2-Fluorophenol	*3.03*		mg/kg wet	*5.000*		*61*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.05*		mg/kg wet	*3.333*		*61*	*30-130*			
Surrogate: Phenol-d6	*3.52*		mg/kg wet	*5.000*		*70*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.97*		mg/kg wet	*3.333*		*89*	*30-130*			
Classical Chemistry										
Batch DI01125 - General Preparation										
Blank										
Conductivity	ND	5	umhos/cm							
LCS										
Conductivity	1380		umhos/cm	1411		98	90-110			
Batch DI01127 - General Preparation										
Reference										
Flashpoint	81		°F	81.00		100	97.9-102.1			
Batch DI01130 - General Preparation										
Blank										
Reactive Cyanide	ND	2.0	mg/kg							
Reactive Sulfide	ND	2.0	mg/kg							
LCS										
Reactive Cyanide	4.0	2.0	mg/kg	100.3		4	0.68-5.41			
Reactive Sulfide	ND	2.0	mg/kg	10.00		0	0-44			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge ESS Laboratory Work Order: 20I0200

Notes and Definitions

Z-10	Soil pH measured in water at 19.9 ºC.
WL	Results obtained from a deionized water leach of the sample.
U	Analyte included in the analysis, but not detected
SD	Surrogate recovery(ies) diluted below the MRL (SD).
S+	Surrogate recovery(ies) above upper control limit (S+).
RRF	Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration
Q	Calibration required quadratic regression (Q).
IC	Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
>	Greater than.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Group

Shipped/Delivered Via: Client

ESS Project ID: 20I0200

Date Received: 9-4-20

Project Due Date: 9-14-20

Days for Project: 5

1. Air bill manifest present? NA
   Air No.: NA
2. Were custody seals present? NA
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Y
   Temp: 2.8 Iced with: Ice
5. Was COC signed and dated by client? Y
6. Does COC match bottles? Y
7. Is COC complete and correct? Y
8. Were samples received intact? Y
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:

12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 9/4/20 Time: 15:27 By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)

2nd Review

Were all containers scanned into storage/lab? Initials

Are barcode labels on correct containers? Yes / No

Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA

Are all Hex Chrome stickers attached? Yes / No / NA

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 9/4/20 1500

Reviewed By: Date & Time: 9/4/20 15:27

Delivered By: 9/4/20 15:27

CHAIN OF CUSTODY

SS Laboratory
ision of Thielsch Engineering, Inc.
5 Frances Avenue, Cranston RI 02910
(401) 461-7181 Fax (401) 461-4486
w.esslaboratory.com

ESS Lab #	2010200
Turn Time:	Standard
Rush:	
Regulatory State:	RI
Reporting Limits	RIDEM Res DEC / I/C DEC
Electonic Deliverables	☒ Limit Checker ☒ Excel ☐ Other (Please Specify) →

Is this project for any of the following?: ☐ MA-MCP ☐ CT-RCP ☐ RGP ☐ Remediation

Company Name	Bate Group
Contact Person	Joe McLoughlin
Project #	6620
Project Name	Sims Ave Pedestrian Bridge
Address	701 George Washington Highway
City	Lincoln
State	RI
Zip Code	02865
PO #	
Telephone Number	401.333.2382
FAX Number	
Email Address	jmcloughlin@bate-inc.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	15 metals, PCBs, TPH	SVOCs	Herb/Pest pH, FP	reactivity, free liquid	specific conductance
1	9/4/20	9:00	Grab	Soil	SB-04 0-2	X	X	X			
2	9/4/20	9:30	Grab	Soil	SB-09 6-8	X	X	X			
3	9/4/20	10:00	Comp	Soil	SB-04 comp				X	X	X
Container Type						V	ag	AG	AG	AG	AG
Preservation Code						6/10	1	1	1	1	1
Number of Containers						3	2 →		←	2 →	

Container Type: AG-Amber Glass B-BOD Bottle G-Glass P-Poly S-Sterile V-Vial O-Other

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*

Laboratory Use Only

Cooler Present: ✓
Seals Intact:
Cooler Temperature: 2.8 °C Ice

Sampled by: Scott Nee

Comments: Please specify "Other" preservative and containers types in this space
TCLP if exceeds 20x rule

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
[signature] 9/4/20 1:54	Amber Garcia 9/4/20 13:54		
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)

CERTIFICATE OF ANALYSIS

Joe McLoughlin
Beta Engineering
701 George Washington Hwy 2nd FL
Lincoln, RI 02865

RE: Sims Ave Pedestrian Bridge (6620)
ESS Laboratory Work Order Number: 20H1039

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 5:14 pm, Sep 17, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

SAMPLE RECEIPT

The following samples were received on August 31, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
20H1039-01	SB-03 0-2	Soil	6010C, 7471B, 8082A, 8100M, 8260B Low, 8270D
20H1039-02	SB-03 6-8	Soil	6010C, 6020A, 7471B, 8082A, 8100M, 8260B Low, 8270D
20H1039-03	SB-03 Comp	Soil	1010A, 7.3.3.2, 7.3.4.1, 8081B, 8151A, 9045, 9050A, 9095A

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

DI00207-BSD1 **Blank Spike recovery is above upper control limit (B+).**
cis-1,3-Dichloropropene (131% @ 70-130%)

8081B Organochlorine Pesticides

DI00106-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
alpha-Chlordane (31% @ 30%)

8100M Total Petroleum Hydrocarbons

D0H0538-CCV3 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Nonadecane (C19) (27% @ 20%)

D0H0538-CCV4 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Nonadecane (C19) (21% @ 20%)

D0H0538-CCV5 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Nonadecane (C19) (33% @ 20%)

D0H0538-CCV6 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Nonadecane (C19) (29% @ 20%)

8270D Semi-Volatile Organic Compounds

D0I0124-CCV1 **Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration**
2-Methylphenol (107% @ 80-120%), bis(2-Chloroethyl)ether (100% @ 80-120%), Hexachloroethane (104% @ 80-120%), N-Nitroso-Di-n-Propylamine (105% @ 80-120%), Phenol (107% @ 80-120%)

D0I0124-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (98% @ 80-120%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 0-2
Date Sampled: 08/31/20 10:00
Percent Solids: 98

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (4.85)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Arsenic	**4.97** (2.42)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Barium	**40.0** (2.42)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Beryllium	**0.25** (0.11)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Cadmium	ND (0.48)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Chromium	**13.4** (0.97)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Copper	**35.1** (2.42)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Lead	**85.1** (4.85)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Mercury	**0.152** (0.033)		7471B		1	MKS	09/02/20 9:26	0.61	40	DI00136
Nickel	**14.9** (2.42)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Selenium	ND (4.85)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Silver	**3.66** (0.48)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Thallium	ND (4.85)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Vanadium	**18.7** (0.97)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135
Zinc	**118** (2.42)		6010C		1	KJK	09/02/20 16:29	2.11	100	DI00135

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 0-2
Date Sampled: 08/31/20 10:00
Percent Solids: 98
Initial Volume: 6.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,1,1-Trichloroethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,1,2,2-Tetrachloroethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,1,2-Trichloroethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,1-Dichloroethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,1-Dichloroethene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,1-Dichloropropene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,2,3-Trichlorobenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,2,3-Trichloropropane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,2,4-Trichlorobenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,2,4-Trimethylbenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,2-Dibromo-3-Chloropropane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,2-Dibromoethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,2-Dichlorobenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,2-Dichloroethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,2-Dichloropropane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,3,5-Trimethylbenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,3-Dichlorobenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,3-Dichloropropane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,4-Dichlorobenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1,4-Dioxane	ND (0.0787)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
1-Chlorohexane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
2,2-Dichloropropane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
2-Butanone	ND (0.0393)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
2-Chlorotoluene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
2-Hexanone	ND (0.0393)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
4-Chlorotoluene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
4-Isopropyltoluene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
4-Methyl-2-Pentanone	ND (0.0393)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Acetone	ND (0.0393)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Benzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Bromobenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 0-2
Date Sampled: 08/31/20 10:00
Percent Solids: 98
Initial Volume: 6.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Bromodichloromethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Bromoform	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Bromomethane	ND (0.0079)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Carbon Disulfide	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Carbon Tetrachloride	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Chlorobenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Chloroethane	ND (0.0079)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Chloroform	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Chloromethane	ND (0.0079)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
cis-1,2-Dichloroethene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
cis-1,3-Dichloropropene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Dibromochloromethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Dibromomethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Dichlorodifluoromethane	ND (0.0079)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Diethyl Ether	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Di-isopropyl ether	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Ethyl tertiary-butyl ether	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Ethylbenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Hexachlorobutadiene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Isopropylbenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Methyl tert-Butyl Ether	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Methylene Chloride	ND (0.0197)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Naphthalene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
n-Butylbenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
n-Propylbenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
sec-Butylbenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Styrene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
tert-Butylbenzene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Tertiary-amyl methyl ether	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Tetrachloroethene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Tetrahydrofuran	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 0-2
Date Sampled: 08/31/20 10:00
Percent Solids: 98
Initial Volume: 6.5
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
trans-1,2-Dichloroethene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
trans-1,3-Dichloropropene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Trichloroethene	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Trichlorofluoromethane	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Vinyl Acetate	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Vinyl Chloride	ND (0.0079)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Xylene O	ND (0.0039)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Xylene P,M	ND (0.0079)		8260B Low		1	09/01/20 13:37	D0I0022	DI00207
Xylenes (Total)	ND (0.00787)		8260B Low		1	09/01/20 13:37		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*119 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*80 %*		*70-130*
Surrogate: Dibromofluoromethane	*105 %*		*70-130*
Surrogate: Toluene-d8	*112 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 0-2
Date Sampled: 08/31/20 10:00
Percent Solids: 98
Initial Volume: 20.8
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 9/1/20 14:15

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.02)		8082A		1	09/04/20 9:22		DI00103
Aroclor 1221	ND (0.02)		8082A		1	09/04/20 9:22		DI00103
Aroclor 1232	ND (0.02)		8082A		1	09/04/20 9:22		DI00103
Aroclor 1242	ND (0.02)		8082A		1	09/04/20 9:22		DI00103
Aroclor 1248	ND (0.02)		8082A		1	09/04/20 9:22		DI00103
Aroclor 1254	ND (0.02)		8082A		1	09/04/20 9:22		DI00103
Aroclor 1260 [2C]	**0.04** (0.02)		8082A		1	09/04/20 9:22		DI00103
Aroclor 1262	ND (0.02)		8082A		1	09/04/20 9:22		DI00103
Aroclor 1268	ND (0.02)		8082A		1	09/04/20 9:22		DI00103

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*76 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*74 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*83 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*89 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering	
Client Project ID: Sims Ave Pedestrian Bridge	ESS Laboratory Work Order: 20H1039
Client Sample ID: SB-03 0-2	ESS Laboratory Sample ID: 20H1039-01
Date Sampled: 08/31/20 10:00	Sample Matrix: Soil
Percent Solids: 98	Units: mg/kg dry
Initial Volume: 19.2	Analyst: MJV
Final Volume: 1	Prepared: 8/31/20 13:43
Extraction Method: 3546	

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**378** (79.9)		8100M		2	09/07/20 22:05	D0I0081	DH03113

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*87 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 0-2
Date Sampled: 08/31/20 10:00
Percent Solids: 98
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/31/20 13:43

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
1,2,4-Trichlorobenzene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
1,2-Dichlorobenzene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
1,3-Dichlorobenzene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
1,4-Dichlorobenzene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2,3,4,6-Tetrachlorophenol	ND (3.61)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2,4,5-Trichlorophenol	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2,4,6-Trichlorophenol	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2,4-Dichlorophenol	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2,4-Dimethylphenol	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2,4-Dinitrophenol	ND (3.61)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2,4-Dinitrotoluene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2,6-Dinitrotoluene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2-Chloronaphthalene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2-Chlorophenol	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2-Methylnaphthalene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2-Methylphenol	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2-Nitroaniline	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
2-Nitrophenol	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
3,3´-Dichlorobenzidine	ND (1.44)		8270D		2	09/04/20 14:18	D0I0124	DH03112
3+4-Methylphenol	ND (1.44)		8270D		2	09/04/20 14:18	D0I0124	DH03112
3-Nitroaniline	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
4,6-Dinitro-2-Methylphenol	ND (3.61)		8270D		2	09/04/20 14:18	D0I0124	DH03112
4-Bromophenyl-phenylether	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
4-Chloro-3-Methylphenol	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
4-Chloroaniline	ND (1.44)		8270D		2	09/04/20 14:18	D0I0124	DH03112
4-Chloro-phenyl-phenyl ether	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
4-Nitroaniline	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
4-Nitrophenol	ND (3.61)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Acenaphthene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Acenaphthylene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Acetophenone	ND (1.44)		8270D		2	09/04/20 14:18	D0I0124	DH03112

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 0-2
Date Sampled: 08/31/20 10:00
Percent Solids: 98
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/31/20 13:43

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (1.44)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Anthracene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Azobenzene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Benzo(a)anthracene	**1.07** (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Benzo(a)pyrene	**1.12** (0.361)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Benzo(b)fluoranthene	**1.01** (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Benzo(g,h,i)perylene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Benzo(k)fluoranthene	**0.796** (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Benzoic Acid	ND (3.61)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Benzyl Alcohol	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
bis(2-Chloroethoxy)methane	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
bis(2-Chloroethyl)ether	ND (0.361)		8270D		2	09/04/20 14:18	D0I0124	DH03112
bis(2-chloroisopropyl)Ether	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
bis(2-Ethylhexyl)phthalate	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Butylbenzylphthalate	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Carbazole	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Chrysene	**1.03** (0.361)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Dibenzo(a,h)Anthracene	ND (0.361)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Dibenzofuran	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Diethylphthalate	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Dimethylphthalate	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Di-n-butylphthalate	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Di-n-octylphthalate	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Fluoranthene	**1.94** (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Fluorene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Hexachlorobenzene	ND (0.361)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Hexachlorobutadiene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Hexachlorocyclopentadiene	ND (3.61)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Hexachloroethane	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Indeno(1,2,3-cd)Pyrene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Isophorone	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Naphthalene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 0-2
Date Sampled: 08/31/20 10:00
Percent Solids: 98
Initial Volume: 14.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/31/20 13:43

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
N-Nitrosodimethylamine	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
N-Nitroso-Di-n-Propylamine	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
N-nitrosodiphenylamine	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Pentachlorophenol	ND (3.61)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Phenanthrene	**1.16** (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Phenol	ND (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Pyrene	**1.87** (0.719)		8270D		2	09/04/20 14:18	D0I0124	DH03112
Pyridine	ND (3.61)		8270D		2	09/04/20 14:18	D0I0124	DH03112

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*41 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*65 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*58 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*54 %*		*30-130*
Surrogate: 2-Fluorophenol	*51 %*		*30-130*
Surrogate: Nitrobenzene-d5	*42 %*		*30-130*
Surrogate: Phenol-d6	*64 %*		*30-130*
Surrogate: p-Terphenyl-d14	*71 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 6-8
Date Sampled: 08/31/20 10:15
Percent Solids: 64

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	ND (7.43)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Arsenic	**10.1** (3.72)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Barium	**13.9** (3.72)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Beryllium	**0.41** (0.16)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Cadmium	ND (0.74)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Chromium	**19.6** (1.49)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Copper	**13.6** (3.72)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Lead	**76.4** (7.43)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Mercury	**0.311** (0.051)		7471B		1	MKS	09/02/20 9:32	0.6	40	DI00136
Nickel	**5.60** (3.72)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Selenium	ND (7.43)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Silver	ND (0.74)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Thallium	ND (0.74)		6020A		1	KJK	09/14/20 13:53	2.1	100	DI00135
Vanadium	**12.0** (1.49)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135
Zinc	**23.0** (3.72)		6010C		1	KJK	09/02/20 16:34	2.1	100	DI00135

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 6-8
Date Sampled: 08/31/20 10:15
Percent Solids: 64
Initial Volume: 6.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,1,1-Trichloroethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,1,2,2-Tetrachloroethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,1,2-Trichloroethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,1-Dichloroethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,1-Dichloroethene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,1-Dichloropropene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,2,3-Trichlorobenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,2,3-Trichloropropane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,2,4-Trichlorobenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,2,4-Trimethylbenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,2-Dibromo-3-Chloropropane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,2-Dibromoethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,2-Dichlorobenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,2-Dichloroethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,2-Dichloropropane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,3,5-Trimethylbenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,3-Dichlorobenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,3-Dichloropropane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,4-Dichlorobenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1,4-Dioxane	ND (0.124)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
1-Chlorohexane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
2,2-Dichloropropane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
2-Butanone	ND (0.0619)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
2-Chlorotoluene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
2-Hexanone	ND (0.0619)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
4-Chlorotoluene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
4-Isopropyltoluene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
4-Methyl-2-Pentanone	ND (0.0619)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Acetone	**0.115** (0.0619)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Benzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Bromobenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 6-8
Date Sampled: 08/31/20 10:15
Percent Solids: 64
Initial Volume: 6.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Bromodichloromethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Bromoform	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Bromomethane	ND (0.0124)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Carbon Disulfide	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Carbon Tetrachloride	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Chlorobenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Chloroethane	ND (0.0124)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Chloroform	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Chloromethane	ND (0.0124)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
cis-1,2-Dichloroethene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
cis-1,3-Dichloropropene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Dibromochloromethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Dibromomethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Dichlorodifluoromethane	ND (0.0124)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Diethyl Ether	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Di-isopropyl ether	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Ethyl tertiary-butyl ether	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Ethylbenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Hexachlorobutadiene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Isopropylbenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Methyl tert-Butyl Ether	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Methylene Chloride	ND (0.0310)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Naphthalene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
n-Butylbenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
n-Propylbenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
sec-Butylbenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Styrene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
tert-Butylbenzene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Tertiary-amyl methyl ether	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Tetrachloroethene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Tetrahydrofuran	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 6-8
Date Sampled: 08/31/20 10:15
Percent Solids: 64
Initial Volume: 6.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Toluene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
trans-1,2-Dichloroethene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
trans-1,3-Dichloropropene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Trichloroethene	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Trichlorofluoromethane	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Vinyl Acetate	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Vinyl Chloride	ND (0.0124)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Xylene O	ND (0.0062)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Xylene P,M	ND (0.0124)		8260B Low		1	09/01/20 14:02	D0I0022	DI00207
Xylenes (Total)	ND (0.0124)		8260B Low		1	09/01/20 14:02		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*114 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*79 %*		*70-130*
Surrogate: Dibromofluoromethane	*103 %*		*70-130*
Surrogate: Toluene-d8	*112 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 6-8
Date Sampled: 08/31/20 10:15
Percent Solids: 64
Initial Volume: 19.8
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 9/1/20 14:15

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (0.04)		8082A		1	09/04/20 9:42		DI00103
Aroclor 1221	ND (0.04)		8082A		1	09/04/20 9:42		DI00103
Aroclor 1232	ND (0.04)		8082A		1	09/04/20 9:42		DI00103
Aroclor 1242	ND (0.04)		8082A		1	09/04/20 9:42		DI00103
Aroclor 1248	ND (0.04)		8082A		1	09/04/20 9:42		DI00103
Aroclor 1254	ND (0.04)		8082A		1	09/04/20 9:42		DI00103
Aroclor 1260	ND (0.04)		8082A		1	09/04/20 9:42		DI00103
Aroclor 1262	ND (0.04)		8082A		1	09/04/20 9:42		DI00103
Aroclor 1268	ND (0.04)		8082A		1	09/04/20 9:42		DI00103

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*78 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*76 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*78 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*83 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 6-8
Date Sampled: 08/31/20 10:15
Percent Solids: 64
Initial Volume: 19.3
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MJV
Prepared: 8/31/20 13:43

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**115** (60.6)		8100M		1	09/07/20 17:11	D0I0081	DH03113

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*110 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 6-8
Date Sampled: 08/31/20 10:15
Percent Solids: 64
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/31/20 13:43

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
1,2,4-Trichlorobenzene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
1,2-Dichlorobenzene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
1,3-Dichlorobenzene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
1,4-Dichlorobenzene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2,3,4,6-Tetrachlorophenol	ND (2.73)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2,4,5-Trichlorophenol	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2,4,6-Trichlorophenol	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2,4-Dichlorophenol	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2,4-Dimethylphenol	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2,4-Dinitrophenol	ND (2.73)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2,4-Dinitrotoluene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2,6-Dinitrotoluene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2-Chloronaphthalene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2-Chlorophenol	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2-Methylnaphthalene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2-Methylphenol	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2-Nitroaniline	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
2-Nitrophenol	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
3,3´-Dichlorobenzidine	ND (1.09)		8270D		1	09/04/20 14:47	D0I0124	DH03112
3+4-Methylphenol	ND (1.09)		8270D		1	09/04/20 14:47	D0I0124	DH03112
3-Nitroaniline	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
4,6-Dinitro-2-Methylphenol	ND (2.73)		8270D		1	09/04/20 14:47	D0I0124	DH03112
4-Bromophenyl-phenylether	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
4-Chloro-3-Methylphenol	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
4-Chloroaniline	ND (1.09)		8270D		1	09/04/20 14:47	D0I0124	DH03112
4-Chloro-phenyl-phenyl ether	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
4-Nitroaniline	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
4-Nitrophenol	ND (2.73)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Acenaphthene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Acenaphthylene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Acetophenone	ND (1.09)		8270D		1	09/04/20 14:47	D0I0124	DH03112

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 6-8
Date Sampled: 08/31/20 10:15
Percent Solids: 64
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/31/20 13:43

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Aniline	ND (1.09)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Anthracene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Azobenzene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Benzo(a)anthracene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Benzo(a)pyrene	ND (0.273)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Benzo(b)fluoranthene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Benzo(g,h,i)perylene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Benzo(k)fluoranthene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Benzoic Acid	ND (2.73)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Benzyl Alcohol	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
bis(2-Chloroethoxy)methane	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
bis(2-Chloroethyl)ether	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
bis(2-chloroisopropyl)Ether	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
bis(2-Ethylhexyl)phthalate	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Butylbenzylphthalate	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Carbazole	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Chrysene	ND (0.273)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Dibenzo(a,h)Anthracene	ND (0.273)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Dibenzofuran	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Diethylphthalate	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Dimethylphthalate	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Di-n-butylphthalate	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Di-n-octylphthalate	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Fluoranthene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Fluorene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Hexachlorobenzene	ND (0.273)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Hexachlorobutadiene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Hexachlorocyclopentadiene	ND (2.73)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Hexachloroethane	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Indeno(1,2,3-cd)Pyrene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Isophorone	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Naphthalene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 6-8
Date Sampled: 08/31/20 10:15
Percent Solids: 64
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 8/31/20 13:43

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Nitrobenzene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
N-Nitrosodimethylamine	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
N-Nitroso-Di-n-Propylamine	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
N-nitrosodiphenylamine	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Pentachlorophenol	ND (2.73)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Phenanthrene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Phenol	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Pyrene	ND (0.545)		8270D		1	09/04/20 14:47	D0I0124	DH03112
Pyridine	ND (2.73)		8270D		1	09/04/20 14:47	D0I0124	DH03112

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*74 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*88 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*92 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*79 %*		*30-130*
Surrogate: 2-Fluorophenol	*85 %*		*30-130*
Surrogate: Nitrobenzene-d5	*72 %*		*30-130*
Surrogate: Phenol-d6	*95 %*		*30-130*
Surrogate: p-Terphenyl-d14	*85 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 Comp
Date Sampled: 08/31/20 10:30
Percent Solids: 87
Initial Volume: 19.6
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 9/1/20 20:00

8081B Organochlorine Pesticides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
4,4´-DDD	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
4,4´-DDE	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
4,4´-DDT	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Aldrin	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
alpha-BHC	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
alpha-Chlordane	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
beta-BHC	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Chlordane (Total)	ND (0.0352)		8081B		1	09/10/20 12:45	D0I0089	DI00106
delta-BHC	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Dieldrin	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Endosulfan I	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Endosulfan II	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Endosulfan Sulfate	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Endrin	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Endrin Aldehyde [2C]	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Endrin Ketone	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
gamma-BHC (Lindane)	ND (0.0018)		8081B		1	09/10/20 12:45	D0I0089	DI00106
gamma-Chlordane	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Heptachlor	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Heptachlor Epoxide	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Hexachlorobenzene	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Methoxychlor	ND (0.0029)		8081B		1	09/10/20 12:45	D0I0089	DI00106
Toxaphene	ND (0.147)		8081B		1	09/10/20 12:45	D0I0089	DI00106

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*83 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*83 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*84 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*85 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 Comp
Date Sampled: 08/31/20 10:30
Percent Solids: 87
Initial Volume: 10.4
Final Volume: 4
Extraction Method: 3546

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 8/31/20 18:00

8151A Chlorinated Herbicides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2,4,5-T	ND (0.010)		8151A		1	09/08/20 23:23	D0I0057	DH03158
2,4,5-TP (Silvex)	ND (0.010)		8151A		1	09/08/20 23:23	D0I0057	DH03158
2,4-D	ND (0.208)		8151A		1	09/08/20 23:23	D0I0057	DH03158
2,4-DB	ND (0.210)		8151A		1	09/08/20 23:23	D0I0057	DH03158
Dalapon	ND (0.201)		8151A		1	09/08/20 23:23	D0I0057	DH03158
Dicamba	ND (0.010)		8151A		1	09/08/20 23:23	D0I0057	DH03158
Dichlorprop	ND (0.208)		8151A		1	09/08/20 23:23	D0I0057	DH03158
Dinoseb	ND (0.210)		8151A		1	09/08/20 23:23	D0I0057	DH03158
MCPA	ND (20.5)		8151A		1	09/08/20 23:23	D0I0057	DH03158
MCPP	ND (20.8)		8151A		1	09/08/20 23:23	D0I0057	DH03158

	%Recovery	Qualifier	Limits
Surrogate: DCAA	*117 %*		*30-150*
Surrogate: DCAA [2C]	*99 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
Client Sample ID: SB-03 Comp
Date Sampled: 08/31/20 10:30
Percent Solids: 87

ESS Laboratory Work Order: 20H1039
ESS Laboratory Sample ID: 20H1039-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 196** (5)		9050A		1	EEM	09/01/20 15:40	umhos/cm	DI00125
Corrosivity (pH)	**6.70** (N/A)		9045		1	CCP	08/31/20 19:44	S.U.	DH03147
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 20.7**								
Flashpoint	**> 200** (N/A)		1010A		1	CCP	09/02/20 15:00	°F	DI00228
Free Liquid	ND (0.3)		9095A		1	CCP	08/31/20 15:00	ml/5 min	DH03146
Reactive Cyanide	ND (2.0)		7.3.3.2		1	JLK	09/02/20 17:15	mg/kg	DI00242
Reactive Sulfide	ND (2.0)		7.3.4.1		1	JLK	09/02/20 17:15	mg/kg	DI00242

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DI00135 - 3050B										
Blank										
Antimony	ND	5.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Barium	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	5.00	mg/kg wet							
Vanadium	ND	1.00	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Blank										
Thallium	ND	0.50	mg/kg wet							
LCS										
Antimony	41.2	16.1	mg/kg wet	42.00		98	80-120			
Arsenic	42.1	8.06	mg/kg wet	43.10		98	80-120			
Barium	618	8.06	mg/kg wet	597.0		103	80-120			
Beryllium	118	0.35	mg/kg wet	117.0		101	80-120			
Cadmium	113	1.61	mg/kg wet	118.0		95	80-120			
Chromium	300	3.23	mg/kg wet	299.0		100	80-120			
Copper	334	8.06	mg/kg wet	330.0		101	80-120			
Lead	142	16.1	mg/kg wet	144.0		99	80-120			
Nickel	175	8.06	mg/kg wet	171.0		102	80-120			
Selenium	148	16.1	mg/kg wet	154.0		96	80-120			
Silver	75.1	1.61	mg/kg wet	73.50		102	80-120			
Vanadium	266	3.23	mg/kg wet	259.0		103	80-120			
Zinc	852	8.06	mg/kg wet	874.0		98	80-120			
LCS										
Thallium	86.6	14.9	mg/kg wet	90.40		96	80-120			
LCS										
Thallium	82.4	7.46	mg/kg wet	90.40		91	80-120			
LCS Dup										
Antimony	39.0	15.6	mg/kg wet	42.00		93	80-120	6	20	
Arsenic	39.3	7.81	mg/kg wet	43.10		91	80-120	7	20	
Barium	588	7.81	mg/kg wet	597.0		98	80-120	5	20	
Beryllium	118	0.34	mg/kg wet	117.0		101	80-120	0.04	20	
Cadmium	107	1.56	mg/kg wet	118.0		91	80-120	5	20	
Chromium	286	3.12	mg/kg wet	299.0		96	80-120	5	20	
Copper	320	7.81	mg/kg wet	330.0		97	80-120	4	20	
Lead	139	15.6	mg/kg wet	144.0		97	80-120	2	20	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DI00135 - 3050B										
Nickel	167	7.81	mg/kg wet	171.0		98	80-120	5	20	
Selenium	143	15.6	mg/kg wet	154.0		93	80-120	3	20	
Silver	72.4	1.56	mg/kg wet	73.50		99	80-120	4	20	
Vanadium	253	3.12	mg/kg wet	259.0		98	80-120	5	20	
Zinc	820	7.81	mg/kg wet	874.0		94	80-120	4	20	
LCS Dup										
Thallium	85.1	15.6	mg/kg wet	90.40		94	80-120	2	20	
LCS Dup										
Thallium	83.4	7.81	mg/kg wet	90.40		92	80-120	1	30	
Batch DI00136 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	22.0	3.14	mg/kg wet	26.60		83	80-120			
LCS Dup										
Mercury	22.2	3.19	mg/kg wet	26.60		83	80-120	0.9	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch DI00207 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge

ESS Laboratory Work Order: 20H1039

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DI00207 - 5035										
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DI00207 - 5035										
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0529*		mg/kg wet	*0.05000*		*106*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0454*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0482*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: Toluene-d8	*0.0514*		mg/kg wet	*0.05000*		*103*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,1,1-Trichloroethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,1,2,2-Tetrachloroethane	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
1,1,2-Trichloroethane	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
1,1-Dichloroethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,1-Dichloroethene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
1,1-Dichloropropene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,2,3-Trichlorobenzene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130			
1,2,3-Trichloropropane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
1,2,4-Trichlorobenzene	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
1,2,4-Trimethylbenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dibromo-3-Chloropropane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dibromoethane	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
1,2-Dichlorobenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
1,2-Dichloroethane	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dichloropropane	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
1,3,5-Trimethylbenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
1,3-Dichlorobenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,3-Dichloropropane	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
1,4-Dichlorobenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
1,4-Dioxane	0.971	0.100	mg/kg wet	1.000		97	70-130			
1-Chlorohexane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
2,2-Dichloropropane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
2-Butanone	0.262	0.0500	mg/kg wet	0.2500		105	70-130			
2-Chlorotoluene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
2-Hexanone	0.241	0.0500	mg/kg wet	0.2500		97	70-130			
4-Chlorotoluene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
4-Isopropyltoluene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
4-Methyl-2-Pentanone	0.230	0.0500	mg/kg wet	0.2500		92	70-130			
Acetone	0.236	0.0500	mg/kg wet	0.2500		94	70-130			
Benzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
Bromobenzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Bromochloromethane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
Bromodichloromethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
Bromoform	0.0529	0.0050	mg/kg wet	0.05000		106	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DI00207 - 5035										
Bromomethane	0.0488	0.0100	mg/kg wet	0.05000		98	70-130			
Carbon Disulfide	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
Carbon Tetrachloride	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Chlorobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Chloroethane	0.0482	0.0100	mg/kg wet	0.05000		96	70-130			
Chloroform	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Chloromethane	0.0459	0.0100	mg/kg wet	0.05000		92	70-130			
cis-1,2-Dichloroethene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
cis-1,3-Dichloropropene	0.0624	0.0050	mg/kg wet	0.05000		125	70-130			
Dibromochloromethane	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
Dibromomethane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Dichlorodifluoromethane	0.0359	0.0100	mg/kg wet	0.05000		72	70-130			
Diethyl Ether	0.0571	0.0050	mg/kg wet	0.05000		114	70-130			
Di-isopropyl ether	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
Ethyl tertiary-butyl ether	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Ethylbenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
Hexachlorobutadiene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Isopropylbenzene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
Methyl tert-Butyl Ether	0.0564	0.0050	mg/kg wet	0.05000		113	70-130			
Methylene Chloride	0.0478	0.0250	mg/kg wet	0.05000		96	70-130			
Naphthalene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
n-Butylbenzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
n-Propylbenzene	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
sec-Butylbenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
Styrene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
tert-Butylbenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
Tertiary-amyl methyl ether	0.0595	0.0050	mg/kg wet	0.05000		119	70-130			
Tetrachloroethene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Tetrahydrofuran	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
Toluene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
trans-1,2-Dichloroethene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
trans-1,3-Dichloropropene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Trichloroethene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Trichlorofluoromethane	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
Vinyl Acetate	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Vinyl Chloride	0.0432	0.0100	mg/kg wet	0.05000		86	70-130			
Xylene O	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
Xylene P,M	0.0969	0.0100	mg/kg wet	0.1000		97	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0492*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0506*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0492*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Toluene-d8	*0.0498*		mg/kg wet	*0.05000*		*100*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	6	25	
1,1,1-Trichloroethane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	4	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DI00207 - 5035										
1,1,2,2-Tetrachloroethane	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	7	25	
1,1,2-Trichloroethane	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	5	25	
1,1-Dichloroethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
1,1-Dichloroethene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
1,1-Dichloropropene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	3	25	
1,2,3-Trichlorobenzene	0.0598	0.0050	mg/kg wet	0.05000		120	70-130	6	25	
1,2,3-Trichloropropane	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	7	25	
1,2,4-Trichlorobenzene	0.0602	0.0050	mg/kg wet	0.05000		120	70-130	6	25	
1,2,4-Trimethylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	6	25	
1,2-Dibromo-3-Chloropropane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	5	25	
1,2-Dibromoethane	0.0571	0.0050	mg/kg wet	0.05000		114	70-130	7	25	
1,2-Dichlorobenzene	0.0555	0.0050	mg/kg wet	0.05000		111	70-130	6	25	
1,2-Dichloroethane	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	5	25	
1,2-Dichloropropane	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	4	25	
1,3,5-Trimethylbenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	5	25	
1,3-Dichlorobenzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130	6	25	
1,3-Dichloropropane	0.0570	0.0050	mg/kg wet	0.05000		114	70-130	6	25	
1,4-Dichlorobenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	6	25	
1,4-Dioxane	1.08	0.100	mg/kg wet	1.000		108	70-130	10	20	
1-Chlorohexane	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	5	25	
2,2-Dichloropropane	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	4	25	
2-Butanone	0.267	0.0500	mg/kg wet	0.2500		107	70-130	2	25	
2-Chlorotoluene	0.0555	0.0050	mg/kg wet	0.05000		111	70-130	6	25	
2-Hexanone	0.249	0.0500	mg/kg wet	0.2500		100	70-130	3	25	
4-Chlorotoluene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130	6	25	
4-Isopropyltoluene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	6	25	
4-Methyl-2-Pentanone	0.244	0.0500	mg/kg wet	0.2500		98	70-130	6	25	
Acetone	0.229	0.0500	mg/kg wet	0.2500		92	70-130	3	25	
Benzene	0.0543	0.0050	mg/kg wet	0.05000		109	70-130	4	25	
Bromobenzene	0.0587	0.0050	mg/kg wet	0.05000		117	70-130	7	25	
Bromochloromethane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
Bromodichloromethane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
Bromoform	0.0579	0.0050	mg/kg wet	0.05000		116	70-130	9	25	
Bromomethane	0.0466	0.0100	mg/kg wet	0.05000		93	70-130	4	25	
Carbon Disulfide	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	3	25	
Carbon Tetrachloride	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
Chlorobenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	6	25	
Chloroethane	0.0478	0.0100	mg/kg wet	0.05000		96	70-130	0.8	25	
Chloroform	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
Chloromethane	0.0443	0.0100	mg/kg wet	0.05000		89	70-130	4	25	
cis-1,2-Dichloroethene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
cis-1,3-Dichloropropene	0.0657	0.0050	mg/kg wet	0.05000		131	70-130	5	25	B+
Dibromochloromethane	0.0581	0.0050	mg/kg wet	0.05000		116	70-130	8	25	
Dibromomethane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	5	25	
Dichlorodifluoromethane	0.0367	0.0100	mg/kg wet	0.05000		73	70-130	2	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DI00207 - 5035										
Diethyl Ether	0.0608	0.0050	mg/kg wet	0.05000		122	70-130	6	25	
Di-isopropyl ether	0.0565	0.0050	mg/kg wet	0.05000		113	70-130	5	25	
Ethyl tertiary-butyl ether	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	5	25	
Ethylbenzene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	5	25	
Hexachlorobutadiene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	3	25	
Isopropylbenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	6	25	
Methyl tert-Butyl Ether	0.0599	0.0050	mg/kg wet	0.05000		120	70-130	6	25	
Methylene Chloride	0.0490	0.0250	mg/kg wet	0.05000		98	70-130	2	25	
Naphthalene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	5	25	
n-Butylbenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
n-Propylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	6	25	
sec-Butylbenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
Styrene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	6	25	
tert-Butylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	6	25	
Tertiary-amyl methyl ether	0.0629	0.0050	mg/kg wet	0.05000		126	70-130	6	25	
Tetrachloroethene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
Tetrahydrofuran	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	5	25	
Toluene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	3	25	
trans-1,2-Dichloroethene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	4	25	
trans-1,3-Dichloropropene	0.0556	0.0050	mg/kg wet	0.05000		111	70-130	6	25	
Trichloroethene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
Trichlorofluoromethane	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	4	25	
Vinyl Acetate	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
Vinyl Chloride	0.0455	0.0100	mg/kg wet	0.05000		91	70-130	5	25	
Xylene O	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	6	25	
Xylene P,M	0.102	0.0100	mg/kg wet	0.1000		102	70-130	5	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0483*		mg/kg wet	*0.05000*		*97*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0504*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0488*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Toluene-d8	*0.0496*		mg/kg wet	*0.05000*		*99*	*70-130*			

8081B Organochlorine Pesticides

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DI00106 - 3546										
Blank										
4,4´-DDD	ND	0.0025	mg/kg wet							
4,4´-DDD [2C]	ND	0.0025	mg/kg wet							
4,4´-DDE	ND	0.0025	mg/kg wet							
4,4´-DDE [2C]	ND	0.0025	mg/kg wet							
4,4´-DDT	ND	0.0025	mg/kg wet							
4,4´-DDT [2C]	ND	0.0025	mg/kg wet							
Aldrin	ND	0.0025	mg/kg wet							
Aldrin [2C]	ND	0.0025	mg/kg wet							
alpha-BHC	ND	0.0025	mg/kg wet							
alpha-BHC [2C]	ND	0.0025	mg/kg wet							
alpha-Chlordane	ND	0.0025	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8081B Organochlorine Pesticides						
Batch DI00106 - 3546										
alpha-Chlordane [2C]	ND	0.0025	mg/kg wet							
beta-BHC	ND	0.0025	mg/kg wet							
beta-BHC [2C]	ND	0.0025	mg/kg wet							
delta-BHC	ND	0.0025	mg/kg wet							
delta-BHC [2C]	ND	0.0025	mg/kg wet							
Dieldrin	ND	0.0025	mg/kg wet							
Dieldrin [2C]	ND	0.0025	mg/kg wet							
Endosulfan I	ND	0.0025	mg/kg wet							
Endosulfan I [2C]	ND	0.0025	mg/kg wet							
Endosulfan II	ND	0.0025	mg/kg wet							
Endosulfan II [2C]	ND	0.0025	mg/kg wet							
Endosulfan Sulfate	ND	0.0025	mg/kg wet							
Endosulfan Sulfate [2C]	ND	0.0025	mg/kg wet							
Endrin	ND	0.0025	mg/kg wet							
Endrin [2C]	ND	0.0025	mg/kg wet							
Endrin Aldehyde	ND	0.0025	mg/kg wet							
Endrin Aldehyde [2C]	ND	0.0025	mg/kg wet							
Endrin Ketone	ND	0.0025	mg/kg wet							
Endrin Ketone [2C]	ND	0.0025	mg/kg wet							
gamma-BHC (Lindane)	ND	0.0015	mg/kg wet							
gamma-BHC (Lindane) [2C]	ND	0.0015	mg/kg wet							
gamma-Chlordane	ND	0.0025	mg/kg wet							
gamma-Chlordane [2C]	ND	0.0025	mg/kg wet							
Heptachlor	ND	0.0025	mg/kg wet							
Heptachlor [2C]	ND	0.0025	mg/kg wet							
Heptachlor Epoxide	ND	0.0025	mg/kg wet							
Heptachlor Epoxide [2C]	ND	0.0025	mg/kg wet							
Hexachlorobenzene	ND	0.0025	mg/kg wet							
Hexachlorobenzene [2C]	ND	0.0025	mg/kg wet							
Methoxychlor	ND	0.0025	mg/kg wet							
Methoxychlor [2C]	ND	0.0025	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0140*		mg/kg wet	*0.01250*		*112*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0140*		mg/kg wet	*0.01250*		*112*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0127*		mg/kg wet	*0.01250*		*101*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0129*		mg/kg wet	*0.01250*		*104*	*30-150*			
LCS										
4,4´-DDD	0.0148	0.0025	mg/kg wet	0.01250		119	40-140			
4,4´-DDD [2C]	0.0144	0.0025	mg/kg wet	0.01250		116	40-140			
4,4´-DDE	0.0130	0.0025	mg/kg wet	0.01250		104	40-140			
4,4´-DDE [2C]	0.0131	0.0025	mg/kg wet	0.01250		105	40-140			
4,4´-DDT	0.0113	0.0025	mg/kg wet	0.01250		91	40-140			
4,4´-DDT [2C]	0.0114	0.0025	mg/kg wet	0.01250		91	40-140			
Aldrin	0.0122	0.0025	mg/kg wet	0.01250		98	40-140			
Aldrin [2C]	0.0122	0.0025	mg/kg wet	0.01250		97	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8081B Organochlorine Pesticides						
Batch DI00106 - 3546										
alpha-BHC	0.0130	0.0025	mg/kg wet	0.01250		104	40-140			
alpha-BHC [2C]	0.0130	0.0025	mg/kg wet	0.01250		104	40-140			
alpha-Chlordane	0.0108	0.0025	mg/kg wet	0.01250		86	40-140			
alpha-Chlordane [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
beta-BHC	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
beta-BHC [2C]	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
delta-BHC	0.0132	0.0025	mg/kg wet	0.01250		106	40-140			
delta-BHC [2C]	0.0127	0.0025	mg/kg wet	0.01250		101	40-140			
Dieldrin	0.0132	0.0025	mg/kg wet	0.01250		106	40-140			
Dieldrin [2C]	0.0131	0.0025	mg/kg wet	0.01250		104	40-140			
Endosulfan I	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
Endosulfan I [2C]	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
Endosulfan II	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
Endosulfan II [2C]	0.0126	0.0025	mg/kg wet	0.01250		101	40-140			
Endosulfan Sulfate	0.0118	0.0025	mg/kg wet	0.01250		94	40-140			
Endosulfan Sulfate [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140			
Endrin	0.0126	0.0025	mg/kg wet	0.01250		101	40-140			
Endrin [2C]	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
Endrin Aldehyde	0.0109	0.0025	mg/kg wet	0.01250		87	40-140			
Endrin Aldehyde [2C]	0.0114	0.0025	mg/kg wet	0.01250		92	40-140			
Endrin Ketone	0.0118	0.0025	mg/kg wet	0.01250		94	40-140			
Endrin Ketone [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140			
gamma-BHC (Lindane)	0.0127	0.0015	mg/kg wet	0.01250		101	40-140			
gamma-BHC (Lindane) [2C]	0.0128	0.0015	mg/kg wet	0.01250		102	40-140			
gamma-Chlordane	0.0122	0.0025	mg/kg wet	0.01250		98	40-140			
gamma-Chlordane [2C]	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
Heptachlor	0.0123	0.0025	mg/kg wet	0.01250		99	40-140			
Heptachlor [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
Heptachlor Epoxide	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
Heptachlor Epoxide [2C]	0.0122	0.0025	mg/kg wet	0.01250		98	40-140			
Hexachlorobenzene	0.0122	0.0025	mg/kg wet	0.01250		98	40-140			
Hexachlorobenzene [2C]	0.0123	0.0025	mg/kg wet	0.01250		99	40-140			
Methoxychlor	0.0110	0.0025	mg/kg wet	0.01250		88	40-140			
Methoxychlor [2C]	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
Surrogate: Decachlorobiphenyl	*0.0131*		mg/kg wet	*0.01250*		*105*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0131*		mg/kg wet	*0.01250*		*105*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0128*		mg/kg wet	*0.01250*		*103*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0131*		mg/kg wet	*0.01250*		*105*	*30-150*			
LCS Dup										
4,4´-DDD	0.0151	0.0025	mg/kg wet	0.01250		121	40-140	2	30	
4,4´-DDD [2C]	0.0148	0.0025	mg/kg wet	0.01250		119	40-140	3	30	
4,4´-DDE	0.0130	0.0025	mg/kg wet	0.01250		104	40-140	0.05	30	
4,4´-DDE [2C]	0.0131	0.0025	mg/kg wet	0.01250		105	40-140	0.08	30	
4,4´-DDT	0.0118	0.0025	mg/kg wet	0.01250		95	40-140	5	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8081B Organochlorine Pesticides						
Batch DI00106 - 3546										
4,4´-DDT [2C]	0.0119	0.0025	mg/kg wet	0.01250		95	40-140	5	30	
Aldrin	0.0122	0.0025	mg/kg wet	0.01250		98	40-140	0.06	30	
Aldrin [2C]	0.0122	0.0025	mg/kg wet	0.01250		97	40-140	0.1	30	
alpha-BHC	0.0128	0.0025	mg/kg wet	0.01250		103	40-140	1	30	
alpha-BHC [2C]	0.0130	0.0025	mg/kg wet	0.01250		104	40-140	0.08	30	
alpha-Chlordane	0.0079	0.0025	mg/kg wet	0.01250		63	40-140	31	30	D+
alpha-Chlordane [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140	0.5	30	
beta-BHC	0.0122	0.0025	mg/kg wet	0.01250		98	40-140	1	30	
beta-BHC [2C]	0.0124	0.0025	mg/kg wet	0.01250		99	40-140	0.1	30	
delta-BHC	0.0130	0.0025	mg/kg wet	0.01250		104	40-140	2	30	
delta-BHC [2C]	0.0127	0.0025	mg/kg wet	0.01250		102	40-140	0.3	30	
Dieldrin	0.0131	0.0025	mg/kg wet	0.01250		105	40-140	0.8	30	
Dieldrin [2C]	0.0130	0.0025	mg/kg wet	0.01250		104	40-140	0.4	30	
Endosulfan I	0.0121	0.0025	mg/kg wet	0.01250		97	40-140	2	30	
Endosulfan I [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140	0.4	30	
Endosulfan II	0.0107	0.0025	mg/kg wet	0.01250		85	40-140	11	30	
Endosulfan II [2C]	0.0129	0.0025	mg/kg wet	0.01250		103	40-140	2	30	
Endosulfan Sulfate	0.0122	0.0025	mg/kg wet	0.01250		98	40-140	4	30	
Endosulfan Sulfate [2C]	0.0129	0.0025	mg/kg wet	0.01250		103	40-140	3	30	
Endrin	0.0126	0.0025	mg/kg wet	0.01250		101	40-140	0.03	30	
Endrin [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	0.3	30	
Endrin Aldehyde	0.0115	0.0025	mg/kg wet	0.01250		92	40-140	5	30	
Endrin Aldehyde [2C]	0.0119	0.0025	mg/kg wet	0.01250		95	40-140	4	30	
Endrin Ketone	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	6	30	
Endrin Ketone [2C]	0.0131	0.0025	mg/kg wet	0.01250		105	40-140	5	30	
gamma-BHC (Lindane)	0.0127	0.0015	mg/kg wet	0.01250		102	40-140	0.6	30	
gamma-BHC (Lindane) [2C]	0.0128	0.0015	mg/kg wet	0.01250		103	40-140	0.3	30	
gamma-Chlordane	0.0122	0.0025	mg/kg wet	0.01250		98	40-140	0.3	30	
gamma-Chlordane [2C]	0.0115	0.0025	mg/kg wet	0.01250		92	40-140	0.03	30	
Heptachlor	0.0123	0.0025	mg/kg wet	0.01250		98	40-140	0.3	30	
Heptachlor [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140	0.1	30	
Heptachlor Epoxide	0.0121	0.0025	mg/kg wet	0.01250		96	40-140	1	30	
Heptachlor Epoxide [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140	0.5	30	
Hexachlorobenzene	0.0120	0.0025	mg/kg wet	0.01250		96	40-140	1	30	
Hexachlorobenzene [2C]	0.0122	0.0025	mg/kg wet	0.01250		97	40-140	1	30	
Methoxychlor	0.0120	0.0025	mg/kg wet	0.01250		96	40-140	8	30	
Methoxychlor [2C]	0.0124	0.0025	mg/kg wet	0.01250		99	40-140	8	30	
Surrogate: Decachlorobiphenyl	*0.0139*		mg/kg wet	*0.01250*		*111*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0139*		mg/kg wet	*0.01250*		*111*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0122*		mg/kg wet	*0.01250*		*98*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0126*		mg/kg wet	*0.01250*		*100*	*30-150*			
				8082A Polychlorinated Biphenyls (PCB)						
Batch DI00103 - 3540C										

