

# East Hartford Connecticut Flood Control System Toe Drain Repair Project Phase 1

East Hartford, Connecticut

**BID NO. 20-18**

**ISSUED FOR BID  
CONTRACT DOCUMENTS**



**Town of East Hartford**  
Department of Public Works  
Engineering Division

MAYOR  
HONORABLE MARCIA A. LECLERC

PUBLIC WORKS DIRECTOR  
John Lawlor, Jr.

TOWN ENGINEER  
DOUGLAS WILSON, P.E.

*Prepared by:*  
**GEI Consultants, Inc.**  
455 Winding Brook Drive, Suite 201  
Glastonbury, CT 06033

GEI Project 124390  
March 2020

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Invitation to Bid

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MARCIA LECLERC  
MAYOR

# TOWN OF EAST HARTFORD

740 Main Street

East Hartford, Connecticut 06108

(860) 291-7270

FAX (860) 282-4857

PURCHASING DEPARTMENT

## TOWN OF EAST HARTFORD, CT INVITATION TO BID

BID # 20-18

RE: East Hartford Flood Control System Toe Drain Phase 1 Repair Project

Sealed bids will be received at the office of the purchasing agent, 740 Main St., East Hartford, CT 06108 until ~~Wednesday, April 8, 2020~~ **Wednesday, April 15, 2020** at 11 a.m. at which time they will be publicly opened and read. **See the attached *Bid Process Changes Due to COVID-19*.**

~~A non-mandatory pre-bid conference will be held on Thursday, March 19, 2020 at 10:00 AM in the Welling Conference Room (2<sup>nd</sup> Floor of Town Hall) at 740 Main Street, East Hartford, CT.~~

The project consists of replacing about 2,400 linear feet of existing toe drain pipe with new pipe and graded filter. The main features of work include, but are not limited to, the following items:

- Site preparation, clearing and grubbing topsoil stripping, stockpiling and spreading.
- General site earthwork including excavation, stockpiling, disposal, backfilling and grading.
- Removal of existing vitrified clay and porous concrete pipe.
- Placement of new slotted PVC pipe with graded aggregate filter and manholes.
- Reconstructing sidewalks and bituminous pavement.
- Site Restoration and seeding.
- Miscellaneous Construction: To include construction fencing, erosion and sediment control devices; slope protection, site maintenance, and grouting abandoned portions of the toe drain.

IN ORDER TO BE CONSIDERED AN OFFICIAL PLAN HOLDER AND ELIGIBLE BIDDER FOR THE PROJECT, THE PURCHASING AGENT MUST RECEIVE AN EMAIL indicating interest in bidding, company information, and main contact information on, or before, Friday, April 3, 2020. All companies that ~~send a representative to the non-mandatory pre-bid meeting or~~ register on the Town's website to download the documents will also be considered an official plan holder eligible to bid the project.

Requests for information (RFIs) will be accepted via email to the Purchasing Agent on or before Friday, April 3, 2020 at 4 PM.

Drawings and Specifications will be available for review at the office of the Purchasing Agent, East Hartford Town Hall, 740 Main Street, East Hartford, CT. (Between the hours of 8:30 am to 4:30 pm, Monday through Friday) and on the Town of East Hartford's Purchasing Website: <http://www.easthartfordct.gov/bids>

The Town reserves the right to reject any or all bids, or any part of all bids, to waive any informality, and reserves all other rights as detailed in the Contract Documents when such action is in the best interest of the Town. The Town is an equal opportunity employer. Contractor must comply with all Federal, State and Local requirements under this contract.

**Addendum No. 1 & 3**

All bidders are requested to note that the award of this Contract is subject to the following conditions and contingencies:

1. The approval of such governmental agencies as may be required by law.
2. The appropriation of adequate funds by the proper agencies.

A five percent (5%) bid bond will be required of all bidders and a one hundred percent (100%) performance/payment bond will be required of the awarded bidder.

The right is reserved to reject any and all bids when such action is deemed to be in the best interest of the Town of East Hartford, CT.

Michelle A. Enman  
Purchasing Agent  
(860) 291-7270

## EFFECTIVE IMMEDIATELY: BID PROCESS CHANGES DUE TO COVID-19

Due to the current health crisis, the Town of East Hartford Purchasing Department is implementing new procedures for bid openings.

1. Bid responses will be received at the time indicated in bid documents. Due to the fact that Town Hall is closed to the public, vendors must utilize the United States Postal Service, UPS or Fed Ex to send in their bid. All bids must be received prior to the bid opening date and time stated in the bid. *No Bids will be accepted by any other method including being dropped off by a staff member.*
2. Bid openings will be held virtually through Microsoft Teams. To view the bid opening live, you must email me the correct email that will be used to view the bid opening. Then, you will get an invite to participate. After you receive the invitation, then follow the instructions to log into the meeting.
3. The virtual bid opening will be held **\*\*30 minutes\*\*** after responses are due, to give vendors time to log-in.
4. The virtual bid opening will be exactly the same as a regular bid opening – the Purchasing Department staff will open the bid and read the results out loud. Results are not final until reviewed, and the requisitioning department will recommend award after a complete analysis of the submissions. Tabulations for bids will be compiled and posted to the Purchasing Department website. As normally done, Request for Proposals & Request (R.F.P.) and Request for Qualifications (R.F.Q.) submissions will only be opened and the name of the company will be recorded. Hourly rates and qualifications on the R.F.P.'s & R.F.Q.'s will not be read out loud.

We are learning more about COVID-19 every day, and our goal in East Hartford is to balance the health and well-being of our community with the need to keep Town business moving forward in a safe manner. We will be reassessing daily and any changes will be posted on the Purchasing Department's web page at [www.easthartfordct.gov/purchasing](http://www.easthartfordct.gov/purchasing).

Questions: Call the Purchasing Department at (860) 291-7271 or email at [menman@easthartfordct.gov](mailto:menman@easthartfordct.gov)

Michelle Enman  
Purchasing Agent  
Town of East Hartford



## TOWN OF EAST HARTFORD, CONNECTICUT

### STANDARD INSTRUCTIONS FOR BIDDERS

1. Sealed bid proposals will be received by the purchasing agent until the date and time indicated on the Invitation to Bid. Bids received later than the date and time specified will not be considered and will be returned unopened.
2. Bids are to be returned with the bid number prominently indicated on any other mailing envelope. The name and address of the bidder should appear in the upper left hand corner of the envelope.  
**Bids will not be accepted via fax or e-mail.**
3. All proposals will be opened and read publicly and are subject to public inspection. Bidders may be present or represented at all openings. Bid results are mailed to all responding bidders.
4. Municipalities are exempt from any sale, excise or federal taxes. Bid prices must be exclusive of taxes and will be so construed.
5. The Town of East Hartford reserves the right to reject any or all bids or any part of all bids and to waive any informality when such action is in the best interest of the Town. The Town also reserves the right to extend by mutual consent an awarded bid when such action is in its best interest.
6. Bidders should familiarize themselves with all of the terms and conditions set forth in the bid specifications. Failure by the bidder to familiarize himself with these terms and conditions does not excuse the bidder from fulfillment of the bid specifications.
7. All entities doing business with the Town certify, upon acceptance of a bid and by virtue of their signature on that bid, that they have read, understood and will comply with the section of the Town's updated plan of affirmative action and equal opportunity relating to contractual and purchasing procedures – Section VIII Dated 01/88. The bidder agrees to cooperate fully should the Town choose to audit this compliance.
8. In case of an error in the extension or addition of prices, the unit price will govern. The Town will not be subject to any price increases after a bid award, unless it was part of the original bid terms.
9. The Town reserves the right to increase or decrease quantities listed in order to stay within the allocated funding at time of bid opening.
10. The Purchasing Department has the obligation to accept the lowest responsible bid which is in the Town's best interest. Factors include, but are not limited to: price, compliance to specifications, quality offered, freight costs, delivery time, past performance, standardization of current equipment, financial resources, technical qualifications, equipment and experience.
11. Bidders shall state in writing and attach to the bid, any conditions/exceptions that are part of the bid price. Comments to the effect "see literature" will not be acceptable.
12. Any manufacturers' names, trade names, brand names or catalog numbers used in the specifications are there for the purpose of establishing and describing general performance and quality levels. Such references are not intended to be restrictive and bids are invited on these and approved equal brands or products of any manufacturer.

TOWN OF EAST HARTFORD, CONNECTICUT

STANDARD INSTRUCTIONS FOR BIDDERS (*cont'd*)

13. The Town's competitive bidding process is not a means for competitors to obtain private/proprietary information that is not otherwise normally available. Such information relates to a bidder's financial records and responsibility, test data, manufacturing drawings, formulas and processes. To promote competition and protect valid interests this type of information/data will remain confidential.
14. All bidder questions shall be directed to the Purchasing Agent. Procedural and clarification questions will be answered appropriately. Questions that require an answer that will in effect change/alter the intent of the specifications will only be answered in writing to all bidders by a bid addendum.
15. Awarded bidders are responsible for obtaining all necessary permits as required by OSHA, Federal, State and/or Town regulations. Town permits will be issued at no cost.
16. Alternate proposals will not be considered unless specifically called for in the bid.
17. Prices shall include packing, transportation and delivery charges F.O.B. to East Hartford/delivered unless specifically noted otherwise.
18. Bidder declares that the proposal is not made in connection with any other bidder submitting a proposal for the same bid and is in all respects fair and without collusion or fraud.
19. Cash discounts may be offered by bidder for prompt payment of bills, but such cash discount will not be taken into consideration in determining the awarded low bidder except in the case of tie bids and then only provided such discount is based on payment of invoice not less than fourteen (14) days after satisfactory delivery and/or receipt of invoice, whichever is later.
20. The Town will not award a bid to any bidder who owes a delinquent tax to the Town. Bidders certify by virtue of their signature on the bid sheet that neither the bidder nor any business or corporation which the Bidder owns an interest is delinquent in tax obligations to the Town. The Purchasing Department will verify that no delinquent taxes are owed before any bid is awarded.
21. All bidders shall include a corporate resolution with your submittal. Sample formats for Corporations and Professional Corporations, Limited Liability Company and Partnerships (including Limited Partnership and Limited Liability Partnership) are attached in this packet
22. The bidding entity is required to provide evidence from the Connecticut Secretary of State that they are in good standing and qualified to conduct business in the State of Connecticut.



TOWN OF EAST HARTFORD, CONNECTICUT

INSTRUCTIONS FOR  
CONSTRUCTION AND/OR LABOR SERVICE BIDS

1. A *Certificate of Insurance* naming the Town as an additional insured will be required of the awarded bidder. The insurance indemnification clause is contained with the bid specifications (see *Insurance Requirements*).
2. This is a prevailing wage bid and the wage rates are attached within the Bid Specifications. In accordance with state law, each contract for the construction, remodeling or repair of any public building or public works or improvements shall contain the following provision when the cost of construction, remodeling or repair exceeds the limits as provided in Connecticut General Statutes 31-53; “the wages paid on an hourly basis to any mechanic, laborer or workman employed upon the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such employee to any employee welfare fund, as defined in Subsection (h) of Section 31-53 for the Connecticut General Statutes, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the Town of East Hartford. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such employees to any such employee welfare fund shall pay to each employee as parts of his wages the amount of payment or contribution for his classification on each pay day”.
3. This project does not need to comply with CHRO contract compliance requirements.
4. A Bid Bond must be submitted with the bid and may be in the form of certified check or cashier’s check **payable to “The Town of East Hartford” or a bond of a surety company authorized to transact business in the State of Connecticut.** No checks will be returned until the bid is awarded. If you are the awarded bidder, your check will be held until it is replaced with another Guarantee of Performance. **Bid Bond shall be 5% (five percent) of total bid price.**
5. A Guarantee of Performance will be required of the awarded bidder and may be in the form of a certified check or cashier’s check payable to “The Town of East Hartford” or a bond of a surety company authorized to transact business in the State of Connecticut. Checks will be retained by the Town for period of time after final acceptance and payment as determined by the complexity of the project. **Performance Bond shall be 100% (one hundred percent) of awarded bid price.**
6. A Guarantee of Payment will be required of the awarded bidder and may be in the form of a certified check or cashier’s check payable to “The Town of East Hartford” or a bond of a surety company authorized to transact business in the State of Connecticut. Checks will be retained by the Town for period of time after final acceptance and payment as determined by the complexity of the project. Labor and Material Bond shall be 100% (one hundred percent) of awarded bid price.
7. The Town requires the contractor to carry an umbrella liability insurance policy with a minimum limit of \$5,000,000



TOWN OF EAST HARTFORD, CONNECTICUT

INSTRUCTIONS FOR CONSTRUCTION AND/OR LABOR SERVICE BIDS (*cont'd*)

8. Before starting any work awarded bidders are responsible for obtaining permits as required by Federal, State, MDC, Utilities and/or Town regulations. Any applicable fees shall be included in the total bid price. Town of East Hartford permits will be issued at no charge.
9. The bidder shall abide by all OSHA, Federal, State and local laws, ordinances and regulation, which any manner affect those engaged or employed on the Work, or the materials or equipment used in the Work, or in any way affect the conduct of the Work, and no pleas of misunderstanding will be considered on account of ignorance. If bidder shall discover any provisions in the drawings, specifications or contract, which are in conflict with any such law, by-law or ordinance or regulation, he shall report it to the Town in writing with the bid proposal.
10. Throughout the work period, the contractor shall maintain the work site in a generally accepted standard of cleanliness, free from accumulation of waste materials or rubbish caused by his operations and shall take prompt action to correct any hazardous conditions reported.
11. It is the responsibility of each bidder before submitting a bid, to familiarize themselves with the specifications and conditions that may affect cost, progress, performance or completion of the project.
12. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with generally accepted industry standards.
13. Unless otherwise specified, the contractor shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, fuel, appliances, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.
14. The Contractor may utilize the services of specialty subcontractors on those parts of the Work which, under normal contracting practices, are performed by specialty subcontractors. The Contractor shall not award any work to any subcontractor without prior written approval of the Town, which approval will not be given until the Contractor submits to the Town a written statement concerning the proposed award to the subcontractor, which statement will contain such information as the Town may require. The Contractor shall be as fully responsible to the Town for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of person directly employed by him. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and other contract documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards to terminating any subcontract that the Town may exercise over the Contractor under any provision of the Contract documents. Nothing contained in this bid shall create any contractual relation between any subcontractor and the Town.
15. The Contractor shall not assign the whole or any part of this contract or any moneys due or to become without written consent of the Town, which in its sole discretion may be denied. In case the Contractor assigns all or any part of any moneys due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and or any moneys due or to become due to the contractor shall be subject to prior claims of all

TOWN OF EAST HARTFORD, CONNECTICUT

INSTRUCTIONS FOR CONSTRUCTION AND/OR LABOR SERVICE BIDS (*cont'd*)

person, firms and corporations for services rendered or materials supplied for the performance of the Work called for in this contract.

16. The submission of a bid offer will constitute an incontrovertible representation by the bidder that he/she has complied with every requirement of the specifications and that the bid documents are sufficient in scope and detail and convey understanding of all terms and conditions for performance of the Work.



## TOWN OF EAST HARTFORD, CONNECTICUT

### INDEMNIFICATION AND INSURANCE REQUIREMENTS FOR CONSTRUCTION, PROFESSIONAL OR LABOR SERVICE BIDS

*NOTE: CERTIFICATE OF INSURANCE WILL ONLY BE REQUIRED OF THE AWARDED BIDDER*

#### A. INDEMNIFICATION

##### **THE AWARDED BIDDER WILL BE REQUIRED TO AGREE TO THE FOLLOWING INDEMNIFICATION LANGUAGE**

To the fullest extent permitted by law, THE AWARDED BIDDER agrees on behalf of itself and its successors and assigns, covenants and agrees at its sole cost and expense, to protect, defend, indemnify, release and hold the Town of East Hartford, its agents, servants, officials, employees, volunteers and members of its boards and commissions (Collectively the "Town of East Hartford"), harmless from and against any and all Losses (defined below) imposed upon or incurred by or asserted against the Town of East Hartford by reason of bodily injury, personal injury, death, or property damage of whatsoever kind or nature, to any individuals or parties (including, but not limited to the Town of East Hartford, the Awarded Bidder, or any other third party) arising out of or resulting from, or alleged to arise out of or arise from Awarded Bidder's performance of its work under the contract, but only to the extent such Losses are attributable to the negligent or intentional act, error or omission of the Awarded Bidder or any person or organization employed or engaged by Awarded Bidder to perform all or any part of the contract. The term "Losses" includes any losses, damages, costs, fees, expenses, claims, suits, judgments, awards, liabilities (including, but not limited to, strict liabilities), obligations, debts, fines, penalties, charges, amounts paid in settlement, foreseeable and unforeseeable consequential damages, litigation costs, attorneys' fees, expert's fees, and investigation costs, of whatever kind or nature, and whether or not incurred in connection with any judicial or administrative proceedings, actions, claims, suits, judgments or awards.

Upon written request by the Town of East Hartford, the Awarded Bidder shall defend and provide legal representation to the Town of East Hartford with respect to any of the matters referenced above. Notwithstanding the foregoing, the Town of East Hartford may, in its sole and absolute discretion, engage its own attorneys and other professionals to defend or assist it with respect to such matters and, at the option of the Town of East Hartford, its attorneys shall control the resolution of such matters. Upon demand, the Awarded Bidder shall pay or, in the sole and absolute discretion of the Town of East Hartford, reimburse, the Town of East Hartford for the payment of reasonable fees and disbursements of attorneys and other professionals in connection with this contract.

**THE TOWN OF EAST HARTFORD WILL NOT AGREE TO INDEMNIFY THE AWARDED BIDDER;  
SUBCONTRACTOR(S); OR INDEPENDENT CONTRACTOR**

TOWN OF EAST HARTFORD, CONNECTICUT

INDEMNIFICATION AND INSURANCE REQUIREMENTS FOR  
CONSTRUCTION, PROFESSIONAL OR LABOR SERVICE BIDS

(cont'd)

B. INSURANCE

1. GENERAL REQUIREMENTS

The AWARDED BIDDER shall be responsible for maintaining insurance coverage in force for the life of this contract of the kinds and adequate amounts to secure all of the AWARDED BIDDERS's obligations under this contract with an insurance company(ies) with an AM Best Rating of A-VII or better licensed to write such insurance in the State of Connecticut and acceptable to the Town of East Hartford.

Additional Insured: **The Town of East Hartford, its officials, employees, volunteers, boards and commissions must be included as an Additional Insured on the AWARDED BIDDER'S Insurance Policies** (except Workers' Compensation and Professional Errors & Omissions). Evidence of this must be provided upon inception of this contract and upon renewal of insurance by the AWARDED BIDDER to the Town of East Hartford in the form of language on a Certificate of Insurance as well as a policy endorsement.

The AWARDED BIDDER shall provide the Town of East Hartford with a Certificate(s) of Insurance signed by an authorized representative of the insurance company(ies) prior to the performance of this contract describing the coverage and providing that the insurer shall give the Town of East Hartford written notice at least thirty (30) days in advance of any termination, expiration, or any and all changes in coverage. Such insurance or renewals or replacements thereof shall remain in force during the AWARDED BIDDER'S responsibility under this contract. Failure to provide or maintain any of the insurance coverage required herein shall constitute a breach of the Contract.

2. SPECIFIC REQUIREMENTS:

a) Commercial General Liability Insurance

The AWARDED BIDDER shall carry Commercial General Liability Insurance (broad form coverage) insuring against claims for bodily injury, property damage, personal injury and advertising injury that shall be no less comprehensive and no more restrictive than the coverage provided by Insurance Services Office (ISO) form for Commercial General (CG 0001 04/2013). By its terms or appropriate endorsements such insurance shall include the following coverage, to wit: Bodily Injury, Property Damage, Fire Legal Liability (not less than the replacement value of the portion of the premises occupied), Personal & Advertising Injury, Blanket Contractual, Independent Contractor's, Premises Operations, Products and Completed Operations (for a minimum of two (2) years following Final Completion of the Project). Any deviations from the standard unendorsed form will be noted on the Certificate of Insurance.

Type of Coverage:	Occurrence Basis
<b>Minimum</b> Amount of Coverage:	\$1,000,000 per occurrence
	\$2,000,000 aggregate
Policy Period:	Annual Policy

TOWN OF EAST HARTFORD, CONNECTICUT

INDEMNIFICATION AND INSURANCE REQUIREMENTS FOR  
CONSTRUCTION, PROFESSIONAL OR LABOR SERVICE BIDS

(cont'd)

b) Workers' Compensation and Employer's Liability Insurance

The AWARDED BIDDER shall provide Statutory Workers' Compensation Insurance as required by the State of Connecticut, including Employer's Liability.

Amount of Coverage: Coverage A:	Statutory
Coverage B (Employer Liability):	\$500,000 Each Accident
	\$500,000 Disease, Policy Limit
	\$500,000 Disease, Each Employee

c) Commercial Automobile Liability Insurance

The AWARDED BIDDER shall carry Commercial Automobile Liability Insurance insuring against claims for bodily injury and property damage and covering the ownership, maintenance or use of any auto or all owned/leased and non-owned and hired vehicles used in the performance of the Work, both on and off the Project Site, including loading and unloading. The coverage should be provided by Insurance Services Office form for Commercial Auto Coverage (CA CA0001 10/2013) or equivalent. "Auto" (symbol 1 or equivalent) is required. Any deviations from the standard unendorsed form will be noted on the Certificate of Insurance.

Type of Coverage:	Occurrence Basis
<b>Minimum</b> Amount of Coverage:	\$1,000,000 combined single limit
Policy Period:	Annual Policy

d) Umbrella Liability Insurance

The Town reserves the right to require the AWARDED BIDDER to carry an umbrella liability insurance policy up to **\$5,000,000**. The necessity and amount of umbrella liability insurance is dependent upon a number of factors including, but not limited to scope, price and duration of the work to be performed. The Town of East Hartford will inform the AWARDED BIDDER as to the necessity and limits for this insurance as soon as practicable, and has sole discretion of the limits to be required.

3. PROFESSIONAL SERVICE CONTRACTOR REQUIRMENTS

(e.g., Architects, Engineers, et al.)

The AWARDED BIDDER shall carry Errors & Omissions coverage in the **minimum** amount \$1,000,000 per claim/\$1,000,000 annual aggregate for all professional services contracts. If the insurance coverage is written on a Claims-Made basis, an extended reporting period of at least 3 years after substantial completion of the project is required. Increased coverage limits may be required based on the scope, price and duration of the work to be performed. The Town of East Hartford will inform the **AWARDED BIDDER** as to the required limits for this insurance as soon as practicable, and has sole discretion of the limits to be required.

4. SUBCONTRACTOR REQUIREMENTS:

TOWN OF EAST HARTFORD, CONNECTICUT

INDEMNIFICATION AND INSURANCE REQUIREMENTS FOR  
CONSTRUCTION, PROFESSIONAL OR LABOR SERVICE BIDS

*(cont'd)*

The AWARDED BIDDER shall require all subcontractors and independent contractors to carry the coverages set forth in section B. INSURANCE and will obtain appropriate Certificates of Insurance before the subcontractors and independent contractors are permitted to begin work.

The AWARDED BIDDER shall require that The Town of East Hartford, its officials, employees, volunteers, boards and commissions be included as an Additional Insured on all subcontractors and independent contractors insurance (except Workers' Compensation and Professional Errors & Omissions) before permitted to begin work.

The AWARDED BIDDER and all subcontractors and independent contractors and their insurers shall waive all rights of subrogation against the Town of East Hartford, and its officers, agents, servants and employees for losses arising from work performed by each on this contract.

**THE TOWN RESERVES THE RIGHT TO AMEND THE AMOUNTS OF  
COVERAGE REQUIRED AND TYPE OF COVERAGE PROVIDED BASED ON  
THE FINAL AGREED UPON SCOPE OF SERVICES**

*Updated 26 March 2020*

# Attachment A- Bid Summary

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# Project Objectives and Criteria for Award

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## Project Objectives

The purpose of this project is to make repairs to the existing toe drain associated with the flood control system. The repairs include replacing portions of the toe drain and abandoning portions of the toe drain system. The work is described in Technical Specification Section 01 11 00: Summary of Work

## Criteria for Award

The Town will award the contract to the lowest-priced responsible bid, which is in the Town's best interest. Lowest-priced responsible bid reflects a combination of competitive pricing and qualifications including the Contractor's:

- Price
- Quality Offered
- Construction Schedule
- Past Performance
- Financial Resources and Stability
- Technical Qualifications
- Equipment Available
- Contractor and Specialty Contractor Company and Staff Experience

Specific requirements for staff and company qualifications and experience are contained in the specifications.



# Proposal Organization and Content

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All proposals must be organized according to the following outline and include the content specified:

## 1.1 TOWN BID DOCUMENTS

- A. Executed Bid Form with the full legal name and business address of the Bidder (including its street address if it differs from its mailing address) signed and dated by a person or persons authorized (an officer of the Contractor company) to bind the Bidder.
- B. Completed Bid Schedule
- C. Bid Bond
- D. Corporate Resolution
- E. Collusion or Fraud Statement
- F. Contact Information

## 1.2 QUALIFICATIONS

- A. Company Experience/Qualifications (max 10 pages)
  - Contractor of Specialty Contractor's qualifications should demonstrate the following minimum experience:
    - At least five (5) completed drain pipe installations of similar size and complexity.
  - Provide the following information of each project used to demonstrate experience:
    - Name of project
    - Client name, and contact information for reference
    - Date of project completion
    - Company staff participating in project

## 1.3 PROJECT STAFFING PLAN

- A. Include resumes for at least the following key staff:
  - Full-time, on-site Superintendent
  - Project Manager (if different from Superintendent)
  - Officer-in-Charge (minimum VP-level corporate officer)The resumes and Superintendent, and Project Manager must demonstrate participation in at least three (3) of the completed projects in Company Experience/Qualifications.
- B. Procedure Plan, containing a narrative discussion of the bidders proposed approach to the Project (maximum length 15 pages of text). At a minimum, the plan must address the following issues:
  - 1. Summary of site security, site access and parking, traffic control, layout, organization, proposed work hours, and work sequence. Must be accompanied by at least one approximately 40-scale sketch showing the proposed location of all equipment, facilities, stockpiles, and traffic flow directions.

2. Proposed site storage and stockpiling operations including specific locations within the work area.
3. Proposed means of placing graded filter within drain trench excavation.
4. Proposed means of grout filling abandoned utility pipes.
5. Proposed means of dust and stormwater control.

#### 1.4 SCHEDULE

- A. Proposed schedule in Gantt chart format. At minimum, include the following tasks and subtasks:
  1. Mobilization
  2. Excavation and Pipe Installation
  3. Backfill
  4. Utility Abandonment
  5. Site restoration
  6. Demobilization

#### 1.5 SUBCONTRACTORS

- A. Roles and qualifications of proposed subcontractors.
- B. Names, company affiliations, qualifications, and license numbers of proposed engineers used for excavation support and dewatering design.

#### 1.6 OTHER INFORMATION

- A. Summary of significant pricing assumptions.
- B. Summary of contract exceptions, if any.

Company Name: \_\_\_\_\_

FORM OF GENERAL BID

BID NO. 20-18

Town of East Hartford  
Purchasing Agent  
740 Main Street  
East Hartford, CT 06108

Attn. Michelle Enman - Purchasing Agent

Having carefully examined the Invitation to Bid, Instructions for Construction and/or Labor Service bids, Insurance Requirements, Form of General Bid, General Conditions, Supplemental Conditions, Technical Specifications, Appendices, Contract Drawings and Exhibits for the furnishing of all materials, equipment, tools, labor and incidentals necessary to complete the Work "TOE DRAIN REPAIR PROJECT PHASE 1", as well as having carefully examined the site and having satisfied himself as to conditions affecting the proposed Work and all Addenda issued by the Town, transmitted to the undersigned by electronic mail prior to the date of opening of Bids, the undersigned proposes to complete all Work on the Contract Drawings and as described in the Bid Speciation, for the lump sum and unit prices for the Work (in place) for the items and estimated quantities shown on the Bid Proposal Sheet(s).

Bidder acknowledges receipt of the following addenda:

No. \_\_\_\_\_, dated \_\_\_\_\_, 20\_\_

No. \_\_\_\_\_, dated \_\_\_\_\_, 20\_\_

No. \_\_\_\_\_, dated \_\_\_\_\_, 20\_\_

No. \_\_\_\_\_, dated \_\_\_\_\_, 20\_\_

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**BID FORM**

TO THE PURCHASING AGENT  
TOWN OF EAST HARTFORD

- A. Pursuant to and in compliance with your Invitation to Bid and the Standard Instructions for Bidders and other documents relating thereto, the undersigned hereby proposes to furnish all the labor, materials, equipment and insurance required for or in connection with the Town of East Hartford, Connecticut, in strict accordance with the Specifications for the Construction of

**East Hartford Flood Control System  
Toe Drain Repair Project Phase 1**

- B. The undersigned, as bidder, declares that the only persons or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any other person, firm or corporation; that he has carefully examined the location of the proposed work, the proposed form of contract, the specifications and plans therein referred to and the Special Provisions hereto attached; and he proposes and agrees, if this proposal is accepted, that he will contract with the Town of East Hartford, in the form of contract contained herein, and that he will take in full payment the unit prices attached to this Bid Form.
- C. The undersigned understands that there may be changes, omissions, or modification in the work, and that appropriate adjustments will be made to the Contract price in accordance with the Contract Documents. The undersigned understands that the Owner reserves the right to accept or reject any or all bids, and to waive all formalities, any irregularities, and accept the Bid deemed to be in the Owner's best interest.
- D. The undersigned agrees that if within 30 days subsequent to the date of the opening of bids, notice that this proposal will be accepted by the Town of East Hartford shall be mailed to him at the at the business address given below, or shall be delivered to him, he will, within ten (10) days thereafter, deliver to the Town of East Hartford, where directed, a contract conforming to that annexed, properly executed in such number of counter-parts as may be required by the Town of East Hartford, with such changes therein as shall have been made by the Town of East Hartford prior to the time named for delivery of this proposal, together with a performance bond and a labor and material payment bond of a surety company, which surety company shall be authorized to transact business in the State of Connecticut and duly qualified therfor, the premiums for which are to be paid by the contractor and are included in the contract sum.
- E. The proposed contract sum is \_\_\_\_\_ dollars (numeric value).

- F. Bid prices shall not include any sales, excise or other taxes for which the Owner is not liable.
- G. Town of East Hartford is the awarding authority. The Bidder agrees to hold the above pricing for sixty (60) days, unless extended by mutual consent.
- H. The Bidder hereby agrees to commence Work under this Contract within ten (10) days of written Notice to Proceed from the Town, and to complete the Work of all base bid items within 12 WEEKS (84) CALENDAR DAYS thereafter. The Bidder further agrees to pay as liquidated damages, the sum of TWO THOUSAND DOLLARS (\$2,000.00) AS PER SP 8-10 for each consecutive calendar day beyond the date of completion. Liquidated damages are not intended as a penalty but rather shall be construed as a best estimate of damages which the Town will suffer due to Bidder's refusal, failure or neglect to perform pursuant to his Bid and Contract Documents.
- I. The Bid security in the sum of: 5% OF TOTAL BID is to become the property of the Town in the event the above forms are not executed within the time set forth above, as liquidated damages, and not as a penalty for the delay and additional expense to the Town caused thereby.
- J. The undersigned guarantees that if awarded the contract he will complete the entire work within \_\_\_\_\_ calendar days from the date of signing the contract. (In no case shall this be greater than the number of days specified in item "H" above.)