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch DI00103 - 3540C										
Blank										
Aroclor 1016	ND	0.02	mg/kg wet							
Aroclor 1016 [2C]	ND	0.02	mg/kg wet							
Aroclor 1221	ND	0.02	mg/kg wet							
Aroclor 1221 [2C]	ND	0.02	mg/kg wet							
Aroclor 1232	ND	0.02	mg/kg wet							
Aroclor 1232 [2C]	ND	0.02	mg/kg wet							
Aroclor 1242	ND	0.02	mg/kg wet							
Aroclor 1242 [2C]	ND	0.02	mg/kg wet							
Aroclor 1248	ND	0.02	mg/kg wet							
Aroclor 1248 [2C]	ND	0.02	mg/kg wet							
Aroclor 1254	ND	0.02	mg/kg wet							
Aroclor 1254 [2C]	ND	0.02	mg/kg wet							
Aroclor 1260	ND	0.02	mg/kg wet							
Aroclor 1260 [2C]	ND	0.02	mg/kg wet							
Aroclor 1262	ND	0.02	mg/kg wet							
Aroclor 1262 [2C]	ND	0.02	mg/kg wet							
Aroclor 1268	ND	0.02	mg/kg wet							
Aroclor 1268 [2C]	ND	0.02	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0246*		mg/kg wet	*0.02500*		*98*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0226*		mg/kg wet	*0.02500*		*90*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0223*		mg/kg wet	*0.02500*		*89*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0230*		mg/kg wet	*0.02500*		*92*	*30-150*			
LCS										
Aroclor 1016	0.5	0.02	mg/kg wet	0.5000		92	40-140			
Aroclor 1016 [2C]	0.4	0.02	mg/kg wet	0.5000		89	40-140			
Aroclor 1260	0.5	0.02	mg/kg wet	0.5000		100	40-140			
Aroclor 1260 [2C]	0.4	0.02	mg/kg wet	0.5000		87	40-140			
Surrogate: Decachlorobiphenyl	*0.0242*		mg/kg wet	*0.02500*		*97*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0223*		mg/kg wet	*0.02500*		*89*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0225*		mg/kg wet	*0.02500*		*90*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0221*		mg/kg wet	*0.02500*		*89*	*30-150*			
LCS Dup										
Aroclor 1016	0.5	0.02	mg/kg wet	0.5000		95	40-140	4	30	
Aroclor 1016 [2C]	0.4	0.02	mg/kg wet	0.5000		90	40-140	0.2	30	
Aroclor 1260	0.5	0.02	mg/kg wet	0.5000		104	40-140	5	30	
Aroclor 1260 [2C]	0.4	0.02	mg/kg wet	0.5000		90	40-140	3	30	
Surrogate: Decachlorobiphenyl	*0.0251*		mg/kg wet	*0.02500*		*100*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0227*		mg/kg wet	*0.02500*		*91*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0229*		mg/kg wet	*0.02500*		*92*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0225*		mg/kg wet	*0.02500*		*90*	*30-150*			

8100M Total Petroleum Hydrocarbons

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch DH03113 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.79*		mg/kg wet	*5.000*		*96*	*40-140*			
LCS										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		72	40-140			
Docosane (C22)	2.3	0.2	mg/kg wet	2.500		94	40-140			
Dodecane (C12)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Eicosane (C20)	2.3	0.2	mg/kg wet	2.500		91	40-140			
Hexacosane (C26)	2.3	0.2	mg/kg wet	2.500		94	40-140			
Hexadecane (C16)	2.2	0.2	mg/kg wet	2.500		87	40-140			
Nonadecane (C19)	3.2	0.2	mg/kg wet	2.500		129	40-140			
Nonane (C9)	1.6	0.2	mg/kg wet	2.500		65	30-140			
Octacosane (C28)	2.4	0.2	mg/kg wet	2.500		95	40-140			
Octadecane (C18)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Tetracosane (C24)	2.3	0.2	mg/kg wet	2.500		94	40-140			
Tetradecane (C14)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Total Petroleum Hydrocarbons	34.5	37.5	mg/kg wet	35.00		99	40-140			
Triacontane (C30)	2.3	0.2	mg/kg wet	2.500		93	40-140			
Surrogate: O-Terphenyl	*3.70*		mg/kg wet	*5.000*		*74*	*40-140*			
LCS Dup										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		74	40-140	3	25	
Docosane (C22)	2.4	0.2	mg/kg wet	2.500		96	40-140	3	25	
Dodecane (C12)	2.1	0.2	mg/kg wet	2.500		84	40-140	6	25	
Eicosane (C20)	2.4	0.2	mg/kg wet	2.500		95	40-140	4	25	
Hexacosane (C26)	2.4	0.2	mg/kg wet	2.500		96	40-140	3	25	
Hexadecane (C16)	2.3	0.2	mg/kg wet	2.500		91	40-140	5	25	
Nonadecane (C19)	3.2	0.2	mg/kg wet	2.500		128	40-140	0.5	25	
Nonane (C9)	1.7	0.2	mg/kg wet	2.500		66	30-140	2	25	
Octacosane (C28)	2.4	0.2	mg/kg wet	2.500		98	40-140	2	25	
Octadecane (C18)	2.3	0.2	mg/kg wet	2.500		93	40-140	5	25	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8100M Total Petroleum Hydrocarbons						
Batch DH03113 - 3546										
Tetracosane (C24)	2.4	0.2	mg/kg wet	2.500		96	40-140	3	25	
Tetradecane (C14)	2.2	0.2	mg/kg wet	2.500		89	40-140	5	25	
Total Petroleum Hydrocarbons	35.7	37.5	mg/kg wet	35.00		102	40-140	4	25	
Triacontane (C30)	2.4	0.2	mg/kg wet	2.500		95	40-140	2	25	
Surrogate: O-Terphenyl	*3.88*		mg/kg wet	*5.000*		*78*	*40-140*			
				8151A Chlorinated Herbicides						
Batch DH03158 - 3546										
Blank										
2,4,5-T	ND	0.010	mg/kg wet							
2,4,5-T [2C]	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex)	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex) [2C]	ND	0.010	mg/kg wet							
2,4-D	ND	0.188	mg/kg wet							
2,4-D [2C]	ND	0.188	mg/kg wet							
2,4-DB	ND	0.190	mg/kg wet							
2,4-DB [2C]	ND	0.190	mg/kg wet							
Dalapon	ND	0.182	mg/kg wet							
Dalapon [2C]	ND	0.182	mg/kg wet							
Dicamba	ND	0.009	mg/kg wet							
Dicamba [2C]	ND	0.009	mg/kg wet							
Dichlorprop	ND	0.188	mg/kg wet							
Dichlorprop [2C]	ND	0.188	mg/kg wet							
Dinoseb	ND	0.190	mg/kg wet							
Dinoseb [2C]	ND	0.190	mg/kg wet							
MCPA	ND	18.6	mg/kg wet							
MCPA [2C]	ND	18.6	mg/kg wet							
MCPP	ND	18.8	mg/kg wet							
MCPP [2C]	ND	18.8	mg/kg wet							
Surrogate: DCAA	*0.174*		mg/kg wet	*0.2000*		*87*	*30-150*			
Surrogate: DCAA [2C]	*0.157*		mg/kg wet	*0.2000*		*78*	*30-150*			
LCS										
2,4,5-T	0.014	0.010	mg/kg wet	0.01900		74	40-140			
2,4,5-T [2C]	0.013	0.010	mg/kg wet	0.01900		68	40-140			
2,4,5-TP (Silvex)	0.014	0.010	mg/kg wet	0.01900		74	40-140			
2,4,5-TP (Silvex) [2C]	0.014	0.010	mg/kg wet	0.01900		74	40-140			
2,4-D	0.133	0.188	mg/kg wet	0.1880		71	40-140			
2,4-D [2C]	0.144	0.188	mg/kg wet	0.1880		77	40-140			
2,4-DB	0.146	0.190	mg/kg wet	0.1900		77	40-140			
2,4-DB [2C]	0.135	0.190	mg/kg wet	0.1900		71	40-140			
Dalapon	0.278	0.182	mg/kg wet	0.4550		61	40-140			
Dalapon [2C]	0.309	0.182	mg/kg wet	0.4550		68	40-140			
Dicamba	0.014	0.009	mg/kg wet	0.01880		74	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8151A Chlorinated Herbicides						
Batch DH03158 - 3546										
Dicamba [2C]	0.014	0.009	mg/kg wet	0.01880		76	40-140			
Dichlorprop	0.159	0.188	mg/kg wet	0.1880		85	40-140			
Dichlorprop [2C]	0.169	0.188	mg/kg wet	0.1880		90	40-140			
Dinoseb	0.019	0.190	mg/kg wet	0.09500		20	10-100			
Dinoseb [2C]	0.019	0.190	mg/kg wet	0.09500		20	10-100			
MCPA	15.8	18.6	mg/kg wet	18.60		85	40-140			
MCPA [2C]	14.4	18.6	mg/kg wet	18.60		77	40-140			
MCPP	15.6	18.8	mg/kg wet	18.80		83	40-140			
MCPP [2C]	15.8	18.8	mg/kg wet	18.80		84	40-140			
Surrogate: DCAA	*0.214*		mg/kg wet	*0.2000*		*107*	*30-150*			
Surrogate: DCAA [2C]	*0.191*		mg/kg wet	*0.2000*		*95*	*30-150*			
LCS Dup										
2,4,5-T	0.013	0.010	mg/kg wet	0.01900		70	40-140	6	30	
2,4,5-T [2C]	0.013	0.010	mg/kg wet	0.01900		70	40-140	3	30	
2,4,5-TP (Silvex)	0.013	0.010	mg/kg wet	0.01900		70	40-140	6	30	
2,4,5-TP (Silvex) [2C]	0.014	0.010	mg/kg wet	0.01900		72	40-140	3	30	
2,4-D	0.126	0.188	mg/kg wet	0.1880		67	40-140	5	30	
2,4-D [2C]	0.135	0.188	mg/kg wet	0.1880		72	40-140	7	30	
2,4-DB	0.139	0.190	mg/kg wet	0.1900		73	40-140	5	30	
2,4-DB [2C]	0.132	0.190	mg/kg wet	0.1900		69	40-140	3	30	
Dalapon	0.265	0.182	mg/kg wet	0.4550		58	40-140	5	30	
Dalapon [2C]	0.280	0.182	mg/kg wet	0.4550		62	40-140	10	30	
Dicamba	0.012	0.009	mg/kg wet	0.01880		64	40-140	14	30	
Dicamba [2C]	0.013	0.009	mg/kg wet	0.01880		68	40-140	11	30	
Dichlorprop	0.143	0.188	mg/kg wet	0.1880		76	40-140	11	30	
Dichlorprop [2C]	0.160	0.188	mg/kg wet	0.1880		85	40-140	5	30	
Dinoseb	0.019	0.190	mg/kg wet	0.09500		20	10-100	0	30	
Dinoseb [2C]	0.019	0.190	mg/kg wet	0.09500		20	10-100	0	30	
MCPA	14.5	18.6	mg/kg wet	18.60		78	40-140	9	30	
MCPA [2C]	13.7	18.6	mg/kg wet	18.60		74	40-140	5	30	
MCPP	14.3	18.8	mg/kg wet	18.80		76	40-140	9	30	
MCPP [2C]	14.9	18.8	mg/kg wet	18.80		79	40-140	6	30	
Surrogate: DCAA	*0.170*		mg/kg wet	*0.2000*		*85*	*30-150*			
Surrogate: DCAA [2C]	*0.154*		mg/kg wet	*0.2000*		*77*	*30-150*			
				8270D Semi-Volatile Organic Compounds						
Batch DH03112 - 3546										
Blank										
1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DH03112 - 3546										
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.667	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.167	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
				8270D Semi-Volatile Organic Compounds						
Batch DH03112 - 3546										
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.167	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.17*		mg/kg wet	*3.333*		*65*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.39*		mg/kg wet	*5.000*		*88*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.55*		mg/kg wet	*5.000*		*71*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.40*		mg/kg wet	*3.333*		*72*	*30-130*			
Surrogate: 2-Fluorophenol	*3.61*		mg/kg wet	*5.000*		*72*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.29*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: Phenol-d6	*3.57*		mg/kg wet	*5.000*		*71*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.39*		mg/kg wet	*3.333*		*102*	*30-130*			
LCS										
1,1-Biphenyl	2.23	0.333	mg/kg wet	3.333		67	40-140			
1,2,4-Trichlorobenzene	2.20	0.333	mg/kg wet	3.333		66	40-140			
1,2-Dichlorobenzene	2.17	0.333	mg/kg wet	3.333		65	40-140			
1,3-Dichlorobenzene	2.17	0.333	mg/kg wet	3.333		65	40-140			
1,4-Dichlorobenzene	2.15	0.333	mg/kg wet	3.333		65	40-140			
2,3,4,6-Tetrachlorophenol	2.57	1.67	mg/kg wet	3.333		77	30-130			
2,4,5-Trichlorophenol	2.68	0.333	mg/kg wet	3.333		80	30-130			
2,4,6-Trichlorophenol	2.62	0.333	mg/kg wet	3.333		79	30-130			
2,4-Dichlorophenol	2.52	0.333	mg/kg wet	3.333		76	30-130			
2,4-Dimethylphenol	2.56	0.333	mg/kg wet	3.333		77	30-130			
2,4-Dinitrophenol	3.48	1.67	mg/kg wet	3.333		104	30-130			
2,4-Dinitrotoluene	2.91	0.333	mg/kg wet	3.333		87	40-140			
2,6-Dinitrotoluene	2.70	0.333	mg/kg wet	3.333		81	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

8270D Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DH03112 - 3546										
2-Chloronaphthalene	2.20	0.333	mg/kg wet	3.333		66	40-140			
2-Chlorophenol	2.28	0.333	mg/kg wet	3.333		68	30-130			
2-Methylnaphthalene	2.28	0.333	mg/kg wet	3.333		69	40-140			
2-Methylphenol	2.36	0.333	mg/kg wet	3.333		71	30-130			
2-Nitroaniline	3.02	0.333	mg/kg wet	3.333		91	40-140			
2-Nitrophenol	2.28	0.333	mg/kg wet	3.333		68	30-130			
3,3´-Dichlorobenzidine	2.78	0.667	mg/kg wet	3.333		83	40-140			
3+4-Methylphenol	5.03	0.667	mg/kg wet	6.667		75	30-130			
3-Nitroaniline	2.74	0.333	mg/kg wet	3.333		82	40-140			
4,6-Dinitro-2-Methylphenol	3.39	1.67	mg/kg wet	3.333		102	30-130			
4-Bromophenyl-phenylether	2.84	0.333	mg/kg wet	3.333		85	40-140			
4-Chloro-3-Methylphenol	2.77	0.333	mg/kg wet	3.333		83	30-130			
4-Chloroaniline	1.93	0.667	mg/kg wet	3.333		58	40-140			
4-Chloro-phenyl-phenyl ether	2.79	0.333	mg/kg wet	3.333		84	40-140			
4-Nitroaniline	2.73	0.333	mg/kg wet	3.333		82	40-140			
4-Nitrophenol	2.72	1.67	mg/kg wet	3.333		82	30-130			
Acenaphthene	2.38	0.333	mg/kg wet	3.333		71	40-140			
Acenaphthylene	2.36	0.333	mg/kg wet	3.333		71	40-140			
Acetophenone	2.16	0.667	mg/kg wet	3.333		65	40-140			
Aniline	1.56	0.667	mg/kg wet	3.333		47	40-140			
Anthracene	2.86	0.333	mg/kg wet	3.333		86	40-140			
Azobenzene	2.60	0.333	mg/kg wet	3.333		78	40-140			
Benzo(a)anthracene	3.00	0.333	mg/kg wet	3.333		90	40-140			
Benzo(a)pyrene	3.15	0.167	mg/kg wet	3.333		95	40-140			
Benzo(b)fluoranthene	3.54	0.333	mg/kg wet	3.333		106	40-140			
Benzo(g,h,i)perylene	3.04	0.333	mg/kg wet	3.333		91	40-140			
Benzo(k)fluoranthene	2.75	0.333	mg/kg wet	3.333		82	40-140			
Benzoic Acid	3.15	1.67	mg/kg wet	3.333		95	40-140			
Benzyl Alcohol	2.18	0.333	mg/kg wet	3.333		65	40-140			
bis(2-Chloroethoxy)methane	2.24	0.333	mg/kg wet	3.333		67	40-140			
bis(2-Chloroethyl)ether	2.29	0.333	mg/kg wet	3.333		69	40-140			
bis(2-chloroisopropyl)Ether	2.27	0.333	mg/kg wet	3.333		68	40-140			
bis(2-Ethylhexyl)phthalate	2.53	0.333	mg/kg wet	3.333		76	40-140			
Butylbenzylphthalate	2.69	0.333	mg/kg wet	3.333		81	40-140			
Carbazole	2.91	0.333	mg/kg wet	3.333		87	40-140			
Chrysene	2.88	0.167	mg/kg wet	3.333		86	40-140			
Dibenzo(a,h)Anthracene	3.11	0.167	mg/kg wet	3.333		93	40-140			
Dibenzofuran	2.53	0.333	mg/kg wet	3.333		76	40-140			
Diethylphthalate	2.88	0.333	mg/kg wet	3.333		86	40-140			
Dimethylphthalate	2.80	0.333	mg/kg wet	3.333		84	40-140			
Di-n-butylphthalate	2.66	0.333	mg/kg wet	3.333		80	40-140			
Di-n-octylphthalate	2.68	0.333	mg/kg wet	3.333		80	40-140			
Fluoranthene	2.88	0.333	mg/kg wet	3.333		87	40-140			
Fluorene	2.85	0.333	mg/kg wet	3.333		86	40-140			
Hexachlorobenzene	2.71	0.167	mg/kg wet	3.333		81	40-140			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

8270D Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DH03112 - 3546										
Hexachlorobutadiene	2.11	0.333	mg/kg wet	3.333		63	40-140			
Hexachlorocyclopentadiene	1.43	1.67	mg/kg wet	3.333		43	40-140			
Hexachloroethane	2.00	0.333	mg/kg wet	3.333		60	40-140			
Indeno(1,2,3-cd)Pyrene	3.00	0.333	mg/kg wet	3.333		90	40-140			
Isophorone	2.09	0.333	mg/kg wet	3.333		63	40-140			
Naphthalene	2.23	0.333	mg/kg wet	3.333		67	40-140			
Nitrobenzene	2.16	0.333	mg/kg wet	3.333		65	40-140			
N-Nitrosodimethylamine	1.90	0.333	mg/kg wet	3.333		57	40-140			
N-Nitroso-Di-n-Propylamine	2.33	0.333	mg/kg wet	3.333		70	40-140			
N-nitrosodiphenylamine	2.72	0.333	mg/kg wet	3.333		82	40-140			
Pentachlorophenol	2.85	1.67	mg/kg wet	3.333		86	30-130			
Phenanthrene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Phenol	2.51	0.333	mg/kg wet	3.333		75	30-130			
Pyrene	2.87	0.333	mg/kg wet	3.333		86	40-140			
Pyridine	1.93	1.67	mg/kg wet	3.333		58	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.28*		mg/kg wet	*3.333*		*68*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.74*		mg/kg wet	*5.000*		*95*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.74*		mg/kg wet	*5.000*		*75*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.55*		mg/kg wet	*3.333*		*77*	*30-130*			
Surrogate: 2-Fluorophenol	*3.79*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.36*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: Phenol-d6	*3.79*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.48*		mg/kg wet	*3.333*		*104*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.17	0.333	mg/kg wet	3.333		65	40-140	3	30	
1,2,4-Trichlorobenzene	2.16	0.333	mg/kg wet	3.333		65	40-140	2	30	
1,2-Dichlorobenzene	2.04	0.333	mg/kg wet	3.333		61	40-140	6	30	
1,3-Dichlorobenzene	2.05	0.333	mg/kg wet	3.333		61	40-140	6	30	
1,4-Dichlorobenzene	2.03	0.333	mg/kg wet	3.333		61	40-140	6	30	
2,3,4,6-Tetrachlorophenol	2.44	1.67	mg/kg wet	3.333		73	30-130	5	30	
2,4,5-Trichlorophenol	2.61	0.333	mg/kg wet	3.333		78	30-130	3	30	
2,4,6-Trichlorophenol	2.54	0.333	mg/kg wet	3.333		76	30-130	3	30	
2,4-Dichlorophenol	2.53	0.333	mg/kg wet	3.333		76	30-130	0.05	30	
2,4-Dimethylphenol	2.57	0.333	mg/kg wet	3.333		77	30-130	0.5	30	
2,4-Dinitrophenol	3.25	1.67	mg/kg wet	3.333		98	30-130	7	30	
2,4-Dinitrotoluene	2.86	0.333	mg/kg wet	3.333		86	40-140	2	30	
2,6-Dinitrotoluene	2.65	0.333	mg/kg wet	3.333		79	40-140	2	30	
2-Chloronaphthalene	2.14	0.333	mg/kg wet	3.333		64	40-140	3	30	
2-Chlorophenol	2.16	0.333	mg/kg wet	3.333		65	30-130	5	30	
2-Methylnaphthalene	2.26	0.333	mg/kg wet	3.333		68	40-140	1	30	
2-Methylphenol	2.26	0.333	mg/kg wet	3.333		68	30-130	5	30	
2-Nitroaniline	2.91	0.333	mg/kg wet	3.333		87	40-140	4	30	
2-Nitrophenol	2.30	0.333	mg/kg wet	3.333		69	30-130	0.6	30	
3,3´-Dichlorobenzidine	2.76	0.667	mg/kg wet	3.333		83	40-140	0.6	30	
3+4-Methylphenol	4.92	0.667	mg/kg wet	6.667		74	30-130	2	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DH03112 - 3546										
3-Nitroaniline	2.67	0.333	mg/kg wet	3.333		80	40-140	2	30	
4,6-Dinitro-2-Methylphenol	3.30	1.67	mg/kg wet	3.333		99	30-130	3	30	
4-Bromophenyl-phenylether	2.81	0.333	mg/kg wet	3.333		84	40-140	1	30	
4-Chloro-3-Methylphenol	2.80	0.333	mg/kg wet	3.333		84	30-130	1	30	
4-Chloroaniline	2.00	0.667	mg/kg wet	3.333		60	40-140	4	30	
4-Chloro-phenyl-phenyl ether	2.69	0.333	mg/kg wet	3.333		81	40-140	4	30	
4-Nitroaniline	2.69	0.333	mg/kg wet	3.333		81	40-140	2	30	
4-Nitrophenol	2.66	1.67	mg/kg wet	3.333		80	30-130	2	30	
Acenaphthene	2.31	0.333	mg/kg wet	3.333		69	40-140	3	30	
Acenaphthylene	2.31	0.333	mg/kg wet	3.333		69	40-140	2	30	
Acetophenone	2.08	0.667	mg/kg wet	3.333		62	40-140	4	30	
Aniline	1.54	0.667	mg/kg wet	3.333		46	40-140	1	30	
Anthracene	2.79	0.333	mg/kg wet	3.333		84	40-140	3	30	
Azobenzene	2.58	0.333	mg/kg wet	3.333		77	40-140	1	30	
Benzo(a)anthracene	2.88	0.333	mg/kg wet	3.333		86	40-140	4	30	
Benzo(a)pyrene	3.06	0.167	mg/kg wet	3.333		92	40-140	3	30	
Benzo(b)fluoranthene	3.56	0.333	mg/kg wet	3.333		107	40-140	0.5	30	
Benzo(g,h,i)perylene	2.94	0.333	mg/kg wet	3.333		88	40-140	3	30	
Benzo(k)fluoranthene	2.54	0.333	mg/kg wet	3.333		76	40-140	8	30	
Benzoic Acid	3.20	1.67	mg/kg wet	3.333		96	40-140	2	30	
Benzyl Alcohol	2.10	0.333	mg/kg wet	3.333		63	40-140	4	30	
bis(2-Chloroethoxy)methane	2.22	0.333	mg/kg wet	3.333		67	40-140	1	30	
bis(2-Chloroethyl)ether	2.18	0.333	mg/kg wet	3.333		65	40-140	5	30	
bis(2-chloroisopropyl)Ether	2.12	0.333	mg/kg wet	3.333		64	40-140	7	30	
bis(2-Ethylhexyl)phthalate	2.46	0.333	mg/kg wet	3.333		74	40-140	3	30	
Butylbenzylphthalate	2.60	0.333	mg/kg wet	3.333		78	40-140	3	30	
Carbazole	2.92	0.333	mg/kg wet	3.333		88	40-140	0.3	30	
Chrysene	2.74	0.167	mg/kg wet	3.333		82	40-140	5	30	
Dibenzo(a,h)Anthracene	3.02	0.167	mg/kg wet	3.333		91	40-140	3	30	
Dibenzofuran	2.47	0.333	mg/kg wet	3.333		74	40-140	2	30	
Diethylphthalate	2.78	0.333	mg/kg wet	3.333		83	40-140	4	30	
Dimethylphthalate	2.67	0.333	mg/kg wet	3.333		80	40-140	5	30	
Di-n-butylphthalate	2.66	0.333	mg/kg wet	3.333		80	40-140	0.2	30	
Di-n-octylphthalate	2.61	0.333	mg/kg wet	3.333		78	40-140	3	30	
Fluoranthene	2.89	0.333	mg/kg wet	3.333		87	40-140	0.2	30	
Fluorene	2.76	0.333	mg/kg wet	3.333		83	40-140	3	30	
Hexachlorobenzene	2.69	0.167	mg/kg wet	3.333		81	40-140	0.7	30	
Hexachlorobutadiene	2.08	0.333	mg/kg wet	3.333		62	40-140	1	30	
Hexachlorocyclopentadiene	1.39	1.67	mg/kg wet	3.333		42	40-140	3	30	
Hexachloroethane	1.87	0.333	mg/kg wet	3.333		56	40-140	6	30	
Indeno(1,2,3-cd)Pyrene	2.94	0.333	mg/kg wet	3.333		88	40-140	2	30	
Isophorone	2.06	0.333	mg/kg wet	3.333		62	40-140	1	30	
Naphthalene	2.16	0.333	mg/kg wet	3.333		65	40-140	3	30	
Nitrobenzene	2.13	0.333	mg/kg wet	3.333		64	40-140	1	30	
N-Nitrosodimethylamine	1.79	0.333	mg/kg wet	3.333		54	40-140	6	30	

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DH03112 - 3546										
N-Nitroso-Di-n-Propylamine	2.26	0.333	mg/kg wet	3.333		68	40-140	3	30	
N-nitrosodiphenylamine	2.70	0.333	mg/kg wet	3.333		81	40-140	0.7	30	
Pentachlorophenol	2.82	1.67	mg/kg wet	3.333		84	30-130	1	30	
Phenanthrene	2.74	0.333	mg/kg wet	3.333		82	40-140	1	30	
Phenol	2.41	0.333	mg/kg wet	3.333		72	30-130	4	30	
Pyrene	2.71	0.333	mg/kg wet	3.333		81	40-140	6	30	
Pyridine	1.82	1.67	mg/kg wet	3.333		55	40-140	6	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.06*		mg/kg wet	*3.333*		*62*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.55*		mg/kg wet	*5.000*		*91*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.50*		mg/kg wet	*5.000*		*70*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.37*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: 2-Fluorophenol	*3.50*		mg/kg wet	*5.000*		*70*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.25*		mg/kg wet	*3.333*		*68*	*30-130*			
Surrogate: Phenol-d6	*3.56*		mg/kg wet	*5.000*		*71*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.21*		mg/kg wet	*3.333*		*96*	*30-130*			
Classical Chemistry										
Batch DI00125 - General Preparation										
Blank										
Conductivity	ND	5	umhos/cm							
LCS										
Conductivity	1390		umhos/cm	1411		98	90-110			
Batch DI00228 - General Preparation										
Reference										
Flashpoint	81		°F	81.00		100	97.9-102.1			
Batch DI00242 - General Preparation										
Blank										
Reactive Cyanide	ND	2.0	mg/kg							
Reactive Sulfide	ND	2.0	mg/kg							
LCS										
Reactive Cyanide	4.1	2.0	mg/kg	100.3		4	0.68-5.41			
Reactive Sulfide	ND	2.0	mg/kg	10.00		0	0-44			

CERTIFICATE OF ANALYSIS

Client Name: Beta Engineering
Client Project ID: Sims Ave Pedestrian Bridge
ESS Laboratory Work Order: 20H1039

Notes and Definitions

Z-10	Soil pH measured in water at 20.7 ºC.
WL	Results obtained from a deionized water leach of the sample.
U	Analyte included in the analysis, but not detected
RRF	Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration
Q	Calibration required quadratic regression (Q).
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
B+	Blank Spike recovery is above upper control limit (B+).
>	Greater than.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/TB

Shipped/Delivered Via: Client

ESS Project ID: 20H1039
Date Received: 8/31/2020
Project Due Date: 9/8/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 4.5 Iced with: Ice
5. Was COC signed and dated by client? Yes

6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about <u>short holds & rushes</u>?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:

12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	81256	Yes	N/A	Yes	8 oz jar	NP	
1	81257	Yes	N/A	Yes	8 oz jar	NP	
1	81262	Yes	N/A	Yes	VOA Vial	MeOH	
1	81264	Yes	N/A	Yes	VOA Vial	DI Water	
1	81265	Yes	N/A	Yes	VOA Vial	DI Water	
2	81258	Yes	N/A	Yes	8 oz jar	NP	
2	81259	Yes	N/A	Yes	8 oz jar	NP	
2	81263	Yes	N/A	Yes	VOA Vial	MeOH	
2	81266	Yes	N/A	Yes	VOA Vial	DI Water	
2	81267	Yes	N/A	Yes	VOA Vial	DI Water	
3	81260	Yes	N/A	Yes	8 oz jar	NP	
3	81261	Yes	N/A	Yes	8 oz jar	NP	

2nd Review

Initials

Were all containers scanned into storage/lab? Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached?

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Beta Engineering - ML/TB

ESS Project ID: 20H1039
Date Received: 8/31/2020

Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Amber Garcia — Date & Time: 8/31/20 13:03
Reviewed By: [signature] — Date & Time: 8/31/20 1312
Delivered By: [signature] — 8/31/20 1312

CHAIN OF CUSTODY

ESS Laboratory
185 Frances Avenue
Cranston, RI 02921
Phone: 401-461-7181
Fax: 401-461-4486
www.esslaboratory.com

ESS Lab # 20H1039

Page 1 of 1

Turn Time: ☐ >5 ☒ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ Same Day

Regulatory State: RI Criteria: RIDEM Res DEC / I/C DEC

Is this project for any of the following?:

☐ CT RCP ☐ MA MCP ☐ RGP ☐ Permit ☐ 401 WQ

ELECTRONIC DELIVERABLES (Final Reports are PDF)

☒ Limit Checker ☐ State Forms ☐ EQuIS
☒ Excel ☐ Hard Copy ☐ Enviro Data
☐ CLP-Like Package ☐ Other (Specify) →

CLIENT INFORMATION

Client: Bohr Group
Address: 701 George Washington Hwy
Lincoln, RI 02865
Phone: 401.333.2382
Email Distribution List: jmcloughlin@bohr-inc.com

PROJECT INFORMATION

Project Name: Sims Ave Pedestrian Bridge
Project Location: Providence, RI
Project Number: 6620
Project Manager: Joe McLoughlin
Bill to: Joe McLoughlin
PO#:
Quote#:

Client acknowledges that sampling is compliant with all EPA / State regulatory programs

REQUESTED ANALYSES

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs	15 Metals, PCBs, TPH, SVOCs, % Solid	Herb/Pest, pH, RCRA8, FP, Cond	Free liquid	Total Number of Bottles
1	8/31/20	10:00	Grab	Soil	SB-03 0-2	X	X			5
2	8/31/20	10:15	Grab	Soil	SB-03 6-8	X	X			5
3	8/31/20	10:30	Comp	Soil	SB-03 comp			X	X	2
Container Type						V	AG	AG	AG	
Container Volume						7	10	10	10	
Preservation Code						6/10	1	1	1	

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*

Chain needs to be filled out neatly and completely for on time delivery.

Sampled by: Scott Ma

Laboratory Use Only

Cooler Temperature (°C): 4.5

Comments: * Please specify "Other" preservative and containers types in this space
TCLP if exceeds 20x rule

All samples submitted are subject to ESS Laboratory's payment terms and conditions.

Dissolved Filtration
☐ Lab Filter

Relinquished by (Signature)	Date	Time	Received by (Signature)	Relinquished by (Signature)	Date	Time	Received by (Signature)
[signature]	8/31/20	12:31	[signature]				

State of Rhode Island
Coastal Resources Management Council
Oliver H. Stedman Government Center
4808 Tower Hill Road, Suite 116
Wakefield, RI 02879-1900

(401) 783-3370
Fax (401) 783-3767

ASSENT

CRMC File No.: 2022-03-089 CRMC Assent No.: A2022-03-089

Whereas,
of

City of Providence
444 Westminster Street; 3rd floor
Providence, RI 02903

has applied to the Coastal Resources Management Council for assent to: To construct and maintain a pedestrian bridge over the Woonasquatucket River close to the intersection of Sims Avenue and Kinsley Street. The project also includes improvements to the intersection to provide accessible pedestrian routes for those walking to the Farm Fresh Rhode Island food hub. The City of Providence represents that they are the owners of the riparian rights attached to the property involved and submitted plans of the work to be done.

Now, said Council, having fully considered said application in accordance with all the regulations as set forth in the Administrative Procedures Act does hereby authorize said applicant, subject to the provisions of Title 46, Chapter 23 of the General Laws of Rhode Island, 1956, as amended, and all laws which are or may be in force applicable thereto: **To construct and maintain a pedestrian bridge over the Woonasquatucket River close to the intersection of Sims Avenue and Kinsley Street. The project also includes improvements to the intersection to provide accessible pedestrian routes for those walking to the Farm Fresh Rhode Island food hub. This project is located at Sims Avenue and Kinsley Avenue, Plat 27, Providence, RI,** and will be conducted in accordance with said plans submitted to this Council and approved by this Council. All work being permitted must be completed on or before **July 13, 2025** after which date this assent is null and void, (unless written application requesting an extension is received by CRMC sixty (60) days prior to expiration date).

Applicant agrees that as a condition to the granting of this assent, members of the Coastal Resources Management Council or its staff shall have access to applicant's property to make on-site inspections to insure compliance with the assent.

Licensee shall be fully and completely liable to State, and shall waive any claims against State for contribution or otherwise, and shall indemnify, defend, and save harmless State and its agencies, employees, officers, directors, and agents with respect to any and all liability, damages (including damages to land, aquatic life, and other natural resources), expenses, causes of action, suits, claims, costs (including testing, auditing, surveying, and investigating costs), fees (including attorneys' fees and costs), penalties (civil and criminal), and response, cleanup, or remediation costs assessed against or imposed upon Licensee, State, or the Property, as a result of Licensee's control of the Property, or Licensee's use, disposal, transportation, generation and/or sale of Hazardous Substances or that of Licensee's employees, agents, assigns, sublicensees, contractors, subcontractors, permittees, or invitees.

Nothing in this assent shall be construed to impair the legal rights of this granting authority or of any person. By this assent the granting authority by no manner, shape, or form assumes any liability or responsibility implied, or in fact, for the stability or permanence of said project; nor by this assent is there any liability implied or in fact assumed or imposed on the granting authority. Further, the granting authority by its representatives or duly authorized agents shall have the right to inspect said project at all times including, but not limited to, the construction, completion, and all times thereafter.

This Assent is granted with the specific proviso that the construction authorized therein will be maintained in good condition by the owner thereof, his heirs, successors, or assigns for a period of fifty (50) years from the date thereof, after which time this permission shall terminate necessitating either complete removal or a new application.

Permits issued by the CRMC are issued for a finite period of time, confer no property rights, and are valid only with the conditions and stipulations under which they are granted. Permits imply no guarantee of renewal, and may be subject to denial, revocation, or modification.

If this matter appeared before the full Council, a copy of the legal decision from this proceeding may be acquired by contacting the CRMC office in writing.

A copy of this Assent shall be kept on site during construction.

Application for future alteration of the shoreline or other construction or alteration within the CRMC jurisdiction shall be submitted to the CRMC for review prior to commencing such activity.

All applicable policies, prohibitions, and standards of the RICRMP shall be upheld.

All local, state or federal ordinances and regulations must be complied with.

Please be advised that as a further conditions of this Assent, it is hereby stipulated that you and/or your agents shall comply at all times with Federal and State Water Quality Standards and other State standards and regulations regarding water quality, and shall exercise such supervision over and control of these facilities to prevent the dumping or discarding or refuse, sanitary wastes and other pollutants in the tidal waters, either from vessels docked at said facilities or from land adjacent thereto.

No work that involves alteration to wetlands or waters of the United States shall be done under this Assent until the required Federal Permit has been obtained.

Non-compliance with this assent shall result in legal action and/or revocation of this permit.

<u>CAUTION:</u>

The limits of authorized work shall be only for that which was approved by the CRMC. Any activities or alterations in which deviate from this assent or what was detailed on the CRMC approved plans will require a separate application and review. Additionally, if the information provided to the CRMC for this review is inaccurate or did not reveal all necessary information

or data, then this permit may be found to be null and void. Plans for any future alteration of the shoreline or construction or alteration within the 200' zone of CRMC jurisdiction or in coastal waters must be submitted for review to the CRMC prior to commencing such activity.

Permits, licenses or easements issued by the Council are valid only with the conditions and stipulation under which they are granted and imply no guarantee of renewal. The initial application or an application for renewal may be subject to denial or modification. If an application is granted, said permit, license and easement may be subject to revocation and/or modification for failure to comply with the conditions and stipulations under which the same was issued or for other good cause.

ATTENTION: ALL STRUCTURES AND FILLED AREAS IN THE TIDAL, COASTAL, OR NAVIGABLE WATERS OF THE STATE OF RHODE ISLAND ARE SUBJECT TO:

1. The Superior Property Rights of the State of Rhode Island in the Submerged and Submersible Lands of the Coastal, Tidal, and Navigable Waters;
2. The Superior Navigation Servitude of the United States;
3. The Police Powers of the State of Rhode Island and the United States to regulate Structures in the Tidal, Coastal, or Navigable Waters.

THE SUBMERGED AND SUBMERSIBLE LANDS OF THE TIDAL, COASTAL, AND NAVIGABLE WATERS OF THE STATE ARE OWNED BY THE STATE AND HELD IN TRUST FOR THE PUBLIC. CONVEYANCE OF THESE LANDS IS ILLEGAL; TITLES PURPORTING TO TRANSFER SUCH LANDS ARE VOID. ASSENTS THAT INVOLVE THE FILLING OR USE OF THE STATES SUBMERGED LANDS ARE GRANTED WITH THE PROVISO THAT IT IS SUBJECT TO THE IMPOSITION OF A USAGE FEE TO BE ESTABLISHED BY THE COASTAL RESOURCES MANAGEMENT COUNCIL.

The lands adjacent to tidal waters and/or access to these lands may be impacted or rendered unusable in the future due to sea level rise, storm surge, and shoreline erosion. Online resources including STORMTOOLS, Shoreline Change Maps, and Sea Levels Affecting Marshes Model (SLAMM) Maps can be accessed through the CRMC website (www.crmc.ri.gov). The Council recommends the use of these resources to evaluate the flood extent and inundation from sea level rise, storm surge and erosion and damages to land, aquatic life, loss of public access and other natural resources on and near the site of the above assent. The project life may be shortened by these processes and may require additional adaptation measure up to and including relocation of the project. By issuing this assent the granting authority neither explicitly nor implicitly assumes any liability or responsibility for the stability or permanence of said project under future climate and shoreline conditions.

SPECIFIC STIPULATIONS OF APPROVAL

General Stipulations

A. For the purpose of this permit, the coastal feature shall be the Retaining Wall (North) and Low Bluff (South); and the inland edge of the coastal feature shall be the inland edge of Retaining Wall and inland edge of Low Bluff (South).

B. The approved plan shall be those entitled "City of East Providence, Rhode Island, Providence Redevelopment Agency, Sim Avenue, Pedestrian Bridge…," sheet 1-26 dated March 2022, by Beta Inc., Stamped by Christopher W. Jones, P.E., Except as stipulated or modified herein, all details and specifications thereon shall be strictly adhered to. Any and all changes require written approval from this office.

C. This project required a Coastal Hazards Analysis (CHA) as per the Rhode Island Coastal Resources Management Council's regulations. The Council recommends residential applications meet a minimum of a 30 year design life (longer design life may not meet recommended criteria). Please be advised this project:

- Meets meet the anticipated 3' rate of Sea Level Rise (SLR).

D. The RE (Resident Engineer or Other Qualified Representative) shall ensure that one or more inspectors are available as necessary for the project, each inspector must be qualified in the required specialized environmental field (i.e. waste management, coastal wetlands, etc). Each inspector must have the education and experience in each respective field to properly inspect the project and recommend corrective measures. The RE shall report site inspections at least once weekly and on an as needed basis during all phases of the project likely to result in environmental impacts. A dated and signed report shall be completed for the record during each inspection. Each inspection shall identify any environmental issues of concern and any non-compliance with the CRMC Assent and other agency approvals (RI Department of Environmental Management, US Army Corps of Engineers and US Coast Guard). Subsequent reports shall describe actions and remedies undertaken to rectify these issues and restore project compliance with the CRMC Assent and the approved plans. Where compliance has not been properly achieved, the RE/ECM shall notify the CRMC on a timely basis. In addition, field reports shall be available to be forwarded to the CRMC upon request.

E. The project is subject to FEMA Conditional Letter of Map Revision (CLOMR)(21-01-1173R). As noted on the FEMA Letter of Map Revision, "the State/Commonwealth (City of Providence) may set higher standards for construction in Special Flood Hazard Area (SFHA)." If the State/Commonwealth (City of Providence) has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP.

F. Note that FEMA CLOMR requires follow up data (Reference CLOMR 21-01-1173R), these requirements shall be strictly adhered to.

Earthwork Stipulations

A. The Permittee shall construct and maintain all soil erosion, runoff, and sediment control practices in accordance with the CRMC approved site plan (referenced herein).

B. Prior to the initiation of site alterations or construction including the mobilization of construction vehicles, equipment or machinery, the Limit of Disturbance (LOD) shall be adequately delineated on site (by survey methods where appropriate). No equipment access, equipment or material storage or other activities including construction vehicle parking shall occur beyond the Limit of Disturbance, even on a temporary basis.

C. Prior to conducting earthwork and other land disturbing activities, erosion, runoff and sediment control measures shall be installed and maintained in accordance with good engineering practices including the applicable details found in the manufacturer's specifications and/or in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended). These measures must be maintained until the site is stabilized through the establishment of vegetative cover and/or construction of the approved facilities (buildings, roadways, parking areas, etc.) has stabilized soils sufficiently to prevent erosion and sedimentation.

D. All discharges which result from dewatering operations must flow into pumping settling basins, portable sediment tanks or portable sediment bags which are properly installed and maintained in accordance with good engineering practices including the applicable details found in the manufacturer's specifications and/or in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended).

E. All excavated material shall be cast on the upslope side of the excavation to minimize sedimentation. No excavated material shall be stockpiled beyond the Limit of Disturbance (LOD) or in unauthorized locations.

F. All areas of disturbed soils which are impacted by construction, site work and related activities shall be temporarily stabilized throughout the site construction period. Soil stabilization may be achieved through appropriate temporary measures as described by the Rhode Island Soil Erosion and Sediment Control Handbook (as amended). Where the season is not conducive to the establishment of vegetative cover, other temporary measures shall be employed including the application of mulch and/or use of fiber rolls (erosion control blankets, etc.). Temporary erosion, runoff and sediment controls shall be employed and maintained until temporary or permanent vegetative cover can be achieved and/or site improvements such as approved buildings, roadways and parking areas are constructed resulting in a lack of exposed soil.

G. Construction sites must be inspected by or under the supervision of the owner and operator at least once every seven (7) calendar days and within 24 hours after any storm event which generates at least 0.25 inches of rainfall per 24 hour period and/or after a significant amount of runoff. If an inspection reveals a problem, the operator must initiate work to fix the problem immediately after discovering the problem, and complete such work by the close of the next work day, if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.

H. There shall be no discharge or disposal of toxic waste, hazardous materials, oil, grease and other lubricants, excess fertilizer, pesticides or other chemicals or controlled materials either on site or in any area which may enter a wetland, watercourse or groundwater. All spills of such materials shall be reported to the RI Department of Environmental Management for appropriate remediation. All used lubricants, excess chemicals, fertilizers, pesticides, etc., shall be removed from the site for transport, handling and disposal in accordance with all applicable state and federal regulations.

I. All excess excavated materials (soils, rock, gravel, etc.), excess construction materials, demolition debris, temporary erosion, runoff and sediment control measures, etc., shall be removed from the site for appropriate re-use and/or proper disposal at a suitable upland location or landfill. All toxic materials and waste shall be properly transported and disposed of in accordance applicable state and federal regulations.

J. Upon the successful stabilization of exposed soils, all temporary (interim) erosion, runoff and sediment control measures as well as pollution prevention measures shall be appropriately decommissioned and removed from the site for re-use and/or for disposal at a suitable, legal upland location or landfill. All temporary sediment basins, sediment traps and channels, etc., shall be removed and/or restored in accordance with the approved site plans.

Building Stipulations

A. The approved CRMC plans have been reviewed on a limited basis (to determine whether or not they violate any standards or policies of the Red Book, and they assure that they do not conflict with approved site plans). As per the latest amendment to Red Book Section 1.3.1(C), specific structural review in terms of building code/flood zone construction standards compliance is not performed by this office. Any and all significant changes to the building plans (size, height, type of foundation, decks, adjacent grading, drains, etc.) requires written approval from this office. For any questions on the level of change requiring review, contact CRMC field staff.

B. All pertinent requirements of the RI State Building Code as administered by the local building and/or state official shall be strictly adhered to.

In Witness Whereof, said Coastal Resources Management Council has hereto set their hands and seal this 13th day of July in the year two-thousand-and-twenty-two.