K. In submitting this bid, it is understood that the Town of East Hartford reserves the right to reject any or all bids and to waive any informalities in bidding, if it be in the public interest so to do. It is also agreed that this bid may not be withdrawn for a period of thirty (30) days following the date of opening the bids, without the consent of the Town of East Hartford.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

BUSINESS ADDRESS OF BIDDER

SIGNATURE OF BIDDER

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\_\_\_\_\_  
Name of Organization

By: \_\_\_\_\_

Title: \_\_\_\_\_

Contractor License: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Email Address: \_\_\_\_\_

Item No.	Description	Approx. Quantity	Units	Written Unit Price	Unit Price	Amount
<b>1</b>	<b>Initial General Items</b>					
1.01	Site Mobilization	1	Lump Sum	at _____ dollars and _____ cents per LUMP SUM		
<b>2</b>	<b>Erosion and Traffic Control</b>					
2.01	Silt Fence/Haybales	2,300	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
2.02	Anti-Tracking Pad	2	Each	at _____ dollars and _____ cents per EACH		
2.03	Catch Basin Erosion Protection	12	Each	at _____ dollars and _____ cents per EACH		
2.04	Temporary Fencing	2,300	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
2.05	Traffic Control Signage	1	Lump Sum	at _____ dollars and _____ cents per LUMP SUM		
2.06a	Traffic Control Person – Police Services	1	Direct Cost Allowance	at _____ dollars and _____ cents per MAXIMUM ALLOWANCE	\$10,000	\$10,000
2.06b	Traffic Control Person - Uniformed Flagger (include 5% markup)	100	Per Hour	at _____ dollars and _____ cents per HOUR		
<b>3</b>	<b>Toe Drain Replacement</b>					
3.01	Site Preparation and Maintenance	1	Lump Sum	at _____ dollars and _____ cents per LUMP SUM		
3.02	Demolition of Pavement	1,250	Square Yard	at _____ dollars and _____ cents per SQUARE YARD		
3.03	Demolition of Curb	725	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
3.04	Demolition of Sidewalks	135	Square Yard	at _____ dollars and _____ cents per SQUARE YARD		
3.05	Excavation	4,500	Cubic Yards	at _____ dollars and _____ cents per CUBIC YARD		

Item No.	Description	Approx. Quantity	Units	Written Unit Price	Unit Price	Amount
3.06	Backfill	2,100	Cubic Yards	at _____ dollars and _____ cents per CUBIC YARD		
3.07	Imported Ordinary Fill	0	Cubic Yards	at _____ dollars and _____ cents per CUBIC YARD		
3.08	Imported Pervious Fill	250	Cubic Yards	at _____ dollars and _____ cents per CUBIC YARD		
3.09	Filter Sand	1,525	Cubic Yards	at _____ dollars and _____ cents per CUBIC YARD		
3.10	Drain Aggregate	825	Cubic Yards	at _____ dollars and _____ cents per CUBIC YARD		
3.11	12" Dia. PVC Toe Drain	1,825	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
3.12	21" Dia. PVC Toe Drain	620	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
3.13	15" Dia. PVC Drain Pipe	27	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
3.14	Manhole	15	Each	at _____ dollars and _____ cents per EACH		
3.15	Manhole/Catch Basin Adjustment	2	Each	at _____ dollars and _____ cents per EACH		
3.16	Subbase	775	Ton	at _____ dollars and _____ cents per TON		
3.17	Bituminous Concrete	600	Ton	at _____ dollars and _____ cents per TON		
3.18	Concrete Sidewalk	135	Square Yard	at _____ dollars and _____ cents per SQUARE YARD		
3.19	Concrete Dumpster Pad	1	Lump Sum	at _____ dollars and _____ cents per Lump Sum		



Item No.	Description	Approx. Quantity	Units	Written Unit Price	Unit Price	Amount
3.20	Granite Curb	100	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
3.21	Bituminous Curb	750	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
3.22	Grouting of Existing Utilities	545	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
3.23	Cleaning Existing Storm Drain	355	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
3.24	Inspection of Existing Storm Drain	355	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
3.25	Disposal of Storm Drain Sediment	80	Ton	at _____ dollars and _____ cents per TON		
3.26	Disposal of Excess Soil	1,400	Ton	at _____ dollars and _____ cents per TON		
3.27	Disposal of Polluted Soil	315	Ton	at _____ dollars and _____ cents per TON		
3.28	Disposal of Contaminated Soil	1,750	Ton	at _____ dollars and _____ cents per TON		
<b>4</b>	<b>Site Restoration 1,2001,200</b>					
4.01	Topsoil	1,200	Square Yard	at _____ dollars and _____ cents per SQUARE YARD		
4.02	Seeding	7,250	Square Yard	at _____ dollars and _____ cents per SQUARE YARD		
4.03	Erosion Control Matting	5,500	Square Yard	at _____ dollars and _____ cents per SQUARE YARD		
4.04	Riprap Restoration	175	Square Yard	at _____ dollars and _____ cents per SQUARE YARD		

Item No.	Description	Approx. Quantity	Units	Written Unit Price	Unit Price	Amount
4.05	Pavement Markings	1,300	Linear Foot	at _____ dollars and _____ cents per LINEAR FOOT		
<b>5</b>	<b>Project Closeout</b>					
5.01	Demob/As-builts/Closeout	1	Lump Sum	at _____ dollars and _____ cents per LUMP SUM		

Base Bid Total: \$ \_\_\_\_\_

**NEW RESOLUTION FOR CORPORATIONS/PROFESSIONAL CORPORATIONS**

*(TO BE TYPED ON CORPORATION LETTERHEAD)*

I (name of Corporation's Secretary), Secretary of (legal name of Corporation) a Corporation duly organized and operating under the laws of (State) and qualified and authorized to do business in the State of Connecticut, DO HEREBY CERTIFY that the following is a true, correct and accurate copy of a Resolution duly adopted at a meeting of the Board of Directors of such Corporation, duly convened and held on (Date of Meeting), at which meeting a duly constituted quorum of the Board of Directors was present and voted in favor of such Resolution.

RESOLVED: That the following Officers of this Corporation, or any one of them individually:

(Name and title of Officer or Officers)

are empowered to execute and deliver, in the name of and on behalf of this Corporation, contracts, bids and other documents to the Town of East Hartford, State of Connecticut, and are further authorized to affix the Corporate Seal to such documents and to bind the Corporation to such contracts, bids and other documents.

I further CERTIFY that such Resolution has not been modified, rescinded or revoked since the date on which it was enacted, and it is at present in full force and effect.

IN WITNESS WHEREFORE, the undersigned has affixed his/her signature and the Corporate Seal of the Corporation, this (date) day of (month) 20\_\_

(Typed name of Corporation's Secretary)

SIGNATURE OF SECRETARY

*(Corporate Seal)*

**PRIOR RESOLUTION FOR CORPORATIONS/PROFESSIONAL CORPORATIONS**

*(TO BE TYPED ON CORPORATION LETTERHEAD)*

I (name of Corporation's Secretary), Secretary of (legal name of Corporation) a Corporation duly organized and operating under the laws of (State) and qualified and authorized to do business in the State of Connecticut, DO HEREBY CERTIFY that the following is a true, correct and accurate copy of a Resolution duly adopted at a meeting of the Board of Directors of such Corporation, duly convened and held on (Date of Meeting), at which meeting a duly constituted quorum of the Board of Directors was present and voted in favor of such Resolution.

RESOLVED: That the following Officers of this Corporation, or any one of them individually:

(Name and title of Officer or Officers)

are empowered to (recite resolution authorizing submission of bid or execution of contract).

I further CERTIFY that such Resolution has not been modified, rescinded or revoked since the date on which it was enacted, and it is at present in full force and effect.

IN WITNESS WHEREFORE, the undersigned has affixed his/her signature and the Corporate Seal of the Corporation, this (date) day of (month) 20\_\_

(Typed name of Corporation's Secretary)

---

SIGNATURE OF SECRETARY

*(Corporate Seal)*

**RESOLUTION FOR LIMITED LIABILITY COMPANIES**

*(TO BE TYPED ON COMPANY LETTERHEAD)*

The undersigned, comprising all Members of (legal name of LLC), a Limited Liability Company duly organized and operating under the laws of (State) and qualified and authorized to do business in the State of Connecticut, DO HEREBY CERTIFY that the following is a true, correct and accurate copy of a Resolution duly adopted at a meeting of the Members, duly convened and held on (Date of Meeting), at which meeting a duly constituted quorum of the voting Members was present and voted in favor of such Resolution. We further CERTIFY that such Resolution has not been modified, rescinded or revoked since the date on which it was enacted, and it is at present in full force and effect:

RESOLVED: That the following Members of this Limited Liability Company, or any one of them:

(Name and title of Members)

are empowered to execute and deliver, in the name of and on behalf of this Limited Liability Company, contracts, bids and other documents to the Town of East Hartford, State of Connecticut, and are further authorized to bind the Limited Liability Company to such contracts, bids and other documents.

IN WITNESS WHEREFORE, the undersigned have executed this resolution, this (date) day of (month) 20\_\_

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(Typed Member Name)

---

(Typed Member Name)

---

(Typed Member Name)

---

(Typed Member Name)

**RESOLUTION FOR LIMITED LIABILITY COMPANIES BY MANAGING PARTNER**

*(TO BE TYPED ON COMPANY LETTERHEAD)*

I (name of Managing Member), Managing Member of (legal name of LLC), a Limited Liability Company duly organized and operating under the laws of (State) and qualified and authorized to do business in the State of Connecticut, DO HEREBY CERTIFY that the following is a true, correct and accurate copy of a Resolution duly adopted at a meeting of the Members, duly convened and held on (Date of Meeting), at which meeting a duly constituted quorum of the voting Members was present and voted in favor of such Resolution. I further CERTIFY that such Resolution has not been modified, rescinded or revoked since the date on which it was enacted, and it is at present in full force and effect:

RESOLVED: That the following Members of this Limited Liability Company, or any one of them:

(Name and title of Members)

are empowered to execute and deliver, in the name of and on behalf of this Limited Liability Company, contracts, bids and other documents to the Town of East Hartford, State of Connecticut, and are further authorized to bind the Limited Liability Company to such contracts, bids and other documents.

IN WITNESS WHEREFORE, the undersigned has affixed his/her signature, this (date) day of (month) 20\_\_

(Typed name of Managing Partner)

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SIGNATURE OF MANAGING PARTNER

**RESOLUTION FOR PARTNERSHIPS**

*(TO BE TYPED ON COMPANY LETTERHEAD)*

The undersigned, comprising all (partners/general partners) of (legal name of partnership), a (partnership/Limited Partnership/Limited Liability Partnership) duly organized and operating under the laws of (State) and qualified and authorized to do business in the State of Connecticut, DO HEREBY CERTIFY that the following is a true, correct and accurate copy of a Resolution duly adopted at a meeting of the voting (partners/general partners), duly convened and held on (Date of Meeting), at which meeting a duly constituted quorum of the voting partners was present and voted in favor of such Resolution. We further CERTIFY that such Resolution has not been modified, rescinded or revoked since the date on which it was enacted, and it is at present in full force and effect:

RESOLVED: That the following (partners/general partners) of this Limited Liability Company, or any one of them:

(Name and title of partners/general partners)

are empowered to execute and deliver, in the name of and on behalf of this (partnership/Limited Partnership/Limited Liability Partnership), contracts, bids and other documents to the Town of East Hartford, State of Connecticut, and are further authorized to bind the (partnership/Limited Partnership/Limited Liability Partnership) to such contracts, bids and other documents.

IN WITNESS WHEREFORE, the undersigned have executed this resolution, this (date) day of (month) 20\_\_

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(Typed partner/general partner Name)

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(Typed partner/general partner Name)

---

(Typed partner/general partner Name)

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(Typed partner/general partner Name)

**COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES  
CONTRACT COMPLIANCE REGULATIONS  
NOTIFICATION TO BIDDERS**

(Revised 09/3/15)

The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a-60a of the Connecticut General Statutes; and, when the awarding agency is the State, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes.

According to Section 46a-68j-30(9) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to “aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials.” “Minority business enterprise” is defined in Section 4a-60 of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: “(1) Who are active in daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Section 32-9n.” “Minority” groups are defined in Section 32-9n of the Connecticut General Statutes as “(1) Black Americans . . . (2) Hispanic Americans . . . (3) persons who have origins in the Iberian Peninsula . . . (4) Women . . . (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians . . .” An individual with a disability is also a minority business enterprise as provided by Section 4a-60g of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of Section 46a-68j-21(11) of the Contract Compliance Regulations.

The awarding agency will consider the following factors when reviewing the bidder’s qualifications under the contract compliance requirements:

- (a) the bidder’s success in implementing an affirmative action plan;
- (b) the bidder’s success in developing an apprenticeship program complying with Sections 46a-68-1 to 46a-68-17 of the Administrative Regulations of Connecticut State Agencies, inclusive;
- (c) the bidder’s promise to develop and implement a successful affirmative action plan;
- (d) the bidder’s submission of employment statistics contained in the “Employment Information Form”, indicating that the composition of its workforce is at or near parity when compared to the racial and sexual composition of the workforce in the relevant labor market area; and
- (e) the bidder’s promise to set aside a portion of the contract for legitimate minority business enterprises. See Section 46a-68j-30(10)(E) of the Contract Compliance Regulations.

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**INSTRUCTIONS AND OTHER INFORMATION**

The following BIDDER CONTRACT COMPLIANCE MONITORING REPORT must be completed in full, signed, and submitted with the bid for this contract. The contract awarding agency and the Commission on Human Rights and Opportunities will use the information contained thereon to determine the bidders compliance to Sections 4a-60 and 4a-60a CONN. GEN. STAT., and Sections 46a-68j-23 of the Regulations of Connecticut State Agencies regarding equal employment opportunity, and the bidder’s good faith efforts to include minority business enterprises as subcontractors and suppliers for the work of the contract.

1) **Definition of Small Contractor**

Section 4a-60g CONN. GEN. STAT. defines a small contractor as a company that has been doing business under the same management and control and has maintained its principal place of business in Connecticut for a one year period immediately prior to its application for certification under this section, had gross revenues not exceeding fifteen million dollars in the most recently completed fiscal year, and at least fifty-one percent of the ownership of which is held by a person or persons who are active in the daily affairs of the company, and have the power to direct the management and policies of the company, except that a nonprofit corporation shall be construed to be a small contractor if such nonprofit corporation meets the requirements of subparagraphs (A) and (B) of subdivision 4a-60g CONN. GEN. STAT.



**MANAGEMENT:** Managers plan, organize, direct, and control the major functions of an organization through subordinates who are at the managerial or supervisory level. They make policy decisions and set objectives for the company or departments. They are not usually directly involved in production or providing services. Examples include top executives, public relations managers, managers of operations specialties (such as financial, human resources, or purchasing managers), and construction and engineering managers.

**BUSINESS AND FINANCIAL OPERATIONS:** These occupations include managers and professionals who work with the financial aspects of the business. These occupations include accountants and auditors, purchasing agents, management analysts, labor relations specialists, and budget, credit, and financial analysts.

**MARKETING AND SALES:** Occupations related to the act or process of buying and selling products and/or services such as sales engineer, retail sales workers and sales representatives including wholesale.

**LEGAL OCCUPATIONS:** In-House Counsel who is charged with providing legal advice and services in regards to legal issues that may arise during the course of standard business practices. This category also includes assistive legal occupations such as paralegals, legal assistants.

**COMPUTER SPECIALISTS:** Professionals responsible for the computer operations within a company are grouped in this category. Examples of job titles in this category include computer programmers, software engineers, database administrators, computer scientists, systems analysts, and computer support specialists

**ARCHITECTURE AND ENGINEERING:** Occupations related to architecture, surveying, engineering, and drafting are included in this category. Some of the job titles in this category include electrical and electronic engineers, surveyors, architects, drafters, mechanical engineers, materials engineers, mapping technicians, and civil engineers.

**OFFICE AND ADMINISTRATIVE SUPPORT:** All clerical-type work is included in this category. These jobs involve the preparing, transcribing, and preserving of written communications and records; collecting accounts; gathering and distributing information; operating office machines and electronic data processing equipment; and distributing mail. Job titles listed in this category include telephone operators, bill and account collectors, customer service representatives, dispatchers, secretaries and administrative assistants, computer operators and clerks (such as payroll, shipping, stock, mail and file).

**BUILDING AND GROUNDS CLEANING AND MAINTENANCE:** This category includes occupations involving landscaping, housekeeping, and janitorial services. Job titles found in this category include supervisors of landscaping or housekeeping, janitors, maids, grounds maintenance workers, and pest control workers.

**CONSTRUCTION AND EXTRACTION:** This category includes construction trades and related occupations. Job titles found in this category include boilermakers, masons (all types), carpenters, construction laborers, electricians, plumbers (and related trades), roofers, sheet metal workers, elevator installers, hazardous materials removal workers, paperhangers, and painters. Paving, surfacing, and tamping equipment operators; drywall and ceiling tile installers; and carpet, floor and tile installers and finishers are also included in this category. First line supervisors, foremen, and helpers in these trades are also grouped in this category..

**INSTALLATION, MAINTENANCE AND REPAIR:** Occupations involving the installation, maintenance, and repair of equipment are included in this group. Examples of job titles found here are heating, ac, and refrigeration mechanics and installers; telecommunication line installers and repairers; heavy vehicle and mobile equipment service technicians and mechanics; small engine mechanics; security and fire alarm systems installers; electric/electronic repair, industrial, utility and transportation equipment; millwrights; riggers; and manufactured building and mobile home installers. First line supervisors, foremen, and helpers for these jobs are also included in the category.

**MATERIAL MOVING WORKERS:** The job titles included in this group are Crane and tower operators; dredge, excavating, and lading machine operators; hoist and winch operators; industrial truck and tractor operators; cleaners of vehicles and equipment; laborers and freight, stock, and material movers, hand; machine feeders and offbearers; packers and packagers, hand; pumping station operators; refuse and recyclable material collectors; and miscellaneous material moving workers.

**PRODUCTION WORKERS:** The job titles included in this category are chemical production machine setters, operators and tenders; crushing/grinding workers; cutting workers; inspectors, testers sorters, samplers, weighers; precious stone/metal workers; painting workers; cementing/gluing machine operators and tenders; etchers/engravers; molders, shapers and casters except for metal and plastic; and production workers.

<p><u>White</u> (not of Hispanic Origin)- All persons having origins in any of the original peoples of Europe, North Africa, or the Middle East.</p> <p><u>Black</u> (not of Hispanic Origin)- All persons having origins in any of the Black racial groups of Africa.</p> <p><u>Hispanic</u>- All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.</p>	<p><u>Asian or Pacific Islander</u>- All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes China, India, Japan, Korea, the Philippine Islands, and Samoa.</p> <p><u>American Indian or Alaskan Native</u>- All persons having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.</p>
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### BIDDER CONTRACT COMPLIANCE MONITORING REPORT

#### PART I - Bidder Information

Company Name Street Address City & State Chief Executive	Bidder Federal Employer Identification Number _____ Or Social Security Number _____
Major Business Activity (brief description)	Bidder Identification (response optional/definitions on page 1)  -Bidder is a small contractor. Yes ___ No ___ -Bidder is a minority business enterprise Yes ___ No ___ (If yes, check ownership category) Black ___ Hispanic ___ Asian American ___ American Indian/Alaskan Native ___ Iberian Peninsula ___ Individual(s) with a Physical Disability ___ Female ___
Bidder Parent Company (If any)	Bidder is certified as above by State of CT Yes ___ No ___
Other Locations in Ct. (If any)	

#### PART II - Bidder Nondiscrimination Policies and Procedures

1. Does your company have a written Affirmative Action/Equal Employment Opportunity statement posted on company bulletin boards? Yes ___ No ___	7. Do all of your company contracts and purchase orders contain non-discrimination statements as required by Sections 4a-60 & 4a-60a Conn. Gen. Stat.? Yes ___ No ___
2. Does your company have the state-mandated sexual harassment prevention in the workplace policy posted on company bulletin boards? Yes ___ No ___	8. Do you, upon request, provide reasonable accommodation to employees, or applicants for employment, who have physical or mental disability? Yes ___ No ___
3. Do you notify all recruitment sources in writing of your company's Affirmative Action/Equal Employment Opportunity employment policy? Yes ___ No ___	9. Does your company have a mandatory retirement age for all employees? Yes ___ No ___
4. Do your company advertisements contain a written statement that you are an Affirmative Action/Equal Opportunity Employer? Yes ___ No ___	10. If your company has 50 or more employees, have you provided at least two (2) hours of sexual harassment training to all of your supervisors? Yes ___ No ___ NA ___
5. Do you notify the Ct. State Employment Service of all employment openings with your company? Yes ___ No ___	11. If your company has apprenticeship programs, do they meet the Affirmative Action/Equal Employment Opportunity requirements of the apprenticeship standards of the Ct. Dept. of Labor? Yes ___ No ___ NA ___
6. Does your company have a collective bargaining agreement with workers? Yes ___ No ___ 6a. If yes, do the collective bargaining agreements contain non-discrimination clauses covering all workers? Yes ___ No ___ 6b. Have you notified each union in writing of your commitments under the nondiscrimination requirements of contracts with the state of Ct? Yes ___ No ___	12. Does your company have a written affirmative action Plan? Yes ___ No ___ If no, please explain.  13. Is there a person in your company who is responsible for equal employment opportunity? Yes ___ No ___ If yes, give name and phone number. _____

Part III - Bidder Subcontracting Practices

1. Will the work of this contract include subcontractors or suppliers? Yes\_\_ No\_\_

1a. If yes, please list all subcontractors and suppliers and report if they are a small contractor and/or a minority business enterprise. (defined on page 1 / use additional sheet if necessary)

1b. Will the work of this contract require additional subcontractors or suppliers other than those identified in 1a. above?

Yes\_\_ No\_\_

PART IV - Bidder Employment Information

Date:

JOB CATEGORY *	OVERALL TOTALS	WHITE (not of Hispanic origin)		BLACK (not of Hispanic origin)		HISPANIC		ASIAN or PACIFIC ISLANDER		AMERICAN INDIAN or ALASKAN NATIVE	
		Male	Female	Male	Female	Male	Female	Male	Female	male	female
Management											
Business & Financial Ops											
Marketing & Sales											
Legal Occupations											
Computer Specialists											
Architecture/Engineering											
Office & Admin Support											
Bldg/ Grounds Cleaning/Maintenance											
Construction & Extraction											
Installation , Maintenance & Repair											
Material Moving Workers											
Production Occupations											
TOTALS ABOVE											
Total One Year Ago											
FORMAL ON THE JOB TRAINEES (ENTER FIGURES FOR THE SAME CATEGORIES AS ARE SHOWN ABOVE)											
Apprentices											
Trainees											

\*NOTE: JOB CATEGORIES CAN BE CHANGED OR ADDED TO (EX. SALES CAN BE ADDED OR REPLACE A CATEGORY NOT USED IN YOUR COMPANY)

PART V - Bidder Hiring and Recruitment Practices

1. Which of the following recruitment sources are used by you? (Check yes or no, and report percent used)				2. Check (X) any of the below listed requirements that you use as a hiring qualification  (X)	3. Describe below any other practices or actions that you take which show that you hire, train, and promote employees without discrimination
SOURCE	YES	NO	% of applicants provided by source		
State Employment Service				Work Experience	
Private Employment Agencies				Ability to Speak or Write English	
Schools and Colleges				Written Tests	
Newspaper Advertisement				High School Diploma	
Walk Ins				College Degree	
Present Employees				Union Membership	
Labor Organizations				Personal Recommendation	
Minority/Community Organizations				Height or Weight	
Others (please identify)				Car Ownership	
				Arrest Record	
				Wage Garnishments	

Certification (Read this form and check your statements on it CAREFULLY before signing). I certify that the statements made by me on this BIDDER CONTRACT COMPLIANCE MONITORING REPORT are complete and true to the best of my knowledge and belief, and are made in good faith. I understand that if I knowingly make any misstatements of facts, I am subject to be declared in non-compliance with Section 4a-60, 4a-60a, and related sections of the CONN. GEN. STAT.

(Signature)	(Title)	(Date Signed)	(Telephone)
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# Attachment B – Contract Award Forms

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## CONTRACT AWARD FORMS

The Town will make an initial determination of the Lowest Responsible Bidder based on the Town's best interest. That bidder must then complete and return the following documents within ten (10) calendar days in order to be considered for a formal bid award:

- Certificate of Insurance (To be provided by Contractor)
- Anticipated Source of Materials Form
- List of Proposed Subcontractors (To be provided by Contractor)
- ~~○ OPM Nondiscrimination Certification~~

*Note that the OPM Nondiscrimination Certification must be submitted to the State of Connecticut, Commission on Human Rights and Opportunities (CHRO). The Town will verify with CHRO that the certification is active. If the apparent low bidder previously submitted a OPM Nondiscrimination Certification to a state agency, that same form can be used by CHRO to confirm an active certification.*

If the total contract price is at least \$500,000, then the Lowest Responsible bidder must submit their Affirmative Action Plan (AAP) to the Commission on Human Rights and Opportunities (CHRO). CHRO must approve the AAP prior to contract award by the Town of East Hartford. See Appendix D for a *Sample Bidder Notification Letter* and a suggested *Affirmative Action Plan Format*.

**These items deleted under Addendum No. 3**



# OFFICE OF POLICY AND MANAGEMENT

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Secretary of OPM  
Benjamin Barnes

For Finance  
(860) 418-6422

- Office of Finance Home
- Office Staff Directory
- Office Finance Structure
- Purchase of Service (POS)
- Personal Service Agreements (PSA)
- Financial Management
- Financial Systems
- Assets Management
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Offices & Divisions



## REQUIRED FOR ALL CONTRACT TYPES

### Nondiscrimination Certification

Effective Date: June 30, 2009

Nondiscrimination Certification Forms		
<a href="#">Form A - Representation by Individual</a>	<a href="#">Form A</a> - Word format	<a href="#">Form A</a> - pdf fillable format
<a href="#">Form B - Representation by Entity</a>	<a href="#">Form B</a> - Word format	<a href="#">Form B</a> - pdf fillable format
<a href="#">Form C - Affidavit by Entity</a>	<a href="#">Form C</a> - Word format	<a href="#">Form C</a> - pdf fillable format
<a href="#">Form D - New Resolution by Entity</a>	<a href="#">Form D</a> - Word format	<a href="#">Form D</a> - pdf fillable format
<a href="#">Form E - Prior Resolution by Entity</a>	<a href="#">Form E</a> - Word format	<a href="#">Form E</a> - pdf fillable format

#### DESCRIPTION:

CHRO (for municipal public works project) per CGS 4a-60 (c)(2)

The Office of the Attorney General has approved the above nondiscrimination certification forms to assist executive branch agencies in complying with the State's contracting requirements under Connecticut General Statutes §§ 4a-60(a)(1) and 4a-60a(a)(1), as amended.

By law, a contractor must provide an awarding State agency with written representation or documentation that certifies the contractor complies with the State's nondiscrimination agreements and warranties prior to the award of a contract. If after the initial submission there is any change in such representation, the contractor shall provide the updated representation to the State or such political subdivision not later than thirty (30) days after such change or upon the execution of a new contract with the state or political subdivision of the state whichever is earlier. Such contractor shall also certify no later than fourteen (14) days after the twelve (12) month anniversary of the most recently filed non-discrimination certification that the representation on file is current and accurate.

**A nondiscrimination certification is generally required for all State contracts – regardless of type, term, cost, or value.** \*\*See list of exempt entities (below). \*\*

#### FORMS:

There are five different certification forms one of which must be submitted in writing or electronically. Form A is always used for contracts with an individual who is not an entity, regardless of the contract value. Form B is always used for contracts with an entity when the contract value is less than \$50,000. Form C is recommended for contracts valued at \$50,000 or more with an entity. If Form C is not used, either Form D or E must be used; both require a resolution (new or prior).

For Use By:	Value Less Than \$50,000	Value \$50,000 or More
Individual	Form A Representation	
Entity	Form B Representation	Form C Affidavit
		Form D New Resolution
		Form E Prior Resolution



### Definitions

- *individual*: a person who is not an entity
- *entity*: corporation, limited liability company, or partnership

### EXPLANATION OF FORMS:

**Form A. Representation:** For use by an individual when entering into any contract, regardless of contract value.

**Form B. Representation:** For use by an entity when entering into any contract valued at less than \$50,000 for any year of the contract.

**Form C. Affidavit:** (Recommended for contracts at or above \$50,000) For use by an entity when entering into any contract valued at \$50,000 or more for any year of the contract **and** the entity certifies through an affidavit that a complying nondiscrimination policy is currently in place.

**Form D. New Resolution:** For use by a entity when entering into any contract valued at \$50,000 or more for any year of the contract **and** the entity has a complying nondiscrimination policy adopted by a new resolution of the board of directors, shareholders, managers, members, or other governing body.

**Form E. Prior Resolution:** For use by a entity when entering into any contract valued at \$50,000 or more for any year of the contract **and** the entity has a complying nondiscrimination policy adopted by a prior resolution of the board of directors, shareholders, managers, members, or other governing body.

### EXEMPTIONS:

Pursuant to Public Act No. 09-158, Section 1(a)(5)(d), the entities listed below are exempt and, therefore, not required to submit a nondiscrimination certification form when entering into a contract with the State:

1. political subdivisions of the State of Connecticut, including, but not limited to municipalities;
2. quasi-public agencies, as defined in C.G.S. § 1-120;
3. other states of the United States, including, but not limited to, the District of Columbia, Puerto Rico, U.S. territories and possessions, and federally recognized Indian tribal governments, as defined in C.G.S. § 1-267;
4. the federal government;
5. foreign governments; and
6. an agency of a subdivision, agency, state or government listed in items 1-5.

### For Further Information, Contact:

Please direct any questions about the nondiscrimination certification forms to the Commission on Human Rights and Opportunities:  
Tel. 860/ 541-3400  
Connecticut Toll Free Tel. 1-800/ 477-5737

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**STATE OF CONNECTICUT**  
**NONDISCRIMINATION CERTIFICATION – Representation**  
**By Individual**  
**For All Contract Types Regardless of Value**

*Written representation that complies with the nondiscrimination agreements and warranties under Connecticut General Statutes §§ 4a-60(a)(1) and 4a-60a(a)(1), as amended*

**INSTRUCTIONS:**

For use by an individual who is not an entity (corporation, limited liability company, or partnership) when entering into any contract type with the State of Connecticut, regardless of contract value. Submit to the awarding State agency prior to contract execution.

**REPRESENTATION OF AN INDIVIDUAL:**

I, \_\_\_\_\_, of \_\_\_\_\_,  
Signatory Business Address

represent that I will comply with the nondiscrimination agreements and warranties of Connecticut General Statutes §§ 4a-60(a)(1) and 4a-60a(a)(1), as amended.

\_\_\_\_\_  
Signatory

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name



**STATE OF CONNECTICUT**  
**NONDISCRIMINATION CERTIFICATION – Representation**  
**By Entity**  
**For Contracts Valued at Less Than \$50,000**

*Written representation that complies with the nondiscrimination agreements and warranties under Connecticut General Statutes §§ 4a-60(a)(1) and 4a-60a(a)(1), as amended*

**INSTRUCTIONS:**

For use by an entity (corporation, limited liability company, or partnership) when entering into any contract type with the State of Connecticut valued at less than \$50,000 for each year of the contract. Complete all sections of the form. Submit to the awarding State agency prior to contract execution.

**REPRESENTATION OF AN ENTITY:**

I, \_\_\_\_\_, \_\_\_\_\_, of \_\_\_\_\_,  
Authorized Signatory Title Name of Entity

an entity duly formed and existing under the laws of \_\_\_\_\_,  
Name of State or Commonwealth

represent that I am authorized to execute and deliver this representation on behalf of

\_\_\_\_\_ and that \_\_\_\_\_  
Name of Entity Name of Entity

has a policy in place that complies with the nondiscrimination agreements and warranties of Connecticut General Statutes §§ 4a-60(a)(1) and 4a-60a(a)(1), as amended.

\_\_\_\_\_  
Authorized Signatory Date

\_\_\_\_\_  
Printed Name



**STATE OF CONNECTICUT**  
**NONDISCRIMINATION CERTIFICATION – Affidavit**  
**By Entity**  
**For Contracts Valued at \$50,000 or More**

*Documentation in the form of an affidavit signed under penalty of false statement by a chief executive officer, president, chairperson, member, or other corporate officer duly authorized to adopt corporate, company, or partnership policy that certifies the contractor complies with the nondiscrimination agreements and warranties under Connecticut General Statutes §§ 4a-60(a)(1) and 4a-60a(a)(1), as amended*

**INSTRUCTIONS:**

For use by an entity (corporation, limited liability company, or partnership) when entering into any contract type with the State of Connecticut valued at \$50,000 or more for any year of the contract. Complete all sections of the form. Sign form in the presence of a Commissioner of Superior Court or Notary Public. Submit to the awarding State agency prior to contract execution.