Jeffrey M. Willis, Executive Director
Coastal Resources Management Council

/lat

APPENDIX 3

WAGE DETERMINATIONS

"General Decision Number: RI20220001 08/26/2022

Superseded General Decision Number: RI20210001

State: Rhode Island

Construction Types: Building, Heavy (Heavy and Marine) and Highway

Counties: Rhode Island Statewide.

BUILDING CONSTRUCTION PROJECTS (does not include residential construction consisting of single family homes and apartments up to and including 4 stories) HEAVY, HIGHWAY AND MARINE CONSTRUCTION PROJECTS

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)(2)-(60).

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 $15.00 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 2022.
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 $11.25 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 2022.

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 https://www.dol.gov/agencies/whd/government-contracts.

Modification Number	Publication Date
0	01/07/2022
1	01/21/2022
2	02/18/2022
3	02/25/2022
4	04/01/2022
5	05/06/2022
6	05/27/2022
7	06/03/2022
8	06/24/2022
9	08/26/2022

ASBE0006-006 06/01/2022

	Rates	Fringes
HAZARDOUS MATERIAL HANDLER (Includes preparation, wetting, stripping, removal scrapping, vacuuming, bagging & disposing of all insulation materials, whether they contain asbestos or not, from mechanical systems)..............	$ 38.30	25.55

ASBE0006-008 09/01/2021

	Rates	Fringes
Asbestos Worker/Insulator Includes application of all insulating materials, protective coverings, coatings & finishes to all types of mechanical systems.	$ 45.00	32.89

BOIL0029-001 01/01/2021

	Rates	Fringes
BOILERMAKER......................$	45.87	29.02

BRRI0003-001 06/01/2020

	Rates	Fringes
Bricklayer, Stonemason, Pointer, Caulker & Cleaner.......$	42.55	28.02

BRRI0003-002 03/01/2020

	Rates	Fringes
Marble Setter, Terrazzo Worker & Tile Setter.............$	40.78	28.92

BRRI0003-003 03/01/2020

	Rates	Fringes
Marble, Tile & Terrazzo Finisher.........................$	34.10	27.88

CARP0330-001 06/05/2022

	Rates	Fringes
CARPENTER (Includes Soft Floor Layer)....................$	41.46	28.82
Diver Tender.....................$	40.72	28.66
DIVER............................$	53.61	28.82
Piledriver.......................$	39.72	28.66
WELDER...........................$	42.46	28.82

FOOTNOTES:

When not diving or tending the diver, the diver and diver tender shall receive the piledriver rate. Diver tenders shall receive $1.00 per hour above the pile driver rate when tending the diver.

Work on free-standing stacks, concrete silos & public utility electrical power houses, which are over 35 ft. in height when constructed: $.50 per hour additional.

Work on exterior concrete shear wall gang forms, 45 ft. or more above ground elevation or on setback: $.50 per hour additional.

The designated piledriver, known as the ""monkey"": $1.00 per hour additional.

CARP1121-002 01/06/2020

	Rates	Fringes
MILLWRIGHT	$ 39.07	29.15

ELEC0099-002 06/01/2022

	Rates	Fringes
ELECTRICIAN	$ 45.86	52.71%
Teledata System Installer	$ 34.40	12.10%+15.12

FOOTNOTES:

Work of a hazardous nature, or where the work height is 30 ft. or more from the floor, except when working OSHA-approved lifts: 20% per hour additional.

Work in tunnels below ground level in combined sewer outfall: 20% per hour additional.

ELEV0039-001 01/01/2022

	Rates	Fringes
ELEVATOR MECHANIC	$ 56.91	36.885+a+b

FOOTNOTES:

A. PAID HOLIDAYS: New Years Day; Memorial Day; Independence Day; Labor Day; Veterans' Day; Thanksgiving Day; the Friday after Thanksgiving Day; and Christmas Day.

B. Employer contributes 8% basic hourly rate for 5 years or more of service of 6% basic hourly rate for 6 months to 5 years of service as vacation pay credit.

ENGI0057-001 06/01/2022

	Rates	Fringes
Operating Engineer: (power plants, sewer treatment plants, pumping stations, tunnels, caissons, piers, docks, bridges, wind turbines, subterranean & other marine and heavy construction work)		
GROUP 1	$ 43.55	29.25+a
GROUP 2	$ 41.55	29.25+a
GROUP 3	$ 37.17	29.25+a
GROUP 4	$ 34.32	29.25+a
GROUP 5	$ 40.60	29.25+a
GROUP 6	$ 31.40	29.25+a
GROUP 7	$ 25.40	29.25+a
GROUP 8	$ 37.25	29.25+a
GROUP 9	$ 41.17	29.25+a

a. BOOM LENGTHS, INCLUDING JIBS:

150 feet and over + $ 2.00
180 feet and over + $ 3.00
210 feet and over + $ 4.00
240 feet and over + $ 5.00
270 feet and over + $ 7.00
300 feet and over + $ 8.00
350 feet and over + $ 9.00
400 feet and over + $10.00

a. PAID HOLIDAYS:
New Year's Day, President's Day, Memorial Day, July Fourth, Victory Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day, Christmas Day. a: Any employee who works 3 days in the week in which a holiday falls shall be paid for the holiday.

a. FOOTNOTES:
Hazmat work: $2.00 per hour additional.
Tunnel/Shaft work: $5.00 per hour additional.

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Cranes, lighters, boom trucks and derricks

GROUP 2: Digging machine, Ross Carrier, locomotive, hoist, elevator, bidwell-type machine, shot & water blasting machine, paver, spreader, graders, front end loader (3 yds.

and over), vibratory hammer & vacuum truck, roadheaders, forklifts, economobile type equipment, tunnel boring machines, concrete pump and on site concrete plants.

GROUP 3: Oilers on cranes.

GROUP 4: Oiler on crawler backhoe.

GROUP 5: Bulldozer, bobcats, skid steer loader, tractor, scraper, combination loader backhoe, roller, front end loader (less than 3 yds.), street and mobile-powered sweeper (3-yd. capacity), 8-ft. sweeper minimum 65 HP).

GROUP 6: Well-point installation crew.

GROUP 7: Utility Engineers and Signal Persons

GROUP 8: Heater, concrete mixer, stone crusher, welding machine, generator and light plant, gas and electric driven pump and air compressor.

GROUP 9: Boat & tug operator.

ENGI0057-002 05/01/2022

	Rates	Fringes
Power Equipment Operator (highway construction projects; water and sewerline projects which are incidental to highway construction projects; and bridge projects that do not span water)		
GROUP 1	$ 36.70	29.25+a
GROUP 2	$ 31.40	29.25+a
GROUP 3	$ 25.40	29.25+a
GROUP 4	$ 31.98	29.25+a
GROUP 5	$ 35.68	29.25+a
GROUP 6	$ 35.30	29.25+a
GROUP 7	$ 30.95	29.25+a
GROUP 8	$ 32.33	29.25+a
GROUP 9	$ 34.28	29.25+a

a. FOOTNOTE: a. Any employee who works three days in the week in which a holiday falls shall be paid for the holiday.

a. PAID HOLIDAYS: New Year's Day, President's Day, Memorial Day, July Fourth, Victory Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day & Christmas Day.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Digging machine, crane, piledriver, lighter, locomotive, derrick, hoist, boom truck, John Henry's, directional drilling machine, cold planer, reclaimer, paver, spreader, grader, front end loader (3 yds. and over), vacuum truck, test boring machine operator, veemere saw, water blaster, hydro-demolition robot, forklift, economobile, Ross Carrier, concrete pump operator and boats

GROUP 2: Well point installation crew

GROUP 3: Utlity engineers and signal persons

GROUP 4: Oiler on cranes

GROUP 5: Combination loader backhoe, front end loader (less than 3 yds.), forklift, bulldozers & scrapers and boats

GROUP 6: Roller,skid steer loaders, street sweeper

GROUP 7: Gas and electric drive heater, concrete mixer, light plant, welding machine, pump & compressor

GROUP 8: Stone crusher

GROUP 9: Mechanic & welder

ENGI0057-003 06/01/2022

BUILDING CONSTRUCTION

	Rates	Fringes
Power Equipment Operator		
GROUP 1	$ 42.82	29.25+a
GROUP 2	$ 40.82	29.25+a
GROUP 3	$ 40.60	29.25+a
GROUP 4	$ 36.60	29.25+a
GROUP 5	$ 33.75	29.25+a
GROUP 6	$ 39.90	29.25+a
GROUP 7	$ 39.47	29.25+a
GROUP 8	$ 36.79	29.25+a

a.BOOM LENTHS, INCLUDING JIBS:

150 ft. and over: + $ 2.00

180 ft. and over: + $ 3.00
210 ft. and over: + $ 4.00
240 ft. and over: + $ 5.00
270 ft. and over: + $ 7.00
300 ft. and over: + $ 8.00
350 ft. and over: + $ 9.00
400 ft. and over: + $10.00

a. PAID HOLIDAYS: New Year's Day, President's Day, Memorial Day, July Fourth, Victory Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day & Christmas Day. a: Any employee who works 3 days in the week in which a holiday falls shall be paid for the holiday.

a. FOOTNOTE: Hazmat work: $2.00 per hour additional.
Tunnel/Shaft work: $5.00 per hour additional.

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Cranes, lighters, boom trucks and derricks.

GROUP 2: Digging machine, Ross carrier, locomotive, hoist, elevator, bidwell-type machine, shot & water blasting machine, paver, spreader, front end loader (3 yds. and over), vibratory hammer and vacuum truck

GROUP 3: Telehandler equipment, forklift, concrete pump & on-site concrete plant

GROUP 4: Fireman & oiler on cranes

GROUP 5: Oiler on crawler backhoe

GROUP 6: Bulldozer,skid steer loaders,bobcats, tractor, grader, scraper,combination loader backhoe, roller, front end loader (less than 3 yds.), street and mobile powered sweeper (3 yds. capacity), 8-ft. sweeper (minimum 65 hp)

GROUP 7: Well point installation crew

GROUP 8: Heater, concrete mixer, stone crusher, welding machine, generator for light plant, gas and electric driven pump & air compressor

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IRON0037-001 09/16/2021

	Rates	Fringes

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IRONWORKER.......................$ 38.21            30.58
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 LABO0271-001 05/30/2021

BUILDING CONSTRUCTION

                                  Rates          Fringes

LABORER
     GROUP 1.....................$ 33.55            26.15
     GROUP 2.....................$ 33.80            26.15
     GROUP 3.....................$ 34.30            26.15
     GROUP 4.....................$ 34.55            26.15
     GROUP 5.....................$ 35.55            26.15

LABORERS CLASSIFICATIONS

  GROUP 1: Laborer, Carpenter Tender, Mason Tender, Cement
  Finisher Tender, Scaffold Erector, Wrecking Laborer,
  Asbestos Removal [Non-Mechanical Systems]

  GROUP 2: Asphalt Raker, Adzemen, Pipe Trench Bracer,
  Demolition Burner, Chain Saw Operator, Fence & Guard Rail
  Erector, Setter of Metal Forms for Roadways, Mortar Mixer,
  Pipelayer, Riprap & Dry Stonewall Builder, Highway Stone
  Spreader, Pneumatic Tool Operator, Wagon Drill Operator,
  Tree Trimmer, Barco-Type Jumping Tamper, Mechanical Grinder
  Operator

GROUP 3: Pre-Cast Floor & Roof Plank Erectors

  GROUP 4: Air Track Operator, Hydraulic & Similar Self-Powered
  Drill, Block Paver, Rammer, Curb Setter, Powderman & Blaster

GROUP 5: Toxic Waste Remover

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 LABO0271-002 05/30/2021

HEAVY AND HIGHWAY CONSTRUCTION

                                  Rates          Fringes

LABORER
     COMPRESSED AIR
      Group 1....................$ 53.45            24.15
      Group 2....................$ 50.98            24.15
      Group 3....................$ 40.50            24.15
     FREE AIR
      Group 1....................$ 44.05            24.15
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Group 2	$ 43.05	24.15
Group 3	$ 40.50	24.15
LABORER		
Group 1	$ 33.55	24.15
Group 2	$ 33.80	24.15
Group 3	$ 34.55	24.15
Group 4	$ 27.05	24.15
Group 5	$ 35.55	24.15
OPEN AIR CAISSON, UNDERPINNING WORK AND BORING CREW		
Bottom Man	$ 39.55	24.15
Top Man & Laborer	$ 38.60	24.15
TEST BORING		
Driller	$ 40.00	24.15
Laborer	$ 38.60	24.15

LABORER CLASSIFICATIONS

GROUP 1: Laborer; Carpenter tender; Cement finisher tender; Wrecking laborer; Asbestos removers [non-mechanical systems]; Plant laborer; Driller in quarries

GROUP 2: Adzeperson; Asphalt raker; Barcotype jumping tamper; Chain saw operators; Concrete and power buggy operator; Concrete saw operator; Demolition burner; Fence and guard rail erector; Highway stone spreader; Laser beam operator; Mechanical grinder operator; Mason tender; Mortar mixer; Pneumatic tool operator; Riprap and dry stonewall builder; Scaffold erector; Setter of metal forms for roadways; Wagon drill operator; Wood chipper operator; Pipelayer; Pipe trench bracer

GROUP 3: Air track drill operator; Hydraulic and similar powered drills; Brick paver; Block paver; Rammer and curb setter; Powderperson and blaster

GROUP 4: Flagger & signaler

GROUP 5: Toxic waste remover

LABORER - COMPRESSED AIR CLASSIFICATIONS

GROUP 1: Mucking machine operator, tunnel laborer, brake person, track person, miner, grout person, lock tender, gauge tender, miner: motor person & all others in compressed air

GROUP 2: Change house attendant, powder watchperson, top person on iron

GROUP 3: Hazardous waste work within the ""HOT"" zone

LABORER - FREE AIR CLASSIFICATIONS

GROUP 1: Grout person - pumps, brake person, track person, form mover & stripper (wood & steel), shaft laborer, laborer topside, outside motorperson, miner, conveyor operator, miner welder, heading motorperson, erecting operator, mucking machine operator, nozzle person, rodperson, safety miner, shaft & tunnel, steel & rodperson, mole nipper, concrete worker, form erector (wood, steel and all accessories), cement finisher (this type of work only), top signal person, bottom person (when heading is 50' from shaft), burner, shield operator and TBM operator

GROUP 2: Change house attendant, powder watchperson

GROUP 3: Hazardous waste work within the ""HOT"" zone

PAIN0011-005 06/01/2021

	Rates	Fringes
PAINTER		
Brush and Roller	$ 36.42	22.90
Epoxy, Tanks, Towers, Swing Stage & Structural Steel	$ 38.42	22.90
Spray, Sand & Water Blasting	$ 39.42	22.90
Taper	$ 37.17	22.90
Wall Coverer	$ 36.92	22.90

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* PAIN0011-006 06/01/2022

	Rates	Fringes
GLAZIER	$ 40.78	23.40

FOOTNOTES:

SWING STAGE: $1.00 per hour additional.

PAID HOLIDAYS: Labor Day & Christmas Day.

PAIN0011-011 06/01/2022

	Rates	Fringes
Painter (Bridge Work)	$ 55.00	23.75

PAIN0035-008 06/01/2011

	Rates	Fringes
Sign Painter	$ 24.79	13.72

PLAS0040-001 06/03/2019

BUILDING CONSTRUCTION

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 36.00	27.15

FOOTNOTE: Cement Mason: Work on free swinging scaffolds under 3 planks width and which is 20 or more feet above ground and any offset structure: $.30 per hour additional.

PLAS0040-002 07/01/2019

HEAVY AND HIGHWAY CONSTRUCTION

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 32.85	22.20

PLAS0040-003 07/01/2019

	Rates	Fringes
PLASTERER	$ 37.55	27.50

PLUM0051-002 08/30/2021

	Rates	Fringes
Plumbers and Pipefitters	$ 46.49	31.40

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* ROOF0033-004 06/01/2022

	Rates	Fringes
ROOFER	$ 42.23	29.00

SFRI0669-001 04/01/2022

	Rates	Fringes
SPRINKLER FITTER.................	$ 47.55	29.38

SHEE0017-002 12/01/2020

	Rates	Fringes
Sheet Metal Worker...............	$ 38.58	36.73

TEAM0251-001 05/01/2022

HEAVY AND HIGHWAY CONSTRUCTION

	Rates	Fringes
TRUCK DRIVER		
GROUP 1....................	$ 28.46	32.10+A+B+C
GROUP 2....................	$ 28.61	$ 32.10+A+B+C
GROUP 3....................	$ 28.66	$ 32.10+A+B+C
GROUP 4....................	$ 28.71	$ 32.10+A+B+C
GROUP 5....................	$ 28.81	$ 32.10+A+B+C
GROUP 6....................	$ 29.21	$ 32.10+A+B+C
GROUP 7....................	$ 29.41	$ 32.10+A+B+C
GROUP 8....................	$ 28.91	$ 32.10+A+B+C
GROUP 9....................	$ 29.16	$ 32.10+A+B+C
GROUP 10....................	$ 28.96	$ 32.10+A+B+C

FOOTNOTES:

A. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, plus Presidents' Day, Columbus Day, Veteran's Day & V-J Day, providing the employee has worked at least one day in the calendar week in which the holiday falls.

B. Employee who has been on the payroll for 1 year or more but less than 5 years and has worked 150 Days during the last year of employment shall receive 1 week's paid vacation; 5 to 10 years - 2 weeks' paid vacation; 10 or more years - 3 week's paid vacation.

C. Employees on the seniority list shall be paid a one hundred dollar ($100.00) bonus for every four hundred (400) hours worked, up to a maximum of five hundred dollars ($500.00)

All drivers working on a defined hazard material job site shall be paid a premium of $2.00 per hour over applicable rate.

TRUCK DRIVER CLASSIFICATIONS

GROUP 1: Pick-up trucks, station wagons, & panel trucks

GROUP 2: Two-axle on low beds

GROUP 3: Two-axle dump truck

GROUP 4: Three-axle dump truck

GROUP 5: Four- and five-axle equipment

GROUP 6: Low-bed or boom trailer.

GROUP 7: Trailers when used on a double hook up (pulling 2 trailers)

GROUP 8: Special earth-moving equipment, under 35 tons

GROUP 9: Special earth-moving equipment, 35 tons or over

GROUP 10: Tractor trailer

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) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which 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. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of 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. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

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A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write 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 the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write 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 by 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

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISIO"

"General Decision Number: RI20220005 02/25/2022

Superseded General Decision Number: RI20210005

State: Rhode Island

Construction Type: Heavy Dredging

Counties: Rhode Island Statewide.

ALL DREDGING (except self propelled hopper dredging) on the Atlantic Coast and tributary waters emptying into the Atlantic Ocean

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)(2)-(60).

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 $15.00 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 2022.
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 $11.25 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 2022.

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 https://www.dol.gov/agencies/whd/government-contracts.

Modification Number	Publication Date
0	01/07/2022
1	02/25/2022

ENGI0025-001 10/01/2021

STATEWIDE

	Rates	Fringes
Dredging:		
CLASS A1	$ 42.66	13.96+a+b
CLASS A2	$ 38.02	13.68+a+b
CLASS B1	$ 36.89	13.61+a+b
CLASS B2	$ 34.73	13.48+a+b
CLASS C1	$ 33.78	13.13+a+b
CLASS C2	$ 32.69	13.06+a+b
CLASS D	$ 27.16	12.53+a+b

CLASSIFICATIONS:
CLASS A1: Deck Captain; Mechanical Dredge Operator, Leverman, Licensed Tug Operator over 1000 HP.
CLASS A2: Crane Operator (360 swing).
CLASS B1: Derrick Operator (180 swing), Spider/Spill Barge Operator, Engineer, Electrician, Chief Welder, Chief Mate, Fill Placer, Operator II, Maintenance Engineer, Licensed Boat Operator, Licensed Crew Boat Operator.
CLASS B2: Certified Welder.
CLASS C1: Mate, Drag Barge Operator, Assistant Fill Placer, Welder, Steward.
CLASS C2: Boat Operator.
CLASS D: Oiler, Deckhand, Shoreman, Rodman, Scowman, Cook, Messman, Porter/Janitor.

INCENTIVE PAY: (Add to Hourly Rate)
Operator (NCCCO License/Certification) $1.80 Licensed Tug Operator over 1000 HP (Assigned as Master) (USCG licensed Master of Towing Vessels (MOTV) $1.80; Licensed Boat

Operator (Assigned as lead boat captain) USCG licensed boat operator $1.30; Engineer (QMED and Tankerman endorsement or licensed engineer (USCG) $1.80 Oiler (QMED and Tankerman endorsement (USCG) $1.80; All classifications (Tankerman endorsement only) USCG $1.55; Deckhand or Mate (AB with Lifeboatman endorsement (USCG) $1.80; All classifications (lifeboatman endorsement only (USCG) $1.55; Welder (ABS certification) $1.55

FOOTNOTES APPLICABLE TO ABOVE CRAFTS:

a. PAID HOLIDAYS: New Year's Day, Martin Luther King, Jr.'s Birthday, Memorial Day, Good Friday, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day

b. VACATION: Eight percent (8%) of the straight time rate, multiplied by the total hours worked.

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.

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Washington, DC 20210

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==

END OF GENERAL DECISIO"

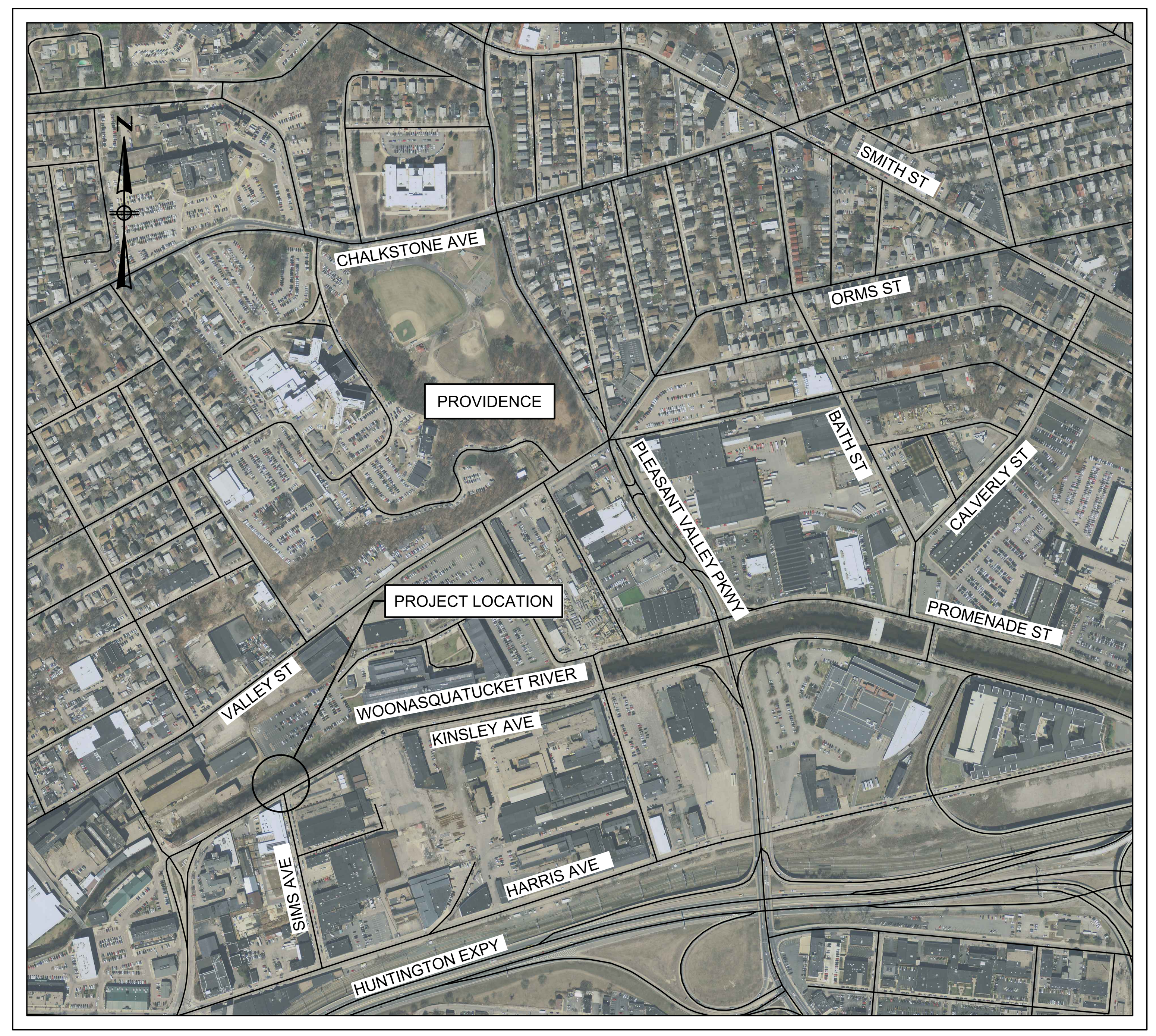
APPENDIX 4
PLANS

CITY OF PROVIDENCE, RHODE ISLAND
PROVIDENCE REDEVELOPMENT AGENCY

SIMS AVENUE
PEDESTRIAN BRIDGE

CONTRACT NO. FY2023-1

SEPTEMBER 2022



LOCATION MAP
1" = 500'

PLAN INDEX

PREPARED BY:

BETA
www.BETA-Inc.com

CHRISTOPHER W. JONES
No. 8367
REGISTERED
PROFESSIONAL ENGINEER
STRUCTURAL
8/31/2022

LEGEND

GENERAL SYMBOLS

EXISTING	PROPOSED	
		CURB OR BERM (TYPE AS NOTED)
		EDGE OF PAVEMENT
CB	CB	CATCH BASIN (OR GUTTER INLET, LEACHING BASIN, DROP INLET, CATCH BASIN CURB INLET)
EHH	EHH	ELECTRIC HANDHOLE (NUMBER AS NOTED)
	EMH	ELECTRIC MANHOLE
	TMH	TELEPHONE MANHOLE
	WMH	WATER MANHOLE
	SMH	SEWER MANHOLE
	DMH	DRAINAGE MANHOLE
GG	GG	GAS GATE
WG	WG	WATER GATE
CS	CS	CURB STOP
HYD.	HYD	HYDRANT
FA	FAB	FIRE ALARM BOX
PM	PM	PARKING METER
LP		STREET LIGHT POLE
UP	UP	UTILITY POLE
UPL	UPL	UTILITY POLE w/ LIGHT
		SIGN
GUY	GUY	GUY POLE
12" RCP D	10'-12" RCP	DRAIN PIPE (SIZE AS NOTED)
8" VCP S	10'-8" PVC	SEWER MAIN (SIZE AS NOTED)
E	10'-8" PVC	ELECTRIC DUCT
4" HP G	10'-4" HP	GAS MAIN (SIZE AS NOTED)
8" CI W	10'-8" DI	WATER MAIN (SIZE AS NOTED)
T	10'-8" PVC	TELEPHONE DUCT (SIZE AS NOTED)
EOH	OHW	OVERHEAD WIRE
MB	MB	MAIL BOX
		WOOD GUARD RAIL STEEL BEAM GUARD, WOOD OR STEEL POSTS (TYPE AS NOTED)
		STEEL GUARD RAIL, STEEL POSTS (TYPE NOTED)
		STONE WALL
		RETAINING WALL (TYPE NOTED)
BND	BND	HIGHWAY/PROPERTY BOUND (TYPE AS NOTED)
SHLO (Date of Layout)		STATE HIGHWAY LAYOUT LINE (SHLO)
		CITY, TOWN OR COUNTY LAYOUT LINE (R.O.W.)
Boundary Name		CITY, TOWN, COUNTY OR STATE BOUNDARY LINE
℞		PROPERTY LINE
		EASEMENT LINE (TYPE NOTED)
	2+00	CONSTRUCTION BASELINE
N00°00'00"E 000.00'		SURVEY LINE
24" PINE		TREE (SIZE AND TYPE AS NOTED)
		HEDGE/SHRUBS
x	x	FENCE (SIZE AND TYPE AS NOTED)
WF-1		EDGE OF WETLAND W/ FLAGGED NUMBER
		EDGE OF RIVER/STREAM LINE
		100-FT. WETLAND BUFFER LIMIT
		100-FT. RIVER FRONT LIMIT
		200-FT. RIVER FRONT LIMIT
		WOODED AREA / LIMIT OF CLEARING
x 00.0	x 00.00	SPOT GRADE
		SAW CUT LINE
	TP-1	TEST PIT
	B-1	BORING
ECB	ECB	EROSION CONTROL BARRIER/COMPOST FILTER TUBE

ABBREVIATIONS

GENERAL

ABAN.	ABANDON
ADJ.	ADJUST
ALT.	ALTERATION
APPROX.	APPROXIMATE
℞	BASELINE
B.B.	BITUMINOUS BERM
B.C.	BITUMINOUS CURB
BD OR BND	BOUND
BLDG.	BUILDING
B.O.	BY OTHERS
BOS	BOTTOM OF SLOPE
BOW	BOTTOM OF WALL
BSW	BACK OF SIDEWALK
C.C.	CONCRETE CURB
CEM.	CEMENT
CLF	CHAIN LINK FENCE
CONC.	CONCRETE
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
DWY	DRIVEWAY
E.P., EOP	EDGE OF PAVEMENT
EL.	ELEVATION
ESMT.	EASEMENT
EXIST.	EXISTING
FDN.	FOUNDATION
GRAN.	GRANITE
GC	GRANITE CURB
HOR.	HORIZONTAL
IP	IRON PIPE
JCT	JUNCTION
LP	LOW POINT
MB	MAIL BOX
MHB	MASSACHUSETTS HIGHWAY BOUND
O.C.	ON CENTER
PCC	POINT OF COMPOUND CURVATURE
PC	POINT OF CURVATURE
PRC	POINT OF REVERSE CURVATURE
PI	POINT OF INTERSECTION
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PERM.	PERMANENT
PGL	PROFILE GRADE LINE
PROP.	PROPOSED
PVC	POINT OF VERTICAL CURVATURE
PVMT.	PAVEMENT
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISCARD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
REM.	REMOVE
REMOD.	REMODEL
RET.	RETAIN
RR	RAILROAD
RT.	RIGHT
SB	SOUTH BOUND OR STONE BOUND
SDWK.	SIDEWALK
SHT.	SHEET
SHLD.	SHOULDER
STA.	STATION
TEMP.	TEMPORARY
TOS	TOP OF SLOPE
TOW	TOP OF WALL
TYP.	TYPICAL
VAR.	VARIABLE
VERT.	VERTICAL
VGC	VERTICAL GRANITE CURB
WCR	WHEELCHAIR RAMP

UTILITIES

ACCMP	ASPHALT COATED CORRUGATED METAL PIPE
CAP	CORRUGATED ALUMINUM PIPE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CI	CURB INLET
CIP	CAST IRON PIPE
CIT	CHANGE IN TYPE
CMP	CORRUGATED METAL PIPE
C	CONDUIT
CPP	CORRUGATED PLASTIC PIPE
CSP	CORRUGATED STEEL PIPE
DI	DROP INLET
DIP	DUCTILE IRON PIPE
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FM	FORCE MAIN
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GG	GAS GATE
HDW	HEADWALL
HYD.	HYDRANT
INV.	INVERT ELEVATION
LP	LIGHT POLE
MH	MANHOLE
PVC	POLY-VINYL-CHLORIDE PIPE
PWW	PAVED WATER WAY
RCP	REINFORCED CONCRETE PIPE (CLASS III UNLESS NOTED)
SD	SUBDRAIN
SMH	SEWER MANHOLE
TS	TRAFFIC SIGNAL
TSV&B	TAPPING SLEEVE, VALVE AND BOX
UP	UTILITY POLE
UPL	UTILITY POLE w/ LIGHT
UPT	UTILITY POLE w/ TRANSFORMER
VCP	VITRIFIED CLAY PIPE
WIP	WROUGHT IRON PIPE
WG	WATER GATE
WM	WATER METER/WATER MAIN

PAVEMENT MARKINGS AND SIGNING SYMBOLS

PROPOSED

CW	CROSSWALK, 2 - 12" WHITE LINES (8' WIDTH)
SL	STOP LINE - 12" WHITE LINE 4' BEHIND CW (TYP.)
SWEL	SOLID WHITE EDGE LINE - 4"
SWCHL	SOLID WHITE CHANNELIZING LINES - 12" (SPACING NOTED)
SWGL	SOLID WHITE GORE LINE 12" @ 33°, (SPACING NOTED)
SWLL	SOLID WHITE LANE LINE - 4"
SWPL	SOLID WHITE PARKING LINE - 4"
BWLL	BROKEN WHITE LANE LINE - 4"
DWLEx	DOTTED WHITE LANE EXTENSION LINE - 4" (2' LINE & 6' GAP)
DYLEx	DOTTED YELLOW LANE EXTENSION LINE - 4" (2' LINE & 6' GAP)
BYCL	BROKEN YELLOW CENTERLINE - 4"
DYCL	DOUBLE YELLOW CENTERLINE - 2 - 4" LINES
SYEL	SOLID YELLOW EDGE LINE - 4"
SYGL	SOLID YELLOW GORE LINE 12" @ 33°, (SPACING NOTED)
SYLL	SOLID YELLOW LANE LINE - 4"
SYCTEL	SOLID YELLOW CYCLE TRACK EDGE LINE - 4"
DYCTCL	DOTTED YELLOW CYCLE TRACK CENTERLINE - 4" (3' LINE & 9' GAP)
SCHOOL	SCHOOL ZONE - WHITE
	HANDICAP SYMBOL - WHITE
	PAVEMENT ARROW - WHITE
ONLY	LEGEND "ONLY" - WHITE

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: SD
DESIGNED BY: BB
CHECKED BY: CJ

REGISTERED PROFESSIONAL

PREPARED BY: BETA www.BETA-Inc.com

SUBCONSULTANT

SCALE: AS SHOWN
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE: SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
LEGEND & ABBREVIATIONS

BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022
SHEET NO. 2 OF 26

8/31/2022 1:53 PM O:\6600S\6620 - PROVIDENCE - SIMS AVE PEDESTRIAN BRIDGE\DRAWING FILES\PLANSET\6620(LEGENDABBREV).DWG (BETA STB BW.STB)

GENERAL NOTES

1. THE ACCURACY & COMPLETENESS OF UNDERGROUND UTILITIES AS SHOWN ON THE PLANS ARE NOT GUARANTEED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE EXACT LOCATION, SIZE, TYPE ETC. OF ALL UNDERGROUND UTILITIES THAT MAY BE AFFECTED BY THE WORK. ALL CITY-OWNED UTILITY STRUCTURES, WITHIN AREAS AFFECTED BY THE WORK SHALL BE ADJUSTED TO NEW LINE AND GRADE AS DIRECTED BY THE ENGINEER. ANY UTILITY POLES AND/OR GUY POLES, WITHIN AREAS AFFECTED BY THE WORK, SHALL BE REMOVED AND RESET BY THE RESPECTIVE UTILITY COMPANY. ALTERATIONS TO UTILITIES NOT OWNED BY THE CITY OF PROVIDENCE SHALL BE MADE BY THE RESPECTIVE UTILITY OWNERS.
2. AN INSTRUMENT FIELD SURVEY WAS PERFORMED BY BRYANT ASSOCIATES IN AUGUST 2019. THE COORDINATES, IN FEET, ARE BASED UPON THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
3. ALL WHEELCHAIR RAMPS SHALL CONFORM TO THE REQUIREMENTS OF THE ARCHITECTURAL ACCESS BOARD (A.A.B), AMERICANS WITH DISABILITIES ACT (ADA) AND THE MASSDOT STANDARDS.
4. EXACT LOCATION OF PROPOSED WHEELCHAIR RAMPS SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.
5. CONTRACTOR SHALL VERIFY EXISTING GRADES. IF ANY ADJUSTMENT IS REQUIRED DUE TO DIFFERENT EXISTING GRADES FOUND IN THE FIELD, THE CONTRACTOR SHALL NOTIFY AND OBTAIN THE APPROVAL OF THE ENGINEER PRIOR TO PERFORMING THE WORK.
6. IN AREAS OF NEW SIDEWALK, NEW EDGE OF PAVEMENT OR CURB WITHOUT SIDEWALK OR ANY WORK ADJACENT TO EXISTING GRASS AREAS, EVEN WHEN NO SLOPE-MATCHING OR GRADING IS NECESSARY & THE EXISTING GRADE IS MET, LOAM AND SEED SHALL BE PROVIDED AS NECESSARY TO REPAIR & COMPLETE ANY DAMAGE TO THE GRADE CAUSED BY THE CONSTRUCTION PROCESS.
7. UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXISTING FEATURES SHALL BE RETAINED.
8. TREES TO BE RETAINED WHICH RESTRICT SIGHT DISTANCE OR RESTRICT HORIZONTAL OR VERTICAL CLEARANCES SHALL BE TRIMMED AS DIRECTED BY THE ENGINEER.
9. ALL AREAS OF PROPOSED GRASS SHALL BE "LOAM & SEED" UNLESS OTHERWISE NOTED ON THE PLANS.
10. ANY AREAS OF GROUND DISTURBED BY CONSTRUCTION ACTIVITIES THAT WILL NOT BE COVERED BY IMPERVIOUS SURFACE SHALL BE EXCAVATED 12" AND REPLACED WITH 4" OF LOAM OVER 8" OF COMMON BORROW.

WHEELCHAIR RAMP NOTES

1. ALL WHEELCHAIR RAMPS SHALL CONFORM TO THE REQUIREMENTS OF THE ARCHITECTURAL ACCESS BOARD (A.A.B) AND THE AMERICANS WITH DISABILITIES ACT (A.D.A.).
2. ALL PROPOSED CURB FOR WHEELCHAIR RAMP TRANSITIONS SHALL BE CUT AND TRANSITIONED AS NECESSARY TO PROVIDE THE CORRECT TRANSITION LENGTHS FOR EACH WHEELCHAIR RAMP, AS SHOWN ON WHEELCHAIR RAMP DETAILS OR AS DIRECTED BY THE ENGINEER. ANY EXISTING CURB INLETS IN AREAS OF NEW WHEELCHAIR RAMP TRANSITIONS, SHALL BE REMOVED AND REPLACED WITH APPROPRIATE TRANSITION CURB, AS DIRECTED BY THE ENGINEER.
3. IN NO CASE, EXCEPT MAXIMUM LENGTH HIGH SIDE TRANSITIONS, SHALL ANY TRANSITION SLOPE OF ANY WHEELCHAIR RAMP EXCEED 7.5%. PROPOSED WHEELCHAIR RAMP SLOPES, ESPECIALLY HIGH SIDE TRANSITIONS, SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO POURING OF CONCRETE, AND ADJUSTED, IF NECESSARY, AT THE DIRECTION OF THE ENGINEER.
4. IN INSTANCES WHERE AN EXISTING MANHOLE, HANDHOLE OR OTHER "SURFACE" TYPE STRUCTURE THAT CANNOT BE REMOVED OR RESET, IS WITHIN THE ACTUAL WHEELCHAIR RAMP PATH, THE STRUCTURE SHALL BE CAREFULLY ADJUSTED SUCH THAT THE TOPMOST SURFACES OF THE STRUCTURE COVER SHALL BE FLUSH WITH THE RAMP SURFACE AND SHALL MATCH THE SLOPE OF THE NEW WHEELCHAIR RAMP EXACTLY, AS DIRECTED BY THE ENGINEER.
5. THE LOCATION OF PROPOSED WHEELCHAIR RAMPS ARE SHOWN ON CONSTRUCTION PLANS AND THE WHEELCHAIR RAMP DETAILS. EXACT LOCATIONS MAY BE ADJUSTED, IF NECESSARY, BY THE ENGINEER IN THE FIELD.
6. ALL PROPOSED WHEEL CHAIR RAMPS SHALL HAVE DETECTABLE WARNING PANELS INSTALLED IN ACCORDANCE WITH RIDOT STANDARD DRAWINGS.

PAVEMENT NOTES

PROPOSED CEMENT CONCRETE SIDEWALK & WHEELCHAIR RAMPS

SURFACE COURSE:	4" PORTLAND CEMENT CONCRETE OVER
SUBBASE:	8" GRAVEL BORROW SUBBASE COURSE

PROPOSED GRAVEL WALK

SURFACE COURSE:	4" CRUSHED STONE
SUBBASE:	EXISTING TO REMAIN

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: SD

DESIGNED BY: BB

CHECKED BY: CJ

REGISTERED PROFESSIONAL

PREPARED BY

BETA

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SCALE: AS SHOWN

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE

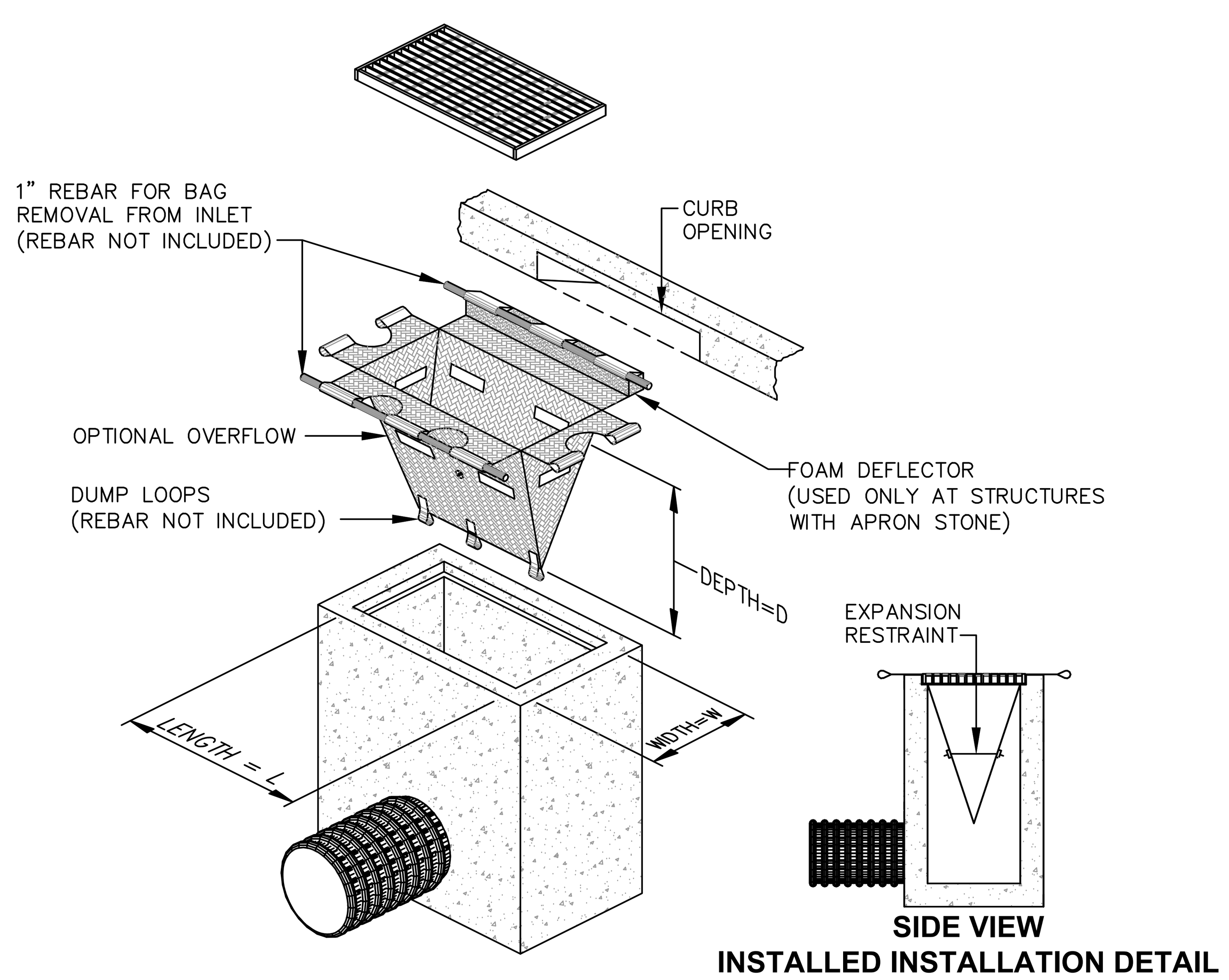
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND

GENERAL NOTES

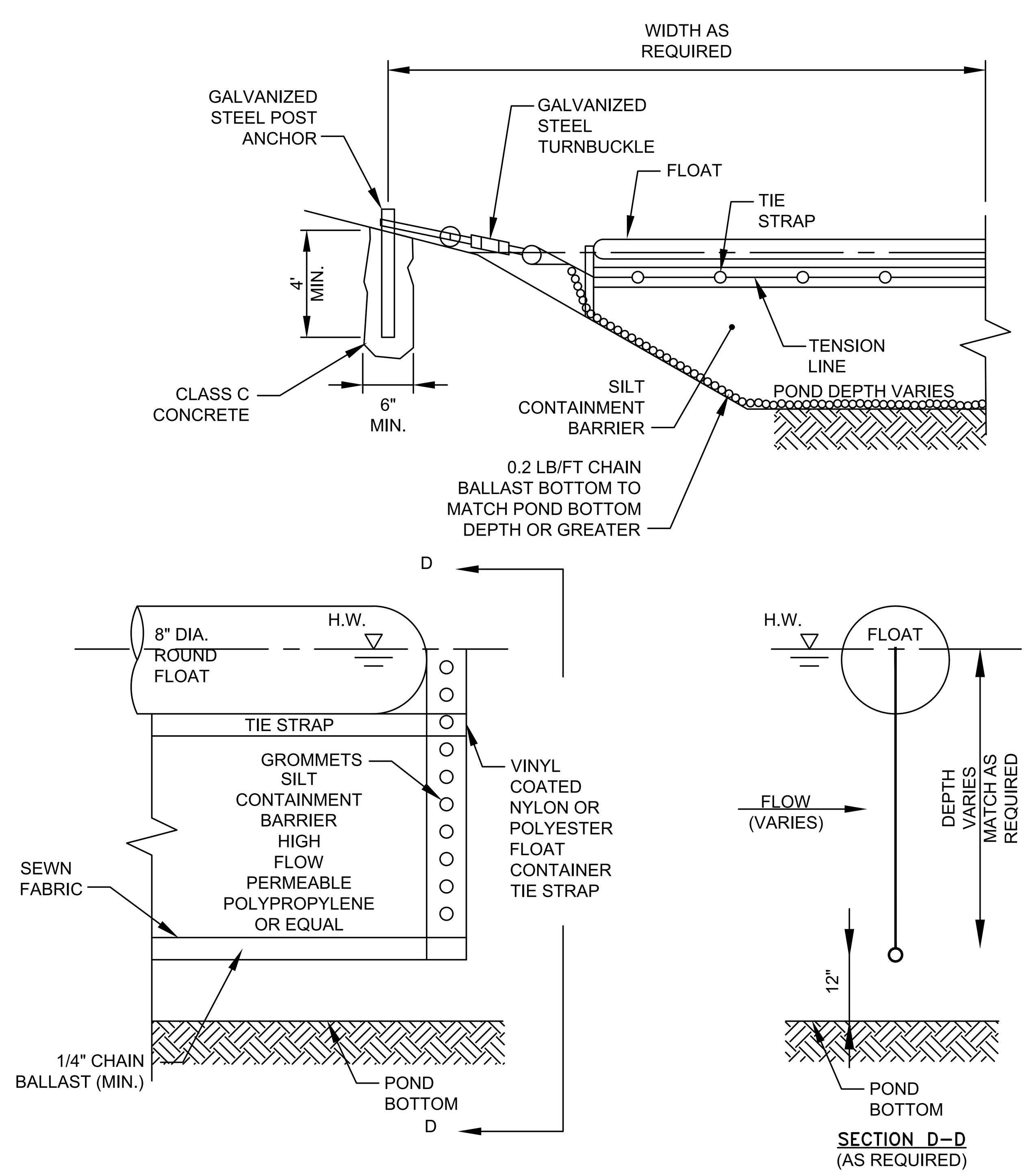
BETA JOB NO. 6620

ISSUE DATE SEPTEMBER 12, 2022

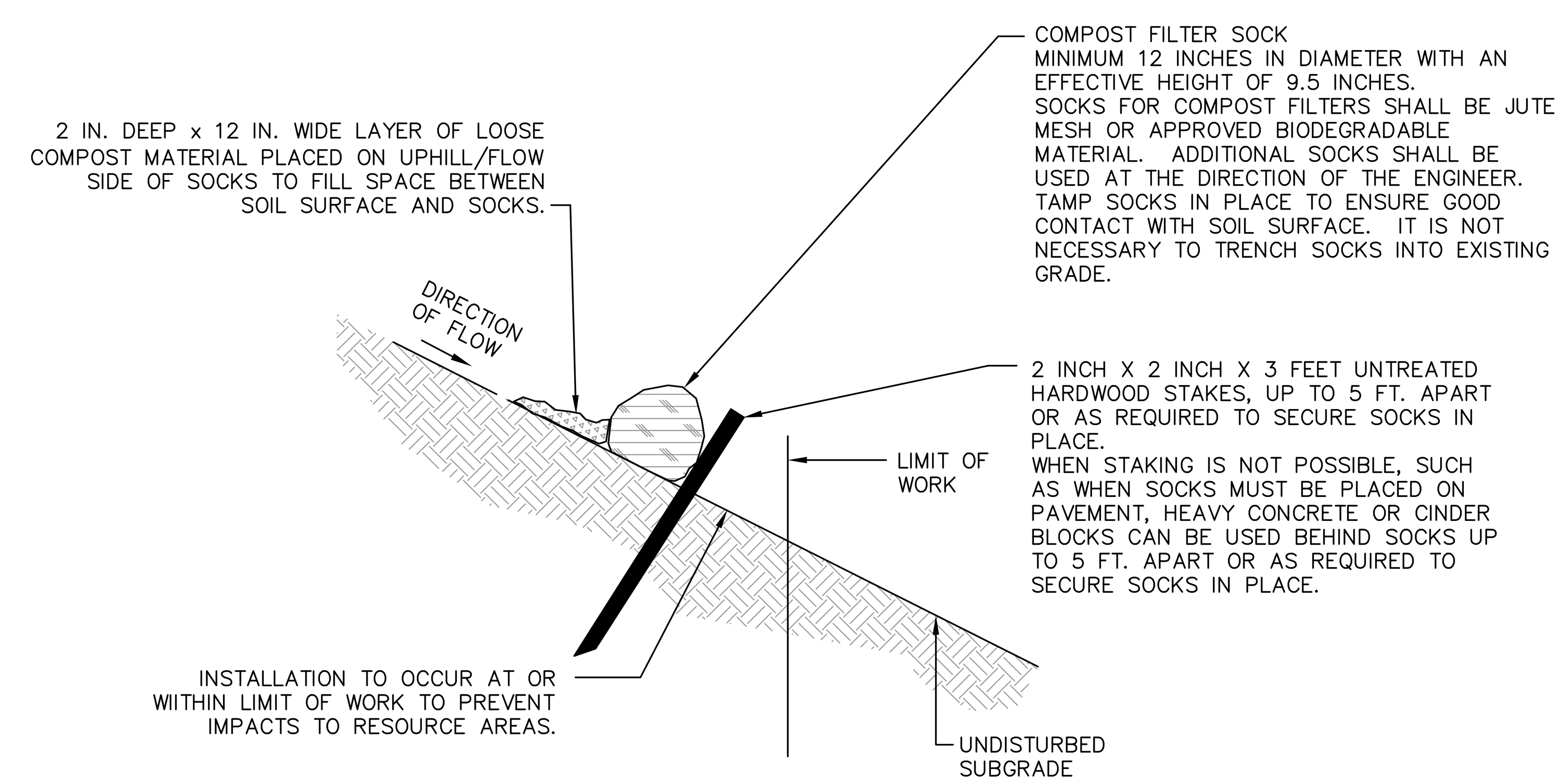
SHEET NO. 3 OF 26



INLET SEDIMENT CONTROL DEVICE
(WITH OPTIONAL CURB DEFLECTOR)
NOT TO SCALE



FLOATING SILT FENCE
NOT TO SCALE



NOTES:

1. PROVIDE A MINIMUM SOCK DIAMETER OF 12 INCHES FOR SLOPES UP TO 50 FEET IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER SOCK DIAMETER OR ADDITIONAL COURSING OF FILTER SOCKS TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
2. INSTALL SOCKS ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
4. CONFIGURE SOCKS AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.