**AFFIDAVIT:**

I, the undersigned, am over the age of eighteen (18) and understand and appreciate the obligations of an oath. I am \_\_\_\_\_ of \_\_\_\_\_, an entity  
Signatory's Title Name of Entity

duly formed and existing under the laws of \_\_\_\_\_.  
Name of State or Commonwealth

I certify that I am authorized to execute and deliver this affidavit on behalf of \_\_\_\_\_ and that \_\_\_\_\_  
Name of Entity Name of Entity

has a policy in place that complies with the nondiscrimination agreements and warranties of Connecticut General Statutes §§ 4a-60(a)(1) and 4a-60a(a)(1), as amended.

\_\_\_\_\_  
Authorized Signatory

\_\_\_\_\_  
Printed Name

**Sworn and subscribed to before me on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.**

\_\_\_\_\_  
**Commissioner of the Superior Court/  
Notary Public**

\_\_\_\_\_  
**Commission Expiration Date**



**STATE OF CONNECTICUT**  
**NONDISCRIMINATION CERTIFICATION – New Resolution**  
**By Entity**  
**For Contracts Valued at \$50,000 or More**

*Documentation in the form of a corporate, company, or partnership policy adopted by resolution of the board of directors, shareholders, managers, members or other governing body of a contractor that certifies the contractor complies with the nondiscrimination agreements and warranties under Connecticut General Statutes §§ 4a-60(a)(1) and 4a-60a(a)(1), as amended*

**INSTRUCTIONS:**

For use by an entity (corporation, limited liability company, or partnership) when entering into any contract type with the State of Connecticut valued at \$50,000 or more for any year of the contract. Complete all sections of the form. Submit to the awarding State agency prior to contract execution.

**CERTIFICATION OF RESOLUTION:**

I, \_\_\_\_\_, \_\_\_\_\_, of \_\_\_\_\_,  
Authorized Signatory Title Name of Entity

an entity duly formed and existing under the laws of \_\_\_\_\_,  
Name of State or Commonwealth

certify that the following is a true and correct copy of a resolution adopted on the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ by the governing body of \_\_\_\_\_,  
Name of Entity

in accordance with all of its documents of governance and management and the laws of \_\_\_\_\_, and further certify that such resolution has not been modified  
Name of State or Commonwealth

or revoked, and is in full force and effect.

RESOLVED: That the policies of \_\_\_\_\_ comply with the  
Name of Entity  
nondiscrimination agreements and warranties of Connecticut General Statutes  
§§ 4a-60(a)(1) and 4a-60a(a)(1), as amended.

The undersigned has executed this certificate this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Authorized Signatory Date

\_\_\_\_\_  
Printed Name



**STATE OF CONNECTICUT**  
**NONDISCRIMINATION CERTIFICATION – Prior Resolution**  
**By Entity**  
**For Contracts Valued at \$50,000 or More**

*Documentation in the form of a corporate, company, or partnership policy adopted by a prior resolution of the board of directors, shareholders, managers, members or other governing body of a contractor that certifies the contractor complies with the nondiscrimination agreements and warranties under Connecticut General Statutes §§ 4a-60(a)(1) and 4a-60a(a)(1), as amended*

**INSTRUCTIONS:**

For use by an entity (corporation, limited liability company, or partnership) when entering into any contract type with the State of Connecticut valued at \$50,000 or more for any year of the contract. Complete all sections of the form. Attach copy of previously adopted resolution (*State of CT, Nondiscrimination Certification, Form D: New Resolution*). Submit all documentation to the awarding State agency prior to contract execution.

**CERTIFICATION OF PRIOR RESOLUTION:**

I, the undersigned, am a duly authorized corporate officer or member of \_\_\_\_\_  
Name of Entity

I have reviewed the attached prior resolution. I certify that:

- (1) the attached prior resolution complies with the nondiscrimination agreements and warranties of Connecticut General Statutes §§ 4a-60(a)(1) and 4a-60a(a)(1), as amended; and
- (2) the prior resolution remains in full force and effect on the date this documentation is submitted to the awarding State agency.

\_\_\_\_\_  
Authorized Signatory Title

\_\_\_\_\_  
Printed Name Date

**RESERVED FOR STATE USE**

I, the undersigned head of the awarding State agency, or designee, certify that the attached prior resolution complies with the nondiscrimination agreements and warranties of Connecticut General Statutes §§ 4a-60(a)(1) and 4a-60a(a)(1), as amended.

\_\_\_\_\_  
Signature of Agency Head (or designee) Date

\_\_\_\_\_  
Awarding State Agency

## AGREEMENT FORMS

Upon receipt of notice of contract award, and receipt of the compiled project Agreement, all of the following documents contained within this section must be completed by the awarded bidder and returned within ten (10) calendar days. Note that a new resolution, with date matching the effective date of the Agreement, must be submitted.

- Fully Endorsed Agreement (*3 originals*)
- Resolution for Corporations/Professional Corporations
- Resolution for Limited Liability Companies
- Resolution for Partnerships
- Performance Bond
- Labor and Materials Bond
- Forms for Department of Public Works License/Permit
  - Certificate of Insurance
  - Hold Harmless Agreement
  - Driveway, Curb & Walk Layer's Bond
  - Drain Layer's Bond
- Contractor's Wage Certification Form

Note that the correct resolution must be prepared based on the type of business contracting with the Town (corporation, professional corporation, limited liability company, partnership, limited liability partnership, or general partnership). Resolutions must be on company letterhead and the date of the resolution must match the Effective Date of the Agreement.

The *Contractor's Wage Certification Form*, which can be found in the wage rate attachments in an appendix, must be submitted directly to the Connecticut Department of Labor. A copy of the form, as submitted to the CTDOL, must be provided to the Town with the Agreement Forms.



## EXAMPLE AGREEMENT

PROJECT X

BID NO. 15-XX

THIS AGREEMENT is by and between the Town of East Hartford, Connecticut, a municipal corporation with principal office and place of business at 740 Main Street, East Hartford, Connecticut 06108, acting herein through the Town's Mayor, (*hereinafter referred to as Owner*) and [REDACTED] with an office and place of business at [REDACTED] a **corporation/partnership/LLC/LLP/sole proprietorship** (*hereinafter referred to as Contractor*) for the construction of the project titled PROJECT X (BID NO. 15-XX).

### ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents.

### ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: [REDACTED]

### ARTICLE 3 – ENGINEER

3.01 The Project was designed by [REDACTED].

3.02 The Owner retained [REDACTED] ("Engineer") to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

[or]

3.03 [REDACTED] will act as Owner's representative ("Engineer"), assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

### ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

### AGREEMENT

Page 1 of 7

4.02 *Contract Times: Dates*

- A. The Work will be substantially completed on or before \_\_\_\_\_, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before \_\_\_\_\_.

[or]

4.02 *Contract Times: Days*

- A. The Work will be substantially completed within \_\_\_\_\_ days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within \_\_\_\_\_ days after the date when the Contract Times commence to run.
- B. Parts of the Work shall be substantially completed on or before the following Milestone(s):
1. Milestone 1 [event & date/days]
  2. Milestone 2 [event & date/days]
  3. Milestone 3 [event & date/days]

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal, or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):
1. Substantial Completion: Contractor shall pay Owner \$\_\_\_\_\_ for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
  2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner \$\_\_\_\_\_ for each day that expires after such time until the Work is completed and ready for final payment.
  3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.
  4. Milestones: Contractor shall pay Owner \$\_\_\_\_\_ for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for achievement of Milestone 1, until Milestone 1 is achieved.

4.04 *Special Damages*

- A. In addition to the amount provided for liquidated damages, Contractor shall reimburse Owner for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract Times.

**AGREEMENT**



## ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

A. For all Work other than Unit Price Work, a lump sum of: \$\_\_\_\_\_.

All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.

B. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) \$\_\_\_\_\_.

## ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 30th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract

a. 95 percent (95%) of Work completed (with the balance being retainage).

b. There will be no payment for the cost of materials and equipment not incorporated in the Work.

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 99 percent (99%) of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

## ARTICLE 7 – INTEREST

7.01 All amounts not paid when due shall bear interest at the rate of eight percent (8%) per annum.

## AGREEMENT

## **ARTICLE 8 – CONTRACTOR’S REPRESENTATIONS**

- 8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:
- A. Contractor examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
  - B. Contractor visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
  - D. Contractor carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
  - E. Contractor considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor’s safety precautions and programs.
  - F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
  - G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
  - H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
  - I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
  - J. Contractor’s entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

## **ARTICLE 9 – CONTRACT DOCUMENTS**

### 9.01 *Contents*

- A. The Contract Documents consist of the following:

### **AGREEMENT**

1. This Agreement (pages 1 to [ ] , inclusive).
  2. Corporate Resolution
  3. Performance bond (pages [ ] to [ ] , inclusive).
  4. Payment bond (pages [ ] to [ ] , inclusive).
  5. General Conditions (pages [ ] to [ ] , inclusive).
  6. Supplemental General Conditions (pages [ ] to [ ] , inclusive).
  7. Technical Specifications as listed in the table of contents of the Bid Specification.
  8. Drawings (not attached but incorporated by reference) consisting of [ ] sheets with each sheet bearing the following general title: [ ] .
  9. Addenda (numbers [ ] to [ ] , inclusive).
  10. Exhibits to this Agreement (enumerated as follows):
    - a. Contractor's Bid (pages [ ] to [ ] , inclusive).
    - b. Committee of Award Documentation (pages [ ] to [ ] , inclusive).
    - c. Contractor's Letter of Award (pages [ ] to [ ] , inclusive).
    - d. Contract Award Forms (pages [ ] to [ ] , inclusive).
  11. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    - a. Notice to Proceed.
    - b. Work Change Directives.
    - c. Change Orders.
    - d. Field Orders.
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

## **ARTICLE 10 – MISCELLANEOUS**

### **10.01 Terms**

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

### **10.02 Assignment of Contract**

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an

## **AGREEMENT**

assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

#### 10.03 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

#### 10.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

#### 10.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
  - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
  - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
  - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

#### 10.06 *Other Provisions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, the said parties hereto have caused this instrument to be signed in duplicate by their respective duly constituted officers, attested, and sealed pursuant to proper resolutions. One counterpart each has been delivered to Owner and Contractor.

This Agreement will be effective on **Month, Day 20xx** (*which is the Effective Date of the Agreement*).

**Signed and sealed** in the presence of:

OWNER: TOWN OF EAST HARTFORD, CONNECTICUT

\_\_\_\_\_  
*Witness*

\_\_\_\_\_  
By Marcia A. Leclerc  
*It's Mayor*

\_\_\_\_\_  
*Witness*

CONTRACTOR: **<NAME OF CONTRACTOR>**

\_\_\_\_\_  
*Witness*

\_\_\_\_\_  
*By*

\_\_\_\_\_  
*Witness*

\_\_\_\_\_  
*Printed Name*  
*It's <Title of Endorser>*

**NEW RESOLUTION FOR CORPORATIONS/PROFESSIONAL CORPORATIONS**

*(TO BE TYPED ON CORPORATION LETTERHEAD)*

I (name of Corporation's Secretary), Secretary of (legal name of Corporation) a Corporation duly organized and operating under the laws of (State) and qualified and authorized to do business in the State of Connecticut, DO HEREBY CERTIFY that the following is a true, correct and accurate copy of a Resolution duly adopted at a meeting of the Board of Directors of such Corporation, duly convened and held on (Date of Meeting), at which meeting a duly constituted quorum of the Board of Directors was present and voted in favor of such Resolution.

RESOLVED: That the following Officers of this Corporation, or any one of them individually:

(Name and title of Officer or Officers)

are empowered to execute and deliver, in the name of and on behalf of this Corporation, contracts, bids and other documents to the Town of East Hartford, State of Connecticut, and are further authorized to affix the Corporate Seal to such documents and to bind the Corporation to such contracts, bids and other documents.

I further CERTIFY that such Resolution has not been modified, rescinded or revoked since the date on which it was enacted, and it is at present in full force and effect.

IN WITNESS WHEREFORE, the undersigned has affixed his/her signature and the Corporate Seal of the Corporation, this (date) day of (month) 20\_\_

(Typed name of Corporation's Secretary)

SIGNATURE OF SECRETARY

*(Corporate Seal)*

**PRIOR RESOLUTION FOR CORPORATIONS/PROFESSIONAL CORPORATIONS**

*(TO BE TYPED ON CORPORATION LETTERHEAD)*

I (name of Corporation's Secretary), Secretary of (legal name of Corporation) a Corporation duly organized and operating under the laws of (State) and qualified and authorized to do business in the State of Connecticut, DO HEREBY CERTIFY that the following is a true, correct and accurate copy of a Resolution duly adopted at a meeting of the Board of Directors of such Corporation, duly convened and held on (Date of Meeting), at which meeting a duly constituted quorum of the Board of Directors was present and voted in favor of such Resolution.

RESOLVED: That the following Officers of this Corporation, or any one of them individually:

(Name and title of Officer or Officers)

are empowered to (recite resolution authorizing submission of bid or execution of contract).

I further CERTIFY that such Resolution has not been modified, rescinded or revoked since the date on which it was enacted, and it is at present in full force and effect.

IN WITNESS WHEREFORE, the undersigned has affixed his/her signature and the Corporate Seal of the Corporation, this (date) day of (month) 20\_\_

(Typed name of Corporation's Secretary)

---

SIGNATURE OF SECRETARY

*(Corporate Seal)*

**RESOLUTION FOR LIMITED LIABILITY COMPANIES**

*(TO BE TYPED ON COMPANY LETTERHEAD)*

The undersigned, comprising all Members of (legal name of LLC), a Limited Liability Company duly organized and operating under the laws of (State) and qualified and authorized to do business in the State of Connecticut, DO HEREBY CERTIFY that the following is a true, correct and accurate copy of a Resolution duly adopted at a meeting of the Members, duly convened and held on (Date of Meeting), at which meeting a duly constituted quorum of the voting Members was present and voted in favor of such Resolution. We further CERTIFY that such Resolution has not been modified, rescinded or revoked since the date on which it was enacted, and it is at present in full force and effect:

RESOLVED: That the following Members of this Limited Liability Company, or any one of them:

(Name and title of Members)

are empowered to execute and deliver, in the name of and on behalf of this Limited Liability Company, contracts, bids and other documents to the Town of East Hartford, State of Connecticut, and are further authorized to bind the Limited Liability Company to such contracts, bids and other documents.

IN WITNESS WHEREFORE, the undersigned have executed this resolution, this (date) day of (month) 20\_\_

---

(Typed Member Name)

---

(Typed Member Name)

---

(Typed Member Name)

---

(Typed Member Name)



**RESOLUTION FOR LIMITED LIABILITY COMPANIES BY MANAGING PARTNER**

*(TO BE TYPED ON COMPANY LETTERHEAD)*

I (name of Managing Member), Managing Member of (legal name of LLC), a Limited Liability Company duly organized and operating under the laws of (State) and qualified and authorized to do business in the State of Connecticut, DO HEREBY CERTIFY that the following is a true, correct and accurate copy of a Resolution duly adopted at a meeting of the Members, duly convened and held on (Date of Meeting), at which meeting a duly constituted quorum of the voting Members was present and voted in favor of such Resolution. I further CERTIFY that such Resolution has not been modified, rescinded or revoked since the date on which it was enacted, and it is at present in full force and effect:

RESOLVED: That the following Members of this Limited Liability Company, or any one of them:

(Name and title of Members)

are empowered to execute and deliver, in the name of and on behalf of this Limited Liability Company, contracts, bids and other documents to the Town of East Hartford, State of Connecticut, and are further authorized to bind the Limited Liability Company to such contracts, bids and other documents.

IN WITNESS WHEREFORE, the undersigned has affixed his/her signature, this (date) day of (month) 20\_\_

(Typed name of Managing Partner)

---

SIGNATURE OF MANAGING PARTNER

**RESOLUTION FOR PARTNERSHIPS**

*(TO BE TYPED ON COMPANY LETTERHEAD)*

The undersigned, comprising all (partners/general partners) of (legal name of partnership), a (partnership/Limited Partnership/Limited Liability Partnership) duly organized and operating under the laws of (State) and qualified and authorized to do business in the State of Connecticut, DO HEREBY CERTIFY that the following is a true, correct and accurate copy of a Resolution duly adopted at a meeting of the voting (partners/general partners), duly convened and held on (Date of Meeting), at which meeting a duly constituted quorum of the voting partners was present and voted in favor of such Resolution. We further CERTIFY that such Resolution has not been modified, rescinded or revoked since the date on which it was enacted, and it is at present in full force and effect:

RESOLVED: That the following (partners/general partners) of this Limited Liability Company, or any one of them:

(Name and title of partners/general partners)

are empowered to execute and deliver, in the name of and on behalf of this (partnership/Limited Partnership/Limited Liability Partnership), contracts, bids and other documents to the Town of East Hartford, State of Connecticut, and are further authorized to bind the (partnership/Limited Partnership/Limited Liability Partnership) to such contracts, bids and other documents.

IN WITNESS WHEREFORE, the undersigned have executed this resolution, this (date) day of (month) 20\_\_

\_\_\_\_\_  
(Typed partner/general partner Name)

\_\_\_\_\_  
(Typed partner/general partner Name)

\_\_\_\_\_  
(Typed partner/general partner Name)

\_\_\_\_\_  
(Typed partner/general partner Name)

PERFORMANCE BOND

Bond No. \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS:

THAT \_\_\_\_\_ as Principal,  
Hereinafter called "PRINCIPAL," and \_\_\_\_\_ as Surety,  
hereinafter called "SURETY," are held and firmly bound unto the Town of East Hartford, Connecticut,  
as Obligee, hereinafter called "TOWN," in the amount of \_\_\_\_\_ Dollars,  
(\$ \_\_\_\_\_), for the payment whereof PRINCIPAL and SURETY bind themselves, their  
heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, PRINCIPAL has by written Contract dated \_\_\_\_\_ entered into  
a Contract with TOWN for \_\_\_\_\_, which Contract is by  
reference made a part hereof, and is hereinafter referred to as the "CONTRACT."

NOW, THEREFORE, the condition of this obligation is such that, if PRINCIPAL shall promptly  
and faithfully perform said CONTRACT, and shall certify in writing that all wages paid under said  
CONTRACT to any mechanic, laborer or workman were equal to the rates of wages customary or then  
prevailing for the same trade or occupation in the Town of East Hartford, then this obligation shall be  
null and void, otherwise it shall remain in full force and effect.

Whenever PRINCIPAL shall be, and declared by the TOWN to be in default under the  
CONTRACT, the TOWN having performed its obligations thereunder, the SURETY may promptly  
remedy the default, or shall promptly:

1. Complete the CONTRACT in accordance with its terms and conditions; or
2. Obtain a bid or bids for submission to the TOWN for completing the CONTRACT in accordance  
with its terms and conditions, and upon determination by the TOWN and SURETY of the lowest  
possible bidder, arrange for a CONTRACT between such bidder and the TOWN, and make  
available as work progresses (even though there should be a default or a succession of defaults  
under the CONTRACT or Contracts of completion arranged under this paragraph) sufficient  
funds to pay the cost of completion less the balance of the Contract Price; but not exceeding,  
including other costs and damages for which the SURETY may be liable hereunder, the amount  
set forth in the first paragraph hereof. The term, "Balance of the Contract Price," as used in this  
paragraph, shall mean the total amount payable by the TOWN to PRINCIPAL under the  
CONTRACT and any amendments thereto, less the amount properly paid by the TOWN to the  
PRINCIPAL.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the TOWN named herein or the heirs, executors, administrators or successors of TOWN.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, A.D., 20 \_\_\_\_.

In the Presence of:

\_\_\_\_\_

\_\_\_\_\_ (SEAL)

(PRINCIPAL)

\_\_\_\_\_

By: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(SURETY)

\_\_\_\_\_

By: \_\_\_\_\_

LABOR AND MATERIALS BOND

Bond No. \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS:

THAT \_\_\_\_\_ as Principal,  
Hereinafter called "PRINCIPAL," and \_\_\_\_\_ as Surety,  
hereinafter called "SURETY," are held and firmly bound unto the Town of East Hartford, Connecticut,  
as Obligee, hereinafter called "TOWN," in the amount of \_\_\_\_\_ Dollars,  
(\$ \_\_\_\_\_), for the payment whereof PRINCIPAL and SURETY bind themselves, their  
heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, PRINCIPAL has by written Contract dated \_\_\_\_\_ entered into  
a Contract with TOWN for \_\_\_\_\_, which Contract is by  
reference made a part hereof, and is hereinafter referred to as the "CONTRACT."

NOW, THEREFORE, if the CONTRACTOR and his/her subcontractors shall pay all indebtedness  
incurred for supplies, materials or labor furnished, used or consumed in connection with, or in or about  
the construction or making of, public improvements, including gasoline, lubricating oils, fuel oils,  
greases, coal and similar items used or consumed directly in furtherance of such improvements, this  
obligation shall be void; otherwise it shall remain in full force and effect;

PROVIDED FURTHER, that the surety, for value received, hereby stipulates and agrees that no change,  
extension of time, alteration, or addition to the terms of the contract, or work to be performed  
thereunder, or the specifications accompanying the same, shall in any way affect its obligations on this  
bond and it does hereby waive notice of any change, extension of time, alteration, or addition to the  
terms of the contract, or to the work, or to the specifications;

PROVIDED FURTHER, that the Surety agrees that any person to whom there is due any sum for  
supplies, materials or labor, as hereinbefore stated, or his/her assigns, may bring an action on this bond  
for the recovery of indebtedness; PROVIDED that no action shall be brought on the bond after twelve  
(12) months from the completion of public improvements.

IN TESTIMONY WHEREOF, the CONTRACTOR has hereunto set his/her hand and said surety has caused these presents to be executed in its name, and its corporate seal to be hereunto affixed, by its attorney-in-fact duly authorized to do so.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, A.D., 20\_\_\_\_.

In the Presence of:

\_\_\_\_\_

\_\_\_\_\_ (SEAL)  
(PRINCIPAL)

\_\_\_\_\_

By: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ (SURETY)

\_\_\_\_\_

By: \_\_\_\_\_

# Attachment C – General Conditions

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**GENERAL CONDITIONS  
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## SECTION 1 TERMS AND DEFINITIONS

### 1-1 GENERAL

Whenever the following terms, titles, or abbreviations are used in these Specifications, or in any document or instrument where these Specifications govern, the intent and meaning shall be as herein defined. Working titles having a masculine gender, such as “workman” and “journeyman” and the pronoun “he”, are utilized in the Specifications for brevity only, and are intended to refer to persons of either gender.

### 1-2 ABBREVIATIONS

AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
AC	Asphalt Concrete
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
APA	American Plywood Association
AQMD	Air Quality Monitoring District
ASA	American Standards Association
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWG	American Wire Gage
AWS	American Welding Society
AWWA	American Water Works Association
BMP	Best Management Practice
CBYG	Call Before You Dig
CL	Centerline
CGS	Connecticut General Statutes
CONNDOT	Connecticut Department of Transportation
CSI	Construction Specifications Institute
CY	Cubic Yards
DI	Drop Inlet
DPW	Town of East Hartford Department of Public Works
EA	Each
EP	Edge of Pavement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FS	Federal Specifications

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Inv	Invert
ISA	International Society of Arboriculture
LB	Pound
LF	Linear Feet
LS	Lump Sum
NAHC	Native American Heritage Commission
NBFU	National Board of Fire Underwriters
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Administration
PCC	Portland Cement Concrete
RW	Relief Well
SD	Storm Drain
SF	Square Foot/Feet
SS	Sanitary Sewer
STA	Station
TOC	Top of Curb
Typ.	Typical
UL	Underwriters' Laboratories, Inc.
UBC	Uniform Building Code (latest edition adopted by Owner)
UMC	Uniform Mechanical Code (latest edition adopted by Owner)
UPC	Uniform Plumbing Code (latest edition adopted by Owner)
USACE	U.S. Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

### 1-3 DEFINITIONS

**Additional or Deleted Work** – Work required by the Department that, in the judgment of the Director, involves any addition to, deduction from, or modification of the Work required by the Contract Documents.

**Allowance** – An amount of money set aside under the Contract for a special purpose identified in the Contract.

**Application for Payment, Progress (Partial) Payment, or Final Payment** – Contractor's certified request for payment of completed portions of the Work.

**Architect and/or Consulting Engineer** – A person or persons, firm, partnership, joint venture, corporation, or combination thereof or authorized representative thereof, acting in the capacity of consultant to the Owner. The Architect or Consulting Engineer shall issue directions to the Contractor only through the Owner. When the Specifications require that approval be obtained from the Architect or Consulting Engineer, such approval shall be requested from and be given by the Owner.

**As Shown, Etc.** – Where "as shown", "as latest indicated", "as detailed", or words of similar import are used, the reference is to the Contract unless specifically stated otherwise. Where "as directed", "as



permitted", "approved", or words of similar import are used, they shall mean the direction, permission, or approval of the Owner.

**Bid** – When submitted on the prescribed bid form, properly signed and guaranteed, the Bid constitutes the offer of the Bidder to complete the Work at the price shown on the Bidder's bid form.

**Bid Bond** – Form of bid security executed by the Bidder as Principal and a Surety Company to guarantee that the Bidder will enter into a Contract within a specified time and furnish any required bond as mandated by Connecticut General Statute Section 4b-92.

**Bidder** – Any person, persons, firm, partnership, corporation, or combination thereof, submitting a Bid for the Work, acting directly or through a duly authorized representative.

**Bid Documents** – The sum of the documents that comprise the Bid by a Bidder to perform the Work.

**Bid Form** – A complete and duly signed proposal to perform Work (or designated portion thereof) for stipulated sum submitted in accordance with the Bid Documents.

**Bid Opening** – The event conducted by the Owner during which the sealed Proposals submitted by Bidders to perform the Work are opened and publicly read.

**Bid Security** – Certified check or Bid Bond submitted with the Bid Form, which provides that the Bidder, if awarded the Contract, will execute such Contract in accordance with the Bid Documents.

**Builder's Risk Insurance** – A specialized form of property insurance that provides coverage for loss or damage to the Work pursuant to the Contract Documents.

**Calendar Day** – Every day shown on the calendar. When the Contract Time is stated in Calendar Days, every day will be charged toward the Contract Time.

**Certificate of Completion** – A document issued by the Construction Administrator to the Owner stating that the Contractor has fulfilled all contractual obligations.

**Certificate of Completion and Acceptance** – A document issued by the Owner to the Contractor stating that all Work has been completed and has been accepted by the Owner.

**Certificate of Compliance** – A document issued by the Engineer to the Owner stating that for portion of the project completed, either the design or the construction, has been performed in substantial compliance with all applicable building codes.

**Certificate of Substantial Completion** – A document prepared by the Engineer and approved by the Owner stating that, on the basis of inspection: 1) the Work, or a designated portion thereof, is determined to be substantially complete, 2) the date of Substantial Completion, 3) the responsibilities of the Owner and the Contractor for security maintenance, heat, utilities, damage to the Work and insurance, and 4) the time within the Contractor shall complete the remaining work.

**Construction Manager or Administrator** – An individual, partnership, firm, or other business organization under contract or employed by the Owner commissioned and/or authorized to oversee the fulfillment of all requirements of the Contract Documents.

**Construction Change Directive** – A written authorization signed by the Owner directing a modification in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum, Contract Time, or both.

**Contract or Contract Documents** – The written agreement signed by the Owner and the Contractor covering the Work and the furnishing of labor, materials, tools, and equipment in the construction of the Work. The Contract shall include the Notice to Contractors, Bid, Drawings (also referred to as Plans), Specifications, Special Provisions, contract bonds, and any project-specific specifications or

documents; also any and all Change Orders amending or extending the Work contemplated and which may be required to complete the Work in a substantial and acceptable manner.

**Contract Change Order** – A Contract amendment approved by the Owner that includes, but is not limited to, alterations, deviations, additions to, or deletions from, the Contract which are required for the proper completion of the Work.

**Contractor** – The person or persons, firm, partnership, corporation, or combination thereof, private or municipal, who (that) has (have) entered into a Contract, as defined in these Specifications, with the Owner.

**Contract Start Date** – The date specified by the Owner in the Notice to Proceed on which the Contractor is required to start the Work.

**Contract Sum** – The sum stated in the Contract, which is the total amount payable by the Owner to the Contractor for the performance of the Work contained in the Contract Documents.

**Contract Time** – The time stated in the Contract for completion of the Work. The Contract Time may be a single allotment of time, a group of times specific to portions of the Work, or a combination of the two.

**Drawings** – The plans, drawings, profiles, cross sections, Working Drawings, and Supplemental Drawings, or reproductions thereof, approved by the Owner, which show the locations, character, dimensions, and details of the Work.

**Engineer** – The Director of Public Works for the Town of East Hartford, acting personally or through agents or assistants duly authorized by the Engineer.

**Equal(s)** – A replacement for the specified material, device, procedure, equipment, etc., which is deemed by the Owner and Engineer to be substantially identical to the listed manufacturer or procedure specified in terms of cost, quality, and performance for the project. The Equal does not constitute a modification in the scope of Work, Schedule, or design intent of the specified material, device, procedure, equipment, etc.

**Estimated Quantities** – The list of items of work and the estimated quantities associated with the Work. The Estimated Quantities provide the basis for the Bid.

**Final Acceptance** – The Owner's written approval and acceptance of the Work issued to the Contractor upon written certification by the Engineer of Final Completion.

**Final Completion** – A written statement by the Engineer to the Owner indicating that the Work has been completed in accordance with the terms and conditions of the Contract Documents.

**Final Inspection** – Review of the Work by the Engineer and the Owner to determine if Final Completion has been achieved.

**Final Payment** – The last payment made by the Owner to the Contractor, made after notice of the Final Acceptance. Payment shall include the entire unpaid balance of the Contract Sum as adjusted by Modifications.

**Float** – The period of time measured by the number of Working or Calendar Days (as specified in the Contract) each non-critical path activity may be delayed before it and its succeeding activities become part of the critical path.

**General Provisions** – The General Provisions of the Contract, included as Division 0.

**General Requirements** – The General Requirements of the Contract, which is Division 1.

**Inspector** – The person(s) authorized to act as agent(s) for the Owner in the inspection of the Work.

**Legal State Holiday** – Holidays recognized by the State of Connecticut.

**Liquidated Damages** – A sum established in the Contract, usually as a fixed sum per day, as a predetermined measure of damages to be paid to the Owner due to the Contractor’s failure to complete the Work within the Contract Time.

**Lump Sum** – An item or category priced a whole rather than broken down into its elements.

**Minor Changes in the Work** – Changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents, which shall be affected by written order issued by the Engineer.

**Modification of Amendment** – 1) A written change to the Contract Documents, 2) A Change Order, 3) A Construction Change directive, 4) Supplemental Instructions for minor changes in the Work and/or additional instructions to the Work.

**Notice of Potential Claim** – Written notice to the Owner indicating the Contractor’s intent to file a claim for additional compensation due to changes in the work, out-of-scope work, or unanticipated conditions.

**Notice To Contractors** – The written notice whereby interested parties are informed of the date, location, and time of the Bid Opening of a proposed Owner Project and the terms and conditions of submitting Bids to perform the Work.

**Notice To Proceed** – The written authorization by the Owner to the Contractor specifying the date the Work may begin and any conditions regarding the beginning of the Work.

**Owner** – The Town of East Hartford, Department of Public Works acting through its authorized representatives.

**Payment Bond, Labor Bond, or Material Bond** – A bond in which the Contractor and the Contractor’s Surety guarantee to the Owner that the Contractor will pay for labor and materials furnished for use in the performance of the Contract, as required by Connecticut General Statutes Section 49-41.

**Performance Bond or Surety Bond** – A bond in which the Contractor and the Contractor’s Surety guarantee to the Owner that the Work will be performed in accordance with the Contract Documents, as required by Connecticut General Statutes Section 49-41.

**Performance Specification** – A description of the desired results or performance of a product, material, assembly, procedure, or piece of equipment with criteria for identifying the standard.

**Plans** – The plans, drawings, profiles, cross sections, Working Drawings, and Supplemental Drawings, or reproductions thereof, approved by the Owner, which show the locations, character, dimensions, and details of the Work.

**Progress Payment** – Payment to the Contractor for portions of Work satisfactorily completed, and for supplies and equipment suitably stored at the site.

**Project** – Shall mean the Work.

**Project Manual** – The set of documents assembled for the Work which includes, but is not limited to, Contract Documents, Bidding Requirements, Sample Forms, Conditions of the Contract, and General Requirements of the Specifications.

**Proposal** – Shall mean “Bid”.

**Proprietary Specification** – As specification that describes a product, procedure, function, material, assembly, or piece of equipment by trade name and/or by naming the manufacturer(s) or manufacturer's procedure, exact model number, item, etc., of those products acceptable to the Owner.

**Retainage** – Portion of the contractor's final payment withheld until the project is either complete or reaches the milestone identified in the contract terms and all claims and liens have been released or have expired. The percent withheld and the point at which the retainage is released is defined in the terms of the contract.

**Record Drawings or As-built Drawings** – Drawings prepared by the Contractor that document changes to, additions to, or deductions from the Drawings, and which represent the Work as constructed.

**Schedule** – A Critical Path Method (CPM) or Construction Schedule as required by the Contract Documents which shall be a diagram, graph, or other pictorial or written schedule showing all events expected to occur and operations to be performed and indicating the Contract Time, start dates, durations, and finish dates and their relationship to Substantial Completion and Final Completion of the Work, rendered in a form permitting determination of the optimum sequence and duration of each operation.

**Schedule of Values** – A statement furnished by the Contractor to the Owner reflecting the portions of the Total Contract Price allotted for the various parts of the Work for each work activity contained on the project schedule. Unless otherwise indicated in the Specifications, the total of the Schedule of Values shall equal the full cost of the Work, including all labor, material, equipment, overhead, and profit. For lump sum contracts, the Schedule of Values is the basis for reviewing the Contractor's application for progress payments.

**Secondary Subcontractor** – An individual, partnership, firm, or Corporation under direct contract with the Subcontractor to the Contractor.

**Shop Drawings** – Drawings provided to the Engineer and Owner by the Contractor that illustrate construction, materials, dimensions, installation, and other pertinent information for incorporation of an element or item into the construction as detailed Contract Documents.

**Specialty Contractor** – Shall mean subcontractor providing services on those parts of the work which, under normal contracting practices, are performed by specialty subcontractors.

**Specialty Items** – Items of Work which require a specialized contractor capable of performing the Work, as required by the contract documents.

**Special Provisions** – The Special Provisions are specific clauses setting forth conditions or requirements peculiar to the Work and supplementary to these Standard Construction Specifications.

**Specifications** – The directions, provisions, and requirements contained in the General Provisions, the Special Provisions, and the technical specifications, together with any amendments or revisions that may be set forth in the Special Provisions.

**Standard Drawings** – The Standard Drawings of the Owner, which are made a part of the Drawings by reference to one or more specific Standard Drawings.

**State** – The State of Connecticut.

**Subcontractor** – A properly licensed party under contract to and responsible to the Contractor for performing a specified part of the Work; or a properly licensed party under contract and responsible to a Subcontractor of the Contractor.

**Submittals** – Documents including, but not limited to, samples, manufacturer’s data, shop drawings, or other such items submitted to the Owner and Engineer by the Contractor for the purpose of approval or other action, as required by the Contract Documents.

**Substantial Completion** – The stage in the progress of the Work when the Work, or designated portion thereof, is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use. Substantial Completion shall be considered when the Contractor has completed at least 95% of the assigned work as identified in his Application for Payment.

**Substitution** – A material, device, procedure, equipment, etc., which has been determined by the Engineer and the Owner to be not an Equal to the first manufacturer or procedure listed in the Specification in terms of cost, quality, and performance, but may be used in place of that item specified. The Substitution constitutes a modification in the Work, the Schedule, or the Engineers design intent.

**Supplemental Drawing** – Supplemental Drawings define the Drawings or Specifications in greater detail by providing additional information that may have not been specifically or clearly shown or called out on the Drawings or in the Specifications.

**Supplementary Conditions** – An extension of the General Conditions applicable to any and all portions of the Work under the Contract Documents.

**Technical Provisions** – The provisions of the Specifications that describe the technical aspects of the Work, included as Divisions 1-16.

**Total Contract Price** – The total price for the Work as bid by the Contractor, including any additions or subtractions made via Contract Change Orders.

**Town** – Town of East Hartford, Connecticut

**Unit Price** – The monetary value stated by the Owner or the Contractor, as a price per unit of measure for materials or services as described in the Contract Documents and/or Bid Documents.

**Work** – All actions which the Contractor is contractually required to do as specified, indicated, shown, contemplated, or implied in the Contract to construct the Work, including all alterations, amendments, or extensions made by Contract Change Order or other written orders or directives of the Owner. Unless specified otherwise in the Contract, the Work includes furnishing all materials, supplies, equipment, tools, labor, transportation, supervision, and all incidentals necessary to complete the Work.

**Working Day** – Monday through Friday, excluding Local, State, and Federal holidays.

**Working Drawing** – Working Drawings detail a particular item of work and the manner in which it is to be accomplished or performed. Working Drawings are prepared by the Contractor as a submittal or a portion of a submittal and may be specifically requested by the Owner or required in the Contract or a Field Instruction or other written directive.

## SECTION 2 BID REQUIREMENTS AND CONDITIONS

### 2-1 BID FORM

The Owner will furnish to each prospective Bidder a bid form which, when properly completed and executed, must be submitted as the Bidder's Bid for the Work. All Bids must be submitted on the Owner-furnished bid form to be valid and accepted. Bids that are not submitted on the Owner-furnished bid form will be rejected. The completed bid form shall be in English and legible, and shall be properly signed in longhand by the Bidder, if an individual, by a member of a partnership, by an officer of a corporation authorized to sign contracts on behalf of the corporation, or by an agent of the Bidder. If submitted by a corporation, the Bid shall show the name of the state under the laws of which the corporation is chartered or organized.

#### *2-1.01 Unit Price Bid*

Where the bid for an item of work is to be submitted on a unit price basis, the Bidder shall bid a unit price as total compensation for completion of one unit of the work described under that item. This price shall be multiplied by the Estimated Quantity included in the bid form to obtain the total bid price for that item. The total amount bid for a unit price contract shall be entered on the space provided on the bid form as a grand total of all individual items.

The Estimated Quantities included on the bid form are approximate and are only included in the bid form as a basis for comparison of Bids. The Owner does not, expressly or by implication, represent, or agree that the actual amount of work will equal the approximate Estimated Quantities. Payment will be made for the actual quantity of Work performed in accordance with the Contract. The Owner reserves the right to increase or decrease the quantity of any class or portion of the Work, or to omit portions of the Work, as may be deemed necessary or advisable at the sole discretion of the Owner. See Section 9-7.02 regarding compensation for alterations in quantities of work, including deviations greater than twenty-five percent (25%).

#### *2-1.02 Lump Sum Bid*

Where the bid for an item of work is to be submitted on a "Lump Sum" basis, a single lump-sum price shall be submitted in the appropriate place on the bid form. Items bid on a lump sum basis shall result in a complete structure, operating plant, or system, in satisfactory working condition with respect to the functional purposes of the installation, as described in the Contract, and no extra compensation will be paid for anything omitted but fairly implied.

#### *2-1.03 Allowances*

Where specific allowance items have been entered on the bid form by the Owner, the total amount entered on the bid form shall be included in the Total Bid Price. However, the total amount to be paid for the Work included in the Allowance shall be the amount of the Allowance actually utilized in the course of completing the Work.

## **2-2 PREPARATION AND SUBMISSION OF BIDS**

By submission of a Bid, the Bidder acknowledges acceptance of the nature and location of the Work, the general and local conditions, conditions of the site, the character, quality and scope of work to be performed, the availability of labor, electric power, water, the kinds of surface and subsurface materials on the site, the materials and equipment to be furnished, and all requirements of the Contract or other matters that may affect the Work, its cost, or the time required to complete the Work. Any failure of a Bidder to become acquainted with all of the available information concerning conditions will not relieve the Bidder from the responsibility for properly estimating the difficulties or cost of the Work.

The Bidder declares by the submission of a Bid that the Bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the Bid is genuine and not collusive or a sham; that the Bidder has not directly or indirectly induced or solicited any other Bidder to put in a false or sham Bid, and has not directly or indirectly colluded or agreed with any Bidder or anyone else to put in a sham Bid or to refrain from bidding; that the Bidder has not directly or indirectly sought by agreement, communication, or conference with anyone to fix the Bid price or the Bid price of any other Bidder, or to fix any overhead, profit, or cost element of such Bid price or that of any other Bidder, or to secure any advantage against the Owner, anyone interested in the Bid as principal, or those named within the Bid; that all statements contained in the Bid are true; that the Bidder has not directly or indirectly submitted a Bid price or any breakdown thereof or the contents thereof, or divulged information or data relative thereto, to any other person, partnership, corporation or association, except to person or persons as have a direct financial interest in the Bidder's general business.

Bid prices shall include everything necessary for the completion of the Work and fulfillment of the Contract, including but not limited to furnishing all materials, equipment, tools, excavation sheeting, bracing and supports, plant, labor and services, except as may be provided otherwise in the Contract. Bid prices shall include all Federal, State, and local taxes, and all other fees and costs not expressly paid for by the Owner as stated in the Special Provisions.

The Bid shall be submitted in a sealed envelope as directed in the "Standard Instructions for Bidders."

Bids submitted in envelopes that are not properly marked will be rejected.

## **2-3 EXAMINATIONS OF PLANS, SPECIFICATIONS, AND SITE OF WORK**

The Bidder shall carefully examine the site of the proposed Work, including the Plans, Specifications, and Bid Documents, as so to satisfy himself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered. The submission of a Bid shall be conclusive evidence that the Bidder is satisfied through the Bidder's own investigation as to the conditions to be encountered; the character, quality, quantity and scope of work to be performed; and the materials and equipment to be furnished.

If material discrepancies or apparent material errors are found in the Plans and Specifications prior to the date of bid opening, an Addendum may be issued (see Section 2-9, "Addenda"). Otherwise, in figuring the Work, Bidders shall consider that any discrepancies or conflict between Plans and Specifications will be governed by Section 3-1, "Intent of Contract Documents."

## **2-4 SUBSURFACE CONDITIONS**

Where investigations of subsurface conditions have been made by the Owner with respect to subsurface conditions, utilities, foundation, or other structural designs, and that information is shown in the Plans, it

represents only a statement by the Owner as to the character of materials which have actually been encountered by the Owner's investigation. This information is only included for the convenience of Bidders.

Investigations of subsurface conditions are made for the purpose of design only. The Owner assumes no responsibility with respect to the sufficiency or accuracy of borings or of the log of test borings, or other preliminary investigations, or of the interpretation thereof. There is no guaranty, either expressed or implied, that the conditions indicated are representative of those existing throughout the Work, or any part of it, or that unanticipated conditions may not occur. When a log of test borings is included in the Plans, it is expressly understood and agreed that the test boring log is not a part of the Contract. The test boring logs provides data concerning the soil conditions encountered at the specific depth, location, and date of the sampling, and is included in the Plans only for the convenience of the Bidders. The Owner makes no representation of the adequacy of this information for Bidder's use and Bidder is solely responsible for making any interpretations of the data, including its adequacy and relevance for Bidder's use. Making information available to Bidders is not to be construed in any way as a waiver of the provisions of the first paragraph of this Section 2-4, and Bidders must satisfy themselves through their own investigations as to conditions to be encountered.

## **2-5 CONTRACTORS/SUBCONTRACTORS REQUIRED TO BE LICENSED**

The Bidder shall be properly licensed to do the type of work contemplated in the project, and shall be skilled and regularly engaged in the general class or type of work called for under the contract. Unless specified otherwise in the Special Provisions, the Bidder shall indicate the license number and class in the space provided for that purpose on the bid form.

All Subcontractors engaged to perform portions of the Work shall be properly licensed to do the type of work for which they are subcontracted, and shall be skilled and regularly engaged in the general class or type of work called for under their subcontracts.

The Owner may not award the Contract if it cannot be verified that the low Bidder is an appropriately licensed Contractor at the time of Contract award.

## **2-6 COMPETENCY OF BIDDERS**

It is the intention of the Owner to award a Contract only to a Bidder who furnishes satisfactory evidence that the Bidder has the requisite experience and ability, and has sufficient capital, facilities, and plant to enable the Bidder to prosecute the Work successfully and promptly, and to complete the Work within the time stated in the Contract.

If required by the Special Provisions or the Notice to Contractors, a statement of experience and business standing, together with that of all Subcontractors that were designated in the Bid, shall be submitted on an Owner-provided form. To determine the experience of a Bidder, any relevant evidence will be considered that the Bidder, or personnel, has satisfactorily performed on other contracts of similar nature and magnitude or difficulty.

## **2-7 JOINT VENTURE BIDS**

Joint venture bids will not be accepted, any joint venture bid received will be rejected, and the bidder(s) will not be considered for award of the project.



## 2-8 SUBCONTRACTORS

Except as noted in the Special Provisions, the Contractor shall perform, with the Contractor's own organization and with workers under the Contractor's immediate supervision, work of a value not less than fifty percent (50%) of the value of original Total Contract Price less "Specialty Items." "Specialty Items" may be performed by subcontract and the cost of any "Specialty Items" so performed may be deducted from the original Total Contract Price before computing the amount of work required to be performed by the Contractor. Where an entire item is subcontracted, the value of work subcontracted will be based on the Contract item bid price. When a portion of an item is subcontracted, the value of work subcontracted will be based on the estimated percentage of the contract item bid price, determined from information submitted by the Contractor, subject to approval by the Owner. Each Bidder shall list in the bid form:

- The name and the location of the place of business of each Subcontractor whom the Bidder proposes to perform work or labor or render service to the prime Contractor in or about the construction of the Work, or a Subcontractor licensed by the State of Connecticut who, under subcontract to the prime Contractor, is proposed by the Bidder to specially fabricate and install a portion of the Work according to detailed drawings contained in the Contract, in an amount in excess of one-half of one percent (0.5%) of the Total Bid or, in the case of a Bid for the construction of streets or highways, including bridges, in excess of one-half of one percent (0.5%) of the Bidder's Total Bid or ten thousand dollars (\$10,000), whichever is greater.
- The portion of the Work [type of work and percentage if not one hundred percent (100%)] that will be done by each Subcontractor. The Bidder shall list only one Subcontractor for each portion as is defined by the Bidder in the Bid.

If a Bidder fails to specify a Subcontractor for any portion of the Work to be performed under the Contract (or specifies more than one Subcontractor for the same work), the Bidder agrees that the Bidder is fully qualified and shall perform that portion of the Work.

A listed Subcontractor shall perform with the Subcontractor's own organization and with workers under the Subcontractor's immediate supervision, work of a value of not less than seventy-five percent (75%) of the value of each item of work for which the Subcontractor is listed.

A Contractor may not perform work with a Subcontractor who is ineligible to perform work on public works projects in the State of Connecticut.

The Contractor shall include provisions in every Subcontract that the Contract between the Contractor and the Owner is part of the Subcontract, and that all terms and provisions of the Contract are incorporated in the Subcontract. Copies of all Subcontracts shall be available to the Owner upon written request.

## 2-9 ADDENDA

The correction of any material discrepancies in, or material additions to, or omissions from, the Plans, Specifications, or other Contract documents, or any interpretation thereof, during the bidding period will be made only by an Addendum issued by the Owner. A copy of each Addendum issued by the Owner will be mailed or delivered to each planholder listed on the Owner planholder list and is a part of the Contract. Any interpretation or explanation not included in the addenda will not be considered binding.

## **2-10 PUBLIC OPENING OF BIDS**

Bids will be opened and read publicly. Bidders or their authorized representatives and other interested parties are invited to be present.

## **2-11 REJECTION OF BIDS**

The Owner reserves the right to reject any and all Bids. The Owner reserves the right to waive irregularities in a Bid and to make an award in the best interest of the Owner. Bids containing omissions, erasures, alterations, conditions, or additions not called for may be rejected.

### **SECTION 3**

## **AWARD AND EXECUTION OF CONTRACT**

### **3-1 AWARD OF CONTRACT**

The award of the Contract, if the Contract is to be awarded, will be to the lowest responsive, responsible Bidder. In addition to price in determining the lowest responsive, responsible Bidder, consideration will be given, but are not limited to:

- The ability, capacity, and skill of the Bidder to perform the Work.
- The ability of the Bidder to perform the Work within the time specified, without delay.
- The ability of the Bidder to perform the Work in a safe manner.
- The character, integrity, reputation, judgment, experience, and efficiency of the Bidder.
- The quality of the Bidder's performance on previous work with the Owner.
- The Bidders technical qualifications.
- The Bidders financial resources.
- The Bidders compliance to the Specifications.
- The Bidders current equipment.

If the Bid Schedule contains an Owner option(s) and if an Owner option(s) are selected by the Owner, award will be based on the lowest total price for the sum of the base bid price plus the bid prices of the selected Owner option(s).

Owner options will be taken in order from a list of those items, depending on available funds as identified in the bid solicitation.

### **3-2 TIME OF AWARD**

The award of the Contract, if made, will be made within forty-five (45) Calendar Days after the Bid Opening. If the lowest responsive, responsible Bidder refuses or fails to execute the Contract, the Owner may award the Contract to the second lowest responsive, responsible Bidder. The specified period of time within which the award of the Contract may be made may be subject to extension for further periods as agreed upon in writing by the Owner and the Bidder.

### **3-3 CONSIDERATION OF BIDS**

After the Bids have been opened and read, they will be checked for accuracy and compliance with the Specifications.

In the event that the product of a unit price and an estimated quantity does not equal the extended amount quoted, the unit price shall govern and the correct product of the unit price and the estimated quantity shall be deemed to be the amount bid. If the sum of two or more items in a bidding schedule or the sum of two or more bidding schedules does not equal the total amounts quoted, the individual item or schedule amounts shall govern and the correct total shall be deemed to be the amount bid. If the Bid is missing the unit price, then it may be deemed incomplete and the Bid may be rejected.

After the Owner has made any necessary corrections in mathematical errors appearing on the face of the Bid, all Bids will be compared based on the bid form.

### **3-4 PERFORMANCE AND PAYMENT BONDS**

The format of the Performance Bond and Payment Bond forms shall be those contained in the Invitation to Bid.

As part of the execution of the Contract, the successful Bidder shall furnish the following corporate surety bonds to the benefit of the Owner. Bonds shall be executed by a surety company authorized to do business in the State of Connecticut and listed in the current Federal Department of Treasury Circular 570. When the amount to be paid to the Contractor is based upon units of work to be performed or items to be provided, the term "Total Contract Price" as used below for the purpose of posting Performance and Payment Bonds shall be computed on the basis of the unit price bid multiplied by the Estimated Quantities of work to be performed.

#### ***3-4.01 Performance Bond***

The Performance Bond, to guarantee the performance of all covenants and stipulations of the Contract, shall be on the form provided by the Owner and shall be in a sum not less than one hundred percent (100%) of the original Total Contract Price as set forth in the Contract.

#### ***3-4.02 Payment Bond***

The Payment Bond, to guarantee the payment of wages and of bills contracted for materials, supplies, or equipment used in the performance of the Contract, shall be on the form provided by the Owner and shall be in a sum not less than one hundred percent (100%) of the original Total Contract Price as set forth in the Contract.

### **3-5 NOTIFICATION OF SURETY COMPANIES**

The surety company shall be familiar with all the provisions and conditions of the Contract. It is understood and agreed that the surety company waives notice of change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or to the specifications accompanying the same, or any other act or acts by the Owner or the Owner's authorized agents under the terms of the Contract; and failure to so notify the surety company of changes shall in no way relieve the surety company of its obligations under the Contract.

### **3-6 EXECUTION OF CONTRACT**

The Contract shall be executed by the successful Bidder and returned to the Owner, together with the Performance Bond, Payment Bond and certificates of insurance within ten (10) Calendar Days of the Bidder's receipt of the documents. Insurance certificates shall be signed by a person authorized by the insurer to bind coverage on its behalf and shall be accompanied by copies of all endorsements required by Section 3-8 "Insurance." When requested by the Owner, the successful bidder shall furnish complete, certified copies of all required insurance policies, including endorsements specifically required by Section 3-8. After execution by the Owner, one copy of the Contract, bonds, and certificates of insurance will be returned to the Contractor.

### **3-7 FAILURE TO EXECUTE CONTRACT**

If the Bidder to whom the Contract is awarded fails to execute the Contract and file acceptable bonds and insurance certificates as provided herein within ten (10) Calendar Days from the time the Contract forms are received by the Bidder, the award may be annulled and the Bidder's Bid Bond forfeited to the Owner.

At the Owner's discretion, the Contract may then be awarded to the next lowest responsive, responsible Bidder.

If the Owner awards the Contract to the second lowest responsive, responsible Bidder, the amount of the lowest responsive, responsible Bidder's Bid Bond shall be applied by the Owner to the difference between the lowest Bid and the Bid of the second lowest responsive, responsible Bidder, and the surplus, if any, will be credited to the surety on the Bidder's Bond.

On refusal or failure of the second lowest responsive, responsible Bidder to execute the Contract, the Owner may award it to the third lowest responsive, responsible Bidder. If the Owner awards the Contract to the third lowest responsive, responsible Bidder, in addition to application of the lowest Bidder's Bid Bond as aforesaid, the amount of the second lowest responsive, responsible Bidder's Bid Bond shall be applied by the Owner to the difference between the Bid of the second lowest responsive, responsible Bidder and the Bid of the third lowest responsive, responsible Bidder, and the surplus, if any, shall be credited to the surety on the second lowest Bidder's Bid Bond.

### 3-8 INSURANCE **Article 3-8 is deleted under Addendum No. 3**

The Contractor shall procure, maintain, and keep in force at all times during the term of the Contract, at the Contractor's sole expense, the following insurance:

#### *3-8.01 Commercial General Liability*

Commercial General Liability insurance including contractual liability, products and completed operations liability, broad form property damage, and Independent Contractors. The limits shall be no less than \$1,000,000 per occurrence and \$2,000,000 annual aggregate. Coverage for hazards of explosion, collapse and underground (X-C-U) must also be included when applicable to the Work. The Town of East Hartford, its employees, officials, and volunteers shall be endorsed as Additional Insured. Additional insured endorsements shall provide coverage on a primary basis.

#### *3-8.02 Owner's and Contractor's Protective Liability*

Owner's and Contractor's Protective Liability insurance providing a combined single limit of \$1,000,000 for all damages arising out of bodily injury or death of persons in any one accident or occurrence and for all damages arising out of injury or destruction of property in any one accident or occurrence, and subject to a total (aggregate) limit of \$2,000,000 for all damages arising out of bodily injury or death of persons in all accidents or occurrences and out of injury to or destruction of property during the policy period. This coverage shall be for and in the name of the Town of East Hartford.

#### *3-8.03 Automobile Liability*

Automobile Liability insurance providing for a combined single limit of \$1,000,000 for all damages arising out of bodily injuries to or death of all persons in any one accident or occurrence and for all damages arising out of injury to or destruction of property in any one accident or occurrence. This coverage shall be provided on a primary basis. Should the Contractor not own any automobiles, the automobile liability shall be amended to allow the Contractor to maintain only hired and non-owned liability.

#### *3-8.04 Workers' Compensation and Employer's Liability*

Workers' Compensation insurance as required by the State of Connecticut including Employers Liability insurance with bodily injury limits of \$1,000,000 per occurrence, \$500,000 disease policy limit, and

\$100,000 disease each employee. When Work is on or contiguous to navigable bodies of waterways and ways adjoining, the Contractor shall include Federal Act endorsement for U.S. Longshoremen's and Harbor Workers Act.

### ***3-8.05 Excess or Umbrella Liability***

Excess or Umbrella liability with a minimum limit of \$5,000,000 per occurrence. The Town of East Hartford shall be specifically endorsed as Additional Insured on the Excess Liability or Umbrella policy, unless the Excess Liability or Umbrella policy provides continuous coverage to the underlying policies on a complete "Follow Form" basis.

### ***3-8.06 Contractor's Equipment***

The Contractor, and each of his Subcontractors, shall separately insure their own equipment for loss and damage. The Contractor's Property and Inland Marine policies shall include, or be endorsed to include, a waiver of subrogation against the Owner, its officers, officials, employees, agents, and volunteers which might arise by reason of damage to the Contractor's property or equipment (owned, leased or borrowed) in connection with work performed under this Contract by the Contractor.

### ***3-8.07 Railroad Protective Liability***

When stated as a requirement in the Special Provisions, the Contractor shall procure, maintain, and keep in force at all times during the term of the Contract, at the Contractor's sole expense, Railroad Protective Liability insurance with limits of liability as set forth in the Special Provisions.

### ***3-8.08 Environmental Liability Insurance***

The Contractor shall procure, maintain, and keep in force at all times during the term of the Contract, at the Contractor's sole expense, Environmental Liability insurance which includes coverage for sudden and accidental pollution arising out of the handling of hazardous materials or hazardous wastes, non-hazardous materials or non-hazardous wastes that when released to the environment, violate regulatory standards of the Federal, State or local government, and coverage for liability arising out of the handling of asbestos.

Limits of coverage shall be two million dollars (\$2,000,000).

The "Retro Date" must be shown, and must be on or before the date of the Contract or the beginning of the Work.

Insurance must be maintained and evidence of insurance must be provided for at least one (1) year after completion of the Contract.

If coverage is cancelled or non-renewed, and not replaced with another claims-made policy form with a "Retro Date" prior to the Contract effective date, the Contractor must purchase "extended reporting" coverage for a minimum of one (1) year after completion of the Contract.

### ***3-8.09 Other Provisions***

The Contractor shall not start the Work until all required insurance has been obtained and approved by the Owner.

Articles 3-8 & 3-9 are deleted under Addendum No. 3

The Contractor shall not allow any Subcontractor to start the Work until all the same insurance has been obtained by the Subcontractor and approved by the Owner, or the Contractor's insurance provides coverage on behalf of the Subcontractor.

Each insurance policy required to be maintained by the Contractor, except Worker's Compensation and Automobile Liability, shall endorse the Town of East Hartford as Additional Insured. Additional Insured endorsements shall provide coverage on a primary basis.

If required to maintain Builder's Risk and/or Inland Marine/Transit, the policies shall endorse the Town of East Hartford as Loss Payee.

The Contractor shall, at his own expense, maintain in full force and effect at all times during the life of the Contract or performance of the Work, insurance coverage as described herein. Insurance certificates shall include a minimum thirty (30) day endeavor to notify requirement to the Owner prior to any cancellation or non-renewal.

The Contractor shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, coinsurance penalty, or self-insured retention, including any loss not covered because of the operation of such deductible, coinsurance penalty, or self-insured retention.

### **3-9 INDEMNIFICATION**

The Contractor shall at all times indemnify and save harmless the Town of East Hartford, the Department of Public Works, their respective officers, agents, and employees, on account of any and all claims, damages, losses, litigation, expenses, counsel fees, and compensation arising out of injuries (including death) sustained by or alleged to have sustained by the officers, agents, and employees of said Town or Department, or of the Contractor, his subcontractor, or materialmen and from injuries (including death) sustained by or alleged to have been sustained by the public, any or all persons on or near the Work, or by any other person or property, real or personal (including property of said Town or Department) caused in whole or in part by the acts, omissions, or neglect of the Contractor including but not limited to any neglect in safeguarding the Work or through the use of unacceptable materials in constructing the Work of the Contractor, any Subcontractor, materialman, or anyone directly employed by any of them while engaged in the performance of the Contract, including the entire elapsed time from the date of the Notice to Proceed or the actual commencement of the Work, whichever occurs first until its completion as certified by the Department of Public Works.

### **3-10 NOTIFICATION OF ACCIDENT OR OCCURRENCE**

The Contractor shall report by telephone to the Owner within twenty-four (24) hours and also report in writing to the Owner within fifteen (15) Calendar Days after the Contractor or any subcontractors or agents have knowledge of any accident or occurrence involving death of or injury to any person or persons, or damage in excess of ten thousand dollars (\$10,000) to the Work, property of the Owner or others, arising out of any work done by or on behalf of the Contractor as part of the Contract. Such report shall contain:

1. The date and time of the occurrence,
2. The names and addresses of all persons involved, and
3. A description of the accident or occurrence and the nature and extent of injury or damage.

## **SECTION 4 SCOPE OF WORK**

### **4-1 INTENT OF CONTRACT DOCUMENTS**

The Work shall be performed and completed according to the Contract documents. The Contract documents provide the details for completing the Work in accordance with the terms of the Contract. Each Contract document is an integral part of the Contract, and a requirement occurring in one is as binding as though occurring in all. The Contract documents shall be interpreted as being explanatory and complementary in requiring complete work ready for use and occupancy or operation in satisfactory working condition with respect to the functional purposes of the installation.

The Contractor shall do all of the work and furnish all labor, materials, tools, equipment, and appliances, except as otherwise herein expressly stipulated, necessary or proper for performing and completing the work herein required, including any Change Order work or disputed work directed by the Owner, and all provisions of the Contract, within the time specified.

All work shown on the Plans, the dimensions of which are not figured, shall be accurately followed to the scale to which the drawings are made; however, figured dimensions shall in all cases be followed, even if they differ from scaled measurements. Full-size drawings shall be utilized in the execution of the Work.

If the Contract does not specifically allow the Contractor a choice of quality or cost of items to be furnished, but could be interpreted to permit such a choice, the Contractor shall furnish the highest quality under current industry standards, regardless of the cost of the item.

Unless otherwise specified, the Contractor agrees to furnish all tools, equipment, apparatus, facilities, labor, material, and transportation necessary to perform and complete the Work in a good and workmanlike manner to the satisfaction of the Owner, in the manner designated, and in strict conformity to the Contract. When portions of the Work are described in general terms, but not in complete detail, it is understood that the Contractor will employ only the best general practice and incorporate only the best quality materials and workmanship in the Work.

No extra compensation will be allowed for anything omitted but fairly implied. The prices paid for the various items will include full compensation for furnishing all labor, materials, tools, equipment, overhead, and incidentals and doing all work necessary to complete the Work as provided in the Contract. The prices paid include all markups and profit.

If the Contractor discovers any discrepancies during the course of the Work between the Contract drawings and conditions in the field, or any errors or omissions in the Contract drawings and conditions in the field, or any errors or omissions in the Contract drawings, the Specifications, or in the layout given by stakes, points, or instructions, it shall be the Contractor's duty to inform the Owner immediately, and the Owner shall promptly verify the same. Any work done after such discovery, until authorized by the Owner, will be done at the Contractor's risk.

### **4-2 PLANS AND SPECIFICATIONS FURNISHED**

The Owner will provide, at no cost to the Contractor, copies of Project Plans, Project Specifications, Special Provisions, and the fully executed Contract for the Contractor's use in prosecuting the Work. The total number of copies of the Plans, Specifications, and Special Provisions provided shall equal the total of the



prime Contractor plus the number of Subcontractors listed in the Bid. The Contractor may purchase additional copies of Plans, Specifications, and Special Provisions at cost.

The Contractor shall retain an approved set of Contract documents on the job during the progress of the Work. This set shall be used by the Contractor as the Record Drawings as described in Section 11-2 “Record Drawings.”

#### **4-3 CONFORMANCE WITH CODES AND STANDARDS**

The Work shall be in full compliance with the latest adopted edition of the following applicable standards and regulations:

- Connecticut General Statutes
- The State Fire Marshal
- The UBC
- OSHA
- The NEC
- The UPC
- Other codes, standard, laws, or regulations applicable to the Work or the Contract.

Nothing in the Contract is to be construed to permit work not conforming to these requirements. When the work detailed in the Plans and Specifications differs from governing codes, the Contractor shall complete the Work in accordance with the higher standard.