COMPOST FILTER SOCK
NOT TO SCALE

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

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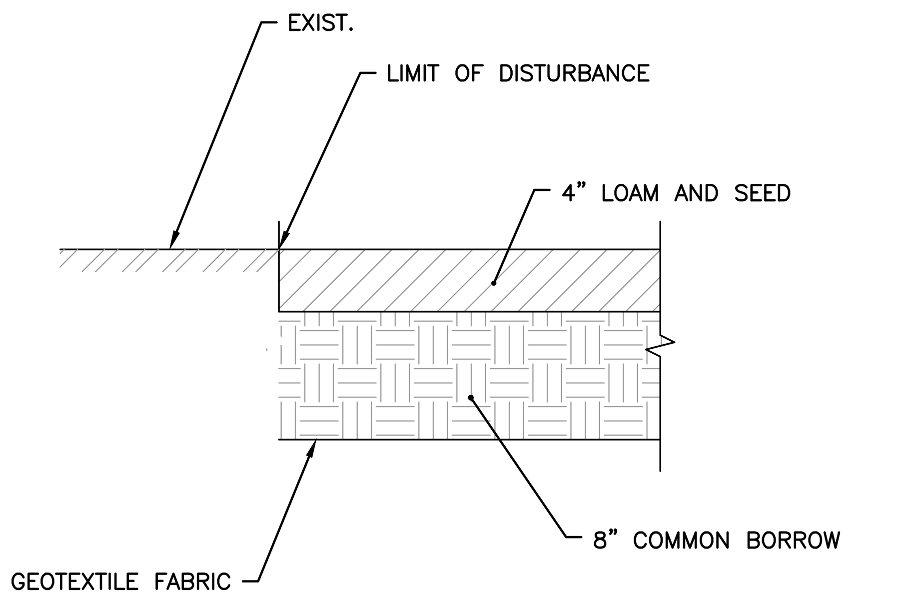
TITLE
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
CONSTRUCTION DETAILS 1

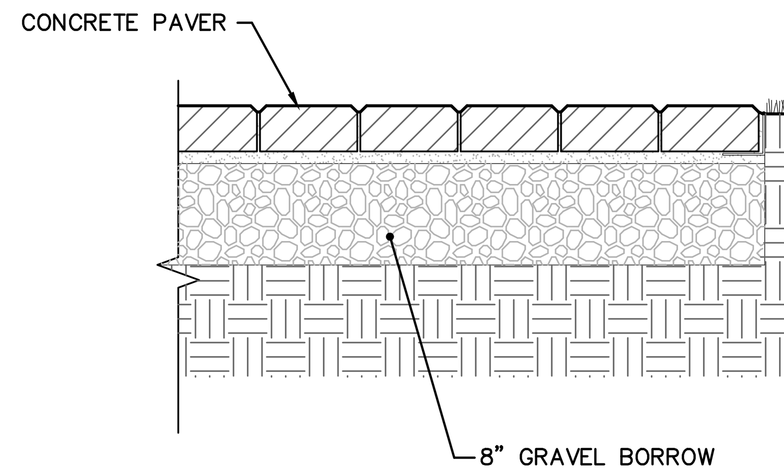
BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022
SHEET NO. 4 OF 26



NOTE: ANY AREAS OF GROUND DISTURBED BY CONSTRUCTION ACTIVITIES THAT WILL NOT BE COVERED BY IMPERVIOUS SURFACE SHALL BE EXCAVATED 12" AND REPLACED WITH 4" OF LOAM OVER 8" OF COMMON BORROW OVER GEOTEXTILE FABRIC.

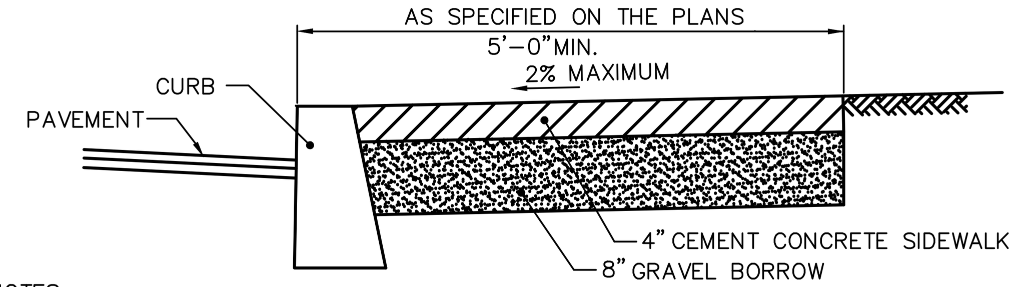
DISTURBED PERVIOUS AREA

NOT TO SCALE



CONCRETE PAVER OVER GRAVEL

NOT TO SCALE

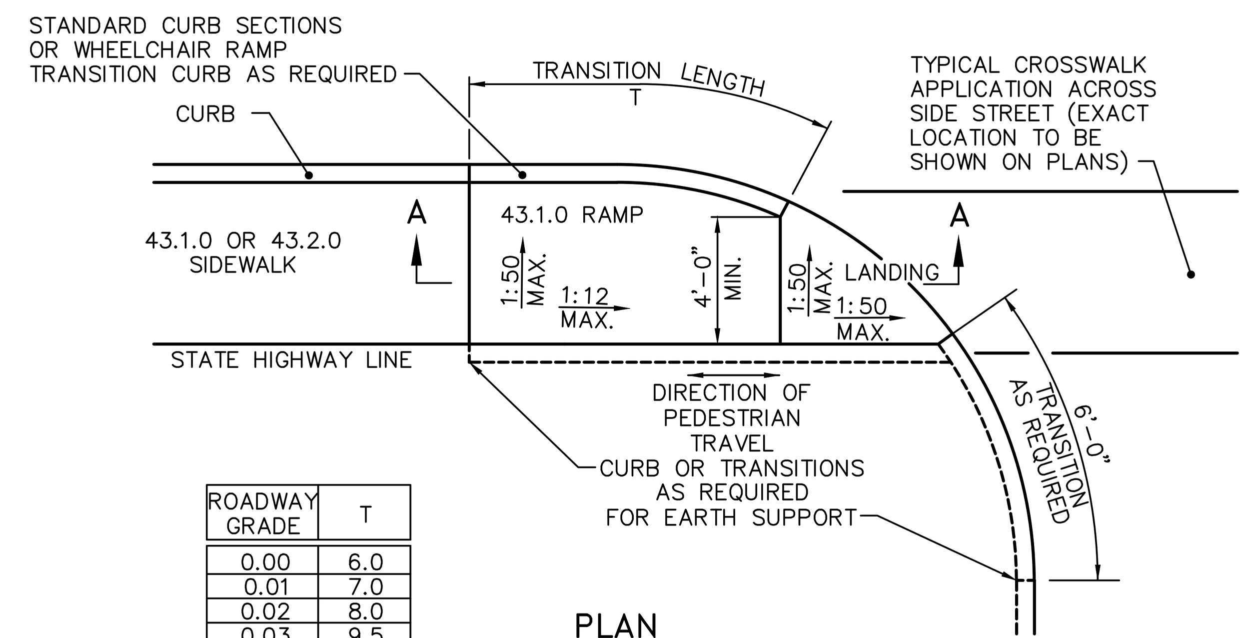


NOTES

1. SHALL BE IN ACCORDANCE WITH SECTION 905 OF THE R.I. STANDARD SPECIFICATIONS.
2. FOR CURB SETTING DETAIL REFERENCE STD. 7.6.0.

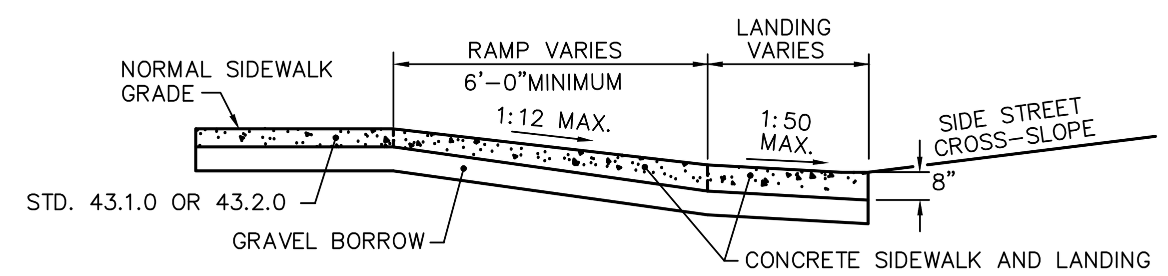
CEMENT CONCRETE SIDEWALK — R.I. STANDARD 43.1.0

NOT TO SCALE



ROADWAY GRADE	T
0.00	6.0
0.01	7.0
0.02	8.0
0.03	9.5
0.04	11.5
0.05	15.0

PLAN



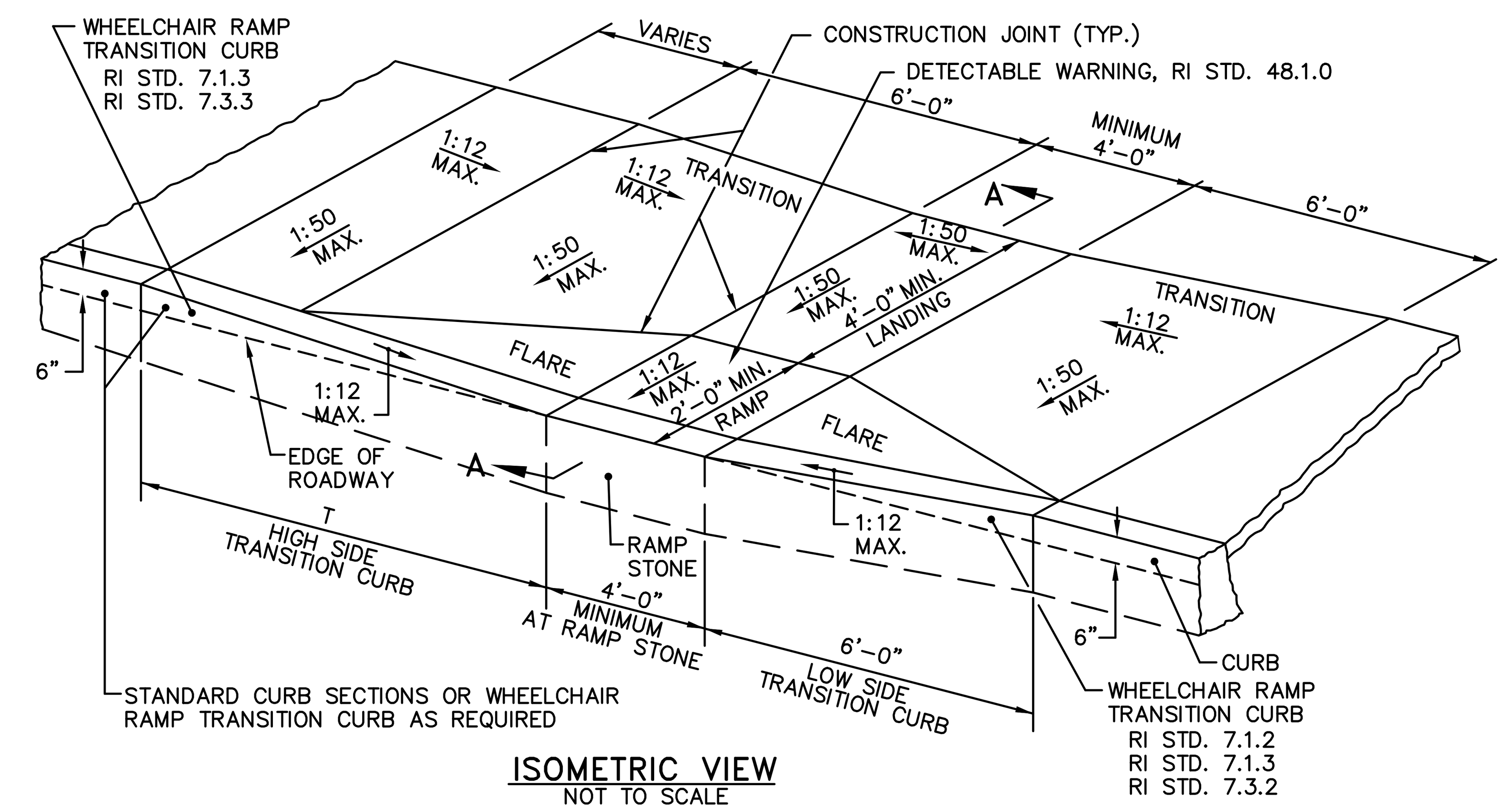
SECTION A–A

NOTES:

1. SHALL BE IN ACCORDANCE WITH SECTION 905 OF THE R.I. STANDARD SPECIFICATIONS.
2. THIS DETAIL IS TO BE USED ONLY WHEN STATE RIGHT–OF–WAY IS LIMITED TO BACK OF SIDEWALK, AND SIDEWALK IS NARROW WITH NO PEDESTRIAN TRAFFIC FROM SIDE STREET.
3. WHEN ANY OBSTRUCTION LOCATED IN THE SIDEWALK FALLS WITHIN A CROSSWALK AREA, IF POSSIBLE, THE OBSTRUCTION SHALL BE PLACED SUCH THAT IT FALLS OUTSIDE OF THE RAMP.
4. AT NO TIME IS ANY PART OF THE WHEELCHAIR RAMP TO BE LOCATED OUTSIDE OF THE CROSSWALK, AND IT IS TO BE CENTERED WHENEVER POSSIBLE.
5. DRAINAGE FACILITIES ARE TO BE LOCATED UP–GRADE OF ALL WHEELCHAIR RAMPS.
6. LOCATION OF WHEELCHAIR RAMPS IS AS SHOWN ON CONTRACT DRAWINGS.
7. ALL REQUIRED CUTTING OF CURB PIECES TO BE PAID FOR UNDER COST OF CURB.
8. WHERE THE ROAD PROFILE EXCEEDS 5% THE TRANSITION LENGTH (T) SHALL BE EIGHTEEN FEET (18'–0").
9. THE ENTRANCE OF THE WHEELCHAIR RAMP SHALL BE FLUSH WITH THE ROADWAY.
10. MINIMUM LENGTH OF STRAIGHT OR CIRCULAR FILLER PIECES TO BE 3'–0"(GREATER LENGTHS PREFERRED).
11. AN UNOBSTRUCTED PATH OF TRAVEL WITH A MINIMUM WIDTH OF 4'–0" SHALL BE MAINTAINED.

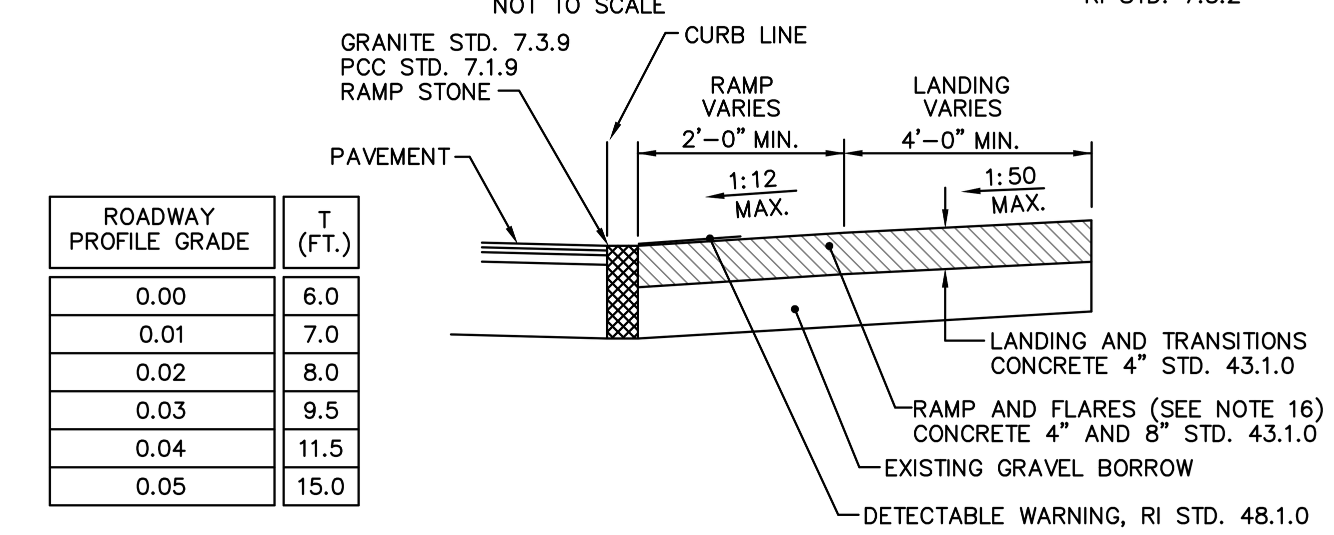
WHEELCHAIR RAMP FOR LIMITED RIGHT–OF–WAY AREAS — R.I. STANDARD 43.3.1

NOT TO SCALE



ISOMETRIC VIEW

NOT TO SCALE



ROADWAY PROFILE GRADE	T (FT.)
0.00	6.0
0.01	7.0
0.02	8.0
0.03	9.5
0.04	11.5
0.05	15.0

SECTION A–A

NOT TO SCALE

NOTES:

1. SHALL BE IN ACCORDANCE WITH SECTION 905 OF THE R.I. STANDARD SPECIFICATIONS.
2. WHEN ANY OBSTRUCTION LOCATED IN THE SIDEWALK FALLS WITHIN A CROSSWALK AREA, THE WHEELCHAIR RAMP WILL BE PLACED SUCH THAT THE OBSTRUCTION FALLS OUTSIDE OF THE RAMP.
3. AT NO TIME IS ANY PART OF THE WHEELCHAIR RAMP TO BE LOCATED OUTSIDE OF THE CROSSWALK, AND IT IS TO BE CENTERED WHENEVER POSSIBLE.
4. DRAINAGE FACILITIES ARE TO BE LOCATED UP–GRADE OF ALL WHEELCHAIR RAMPS.
5. LOCATION OF WHEELCHAIR RAMPS IS AS SHOWN ON CONTRACT DRAWINGS.
6. IN NO INSTANCE SHALL THE SIDEWALK CROSS SLOPE EXCEED 1:50 EXCEPT WITHIN THE RAMP AREA.
7. AN UNOBSTRUCTED PATH OF TRAVEL WITH A MINIMUM WIDTH OF 4'–0" SHALL BE MAINTAINED.
8. THE WHEELCHAIR RAMP SLOPE AND SIDE SLOPES (TRANSITIONS), MUST NOT BE STEEPER THAN 1:12. HOWEVER, THESE SLOPES MAY BE FLATTER THAN 1:12 WHEN WARRANTED BY SURROUNDING CONDITIONS.
9. WHERE THE ROAD PROFILE EXCEEDS 5% THE HIGH SIDE TRANSITION LENGTH (T) SHALL BE EIGHTEEN FEET (18'–0").
10. IN NO CASE, WHERE A STOP LINE IS WARRANTED, SHALL A RAMP BE PLACED BEHIND THE STOP LINE.
11. THE ENTRANCE OF THE WHEELCHAIR RAMP SHALL BE FLUSH WITH THE ROADWAY.
12. THE WHEELCHAIR RAMP SHALL BE CENTERED RADIALLY, OPPOSITE THE RADIUS POINT WHEN POSSIBLE.
13. MINIMUM LENGTH OF STRAIGHT OR CIRCULAR FILLER PIECES TO BE 3'–0"(GREATER LENGTHS PREFERRED).
14. ALL REQUIRED CUTTING OF CURB PIECES TO BE PAID FOR UNDER COST OF CURB.
15. DETECTABLE WARNINGS TO BE PAID FOR UNDER SECTION 942 OF THE R.I. STANDARD SPECIFICATION.
16. 8" CONCRETE DEPTH FOR RADIUS WHEELCHAIR RAMPS ONLY. USE 4"DEPTH FOR TANGENT (MID–BLOCK) LOCATIONS.
17. EXISTING GRAVEL BORROW SUBBASE SHALL BE ADJUSTED TO CLOSE CONFORMANCE WITH THE LINES, GRADES, AND TYPICAL CROSS SECTIONS INDICATED ON THE PLANS. ANY NEW GRAVEL BORROW SUBBASE REQUIRED AS A RESULT OF ADJUSTMENT SHALL BE INCLUDED AND PAID FOR UNDER ITEM 906.9910 CURBING AND SIDEWALKS.
18. IF EXISTING GRAVEL BORROW SUBBASE DOES NOT EXIST BENEATH ANY NEW WHEELCHAIR RAMPS, NEW GRAVEL BORROW SUBBASE SHALL BE INSTALLED AT A DEPTH OF 8 INCHES AND SHALL BE PAID FOR UNDER ITEM 302.0100 GRAVEL BORROW SUBBASE COURSE.

WHEELCHAIR RAMP — R.I. STANDARD 43.3.0

NOT TO SCALE

(MODIFIED)

WHEELCHAIR RAMP DATA 43.3.1

WCR #	RAMP REFERENCE POINT		WIDTH OF SIDEWALK (FT)	WIDTH OF RAMP ENTRANCE (FT)	CLEAR PATH OF TRAVEL (FT)	ROADWAY GUTTER SLOPE	TRANSITION LENGTH (FT)
	STATION	OFFSET					
2	0+17.8 PEDESTRIAN RAMP	41.05' LT	7.7	7.7	7.7	NA	8.3

WHEELCHAIR RAMP DATA 43.3.3

WCR #	BASELINE	RAMP REFERENCE POINT		LENGTH OF RAMP (FT)	SIDEWALK WIDTH (FT)	WIDTH OF RAMP OPENING (FT)	ROADWAY GUTTER SLOPE (%)	PATH OF TRAVEL (3'-0" MIN.) (FT)	TRANSITION LENGTH		NOTES
		STATION	OFFSET						*LEFT SIDE	*RIGHT SIDE	
1	PEDESTRIAN RAMP	1+60.3	29.79 R	4.0	7.5	5.0	0.38	4.0	7.0	6.0	LEFT SIDE KINSLEY AVE

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: SD
DESIGNED BY: BB
CHECKED BY: CJ

REGISTERED PROFESSIONAL

PREPARED BY

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TITLE

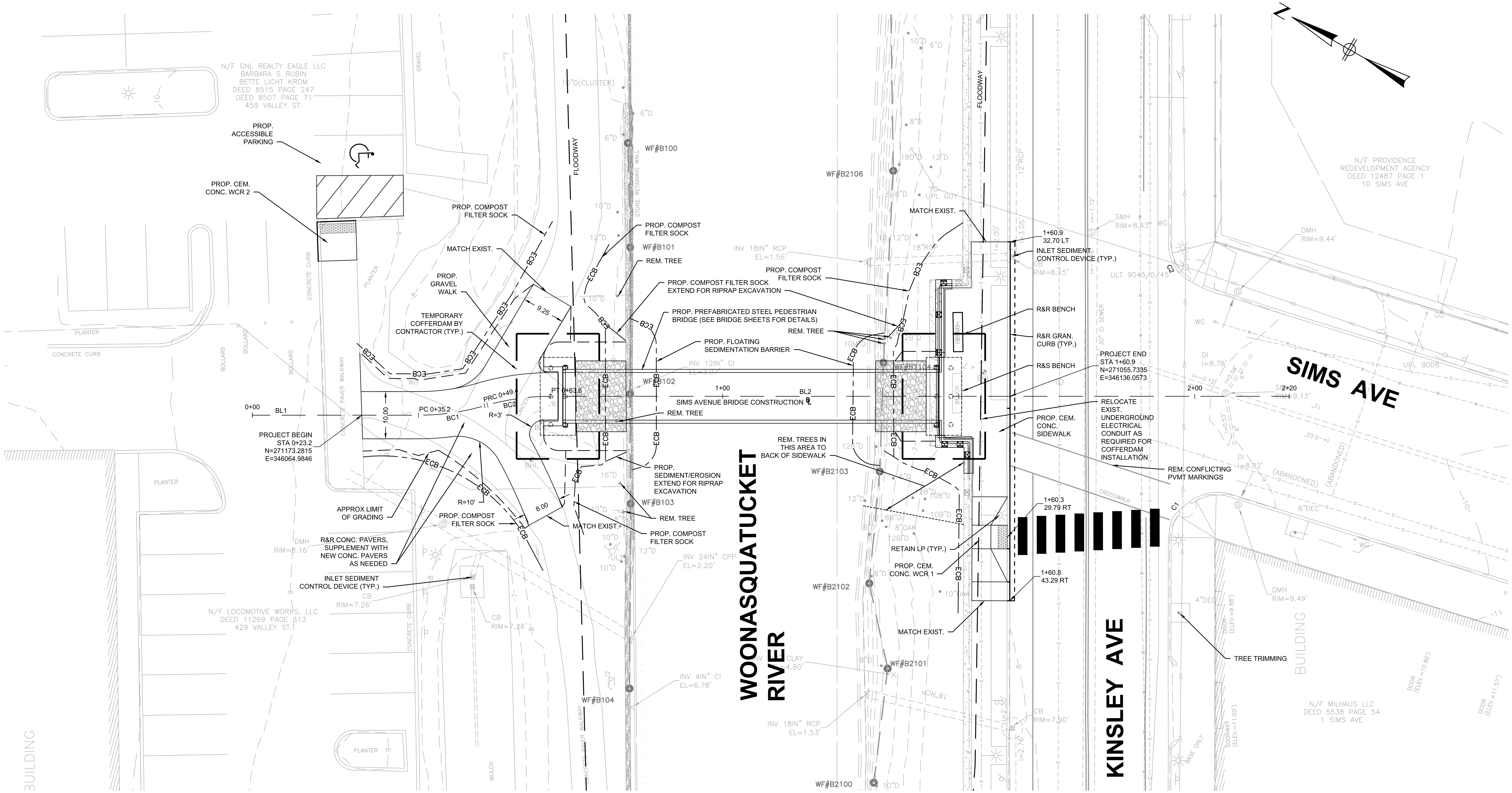
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND

CONSTRUCTION DETAILS 2

BETA JOB NO. 6620

ISSUE DATE SEPTEMBER 12, 2022

SHEET NO. 5 OF 26



SIMS AVENUE BRIDGE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
BL1	0+00.00	271193.4609	346053.5725		S29°29'23"E 35.18'	0+35.18	271162.8416	346070.8888
BC1	0+35.18	271162.8416	346070.8888	R=50.00' Δ= 16°15'37" L=14.19' T=7.14'		0+49.37	271151.6399	346079.5214

SIMS AVENUE BRIDGE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
BC2	0+49.37	271151.6399	346079.5214	R=50.00' Δ= 16°15'37" L=14.19' T=7.14'		0+63.56	271140.4382	346088.1540
BL2	0+63.56	271140.4382	346088.1540		S29°29'23"E 156.44'	2+20.00	271004.2623	346165.1660

NOTE: AREAS OF GROUND DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE ENCAPSULATED USING ONE OF THE FOLLOWING METHODS TO PREVENT DIRECT EXPOSURE TO CONTAMINANTS OF CONCERN:

BRIDGE ABUTMENTS: WHERE BRIDGE ABUTMENTS WILL BE INSTALLED, THE SOIL WILL BE COVERED WITH A MONOLITHIC CONCRETE ABUTMENT.

LANDSCAPED CAP: WHERE PERVIOUS SURFACES WILL BE RE-ESTABLISHED, THE CAP WILL CONSIST OF A GEOTEXTILE FABRIC OVER EXISTING SOIL COVERED WITH 12 INCHES OF IMPORTED CLEAN SOIL.

HARDSCAPE CAP: WHRE PAVED WALKING PATHS NEED TO BE ESTABLISHED, THE CAP WILL CONSISIT OF A MINIMUM OF 4 INCHES OF HOT MIX ASPHALT, CONCRETE, OR CONCRETE PAVERS AS DESIGNATED ON THE PLANS OVERLYING A MINIMUM OF 8 INCHES OF STRUCTURAL SUB-BASE FILL OVER EXISTING SOIL.

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: BB
DESIGNED BY: BB
CHECKED BY: CWJ

REGISTERED PROFESSIONAL

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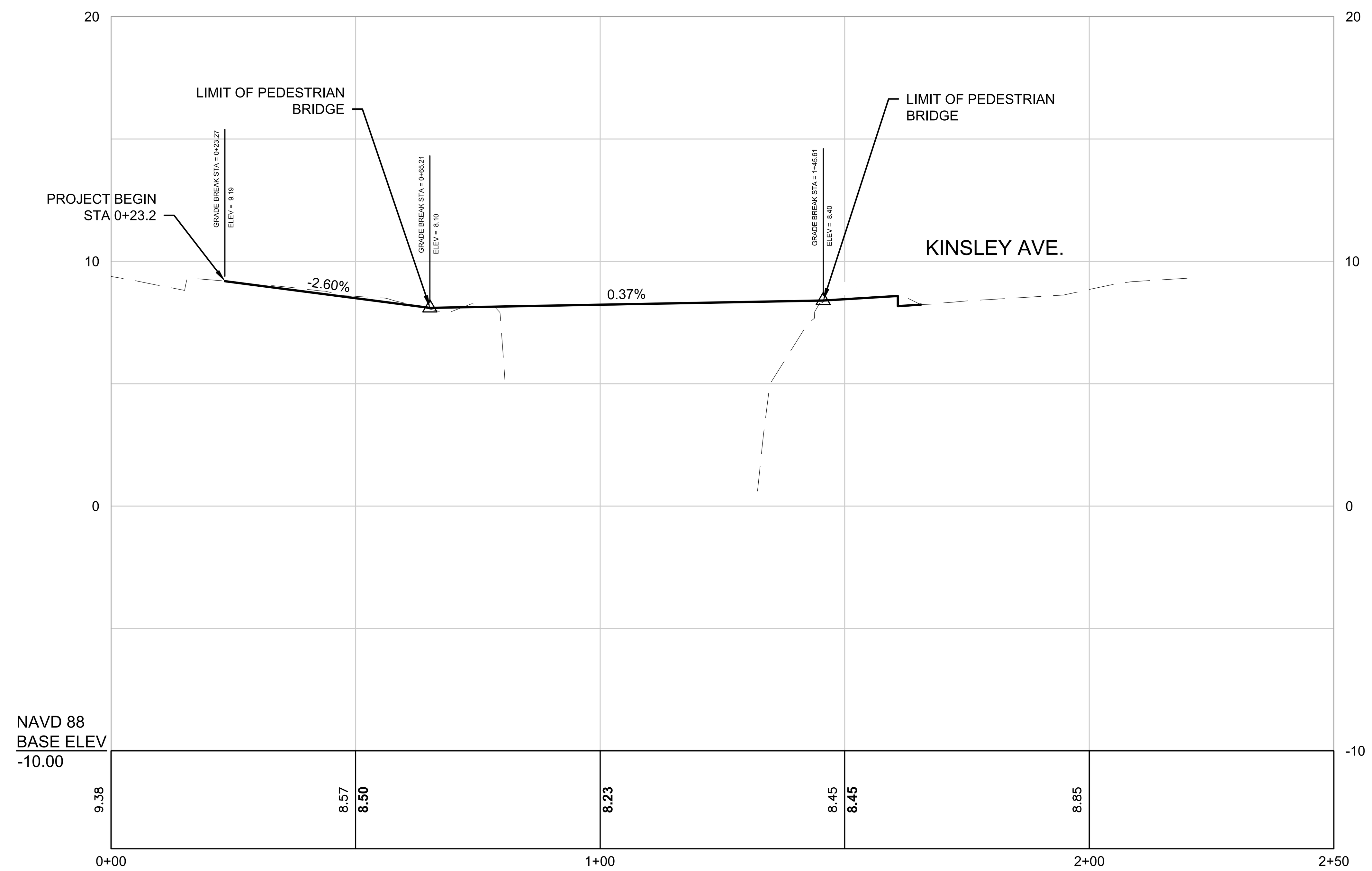
SCALE
10 0 10 20
SCALE IN FEET: 1"=10'
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
CONSTRUCTION PLAN

BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022
SHEET NO. 6 OF 26

SIMS AVENUE BRIDGE
STA 0+00 TO STA 2+50.00



NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: SD

DESIGNED BY: BB

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REGISTERED PROFESSIONAL

PREPARED BY

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SCALE

HOR. SCALE IN FEET: 1"=20'

20 0 20 40

4 0 4 8

VER. SCALE IN FEET: 1"=4'

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE

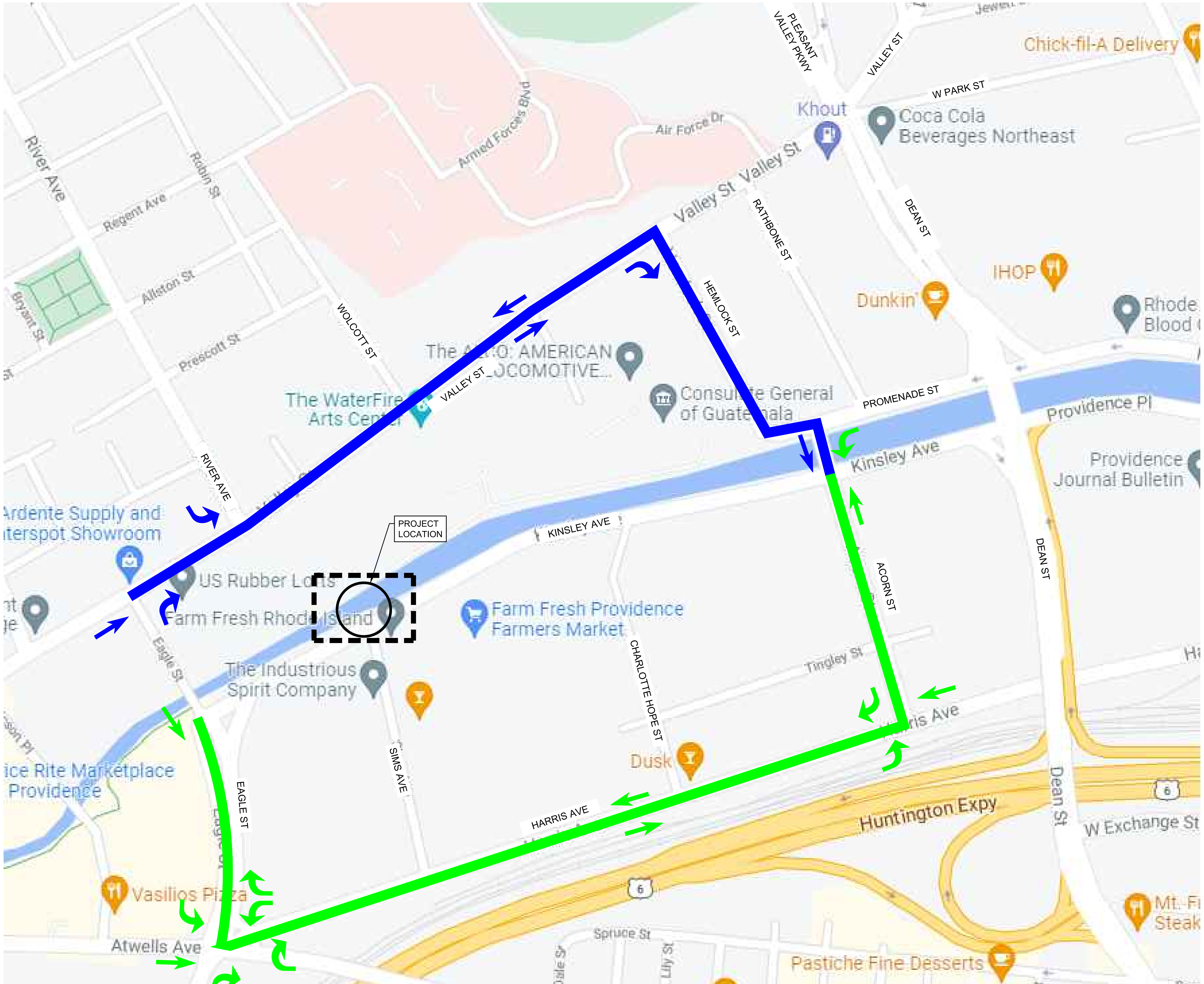
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND

PROFILE

BETA JOB NO. 6620

ISSUE DATE SEPTEMBER 12, 2022

SHEET NO. 7 OF 26



OVERALL DETOURS

N

NOTES:

1. EMERGENCY ACCESS MUST BE MAINTAINED TO ALL PROPERTIES AT ALL TIMES.
2. DETOUR SIGNS SHALL BE COVERED WHEN DETOUR IS NOT IN ACTIVE USE.

LEGEND

- TRAFFIC FROM NORTH OF KINSLEY AVE
- TRAFFIC FROM SOUTH OF KINSLEY AVE

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: SD
DESIGNED BY: JC
CHECKED BY: PB

REGISTERED PROFESSIONAL

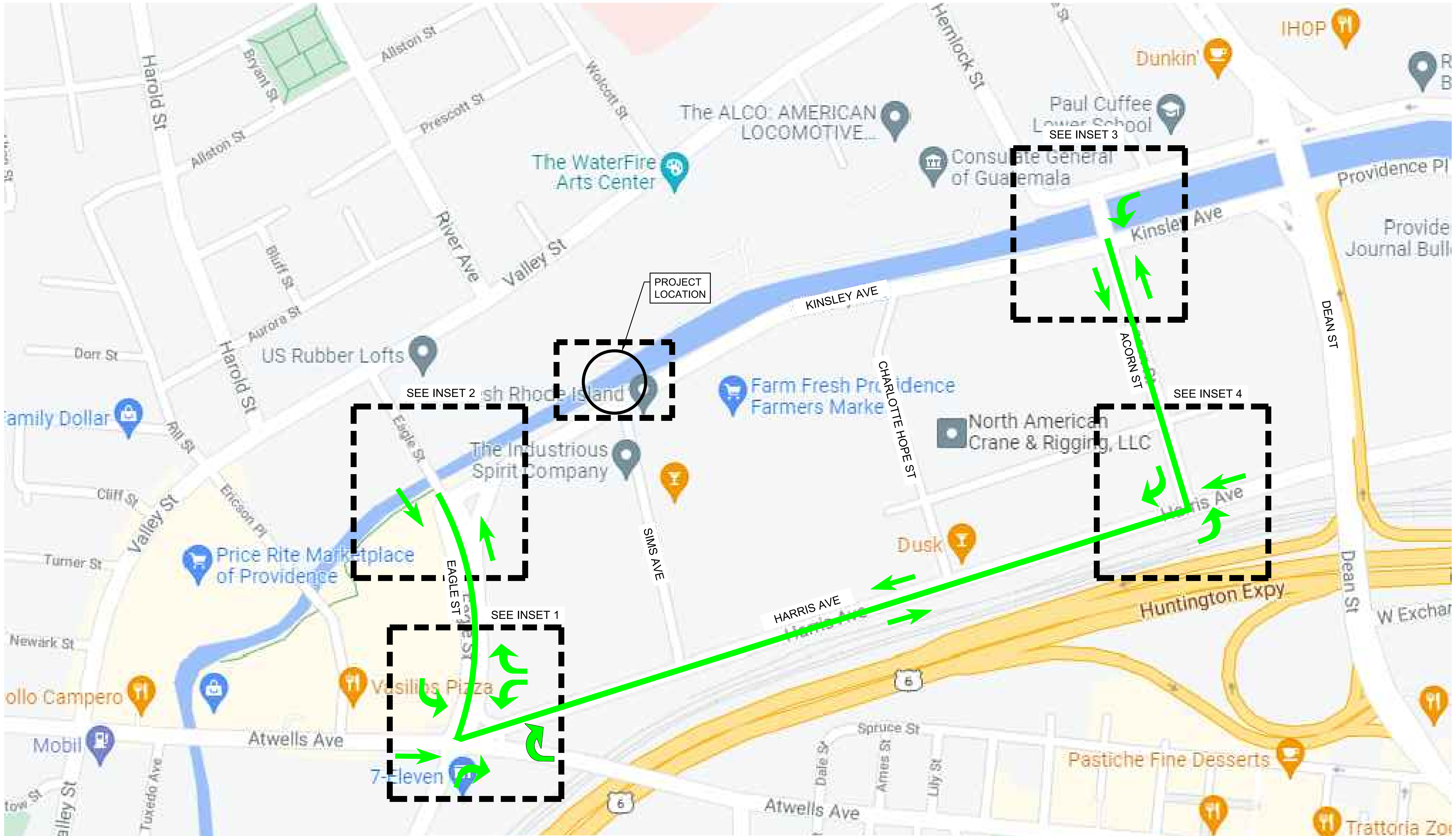
PREPARED BY: BETA www.BETA-Inc.com

SUBCONSULTANT

SCALE: NONE

TITLE:
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
TRAFFIC CONTROL PLAN NO. 1

BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022
SHEET NO. 8 OF 26

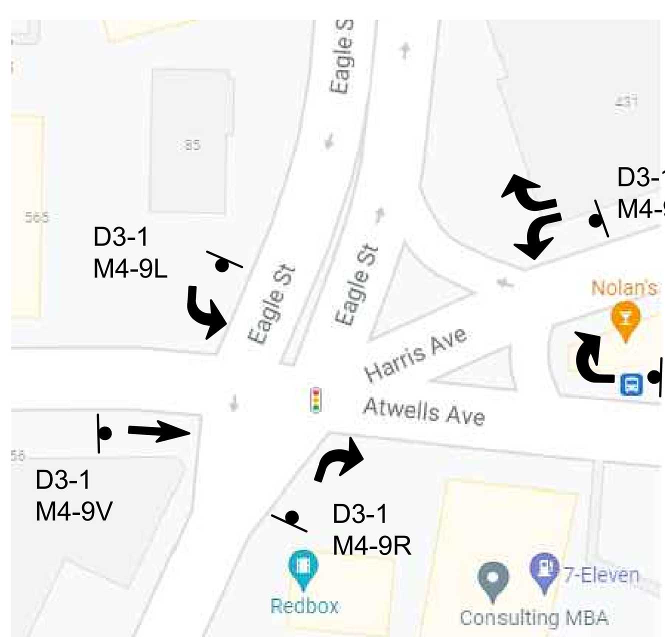


DETOUR - TRAFFIC FROM SOUTH OF KINSLEY AVE

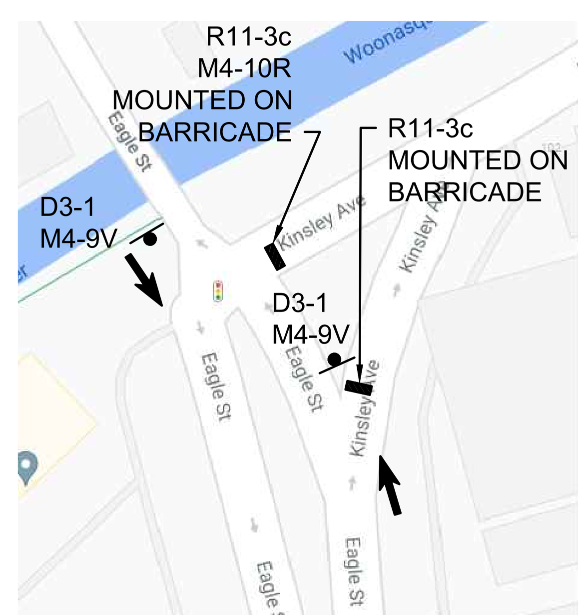
N

NOTES:

1. EMERGENCY ACCESS MUST BE MAINTAINED TO ALL PROPERTIES AT ALL TIMES.
2. DETOUR SIGNS SHALL BE COVERED WHEN DETOUR IS NOT IN ACTIVE USE.