#### **4-4 SUPPLEMENTAL DRAWINGS**

In addition to the Plans incorporated in the Contract at the time of signing, the Owner may furnish Supplemental Drawings as necessary to clarify or define in greater detail the intent of the Contract. In furnishing such Supplemental Drawings, the Owner may make minor changes in the Work, not involving extra cost and not inconsistent with the nature of the Work. The Supplemental Drawings shall become a part of the Contract.

#### **4-5 FIELD INSTRUCTIONS OR OTHER WRITTEN DIRECTIVES**

The Owner may issue Field Instructions or other written directives during the course of the Work, and the Contractor shall comply with the Field Instructions or other written directives. A Field Instruction or other written directive may be used to add, delete, modify, or reject work, to note deficiencies in work, to clarify the Contract, or to order work to be performed. Work required by a Field Instruction or other written directive shall be in accordance with the Contract and any previously executed Contract Change Orders, except as delineated otherwise in the Field Instruction or other written directive. Drawings included with Field Instructions or other written directives are part of the Contract and shall be incorporated into the Record Drawings.

If the Contractor refuses or neglects to comply with or make progress in the execution of any Field Instruction or other written directive, the Owner may employ any person or persons to perform such work, and the Contractor shall not interfere with the person or persons so employed.

At appropriate intervals, Field Instructions and other written directives that alter the Contract will be grouped to form a Contract Change Order as described in Section 9, “Changes and Claims.”

## **4-6 DOCUMENT PRECEDENCE**

The component Contract documents are intended to provide explanation for each other.

Any work shown on the Plans and not in the Specifications, or vice versa, is to be executed as if indicated in both. In case of conflict in the Contract, the following order of precedence will govern interpretation of the Contract:

1. Field Instructions, change orders, or other written directives
2. Addenda
3. Specifications
4. Project Drawings

## **4-7 REQUESTS FOR INFORMATION**

### **4-7.01 General**

Contractor shall prepare a Request for Information (RFI) when additional information, clarification, or interpretation of the Contract is required. RFIs may also be used for apparent conflicts, inconsistencies, ambiguities, or omissions.

RFIs shall be submitted to the Owner sufficiently in advance of the work to permit time for investigation and preparation of a response. Any work undertaken prior to receipt of a response to an RFI will be at the Contractor's risk.

RFIs shall not be used for submittals or for substitution of material or equipment, or for waiving of requirements.

### **4-7.02 Procedure**

An RFI shall be submitted on an approved form as defined at the preconstruction meeting, and shall be numbered consecutively. A status log shall be prepared and updated by the Contractor and reviewed with the Owner at each progress meeting. Each RFI shall deal with only one topic, item, issue, or system.

The RFI shall clearly describe and specifically state what is being requested. Relevant portions of the Contract shall be cited, marked-up, and attached.

The Contractor shall review each RFI before submittal and compare it with the Contract to verify that a response is required. RFIs will only be accepted from the Contractor and not from Subcontractors or suppliers. A recommendation or proposed solution may be included when appropriate or expedient.

RFIs that are not clear or RFIs for which a response is clearly identified in the Contract will not be accepted.

### **4-7.03 Response**

The Owner will normally respond within fourteen (14) Calendar Days. The Owner will provide a written response, and that response shall control.

The Contractor shall indicate a priority for responses to RFIs if more than five (5) RFIs are pending at the same time. If Contractor believes that work required by an RFI is an increase in contract scope, it must notify Owner in writing, as required in Section 9-14, "Dispute Regarding Contract Requirements."

Subsequent resubmittals of an RFI shall be identified with the same RFI number and a letter designation. Resubmittals shall clearly state the reason for the resubmittal.

Responses to RFIs shall be recorded by the Contractor on the Record Documents in accordance with Section 11-2, "Record Drawings."

#### **4-8 DELETED ITEMS**

The Owner may delete from the Work any item of work. The Contractor will be paid for all work done toward the completion of the item prior to such omission, as provided in Section 9, "Changes and Claims," but in no event will the amount paid exceed the Bid or Schedule of Values amount less the value of the deleted work.

The Contractor shall make no claim, nor receive any compensation for profits, for loss of profit, for damages, or for any extra payment because of any deleted items of work.

#### **4-9 EXTRA WORK**

Work not covered by the Contract but necessary for the proper completion of the Project will be classed as extra work and shall be performed by the Contractor when directed in writing by the Owner. Extra work shall be performed in accordance with the Contract and as directed by the Owner.

Extra work must be authorized in writing by the Owner before the work is started. Payment for extra work will not be made unless such prior written authorization is obtained.

In the event of an emergency or other situation that endangers the Work or endangers public safety, the Owner will direct the Contractor to perform such extra work necessary to protect the Work or the public.

#### **4-10 USE OF COMPLETED PORTIONS**

The Owner has the right during the progress of the Work to take over and place in service any completed or partially completed portion of the Work. Taking possession shall not be deemed acceptance of any other portions of the Work, nor work on those portions not completed in accordance with the Contract.

#### **4-11 LANDS AND RIGHTS-OF-WAY**

The Owner shall provide the lands, rights-of-way, and easements upon which the Work is to be done, and such other lands as may be designated on the Plans for the use of the Contractor. The Contractor shall confine his operations to within these limits.

The Contractor shall provide at the Contractor's own expense any additional land and access that is required for temporary construction facilities or storage of materials. The Contractor shall obtain all required permissions for use of private property prior to taking possession or use. The permission shall be obtained in writing and a copy forwarded to the Owner prior to the Contractor taking possession of said property.

#### **4-12 WARRANTY**

The Performance Bond furnished by the Contractor as part of the execution of the Contract shall define the terms and time period of the Warranty of the Contractor's work unless otherwise specified in the Special Provisions. If no time period is specified in the Performance Bond, the time period will be one year after field acceptance of Work (see Section 7-20, "Final Inspection and Acceptance").

If required by the Special Provisions, the Contractor shall enter into and sign Warranty statements in the form provided to warranty various segments of the Work for the time specified. If no time is otherwise stated, the specified warranty period begins on completion of the project and continues for one year thereafter.

If at anytime during the specified warranty period, the Work, or any portion thereof, fails, does not meet the requirements of the Contract or is otherwise defective, Contractor shall promptly make the needed repairs at the Contractor's expense.

The Owner is hereby authorized to make such needed repairs if the Contractor fails to undertake, with due diligence, the needed repairs within ten (10) Calendar Days after the Contractor is given written notice of such failure and without notice to the surety; provided, however, that in case of emergency where, in the opinion of the Owner, delay would cause serious loss or damages or a serious hazard to the public, the repairs may be made or lights, signs, and barricades erected without prior notice to the Contractor or surety, and the Contractor shall pay the entire costs.

## **SECTION 5 CONTROL OF WORK AND MATERIALS**

### **5-1 AUTHORITY OF OWNER**

The Owner will decide all questions regarding the quality and acceptability of materials furnished, work performed, and rate of progress of the Work. The Owner will decide all questions regarding the interpretation and fulfillment of the Contract on the part of the Contractor, and all questions as to the rights of different contractors involved with the Work.

The Owner will determine the amount and quality of the Work performed and materials furnished for which payment is to be made under the Contract.

The Owner will administer its authority through a duly designated representative identified at the preconstruction meeting. The Contractor and the Owner representative shall make good faith attempts to resolve disputes that arise during the performance of the Work.

Any order given by the Owner not otherwise required by the Contract to be in writing will be given or confirmed by the Owner in writing at the Contractor's request. Such request shall state the specific subject of the decision, order, instruction, or notice and, if it has been given orally, its date, time, place, author and recipient.

### **5-2 ATTENTION AND COOPERATION OF CONTRACTOR**

The Contractor shall comply with any instruction delivered to the Contractor or the Contractor's authorized representative.

### **5-3 SUGGESTIONS TO CONTRACTOR**

Any plan or method suggested to the Contractor by the Owner, Engineer or their consultants, but not required by Owner in writing, is without any responsibility or liability on behalf of Owner, Engineer or their consultants. If Contractor utilizes the suggestion, in whole or in part, it does so at its own risk.

### **5-4 SEPARATE CONTRACTS**

The Owner reserves the right to award other Contracts in connection with the Work. The Contractor shall afford other contractors reasonable opportunity for the delivery and storage of their materials and the execution of their work and shall properly connect and coordinate their work with the other contractors.

If any part of the Contractor's work depends upon the work of any other contractor for proper execution or results, the Contractor shall inspect and promptly report to the Owner any defects in such work that render it unsuitable for proper execution and results. The Contractor's failure to so inspect and promptly report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of the Contractor's work, unless defects develop in the other contractor's work after the execution of the Contractor's work.

## **5-5 COOPERATION WITH OTHER CONTRACTORS**

The Owner or adjacent property owners may perform work adjacent to or within the Work area concurrent with the Contractor's operations. The Contractor shall conduct operations to minimize interference with the work of other forces or contractors.

Any disputes or conflicts between the Contractor and other forces or contractors retained by the Owner which create delays or hindrance to each other shall be referred to the Owner for resolution. If the Contractor's work is delayed because of the acts or omissions of any other force or contractor, the Contractor shall have no claim against the Owner other than for an extension of time (see Section 7-17, "Extension of Time").

## **5-6 CONTRACTOR'S DISMISSAL OF UNSATISFACTORY EMPLOYEES**

If any person employed by the Contractor or any Subcontractor shall fail or refuse to carry out the directions of the Owner or the provisions of the Contract, or is, in the opinion of the Owner, incompetent, unfaithful, intemperate, or disorderly; or uses threatening or abusive language to any person on or associated with the Work; or is acting or working in a manner that compromises the safety of the Work or persons or property involved with the Work, or is otherwise unsatisfactory, the Contractor shall, when requested by the Owner, remove the worker from the Work immediately, and shall not again employ the removed worker on the Work except with the written consent of the Owner.

## **5-7 CONTRACTOR'S EQUIPMENT**

The Contractor shall provide adequate and suitable equipment, in new or refurbished condition, labor, and means of construction to meet all the requirements of the Work, including completion within the Contract Time. Equipment that breaks down shall be promptly replaced with reliable equipment. Only equipment suitable to produce the quality of work required will be permitted to operate on the Project. Specific types of equipment may be requested by the Owner on component parts of the Work.

The Owner may, at the Owner's option, permit the use of new or improved equipment. If such permission is granted, it is understood that it is granted for the purpose of testing the quality and continuous attainment of work produced by the equipment, and the Owner shall have the right to withdraw such permission at any time that the Owner determines that the alternative equipment is not producing work that is equal in all respects to that specified, or will not complete the Work in the time specified in the Contract.

In any case where the use of a particular type or piece of equipment has been banned, or in cases where the Owner has condemned for use on the Work any piece or pieces of equipment, the Contractor shall promptly remove such equipment from the site of the work. Failure to do so within a reasonable time may be considered a breach of contract.

## **5-8 CONTRACTOR'S SUBMITTALS**

### ***5-8.01 Submittals - General***

The Contractor shall furnish all working drawings, plans, computations, designs, specifications, descriptive data, certificates, samples, tests, methods, schedules, and manufacturer's instructions as required in the Contract, and any other information required to demonstrate that the materials and equipment to be furnished and the methods of work comply with the provisions and intent of the Contract. Submittals shall be submitted by the dates specified in the Contract. Dates for submittals, including reasonable durations for their review by the Owner, must be included in the construction schedule.

Submittals for systems shall be bound together and include all information for the system.

If the information furnished in a submittal shows any deviation from the Contract requirements, the Contractor shall, by a statement in writing accompanying the information, advise the Owner of the deviation and state the reasons. It shall be the Contractor's responsibility to ensure there is no conflict with other submittals and to notify the Owner in any case where the Contractor's submittal may concern work by another contractor or the Owner. The Contractor is solely responsible for coordination of submittals among all related crafts performing the Work. The Contractor shall verify that its Subcontractors' submittals are complete in every way and meet the requirements of the Contract.

The approval of the Contractor's submittals shall not relieve the Contractor of responsibility for any error or of any obligation for accuracy of dimensions and details, for agreement with and conformity to the Contract, or responsibility to fulfill the Contract as prescribed. Nor shall such approval be considered as approval of any deviation or conflict unless the Owner has been expressly advised of the same as set forth immediately above, and the Owner has expressly approved such deviation or conflict.

The Contractor shall make no changes to any submittal after it has been approved, and the equipment or materials shall not deviate in any way except with written approval by the Owner. Fabrication or other work performed in advance of approval shall be done entirely at the Contractor's risk.

Minimum requirements for submittals are contained in these Specifications. Additional and/or project-specific requirements may be contained in the Contract. The Contractor is responsible for identifying and providing all required submittals.

#### **5-8.02 Resubmittals**

Resubmittals shall address all comments from the Owner. Partial resubmittals may be returned "REJECTED." The Contractor is responsible for the Owner's review costs for each resubmittal in excess of the first resubmittal. These costs will be back charged to the Contractor and will be deducted from progress payments. Submittals not required by the Contract may be returned by Owner without review or comment.

#### **5-8.03 Submittals Containing Proprietary Information**

All required information shall be provided even though some or all of such information may be considered proprietary.

#### **5-8.04 Electrical, Instrumentation, Control, and Communication Systems**

Electrical, instrumentation, control, and communication system drawings shall include elementary and loop diagram drawings, functional single line system layout drawings, connection drawings, interconnection drawings, panel/cabinet fabrication drawings, and detailed circuit board and component drawings. Detailed circuit schematics and circuit board layout drawings shall clearly show, locate, and identify all components and wiring. Each circuit board component shall be identified by the component's original manufacturer name and part number. Industry standard part numbers shall be used. Component values, voltage/current levels, setpoints, and timing values shall be defined. Drawings shall be in the latest version of AutoCAD™ or other electronic reproducible medium specified by the Owner.

Complete annotated software/firmware source code listings and program documentation shall be provided for all electronic/electrical systems, subsystems, assemblies, parts, components, and equipment that

incorporate programmable devices. All instructions and hardware necessary to load, store, modify, and activate software/firmware source codes and programs shall be provided.

#### **5-8.05 Maintenance and Operations (M&O) Submittals**

For use in subsequent maintenance and operations the Contractor shall furnish, unless otherwise provided for in the Technical Provisions, one (1) original and five (5) copies, all bound and indexed, of maintenance and operation information, including all the highest level of factory maintenance manuals that are available to factory representatives with a three-year subscription to newsletters and updates supplied by the manufacturer covering all equipment and systems included in the Contract. The Owner may withhold up to thirty percent (30%) of the Total Contract Price until M&O submittals have been submitted and approved. The submittal shall include at a minimum:

- Drawings
- Illustrations
- Parts lists
- Wiring diagrams of systems
- Internal wiring diagrams and circuit board schematics and layout drawings
- Manufacturer's recommended spare parts lists
- Name, address and phone number of nearest parts and service agency
- Systems balance data
- Maintenance and service instructions
- Operation instructions
- Troubleshooting Guides
- Software including annotated source lists and programs

The submittal of maintenance and operation information is required for all mechanical, electrical, instrumentation, control, communications, sound, or special equipment and systems. The Contractor shall submit the required data for review at least thirty (30) Calendar Days prior to any required training or the final inspection date. Corrections, additions, and/or resubmittal of data shall be made as directed by the Owner.

The Owner, and such representatives as the Owner may designate, shall receive complete maintenance and operating instructions for all items included above prior to final inspection of the Work.

### **5-9 SURVEYS**

#### **5-9.01 Owner-Furnished Surveys**

The Owner will show, to the best of its knowledge, the location and character of survey control points or monuments on the Contract Drawings located within the construction area. From this information, the Contractor shall develop and make all additional detail surveys and measurements necessary for the construction of the Work.

#### **5-9.02 Survey Control Points or Monuments**

The Contractor is responsible for locating all survey control points or monuments. This work shall be done by or under the direction of a Connecticut Licensed Land Surveyor prior to the beginning of construction



or maintenance work that could disturb or destroy a survey control point or monument. Any control points or monuments found shall be referenced and reset by or under the direction of a Connecticut Licensed Land Surveyor. On thin surface treatments, such as chip seals, the control points/monuments can be covered in advance of the maintenance treatment with a suitable material and then removed to expose the control point/monument. When survey control points/monuments not shown on the plans are discovered, the Contractor shall bring them to the attention of the Owner prior to damaging them. Any damaged or destroyed survey control points/monuments shall be reset by the Contractor's expense.

When the Special Provisions require that the Contractor provide all surveys, the Contractor shall be responsible for referencing, resetting, and filing of corner records for all survey monuments disturbed or destroyed by construction activities.

All survey monuments and references shall be set or reset by or under the direction of a Connecticut Licensed Land Surveyor.

### **5-9.03 Contractor Surveys**

It is the Contractor's responsibility to arrange and pay for a diligent and thorough search for survey monuments. Except as set forth in this Section or in the Special Provisions, the Contractor shall be responsible for performing all necessary surveys to lay out and control the Work to the locations, elevations, lines, and dimensions shown or specified in the Contract. Any deviations must receive prior written approval of the Owner. All surveys affecting the line or elevation of underground drainage, sewers, or utilities, and all other work within public rights-of-way or easements, shall be performed by or under the direction and supervision of a Connecticut Licensed Land Surveyor. The Contractor shall be responsible for protecting and perpetuating survey monuments affected by construction activities. The Contractor shall be responsible for the accuracy of the Contractor's own layout work, and shall be liable for the preservation of all established lines and grades. Stakes damaged or destroyed by the operations of the Contractor shall be replaced at the Contractor's expense.

## **5-10 RESPONSIBILITY FOR ACCURACY**

The Contractor shall obtain all necessary measurements for and from the Work, and shall check dimensions, elevations, and grades for all layout and construction work and shall supervise such work; the accuracy for all of which the Contractor shall be responsible. The Contractor is responsible for adjusting, correcting, and coordinating the work of all Subcontractors so that no discrepancies result.

## **5-11 DUTIES AND POWERS OF INSPECTORS**

Inspectors are the authorized representatives of the Owner to observe work as it is being performed. Their duty is to inspect materials and workmanship of those portions of the Work to which they are assigned, either individually or collectively, under instructions of the Owner, and to report all deviations from the Contract. Inspectors are not authorized to permit any deviations from the requirements of the Contract. Any statements or suggestions by Inspectors as to means and methods for performing Work are suggestions only and not Owner directives. The Contractor assumes all risk if it chooses to adopt or follow such statements or suggestions.

## **5-12 INSPECTION**

The inspection of the Work does not relieve the Contractor of his obligation to fulfill all Contract requirements. Any work, materials, or equipment not meeting the requirements and intent of the Contract

will be rejected, and unsuitable work or materials shall be made good, notwithstanding the fact that such work or materials may have previously been inspected or approved and payment may have been made.

Re-examination of any part of the Work may be ordered by the Owner, and such part of the Work shall be uncovered by the Contractor. The Contractor shall pay the entire cost of such uncovering, re-examination, and replacement if the re-examined work does not conform to the Contract.

All work and materials furnished pursuant to the Contract shall be subject to inspection and approval by the Owner. The Contractor shall provide the Owner and Inspectors with access to the Work during construction and shall furnish every reasonable facility and assistance for ascertaining that the materials and the workmanship are in accordance with the requirements and intent of the Contract.

Unless authorized in writing by the Owner, any work done in the absence of an Inspector, whether completed or in progress, shall be subject to inspection. The Contractor shall furnish all tools, labor, materials, access facilities, and other facilities necessary to allow such inspection, even to the extent of uncovering or taking down completed portions of the Work. The Contractor shall pay all costs incurred, whether or not any defective work is discovered. The Contractor shall also be solely responsible for any costs associated with the removal of any defective work discovered during the inspection and the complete cost of reconstruction.

The Contractor shall notify the Owner of the time and place of any factory tests and submit test procedures for approval at least twenty-one (21) Calendar Days in advance for any tests that are required by the Contract. The Contractor shall report the time and place of preparation, manufacture or construction of any material for the Work, or any part of the Work, that the Owner wishes to inspect. The Contractor shall give at least five (5) Working Days notice in advance of the beginning of work on any such material or of the beginning of any such test to allow the Owner to make arrangements for inspecting and testing or witnessing.

### **5-13 QUALITY OF MATERIALS AND WORKMANSHIP**

Unless otherwise allowed or required by the Special Provisions, all materials shall be new and of a quality at least equal to that specified. When the Contractor is required to furnish materials or manufactured articles or shall do work for which no detailed specifications are set forth, the materials or manufactured articles shall be of the best grade in quality and workmanship obtainable in the market. If not ordinarily carried in stock, the articles shall conform to the usual standards for first-class materials or articles of the kind required. The work performed shall secure the best standard of construction and equipment of the work as a whole or in part.

Materials shall be furnished in sufficient quantities and at such times to ensure uninterrupted progress of the Work. All required spare parts shall be delivered in new condition, not in a used refurbished, or unknown condition, and with any certificates required. Materials, supplies, and equipment shall be stored properly and protected as required. The Contractor shall be entirely responsible for damage or loss by weather or other causes.

### **5-14 SUBSTITUTIONS**

Certain materials, articles, or equipment may be designated in the Contract by brand or trade name or manufacturer together with catalog designation or other identifying information. Substitute material, article, or equipment which is of equal quality and of required characteristics for the intended purpose may be proposed for use, provided the Contractor complies with the requirements of the following paragraphs.

### **5-14.01 *Written Request***

Unless otherwise specified in the Special Provisions, the Contractor shall submit any request for substitution after award of the Contract.

### **5-14.02 *Documentation***

If requested by the Owner, a proposal for substitution must be accompanied by complete information and descriptive data, including cost of operation, cost of maintenance, and physical requirements necessary to determine the equality of offered materials, articles, or equipment. The Contractor shall also submit such shop drawings, descriptive data, and samples as requested. The burden of proof of comparative quality, suitability, and performance of the offered proposal shall be upon the Contractor. The determination of equal quality, suitability, and performance shall be at the sole discretion of the Owner. The Owner will examine such submittals with reasonable promptness. If the Owner rejects the request for such substitution, then one of the particular products designated by brand name in the Contract shall be furnished. Acceptance of substitution by the Owner shall not relieve the Contractor from responsibility for deviations from the Plans and Specifications or from responsibility for errors in submittals. Failure by the Contractor to identify deviations in the request material from the Plans and Specifications shall void the submittal and any action taken thereon by the Owner.

If mechanical, electrical, structural, or other changes are required for proper installation and fit of substitute materials, articles or equipment, or because of deviations from the Contract, such changes shall not be made without the written consent of the Owner and shall be made by the Contractor without additional cost to the Owner. The Contractor shall pay the costs of design, drafting, architectural or engineering services, and building alterations of the construction required to accommodate any Contractor substitution or construction error to maintain the original function and design.

## **5-15 PREPARATION FOR TESTING**

The Contractor shall maintain proper facilities and provide safe access for inspection by the Owner to all parts of the Work and to the shops wherein parts of the Work are in preparation. Where the Contract requires work to be tested or approved, such work shall not be tested or covered up without at least a five (5) Working Day notice to the Owner of its readiness for inspection, unless the written approval of the Owner for such testing or covering is first obtained.

## **5-16 MATERIALS SAMPLING AND TESTING**

Materials sampling and testing for purposes of Quality Control shall be the responsibility of the Contractor.

Testing shall be done to such standards and frequencies as set forth in the Specifications. References made in these documents to standard methods of testing materials shall make such standards a part of the Specifications.

Whenever a reference is made in the Specifications to a specification or test designation of any recognized national organization or State agency, and the number or other identification representing the year of adoption or the latest revision is omitted, it shall mean the specification or test designation in effect on the date of the original Notice to Contractors for the Work.

Materials to be used in the Work will be subject to sampling and tests by the Owner. The Contractor shall furnish the Owner with a list of the Contractor's sources of materials and the locations at which such

materials will be available for inspection. The list shall be furnished to the Owner in time to permit the inspection and testing of materials in advance of their use.

When requested by the Owner, samples or test specimens of the proposed materials shall be prepared at the expense of the Contractor and furnished by the Contractor in such quantities and sizes required for proper examination and tests, and with complete information describing type, kind, or size of material, and its source. All samples shall be submitted in time to permit the making of proper tests, analyses, or examinations before incorporating the materials into the Work. No material shall be used in the Work unless or until it has been approved by the Owner. The Owner will perform material testing in accordance with recognized standard practices. The Contractor shall pay the cost of the first retest and any subsequent retest of any area or material. The Owner will secure and test samples whenever necessary.

## **5-17 APPROVAL OF MATERIALS**

### ***5-17.01 Sources of Supply***

The Owner's approval at the source of supply may be required prior to procurement. Such approval shall not prevent subsequent disapproval or rejection of materials by the Owner if the quality is less than required by the Contract.

### ***5-17.02 Plant Inspection***

The Owner assumes no obligation to inspect materials at the source of supply. The Contractor is responsible for incorporating satisfactory materials into the Work, notwithstanding any prior inspections or tests.

The Owner will inspect materials at the source if the Contractor submits a written request and if the Owner deems the inspection necessary. The Contractor and the supplier will cooperate with and assist the Owner while performing the inspection. The Owner shall have access to all production areas of the plant.

## **5-18 PROVISIONS FOR EMERGENCIES**

The Owner may provide necessary labor, material and equipment to correct any emergency resulting from the Contractor's operation including noncompliance with the Contract, public convenience, safety, traffic control, and protection of work, persons and property. The nature of the emergency may prevent the Owner from notifying the Contractor prior to taking action. The costs of such labor, material, and equipment will be deducted from progress payments.

The performance of such emergency work under the direction of the Owner shall not relieve the Contractor from any damages resulting from the emergency.

## **5-19 RIGHT TO RETAIN IMPERFECT WORK**

If any portion of the work done or materials furnished under the Contract shall prove defective or not in accordance with the Contract, and if the defect in the work or materials is not of sufficient magnitude or importance to make the work dangerous or undesirable, or if the removal of such work or materials is impracticable or will create conditions which are dangerous or undesirable, the Owner shall have the right and authority to retain the work or materials instead of requiring it to be removed and reconstructed or replaced. Progress payment deductions will be made as described in Section 8-9, "Deductions for Imperfect Work."

## **5-20 REMOVAL OF REJECTED MATERIALS OR WORK**

The Contractor shall remove all rejected or condemned materials or structures brought to or incorporated in the Work within two (2) Calendar Days of the Owner's written order. No such rejected or condemned materials shall again be offered for use in the Work. The Contractor shall, at the Contractor's expense, bring into Contract compliance all rejected material or work in a manner acceptable to the Owner.

The Owner may bring into Contract compliance the rejected material if the Contractor fails to comply with this Section. All costs will be deducted from the Progress Payment.

## **5-21 TEMPORARY SUSPENSION OR DELAY OF WORK**

The Owner has the authority to suspend or delay the Work, wholly or in part, for any period the Owner deems necessary. The Contractor shall immediately comply with the Owner's written order to suspend or delay the Work. The suspended or delayed work shall be resumed only when conditions are favorable or methods are corrected, as ordered or approved in writing by the Owner. Public safety and convenience must be maintained throughout the suspension or delay in accordance with Sections 6-12, "Public Convenience and Safety," and 6-13, "Public Safety and Traffic Control."

Delays due to suspension of work shall be classified as Avoidable or Unavoidable Delays in accordance with Section 7-12, "Delays."

Such suspension shall not relieve the Contractor of the Contractor's responsibilities as described in the Contract.

## **5-22 TERMINATION OF CONTRACT**

### ***5-22.01 Reasons for Termination***

The Owner reserves the right to terminate the Contract for any of the reasons listed below:

#### ***5.22.01.A Contractor Bankrupt***

If the Contractor is adjudged bankrupt or makes an assignment for the benefit of the Contractor's creditors, or if a receiver is appointed because of the Contractor's insolvency, the Owner may terminate the Contractor's control over the Work and so notify the Contractor and the Contractor's sureties.

#### ***5.22.01.B Completion Delay***

The Owner may terminate the Contract if the Contractor has not completed the Work on or before the completion date adjusted by Contract Change Order. The Contractor is not entitled to any compensation and is liable to the Owner for liquidated damages for all time beyond such Contract completion date until the Work is completed, if the Owner chooses to complete the Work.

#### ***5.22.01.C Abandonment and Unsatisfactory Performance***

The Owner may give the Contractor and the Contractor's surety written notice that the Contract will be terminated if the following breaches are not corrected:

- The Contractor abandons the Work.
- The Work or any portion is sublet or assigned without the Owner's consent.

- The rate of progress is not in accordance with the Contract.
- Any portion of the Work is unnecessarily delayed.
- The Contractor willingly violates any terms or conditions of the Contract.
- The Contractor does not supply sufficient materials or properly skilled labor.
- The Contractor fails to promptly pay its Subcontractors.
- The Contractor disregards laws, ordinances, or Owner orders.
- The Contractor fails to respond to defective work notices.

The Contractor shall cease and terminate the Work if satisfactory arrangement for correction is not made within ten (10) Calendar Days from such notification.

#### *5.22.01.D Termination of Contract for Convenience*

The Owner may terminate the performance of work in whole or in part for any of the following reasons:

- Issuance of an order of a court or other public authority having jurisdiction.
- An act of government, such as a declaration of national emergency, causing material to be unavailable.
- Conditions encountered during the Work make it impossible or impractical to proceed.
- Such termination is in the best interest of the Owner.

#### *5-22.02 Notice of Termination*

The Owner may give written Notice of Termination of at least five (5) Calendar Days to the Contractor and the Contractor's sureties that the Contractor's control over the Work will be terminated for the reasons stated in the Notice of Termination. Owner may require the Surety to take over and perform the Work. The Owner may take over the Work at the Contractor's and Surety's expense if the surety does not commence performance within thirty (30) Calendar Days from the date of mailing the Notice of Termination. The Contractor shall be liable for any excess cost incurred by the Owner.

1. Immediately upon receipt of a Notice of Termination, except as otherwise directed in writing by the Owner, the Contractor shall:
2. Stop work under the Contract on the date and to the extent specified in the Notice of Termination.
3. Place no further orders or subcontracts for materials, services, or facilities except as necessary to complete the portion of the Work that is not terminated.
4. Terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination.
5. Assign to the Owner, in the manner, at the times, and to the extent directed by the Owner, all of the rights, titles, and interests of the Contractor under the orders and subcontracts so terminated. The Owner shall have the right, at its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts.
6. Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts with the approval or ratification of the Owner. The Owner's approval or ratification shall be final.

7. Transfer title to the Owner, and deliver in the manner, at the times, and to the extent directed by the Owner, fabricated or unfabricated parts, work in process, completed work, supplies, other material produced as a part of, or acquired in connection with, the terminated work, and the completed or partially completed drawings, information, and other property that, if the Contract had been completed, would have been submitted to the Owner.
8. Sell, in the manner, at the times, to the extent, and at the price that the Owner directs or authorizes, any property of the types referred to in Item 6 of this Section (Section 5-22.02). The Contractor is not required to extend credit to any purchaser, and may acquire any such property under the conditions prescribed and at a price approved by the Owner. The proceeds of any such transfer or disposition shall be used to reduce any payments made to the Contractor under the Contract or be credited to the cost of the work covered by the Contract or paid as the Owner directs.
9. Complete performance of the Work not terminated by the Notice of Termination.
10. Take necessary action, or as the Owner directs, to protect and preserve the property related to the Contract in which the Owner has an interest.

### ***5-22.03 Payments to Contractor Upon Termination of Contract***

The Contractor and the Owner may agree upon the amount paid to the Contractor for the total or partial termination of the Work. The amount may include those items specified in Section 9, "Changes and Claims." However, such agreed amount shall not exceed the Total Contract Price, reduced by the amount of payments already made and the Contract price of work not terminated. The Contract shall be amended accordingly, and the Contractor shall be paid the agreed amount.

If the Contractor and the Owner fail to agree on the amount to pay the Contractor because of the termination of work under this Section, the Owner shall determine the amount due the Contractor.

If the work is not completed as provided in Section 5-22.02 in this Section of these Specifications, the Contractor is not entitled to receive any portion of the amount to be paid under the Contract until it is fully completed. After completion, if the unpaid balance exceeds the sum of the amount expended by the Owner in finishing the work, plus all damages sustained or to be sustained by the Owner, any accrued liquidated damages, plus any unpaid claims on account of labor, materials, tools, equipment, or supplies contracted for by the Contractor for the Work, provided that sworn statements of said claims shall have been filed as required by Section 9, "Changes and Claims", of these Specifications, the excess not otherwise required by these Specifications to be retained shall be paid to the Contractor. If the sum so expended exceeds the unpaid balance of the Total Contract Price, the Contractor and the Contractor's surety are liable to the Owner for the amount of such excess. If the surety completes the Work as provided above, such surety shall be subrogated to money due under the Contract and to money which shall become due in the course of completion by the surety.

The Contractor shall submit to the Owner any termination claim in the form and with the certification that the Owner prescribes. Such claim shall be submitted no later than ninety (90) Calendar Days from the effective date of termination unless the Owner grants one or more extensions, in writing, upon Contractor's written request transmitted within such ninety (90) day period or authorized extension. If the Contractor fails to submit a termination claim within the time allowed, the Owner may determine the amount, if any, due the Contractor because of the termination. The Owner will then pay the Contractor that amount.

### ***5-22.04 Owner Completion***

In the event of termination of the Contract, the Owner may take possession of and use all or any part of the Contractor's materials, tools, equipment, and appliances on the premises to complete the Work. The Owner

assumes the responsibility for returning such equipment in as good condition as when it was taken over, reasonable wear and tear excepted. The items shall be returned when the Work is complete or sooner, at the Owner's discretion. The Owner agrees to pay a reasonable amount for the use of such materials and equipment.

The Owner may direct all or any part of the Work be completed by day labor and/or other contractors.

*5.22.04.A Payment for Owner Completion*

If the Owner completes the Work, no payment will be made to the Contractor until the Work is complete. All costs of completing the Work, including, but not limited to, legal expenses, Owner forces, administration and management, direct and indirect, shall be deducted from any sum due the Contractor. If the cost of completing the Work exceeds sums due the Contractor, the Contractor and the Contractor's surety shall, upon demand, pay the Owner a sum equal to the difference. If the Owner completes the Work and there is a sum due the Contractor after the Owner deducts the costs of completing the Work, the Owner will pay such sum to the Contractor and/or the Contractor's surety, as appropriate.

*5.22.04.B Owner Completion Not a Waiver of Owner Rights*

No act by the Owner before the Work is finally accepted shall operate as a waiver or stop the Owner from acting upon any subsequent event, occurrence, or failure by the Contractor to fulfill the terms and conditions of the Contract. The rights of the Owner pursuant to this Section are in addition to all other rights of the Owner pursuant to the Contract, and at law or in equity.

**5-23 TERMINATION OF UNSATISFACTORY SUBCONTRACTS**

When any portion of the Work subcontracted by the Contractor is not prosecuted in a satisfactory manner, the Contractor shall immediately terminate the subcontract upon written notice from the Owner. The Subcontractor shall not again be employed for any portion of the work on which the Subcontractor's performance was unsatisfactory.



## SECTION 6 LEGAL RELATIONS AND RESPONSIBILITIES

### 6-1 COMPLIANCE WITH LAWS AND REGULATIONS

The Contractor shall be familiar and comply with all Federal, State, and local laws, ordinances, codes and regulations which in any manner affect the Work, those engaged or employed in the Work or the material or equipment used in or upon the Work, or in any way affect the conduct of the Work. No ignorance or pleas of misunderstanding of such laws, ordinances, codes, or regulations on the part of the Contractor shall modify the provisions of the Contract. The Contractor and the Contractor's surety shall indemnify and save harmless the Owner and the Owner's officers, officials, agents, employees, volunteers, members, affiliates and their duly authorized representatives against any claim for liability arising from, or based upon, the violation of any such law, ordinance, regulation, decree, or order, whether by the Contractor or by the Contractor's employees.

The attention of the Contractor is directed to certain laws that affect the Contract. The listing of these laws in this Section is not to be construed as a listing of all applicable laws. The Contractor is solely responsible for familiarity and compliance with all applicable laws. Particular attention is called to the following:

#### **6-1.01 Hours of Labor**

No person shall be employed to work or be permitted to work more than eight (8) hours in any day or more than forty (40) hours in any week in the performance of the Work under the Contract, in accordance with Connecticut General Statute Section 31-57.

The operation of such limitation of hours of work may be suspended during an emergency, upon approval of the Owner, in accordance with Connecticut General Statute Section 31-57.

Overtime and shift work may be established by the Contractor with reasonable notice and the written permission of the Owner. No work under the Contract shall be executed prior to 7:00 a.m. or after 5:00 p.m., except such work as is necessary for the proper care and protection of work already performed or except in case of an emergency without the approval of the Owner. Such approval may be revoked by the Owner for good cause, including, without limitation, failure to maintain adequate equipment and lighting at night for the proper implementation, control and inspection of the work. If work is done without the Owner's prior approval and as a result the Owner is unable adequately to inspect the Work, the Work done during these periods of time may be declared defective, solely on the grounds that it was not properly inspected. No extra money will be awarded to the Contractor by the Town due to labor overtime or other increased costs of performing the Work on Saturdays, Sundays, holidays, or at night, so long as such work was not caused by the actions or inaction of the Town.

Failure of the Contractor to perform the Work in accordance with this policy shall be cause for termination under Section 5-22, "Termination of Contract," of these Specifications.

#### **6-1.02 Working and Non-Working Days**

Working Days include all days that the Contractor is permitted to execute the Work or employ any person to execute the Work within the Contract Time.

Non-working Days include Saturdays, Sundays, Legal State Holidays and any other days identified in the Contract that the Contractor or persons employed by the Contractor is not permitted to execute the Work. Non-working Days may be suspended upon written approval of the Owner.

### **6-1.03 Prevailing Wage**

Pursuant to Connecticut General Statute Section 31-53 and Public Act 05-50, the Contractor and the Contractor's Subcontractors shall pay not less than the prevailing rate of per diem wages, including, but not limited to, overtime, Saturday, Sunday, and holiday work, travel and subsistence.

Prevailing wage determinations shall be obtained from the Connecticut Department of Labor Wage and Workplace Standards Division ([www.ctdol.state.ct.us](http://www.ctdol.state.ct.us)). The Contractor shall pay the annual adjusted prevailing wage that is in effect each July 1st throughout the duration of the Contract.

The Contractor shall post in a conspicuous area of the site a schedule showing all determined wage rates for all trades and all authorized deductions, if any, from the wages to be paid.

### **6-1.04 Payroll Records**

The Contractor and the Contractor's Subcontractors shall keep accurate payroll records, showing the name, address, Social Security number, straight time and overtime hours worked each day and week, and the actual wages paid to each journeyman, apprentice, worker, or other employee employed in connection with the Work. The Contractor and the Contractor's Subcontractors shall provide certified copies of the records to the Owner on a weekly basis. The Contractor shall be held responsible for all Subcontractors' compliance with this requirement.

### **6-1.05 Fair Labor Standards**

The Contractor shall comply with the Fair Labor Standards Act of 1938 as amended (29 U.S.C. 3201 et seq.) as applicable.

### **6-1.06 Occupational Safety and Health**

The Contractor must comply with all applicable provisions of the Occupational Safety and Health Administration (OSHA). Failure of the Owner to suspend the work or notify the Contractor of the inadequacy of the safety precautions or non-compliance with existing laws and regulations shall not relieve the Contractor of this responsibility.

The Contractor shall prepare and submit a Health and Safety Plan which complies with all relevant regulations within 15 Calendar Days after Notice to Proceed and prior to starting any field work.

## **6-2 INDEMNIFICATION Article 6-2 is deleted under Addendum No. 3**

### **6-2.01 Contractor's Performance**

Subject to the limitations of Connecticut General Statutes, the Contractor shall indemnify, defend and hold harmless the Owner, its officers, employees, agents, Consulting Engineer, Owner and Consulting Engineer's engineering consultants, and duly authorized representatives of each of them, from and against any and all claims, losses, liabilities, or damages, demands and actions including payment of reasonable attorneys' fees, arising out of or resulting from the performance of this Agreement, breach of its terms, violation of law or regulation, or caused in whole or in part by any negligent or willful act or omission of

the Contractor, its officers, employees, or agents, or anyone directly or indirectly acting on behalf of the Contractor, regardless of whether caused in part by a party indemnified hereunder.

#### *6-2.02 No Limitation of Liability for Indemnification*

The indemnities set forth in this Section shall not be limited by the insurance requirements set forth in the Contract.

**Article 6-2 is deleted under Addendum No. 3**

### **6-3 CONTRACTOR'S LEGAL ADDRESS**

Both the address given in the Bid and the Contractor's office in the vicinity of the Work are designated as places that samples, notices, letters, or other articles or communications to the Contractor may be mailed or delivered. The delivery to either of these places shall be deemed sufficient service to the Contractor and the date of such service shall be the date of delivery. The address named in the Bid may be changed at any time by written notice from the Contractor to the Owner. Nothing herein shall be deemed to preclude or render inoperative the service of any drawing, sample, notice, letter or other article or communication to the Contractor.

### **6-4 CONTRACTOR NOT AN AGENT OF OWNER**

The Contractor shall be an independent contractor and not an employee, agent, or other representative of the Owner. Nothing in the Contract shall be construed to create any relationship of joint venture, partnership, or any other association of any nature whatsoever between the Owner and the Contractor other than that of owner and independent contractor. The Owner shall have the right to direct the Contractor as provided in the Contract. The aforementioned right of supervision shall not reduce or abrogate the Contractor's liability of all damage or injury to persons, public property, or private property that may arise directly or indirectly from the Contractor's execution of the Work.

### **6-5 SUBSTITUTION OF SUBCONTRACTORS**

The Contractor shall not, without the written consent of the Owner: (a) substitute any party as Subcontractor in place of the Subcontractor designated in the original bid; (b) permit any such subcontract to be assigned or transferred; or (c) allow the subcontracted work to be performed by anyone other than the original Subcontractor listed on the bid. Consent for substitution or subletting shall only be given:

1. When the Subcontractor listed in the bid, after having reasonable opportunity to do so, fails or refuses to execute a written contract that is based upon the Plans and Specifications for the project or refuses the terms of such Subcontractor's written bid and is presented to the Subcontractor by the Contractor; or
2. When the listed Subcontractor becomes bankrupt or insolvent; or
3. When the listed Subcontractor fails or refuses to perform the subcontract; or
4. When the listed Subcontractor fails or refuses to meet the bond requirements of the Contractor as set forth in the Contract; or
5. When the Contractor demonstrates to the Owner that the name of the Subcontractor was listed as a result of an inadvertent clerical error; or
6. When the Owner determines that the work performed by the listed Subcontractor is substantially unsatisfactory and not in substantial accordance with the Contract, or that the Subcontractor is substantially delaying or disrupting the progress of the work; or

7. When the listed Subcontractor is ineligible to work on a public works project.

## **6-6 ASSIGNMENT OF CONTRACT**

The Contract or the performance of the Contract may not be assigned by the Contractor except with the written consent of Owner and Surety. Contractor's and Surety's obligations to Owner under this Contract shall survive, and not be diminished by, any contract assignment.

## **6-7 ASSIGNMENT OF MONIES**

The Contractor may assign monies due the Contractor under the Contract, and such assignment will be recognized by the Owner, if given proper notice, to the extent permitted by law. Any assignment of monies shall be subject to all deductions provided for in the Contract. All money withheld may be used by the Owner for the completion of the Work if the Contractor defaults.

## **6-8 PROTECTION OF OWNER AGAINST PATENT CLAIMS**

The Contractor shall assume all costs arising from the use of patented materials, equipment, devices, and processes on or incorporated in the Work and shall indemnify and hold harmless the Owner and the Owner's officers, officials, agents, employees, volunteers, members, affiliates and their duly authorized representatives from all actions for, or on account of, the use of any patented materials, equipment, devices, or processes in the construction of, or subsequent operation of, the Work. Before final payment, if requested by the Owner, the Contractor shall furnish acceptable proof of a proper release from all costs or claims arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the Work.

## **6-9 RESPONSIBILITY OF THE CONTRACTOR**

The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, procedures, and coordination of all portions of the Work under the Contract, unless otherwise provided in the Contract.

The Work shall be under the Contractor's responsible care and charge until completion and final acceptance, and the Contractor shall bear the entire risk of injury, loss, or damage to any part by any cause. The Contractor shall rebuild, repair, restore, and make good all injuries, losses or damage to any portion of the Work or the materials occasioned by any cause, and shall bear the entire expense.

In no case shall the Contractor's use of Subcontractors in any way alter the position of the Contractor or the Contractor's sureties with relation to the Contract. When a Subcontractor is used, the responsibility for every portion of the Work shall remain with the Contractor. No Subcontractor will be recognized as having a direct contractual relationship with the Owner. All persons engaged in the Work under the Contract will be considered as employees of the Contractor and their work shall be subject to all the provisions of the Contract. The Owner will deal only with the Contractor who is responsible for the proper execution of the Work. The Contractor shall pay when due all valid claims of Subcontractors, suppliers, and workmen with respect to the Work.

The mention herein of any specific duty or responsibility imposed upon the Contractor shall not be construed as a limitation or restriction of any other responsibility or duty imposed upon the Contractor by the Contract, said reference being made herein merely for the purpose of explaining the specific duty or responsibility.

The Contractor shall do all of the work and furnish all labor, materials, tools, equipment, and appliances, except as otherwise herein expressly stipulated, necessary or proper for performing and completing the Work herein required, including any change order work or disputed work directed by the Owner in conformity with the true meaning and intent of the Contract drawings, Specifications, and all provisions of the Contract, within the time specified.

If the Contractor discovers any discrepancies during the course of the Work between the Contract drawings and conditions in the field, or any errors or omissions in the Contract drawings and conditions in the field, or any errors or omissions in the Contract drawings, the Specifications, or in the layout given by stakes, points, or instructions, it shall be the Contractor's duty to inform the Owner immediately, and the Owner shall promptly verify the same. Any work done after such discovery until authorized by the Owner, will be done at the Contractor's risk.

## **6-10 PERMITS AND LICENSES**

The Contractor shall, at the Contractor's sole expense, obtain all necessary permits and licenses for the construction of the Work, give all necessary notices, pay all fees required by law, and comply with all laws, ordinances, rules, and regulations relating to the Work and to the preservation of the public health and safety. The Contractor shall also procure all permits and licenses necessary for the normal conduct of the Contractor's business and construction operations, including all Federal and state licenses and permits.

The following is a list of licenses and permits which may be required. These requirements are subject to change without notice. This list should not be deemed to be exhaustive.

<u>License or Permit</u>	<u>Location</u>
East Hartford Construction Permit	Engineering Division Town of East Hartford 740 Main Street East Hartford, CT 06108
East Hartford Building Permit	Inspections and Permits Town of East Hartford 740 Main Street East Hartford, CT 06108

## **6-11 GENERAL SAFETY REQUIREMENTS**

### ***6-11.01 Compliance With Safety & Health Regulations***

The Contractor is solely responsible for all safety within the project boundaries and shall conform to all applicable occupational safety and health standards, rules, regulations, and orders established by the State of Connecticut or Federal Government.

### ***6-11.02 24-Hour Contact Information***

The Contractor shall have on record with the Owner the following twenty-four (24) hour emergency contact numbers:

- Traffic control device supplier: Supplier of barricades, steel plates, delineators, channelizers, construction signs, and other traffic control equipment to be used during construction.

- Contractor representative: An employee of the Contractor having the authority to make decisions and the ability to respond to an emergency on the project at any time.
- Safety Representative: The Contractor's Safety Representative shall have the authority to make decisions regarding safety and health concerns on the project and to direct the Contractor's personnel to abate any hazard identified by the Owner.

### ***6-11.03 Work During Hours of Darkness***

Working areas utilized by the Contractor during the hours of darkness shall be illuminated to conform to the minimum illumination intensities established by Occupational Safety and Health Administration and shall conform to Section 6-1.01 of the General Provisions.

## **6-12 PUBLIC CONVENIENCE AND SAFETY**

### ***6-12.01 Public Convenience***

The Contractor shall perform all work within public streets and/or roadway rights-of-way in an expeditious manner and cause as little inconvenience to the traveling public as possible. Vehicles, bicycles, and pedestrians must be allowed to pass at all times except during an emergency closure.

### ***6-12.02 Pedestrian and Bicyclist Access on Public Roadways***

The Contractor shall not block the movement of pedestrian or bicycle traffic along public roadways in the project area unless such blockage is specifically identified in the drawings. The Contractor shall provide for pedestrian and bicycle traffic by phasing construction operations or by providing alternative pedestrian and bicyclist access through or adjacent to construction areas. Proper advance notice signage with reasonable detours shall be installed and maintained through all phases of construction. Access to pedestrian and bicycle devices at traffic signals shall be maintained at all times. At no time shall pedestrians be diverted into a portion of the street used for vehicular traffic or on to private property unless adequate lane closure signage is in place. Pedestrian and bicycle access shall consist of four-foot (4-ft) wide bridges across trenches and four-foot (4-ft) wide passageways through construction areas. Hand railings for pedestrians shall be provided when required by OSHA Regulations or the Americans with Disabilities Act (ADA) on each side of each bridge or passageway to protect pedestrians from hazards caused by construction operations or adjacent vehicular traffic.

Railings or barricades, which border passageways located in roadway areas, shall be reflectorized on the side facing oncoming traffic.

### ***6-12.03 Written Notification To Residences and Businesses***

The Contractor shall notify, in writing, residents and business establishments along the route of the Work at least fourteen (14) Calendar Days prior to road closures and at least five (5) Calendar Days prior to disruption of ingress and egress. The notice provided to the residences or businesses shall include, at a minimum, schedule of closures with estimated closure times, closure location, alternate route or detour, and name and twenty-four (24) hour phone number of a contact person employed by the Contractor.

The Contractor shall notify, in writing, residents and business establishments along the route of the Work at least five (5) Calendar Days prior to placing parking restrictions within the Town rights-of-way. The notice provided to the residences or businesses shall include, at a minimum, schedule of parking restrictions

with estimated times, location, and a name and twenty-four (24) hour phone number of a contact person employed by the Contractor.

#### ***6-12.04 Access To Driveways, Houses and Buildings***

Access and passable grades shall be maintained at all times for business establishments during construction. Safe and passable pedestrian, bicyclist, and vehicular access shall be provided and maintained to fire hydrants, homes, businesses, churches, schools, parking lots, fire and police stations, hospitals, and establishments of similar nature. Access to these facilities shall be continuous and unobstructed unless otherwise approved. Ramps and driveways shall not have “lips” or elevation differences greater than one and one-half (1½) of an inch. All pedestrian facilities shall have no lip.

When abutting property owner’s access across the right-of-way line is to be eliminated, repaired, or replaced under the Contract, the existing access shall not be closed until the replacement access facilities are completed and functional.

#### ***6-12.05 Property Damage***

Any property damage caused by the Contractor shall be repaired at the Contractor’s expense to the satisfaction of the Owner.

#### ***6-12.06 Erection of Signs To Expedite Passage of Vehicles***

The Contractor shall erect such warning and directional signs as necessary or as directed by the Owner for expediting the passage of public traffic through or around the Work and the approaches. All warning and directional signs shall comply with Section 6-13, “Public Safety and Traffic Control,” Section 12, “Construction Area Traffic Control,” and the Connecticut Department of Transportation.

#### ***6-12.07 Traffic Obstructions, Delays and Inconveniences***

All public traffic shall be permitted to pass through the Work and the Contractor shall conduct operations that offer the least possible obstruction, delay, and inconvenience to the public.

#### ***6-12.08 Work On Private Property***

The Contractor must obtain written permission from the owner of any privately owned property prior to beginning any work, storing materials, or otherwise conducting any operations on said property. The written approval from the property owner must be on file with the Owner before any operations will be permitted on said property.

#### ***6-12.09 Hazardous Conditions Created***

Whenever the Contractor’s operations create a condition hazardous to pedestrians, bicyclists, or the traveling public, the Contractor shall, at the Contractor’s own expense, furnish, erect and maintain any fences, temporary railing, barricades, lights, signs and other devices necessary or as directed by the Owner to prevent accidents or damage or injury to the public or property.

If needed for public use, roadway excavation shall be conducted to maintain a smooth and even surface satisfactory for use by public traffic at all times. The surface of the roadbed shall be kept in a smooth, even condition free of humps and depressions, satisfactory for the use of public traffic as determined by the Owner.

Temporary facilities that the Contractor uses to perform the Work or store or stage material or equipment shall not be installed or placed where they will interfere with the free and safe passage of public vehicular, bicycle, or pedestrian traffic.

#### ***6-12.010 Emergency Access***

Access for emergency vehicles is to be provided at all times. If emergency access cannot be provided the Contractor shall notify and coordinate with the public safety agencies.

### **6-13 PUBLIC SAFETY AND TRAFFIC CONTROL**

#### ***6-13.01 General***

All traffic controls shall be installed in accordance with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).

#### ***6-13.02 Responsibility For Safety***

It is the Contractor's responsibility to provide for public safety and traffic control. The Owner may review the Contractor's operations and inform the Contractor if an unsafe or hazardous condition is observed. The Contractor may be directed verbally or via Field Instruction, letter, or other means to abate the hazard. The Contractor must comply with all directives for hazard abatement immediately and within the timeframe imposed by the Owner.

#### ***6-13.03 Passage of Emergency Vehicles***

The Contractor shall provide for the uninterrupted passage of emergency vehicles through the Work zone at all times regardless of the controlled traffic conditions in place at the time.

#### ***6-13.04 Furnishing, Installing, and Maintaining Traffic Controls***

Signs, lights, barriers, fences, temporary railing, barricades, and other facilities shall be furnished, erected, and maintained by the Contractor to provide an adequate warning to the public of dangerous conditions to be encountered during construction at all hours of the day or night. Warning and directional signs shall be erected and maintained as required by the Owner and by law. All traffic controls shall be installed as required by this Section and Section 12, "Construction Area Traffic Control."

#### ***6-13.05 Inadequate Traffic Controls and After-Hour Maintenance and Repairs***

Should the Contractor appear negligent in furnishing and maintaining sufficient traffic control devices or protective measures or fail to provide flaggers as necessary to control traffic, the Owner may direct the Contractor, at the Contractor's expense, to abate the hazard.

Should the Owner point out the inadequacy of warning devices and protective measures, that action shall not relieve the Contractor from responsibility for public safety or abrogate the obligation to furnish and pay for these devices and measures.

Should the Contractor fail to properly furnish or maintain traffic controls, or correct a hazard caused by inadequate or inappropriate traffic control, the Owner will abate the hazard. All Owner costs to abate the hazard shall be reimbursed by the Contractor or deducted from the progress payment. If the Contractor is



not available to perform after-hour maintenance and repair to traffic control devices, the Owner will correct the situation and deduct all costs from the progress payment.

### **6-13.06 Construction Signs**

The Contractor is responsible for supplying, installing, and maintaining all construction signs and posts. The Contractor will receive direction from the Owner as to the specific locations and placement of each sign. Regulatory signs or guide signs shall be supplied, erected and maintained by the Contractor, subject to Owner approval, and shall be protected from damage from construction activities by the Contractor through the duration of the project.

Construction signs shall be covered by the Contractor when not in use. When construction signs are no longer required, they shall be removed by the Contractor immediately.

### **6-13.07 Temporary Bridging of Excavations and Trenches**

Whenever necessary or requested by the Owner, excavations shall be bridged with steel plates to allow an unobstructed flow of traffic. Bridging of excavations with steel plates will not be allowed from mid-fall to mid-spring in areas where snow removal operations are required. Excavations bridged with steel plates shall conform to the following provisions:

1. Asphalt concrete “cutback” shall be placed around the edges of the plate to provide a ramp and smooth transition from the pavement to the plate to minimize wheel impact. All ramping must be accomplished to provide a minimum angle of approach of twelve horizontal to one vertical (12H:1V).
2. Bridging shall be secured against displacement by using railroad spikes or other approved fastening device.
3. Steel plates used for bridging shall extend at least one (1) trench width on each side beyond the edges of the trench. Any deviations from these requirements must be designed by a Connecticut Licensed Civil Engineer and reviewed by the Owner.
4. Depending upon the depth of the excavation, soil type, vibration and other variables, the trench may require shoring to support bridging. The Contractor should consult with a Connecticut Licensed Professional Civil Engineer if there is any question about the capability of the excavation and bridging to support the forces of traffic.

WIDTH OF EXCAVATION	MINIMUM THICKNESS OF STEEL PLATES
2.0 ft. or less (0.6 m or less)	7/8 inch (22mm)
3.0 ft. (0.9 m)	1 inch (25 mm)
4.0 ft. (1.2 m)	1-1/4 inch (32mm)

Asphalt concrete “cutback” or other non-displaceable material must be used to provide a ramp for pedestrian and handicap access. All ramping must be accomplished to provide a minimum angle of approach of twelve horizontal to one vertical (12H:1V). Vehicular travel over backfilled but unpaved excavations will not be allowed, unless the Contractor provides a temporary surface suitable for driving consisting of at least two inches (2”) of plant mix asphalt over six inches (6”) of aggregate base, concrete slurry (completely cured), or traffic plates placed over the excavated area of sufficient width and thickness as indicated in this Section.

### ***6-13.08 Entering and Leaving the Construction Zone***

Construction equipment shall enter and leave the roadway by moving in the direction of public traffic. All movements of workmen and construction equipment on or across lanes open to public traffic shall be performed in a safe manner that will not endanger the workmen or the public. When leaving a work area and entering a roadway carrying public traffic, the Contractor's equipment operator shall yield to public traffic.

### ***6-13.09 Existing Traffic Signal and Lighting Systems, Signs and Pavement Markings***

Existing traffic signal and highway lighting systems shall be kept in operation during progress of the Work. When traffic signal shutdown is permitted by the Owner, the Contractor shall notify the Owner at least seven (7) Calendar Days prior to shutdown. Traffic signal detectors accidentally cut or damaged during construction shall be repaired or replaced by the Contractor at the Contractor's expense and be operational within seventy-two (72) hours. When traffic signals are approved for shutdown, the Contractor shall control traffic by use of flaggers as directed by the Owner.

Existing signs and pavement markings shall be maintained by the Contractor and shall not be removed or altered without Owner approval. Contractor shall coordinate with CONNDOT regarding any traffic signals owned by CONNDOT.

### ***6-13.010 Bus Stops***

If construction operations will obstruct a bus stop, the Contractor shall notify the CT Transit seven (7) Calendar Days in advance of beginning that portion of the Work and make provisions agreeable to the CT Transit to provide an alternate location where people can safely board the bus.

CT Transit  
100 Leibert Rd.  
P.O. Box 66  
Hartford, CT 06141-0066  
Phone: (860) 522-8101  
Fax: (860) 247-1810

### ***6-13.011 Dust***

Water or dust palliative shall be applied as ordered by the Owner for the alleviation or prevention of dust nuisance caused by the Contractor's operations as provided in the relevant technical provision of these Specifications.

### ***6-13.012 Removal of Spillage From Roadway***

The Contractor shall immediately remove any spillage resulting from hauling operations along or across any public traveled way including any spillage tracked onto the roadway.

## **6-14 TRAFFIC CONTROL PLANS (TCP)**

### ***6-14.01 Traffic Pattern Changes***

The Contractor shall notify the Owner in advance of the Contractor's desire to change any existing traffic patterns. For traffic pattern changes that do not require a road closure, the Contractor shall provide the

Owner with a minimum of seven (7) Calendar Days advance notification, unless otherwise approved or deemed an emergency lane closure by the Owner. For all road closures, the Contractor shall provide the Owner with a minimum of twenty-eight (28) Calendar Days notice prior to the desired closure date, unless otherwise approved or deemed an emergency road closure by the Owner.

#### ***6-14.02 Traffic Control Plans (TCP)***

Unless the requirement has been modified by 1) the Special Provisions, 2) specifications for development or frontage work, or 3) an encroachment permit issued by the Town, the Contractor shall submit a Traffic Control Plan (TCP) to the Owner and/or the Connecticut Department of Transportation (CONNDOT) for approval before the initiation of constructions-related activity that could adversely affect traffic on local roadways. The TCP shall show traffic control measures to be used for vehicles, bicyclists, and pedestrians affected by the construction. Five (5) sets of the TCP shall be submitted on eleven-inch by seventeen-inch (11"x17") (minimum) paper. The Contractor will not be allowed to begin work associated with the road or lane closure until the TCP has been approved by the Owner and/or CONNDOT.

Detours shall not be allowed unless there is no feasible alternative to maintaining traffic in a safe manner. Detours shall not be utilized for the Contractor's convenience. Any detours utilized shall be included in the submitted TCP's. Detours used exclusively by the Contractor for hauling materials and equipment shall be constructed and maintained by the Contractor at the Contractor's expense. If the Contractor's operations are damaging the roadway, the Owner has the authority to regulate the Contractor's operations and direct the Contractor to repair the roadway at the Contractor's expense.

### **6-15 BARRICADING OPEN TRENCHES**

No trenches or excavations shall be permitted to be left open, unless approved by the Owner. Any excavation permitted to be left open by the Owner shall be barricaded with Type II or Type III barricades with flashers. Signs stating "OPEN TRENCH" shall be posted on all sides of the excavation. All open excavated areas shall be barricaded with at least two (2) Type III barricades at the end of the excavation that faces oncoming traffic. Any excavation within four (4) feet of the traveled way, not protected by K-rail or a similar traffic control barrier approved by the Owner, shall be backfilled at the end of the work shift or plated in accordance with Section 6-13.07, "Temporary Bridging of Excavations and Trenches."

#### ***6-15.01 Protection of Existing Plant Materials***

The Contractor shall be responsible for taking all reasonable steps for protecting, transplanting, and replanting existing trees, shrubs, and other plant materials which may be affected by the Work. Plants designated to remain shall be protected by construction fencing or barriers at all times during the entire contract period. No material shall be stockpiled and no equipment shall be parked or repaired within twenty-five (25) feet of existing trees unless it is impossible to avoid doing so. No oil, gasoline, concrete, or other materials shall be dumped or temporarily stockpiled anywhere on site unless permission is first obtained from the Owner. Any plants damaged or scarred during construction shall be mitigated immediately at the Contractor's expense.

The removal and/or replanting of trees, shrubs, and other plant material shall be coordinated with the Town of East Hartford's Tree Warden. Coordination may include posting public notice of tree removal, posting of the trees, and public hearing if there is public feedback concerning removal of the trees.

## **6-16 EXISTING UTILITIES**

### **6-16.01 General**

The Contractor shall coordinate and fully cooperate with the Owner and utility owners for the location, relocation, and protection of utilities. The Contractor's attention is directed to the existence of utilities, underground and overhead, necessary for all buildings in the Work area. The Contractor shall arrange with utility owners for the location of service lines serving these buildings in advance of the actual construction and for the relocation of such facilities, if necessary, by the utility owner or the Contractor.

### **6-16.02 Maintenance and Protection**

Unless otherwise shown or specified in the Contract, the Contractor shall maintain in service all drainage, water, gas, sewer lines, power, lighting, telephone conduits, and any other surface or subsurface utility structure that may be affected by the Work. However, the Contractor, for convenience, may arrange with individual owners to temporarily disconnect service lines or other facilities along the line of the Work. The cost of disconnecting and restoring such utilities shall be borne by the Contractor.

Unless otherwise specified in the Special Provisions, the Contractor shall protect all existing utilities on all projects being constructed, whether inside or outside of highway rights-of-way. The utility owner in these cases may elect to provide the necessary protective measures and bill the Contractor for the cost. "Existing utilities" includes traffic control devices, conduits, streetlights, and related appurtenances.

### **6-16.03 Exact Locations Unknown**

The locations of existing utility facilities shown on the Plans are approximate and represent the best information obtainable from utility maps and other information furnished by the various utility owners involved. The Owner warrants neither the accuracy nor the extent of actual installations as shown on the Plans. There may be additional utilities on the property unknown to either party to the Contract. If, during the course of the Work, additional subsurface utilities are discovered, the Owner may make adjustments to the Work. Compensation for such adjustments will be in accordance with Section 9, "Changes and Claims."