INSET 1
NOT TO SCALE



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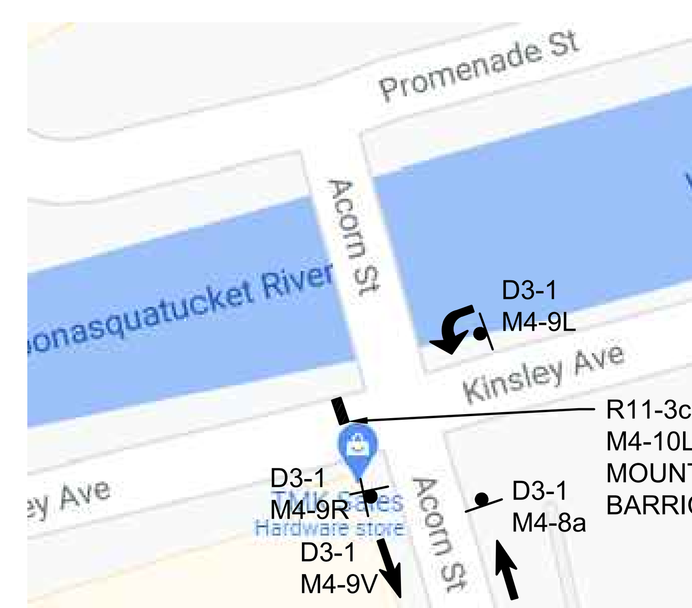
NOT TO SCALE



INSET 3
NOT TO SCALE

INSET 4
NOT TO SCALE

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: SD

DESIGNED BY: JC

CHECKED BY: PB

REGISTERED PROFESSIONAL

PREPARED BY

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SCALE

NONE

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TITLE

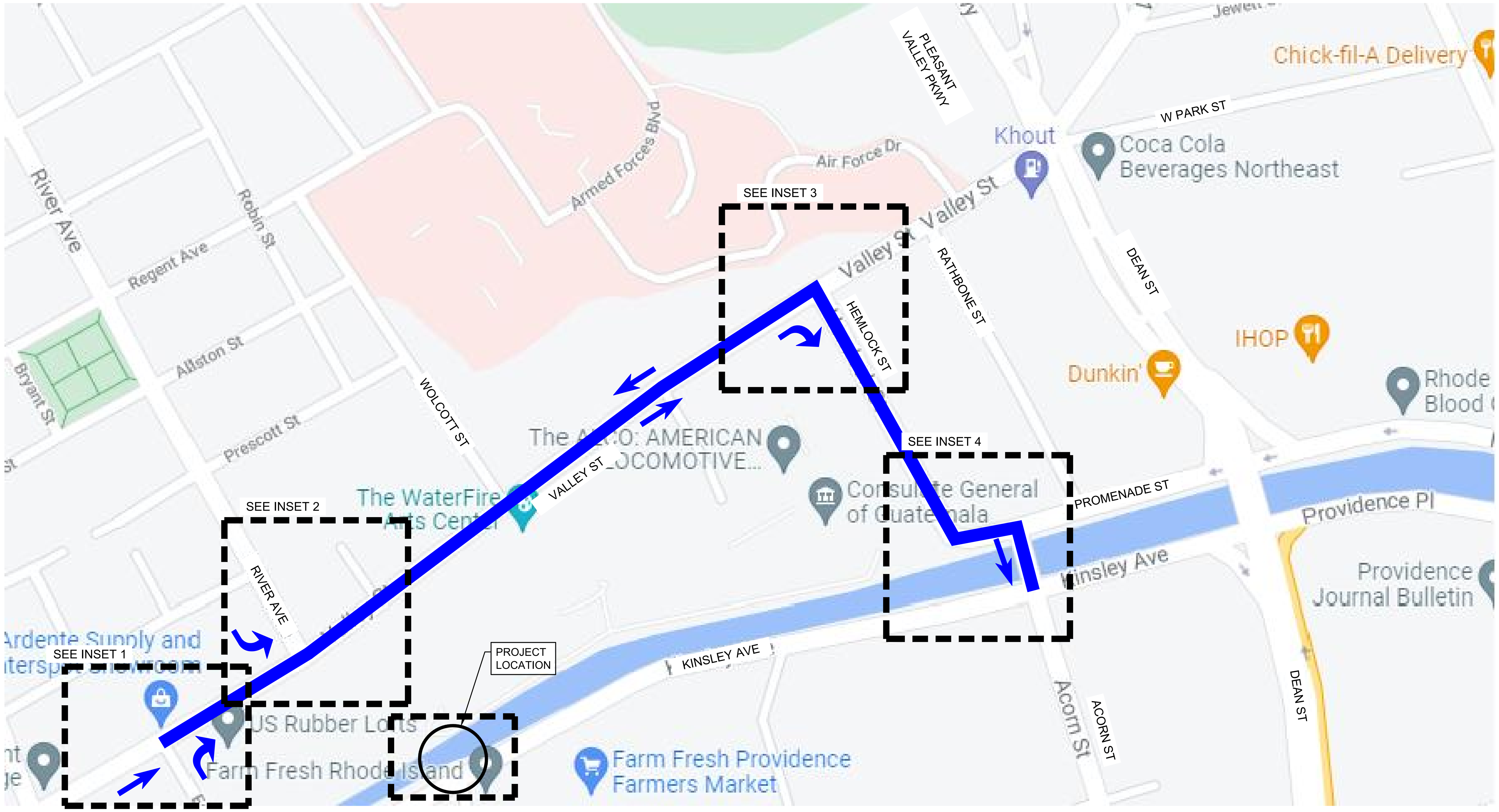
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND

TRAFFIC CONTROL PLAN NO. 2

BETA JOB NO. 6620

ISSUE DATE SEPTEMBER 12, 2022

SHEET NO. 9 OF 26

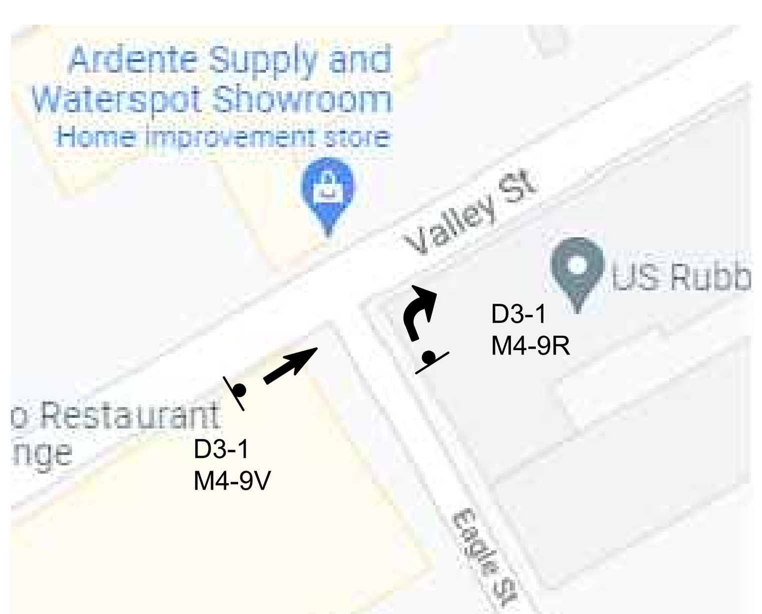


DETOUR - TRAFFIC FROM NORTH OF KINSLEY AVE

N

NOTES:

1. EMERGENCY ACCESS MUST BE MAINTAINED TO ALL PROPERTIES AT ALL TIMES.
2. DETOUR SIGNS SHALL BE COVERED WHEN DETOUR IS NOT IN ACTIVE USE.



INSET 1

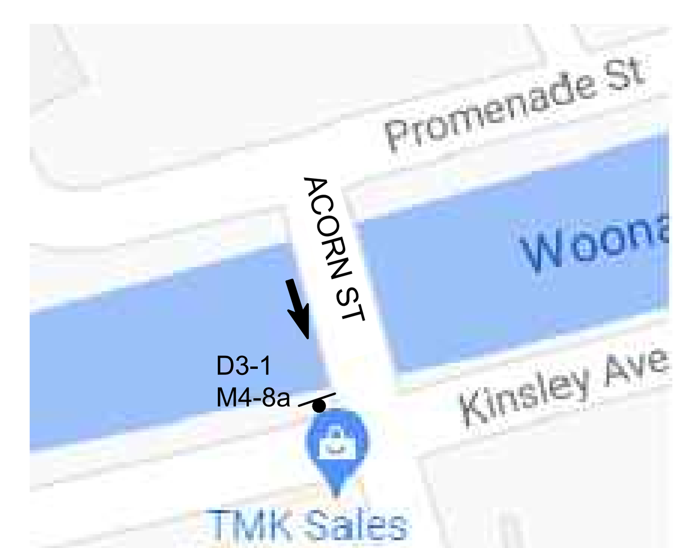
NOT TO SCALE

INSET 2

NOT TO SCALE

INSET 3

NOT TO SCALE



INSET 4

NOT TO SCALE

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DESIGNED BY: JC
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REGISTERED PROFESSIONAL

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SCALE: NONE

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TITLE: SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
TRAFFIC CONTROL PLAN NO. 3

BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022
SHEET NO. 10 OF 26

MAINTENANCE AND PROTECTION OF TRAFFIC NOTES:

1. ALL MAINTENANCE AND PROTECTION OF TRAFFIC CONTROL SETUPS, SIGNS, CHANNELIZING DEVICES, ETC., SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
2. ALL SIGN MOUNTINGS FOR TEMPORARY AND CONSTRUCTION SIGNS SHALL BE IN ACCORDANCE WITH THE R.I.D.O.T. STANDARD SPECIFICATIONS, LATEST EDITION.
3. THE CONTRACTOR SHALL COVER ALL EXISTING AND/OR TEMPORARY SIGNS THAT ARE NOT RELEVANT TO THE TRAFFIC CONTROL REQUIRED DURING ANY PARTICULAR STAGE OF THE CONTRACT.
4. ADVANCE FLAGPERSON SIGNS (W20-7A) SHALL BE USED IN ADVANCE OF ANY POINT AT WHICH A FLAGPERSON OR A POLICE OFFICER HAS BEEN STATIONED TO CONTROL TRAFFIC. WHEN NEEDED, AN APPROPRIATE DISTANCE MESSAGE MAY BE DISPLAYED ON A SUPPLEMENTAL PLATE (24"x18") BELOW THE FLAGPERSON SYMBOL SIGN. THE SIGN SHALL BE PROMPTLY REMOVED OR COVERED WHENEVER THE FLAGPERSON IS NOT AT THE STATION.
5. POLICE OFFICERS (AND NOT FLAGPERSONS) SHALL BE UTILIZED WHEN WORK WILL IMPACT SIGNALIZED INTERSECTIONS AND LIMITED ACCESS HIGHWAYS.
6. POLYETHYLENE DRUMS SHALL BE UTILIZED AS A CHANNELIZING DEVICE WHEN A TRAFFIC CONTROL SET-UP IS TO REMAIN BEYOND WORKING HOURS WHEN NO WORKERS ARE PRESENT. CONES SHALL BE UTILIZED WHEN A TRAFFIC CONTROL SET-UP IS TO REMAIN ONLY DURING WORKING HOURS AND IS SUBSEQUENTLY BROKEN DOWN AT THE END OF THE WORKDAY.
7. ARROW PANELS SHALL BE SET IN THE FLASHING FOUR CORNERS CAUTION MODE UNLESS UTILIZED FOR A MERGING TAPER. ARROW PANELS SET IN THE FLASHING ARROW MODE SHALL NOT BE UTILIZED FOR LANE SHIFTS.
8. TEMPORARY CONSTRUCTION SIGNS AND OTHER WORKZONE TRAFFIC CONTROL DEVICES THAT ARE DAMAGED OR REQUIRE RELOCATION SHALL BE REPLACED AND / OR RELOCATED UNDER THE PAY ITEM FOR "MAINTENANCE AND MOVEMENT TRAFFIC PROTECTION."
9. THE PRIVATE VEHICLES OF CONSTRUCTION WORKERS SHALL NOT BE PARKED ON THE TRAVEL LANES OR SHOULDERS. THEY MAY BE PARKED WITHIN THE STATE RIGHT-OF-WAY ONLY IN AREAS 30' BEYOND THE OUTSIDE EDGE OF THE TRAVEL LANES AND/OR IN AREAS APPROVED BY THE ENGINEER.
10. TEMPORARY CONSTRUCTION SIGNS AND OTHER TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE INSTALLED PRIOR TO THE START OF WORK IN ANY AREA OPEN TO TRAFFIC, AND SHALL BE REMOVED AS SOON AS PRACTICAL WHEN THEY ARE NO LONGER APPROPRIATE.
11. THE INTENDED VEHICLE PATHS THROUGH EACH WORK ZONE SHALL BE CLEARLY MARKED AT ALL TIMES. WATERBORNE PAVEMENT MARKINGS SHALL BE INSTALLED BEFORE THE END OF THE WORK SHIFT ON ALL COLD-PLANED AND NEW ROADWAY SURFACES THAT WILL BE OPENED TO TRAFFIC AT THE END OF THE SHIFT.

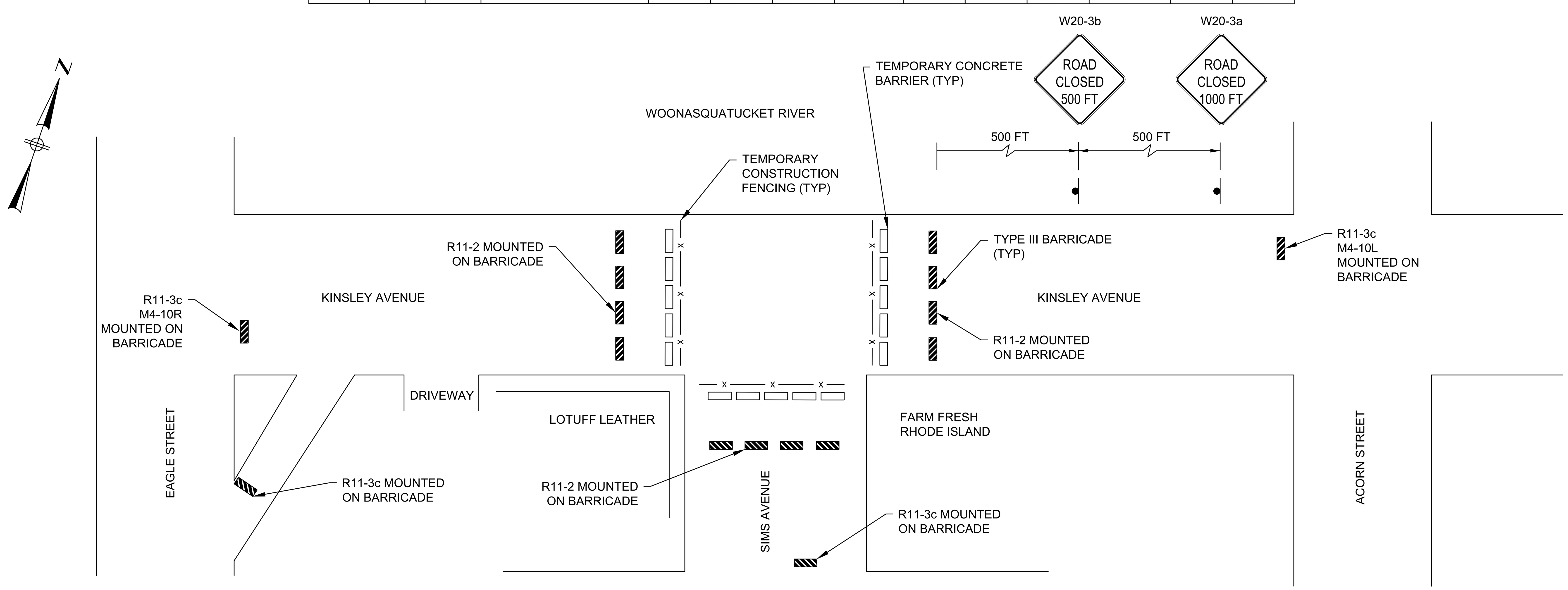
DETOUR SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN: WIDTH	HEIGHT	TEXT	DIMENSIONS (in): LETTER HEIGHT	VERTICAL SPACING	ARROW	NUMBER OF SIGNS REQUIRED	COLOR: BACKGROUND	LEGEND	BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA IN SQUARE FEET	AREA IN SQUARE FEET
R11-2	48 in	30 in	ROAD CLOSED	SEE 2009 MUTCD STANDARDS			3	WHITE	BLACK	BLACK	MOUNT ON BARRICADE	10.0	30.0
R11-3c	60 in	30 in	ROAD CLOSED AHEAD BUSINESSES OPEN				4	ORANGE	BLACK	BLACK	MOUNT ON BARRICADE	12.5	50.0
W20-3a	36 in	36 in	ROAD CLOSED 1000 FT				1	ORANGE	BLACK	BLACK	P-5 1	9.0	9.0
W20-3b	36 in	36 in	ROAD CLOSED 500 FT				1	ORANGE	BLACK	BLACK	P-5 1	9.0	9.0
M4-8a	24 in	18 in	END DETOUR				2	ORANGE	BLACK	BLACK	MOUNT W/ D3-1	3.0	6.0
M4-9L	30 in	24 in	DETOUR ←				4	ORANGE	BLACK	BLACK	MOUNT W/ D3-1	5.0	20.0
M4-9R	30 in	24 in	DETOUR →				7	ORANGE	BLACK	BLACK	MOUNT W/ D3-1	5.0	35.0
M4-9V	30 in	24 in	DETOUR ↑				6	ORANGE	BLACK	BLACK	MOUNT W/ D3-1	5.0	30.0
M4-10L	48 in	18 in	← DETOUR				1	ORANGE	BLACK	BLACK	MOUNT W/ R11-3c	6.0	6.0
M4-10R	48 in	18 in	DETOUR →				1	ORANGE	BLACK	BLACK	MOUNT W/ R11-3c	6.0	6.0
D3-1	48 in	12 in	Kinsley Ave	6/4D	3.25 2.75		19	ORANGE	BLACK	BLACK	P-5 19	4.0	76.0

NOTES:
1. SEE THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND "STANDARD HIGHWAY SIGNS" FOR THE LATEST SPECIFICATIONS ON TEXT DIMENSIONS AND COLOR. (ALSO SEE SECTION M9.30.0 TYPE III MHD STANDARD SPECIFICATION, THE "MASSACHUSETTS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES," AND "GUIDE SIGN POLICY FOR SECONDARY STATE HIGHWAYS" (LATEST EDITIONS) BY THE MASSACHUSETTS HIGHWAY DEPARTMENT).
2. ALL P5 POSTS SHALL BE TELESCOPIC, RECTANGULAR TYPE POSTS, CONFORMING TO THE DIMENSIONS AND REQUIREMENTS OF THE MHD "STANDARD DRAWINGS FOR SIGNS AND SUPPORTS" (LATEST EDITION).

LEGEND:

- REFLECTORIZED PLASTIC DRUM
- P POLICE DETAIL
- TYPE III BARRICADE
- FLASHING ARROW PANEL
- FLASHING ARROW PANEL
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- WORK ZONE
- DIRECTION OF TRAFFIC
- IMPACT ATTENUATOR
- MEDIAN BARRIER
- MEDIAN BARRIER WITH WARNING LIGHTS
- CHAIN LINK FENCE
- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN



KINSLEY AVENUE & SIMS AVENUE INTERSECTION SIGNING DETAIL

NOT TO SCALE

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

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DESIGNED BY: JC
CHECKED BY: PB

REGISTERED PROFESSIONAL

PREPARED BY: BETA www.BETA-Inc.com

SUBCONSULTANT

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TITLE: **SIMS AVENUE PEDESTRIAN BRIDGE**
PROVIDENCE, RHODE ISLAND
TRAFFIC CONTROL PLAN NO. 4

BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022
SHEET NO. 11 OF 26

Meaning of Symbols on Typical Application Diagrams

- Arrow board
- Arrow board support or trailer (shown facing down)
- Changeable message sign or support trailer
- Channelizing device
- Crash cushion
- Direction of temporary traffic detour
- Direction of traffic
- Flagger
- High-level warning device (Flag tree)
- Longitudinal channelizing device
- Luminaire
- Pavement markings that should be removed for a long-term project
- Shadow vehicle
- Sign (shown facing left)
- Surveyor
- Temporary barrier
- Temporary barrier with warning light
- Traffic or pedestrian signal
- Truck-mounted attenuator
- Type 3 barricade
- Warning light
- Work space
- Work vehicle

Meaning of Letter Codes on Typical Application Diagrams

Road Type	Distance Between Signs**		
	A	B	C
Urban (low speed)*	100 feet	100 feet	100 feet
Urban (high speed)*	350 feet	350 feet	350 feet
Rural	500 feet	500 feet	500 feet
Expressway / Freeway	1,000 feet	1,500 feet	2,640 feet

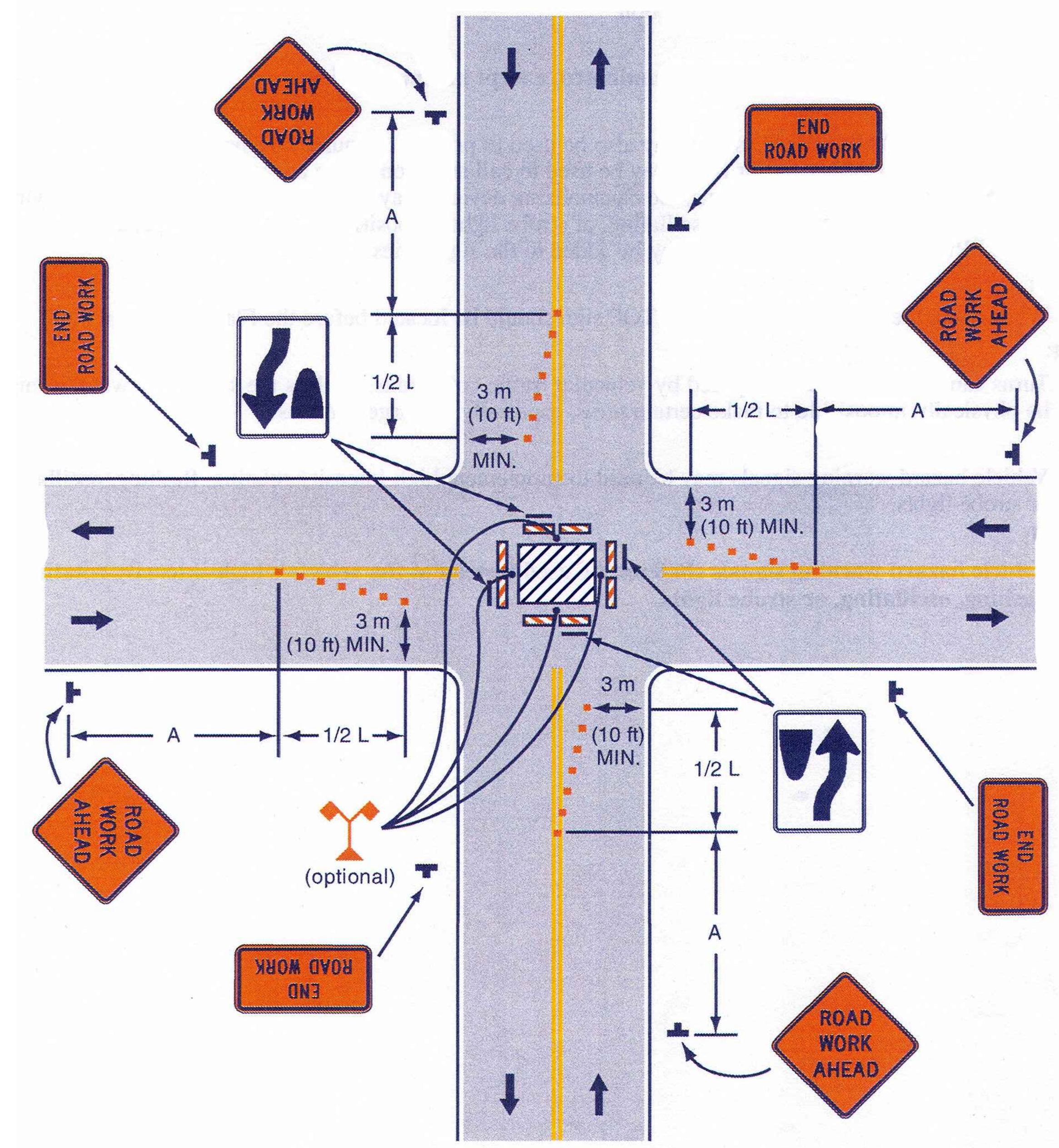
* Speed category to be determined by highway agency

** The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The "first sign" is the sign in a three-sign series that is closest to the TTC zone. The "third sign" is the sign that is furthest upstream from the TTC zone.)

Formulas for Determining Taper Length

Speed (S)	Taper Length (L) in feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	$L = WS$

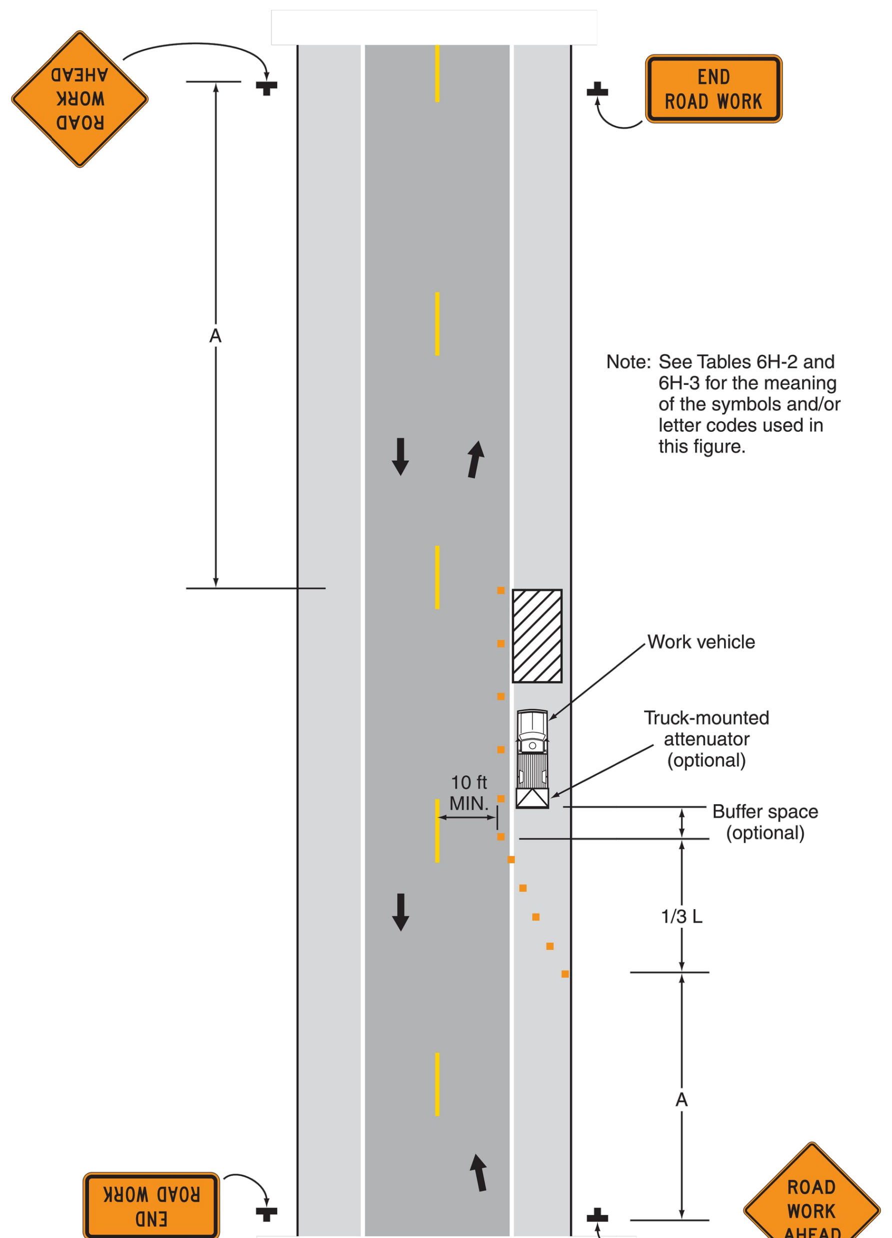
Where: L = taper length in feet
W = width of offset in feet
S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph



Typical Application 26

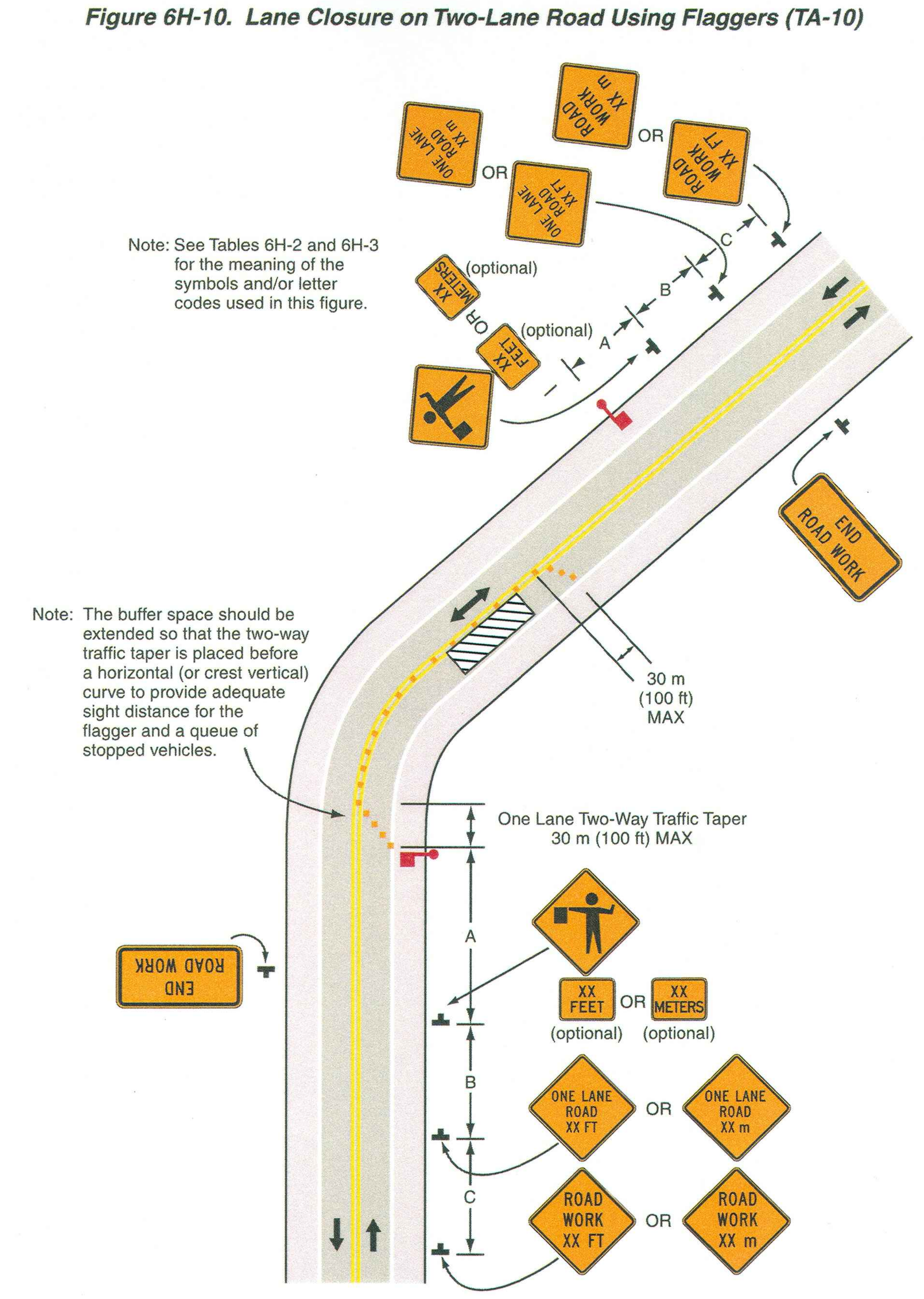
Figure 6H-26. Closure in Center of Intersection (TA-26)

Figure 6H-6. Shoulder Work with Minor Encroachment (TA-6)

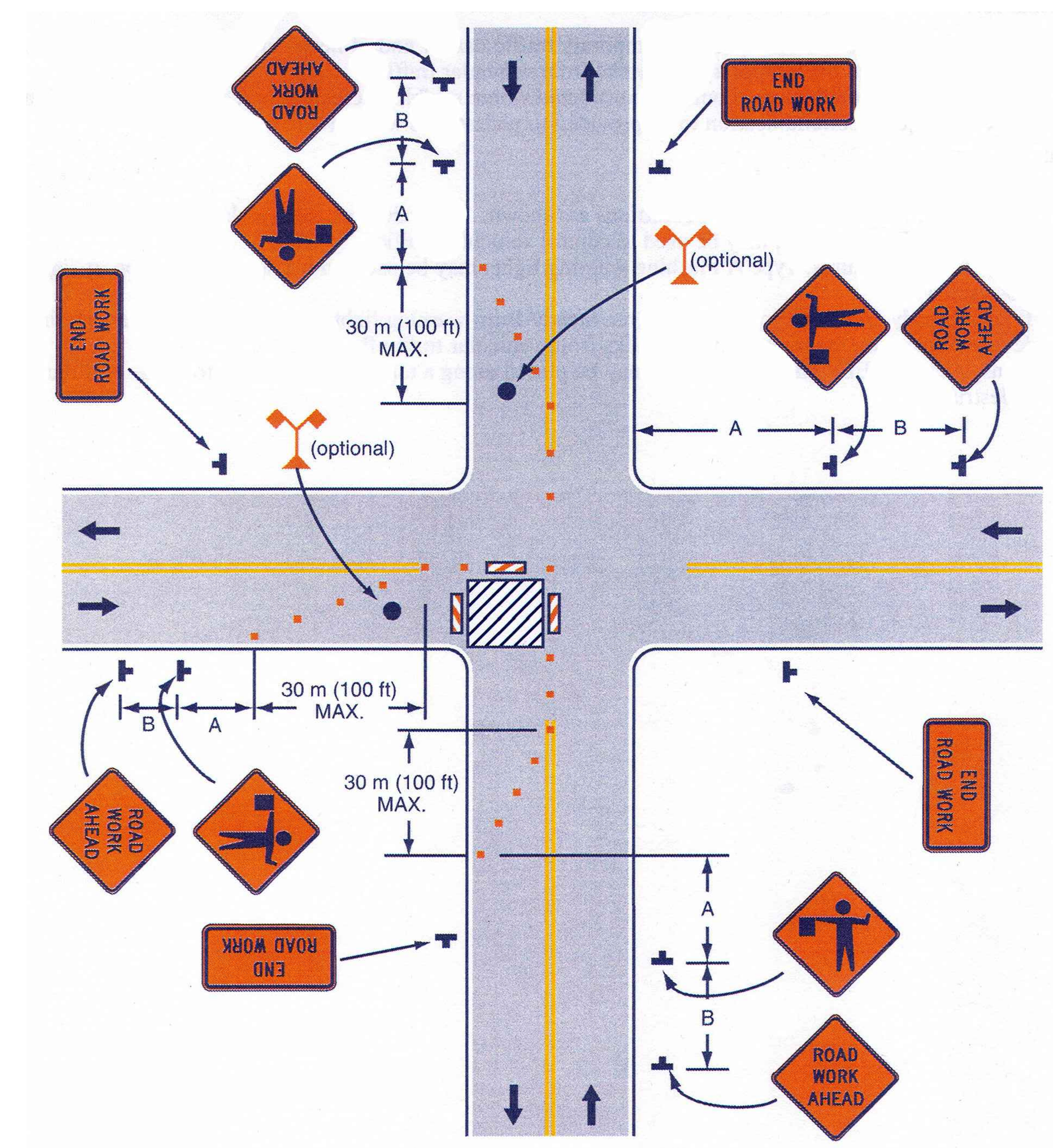


Typical Application 6

Figure 6H-10. Lane Closure on Two-Lane Road Using Flaggers (TA-10)



Typical Application 10



Typical Application 27

Figure 6H-27. Closure at Side of Intersection (TA-27)

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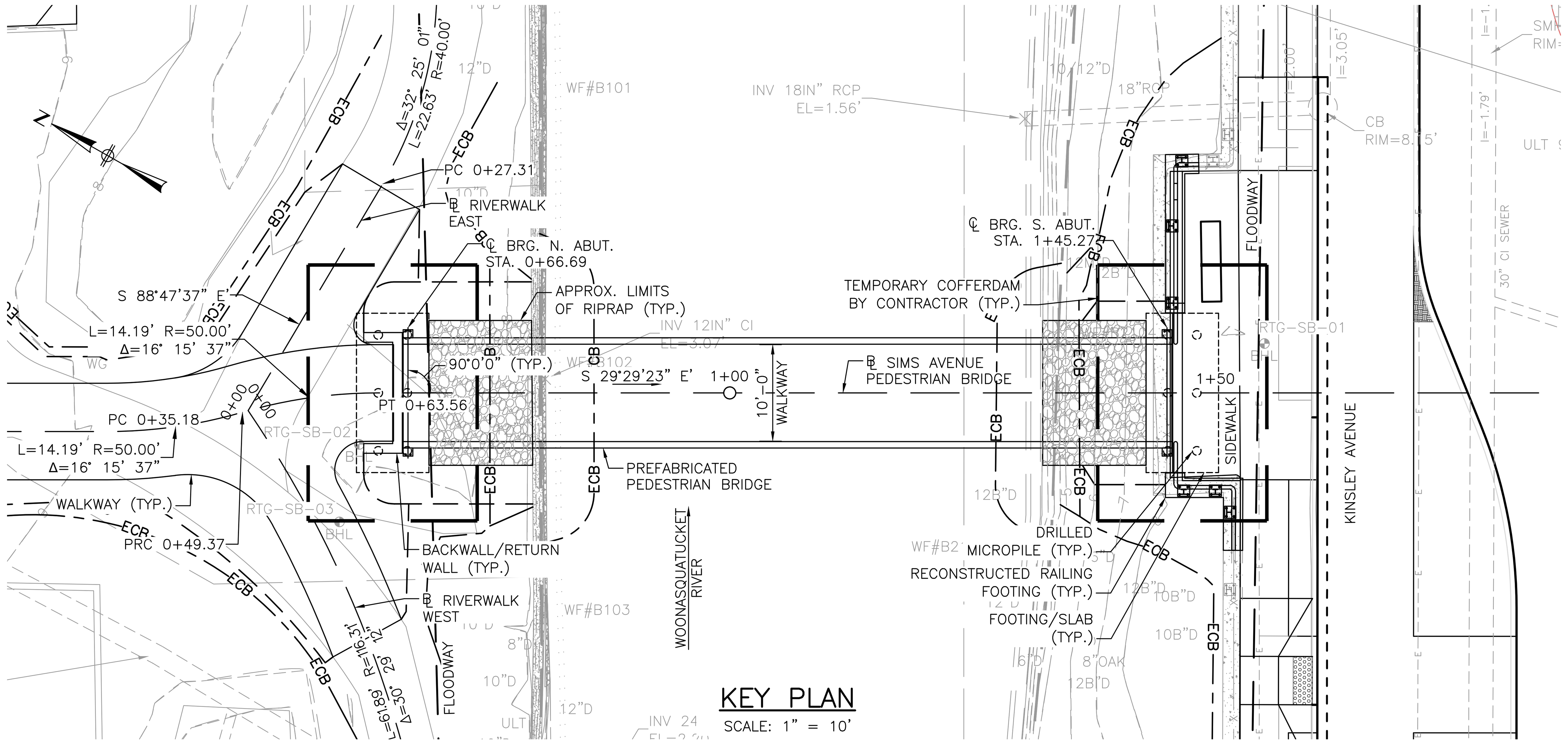
TITLE
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
TRAFFIC CONTROL PLAN NO. 5

BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022
SHEET NO. 12 OF 26



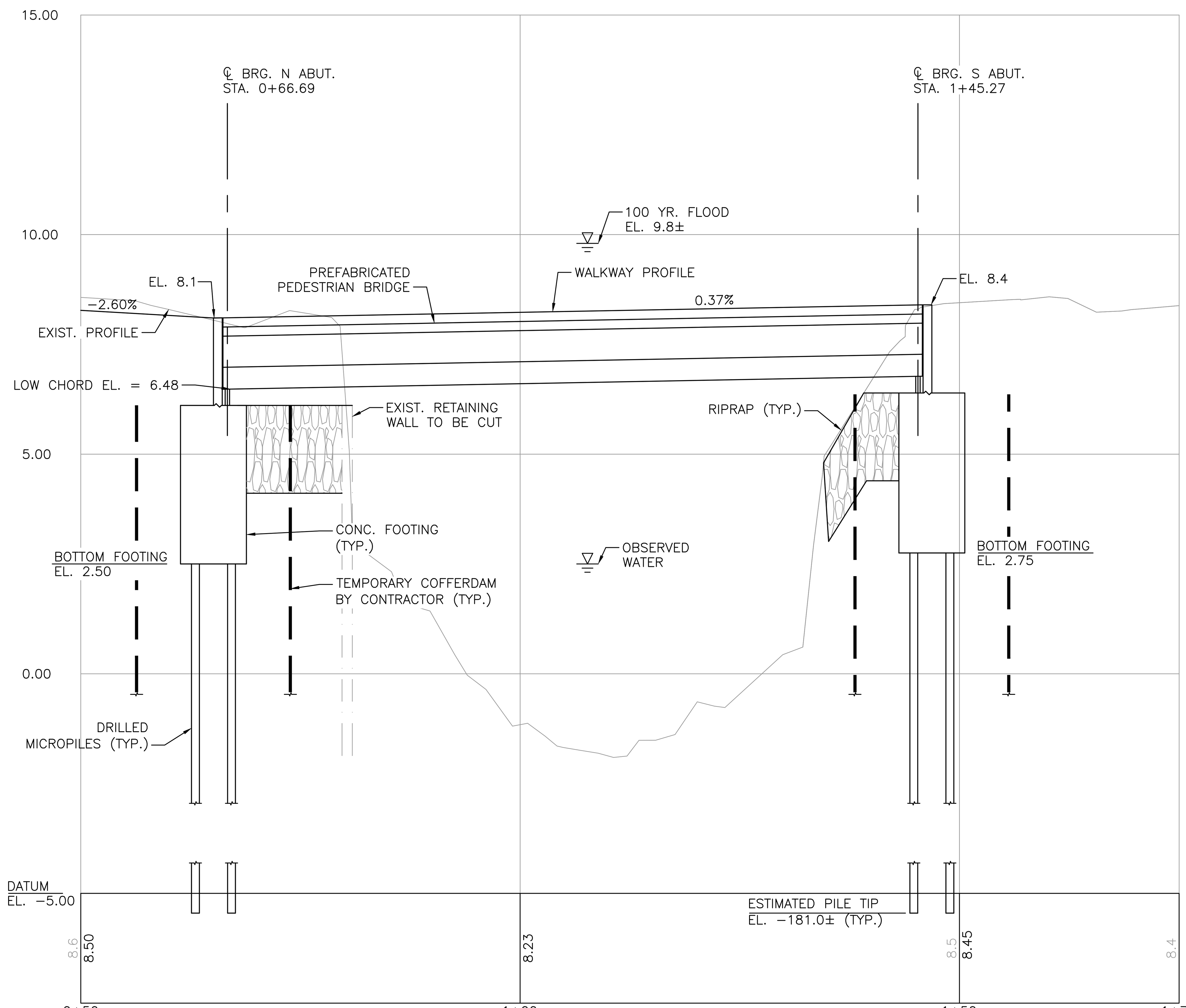
KEY PLAN

SCALE: 1" = 10'

LOCUS

SCALE: 1" = 1000'

BRIDGE SHEET INDEX



SIMS AVENUE PEDESTRIAN BRIDGE PROFILE

HORIZONTAL SCALE: 1" = 10'

VERTICAL SCALE: ½" = 1'-0"

NOTE:

ALL ELEVATIONS AND COORDINATES ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), AND NORTH AMERICAN DATUM OF 1983 (NAD83), RESPECTIVELY.

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

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TITLE

SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND

BRIDGE KEY PLAN, PROFILE, LOCUS, & INDEX

BETA JOB NO. 6620

ISSUE DATE SEPTEMBER 12, 2022

SHEET NO. 13 OF 26

LIST OF ABBREVIATIONS

A

ABUTMENT	= ABUT.
ALTERNATE	= ALT.
ANCHOR BOLT	= A.B.
APPROVED	= APPD.
APPROXIMATE	= APPROX.
AVERAGE	= AVG.

B

BEAM	= BM.
BACK TO BACK	= B TO B
BETWEEN	= BTWN
BEARING	= BRG.
BITUMINOUS	= BIT.
BUILDING	= BLDG.
BUILDING LINE	= B.L.
BOLT CIRCLE	= B.C.
BOTTOM	= BOT.

C

CENTER TO CENTER	= C TO C
CENTERLINE	= C_L
CIRCLE	= CIR.
CLEARANCE	= CL.
COLUMN	= COL.
CONCRETE	= CONC.
CONDUIT	= COND.
CONNECTION	= CONN.
CONSTRUCTION	= CONST.
CONTRACTION	= CONTR.
COUNTERSINK	= CSK.
COUPLING	= CPLG.
CLASS I CONTROLLED LOW STRENGTH MATERIAL	= CLSM

D

DETAIL	= DET.
DIAGONAL	= DIAG.
DIAPHRAGM	= DIAPHM.
DIAMETER	= DIA.
DIMENSION	= DIM.
DRAWING	= DWG.
DRAIN	= DR.

E

EACH	= EA.
EACH FACE	= E.F.
ELEVATION	= EL.
EXISTING	= EXIST.
EXPANSION	= EXP.

F

FAR FACE	= F.F.
FAR SIDE	= F.S.
FABRICATE	= FAB.
FACE TO FACE	= F TO F
FLANGE	= FLG.
FLAT HEAD	= F.H.
FOOTING	= FTG.
FOUNDATION	= FDN.
FURNISH, FABRICATE & ERECT	= F.F. & E.

G

GAGE	= GA.
GALVANIZE	= GALV.
GRADE	= GR.
GRATING	= GRTG.
GROUND	= GND.

H

HEIGHT	= HGT.
HEXAGON	= HEX.
HOT MIX ASPHALT	= HMA
HORIZONTAL	= HORIZ.

I

INCH	= IN.
INFORMATION	= INFO.
INSIDE DIAMETER	= I.D.
INVERT	= INV.

J

JOINT	= JT.

L

LENGTH	= LGTH.
LIGHTING	= LTG.
LONG	= LG.
LOAD & RESISTANCE FACTOR DESIGN	= LRFD

M

MATERIAL	= MATL.
MAXIMUM	= MAX.
MEAN HIGH WATER	= M.H.W.
MEAN SEA LEVEL	= M.S.L.
MINIMUM	= MIN.
MISCELLANEOUS	= MISC.

N

NEAR FACE	= N.F.
NEAR SIDE	= N.S.
NOT TO SCALE	= N.T.S.
NUMBER	= NO.

O

ON CENTER	= O.C.
OPENING	= OPNG.
OUTSIDE DIAMETER	= O.D.
OPTIONAL	= OPT.

P

PLATE	= P_L
POINT OF VERTICAL CURVATURE	= P.V.C.
POINT OF VERTICAL TANGENCY	= P.V.T.
POLYVINYL CHLORIDE	= PVC
POINT OF TANGENCY	= P.T.
POUNDS PER SQUARE INCH	= P.S.I.
POUNDS PER SQUARE FOOT	= P.S.F.

R

RADIUS	= RAD.
RAILROAD	= RR
REQUIRED	= REQD.
REINFORCING	= REINF.
REHABILITATION	= REHAB.
REMOVE & DISPOSE	= R & D

S

SECTION	= SECT.
SCHEDULE	= SCH.
SCHEMATIC	= SCHEM.
SHEET	= SH.
SPACES	= SP.
STATION	= STA.
SYMMETRICAL	= SYM.
STAY IN PLACE	= S.I.P.

T

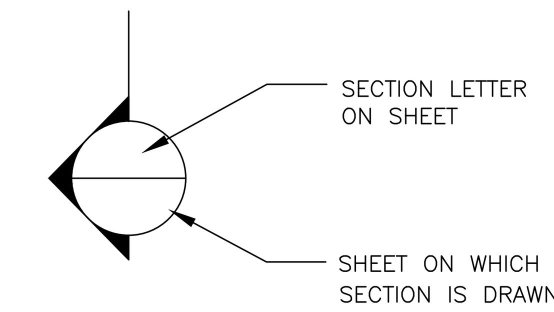
TOP	= T
TYPICAL	= TYP.

V

VARIES	= VAR.
VERTICAL CURVE	= V.C.
VERTICAL	= VERT.

W

WELDED WIRE FABRIC	= W.W.F.
WITH	= W/
WIDE FLANGE	= W
WORKING POINT	= W.P.



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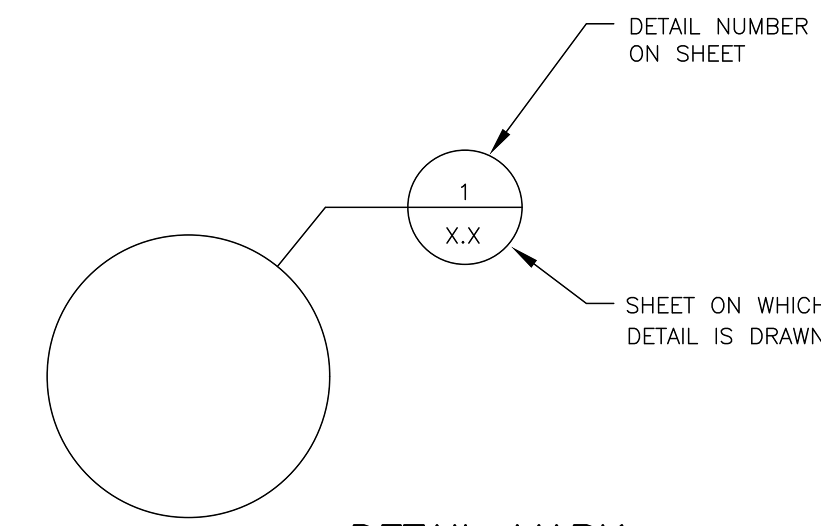

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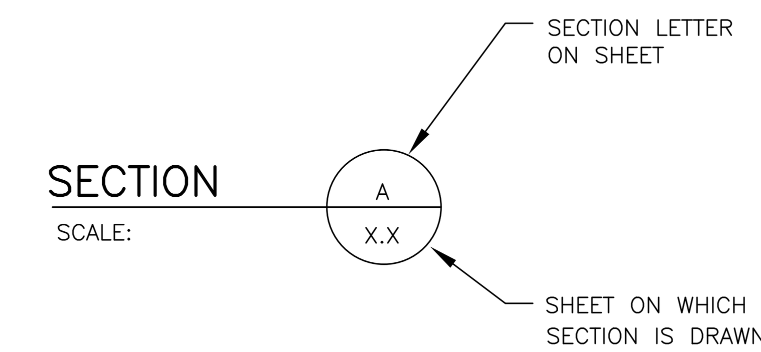
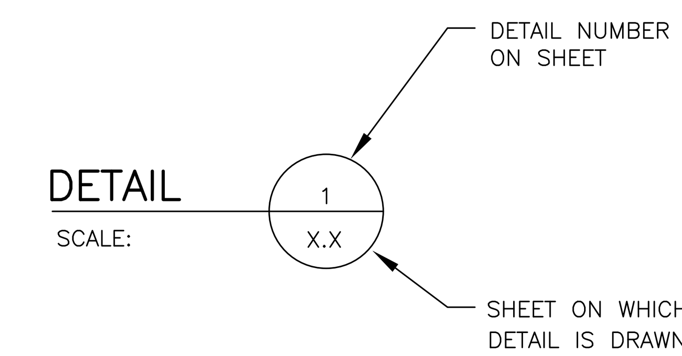


SECTION TITLE



DETAIL TITLE

SECTION & DETAIL DESIGNATIONS

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TITLE
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
BRIDGE NOTES 1

BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022
SHEET NO. 14 OF 26

GENERAL NOTES

1. ALL CONSTRUCTION INDICATED ON THESE PLANS SHALL BE IN ACCORDANCE WITH:
   - THE 2018 AMENDED EDITION OF THE 2004 RHODE ISLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (RI STANDARD SPECIFICATIONS).
   - THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, 4TH EDITION, 2017, INCLUDING THE LATEST INTERIM REVISIONS.
   - THE SPECIFICATIONS ACCOMPANYING THESE PLANS.
2. DIMENSIONS, STATIONS, AND ELEVATIONS ARE SHOWN TO THE NEAREST ONE–HUNDREDTH OF A FOOT OR ONE–EIGHTH OF AN INCH, EXCEPT STRUCTURAL STEEL DIMENSIONS WHICH ARE TO THE NEAREST ONE–SIXTEENTH OF AN INCH.
3. ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.
4. COORDINATES USED ON THESE PLANS ARE BASED ON THE STATEWIDE COORDINATE SYSTEM, THE NORTH AMERICAN DATUM OF 1983 (NAD 83).
5. FOR BENCH MARKS AND TIES SEE HIGHWAY LOCATION PLANS.
6. ANGLES ARE SHOWN TO THE NEAREST SECOND.
7. ALL FOOTINGS SHALL BE APPROVED BY THE ENGINEER AS TO DIMENSIONS, ELEVATIONS, AND SUITABILITY OF FOUNDATION MATERIAL BEFORE THE PLACING OF CONCRETE.
8. ALL WORKING POINTS ARE SHOWN AT THE CENTERLINES OF BEARINGS OF ABUTMENTS AND AT THE CENTERLINES OF PIERS, UNLESS OTHERWISE NOTED.
9. ALL ABUTMENTS AND WALLS ARE DRAWN LOOKING AT THE EXPOSED FACES.
10. IF THIS PROJECT IS ON A HURRICANE EVACUATION AND DIVERSIONARY ROUTE AS DESIGNATED ON THE COVER SHEET, THE CONTRACTOR IS ADVISED THAT, UPON 12 (TWELVE) HOURS NOTICE, THE ROADWAY SHALL BE OPEN TO EVACUEES AND EMERGENCY PERSONNEL. ANY EXTRA WORK NECESSARY TO COMPLY WITH THIS REQUIREMENT WILL BE REIMBURSED UNDER FORCE ACCOUNT PROCEDURES.
11. THE EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE AND WERE LOCATED USING THE BEST AVAILABLE INFORMATION. NO BUILDING SERVICE CONNECTIONS (ELECTRIC, TELEPHONE, GAS, WATER, SANITARY AND OTHERS) ARE SHOWN. THE CONTRACTOR IS TO ASSUME THAT SERVICES TO ALL BUILDINGS ARE PRESENT.
12. BOTH FEDERAL AND STATE LAW (RI. GENERAL LAW 39–1.2) REQUIRE NOTIFICATION OF APPROPRIATE UTILITY COMPANIES BEFORE DIGGING, TRENCHING, BLASTING, DEMOLISHING, BORING, BACK FILLING, GRADING, LANDSCAPING, OR OTHER EARTH MOVING OPERATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY ALL UTILITY COMPANIES (INCLUDING THROUGH THE "DIG SAFE" PROGRAM) TO ENSURE THAT ALL UTILITIES, BOTH UNDERGROUND AND OVERHEAD, HAVE BEEN MARKED BEFORE COMMENCEMENT OF SUCH WORK. THE CONTRACTOR SHOULD UNDERSTAND THAT NOT ALL UTILITIES SUBSCRIBE TO THE "DIG SAFE" PROGRAM. ANY DAMAGE TO EXISTING UTILITIES MARKED IN THE FIELD, OR AS A RESULT OF FAILING TO CONTACT THE APPROPRIATE UTILITY COMPANIES, SHALL BE REPAIRED OR REPLACED (AS DEEMED APPROPRIATE BY THE STATE AND/OR THE IMPACTED UTILITY COMPANY) AT NO ADDITIONAL COST TO THE PROVIDENCE REDEVELOPMENT AUTHORITY.

DESIGN DATA

1. DESIGN SPECIFICATIONS
   - THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES WITH CURRENT 2015 INTERIM REVISIONS AND THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, 2020, INCLUDING THE LATEST INTERIM REVISIONS.
   - THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL 2007 EDITION INCLUDING ALL REVISIONS TO DATE.
   - ALL OTHER APPLICABLE DESIGN SPECIFICATIONS ARE REFERENCED IN SECTION 1 OF THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL DATED 2007.
   - THE 2018 REVISION OF AND SUPPLEMENTS TO THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (RI STANDARD SPECIFICATIONS).
   - IN CASE OF CONFLICT, THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL SHALL GOVERN.
2. LOAD MODIFIERS

   THE LOAD MODIFIERS FOR THIS PROJECT ARE AS FOLLOWS:
   - THE LOAD MODIFIER FOR DUCTILITY SHALL BE TAKEN AS 1.0 FOR ALL LIMIT STATES.
   - THE LOAD MODIFIER FOR REDUNDANCY SHALL BE TAKEN AS 1.0.
   - THE LOAD MODIFIER FOR OPERATIONAL IMPORTANCE SHALL BE TAKEN AS 1.0.
3. LOAD FACTORS

   ALL LOAD FACTORS SHALL BE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, EXCEPT AS MODIFIED IN THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL (SPECIFIED BELOW).
   - THE LOAD FACTOR FOR TEMPERATURE GRADIENT SHALL BE TAKEN AS 1.2 FOR STRENGTH AND SERVICE LIMIT STATES, AND 0.0 AT THE EXTREME I LIMIT STATE.
   - THE LOAD FACTOR FOR LIVE LOAD FOR THE EXTREME EVENT I SHALL BE TAKEN AS ZERO.
   - THE LOAD FACTOR FOR DEAD LOAD FOR THE EXTREME EVENT I AND EXTREME EVENT II SHALL BE TAKEN AS 1.0
   - THE LOAD FACTOR FOR SETTLEMENT FOR ALL LIMIT STATES SHALL BE TAKEN AS 1.0
4. LIVE LOADS
   - THE DESIGN VEHICULAR LIVE LOAD SHALL BE THE H–10 DESIGNATION ADJUSTED FOR DYNAMIC LOAD ALLOWANCE AND MULTIPLE PRESENCE FACTOR.
   - THE DESIGN PEDESTRIAN LIVE LOAD SHALL BE 90 PSF.
5. WIND LOADING DESIGN DATA

   THE WIND LOADING DESIGN SHALL BE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL, AND AS MODIFIED HEREIN.
   - EXCEPT DURING CONSTRUCTION, THE DESIGN WIND PRESSURE IS BASED ON A DESIGN WIND SPEED OF 140 MPH UNDER STRENGTH III, 80 MPH UNDER STRENGTH V, 70 MPH UNDER SERVICE I, AND 105 MPH UNDER SERVICE IV.
   - THE DESIGN WIND PRESSURES DURING CONSTRUCTION SHALL BE AS SPECIFIED UNDER THE NOTES TITLED "GENERAL NOTES REGARDING TEMPORARY CONSTRUCTION CONDITIONS".
6. HYDRAULIC AND SCOUR DATA

   10 YEAR FLOOD EL. 6.7
   50 YEAR FLOOD EL. 9.3
   100 YEAR FLOOD EL. 9.8
7. UNIFORM TEMPERATURE EFFECTS SHALL BE TAKEN INTO CONSIDERATION IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
8. SEISMIC DESIGN DATA
   - THE SEISMIC ANALYSIS AND DESIGN SHALL BE IN ACCORDANCE WITH THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL.
   - THE COMBINATION OF SEISMIC FORCE EFFECTS IS IN ACCORDANCE WITH THE RHODE ISLAND LRFD BRIDGE DESIGN MANUAL.
   - THIS BRIDGE HAS BEEN CLASSIFIED AS NON–CRITICAL.
   - SCOUR AND LIQUEFACTION EFFECTS HAVE BEEN CONSIDERED IN THE SEISMIC ANALYSIS OF THIS BRIDGE.
   - THE SEISMIC ANALYSIS OF THIS BRIDGE WAS BASED ON THE FOLLOWING DESIGN SPECTRA:

SEISMIC DESIGN CRITERIA	
DESIGN RETURN PERIOD	1000 YEARS
DESIGN SPECTRA	
A_S	0.148
S_{DS}	0.313
S_{D1}	0.119
SITE CLASS	E
SEISMIC DESIGN CATEGORY (SDC)	A

MATERIALS

STRUCTURAL STEEL:
- AASHTO DESIGNATION M 270, GRADE 36
- AASHTO DESIGNATION M 270, GRADE 50
- AASHTO DESIGNATION M 270, GRADE 50W

(*DESIGNER TO LIST ALL OTHER STEEL TYPES SPECIFIED ON A PROJECT*)

REINFORCING STEEL:
- AASHTO DESIGNATION M 31, GRADE 60

CONCRETE STRENGTHS:
- CLASS HP ¾" f'c=5,000 PSI

  BACKWALLS AND RAILING FOOTINGS
- CLASS XX ¾" f'c=4,000 PSI

  ABUTMENT FOOTINGS

FOUNDATIONS

1. THE FURNISHING AND INSTALLING OF THE DEEP FOUNDATIONS TYPES SPECIFIED IN THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE MICROPILE DETAILS AND TECHNICAL SPECIFICATIONS PREPARED BY TIGHE & BOND.
2. GEOTECHNICAL INFORMATION UTILIZED FOR DESIGN IS PROVIDED IN THE SOIL BORING LOGS/DATA PREPARED BY TIGHE & BOND (FORMERLY RT GROUP, INC.).

CONCRETE NOTES

1. CLASSES OF CONCRETE SHALL BE HIGH PERFORMANCE CLASS HP AND CLASS XX, AS DESCRIBED IN THE RI STANDARD SPECIFICATIONS AND THE SPECIAL PROVISIONS OF THE SPECIFICATIONS. REFER TO THE "MATERIAL" NOTES FOR CLASSES OF CONCRETE SPECIFIED FOR VARIOUS COMPONENTS.
2. THE CONTRACTOR MAY, AT THE APPROVAL OF THE ENGINEER, PROPOSE THE USE OF SELF–CONSOLIDATING CONCRETE FOR ANY CLASS OF CONCRETE ON THIS PROJECT. SECTION 606 "SELF CONSOLIDATING CONCRETE (SCC)", CONTAINS THE REQUIREMENTS FOR MODIFYING ALL CLASSES OF CONCRETE MIX DESIGN FOR SELF–CONSOLIDATING APPLICATIONS.
3. ALL PORTLAND CEMENT CONCRETE SHALL BE AIR–ENTRAINED.
4. ALL REINFORCING STEEL SHALL BE GALVANIZED. ALL WIRE TIES AND MISCELLANEOUS HARDWARE USED FOR PLACEMENT OF GALVANIZED REINFORCING SHALL ALSO BE GALVANIZED. GALVANIZED COATING FOR REINFORCING STEEL SHALL CONFORM TO ASTM A767 CLASS 1.
5. ALL CRITICAL LAP SPLICES SHALL BE AS SHOWN ON THE PLANS. ALL SPLICES NOT SHOWN ON THE PLANS SHALL BE LAPPED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR CLASS C LAP SPLICES.
6. UNLESS OTHERWISE INDICATED ON THE PLANS, ALL MAIN REINFORCING BARS SHALL HAVE THE FOLLOWING MINIMUM COVER:

CONCRETE CAST AGAINST OR PERMANENTLY EXPOSED TO EARTH (FOOTINGS, ABUTMENT AND WALL FACES, BACKWALLS)	3"
ALL OTHER BARS	2"

   COVER TO TIES AND STIRRUPS MAY BE 0.5 INCH LESS THAN THE ABOVE VALUES SPECIFIED FOR MAIN REINFORCING, BUT IN NO CASE LESS THAN 1.5 INCHES.
7. ALL ANCHOR BOLTS SHALL BE ASTM DESIGNATION A 307 AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO DESIGNATION M 232 OR METALIZED IN ACCORDANCE WITH SECTION M.05. SWEDGED RODS SHALL BE AASHTO DESIGNATION M 270 GRADE 36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO DESIGNATION M 232.
8. ALL ANCHOR BOLTS SHALL BE SET PRIOR TO PLACEMENT OF CONCRETE UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER.
9. HORIZONTAL CONSTRUCTION JOINTS OTHER THAN THOSE SHOWN ON PLANS WILL NOT BE PERMITTED WITHOUT A WRITTEN REQUEST BY THE CONTRACTOR AND PRIOR AUTHORIZATION BY THE ENGINEER.
10. UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CONCRETE SURFACES VISIBLE IN ELEVATION TO ONE FOOT BELOW FINAL GROUND LINE, SHALL RECEIVE A CONCRETE SURFACE RUBBED FINISH IN ACCORDANCE WITH THE RI STANDARD SPECIFICATIONS.
11. THE ENTIRE TOPSIDE SURFACES OF ABUTMENT AND BEAM SEATS, AS WELL AS VERTICAL FACES OF BACKWALLS SHALL BE PROVIDED WITH A FILM–FORMING SEALER (M12.03.1) CONCRETE SURFACE TREATMENT–PROTECTIVE COATING IN ACCORDANCE WITH SECTION 820 OF THE RI STANDARD SPECIFICATIONS.
12. 13 ALL EXPOSED EDGES AND REENTRANT CORNERS NOT OTHERWISE DETAILED ON THE PLANS SHALL HAVE A MINIMUM ¾" CHAMFER.
13. ALL JOINT SEALANT SHALL BE POLYURETHANE, POLYURETHANE ELASTOMERIC, OR SILICONE SEALANT AS DESIGNATED ON THE PLANS. THE COLOR OF THE JOINT SEALANT, WHERE EXPOSED, SHALL BE NEUTRAL (LIGHT GRAY OR TAN). THE COLOR OF THE SEALANT, WHERE NOT EXPOSED, WILL BE AT THE DISCRETION OF THE CONTRACTOR.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING CONCRETE STAINS OR DISCOLORATIONS DURING CONSTRUCTION UNTIL SUCH TIME WHEN THE SURFACES ARE APPROVED AND ACCEPTED. ANY CONCRETE STAINS OR DISCOLORATIONS OCCURRING PRIOR TO ACCEPTANCE OF THE SURFACES SHALL BE REMOVED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROVIDENCE REDEVELOPMENT AUTHORITY.
15. UNLESS OTHERWISE NOTED ON THE PLANS, JOINT FILLER IS TO BE A PREFORMED, NON–EXPANSIVE, NON–EXTRUDING TYPE IN ACCORDANCE WITH SECTION M.02.11.1 OF THE RI STANDARD SPECIFICATIONS.
16. EMBEDMENT LENGTHS FOR DRILLED AND GROUTED DOWELS SHALL BE IN ACCORDANCE WITH SECTION 819 OF THE RI STANDARD SPECIFICATIONS.
17. IN ACCORDANCE WITH THE RI STANDARD SPECIFICATIONS, ALL METAL TIES, NON–METALLIC TIES OR ANCHORAGES WHICH ARE REQUIRED FOR CONCRETE FORMWORK SHALL BE SO CONSTRUCTED THAT THEY CAN BE REMOVED TO AT LEAST ONE INCH BELOW THE EXPOSED SURFACE OF THE CONCRETE WITHOUT CAUSING DAMAGE TO THE CONCRETE SURFACE. SNAP TIES MAY BE USED ONLY IF APPROVED BY THE ENGINEER. IF THE CONTRACTOR PROPOSES TO USE THEM, A CATALOG CUT AND OTHER NECESSARY INFORMATION MUST BE SUBMITTED TO THE ENGINEER TO DEMONSTRATE THAT THE TIES WILL SNAP–OFF FAR ENOUGH INTO THE CONCRETE TO ALLOW FOR PROPER PATCHING. SNAP TIES MUST PROVIDE ADEQUATE STRENGTH TO SUPPORT THE FORMS. ALL CAVITIES SHALL BE FILLED WITH AN APPROVED CEMENT MORTAR MEETING THE REQUIREMENTS OF ASTM C 928.
18. WATER STOPS ARE REQUIRED FOR HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS IN ABUTMENTS AND WALLS WHEN EXPOSED TO BACKFILL EARTH MATERIAL. WATER STOPS SHALL BE INSTALLED AT THE LOCATIONS DETAILED ON THE PLANS, AT THE LOCATIONS AS SPECIFIED ABOVE AND AT ALL LOCATIONS AS DIRECTED BY THE ENGINEER, ALL IN ACCORDANCE WITH SECTION 812 OF THE RI STANDARD SPECIFICATIONS.

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: -

DESIGNED BY: -

CHECKED BY: -

REGISTERED PROFESSIONAL

PREPARED BY

BETA

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SUBCONSULTANT

SCALE

NONE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE

SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND

BRIDGE NOTES 2

BETA JOB NO. 6620

ISSUE DATE SEPTEMBER 12, 2022

GENERAL NOTES REGARDING TEMPORARY CONSTRUCTION CONDITIONS

1. DESIGN WIND PRESSURES FOR CONSTRUCTION:

   MINIMUM WIND PRESSURES TO BE USED BY THE CONTRACTOR FOR DESIGN DURING THE CONSTRUCTION CONTRACT (WITH THE EXCEPTION OF SIGNS) SHALL BE FROM THE FOLLOWING TABLE:

HEIGHT ABOVE GROUND	WIND PRESSURE (PSF)
UP TO 17'	23
OVER 17' AND UP TO 33'	27
OVER 33' AND UP TO 50'	30
OVER 50' AND UP TO 75'	34
OVER 75' AND UP TO 100'	37

TABLE NOTES

A. APPLICATION OF THE TABULAR PRESSURE:

- BRIDGE COMPONENTS DURING CONSTRUCTION, PRIOR TO THE INSTALLATION OF THE PERMANENT BRACING SYSTEMS, NOT INCLUDING CRANE LIFTING.
- FALSE WORK, SHORING, AND SCAFFOLDING AS DEFINED IN FHWA "GUIDE DESIGN SPECIFICATION FOR BRIDGE TEMPORARY WORKS", EXCLUDING 3-DIMENSIONAL LATTICED OR TRUSSED FRAMES OR TOWERS;
- TEMPORARY SHIELDING.

WIND PRESSURES FOR ALL OTHER STRUCTURES SHALL BE CALCULATED BASED ON ASCE "DESIGN LOADS ON STRUCTURES DURING CONSTRUCTION", SEI/ASCE 37-02 (ALL REFERENCES TO THE ASCE 7 IN THE SEI/ASCE 37-02 PUBLICATION, SHALL BE THE LATEST REVISION OF ASCE 7). THE EXPOSURE CATEGORY SHALL BE B.

B. WHERE APPLICABLE HIGHER AMTRAK WIND REQUIREMENTS SHALL SUPERSEDE THESE REQUIREMENTS.

C. FOR STRUCTURES SITUATED ABOVE LIVE INTERSTATE TRAFFIC, THE TABULAR VALUES SHALL BE INCREASED BY 5 PSF.

2. ERECTION OF BRIDGE COMPONENTS:

   FOR THE ERECTION OF STRUCTURES, THE FOLLOWING SHALL APPLY:

- THE CONTRACTOR SHALL SUBMIT AN ERECTION PLAN THAT PROVIDES COMPLETE DETAILS OF THE PROCESS INCLUDING, BUT NOT LIMITED TO, TEMPORARY SUPPORTS, SCHEDULING AND OPERATION SEQUENCING, CRANE PLACEMENT, AND ASSUMED LOADS AND CALCULATED STRESSES DURING VARYING STAGES OF LIFTING. THIS APPLIES TO STRUCTURES OF ANY KIND. THE CAPACITY OF THE CRANE AND ALL LIFTING AND CONNECTING DEVICES SHALL BE ADEQUATE FOR 125 PERCENT (150 PERCENT OVER AMTRAK) OF THE TOTAL PICK LOAD INCLUDING SPREADERS, RIGGING, HOOKS, AND ALL OTHER MATERIALS. THIS FACTOR OF SAFETY SHALL BE IN ADDITION TO ALL MANUFACTURERS' PUBLISHED FACTORS OF SAFETY.
- A REGISTERED PROFESSIONAL ENGINEER, LICENSED IN THE STATE OF RHODE ISLAND, WILL BE REQUIRED TO STAMP THE CONTRACTOR'S ERECTION PLAN.
- THE CONTRACTOR'S PROFESSIONAL ENGINEER WILL BE REQUIRED TO INSPECT AND PROVIDE WRITTEN APPROVAL OF INSTALLATION, PRIOR TO ALLOWING VEHICLES OR PEDESTRIANS ON OR BELOW THE STRUCTURE. THE PROFESSIONAL ENGINEER MUST ALSO STAMP ALL CHANGES TO THE CONTRACTOR'S ERECTION PLAN. ADDITIONALLY, ALL PROPOSED CHANGES MUST BE SUBMITTED TO RIDOT FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
- A MANDATORY PRE-ERECTION CONFERENCE WILL BE HELD AT LEAST TWO WEEKS PRIOR TO THE START OF THE GIRDER INSTALLATION TO DISCUSS THE PLAN AND PROCEDURES, WORK SCHEDULES, CONTINGENCY PLANS, SAFETY REQUIREMENTS AND TRAFFIC CONTROL. THE CONTRACTOR'S PROFESSIONAL ENGINEER AND ERECTION SUBCONTRACTOR WILL BE REQUIRED TO ATTEND THIS MEETING, AS WILL THE RIDOT RESIDENT ENGINEER, THE DESIGN PROJECT ENGINEER AND THE DESIGN CONSULTANT. BASED UPON DISCUSSIONS AT THIS MEETING AND A REVIEW OF THE CONTRACTOR'S ERECTION PLAN, RIDOT MAY ORDER THE CONTRACTOR TO MODIFY AND RESUBMIT THE ERECTION PLAN TO THE ENGINEER FOR REVIEW AND APPROVAL.
- THE CONTRACTOR WILL BE REQUIRED TO PERFORM DAILY INSPECTIONS OF THE ERECTED GIRDERS UNTIL THE BRIDGE DECK IS COMPLETELY POURED.
- THE COST OF PREPARING AND STAMPING THE ERECTION PLAN, COMPUTATIONS, AND REPORTS, RESPONDING TO RIDOT'S COMMENTS AND MAKING THE NECESSARY REVISIONS, AND ATTENDANCE AT MEETINGS SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE SUPERSTRUCTURE PAY ITEM, BE IT CONCRETE, STEEL OR TIMBER.

PREFABRICATED PEDESTRIAN BRIDGE

THE PREFABRICATED PEDESTRIAN BRIDGE WILL BE PROVIDED BY OTHERS. THE CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING DELIVERY OF THE BRIDGE, OFFLOADING THE COMPONENTS, ASSEMBLY OF THE BRIDGE, AND BRIDGE ERECTION. SEE SPECIFICATIONS.

MICROPILE NOTES

GENERAL:

1. COORDINATE WITH THESE DRAWINGS AND SECTION 02310, DRILLED MICROPILES.
2. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR THE CONDITIONS OF THE JOB SITE, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY DURING THE PERFORMANCE OF THE WORK. SAFETY PROVISIONS SHALL COMPLY WITH OSHA AND OTHER APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS. THESE REQUIREMENTS SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS.
3. THE UTILITY LOCATIONS SHOWN ON THE DRAWINGS WERE PROVIDED BY OTHERS AND ARE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO REVIEW/FIELD VERIFY THE LOCATIONS OF THE ONSITE UTILITIES (ABOVE AND BELOW GROUND) PRIOR TO THE PERFORMANCE OF THIS WORK. IN ADDITION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING DIGSAFE (1-888-DIG-SAFE) 3 BUSINESS DAYS BEFORE COMMENCING WITH ANY EXCAVATION WORK.
4. STANDARD SPECIFICATIONS, WHEN REFERENCED IN THE DRAWINGS, SHALL MEAN THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (CURRENT EDITION). PARTS OF THE STANDARD SPECIFICATIONS THAT ARE SPECIFICALLY REFERENCED SHALL BECOME PART OF THE DRAWINGS AS THOUGH STATED IN FULL. IN CASE OF A DISCREPANCY BETWEEN THE STANDARD SPECIFICATIONS AND THE REQUIREMENTS STATED WITHIN THE DRAWINGS, THE REQUIREMENTS STATED WITHIN THE DRAWINGS SHALL PREVAIL.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MICROPILE LAYOUT AND CONTROL BASED ON THE INFORMATION PROVIDED, INCLUDING VERIFICATION/CROSS-REFERENCING WITH THE CONTRACT DOCUMENTS AND APPROVED SUBMITTALS.
6. THE MICROPILE DETAILS PRESENTED HEREIN HAVE BEEN PREPARED BY TIGHE & BOND FOR THE SOLE USE OF THE MICROPILE CONTRACTOR BASED ON THE CONDITIONS SHOWN. THE USE OF THE DETAILS SHOWN ON THE DRAWINGS BY OTHERS, FOR DIFFERENT STRUCTURES, LOADINGS, AND SOIL CONDITIONS IS NOT RECOMMENDED.

DESIGN CRITERIA:

1. MICROPILES SHALL BE CAPABLE OF SUPPORTING THE FOLLOWING MINIMUM DESIGN LOADS:

VERTICAL COMPRESSION:	345 KIPS ULTIMATE (ALLOWABLE X 2.5) 138 KIPS ALLOWABLE
VERTICAL TENSION:	0 KIPS
LATERAL:	2.5 KIPS ULTIMATE (ALLOWABLE X 2.5) 1.0 KIP ALLOWABLE

2. THE VERTICAL COMPRESSION LOAD INCLUDES THE ESTIMATED DOWNDRAG FORCES INDUCED BY THE SOFT LAYERS OF COMPRESSIBLE SILT AND THE SILT/SAND LAYERS ABOVE THEM.
3. THE DOWNDRAG FORCES FAR EXCEED THE ESTIMATE SERVICE STATE LOADS AND THE MICROPILE LENGTHS SHOWN ON THE DRAWINGS HAVE BEEN ESTABLISHED TO RESIST THEM AND MAINTAIN BRIDGE SETTLMENTS WITHIN TOLERABLE LEVELS.
4. BASED ON THE ABOVE, NO REDUCTIONS TO THE SPECIFIED MICROPILE LENGTHS WILL BE ALLOWED.

ENVIRONMENTAL PROTECTION:

THE CONTRACTOR SHALL BE RESPONSIBLE TO TAKE PREVENTATIVE MEASURES TO HELP MINIMIZE ANY ENVIRONMENTAL IMPACTS. THESE MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

1. NO FUEL WILL BE STORED ON SITE. ALL FUEL WILL BE BROUGHT TO THE SITE AS REQUIRED.
2. ALL FUEL TRANSFER OPERATIONS ARE TO BE CONDUCTED IN AN EFFICIENT AND SAFE MANNER IN ACCORDANCE WITH THE CONTRACTOR'S OPERATIONS MANUAL.
3. ABSORBENT DIAPERS DESIGNED FOR USE WITH PETROLEUM PRODUCTS SHALL BE PLACED UNDER ALL MACHINERY DURING FUELING OPERATIONS.
4. ALL HYDRAULIC EQUIPMENT SHALL UTILIZE VEGETABLE BASED, NON-TOXIC, AND NON-POLLUTING HYDRAULIC FLUID.
5. EQUIPMENT SHALL BE PROPERLY MAINTAINED AND RECORDED IN WEEKLY LOGS INCLUDING THE REQUIREMENTS FOR AND ACTUAL MAINTENANCE COMPLETED.
6. A SPILL KIT AND/OR ABSORBENT MATERIALS SHALL BE ON-SITE AT ALL TIMES DURING CONSTRUCTION OPERATIONS.

MATERIALS:

1. REFER TO SECTION 02301, DRILLED MICROPILES.

SUBMITTALS:

1. REFER TO SECTION 02310, DRILLED MICROPILES.

LOAD TESTING:

1. THE PURPOSE OF THE LOAD TESTS IS TO VERIFY THE ADEQUACY OF THE MICROPILE BOND ZONE AND VERIFY THE CONSTRUCTION PROCEDURES.
2. THE TEST MICROPILES SHALL BE INSTALLED USING THE SAME METHODS PROPOSED FOR THE PRODUCTION MICROPILES WITH THE FOLLOWING EXCEPTIONS:
   a. THE CEMENT USED IN THE GROUT MAY BE CHANGED TO TYPE III TO ALLOW FOR A MORE RAPID SET TIME FOR THE VERIFICATION LOAD TEST; AND
   b. THE REINFORCING BAR MAY BE UPSIZED, IF REQUIRED, TO ACCOUNT FOR THE TEST LOAD FOR THE VERIFICATION LOAD TEST.
5. THE VERIFICATION TEST LOAD SHALL BE EQUAL TO 2.5 X THE ALOWABLE VERTICAL COMPRESSION LOAD.
6. THE PROOF TEST LOAD SHALL BE EQUAL TO THE 1.67 X THE ALLOWABLE VERTICAL COMPRESSION LOAD.
7. THE SUGGESTED LOAD CYCLES FOR THE VERIFICATION AND PROOF TESTS ARE PRESENTED IN TABLES 1 AND 2, RESPECTIVELY. ANY PROPOSED CHANGES TO THE SUGGESTED LOAD CYCLES SHALL BE REFLECTED IN THE CONTRACTOR'S DRILLED MICROPILE CONSTRUCTION SUBMITTAL.

TABLE 1 VERIFICATION LOAD TEST - SUGGESTED LOAD CYCLE

% DESIGN LOAD	MINIMUM HOLD TIME (MIN)	% DESIGN LOAD	MINIMUM HOLD TIME (MIN)
AL	0	5	1
5	1	25	1
25	1	50	1
50	1	75	1
5	1	100	1
25	1	133	60
50	1	175	1
75	1	200	1
5	1	225	1
25	1	250	30
50	1		
75	1		
100	1		

AL=ALIGNMENT LOAD

TABLE 2 PROOF LOAD TEST - SUGGESTED LOAD CYCLE

% DESIGN LOAD	MINIMUM HOLD TIME (MIN)	% DESIGN LOAD	MINIMUM HOLD TIME (MIN)
AL	1		
5	1		
25	1		
50	1		
75	1		
100	1		
133	60		
167	10		

AL=ALIGNMENT LOAD

EXECUTION:

1. THE CONTRACTOR SHALL COORDINATE MICROPILE INSTALLATION WITH THE CONTRACT DOCUMENTS AND APPROVED SUBMITTALS FOR THIS PROJECT.

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:

DESIGNED BY:

CHECKED BY:

REGISTERED PROFESSIONAL

PREPARED BY

BETA

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SCALE

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TITLE

SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND

MICROPILE NOTES

BETA JOB NO. 6620

ISSUE DATE SEPTEMBER 12, 2022

SHEET NO. 17 OF 26

NOTES:

1. LOCATION OF BORINGS SHOWN ON THE PLAN THUS:
2. BORINGS ARE TAKEN FOR THE PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1 3/8" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. BORING SAMPLES ARE STORED AT A STORAGE FACILITY LOCATED AT TIGHE & BOND, INC. OF 70 ROMANO VINEYARD WAY, SUITE 134, NORTH KINGSTON, RI 02852.
6. BORINGS WERE MADE IN JUNE, 2019, AUGUST AND SEPTEMBER, 2020.
7. BORINGS WERE MADE BY NEW ENGLAND BORING CONTRACTORS, INC. OF 40 FORDWAY STREET DERRY, NH 03038.
8. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

SOIL BORING LOG

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BORING NUMBER: RTG-SB-01
DATE(S): 6/17/2019-6/18/2019
PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge
LOCATION: N:271062.9, E:346137.3 (RI State Plane)
ELEVATION: 8.4' (NAVD 88)
DRILLING CONTRACTOR: New England Boring Contractors, Inc.
DRILLING METHOD AND EQUIPMENT: Driven casing and wash, truck mounted CME-75 drill rig
WATER LEVEL AND DATE: 6' below grade (tidal) 6/20/2019
START: 8:00AM 6/17/19
FINISH: 12:50PM 6/18/19
LOGGER: A. Ahearn

INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0-2	SS S-1	0.9	9-10-9-9	WELL GRADED SAND WITH SILT AND GRAVEL, (SW-SM), olive gray, dry, medium dense, f-c gravel	Gravel may be from sidewalk sub-base
					4" casing to 5'
5-7	SS S-2	0.4	3-3-2-1	POORLY GRADED SAND WITH SILT, (SP-SM), dark gray, moist, loose, f-m sand	4" casing to 7'
7-9	SS S-3	1.0	WOH-1-1-1	A: SILTY SAND, (SM), dark gray, wet B: POORLY GRADED SAND WITH SILT, (SP-SM), olive gray, moist, very loose	Individual recovery length not recorded 4" casing to 9'
9-11	SS S-4	1.2	1-3-12-12	SILTY SAND, (SM), dark gray, wet, (top 6") POORLY GRADED SAND WITH SILT, (SP-SM), gray, moist, medium dense, (bottom 8")	4" casing to 11'
11-13	SS S-5	0.3	16-19-18-11	WELL GRADED GRAVEL WITH SAND, (GP), gray, wet, dense, f-c gravel	Rock prevented recovery, 3" spoon used for better recovery 4" casing to 13'
13-15	SS S-6	0.1	13-8-9-6	WELL GRADED GRAVEL WITH SAND, (GP), gray, wet, medium dense, coarse gravel	Rock prevented recovery, 3" spoon used for better recovery, 4" recovery with 3" spoon
18-20	SS S-7	1.3	7-8-11-11	SILTY SAND, (SM), gray, moist, medium dense	4" casing to 18'
23-25	SS S-8*	1.2	3-2-2-3	SILTY SAND, (SM), dark gray, wet, very loose, fine sand	4"casing to 23'
28-30	SS S-9	1.3	2-2-5-6	SILTY SAND, (SM), dark gray, wet, loose, fine sand	4"casing to 28'
33-35	SS S-10	1.3	2-2-3-3	SILTY SAND, (SM), dark gray, wet, loose, fine sand	4" casing to 33'
38-40	SS S-11	1.3	2-3-3-4	POORLY GRADED SAND WITH SILT, (SP-SM), dark gray, wet, loose	4" casing to 38'
43-45	SS S-12*	1.0	WOR-WOH-2-2	SILT WITH SAND, (ML), dark gray, wet, soft	4" casing to 43'
48-50	SS S-13	1.3	3-3-5-5	SILT, (ML), dark gray, wet, firm	4" casing to 48'
53-55	SS S-14*	1.2	4-3-4-5	SILTY SAND, (SM), dark gray, wet, loose	4" casing to 53'
58-60	SS S-15	1.0	WOR-WOR-WOH-2	SILT, (ML), dark gray, wet, very soft	4" casing to 58'
63-65	SS S-16	1.0	WOR-WOH-2-3	SANDY SILT, (ML), dark gray, wet, soft	4" casing to 63'
68-70	SS S-17	1.3	1-5-5-4	SILT, (ML), olive gray, wet, stiff	4" casing to 68'
73-75	SS S-18	1.4	3-6-7-6	SILT, (ML), olive gray, wet, stiff (top 12") SANDY SILT, (ML), olive gray, wet, (bottom 5")	4" casing to 73' Some light brown material observed in the bottom 5" of recovery
78-80	SS S-19	1.4	WOR-WOR-1-4	SILT, (ML), olive gray, wet, very soft	4" casing to 78' Switched to 3" casing
83-85	SS S-20	1.0	WOR-WOR-2-4	SILT, (ML), olive gray, wet, soft	3" casing to 83'
88-90	SS S-21*	1.3	--	SILT, (ML), olive gray, wet, very soft	3" casing to 88' 3" casing sunk to 94', unable to collect undisturbed sample or blow counts
93-95	--	--	--	No recovery	Casing sunk to 94', unable to collect undisturbed sample or blow counts
98-100	SS S-22	1.3	25-13-14-14	SILT WITH SAND, (ML), olive gray, wet, very stiff	3" casing to 98' Sampled after 1.25 hour break for drill rig repair
				END BORING AT 100' BELOW GRADE	End drilling at 12:50 PM, 6/18/19
				An asterisk (*) next to a sample number denotes a sample on which a laboratory grain size analysis was performed.	Backfilled boring hole with soil cuttings, and finished with a concrete plug to the top of the concrete sidewalk.

BOT. FOOTING S. ABUT.
EL. 2.75

BORING RTG-SB-01
SCALE: 1/8" = 1'-0"

SOIL BORING LOG

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BORING NUMBER: RTG-SB-02
DATE(S): 6/19/2019-6/20/2019
PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge
LOCATION: N:271142.0, E:346086.4 (RI State Plane)
ELEVATION: 8.1' (NAVD 88)
DRILLING CONTRACTOR: New England Boring Contractors, Inc.
DRILLING METHOD AND EQUIPMENT: Driven casing and wash, truck mounted CME-75 drill rig
WATER LEVEL AND DATE: 6' below grade (tidal) 6/20/2019
START: 7:53 AM 6/19/2019
FINISH: 2:30 PM 6/20/2019
LOGGER: A.Ahearn

INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0-2	SS S-1	1.2	4-13-13-22	POORLY GRADED SAND, (SP), black, dry, medium dense	Top 4" topsoil, 2" of asphalt at 10"
					4" casing to 5'
5-7	SS S-2	0.9	4-1-1-1	SILTY SAND, (SM), olive gray, moist, very loose, fine	4" casing to 7'
7-9	SS S-3	1.3	1-3-3-2	POORLY GRADED SAND WITH SILT, (SP-SM), dark gray, moist, loose	4" casing to 9'
9-11	SS S-4	1.0	1-1-7-10	SILTY SAND, (SM), dark gray, moist, loose	Trace org. mtl. (top 9"), trace gravel (bottom 3") 4" casing to 11'
11-13	SS S-5	0.3	8-11-9-18	WELL GRADED SAND WITH GRAVEL, (GP-GM), olive gray, moist, medium dense, f-c gravel	4" casing to 13'
13-15	SS S-6	0.3	5-3-3-3	WELL GRADED GRAVEL WITH SAND, (GW), olive gray, moist, medium dense	
18-20	SS S-7	0.3	5-1-2-3	SANDY SILT, (ML), dark gray, wet, soft	4" casing to 18'
23-25	SS S-8*	1.2	3-2-2-3	SANDY SILT, (ML), dark gray, wet, soft	4"casing to 23'
28-30	SS S-9	1.1	2-3-3-5	SILT WITH SAND, (ML), dark gray, wet, firm	4"casing to 28'
33-35	SS S-10*	1.3	3-1-2-3	SANDY SILT, (ML), dark gray, wet, soft	4" casing to 33'
38-40	SS S-11	1.1	2-1-2-3	SANDY SILT, (ML), dark gray, wet, soft	4" casing to 38'
43-45	SS S-12	1.1	1-2-1-2	SILTY SAND, (SM), dark gray, wet, very loose	4" casing to 43'
48-50	SS S-13	1.3	2-3-3-3	POORLY GRADED SAND WITH SILT, (SP-SM), dark gray, wet, loose	4" casing to 48'
53-55	SS S-14	1.2	1-3-2-3	POORLY GRADED SAND, (SP), dark gray, wet, loose, fine sand	4" casing to 53' One piece of 1" gravel found in sample
58-60	SS S-15	1.6	2-1-WOH-WOH	SILT WITH SAND, (ML), dark gray, wet, very soft, fine sand	4" casing to 58' Bottom 6" more dense than remaining material
63-65	SS S-16*	1.3	WOH-WOH- 2-2	SILT WITH SAND, (ML), dark gray, wet, soft, fine sand	4" casing to 63'
68-70	SS S-17	1.1	WOH-WOH-7-7	SILT, (ML), light gray, wet, firm	4" casing to 68' Stop for day at 2:30 PM 6/19/19
73-75	SS S-18	1.3	WOR-WOH-1-2	SILT, (ML), light gray, wet, very soft	4" casing to 73' Drilling resumes at 7:20 AM 6/20/19 Switched to 3" casing
78-80	--	--	--	No recovery	3" casing to 78' 3" casing sunk to 83'
83-85	SS S-19	1.8	WOH-3-4-9	SILT, (ML), light gray, wet, firm	3" casing to 83'
88-90	SS S-20*	1.3	8-7-10-8	SILT WITH SAND, (ML), light gray, wet, very stiff	3" casing to 88' Slight light brown color change observed at 10"
93-95	SS S-21	1.5	3-4-4-6	POORLY GRADED SAND, (SP), dark gray, moist, loose, fine sand	3" casing to 93'
98-100	SS S-22	1.7	6-4-7-7	SANDY SILT, (ML), light gray, wet, stiff	3" casing to 98'
103-105	SS S-23	1.2	8-4-4-3	SILTY SAND, (SM), light gray, wet, loose	3" casing to 103'
108-110	SS S-24*	0.8	8-3-3-3	SILT WITH SAND, (ML), light gray, wet, firm	3" casing to 108'
113-115	SS S-25	1.4	WOH-1-WOH-2	SILT, (ML), light gray, wet, very soft	3" casing to 113'
118-120	SS S-26	1.3	8-4-3-5	SILT, (ML), light gray, wet, firm	3" casing to 118'
				END BORING AT 120' BELOW GRADE	End drilling at 2:30PM, 6/20/2019
				An asterisk (*) next to a sample number denotes a sample on which a laboratory grain size analysis was performed.	Backfilled boring hole with soil cuttings to grade

BOT. FOOTING N. ABUT.
EL. 2.50

BORING RTG-SB-02
SCALE: 1/8" = 1'-0"

SOIL BORING LOG

RT Group, Inc.
Engineered from the Ground Up℠
70 Romano Vineyard Way, Suite 134
North Kingstown, Rhode Island 02852
T 401 438 3100 F 401 294 9806
DAM SAFETY · WATERFRONT · CONSTRUCTION ENGINEERING · GEOTECHNICAL · GEO-ENVIRONMENTAL · STRUCTURAL · CIVIL

BORING NUMBER: RTG-SB-03
DATE(S): 8/31/2020 - 9/8/2020
PROJECT NUMBER: 19104.00

PROJECT: Sims Ave. Pedestrian Bridge
LOCATION: N: 271132.0, E: 346079.9 (RI State Plane)
ELEVATION: 8.0' (NAVD 88)
DRILLING CONTRACTOR: New England Boring Contractors, Inc.
DRILLING METHOD AND EQUIPMENT: Driven Casing & Wash, Truck Mounted CME-75 Drill Rig, Autohammer
WATER LEVEL AND DATE: 8.5' B.G. (tidal) 9/2/2020 at 6:50AM
START: 9:15 AM 8/31/2020
FINISH: 4:15 PM 9/8/2020
LOGGER: A. Gilmore

INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"- 6"- 6"- 6"	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
				3" Topsoil	Start boring at 9:15 AM on 8/31/2020
0' - 2'	SS-1	1.5'	7-20-27-21	POORLY GRADED SAND, (SP), light brown, dry, dense	2" of asphalt at 12" B.G. 3"Ø split spoon
2' - 4'	SS-2	1.3'	21-24-16-13	POORLY GRADED SAND WITH GRAVEL, (SP), light brown, dry, dense	3"Ø split spoon
4' - 6'	SS-3	1.5'	11-11-9-8	POORLY GRADED SAND WITH SILT, (SP-SM), dark brown, tan, and reddish-brown, moist, medium dense	3"Ø split spoon
6' - 8'	SS-4	1.9'	3-4-8-10	SILTY SAND, (SM), dark brown, moist, medium dense	Organic odor and roots noted in sample 3"Ø split spoon
8' - 10'	SS-5	1.6'	8-8-7-6	POORLY GRADED SAND, (SP), brown, wet, medium dense	Organic odor and roots noted in sample 3"Ø split spoon
48' - 49.5'	SS-6	0.5'	6-4-4	POORLY GRADED SAND WITH SILT, (SP-SM), gray, wet, loose	5" casing to 48 ft. B.G. 2"Ø split spoon used for remainder of split spoon samples
53' - 54.5'	SS-7	0.8'	4-3-5	POORLY GRADED SAND, (SP), gray, wet, loose	5" casing to 53 ft. B.G. Stop drilling at 2:15 PM on 8/31/2020 Start drilling at 7:15 AM on 9/1/2020
58' - 59.5'	SS-8	1.4'	WOR-WOH-2	SANDY SILT, (ML), dark gray, wet, soft, very fine sand	4" casing to 58 ft. B.G.
60' - 61.8'	ST-1	0'	1.2 in/sec	No recovery.	4" casing to 60 ft. B.G. Waited 20 mins. prior to recovering sample.
62.5' - 64.5'	ST-2*	1.3'	0.9 in/sec	SANDY SILT, (ML), dark gray, wet, very fine sand	Waited 20 mins. prior to recovering sample.
73' - 74.5'	SS-9	1.2'	2-6-7	SANDY SILT, (ML), brownish gray, wet, firm, fine sand	4" casing to 73 ft. B.G.
74.5' - 76'	SS-10	1.9'	7-5-5	SANDY SILT, (ML), gray, wet, stiff, very fine sand	4" casing to 76 ft. B.G.
76' - 77.5'	SS-11	1.0'	WOR-3-4	SILT WITH SAND, (ML), light gray, wet, firm, very fine sand	
78' - 80'	ST-3*	1.4'	0.8 in/sec	SILT, (ML), light gray, wet, very fine sand	4" casing to 78 ft. B.G. Waited 20 mins. prior to recovering sample. 4" casing to 88 ft. B.G.
					Stop drilling at 3:05 PM on 9/1/2020 Start drilling at 7:45 AM on 9/2/2020
94' - 95.5'	SS-12	1.8'	4-6-8	POORLY GRADED SAND WITH SILT, (SP-SM), dark gray, wet, medium dense, very fine sand	4" casing to 95 ft. B.G.
111'-112.5'	SS-13	2.0'	8-4-7	SILT, (ML), dark gray, wet, stiff	Used cat head to drive 4" casing to 113 ft. B.G. (End of cased hole)
113'-115	ST-4	0.1'	0.5 in/sec	SILT, (ML), dark gray, wet, trace of very fine sand	Waited 20 mins. prior to recovering sample.