The Owner will compensate the Contractor for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, removing, relocating, or protecting existing utility facilities not indicated in the Plans and Specifications with reasonable accuracy, and for equipment on the Work necessarily idled during such work. In no event shall the Owner be liable for any further or additional costs resulting directly or indirectly from any such occurrence. Compensation will be in accordance with Section 9, "Changes and Claims." Nothing herein shall be deemed to require the Owner to indicate the presence of existing utility services, laterals, or appurtenances whenever their presence can be inferred from other visible facilities such as buildings, meters, junction boxes, valves, service facilities, identification markings, and other indicators on or adjacent to the Work.

If the Contractor discovers utilities not identified in the Plans or Specifications, the Contractor shall immediately notify the Owner and the utility owner by the most expeditious means available and later confirm the notification in writing. Upon receiving direction from the Owner, the Contractor shall proceed to relocate the utilities as directed. Nothing herein shall preclude the Owner from pursuing any appropriate remedy against the utility for delays that are the responsibility of the utility. The Contractor shall not be assessed liquidated damages for delay in completion of the Work for that portion of such delay as is caused by failure of the Owner or the owner of a utility to provide direction for the removal or relocation of existing utilities.

**6-16.04 Call Before You Dig (CBYD)**

The Contractor and any Subcontractor shall notify Call Before You Dig (CBYD) at least two (2) Working Days, but no earlier than ten (10) Business Days, in advance of performing excavation work. CBYD can be reached by calling the toll free number – (800) 922-4455 CBYD’s website address is www.cybd.com

Each phase of a project shall be called into CBYD and continuing excavation reported every fourteen (14) Calendar Days. CBYD will provide an inquiry identification number to the person contacting the center. The CBYD inquiry identification number shall be available to the Inspector at the job site along with the date CBYD. If the CBYD notifications are not kept up-to-date, the excavation may be stopped and a new forty-eight (48) hour notice will be required before continuing the excavation. If, at any time during an excavation for which there is a valid inquiry identification number, the field markings are no longer reasonably visible, the Contractor shall contact CBYD to have the area re-marked.

Prior to calling CBYD, the Contractor shall clearly mark the excavation site with white, water-soluble paint in paved areas or white flagging, stakes painted white, or some other approved method in unpaved areas. The Contractor shall determine the exact location twenty-four (24) inches from outside edge on each side of the facility of utilities in conflict with the proposed excavation by exposing the subsurface installation with hand tools before using any power-operated or power-driven equipment. The Contractor shall only request the marking of facilities within the area to be excavated within fourteen (14) Calendar Days of the call.

**6-16.05 Damage to Existing Utilities**

The Contractor shall notify the affected utility of any contact, scrape, dent, nick, or damage to its facility. The Contractor is responsible for the cost of any repair or damages due to utilities caused by his operations.

**6-16.06 Utility Markings**

The following table designates color codes and symbols that shall be used by the Contractor and the utility owners to identify utilities:

FIELD MARKINGS		
COLOR CODES AND SYMBOLS		
Color	Symbol	Name
Safety Precaution Blue	W	Water
Safety Alert Orange	FA	Fire Alarm
	Tel	Telephone/Communication
	R	Railroad
	TV	Television/CATV
Safety Green	WU	Western Union
	S	Sewer
Safety Red	D	Storm Drain
	L	Street Lighting
	E	Electric
High Visibility Safety	T	Traffic Signals
	G	Gas

FIELD MARKINGS		
COLOR CODES AND SYMBOLS		
Color	Symbol	Name
Yellow	Company Name	Oil or Chemical Steam
Purple	RW	Reclaimed Water
Pink	TSM	Temporary Survey
White	USA	Proposed Excavation - Paint outline of proposed excavation area with white dotted line.

**6-17 APPROVAL OF CONTRACTOR'S PLANS NO RELEASE FROM LIABILITY**

The review or approval by the Owner of any working drawing or any method of work proposed by the Contractor shall not relieve the Contractor of any of the Contractor's responsibility for any errors and shall not be regarded as any assumption of risk or liability by the Owner or any officer, official, agent, employee, member, volunteer, affiliate, or their duly authorized representatives. The Contractor shall have no claim under the Contract because of the failure or partial failure or inefficiency of any reviewed or approved plan or method. Owner review or approval means that the Owner has no objection to the Contractor using the proposed plan or method at the Contractor's responsibility and risk.

**6-18 CONTRACTOR SHALL NOT MORTGAGE EQUIPMENT**

The Contractor shall not mortgage or otherwise convey the title of the plant, machinery, tools, appliances, supplies, or materials that may at any time be in use, or further required or useful, in the prosecution of the Work, without prior written consent of the Owner.

**6-19 PROPERTY RIGHTS IN MATERIALS**

Nothing in the Contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been installed, attached, or affixed to the Work, and on which partial payments have been made by the Owner. All such materials shall be the property of the Contractor and the Owner jointly as their interests may appear, and shall not be removed from the Work by the Contractor without the Owner's consent.

**6-20 PRESERVATION OF PROPERTY**

Trees and shrubbery that are to remain, pole lines, fences, signs, traffic control devices, striping, survey markers and monuments, buildings and structures, conduits, under- or above-ground pipelines, and any other improvements and facilities shall be protected from injury or damage. If ordered by the Owner, the Contractor shall provide and install suitable safeguards to protect such objects from injury or damage. If such objects are injured or damaged by reason of the Contractor's operations, said objects shall be replaced or restored at the Contractor's expense to a condition as good as when the Contractor entered upon the Work. The Contractor shall receive Owner approval before the removal of any road sign or permanent traffic control device that interferes with the Work.

## **6-21 OVERLOADING**

The Contractor shall determine safe loading capacities and shall not overload any structure, embankment, equipment, pavement, or material beyond its safe capacity, or significantly deteriorate the preconstruction condition, during construction. In addition to assuming full responsibility for bodily injury resulting from any such overloading, the Contractor shall repair to the Owner's satisfaction or reimburse the Owner for the costs of repairing the damage.

## **SECTION 7 PROSECUTION OF THE WORK**

### **7-1 BEGINNING OF WORK**

No work may take place prior to receipt of the executed Contract and review of the prescribed bonds and insurance. Upon receipt of the executed Contract and approval of the bonds and insurance by the Owner, a Notice to Proceed will be issued which will constitute authorization to begin work.

The counting of Contract Time shall begin fifteen (15) Calendar Days from the time the Contractor receives the executed Contract and Notice to Proceed.

### **7-2 AMOUNT OF WORK UNDER CONSTRUCTION**

The Contractor shall not have more work under construction than can be prosecuted properly with regard to the rights of the public and the safety and integrity of the project.

### **7-3 PRECONSTRUCTION CONFERENCE AND PROGRESS MEETINGS**

Prior to beginning work, a preconstruction conference shall be held for the purpose of reviewing the Work. The Contractor must attend this preconstruction conference, and shall invite Subcontractors and others necessary to ensure all topics are adequately covered. Topics discussed include, but are not limited to, mobilization, access, temporary facilities, utilities, coordinating with landowners, subcontractors, schedules, procedures, correspondence, progress payments, payroll records, Storm Water Pollution Prevention Plans (SWPPP), coordination, safety, after-hour contacts for Contractor and Owner personnel, quality control/quality assurance, personnel assignments, and other topics as appropriate.

Progress meetings, as stipulated in the Special Provisions or as required by the Owner, will be conducted throughout the duration of the Contract. The purpose of these meetings is to inform, discuss, and resolve issues related to the Work; the Contractor or the Contractor's agent shall attend these progress meetings. Topics discussed include, but are not limited to, progress, schedules, safety, SWPPP, Requests for Information, Field Instructions, Change Orders, field coordination, submittals, quality control/quality assurance, testing, startup, safety, and other topics related to the Work.

### **7-4 WORK TO BE PROSECUTED WITH ADEQUATE SUPERVISION, LABOR FORCE, AND EQUIPMENT AND METHODS**

The Contractor shall prosecute the Work with all materials, tools, machinery, apparatus, and labor necessary to complete the Work as described, shown, or reasonably implied under the Contract, or as directed by the Owner, on or before the scheduled completion date.

#### **7-4.01 *Superintendence***

Throughout the prosecution of the Work, the Contractor shall keep a competent superintendent on site who shall have complete authority to represent and act for the Contractor. Such superintendent shall be capable of reading and understanding the Contract, and shall receive and follow any instruction given by the Owner. Within five (5) working days after Notice to Proceed, Contractor shall provide Owner with the name and qualifications of the superintendent. The Owner may require Contractor to provide a more qualified superintendent if the proposed superintendent does not have successful experience on projects of similar



type and size. Contractor shall not remove or replace the designated superintendent without the written approval of Owner, which may not be unreasonably withheld.

Whenever the Contractor or the Contractor's superintendent is not present on a particular part of the Work where it may be desired to give direction, orders will be given by the Owner and shall be received and obeyed by the foreman or other representative who may have charge of the particular work in reference to which the orders are given, or the Owner may stop the work until the Contractor or the Contractor's superintendent arrives.

#### **7-4.02 Labor Force**

Workers, laborers, or mechanics skilled in each class of work shall accomplish every part of the Work.

#### **7-4.03 Equipment and Methods**

The Contractor is responsible for the safety, adequacy, and efficiency of his plant, equipment, and methods. Only equipment and methods suitable to produce the quality required by the Contract will be permitted to operate on the Work. Except as specified in Section 5-7, "Contractor's Equipment," or in the Special Provisions, or the Technical Specifications, equipment shall be that used in general practice for the work undertaken. If any part of the Contractor's plant, equipment, or methods of executing the Work is unsafe, inefficient, or inadequate to ensure the required quality or rate of progress of the Work, the Owner may order the Contractor to modify the Contractor's facilities or methods. The Contractor shall promptly comply with such orders at the Contractor's expense. However, neither compliance with such orders nor failure of the Owner to issue such orders shall relieve the Contractor from the obligation to secure the degree of safety, the quality of the Work, and the rate of progress required by the Contract.

### **7-5 SCHEDULES**

The Contractor shall submit a schedule within fifteen (15) Calendar Days after Notice to Proceed, in accordance with this Section 6 and Section 5-8, "Contractor's Submittals" that illustrates the Contractor's plans for carrying out the Work. The Owner will review the schedule, and any updates or revisions, for conformance to the Contract. Owner review of a schedule, update, or revision does not relieve the Contractor of responsibility for the feasibility of the schedule or requirements for accomplishments of milestones and completion within Contract Time, nor does the Owner review warrant or acknowledge the reasonableness of the schedule's logic, durations, labor estimates, or equipment productivity.

A bar chart or similar form of progress schedule will be required for all contracts. Unless otherwise agreed to by the Owner, the latest version of Microsoft Project™ shall be used. The Contractor shall submit three (3) copies, plus an electronic copy, of a complete baseline progress schedule at the preconstruction conference. The baseline progress schedule shall show all major portions of the Work, the estimated dates on which the Contractor shall start and complete each portion.

Unless agreed to by the Owner, the progress schedule shall be updated and submitted to the Owner with each Progress Payment request, at each progress meeting, or when requested by the Owner.

The Contractor shall carry out the various elements of the Work concurrently, as is practicable, and shall not defer construction of any portion of the Work in favor of any other portion, without the express written approval of the Owner.

Despite the submission of a progress schedule, the Contractor shall be governed by the direction of the Owner if, in the judgment of the Owner, it becomes necessary to accelerate the Work or any part thereof,

or cease work at any particular point and concentrate the Contractor's forces at such other point or points, with the intent of preventing delays.

## **7-6 UNUSUAL SITE CONDITIONS**

The Contractor shall promptly, and before the following conditions are disturbed, notify the Owner, in writing, of any:

1. Material that the Contractor believes may be hazardous waste, as defined in Section 22a-449(c)-100 of the Regulations of Connecticut State Agencies.
2. Subsurface or latent physical conditions at the site differing from those indicated in the Contract.
3. Unknown physical conditions at the site of any unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

The Contractor shall follow up the prompt notification with written documentation of the unusual site condition within seven (7) Calendar Days. The Owner will have the site remediated or issue a Contract Change Order per Section 9, "Changes and Claims" if it finds that the conditions do materially differ or involve hazardous waste.

## **7-7 WORK DURING INCLEMENT WEATHER**

During inclement or unsuitable weather or other unfavorable conditions, the Contractor shall pursue only such portions of the Work that will not be damaged by the weather or unfavorable conditions. When the weather or unfavorable conditions creates hazardous travel or working conditions, as determined by the Owner, the Contractor may be directed to stop that portion of the Work, in accordance with Section 5-21, "Temporary Suspension or Delay of Work" until the weather clears or the conditions are no longer unfavorable.

The Contractor must keep roads safe and inspect and maintain stormwater pollution prevention and erosion control devices during inclement weather or unfavorable conditions. Lane and road closures may not be allowed if the Owner determines that the traffic controls will create unnecessary risk to the traveling public, the Contractor, and/or Owner employees.

## **7-8 TEMPORARY FACILITIES AND SERVICES**

Unless specified otherwise in the Special Provisions, the Contractor shall be responsible for providing and maintaining necessary material storage facilities, utilities, field offices, temporary roads, fences, security, etc. for prosecuting the Work.

## **7-9 PROTECTION OF WORK, PERSONS, AND PROPERTY**

The Contractor shall protect the Work and materials from damage until completion and acceptance of the Work. Neither the Owner nor any of its agents assume any responsibility for collecting funds from any person or persons that damages the Contractor's work.

The Contractor shall store materials and equipment in accordance with manufacturer's recommendations and erect such temporary structures as required to protect them from damage.

The Contractor shall furnish guards, fences, warning signs, walks, and lights, and shall take all other necessary precautions to prevent damage or injury to persons or property.

## **7-10 PROOF OF COMPLIANCE WITH CONTRACT**

When requested by the Owner, the Contractor shall submit properly authenticated proof of the Contractor's compliance with the Contract.

## **7-11 DELAYS**

The Contractor shall provide notification to the Owner for any delays, in accordance with Section 7-13, "Notice of Delays."

### ***7-11.01 Avoidable Delays***

The Contractor shall not receive any time extensions or compensation for avoidable delays. Avoidable delays include, but are not limited to, the following:

1. Delays that affect only a portion of the work but do not prevent or delay the prosecution of controlling items of work nor the completion of the whole Work within the Contract Time.
2. Delays associated with the reasonable interference of other contractors employed by the Owner that do not necessarily prevent or delay the prosecution of controlling items of work or the completion of the whole Work within the Contract Time.
3. Delays associated with loss of time resulting from the necessity of submitting plans for Owner approval or from Owner surveys, measurements, inspections, and testing.
4. Delays that could have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or Subcontractors.

### ***7-11.02 Unavoidable Delays***

The Contractor may be granted an extension of Contract time for delays that are determined to be beyond the control of the Contractor, that lengthen the project critical path, and could not be prevented by the exercise of care, prudence, foresight, and diligence. Unavoidable delays may include Owner acts, acts of God or of the public enemy, fire, floods, epidemics, and strikes. Material shortages and delays in utility company relocations may be classified as unavoidable if the Contractor produces satisfactory evidence of acting in a timely manner.

The Contractor shall not receive any additional compensation due to inclement or unsuitable weather or conditions resulting therefrom, acts of God or of the public enemy, fire, floods, epidemics, strikes, material shortages, or utility relocations.

## **7-12 NOTICE OF DELAYS**

The Contractor shall immediately notify the Owner in writing if the Contractor foresees any delay in the prosecution of the Work or immediately upon the occurrence of any unavoidable delay, but in no case shall the written notice be provided to the Owner later than five (5) Calendar Days after the occurrence of the unavoidable delay. The Contractor shall state the probability of the delay occurring and its cause so the Owner may take steps to prevent the occurrence or continuance of the delay and determine whether the delay is avoidable or unavoidable, its duration, and the extent. Failure to provide notice of delay, as required by this section, waives any right to a contract extension due to the alleged delay.

All delays are conclusively presumed to be avoidable unless the Owner was notified as indicated above and through its investigation found them unavoidable. No consideration for additional time or compensation will be given for any delay not called to the Owner's attention at the time of its occurrence.

### **7-13 CARELESS DESTRUCTION OF STAKES AND MARKS – NO CAUSE FOR DELAY**

The Contractor shall have no claim for damages or time extensions if he or any of his Subcontractors carelessly destroy Owner-placed benchmarks or elevation reference points causing a delay in the Work.

### **7-14 TIME OF COMPLETION**

Time is of the essence on all Owner contracts. The Contractor shall complete all of the Work called for under the Contract within the Contract Time set forth in the Special Provisions.

### **7-15 EXTENSION OF TIME NOT A WAIVER**

Time extensions granted for unavoidable delays or for the execution of extra or additional work shall not operate as a waiver of the Owner's rights under the Contract.

### **7-16 INCLEMENT WEATHER AND CONTRACT TIME**

If the Contractor believes that a contract extension should be granted due to delays caused by excusable, inclement weather, it may request a contract extension in writing from the Owner.

Excusable, inclement weather is snowfall, rainfall, freezing temperatures or excessive wind conditions, the degree or duration of which varies in excess of the average conditions expected, which is unusual for the particular time and place where the work is to be performed, or which could not have been reasonably anticipated by the Contractor, as determined from U.S. Weather Bureau records for the location closest to the site or the Work for the preceding 10-year period. No extensions of contract time will be allowed for any inclement weather that could reasonable have been predicted from such weather records.

The Contractor shall include in its construction schedule the appropriate number of estimated calendar days lost due to adverse weather conditions for each month.

During cold weather, the Contractor shall protect all Work from damage. If low temperature makes it impossible to continue operations safely in spite of cold weather precautions, the Contractor may cease Work upon the written approval of the Owner.

### **7-17 EXTENSION OF TIME**

The Contractor will be allowed a time extension to complete the Work equal to the sum of all unavoidable delays as determined in accordance with Section 7-11.02, "Unavoidable Delays" plus any adjustments in Contract Time due to Contract Change Orders as outlined in Section 9-10, "Time Extensions for Changes." During such time extension, the Contractor will not be charged for extra engineering and inspection or liquidated damages. Requests for a time extension must be submitted in writing to the Owner within ten (10) Calendar Days of the event that is the reason for the request for time extension and before the expiration of the Contract time.

## **7-18 SUBSTANTIAL COMPLETION**

When the Contractor considers the entire Work substantially complete, the Contractor shall certify in writing to the Owner that the Work is substantially complete and request that the Owner grant substantial completion. Within seven (7) Calendar Days, the Owner and the Contractor shall inspect the Work to determine the status of completion. If the Owner does not consider the Work ready for its intended use, the Owner will notify the Contractor in writing, giving the Owner's reasons.

If the Owner considers the Work ready for its intended use, the Owner will grant a Certificate of Substantial Completion. The Certificate of Substantial Completion shall establish the date when the responsibilities of the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance are transferred to the Owner.

Along with the Certificate of Substantial Completion, the Owner will provide a (punch) list of items to be completed or corrected before Final Acceptance and Final Payment. The Contractor shall proceed to correct or complete such items within ten (10) Calendar Days of being provided said list. The counting of time for liquidated damages will cease for the entire Work, or a designated portion of the Work, on the date substantial completion is granted, but shall not bind the Owner to formal acceptance nor relieve the Contractor from the responsibility of completing or correcting any work.

## **7-19 CLEANING UP**

On a daily basis and throughout the construction period, the Contractor shall keep the site of the Work in a presentable condition, dispose of any surplus materials, keep roadways reasonably clear of dirt and debris, keep all sidewalk and other pedestrian areas clear of dirt, loose gravel, debris and any tripping hazards, remove ruts, grade surfaces to a smooth condition, install erosion protection measures, clean out all drainage ditches and structures, and repair any fences or other property damaged during the progress of the Work, to the satisfaction of the Owner. The Contractor shall also keep the work site cleaned of all rubbish, excess material, and equipment. All portions of the work shall be left in a neat and orderly condition prior to requesting final inspection. Surplus material shall be disposed of in accordance with the relevant technical provision of these Specifications.

The final inspection will not be made until final clean up has been accomplished.

If the Owner determines that the Contractor has failed to clean the site of the Work, the Owner may remove the rubbish and charge the Contractor for the cost removal. The Owner will issue a deduct Change Order to recover such cost.

## **7-20 FINAL INSPECTION AND ACCEPTANCE**

Upon Final Completion of the Work, the Contractor shall notify the Owner in writing that the Work is ready for Final Inspection, and also forward a Final Application for Payment. The Owner shall promptly inspect the Work. The Contractor or the Contractor's representative shall be present at the final inspection. The Contractor will be notified in writing of any defects or deficiencies. The Contractor shall proceed to correct such defects or deficiencies within ten (10) Calendar Days of such notification.

When notified that correction of the defective or deficient work is complete, the Owner will again inspect the Work to ascertain that the corrections are in accordance with the Contract. Upon the Owner's determination that all the Work is complete, including acceptance of Maintenance & Operation manuals, Record Drawings, and test reports, the Owner will accept the Contract as complete and issue a Certificate of Completion and Acceptance.

## **7-21 NOTICE OF COMPLETION**

Upon completion of the Work in accordance with the terms and conditions of the Contract Documents, a Certificate of Completion will be issued to be signed by the Contractor.

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## SECTION 8 MEASUREMENT AND PAYMENT

### 8-1 BASIS AND MEASUREMENT OF PAYMENT QUANTITIES

It is the Contractor's responsibility to measure and/or compute the quantities of work completed, subject to verification by the Owner, under the terms of the Contract. In computing quantities, the length, area, solid contents, number, weight, or time as specified in the Contract or the Schedule of Values shall be used.

#### **8-1.01 Unit Price Contracts**

Payment for all work bid at a price per unit of measurement will be based upon the actual quantities of work as measured upon completion. The Estimated Quantities provided in the Bid Documents are for comparative bidding only. The Owner does not express or imply that the actual amount of work or materials will correspond to the Estimated Quantities. The Contractor shall make no claim nor receive any compensation for anticipated profits, loss of profit, damages, or any extra payment due to any difference between the amount of work actually completed, or materials or equipment furnished, and the Estimated Quantities. (See also Section 9-12, "Contract Change Order")

#### **8-1.02 Lump Sum or Job Contracts**

Progress Payments will be based on the Schedule of Values prepared by the Contractor and approved by the Owner prior to acceptance of the first Progress Payment request (see Section 8-5, "Progress Payment Procedures"). If requested by the Owner, the Contractor shall furnish full copies of Subcontracts showing actual costs. The Schedule of Values shall be consistent with the baseline progress schedule prepared by the Contractor pursuant to Section 7-5, "Progress Schedule."

#### **8-1.03 Payment for Mobilization**

Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the site; for the establishment of all offices, buildings, and other facilities necessary for the Work; and for all other work and operations which must be performed, or costs incurred, prior to beginning the Work.

Payment for mobilization will be as follows:

##### **8.1.03.A Mobilization Not a Pay Item**

When the Contract does not include a separate pay item for mobilization, full compensation for mobilization will be included in the Contract lump sum price or in the prices paid for the various items of work in a unit price contract, and no additional compensation will be paid.

##### **8.1.03.B Mobilization a Pay Item**

When the Contract or proposed Schedule of Values includes a separate item for mobilization, payment for mobilization will include full compensation for the furnishing of all labor, materials, tools, equipment, administrative costs, and incidentals for mobilization.

1. The Owner will pay no greater than five percent (5%) of the Total Contract Price as a separate pay item for mobilization. In the event the Contractor submits a mobilization pay item greater than five

percent (5%) of the Total Contract Price, the Owner will pay any excess mobilization amount with the final Progress Payment.

2. Payment for mobilization will be prorated as follows:
  - a. When the Progress Payment request is five percent (5%) or more of the original Total Contract Price (excluding mobilization), fifty percent (50%) of the contract item price for mobilization or two and one-half percent (2.5%) of the Total Contract Price, whichever is less, will be paid for mobilization.
  - b. When the Progress Payment request is ten percent (10%) or more of the original Total Contract Price (excluding mobilization), seventy percent (70%) of the contract item price for mobilization or three and one-half percent (3.5%) of the Total Contract Price, whichever is less, will be paid for mobilization.
  - c. When the Progress Payment request is twenty percent (20%) or more of the original Total Contract Price (excluding mobilization), ninety percent (90%) of the contract item price for mobilization or four and one-half percent (4.5%) of the Total Contract Price, whichever is less, will be paid for mobilization.
  - d. When the Progress Payment request is fifty percent (50%) or more of the original Total Contract Price (excluding mobilization), one hundred percent (100%) of the contract item price for mobilization or five percent (5%) of the Total Contract Price, whichever is less, will be paid for mobilization.
  - e. After final acceptance of the Contract, the amount, if any, of the Contract item price for mobilization in excess of five percent (5%) of the original Total Contract Price will be included for payment in the final estimate made in accordance with Section 8-11, "Final Estimate and Payment."
3. The Owner will not pay additional mobilization compensation for work under a Contract Change Order. Payment for mobilization shall be subject to retention per Section 8-7, "Retention."

## **8-2 SCOPE OF PAYMENT**

### **8-2.01 General**

Compensation under the terms of the Contract shall be full payment for the Work, including loss or damage arising from the nature of the Work, action of the elements, or unforeseen difficulties encountered during the prosecution of the Work and until its final acceptance; and all risks connected with the prosecution of the Work.

### **8-2.02 Unit Price Contract**

Progress Payments will be made based on the unit price bid and measured quantities for work completed, plus work completed on approved Change Orders. For compensation for alterations in quantities of work, including deviations greater than twenty-five percent (25%), see Section 9-07.02, "Payment for Changes – Unit Prices."

### **8-2.03 Lump Sum or Job Contract**

Progress Payments will be based on the approved Schedule of Values for work completed, plus work completed on approved Change Orders.



### **8-2.04 Final Pay Items**

An item designated as a Final Pay Item in the Contract shall be paid for as specified in Section 8-11, “Final Estimate and Payment.”

### **8-2.05 Allowances**

Allowances may be included in the Bid Form for materials and/or work that may be added during the course of the Contract. The Allowance may be used in whole, in part, or not at all as determined by the Owner. Whenever costs of the Work included in the Allowance item are more or less than the specified Allowance amount, the Total Contract Price will be adjusted accordingly by Contract Change Order. The Contractor shall make no claim nor receive any compensation for anticipated profits, loss of profit, damages, or any extra payment due to any difference between the amount of work actually completed, or materials or equipment furnished, and the Estimated Quantities for the Allowance.

### **8-2.06 Payment for Material Not Incorporated in the Work**

No Progress Payments will be made for materials and equipment not incorporated in the Work.

## **8-3 WORK TO BE DONE WITHOUT DIRECT PAYMENT**

Compensation for any portion of the Work not specifically identified in the Bid Form or Schedule of Values is understood to be included in the price for other items, unless specified in the Special Provisions as extra work. No additional compensation is allowed for additional shifts or premium pay necessary to ensure that the Work is completed within the time limits specified in the Contract.

## **8-4 PAYMENT FOR USE OF COMPLETED PORTIONS OF WORK**

If the Owner accepts a completed or partially completed portion of the Work under Section 4-10, “Use of Completed Portions,” the Contractor will be compensated in accordance with Sections 8-11, “Final Estimate and Payment” and 8-12, “Final Payment to Terminate Liability of Owner.” When the Owner accepts a completed or partially completed portion of the Work, the warranty period for that portion commences and the Contractor will be relieved of any further maintenance and protection of that portion. The Contractor will not be relieved of the Contract requirements for repairing or replacing defective work and materials.

## **8-5 PROGRESS PAYMENT PROCEDURES**

Unless otherwise agreed to at the preconstruction meeting or identified in the Special Provisions, on the 20th day of each month the Contractor shall submit in writing for Owner review an Application for Payment. The Application for Payment shall consist of an estimate of the total amount and value of work done, including that done under approved Change Orders, and the acceptable materials furnished and incorporated in the work through the 20th day of the month. The Bid Form or Schedule of Values shall be used to prepare the Application for Payment request for the items, or portions of items, of the Work completed during the monthly progress period. After deducting all previous payments, the retention as described in Section 8-7, “Retention” and other withholdings as specified in the Contract from the estimated total value, and after review and acceptance by the Owner, the Owner will pay the Contractor the balance.

No Progress Payment will be made when, in the judgment of the Owner, the Work is not proceeding in accordance with the provisions of the Contract or when the total work done since the last Progress Payment

amounts to less than one thousand dollars (\$1,000). No Progress Payment will be made for improperly stored or protected materials, or unacceptable work

For each Application for Payment under this Contract, the Owner reserves the right to require the Contractor and every Subcontractor to submit a written verified statement in a form satisfactory to the Owner, showing in detail all amounts then due and unpaid by said Contractor and Subcontractor(s) for daily and weekly wages to all laborers employed by him performing work under this Contract, or other persons for materials, equipment, or supplies delivered to the site. Failure to comply with this requirement may result in the Owner withholding the Application for Payment.

The payment of a Progress Payment or the acceptance thereof by the Contractor does not constitute acceptance of any portion of the Work, and does not reduce the Contractor's liability to replace unsatisfactory work, material, or equipment. An inadvertence or error in an approved Progress Payment request does not release the Contractor or the Contractor's surety from damages arising from the work covered by the approved payment request or from enforcement of every provision of the Contract. The Owner has the right to correct any error made in any Progress Payment. Retainage and future credits will not be utilized to adjust for defective Work.

#### **8-6 INSPECTION AND PROGRESS PAYMENTS NOT A WAIVER OF CONTRACT PROVISIONS**

No inspection, order, measurement, approval modification, payment, acceptance of work or material (including, but not limited to, acceptance of the entire Work), time extension, or possession of the Work or any part thereof shall be a waiver of any of the terms and conditions of the Contract, the powers reserved by the Owner, or any right of the Owner to damages or to reject the Work in whole or part. No breach of this Contract shall be construed a waiver of any other or subsequent breach. All remedies provided in the Contract shall be cumulative and shall be in addition to all other rights and remedies that may exist at law or in equity.

#### **8-7 RETENTION**

As described in Section 8-11, "Final Estimate and Payment," the Owner will retain five percent (5%) of each Progress Payment to ensure performance under the Contract until thirty-five (35) days after filing of the Notice of Completion.

The Owner may also retain portions of a Progress or Final Payment for Contract noncompliance in an amount deemed appropriate by the Owner.

No interest shall be paid on any payment so retained.

#### **8-8 WITHHOLDINGS/DENIAL OF PROGRESS PAYMENT REQUEST**

The Owner may deny or withhold a portion of a Progress Payment request:

- Protect the Owner's interest from loss due to defective, unacceptable, or non-conforming work not remedied by the Contractor.
- To protect the Owner from loss due to injury to persons or damage to the Work or property of other contractors, subcontractors, or others caused by the act or neglect of the Contractor or his subcontractors.

The Owner may also deny a Progress Payment request and/or withhold money, or modify any previous Progress Payment, as necessary to protect the Owner from loss due to or affecting enforcement of:

- Fines levied against the Work by the Owner or other entities.
- Stop notices filed.
- Evidence that the Work cannot be completed for the unpaid balance of the Contract sum.
- Evidence that the Work will not be completed within the Contract time.
- Damage to the Owner or another contractor.
- Failure to carry out the Work in accordance with the Contract.

The Owner shall have the right to apply any amount withheld under this section as the Owner deems proper to satisfy claims against the Owner as a result of the Contractor's actions

The Owner has the right to withhold payment if the Contractor fails to provide accurate submissions of submittals, up-to-date status of documents including, but not limited to: as-builts, RFI logs, project schedules, submittal logs, change order logs, certified payrolls, daily reports, and all other requirements of the Contract.

When, under the provisions of the Contract, the Owner charges any sum of money against the Contractor, the Owner will deduct and retain the amount of such charge from a Progress or Final Payment. If, on completion or termination of the Contract, sums due the Contractor are insufficient to pay the Owner charges against the Contractor, the Owner has the right to recover the balance from the Contractor or the Contractor's surety.

### **8-9 DEDUCTIONS FOR IMPERFECT WORK**

For any portion of the Work retained in accordance with Section 5-19, "Right to Retain Imperfect Work," the Owner will deduct from a Progress Payment a just and reasonable amount.

### **8-10 LIQUIDATED DAMAGES FOR DELAY**

The Contractor shall pay the Owner the sum set forth in the Special Provisions for each and every day's delay beyond the time stated in the Special Provisions, plus any time extensions as provided in Section 7-17, "Extension of Time."