BORING RTG-SB-03
SCALE: 1/8" = 1'-0"

INTERVAL	TYPE AND NUMBER	RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
					Roller bit to 115.5 ft. B.G.
115.5'-117.5'	ST-5	0.1'	0.5 in/sec	SANDY SILT, (ML), dark gray, wet	Waited 20 mins. prior to recovering sample. Contents of Shelby Tube fell out of the top of tube.
118'-119.5'	SS-14*	1.8'	4-5-9	CLAYEY SILT, (ML), wet, dark gray, stiff	
123'-125'	SS-15	1.3'	11-9-11-21	SANDY SILT, (ML), wet, dark gray, very stiff, (top 10") SILT, (ML), wet, dark gray, very stiff, (bottom 5")	Roller bit to 123 ft. B.G. Stop drilling at 2:53 PM on 9/2/2020 Start drilling at 8:15 AM on 9/3/2020 Roller bit to 128 ft. B.G.
128'-130'	SS-16	2.0'	25-25-27-26	SILT, (ML), dark gray, wet, hard	Mix in BIO-BORE bio-degradable drilling fluid concentrate to maintain open borehole Roller bit to 133 ft. B.G.
133'-135'	SS-17	2.0'	1-10-13-22	SILT, (ML), dark gray, wet, very stiff	Roller bit to 138 ft. B.G.
138'-140'	SS-18	2.0'	2-8-10-21	SILT, (ML), dark gray, wet, very stiff	Roller bit to 143 ft. B.G.
143'-145'	SS-19*	2.0'	8-12-15-20	CLAYEY SILT, (ML), dark gray, wet, very stiff	Roller bit to 148 ft. B.G.
148'-150'	SS-20	2.0'	7-9-17-21	SILT, (ML), dark gray, wet, very stiff	Roller bit to 153 ft. B.G.
153'-155'	SS-21	2.0'	5-6-10-15	SILT, (ML), dark gray, wet, stiff	Roller bit to 158 ft. B.G.
158'-160'	SS-22	1.2'	13-18-22-22	SILT WITH SAND, (ML), dark gray, wet, hard, very fine sand	Roller bit to 163 ft. B.G.
163'-165'	SS-23	1.3'	9-21-24-25	SILT, (ML), dark gray, wet, hard	Stop drilling at 3:00 PM on 9/3/2020 Start drilling at 7:30 AM on 9/4/2020 Roller bit to 170 ft. B.G.
170'-172'	SS-24	1.8'	7-10-16-22	SANDY SILT, (ML), dark gray, wet, very stiff, very fine sand	Sand content increases towards bottom of sample
180'-182'	SS-25	1.0'	21-22-33-28	SILTY GRAVEL WITH SAND, (GM), dark gray, wet, very dense, f-c gravel, f-c sand	
182'-184'	SS-26	0.8'	34-24-20-19	SILTY GRAVEL WITH SAND, (GM), dark gray, wet, dense, f-c gravel, f-c sand	Roller bit to 190 ft. B.G.
190'-192'	SS-27	0.0'	0"/100 blows		Rock fragments in tip, Top of bedrock Roller bit to 195 ft. B.G. End rock core at 1:11 PM
195'-200'	C-1	2.6'	5 Min/FT 4 Min/FT 4 Min/FT 4 Min/FT 4 Min/FT	No recovery from initial core sample Recovered sampled material at 1:40PM. Gray weathered and fractured graywacke RQD= 5"/60" = 8.3%	2" roller bit to 210 ft. B.G.
				END BORING AT 210' BELOW GRADE	End drilling at 3:15 PM on 9/4/2020 Begin disassembling rod and casing at 7:30 AM on 9/8/2020
				An asterisk (*) next to a sample number denotes a sample on which a laboratory grain size analysis was performed.	Boring backfilled with drill cuttings from 200 ft to 20 ft B.G. 20 ft. long observation well installed comprised of 20-slot screen at the lower 15 ft. and 2" diameter PVC casing at the upper 5 ft. Holliston 1S sand filter pack was installed around the well to 2 ft B.G., followed by a granular bentonite seal to 6 in. B.G. The well was topped with a 6" diameter road box set in a concrete collar.
				B.G. - below grade	Excess drill cuttings placed into drums and left at site for BETA representative to label and dispose of.

ESTIMATED PILE TIP
EL. −181.0±

BORING RTG-SB-03 CONTINUED
SCALE: 1/8" = 1'-0"

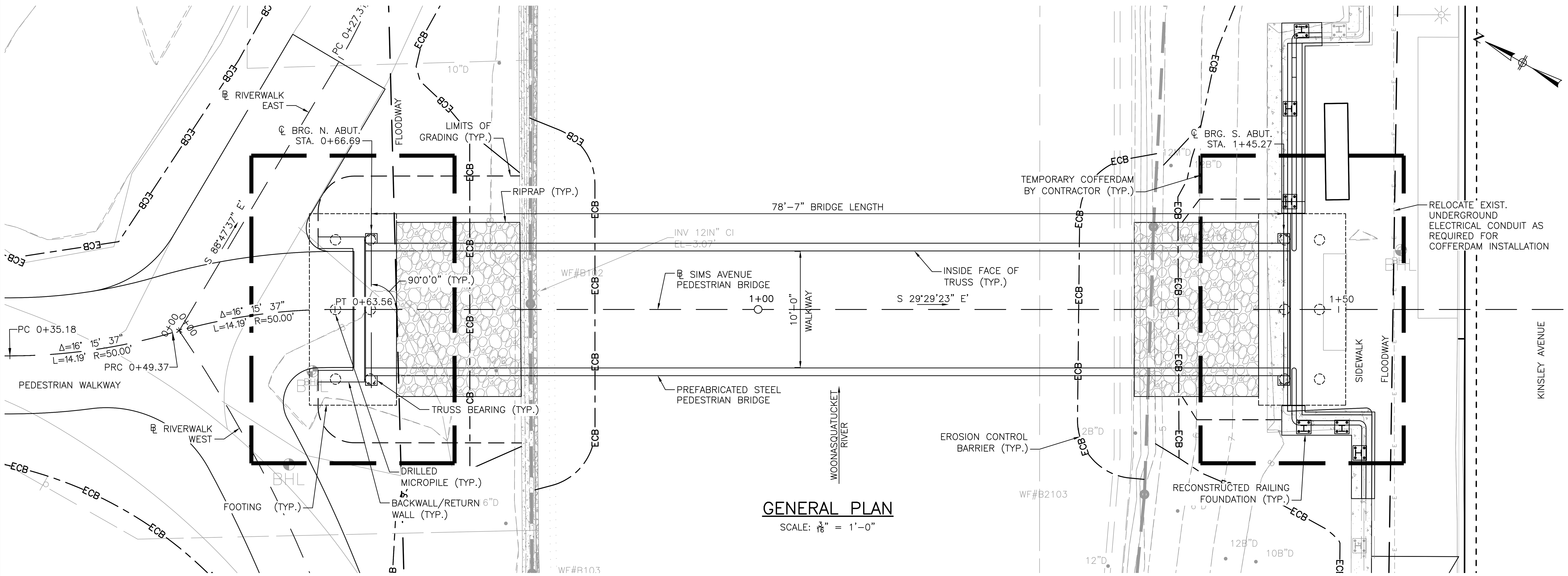
NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: DW
DESIGNED BY: DW
CHECKED BY: CWJ

REGISTERED PROFESSIONAL
PREPARED BY
BETA
www.BETA-Inc.com
SUBCONSULTANT
SCALE: AS SHOWN
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
BORING LOGS

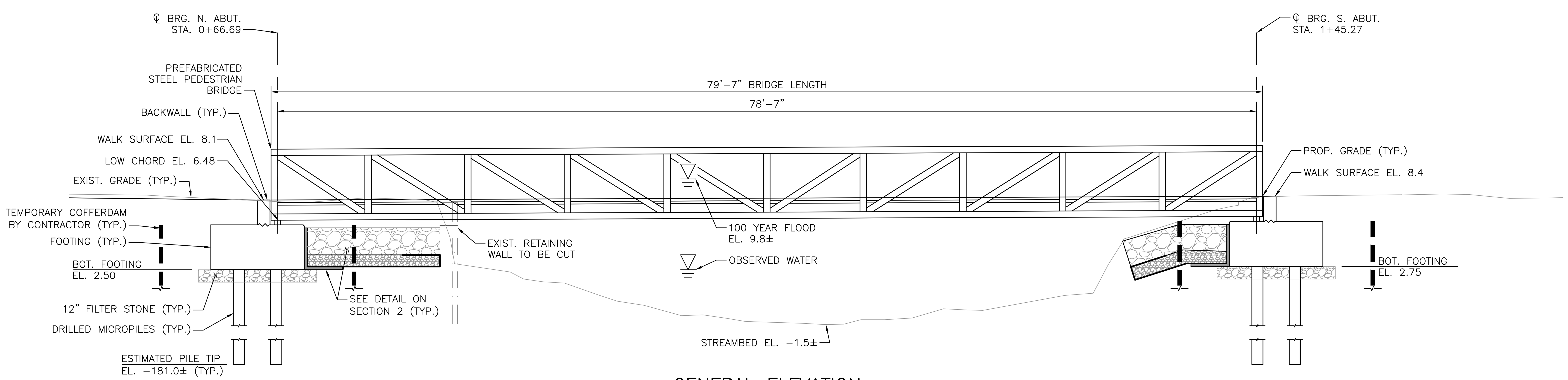
BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022



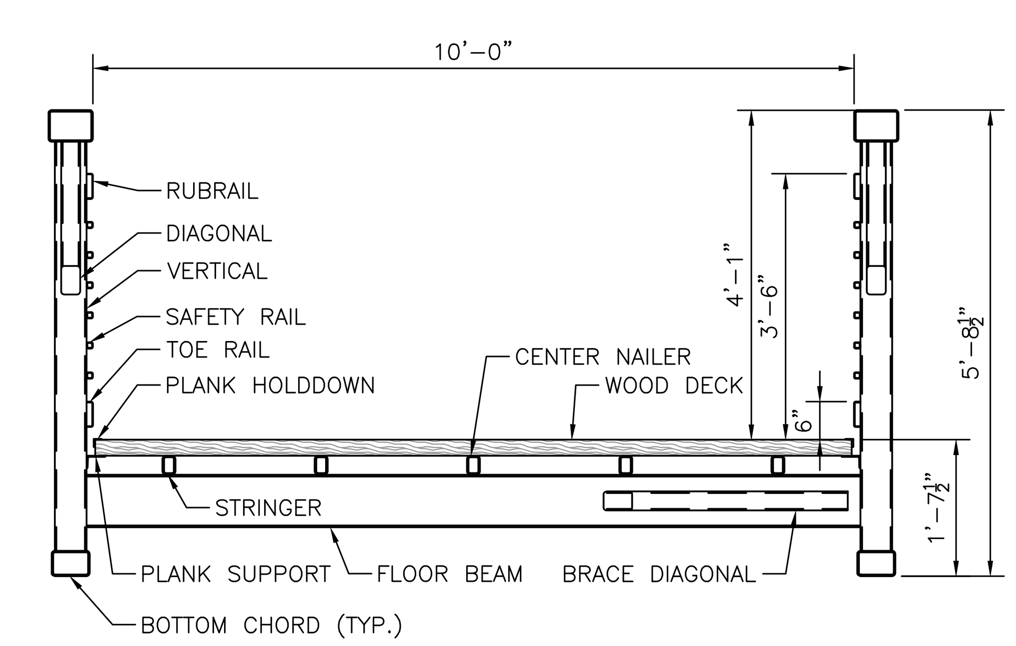
GENERAL PLAN
SCALE: $\frac{3}{16}$" = 1'–0"

NOTES:

1. THE DESIGN OF THE TEMPORARY COFFERDAMS IS THE RESPONSIBILITY OF THE CONTRACTOR. COORDINATE WITH SECTION 02300, TEMPORARY EARTH RETAINING SYSTEMS AND COFFERDAMS AND SECTION 02400, DEWATERING, CONTROL, AND DIVERSION OF WATER.
2. THE CONTRACTOR SHALL INSTALL THE MICROPILES FROM EXISTING GRADE. FOLLOWING THEIR INSTALLATION, THE TEMPORARY COFFERDAMS SHALL BE INSTALLED AND THE CONTRACTOR SHALL EXCAVATE BETWEEN/AROUND THE MICROPILES TO SUBGRADE ELEVATION, TAKING CARE NOT TO DAMAGE THE INSTALLED MICROPILES. ANY DAMAGE THAT OCCURS SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST.
3. SHOULD THE CONTRACTOR ELECT TO UTILIZE INTERLOCKING STEEL SHEET PILES OR TIMBER SHEETS TO SUPPORT ITS EXCAVATIONS AND CONTROL RIVER/GROUNDWATER INFLOWS, THE EMBEDMENT DEPTH OF SUCH SYSTEMS BELOW THE SUBGRADE ELEVATION SHALL BE MINIMIZED TO THE GREATEST EXTENT POSSIBLE IN ORDER TO LIMIT THE DISTURBANCE TO THE SOFT/LOOSE SILT/SAND LAYERS.
4. LIMITING DISTURBANCE TO THE SOFT/LOOSE SILT/SAND LAYERS, WHICH HAVE HISTORICALLY BEEN "SENSITIVE" TO VIBRATIONS AS A RESULT OF DRIVING, IS REQUIRED IN ORDER TO REDUCE THE LIKELIHOOD THAT THESE LAYERS SETTLE, WHICH COULD DAMAGE NEARBY STRUCTURES/UTILITIES.
5. PRELIMINARY ANALYSES COMPLETED BY THE ENGINEER, WHICH TAKE INTO ACCOUNT THE ROTATIONAL STABILITY OF SUCH A SYSTEM AND THE NEED TO CONTROL PIPING, INDICATE THAT IT SHOULD BE POSSIBLE TO LIMIT THE EMBEDMENT DEPTH OF A DRIVEN SYSTEM (AZ 18 ASSUMED) TO ABOUT 8 BELOW SUBGRADE ELEVATION (15–FOOT–LONG ± SHEETS). THIS WOULD PLACE THE SYSTEM ENTIRELY ABOVE THE UPPER MOST SOFT/LOOSE SILT/SAND LAYER AND WOULD REQUIRE AT LEAST ONE LEVEL OF INTERNAL BRACING.
6. THE PRELIMINARY ANALYSES ARE BASED ON A PRE–CUT ELEVATION OF 8.0 FEET, A SUBGRADE ELEVATION OF 1.5 FEET (6.5–FOOT–DEEP CUT), A RIVER/GROUNDWATER ELEVATION OF 8.0 FEET (MAX), AND A UNIFORM VERTICAL CONSTRUCTION LIVE LOAD OF 600 POUNDS PER SQUARE FOOT. IT WAS ASSUMED THAT THE CONTRACTOR WOULD ALLOW THE SYSTEM TO FLOOD DURING STORM EVENTS THAT PRODUCE A RIVER/GROUNDWATER ELEVATION GREATER THAN ABOUT 8.0 FEET.
7. THE CONTRACTOR'S TEMPORARY EARTH RETAINING SYSTEMS/COFFERDAMS SHALL BE DESIGNED BY AN EXPERIENCED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF RHODE ISLAND. APPROVAL OF THE CONTRACTOR'S TEMPORARY EARTH RETAINING/COFFERDAM SUBMITTAL BY THE ENGINEER WILL, AT A MINIMUM, BE CONTINGENT ON MAINTAINING THE TIP ELEVATIONS OF ALL SUCH SYSTEMS ABOVE THE SOFT/LOOSE SILT/SAND LAYERS.



GENERAL ELEVATION
SCALE: $\frac{3}{16}$" = 1'=0"



NOTE:
PREFABRICATED BRIDGE TO BE SUPPLIED BY OTHERS. SEE SPECIFICATIONS.

TRANSVERSE SECTION
NOT TO SCALE

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: DW
DESIGNED BY: DW
CHECKED BY: CWJ

REGISTERED PROFESSIONAL

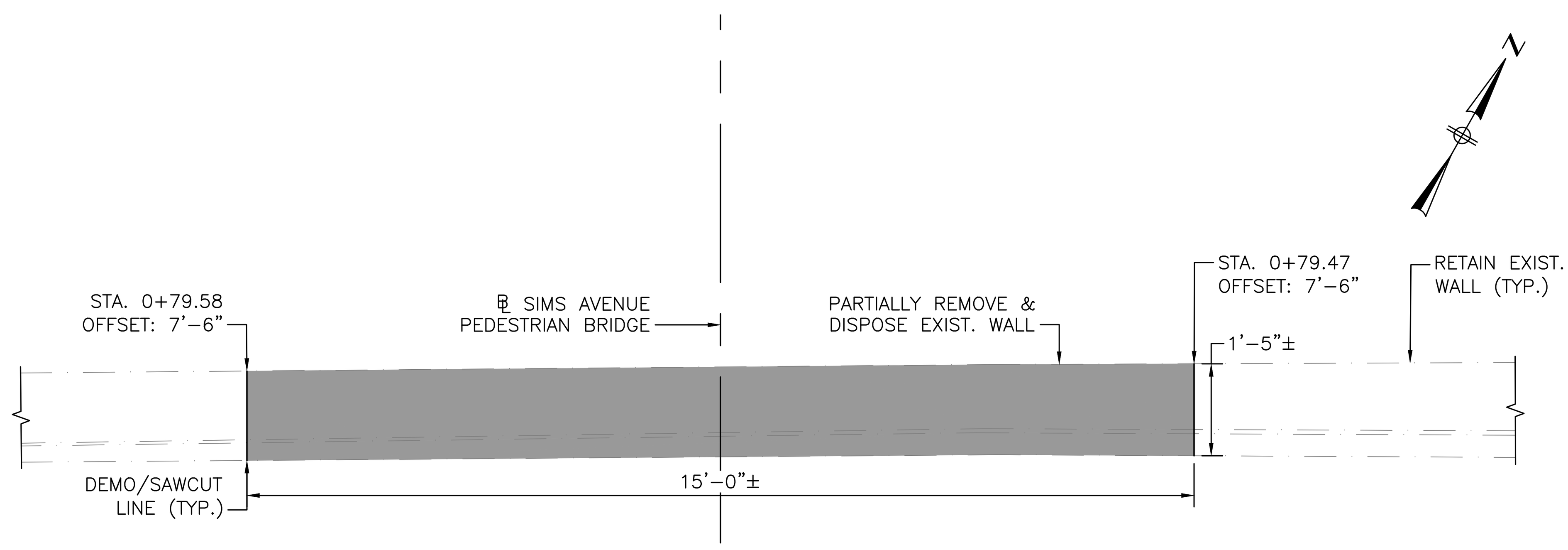
PREPARED BY: BETA www.BETA-Inc.com

SUBCONSULTANT

SCALE: AS SHOWN
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

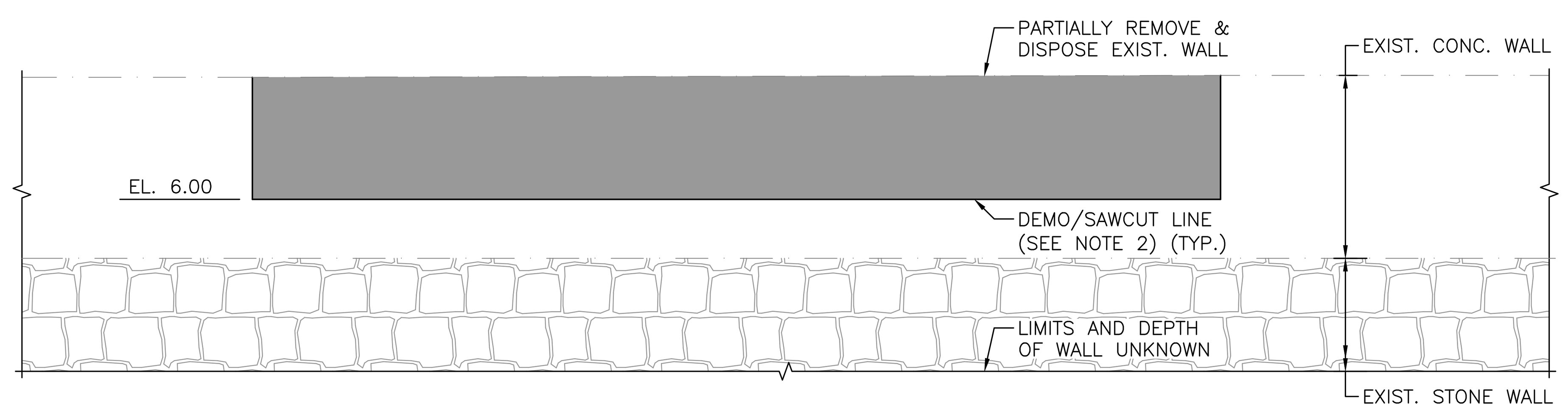
TITLE:
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
BRIDGE GENERAL PLAN, ELEVATION, & TRANSVERSE SECTION

BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022
SHEET NO. 19 OF 26



NORTH WALL DEMOLITION PLAN

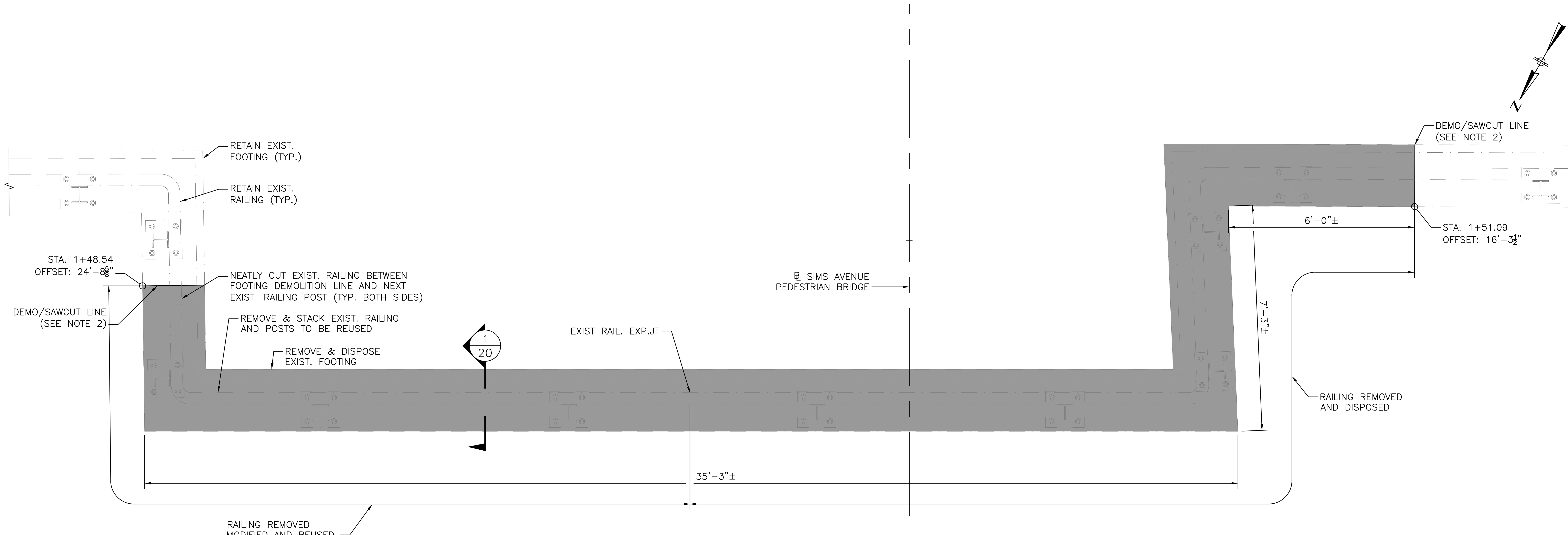
SCALE: ½" = 1'-0"



[LOOKING NORTH]

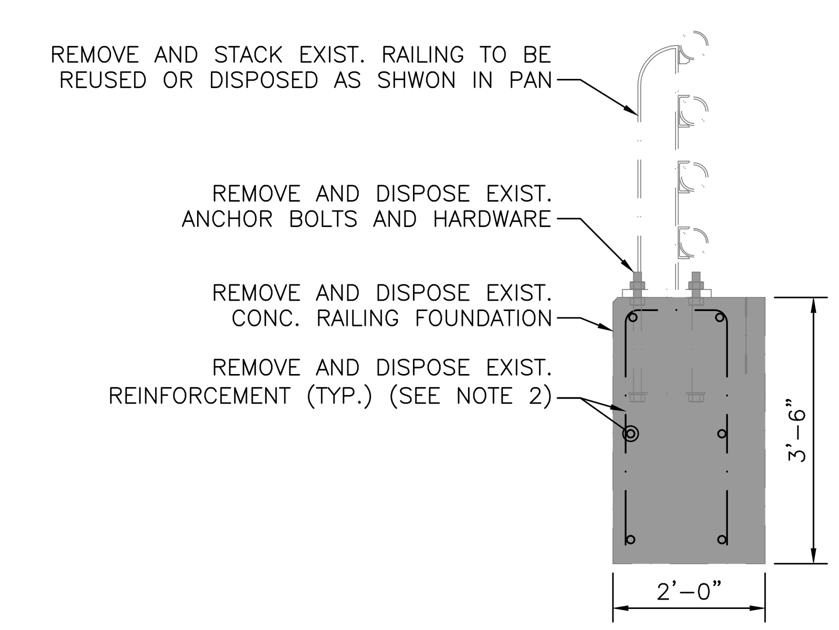
NORTH WALL DEMOLITION ELEVATION

SCALE: ½" = 1'-0"



SOUTH RAILING FOUNDATION DEMOLITION PLAN

SCALE: ½" = 1'-0"



SECTION 1 – RAILING FOUNDATION DEMOLITION

SCALE: ½" = 1'-0"

DEMOLITION NOTES

1. [shaded] INDICATES AREA TO BE REMOVED AND DISPOSED.
2. CUT AND BURN BACK EXPOSED EXISTING REINFORCEMENT AS REQUIRED AT DEMOLITION/SAWCUT LINES. FILL VOIDS WITH NON-SHRINK GROUT.

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: DW
DESIGNED BY: DW
CHECKED BY: CWJ

REGISTERED PROFESSIONAL

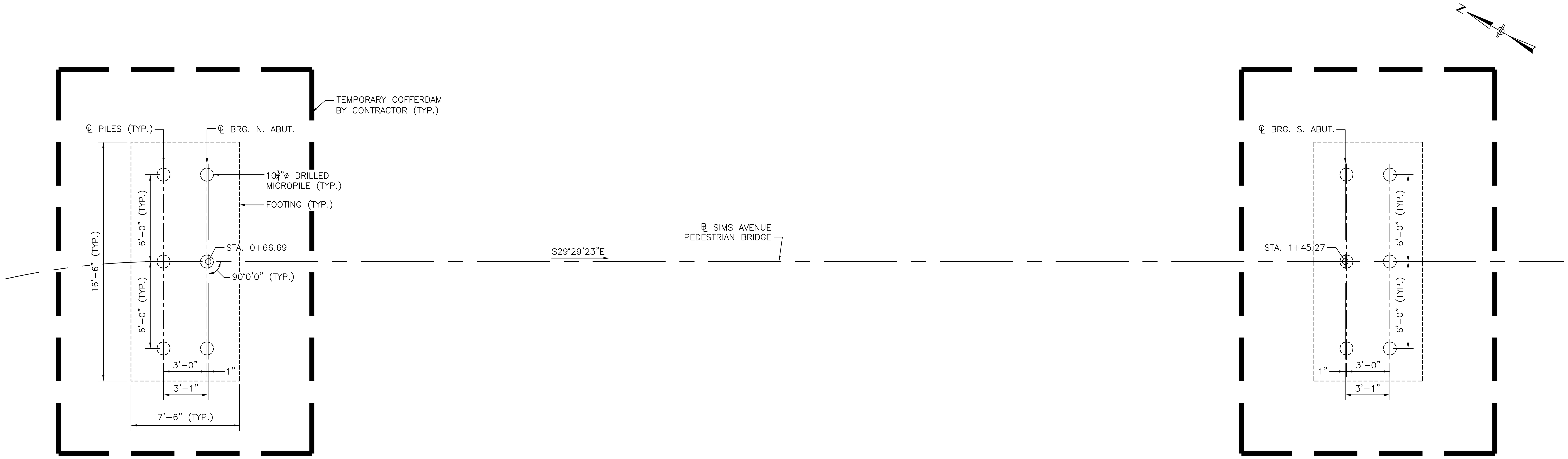
PREPARED BY
BETA
www.BETA-Inc.com

SUBCONSULTANT

SCALE
AS SHOWN
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
DEMOLITION PLAN & DETAILS

BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022
SHEET NO. 20 OF 26



PILE PLAN

SCALE: ¼" = 1'-0"

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: DW

DESIGNED BY: DW

CHECKED BY: CWJ

REGISTERED PROFESSIONAL

PREPARED BY

BETA www.BETA-Inc.com

SUBCONSULTANT

SCALE: AS SHOWN

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE

SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND

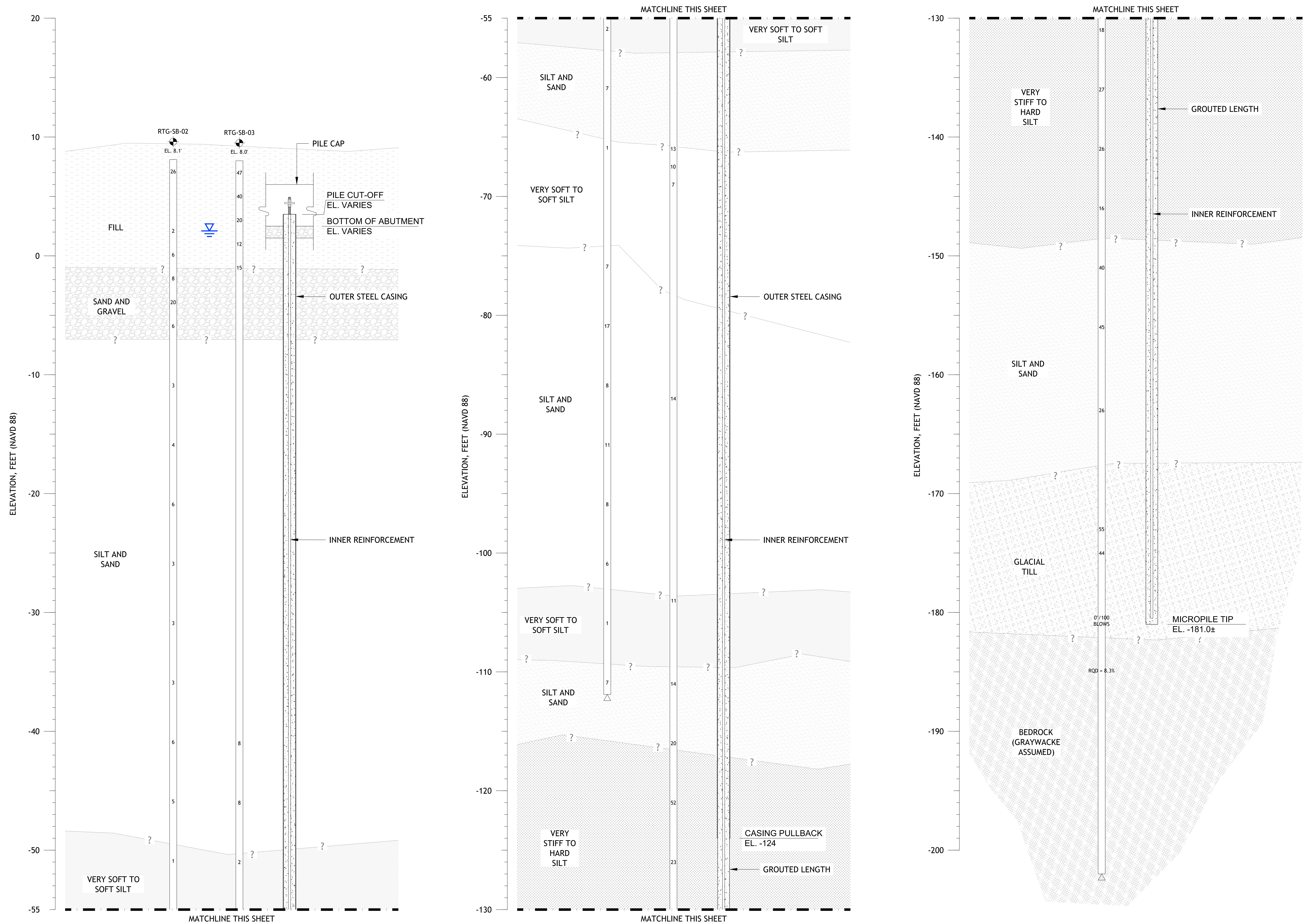
PILE PLAN

BETA JOB NO. 6620

ISSUE DATE SEPTEMBER 12, 2022

SHEET NO. 21 OF 26

8/31/2022 1:56 PM O:\6600\6620 - PROVIDENCE - SIMS AVE PEDESTRIAN BRIDGE\DRAWING FILES\PLANSET\PILE PLAN.DWG (BETA STB BW.STB)



LEGEND:

RTG-SB-01 — DENOTES THE APPROXIMATE LOCATION OF SOIL BORINGS PERFORMED BY NEW ENGLAND BORING CONTRACTORS, INC. (NEB) AND OBSERVED BY T&B BETWEEN JUNE 17 AND 20, 2019, AND BETWEEN AUGUST 31 AND SEPTEMBER 8, 2020.

BOTTOM OF SOIL BORING

15 — STANDARD PENETRATION NUMBER ("N" VALUE)

APPROXIMATE GROUNDWATER ELEVATION

FILL

SAND AND GRAVEL

SILT AND SAND

SOFT TO VERY SOFT SILT

VERY STIFF TO HARD SILT

GLACIAL TILL

BEDROCK (GRAYWACKE)

NOTES:

1. THE EXISTING GRADE AND BRIDGE ELEVATION DATA SHOWN WAS OBTAINED FROM AN AUTOCAD DRAWING FILE TITLED "6620_SR(GeneralElevation)" PROVIDED TO T&B BY BETA ON SEPTEMBER 18, 2020.

2. THE SOIL BORING ELEVATION DATA SHOWN ON THIS FIGURE WAS SURVEYED IN THE FIELD BY RTG ON JUNE 20, 2019, AND ON SEPTEMBER 8, 2020 USING A LEICA GNSS RTK GPS AND TOTAL STATION (SUB-INCH ACCURACY).

3. THE DEPTH AND THICKNESS OF THE SUBSURFACE STRATA INDICATED ON THE SECTIONS WERE GENERALIZED FROM AND INTERPOLATED BETWEEN SOIL BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE SPECIFIC LOCATION AND ON THE DATES INDICATED. SOIL AND ROCK CONDITIONS, AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THE BORING LOCATIONS. ALSO THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE CONDITIONS AT THE SOIL BORING LOCATIONS.

8/31/2022 1:56 PM O:\6600S\6620 - PROVIDENCE - SIMS AVE PEDESTRIAN BRIDGE\DRAWING FILES\PLANSET\6620(MICROPILESHEETS).DWG (BETA STB BW.STB)

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:

DESIGNED BY:

CHECKED BY:

REGISTERED PROFESSIONAL

PREPARED BY

BETA
www.BETA-Inc.com

SUBCONSULTANT

Tighe&Bond
70 Romano Vineyard Way, Ste 134
North Kingstown, RI 02852
(401) 438-3100

SCALE

AS SHOWN

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TITLE

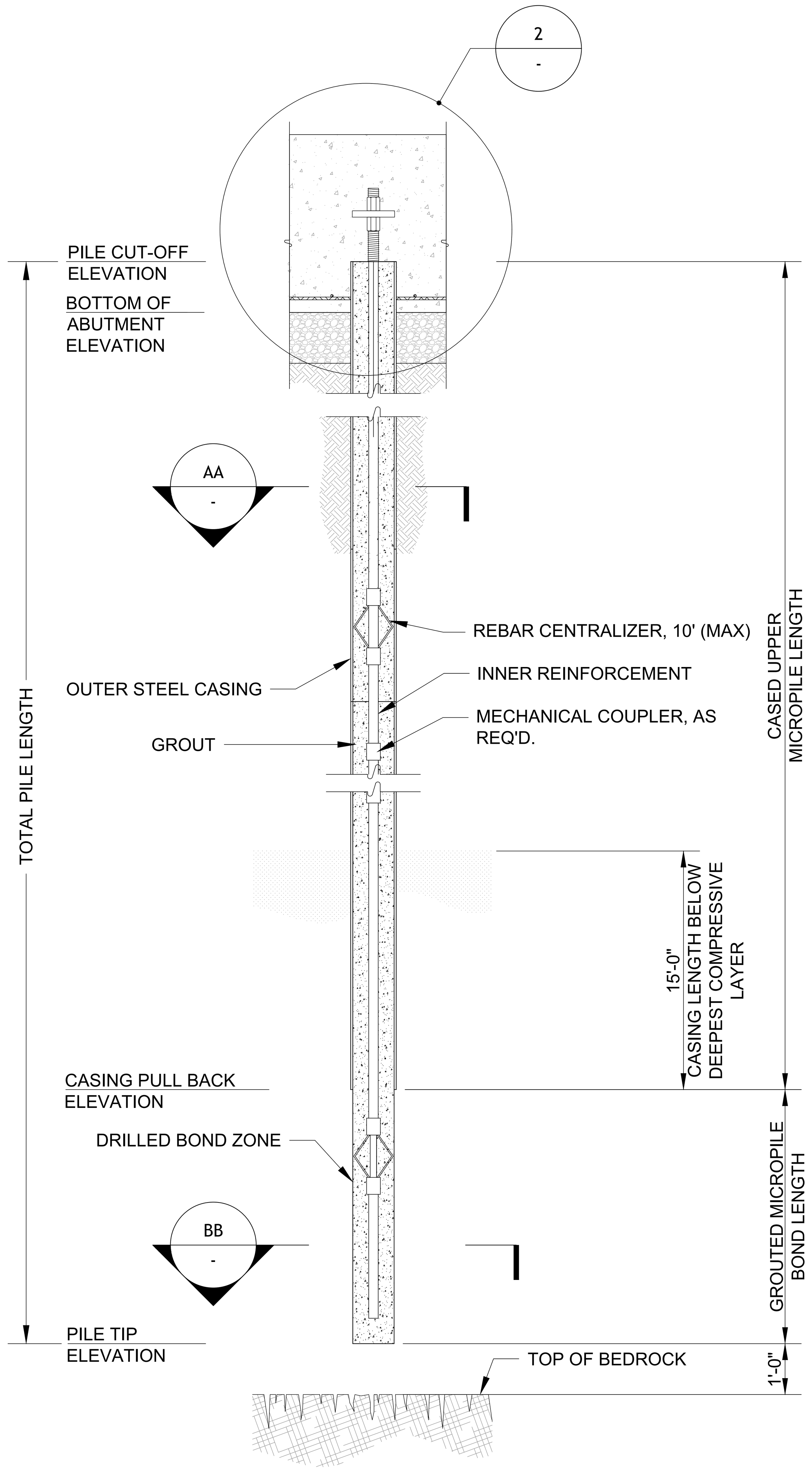
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND

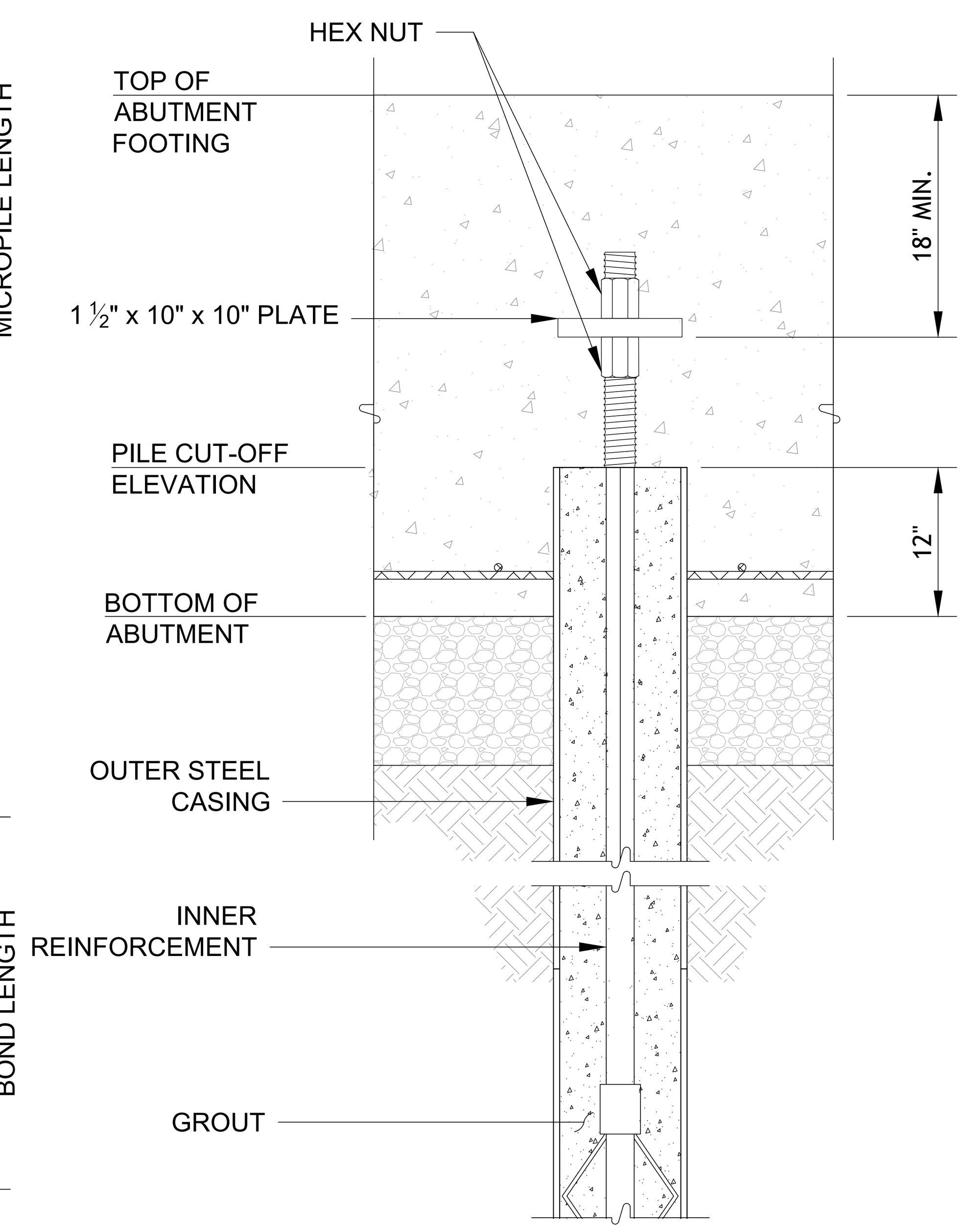
ANTICIPATED MICROPILE PROFILE
(NORTH ABUTMENT)

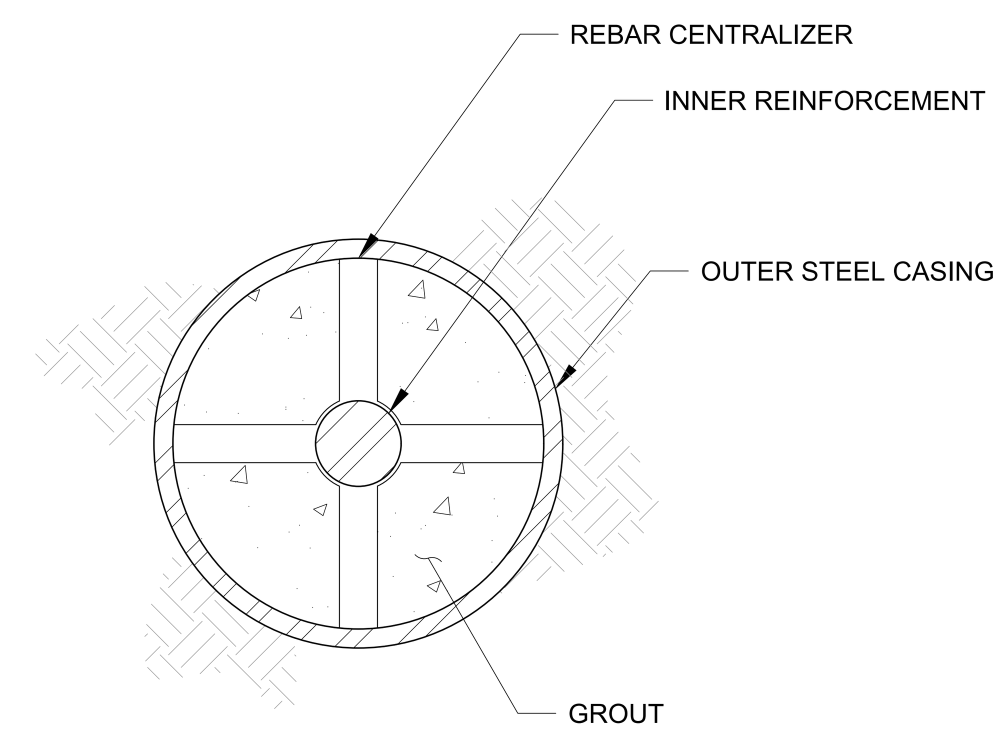
BETA JOB NO. 6620

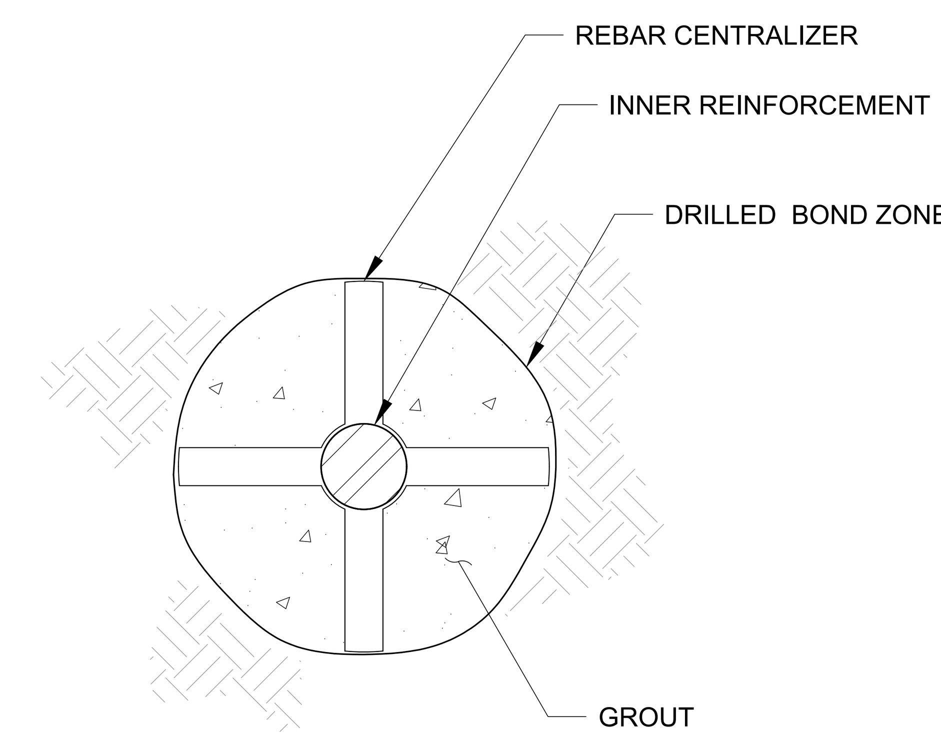
ISSUE DATE SEPTEMBER 12, 2022

SHEET NO. 22 OF 26









NOTES:

1. THE MICROPILE LENGTHS SHOWN ARE THE MINIMUM ESTIMATED LENGTHS TO PROVIDE THE SPECIFIED ULTIMATE CAPACITY. THE MICRO-PILE SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ADJUSTMENTS TO THESE LENGTHS AS REQUIRED TO ACHIEVE THE SPECIFIED ULTIMATE CAPACITY, BUT IN NO CASE SHALL THE LENGTHS BE REDUCED.

DRILLED MICRO-PILE DETAIL (1 / -)
SCALE: NTS

MICRO-PILE TOP CONNECTION DETAIL (2 / -)
SCALE: 1"=1'-0"

SECTION (AA / -)
SCALE: 3"=1'-0"

SECTION (BB / -)
SCALE: 3"=1'-0"

TABLE 1
ELEVATION SUMMARY

MICRO-PILE LOCATION	ELEVATIONS (FT)					
	BOTTOM OF ABUTMENT	PILE CUT-OFF	ESTIMATED TOP OF BEDROCK	ESTIMATED PILE TIP	CASING PULL BACK	GROUTED BOND LENGTH
NORTH ABUTMENT	2.50	3.50	-182±	-181±	-124	57
SOUTH ABUTMENT	2.75	3.75	-182±	-181±	-124	57

TABLE 2
DESIGNATION/SIZE SUMMARY

LOCATION	ITEM	DESIGNATION/SIZE
ABUTMENTS	OUTER STEEL CASING	PP 10.75" x 0.50"
	INNER REINFORCEMENT	No. 20 ALL THREAD BAR, Gr. 100 (EPOXY)
	DRILLED SHAFT	10.75"Ø (MIN)

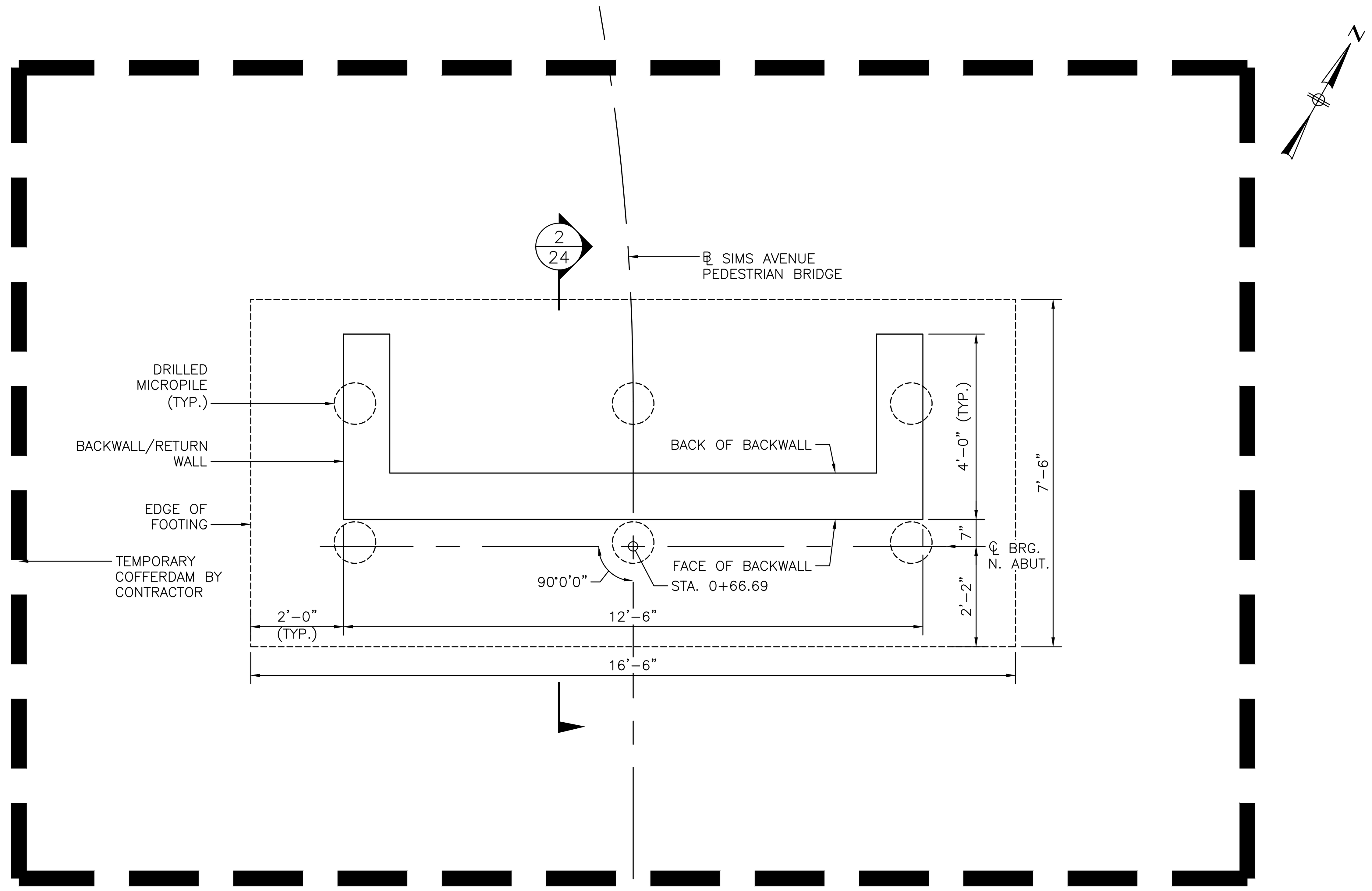
NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY:
DESIGNED BY:
CHECKED BY:
REGISTERED PROFESSIONAL
PREPARED BY
BETA
www.BETA-Inc.com
SUBCONSULTANT
Tighe&Bond
70 Romano Vineyard Way, Ste 134
North Kingstown, RI 02852
(401) 438-3100
SCALE
AS SHOWN
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION
TITLE
SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND
MICROPILE DETAILS
BETA JOB NO. 6620
ISSUE DATE SEPTEMBER 12, 2022
SHEET NO. 23 OF 26

ABUTMENT NOTES:

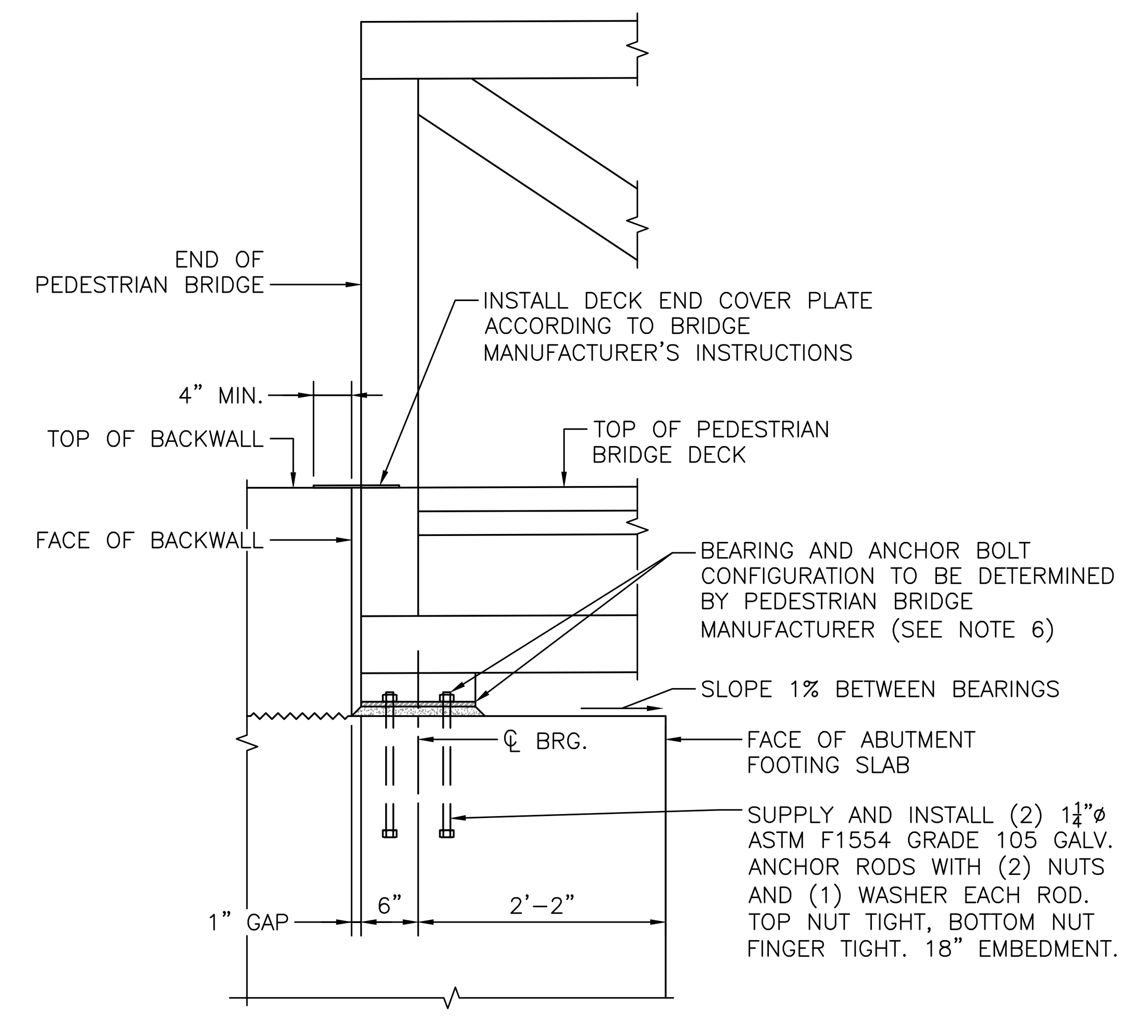
1. ALL REINFORCEMENT SHOWN IN THESE DETAILS SHALL BE GALVANIZED.
2. ALL CONCRETE SHALL BE CLASS HP ¾", EXCEPT THE ABUTMENT FOOTING, WHICH SHALL BE CLASS XX ¾".
3. CONSTRUCTION JOINT FOR BACKWALL SHALL BE GIVEN A RAKE FINISH WITH A ¼" MINIMUM AMPLITUDE.
4. TOP OF BACKWALL SHALL BE TROWELED SMOOTH PARALLEL TO THE PROFILE GRADE.
5. PROVIDE 4"ø WEEPHOLES AT 10'-0" O.C. THROUGH BACKWALL. PROVIDE 1 CUBIC YARD OF FILTER STONE CONFORMING TO M.01.09 WRAPPED WITH GEOTEXTILE FABRIC AT THE RETAINED SIDE OF WEEPHOLE.
6. CONTRACTOR TO COORDINATE SIZE AND CONFIGURATION OF EXPANSION BEARING ASSEMBLY WITH PREFABRICATED BRIDGE MANUFACTURER.
7. INSULATION TO HAVE A MINIMUM THICKNESS OF 3" AND CONFORM TO ASTM C578 TYPE IX OR TYPE IV WITH A MINIMUM R-VALUE OF 6.1.

* COORDINATE WITH BRIDGE MANUFACTURER



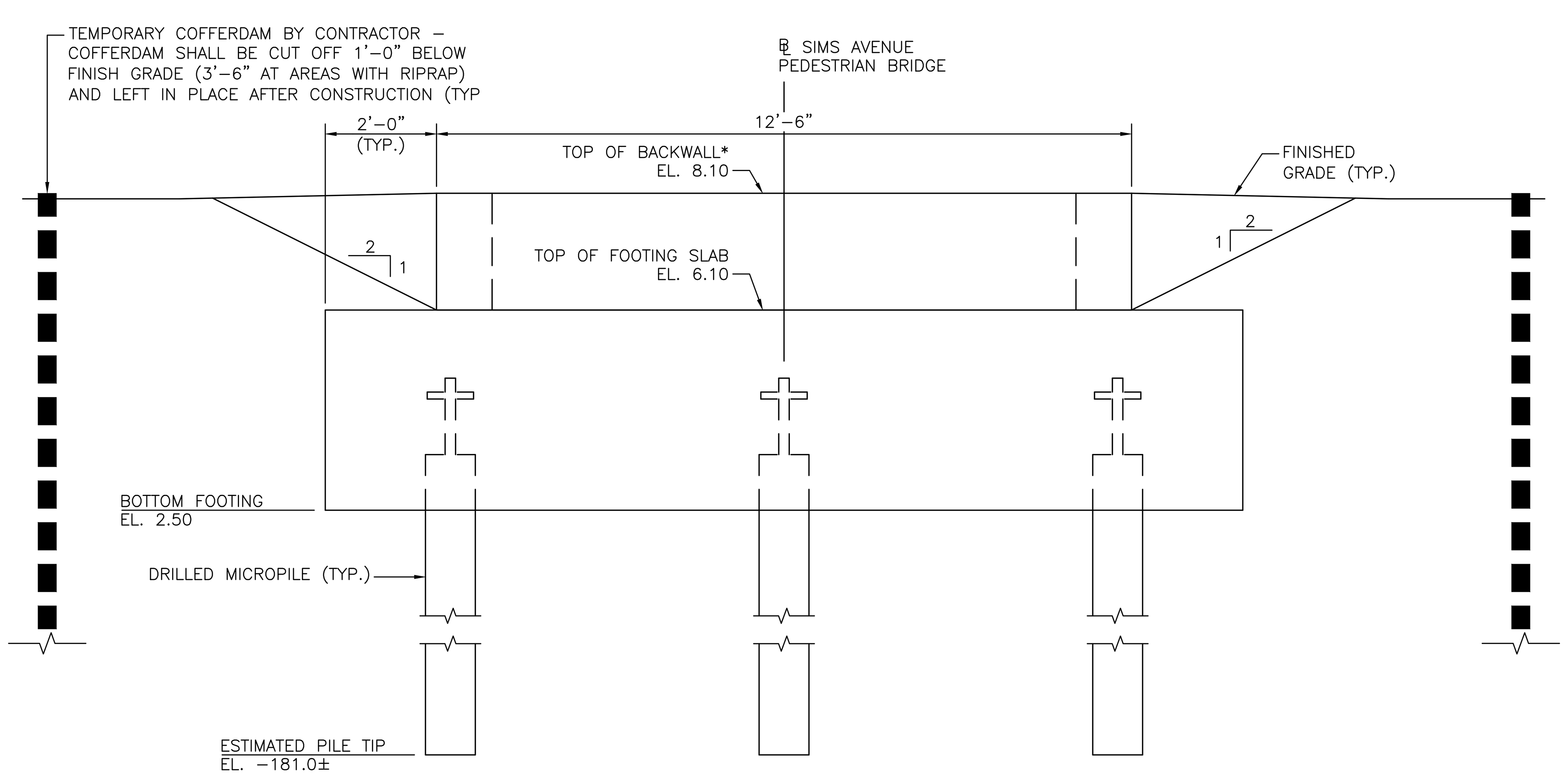
NORTH ABUTMENT PLAN

SCALE: ½" = 1'-0"



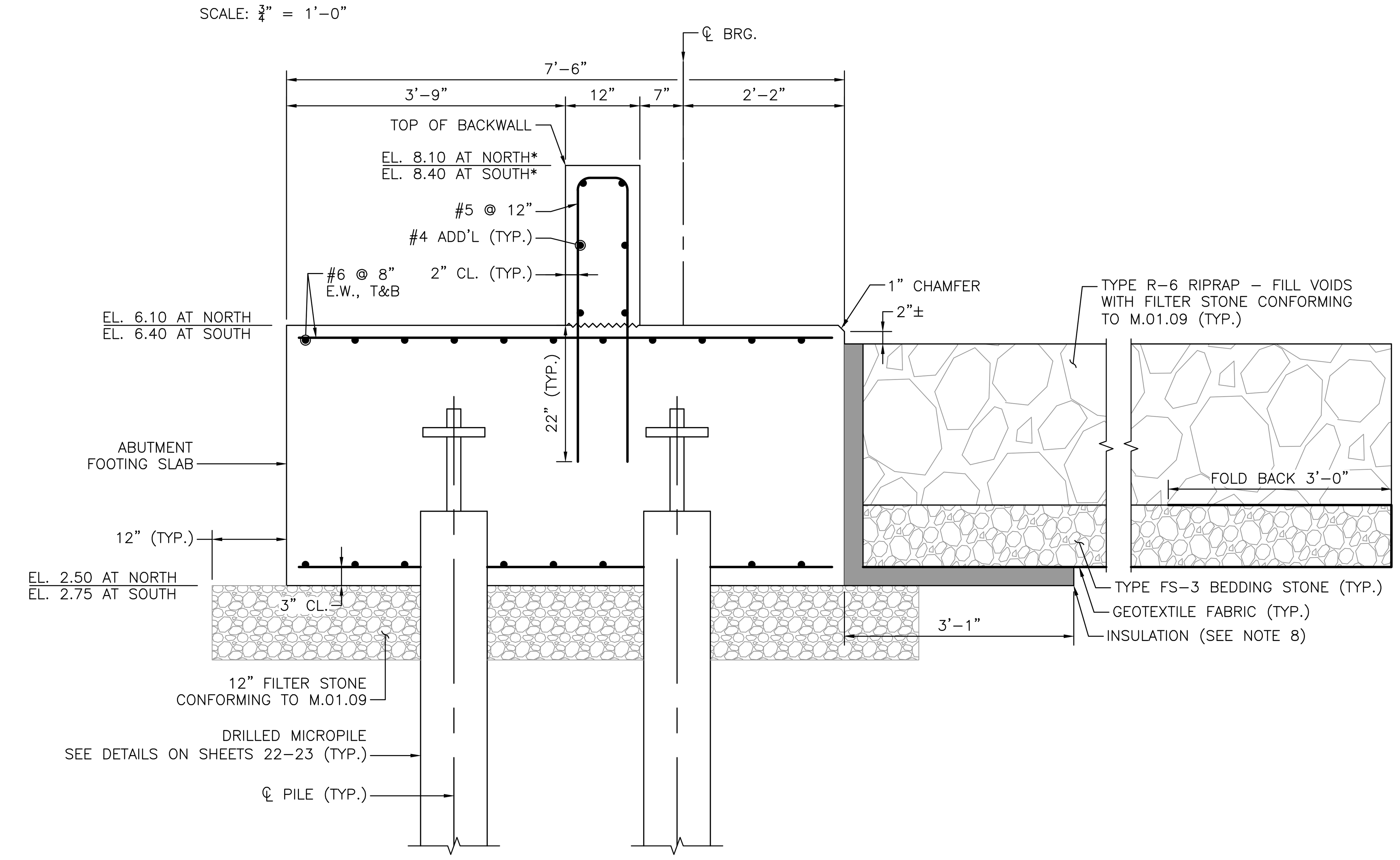
END OF BRIDGE DETAIL

SCALE: ¾" = 1'-0"



NORTH ABUTMENT ELEVATION

SCALE: ½" = 1'-0"



SECTION 2 – TYPICAL ABUTMENT SECTION

SCALE: ¾" = 1'-0"

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS

DRAWN BY: DW

DESIGNED BY: DW

CHECKED BY: CWJ

REGISTERED PROFESSIONAL

PREPARED BY

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TITLE

SIMS AVENUE PEDESTRIAN BRIDGE
PROVIDENCE, RHODE ISLAND

NORTH ABUTMENT PLAN, ELEVATION, & DETAILS

BETA JOB NO. 6620

ISSUE DATE SEPTEMBER 12, 2022

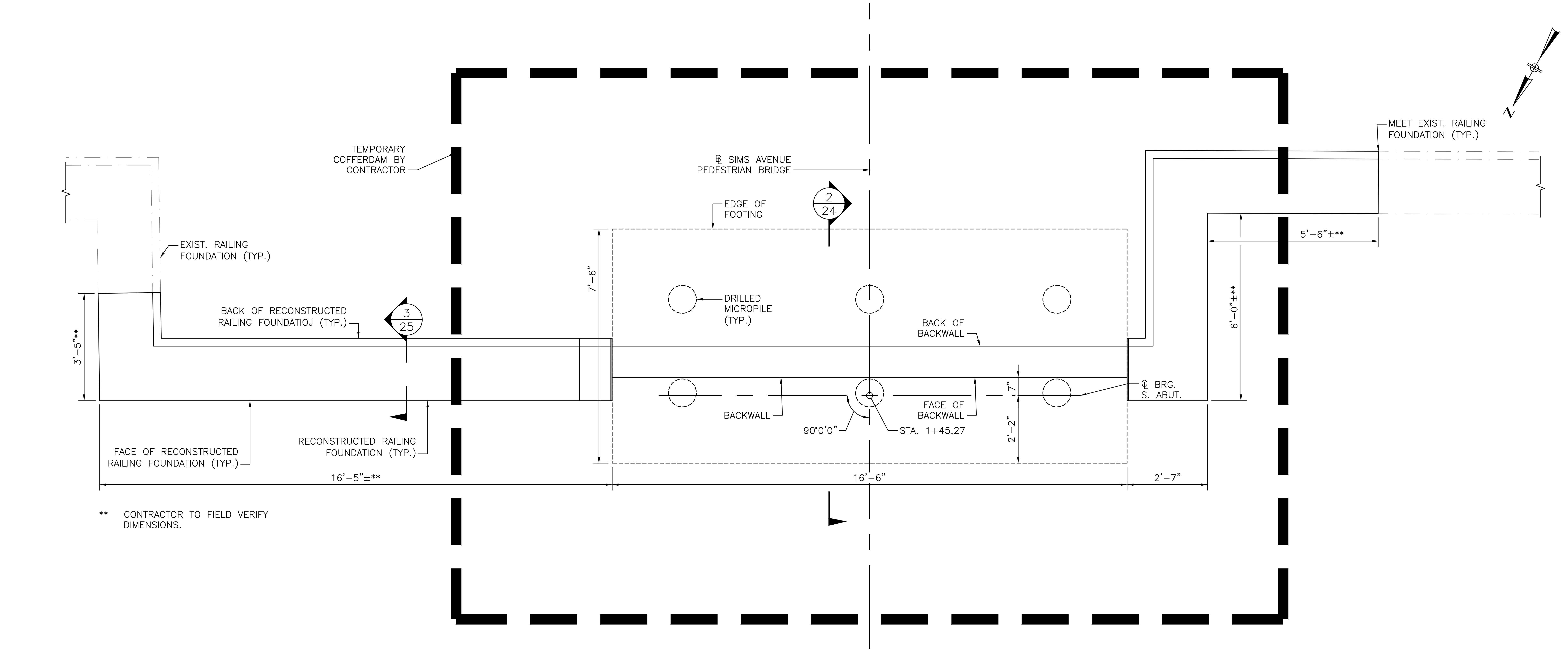
SHEET NO. 24 OF 26

ABUTMENT NOTES:

1. SEE NOTES ON SHEET 24.

RAILING FOUNDATION NOTES:

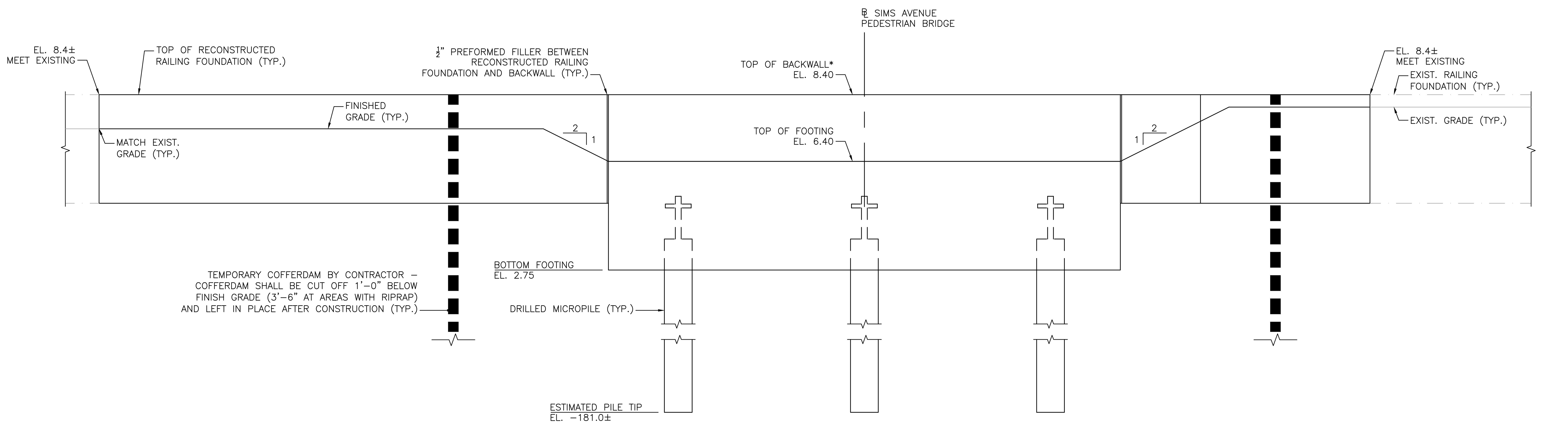
1. ALL REINFORCEMENT SHALL BE GALVANIZED.
2. RAILING FOOTING CONCRETE SHALL BE CLASS HP ¾".



** CONTRACTOR TO FIELD VERIFY DIMENSIONS.

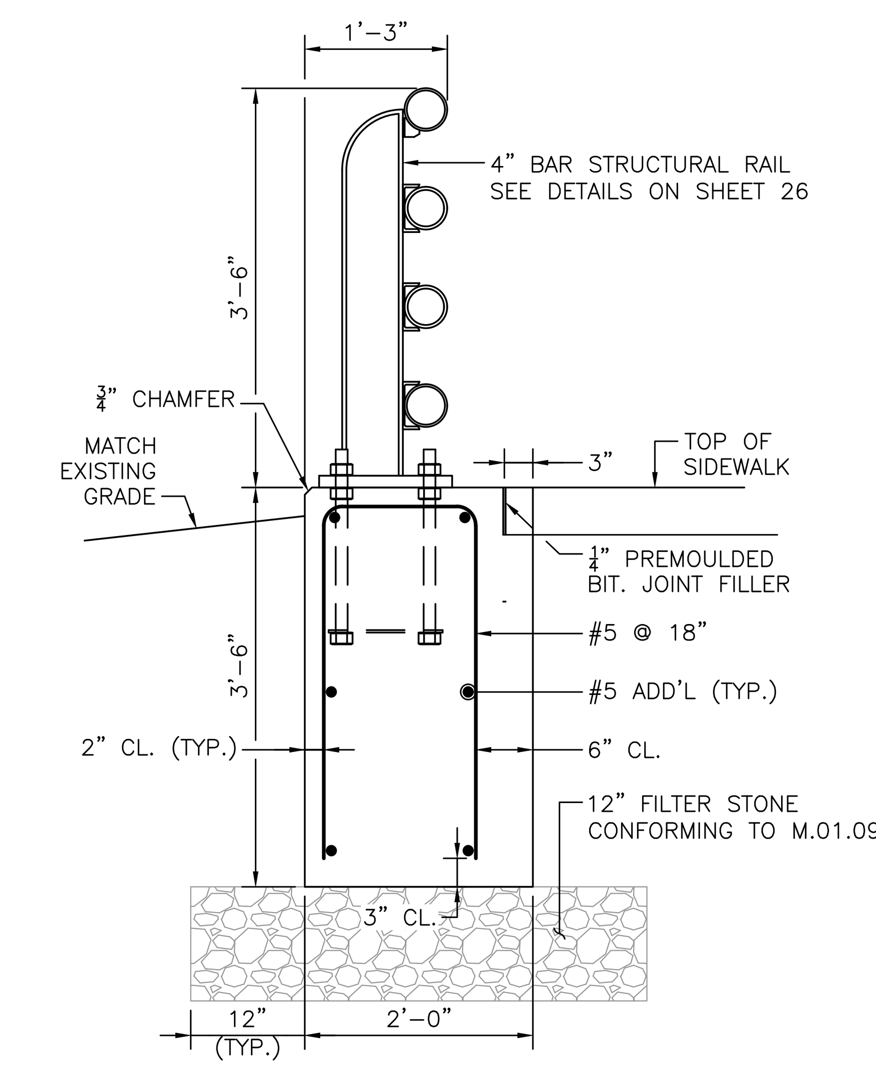
SOUTH ABUTMENT PLAN

SCALE: ½" = 1'-0"



SOUTH ABUTMENT ELEVATION

SCALE: ½" = 1'-0"



SECTION 3 – RECONSTRUCTED RAILING FOUNDATIOM

SCALE: ¾" = 1'-0"

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PROVIDENCE, RHODE ISLAND
SOUTH ABUTMENT PLAN, ELEVATION, & DETAILS

BETA JOB NO. 6620
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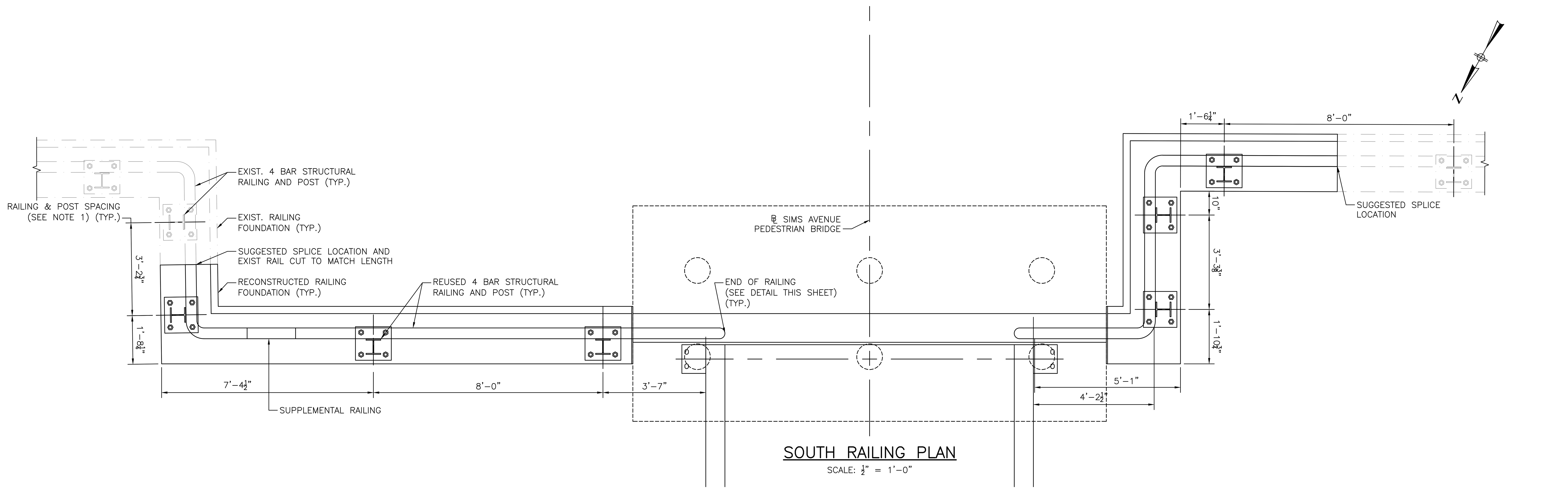
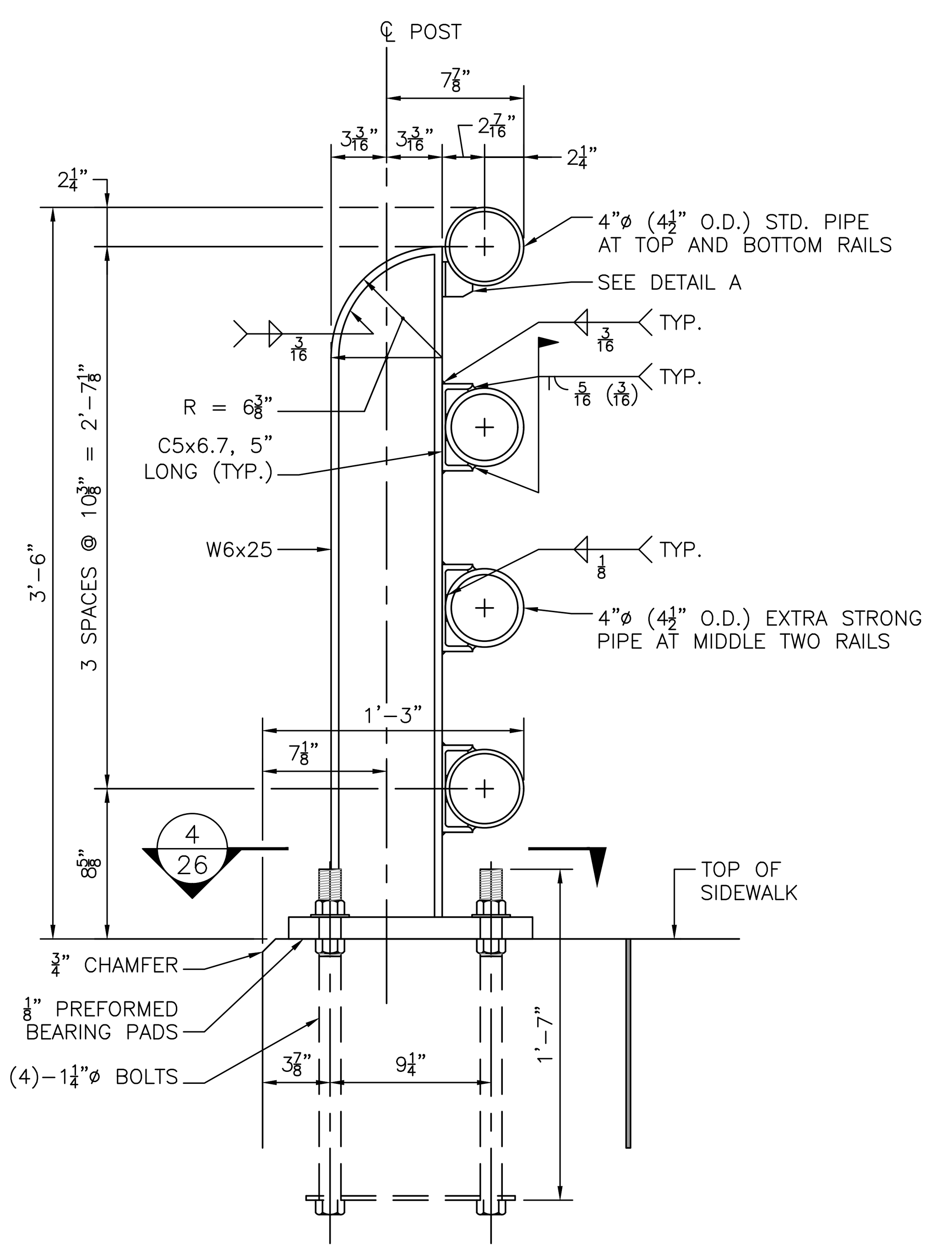


SOUTH RAILING PLAN

SCALE: ½" = 1'-0"

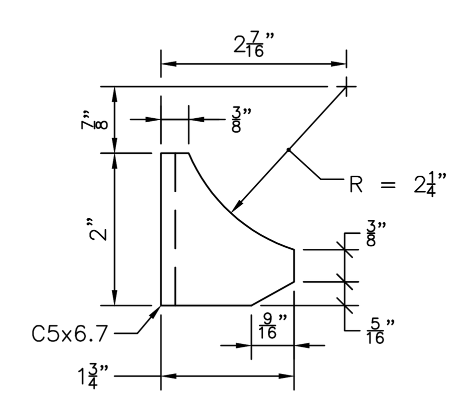
RAILING NOTES:

1. RAILING AND POST SPACING ARE TAKEN FROM EDGE OF FOOTING, CENTER OF POST, AND END OF RAILING. PRIOR TO SETTING RAILING AND POSTS, CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. THE ENTIRE RAILING SYSTEM SHALL BE GALVANIZED ACCORDING TO (ASTM A123) AASHTO M111 AND PAINTED AS REQUIRED BY SPECIFICATIONS.
3. STEEL PIPE RAILING SHALL BE ASTM A53 GRADE B STANDARD AND EXTRA STRONG.
4. STRUCTURAL SHAPES AND PLATES SHALL BE ASTM A36.
5. ANCHOR BOLTS SHALL BE ASTM A307.
6. GALVANIZE ENTIRE ANCHOR BOLT ASSEMBLY.
7. RAIL POST SHALL BE SET VERTICAL IN THE FIELD. PREFORMED BEARING PADS SHALL BE USED UNDER BASE PLATES TO MAKE UP THE DIFFERENCE BETWEEN THE FABRICATED POST UNIT AND THE TOP SURFACE OF THE FOUNDATION MODULE.
8. THE RAILS SHALL BE WELDED PARALLEL TO THE TOP SURFACE OF THE FOUNDATION MODULE WHICH SHALL MATCH THE SLOPE AND TOP SURFACE OF THE SIDEWALK.
9. RAIL JOINTS SHALL BE PLACED AT ALL JOINTS IN FOUNDATION MODULE.
10. PROVIDE EXPANSION JOINTS BETWEEN EACH MODULE. USE ¼" PREMOULDED JOINT FILLER.
11. SEAL BACKFACE OF ALL JOINTS BETWEEN 7'-6" MODULES WITH ¼"x½" POLYURETHANE JOINT SEALANT. COLOR TO BE AT DISCRETION OF CONTRACTOR.
12. SURFACE RUB EXPOSED FACES AND/OR TOP.
13. ANY EXIST RAILING REMOVED AND REUSED
14. PREFORMED BEARING PADS (⅛" THICK) SHALL CONFIRM TO AASHTO M251



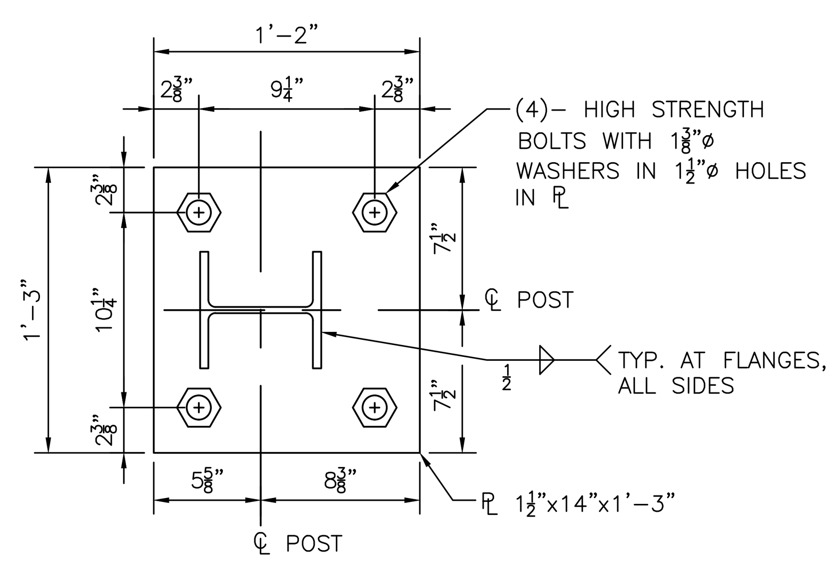
4 BAR STRUCTURAL RAILING DETAIL

SCALE: 1½" = 1'-0"



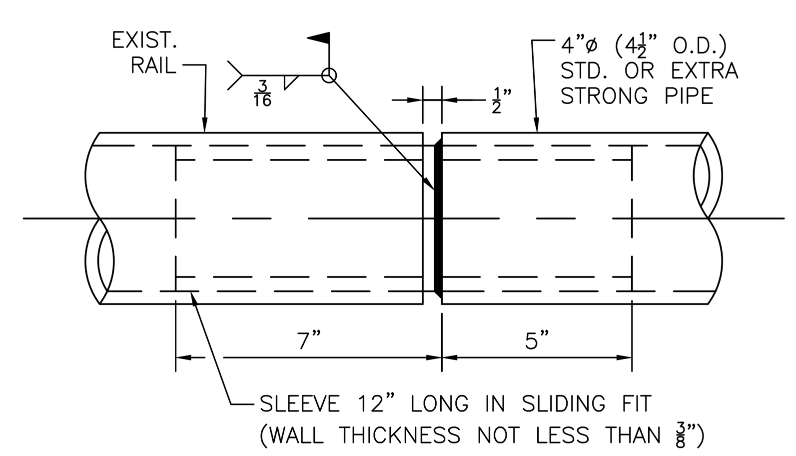
DETAIL A

SCALE: 6" = 1'-0"



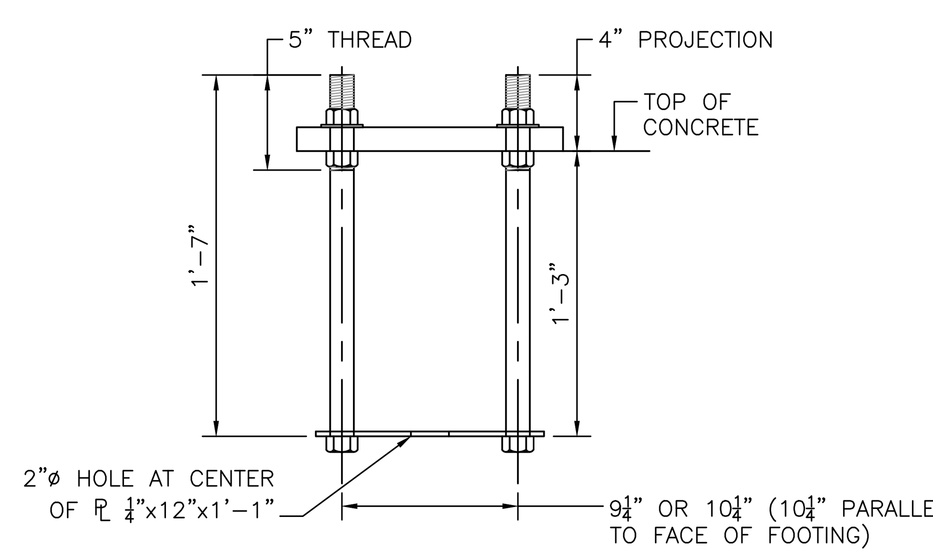
SECTION 4 – BASEPLATE DETAIL

SCALE: 1½" = 1'-0"



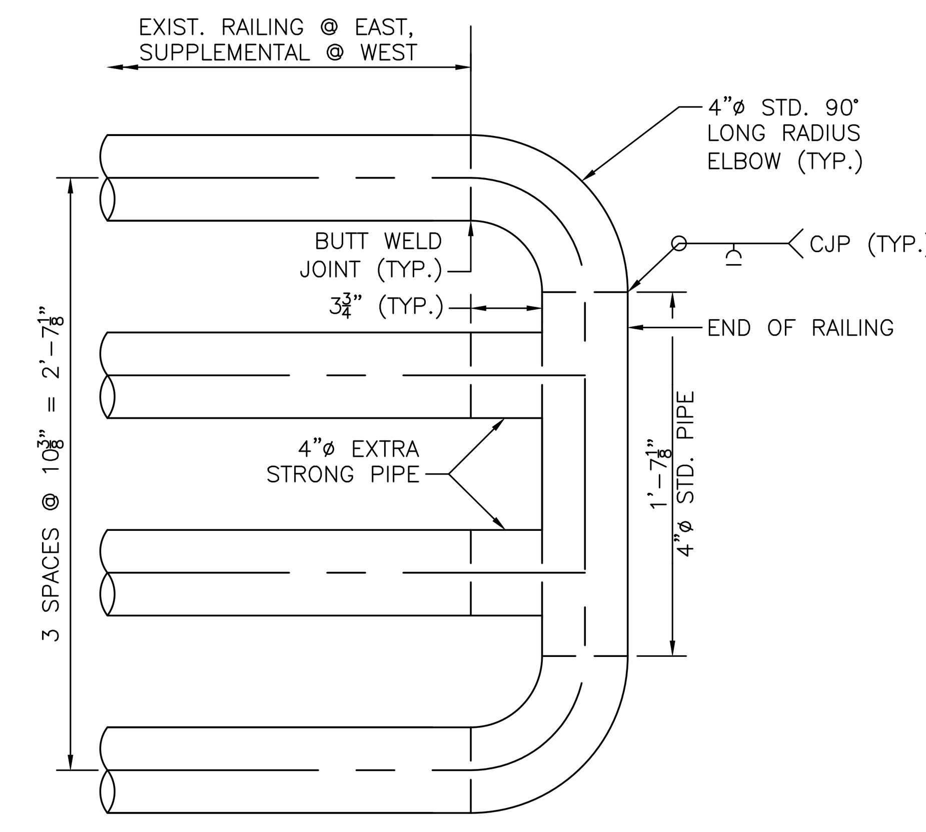
RAILING SPLICE DETAIL

SCALE: 3" = 1'-0"



ANCHOR BOLT DETAIL

SCALE: 1½" = 1'-0"



END OF RAILING DETAIL

SCALE: 1½" = 1'-0"

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SHEET NO. 26 OF 26