No payment by the Owner, either partial or final, shall be construed to waive the Owner's right to seek Liquidated Damages

The Liquidated Damages or any portion thereof may be waived at the sole discretion of the Owner.

### **8-11 FINAL ESTIMATE AND PAYMENT**

As detailed in Section 7-20, "Final Inspection and Acceptance," the Contractor shall forward the Application for Final Payment, segregated as to Contract item and Contract Change Order work.

The Owner will review the Application for Final Payment and, after deducting all previous payments and all amounts to be deducted, withheld, and/or retained under the provisions of the Contract, shall create the proposed Final Payment request. All Progress Payments shall be subject to correction in the Final Payment.

Within fifteen (15) Calendar Days after the proposed Final Payment request is returned to the Contractor, the Contractor shall submit to the Owner a written approval of said request or a written statement of exceptions. The Contractor's statement of exceptions shall be in sufficient detail for the Owner to ascertain the basis and amount of the exceptions. Failure to provide sufficient detail shall be cause for denial of the exceptions. Any claim of the Contractor or the Contractor's Subcontractors or suppliers with respect to the performance or breach of the Contract or any alterations thereof (except for payment of the balance of the Contract price as set forth in the Final Payment request) not specifically set forth in the statement of exceptions, is waived by the Contractor. If the Contractor fails to file a statement of exceptions within the time allowed, the Owner will infer acceptance of the Final Payment request as submitted to the Contractor.

If no liens or claims have been filed against the Contractor after thirty-five (35) days from the filing of Notice of Completion, the Owner will approve for payment the entire sum due, including the release of any retention.

Final Payment shall not be released until a Certificate of Acceptance and Completion and a Certificate of Compliance have been issued.

Neither Final Payment nor any remaining Retainage shall become due until the Contractor submits to the Owner the following:

- An affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or Owner's property might be responsible or encumbered (less amounts retained by the Owner) have been paid or satisfied.
- A certificate evidencing that insurance required by the Contract Documents to remain in effect after Final Payment currently is in effect and will not be canceled or allowed to expire without at least thirty (30) days prior written notice to the Owner.
- A written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents.
- Written consent of surety, if any, to Final Payment.

If requested by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interest or encumbrances arising out of the Contract, to the extent and in such form as designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the contractor may furnish a bond acceptable to the Owner to indemnify the Owner against lien. If such lien remains unsatisfied after Final Payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay to discharge such lien, including all costs and reasonable attorneys' fees.

If, after Substantial Completion of the Work, Final Completion is materially delayed through no fault of the Contractor or Change Orders affecting Final Completion, the Owner will make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance of Work not fully completed or corrected is less than the retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Owner prior to Final Payment. Such payment shall be made under the terms and conditions governing Final Payment, except that it shall not constitute a waiver of claims.

No Application for Final Payment shall act as a release to the Contractor or his Sureties from any obligations under this Contract.

## **8-12 FINAL PAYMENT TO TERMINATE LIABILITY OF OWNER**

Payment of the final amount due under the Contract shall release the Owner, and the Owner's officers, officials, agents, employees, members, volunteers, affiliates, Consulting Engineer, and their duly authorized representatives from all claims or liability on account of work performed under the Contract. Tender of this payment shall constitute denial by the Owner of any unresolved claim of the Contractor not specifically excepted in writing by the Contractor. The Contractor's acceptance of the Final Payment shall release the Owner and the Owner's officers, officials, agents, employees, members, volunteers, affiliates, engineering consultants, and their duly authorized representatives from all claims or liability on account of work performed under the Contract or any alterations thereof, except unresolved items set forth in the statement of exceptions.

## **8-13 DISPUTED PAYMENTS**

The Owner will decide disputes regarding payments under the Contract according to the procedures set forth in Section 9, "Changes and Claims." The decision of the Owner will be final.

## **SECTION 9 CHANGES AND CLAIMS**

### **9-1 AUTHORITY FOR CHANGES**

The Owner reserves the right to order corrections, alterations, additions, modifications, deletions or other changes as required for the proper completion of the Work. The order may be made prior to the final acceptance of the Contract without voiding the Contract, without notice to the Contractor's sureties, and in accordance with the provisions of Section 9-2, "Ordering of Changes."

The Contractor shall not perform corrections, alterations, additions, modifications, deletions, or other changes to the Work without a written order from the Owner.

Payment for changed or extra work will not be made without the Owner's written authorization.

The provisions of this Section shall not affect the power of the Contractor to act case of emergency, threatened injury to persons, or damage to the Work or adjacent property.

### **9-2 ORDERING OF CHANGES**

The Owner may order a change, in writing, during the course of the Work, and the Contractor shall comply with the order. Changes to the Work shall in no way affect, vitiate, or make void the Contract or any part thereof, except that which is necessarily affected by such changes and is clearly the evident intention of the parties to the Contract.

Changes to the Work may be initiated as described in Section 4-5, "Field Instructions or Other Written Directives." Changes that require an adjustment to the total Contract Price or the Contract Time will be formalized in a Contract Change Order, in accordance with Section 9-12, "Contract Change Order (CCO)." Failure of the Owner and Contractor to agree to terms of any order for change shall not relieve the Contractor of his obligation to complete all work specified in the order.

### **9-3 CHANGES TO THE CONTRACT**

If directed by the Owner, within fourteen (14) Calendar Days of issuance of an order for a change, the Contractor shall provide a cost and time proposal prepared in accordance with the requirements of Sections 9-7, "Payment for Changes," and 9-10, "Time Extensions for Changes." The Contractor's proposal shall indicate the amount to be added or deducted from the Total Contract Price, supported by complete details of all Contractor, Subcontractor, vendor, or supplier costs per Section 9-5, "Cost and Pricing Data."

If the Contractor does not submit a proposal within fourteen (14) Calendar Days, and unless the Owner is otherwise notified within fourteen (14) Calendar Days of a potential cost impact, the Contractor agrees to perform the work described in the order for change with no additional compensation. If the order for change is issued on a force account basis, the Contractor must immediately begin keeping records in accordance with Section 9-7.03, "Force Account."

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## **9-4 PROSECUTION OF CHANGES TO THE CONTRACT**

The Contractor shall comply with and prosecute all portions of the order for change with the same diligence and manner as if the changes were originally included in the Contract, except as otherwise provided in the order.

If agreement is reached regarding payment, but not a time adjustment, the Owner shall have the right to direct the Contractor to proceed with the change at the agreed price. The impact of the changed work on the project schedule will be considered by the Owner in accordance with Section 9-10, "Time Extensions for Changes."

When the Owner and Contractor cannot agree on the credit for deleted work, the Owner's estimate will be deducted from the Total Contract Price, unless the Contractor presents proof prior to the Final Payment that the Owner's estimate is in error.

## **9-5 COST AND PRICING DATA**

Cost and pricing data submitted by the Contractor shall be true, complete, accurate, and current. The Owner may require a formal certification to verify Contractor-submitted cost and pricing data. Additional requirements for cost and pricing data may also be included in the Special Provisions. The Owner shall have access to the records supporting such cost and pricing data in accordance with Section 9-6, "Access to Records."

## **9-6 ACCESS TO RECORDS**

Upon reasonable notice and during normal business hours, the Owner shall have access to the Contractor's and Subcontractors' records for the purpose of verifying and evaluating the accuracy of cost and pricing data submitted by the Contractor. "Records" as used in this Section shall include, but not be limited to: original estimates, subcontract agreements, purchase orders, books, documents, accounting records, papers, project correspondence, project files, and scheduling information necessary to determine the direct and indirect costs, job site, area and home office overhead, delay and impact costs. Records shall include the original Bid and all documents related to the Bid and its preparation, the as-planned construction schedule and all related documents. Such access shall include the right to examine and audit such records and make excerpts, transcriptions, and photocopies at the Owner's cost.

## **9-7 PAYMENT FOR CHANGES**

The method of payment agreed upon by the Contractor and the Owner, or selected by the Owner in the absence of agreement, shall be set forth in the order for change. The amount of compensation resulting from a Change Order to be paid to the Contractor for any Additional Work, or to be deducted from the Contract Price for any deleted Work, shall be determined in the one of the following manners:

### **9-7.01 Lump Sum Price**

The Contractor shall submit a lump sum price proposal for approval by the Owner. The proposed lump sum price shall be based upon the following itemized costs:

- Labor (Contractor's own or Subcontractor)
- Materials (used by the Contractor or Subcontractor)

- Benefits (including Worker's Compensation, Federal Social Security, Connecticut State Unemployment Compensation, and Fringe Benefits)
- Rented Equipment (to be used directly for the Work by the Contractor or Subcontractor)
- Owned Equipment (to be used directly for the Work by the Contractor or Subcontractor).

The daily rate for Owned Equipment shall not exceed three percent (3%) of the monthly rental rate as identified by a nationally recognized construction cost estimating guide or service.

Trade related equipment, hand tools, and power tools normally supplied with the labor are not compensable.

### **9-7.02 Unit Prices**

When the accepted quantities of work vary from the quantities in the contract, the Contractor shall be paid, so far as contract items are concerned, at the contract unit prices for the accepted quantities of Work done. The Contractor shall also set forth unit prices in all subcontracts to which they apply.

Should the final pay quantity of any major contract item increase or decrease by more than twenty percent (25%) from the quantity in the contract, the contract unit price will be adjusted to balance fixed and job indirect costs as by the parties to the contract. A major contract item is any item having an original contract value in excess of ten percent (10%) of the original contract amount. The new unit prices negotiated will be distributed over, and will apply to, the total final pay quantity for the item, and not solely the excessive overrun or excessive under run quantities.

### **9-7.03 Cost-Plus Work**

If no agreement as to a lump sum or unit price can be reached, the Engineer may order that the work will be paid for on a cost-plus basis.

For all work done on a cost-plus basis, the Contractor's compensation shall be determined in accordance with the following requirements:

#### **9.7.03.A Labor:**

1. For all labor, the Town shall pay the Contractor the wage rate actually paid as shown by its certified payroll, which shall be at least the minimum rate established for the Project by the State Labor Department or the U.S. Department of Labor. For all foremen in direct charge of Project work, the Town will pay the Contractor the actual wage paid to the foremen as shown on the Contractor's certified payroll.
2. The Town will reimburse the Contractor for the actual costs paid to, or on behalf of, workers by reason of allowances, health and welfare benefits, pension fund benefits and other such benefits, when such amounts are required by a collective bargaining agreement or another employment contract generally applicable to the classes of labor employed on the Project. The Contractor shall certify all such costs.
3. For property damage, bonding, liability and workmen's compensation insurance premiums, unemployment insurance contributions and social security taxes on Project cost-plus work, the Town will reimburse the Contractor for its actual Project costs. The Contractor shall provide to the Engineer documentation, satisfactory to the Engineer in form and substance, of all such costs.
4. The Town will also pay to the Contractor an amount equal to 20% (15% for overhead, 5% for profit) of the total sums described in (a) (1) through (3) above.



No part of the salary or expenses of anyone connected with the Contractor's forces above the grade of foreman, who provides general supervision of Project work, will be included in the above payment calculations, except when the Contractor's organization is entirely occupied with cost-plus work, in which case the salary of a superintendent may be included in said labor item when the nature of the pertinent Project work is such that, in the opinion of the Engineer, a superintendent is required for that work. The allowable rate of pay for such superintendent shall be agreed upon before the Contractor begins the pertinent work. If no agreement on the rate can be reached, the Engineer will make payment based on such rate as he deems reasonable

The Engineer reserves the right to determine the number and type of personnel to be employed for the cost-plus Project work.

*9.7.03.B Specialized Work:*

When the Engineer directs the Contractor to perform specialized work requiring skills, tools and equipment substantially unlike those ordinarily used by the Contractor or its authorized Project subcontractors, the Town will pay the Contractor for the use of a specialist to perform the specialized work. For such specialized services, including materials incorporated into the Project, the Town will pay the Contractor its actual costs, plus additional compensation in accordance with subparagraph (e) below. Prior to performing such specialized work, the Contractor shall obtain and submit to the Engineer a minimum of three price quotes for the work, if requested by the Engineer.

*9.7.03.C Materials:*

For all materials necessary for cost-plus Project work, the Town will pay the Contractor its actual cost for such materials as delivered to the Project site, including delivery charges as shown by original receipted bills, plus 15 % of the sum of said cost and charges.

In lieu of receipted bills for materials used which were not specifically purchased for the Project, but were taken from the Contractor's stock, the Contractor shall provide to the Engineer an affidavit certifying that such materials were not purchased for the Project, that the materials were taken from the Contractor's stock, that the quantity claimed to have been used on the Project was actually so used, and that the price claimed for the materials is currently their fair market value. The Town will pay for costs of transporting the materials to the Project site, in accordance with subparagraphs (a) and (d) hereof.

The Town will not reimburse the Contractor for any penalty or charge incurred due to the Contractor's late or delayed payment for the pertinent materials.

*9.7.03.D Equipment:*

All equipment used for cost-plus Project work must, in the judgment of the Engineer, be in good working condition and suitable for the purpose intended; and the Engineer reserves the right to determine the size and number of units of equipment to be used for such work. The manufacturer's ratings shall be the basis for all Rental Rate Blue Book classifications used for payment purposes. ("Rental Rate Blue Book" as used in these specifications refers to the current edition of the Rental Rate Blue Book, taking into account all current Rate Adjustment Tables, and amendments thereof, which is published by K III Directory Corporation of San Jose, California, including all current Rate Adjustment Tables and amendments thereof.) Trucks will be classified by cubic-yard capacity.

No percentage mark-up will be added for payment purposes to amounts charged by the Contractor based on equipment rental rates.

The Town will not pay rental rates for small tools needed to complete the cost-plus Project work.

For payment purposes, estimated operating costs per hour from the Rental Rate Blue Book will apply only to the actual time during which the equipment is actively being used to perform cost-plus Project work.

For equipment that is also being used for non-cost-plus Project work, the Town will pay the applicable hourly rate only for the actual time that the equipment is assigned to cost-plus Project work. The applicable period of assignment for each piece of equipment shall start when the equipment commences to be used for cost-plus Project work ordered by the Engineer, and shall end at the time designated by the Engineer.

For equipment which has to be brought to the Project site exclusively for cost-plus work, the Town will reimburse the Contractor for loading and unloading costs and costs of transporting such equipment to and from the Project site; provided, however, that payment for return transportation from the Project site shall not exceed the cost of moving the equipment to that site. If such a piece of equipment is self-propelled, and is driven to the Project site under its own power, then the Town will pay only operating costs and labor costs for its transport to and from the Project site. The Town will not, however, pay for any loading, unloading and transportation costs if the equipment is used for any Project work on the site other than cost-plus work.

1. Owned Equipment: The Town will pay the Contractor the applicable rental rate set forth in the Rental Rate Blue Book for any equipment (1) which the Contractor uses, with the Engineer's authorization, to perform cost-plus Project work, and (2) which is owned by the Contractor or a subsidiary, affiliate, or parent company of the Contractor (no matter how far up or down the chain of ownership from the Contractor).

The maximum hourly rate to be used in paying for Contractor-owned equipment assigned to cost-plus work shall be the applicable monthly rate in the Rental Rate Blue Book, divided by 176 (176 working hours per month).

Should the proper completion of the cost-plus Project work require equipment of a type not covered by the Rental Rate Blue Book, the Engineer will determine, and the Town will make payment to the Contractor at, a reasonable rental rate based on rates prevailing in the area of the Project. If practicable, such rates shall be determined by the Engineer before the affected work is begun. If the Contractor proposes that the Engineer use a particular rate in such an instance, the Contractor must disclose to the Engineer the specific sources of, or support for, said rate.

If a piece of equipment owned by the Contractor is assigned to cost-plus Project work, but remains idle for some portion of the period of the cost-plus work, the Town will pay for that idle time at 50% of the applicable rental rate (exclusive of operating costs) in the Rental Rate Blue Book.

For payment purposes, the period of equipment usage shall be deemed to start when the Contractor begins to use the equipment for cost-plus Project work and shall be deemed to end when the equipment is released by the Engineer from use for such work. Any hours during which the equipment is used for work other than cost-plus Project work will be deducted from the pertinent payment period.

For any piece of Contractor-owned equipment assigned to cost-plus Project work, the Town will reimburse the Contractor for an aggregate minimum of 8 hours (of use time, idle time, or a combination thereof) in each 24-hour day (measured from one midnight to the following midnight) during the assignment period. No such reimbursement will be made, however, for Saturdays, Sundays and legal holidays during which the Contractor does no Project work, or for any other day on which the Engineer orders the Contractor to do no Project work. If the equipment is used to perform cost-plus Project work for more than 8 hours in a day, the Town will pay the Contractor at the applicable hourly rate computed on a monthly basis for the actual time of use; however the

Town will not pay the Contractor for more than 8 hours of idle time for a piece of equipment during a given day.

The Town shall have the right to limit its aggregate Project payments for idle time for a given piece of equipment to the replacement value of that equipment.

2. Rented Equipment: If the Engineer determines that in order to perform the cost-plus Project work the Contractor must rent certain machinery, trucks or other equipment not owned by the Contractor or a subsidiary, affiliate, or parent company of the Contractor (no matter how far up or down the chain of ownership from the Contractor), the Contractor shall inform the Engineer, in advance of such rental, (1) of the specific nature of the rental(s), (2) the reasons for its need for such rental(s), (3) the anticipated or proposed rental rate(s), and (4) the estimated duration for the use of the equipment. Rates for such rented equipment must be provided based on the following:

- A daily rate per hour when the equipment is to be specifically assigned to Project work by the Engineer for a period of 7 consecutive calendar days or less.
- A weekly rate per hour when such assigned time exceeds 7 consecutive calendar days, but does not exceed 21 consecutive calendar days.
- A monthly rate per hour when such assigned time exceeds 21 consecutive calendar days.

The applicable daily, weekly, or monthly rate will be determined at the expiration of 21 calendar days or upon release of the equipment by the Engineer, whichever occurs first. Interruptions of the rental period, when equipment is used on other than assigned cost-plus work, will not entitle the Contractor to payment at a rental rate that would be applicable to the shorter periods arguably occasioned by such interruptions.

Prior to renting such equipment, the Contractor shall obtain and submit to the Engineer a minimum of three quotes, if requested by the Engineer.

The Town will pay the Contractor for such rental at the rate actually paid by the Contractor, provided that the given use and rental rate are acceptable to the Engineer. In order to obtain such payment, the Contractor must provide the Engineer with a copy of the original receipted bill for the rental expenses incurred.

*9.7.03.E Administrative Expense:*

When extra work on a cost-plus basis is performed by an authorized subcontractor, the Town will pay the Contractor for that work, based on the following table; such payment will be in addition to the percentage payments described in (a), (b), (c) and (d) above, as a reimbursement for the Contractor's administrative expense in connection with such work.

Amounts of extra work performed by subcontractor, valued at up to \$1,000: an added 10% of that dollar value.

Over \$1,000 to \$10,000: \$100 plus 5% of any amount over \$1,000.

Over \$10,000: \$550 plus 3% of any amount over \$10,000.

Approval of such additional payments will be given only after the Contractor provides to the Engineer receipted invoices for all relevant costs.

9.7.03.F *Miscellaneous:*

The compensation provided for in (a), (b), (c), (d) and (e) above shall be deemed to be payment in full for the extra work and shall be deemed as full compensation for same, including costs of superintendence, use of small tools, equipment for which no rental is allowed, safety equipment, consumables, field office overhead, home office overhead, bonding, other insurance, and profit. The Contractor's representative and the Engineer shall compare their respective records of the extra work done on a cost-plus basis at the end of each day. Copies of these records shall be signed by both the Engineer and the Contractor's representative. The Engineer will then forward a copy of same to the Contractor and to any affected subcontractor in accordance with Department procedures. Upon payment of such costs by the Contractor, the Contractor shall immediately furnish the Engineer with original receipted bills covering the costs, including transportation charges, for all materials used for such work.

Overhead and Profit percentages FOR CHANGED WORK

The Contractor's and Subcontractor's maximum allowable percentages applied to labor, benefits, materials, and equipment for Work performed by their own workforce is summarized in the table below.

CHANGE ORDER AMOUNT	OVERHEAD AND PROFIT
\$0 to \$5,000	20%
\$5,001 to \$15,000	17%
\$15,001 to \$25,000	15%
\$25,000 and greater	12%

The maximum allowed Contractor markup for overhead and profit for Work performed by their Subcontractors is six percent (6%).

The maximum allowed Subcontractor markup for overhead and profit for Work performed by their Secondary Subcontractors is six percent (6%).

The Owner will not accept markup by the Secondary Contractor.

**9-8 LIMITATIONS ON PAYMENTS FOR CHANGED WORK**

The Owner will not pay the Contractor for costs in excess of prevailing market values, unless the Contractor can establish, to the satisfaction of the Owner, that the Contractor has investigated all possible means of providing the work and that the excess costs could not be avoided. The Owner will be the sole judge of the necessity of incurring costs in excess of market value and whether the excess costs are directly required for performance of changed work. The Owner's determination will be final.

**9-9 TIME EXTENSIONS FOR CHANGES**

The Contract Time specified for the performance of the Contract shall include the Work of the original Contract plus any additional work ordered by the Change Order. No extension of time will be granted if the additional Work can be performed concurrently with the original Work.

The Contractor may request, and the Owner may grant additional time when, in the opinion of the Owner, the Contractor has demonstrated that the additional work cannot be performed concurrently with the additional Work.

The Contractor is entitled only to adjustment in Contract Time if completion of the entire Work is extended due to the change impacting the controlling item of work. Each proposal submitted by the Contractor in accordance with Section 9-4, "Prosecution of Changes to the Contract" shall state the amount of extra time the Contractor believes the change added to the overall project schedule.

Failure to request a time extension within the time allowed constitutes a waiver of the Contractor's right to subsequently claim an adjustment in Contract Time.

### **9-10 EFFECT ON SURETIES OF CHANGES TO THE WORK**

No alterations, time extensions, extra or additional work or other changes authorized by these conditions or any part of the Contract shall affect the sureties' obligations under the Contract.

### **9-11 CONTRACT CHANGE ORDER (CCO)**

The Owner will issue a Contract Change Order (CCO) for approval if a change to the Total Contract Price or Contract Time is necessary. The Contractor shall not be entitled to any adjustments in either Total Contract Price or Contract Time for changes performed before receipt of an approved Contract Change Order.

### **9-12 ACCEPTANCE OF ORDERS FOR CHANGES**

The Contractor's written agreement of a Contract Change Order, Field Instruction, or other written directive will constitute his final and binding agreement to the provisions of the Contract Change Order, Field Instruction, or other written directive, and a waiver of all claims in connection therewith, whether direct or consequential in nature, including those of any Subcontractors or suppliers. If the Contractor disagrees with any Contract Change Order, Field Instruction, or other written directive, the Contractor may submit a Notice of Potential Claim to the Owner in accordance with Section 9-15, "Notice of Potential Claim." Disagreement with the provisions of a Contract Change Order, Field Instruction, or other written directive will not relieve the Contractor of the Contractor's obligations under the Contract.

### **9-13 DISPUTE REGARDING CONTRACT REQUIREMENTS**

If the Contractor and Owner fail to agree whether or not any work required by Owner is within the scope of the Contract, the Contractor shall nevertheless immediately perform such work upon receipt of a written Field Instruction or other written directive. Within seven (7) Calendar Days after receipt of the Field Instruction or other written directive, the Contractor may submit a written protest detailing the Contract requirements exceeded and the approximate cost and/or time change. Failure to submit a protest within the specified period constitutes a waiver of the Contractor's rights to adjustments in the Total Contract Price or Contract Time for the disputed Contract requirement.

The Contractor shall not stop performing the Work pending resolution of a dispute, unless ordered in writing by the Owner.

If the Owner agrees with the Contractor's written protest, the Total Contract Price and/or Contract Time will be adjusted through a Contract Change Order granting the Contractor's request, in whole or in part. Granting the request in part will be deemed a denial of the portion not granted. If no action is taken by the Owner, the protest is denied thirty (30) Calendar Days after it was submitted. If Contractor disagrees with the denial, Contractor shall file a Notice of Potential Claim within seven (7) Calendar Days after denial or the protest. The Contractor's failure to file within a timely manner shall result in a waiver of any claim arising from the proposed additional work scope.

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## 9-14 NOTICE OF POTENTIAL CLAIM

The Contractor shall not be entitled additional compensation and/or time for any cause, including any disagreement, protest, or change, any act or failure to act by the Owner, or the happening of any event, thing or occurrence, unless the Contractor has given the Owner due advance written Notice of Potential Claim. The written Notice of Potential Claim shall present the reasons for which the Contractor believes additional compensation and/or time will or may be due, the nature of the costs and/or time involved, and, insofar as possible, the amount of the potential claim.

The Contractor shall provide written notification to the Owner within seven (7) Calendar Days upon discovery of concealed or unknown conditions or any disagreement, protest, situation, event, or occurrence that may result in a claim. Failure to provide written notification within a timely manner shall result in a waiver of the claim.

## 9-15 SUBMISSION OF CLAIMS

Contractor shall submit three (3) certified copies of all claim documentation. All claim documentation shall be complete when submitted. The evaluation of the Contractor's claim will be based on Owner's records and the claim documentation submitted by Contractor.

Claim documentation shall conform to generally accepted auditing standards and shall be in the following format:

1. Introduction and background
2. Issues
  - a. Index of issues
  - b. For each issue:
    - i. Background
    - ii. Chronology
    - iii. Contractor's position (reason for Owner's potential liability)
    - iv. Supporting documentation of merit
    - v. Supporting documentation of damages
3. Critical path method schedules, as-planned versus as-built, and delay analysis
4. Productivity and damages exhibits
5. Summary of issues and damages

Supporting documentation of merit for each issue shall be cited by reference, photocopies, or explained. Supporting documentation may include, but not be limited to, general conditions, technical specifications, drawings, correspondence, conference notes, shop drawing logs, survey books, inspection reports, delivery schedules, test reports, daily reports, subcontracts, fragmentary critical path method schedules, photographs, technical reports, requests for information, field instructions, and other related records.

Supporting documentation of damages for each issue shall be cited, photocopied, or explained. Supporting documentation may include, but not be limited to, certified detailed labor, materials, equipment, and construction equipment and services costs; purchase orders; invoices; project as-planned and as-built costs; subcontractor payment releases; quantity reports; other related records; general ledger and any other accounting materials.

Contractor shall update and revise its claim and provide additional supporting information whenever more accurate or more detailed information becomes available. In no event will Contractor assert claims based on hypothetical or speculative assumptions.

Each copy of claim documentation shall include the following certification, signed in the same manner as the Contract was signed:

“I, \_\_\_\_\_, being the (must be an officer) of (general contractor), declare under penalty of perjury under the laws of the State of Connecticut, and do personally certify and attest that: I have thoroughly reviewed the attached claim for additional compensation and/or extension of time, and know its contents, and said claim is made in good faith; the supporting data is truthful and accurate; that the amount requested accurately reflects the Contract adjustment for which the Contractor believes the Owner is liable. Further, I am familiar with Connecticut Penal Code Section \_\_\_\_\_, et seq., pertaining to false claims, and understand that submission or certification of a false claim may lead to fines, imprisonment and/or other severe legal consequences.

*(Signature of officer)*

*(Date)*

## **9-16 ENGINEER’S DECISION**

The Engineer may be requested to consider a dispute or claim if the Owner and Contractor reach an impasse. A request for an Engineer’s Decision shall be made by the Contractor, in writing, within fourteen (14) Calendar days of the date of impasse. In requesting an Engineer’s Decision, each party shall provide a detailed description of their position and state the objections to the position of the other party. Evidence, records, and supporting information shall be included. Copies of all correspondence and information shall be provided to both parties.

The Engineer will review the facts of the dispute and may request additional information, evidence, or testimony. The Engineer will render a fair, impartial decision based on the Contract, and the evidence submitted by the Owner and Contractor.

The Engineer may decline to consider a dispute and refer the matter to a Dispute Review Board, if provided for in the Contract.

## **9-17 ALTERNATIVE DISPUTE RESOLUTION**

After all remedies and provisions of the Contract are exhausted, any dispute related to the Work or Contract may be resolved by Mediation if the Contractor and the Owner agree in writing. The Contractor shall submit a written request for Mediation no later than thirty Calendar (30) days after the Owner issues the final written decision.

Said Mediation is voluntary, non-binding, and intended to provide an opportunity for the parties to evaluate each other’s cases and arrive at a mutually agreeable solution. These provisions relating to voluntary Mediation shall not be construed or interpreted as mandatory arbitration.

### ***9-17.01 Initiation of Mediation***

Any party to a dispute or claim may initiate Mediation by notifying the other party or parties in writing.

### ***9-17.02 Request for Mediation***

A Request for Mediation shall contain a brief statement of the nature of the dispute or claim, and the names, addresses, and phone numbers of all parties to the dispute or claim, and those who will represent them, if any, in the Mediation.

### ***9-17.03 Selection of Mediator***

Within thirty (30) Calendar days upon receipt of a Request for Mediation, the parties will meet and confer to select an appropriate Mediator agreeable to all parties. If the parties cannot agree on a Mediator, the party requesting mediation will request that the American Arbitration Association appoint a mediatory experienced in construction matters from construction mediators in its Large and Complex Case Program.

### ***9-17.04 Time and Place of Mediation***

The Mediator shall set the time of each Mediation session. The Mediation shall be held at any convenient location agreeable to the Mediator and the parties, as the Mediator shall determine. All reasonable efforts will be made by the parties and the Mediator to schedule the first session within thirty (30) Calendar Days after selection of the Mediator.

### ***9-17.05 Identification of Matters in Dispute***

At least fourteen (14) Calendar Days before the first scheduled Mediation session, each party shall provide the Mediator with a brief memorandum setting forth its position with regard to the issues that need to be resolved. Such memoranda shall be mutually exchanged by the parties.

### ***9-17.06 Confidentiality***

Information disclosed to the mediator and communications between the parties in relation to the mediation are subject to privilege status.

### ***9-17.07 Expenses***

The mediator's fee and any administrative expenses charged for the mediation will be divided pro rata among the parties.

## **9-18 NO ALTERNATIVE CLAIMS PROCEDURE**

Nothing in the Contract constitutes an agreement for an alternative claim procedure.

## **9-19 ASSIGNMENT OF CLAIMS**

The Contractor shall not assign any portion of the moneys due the Contractor without written Owner approval. No person other than the party signing the Contract has any claim under the Contract, except as provided in the Contract.



## **SECTION 10 ENVIRONMENTAL CONTROLS AT WORK SITE**

### **10-1 DUST CONTROL**

Dust control shall conform to the relevant article of the Special Provisions of these Specifications.

### **10-2 AIR POLLUTION CONTROL**

The Contractor shall comply with all Federal, State, and local air pollution control rules, regulations, ordinances, and statutes that apply to the Work. The Contractor shall also comply with the requirements of any permits issued to the Owner as noted in the Special Provisions.

### **10-3 BURNING**

Unless otherwise provided in the Special Provisions or approved by the Owner in writing, material shall not be burned on site or removed from the site for disposal by open burning.

### **10-4 EROSION, SEDIMENT, AND WATER POLLUTION CONTROL**

The Contractor shall protect the local storm drain system from pollution, and shall conduct and schedule operations to avoid erosion and sediments. Where erosion may cause water pollution due to the nature of the material or the season, the Contractor's operations shall be scheduled so temporary or permanent erosion control features are installed concurrently with, or immediately following, grading operations.

In order to provide effective and continuous control of water pollution, it may be necessary for the Contractor to perform the Work in small or multiple units, on an out-of-phase schedule, and/or with modified construction procedures. The Contractor shall coordinate water pollution control work with all other Contract work.

The Contractor is responsible for complying with all Federal, State, Town, County, Owner and local permits, rules, regulations, ordinances, statutes, and Owner directions that apply to erosion, sediment, and water pollution control.

The Contractor's responsibility to provide water pollution control under this Section ends at Field Acceptance of the Work unless subsequent site maintenance is included in the Contract as an item of work. (See Section 7-21, "Final Inspection and Acceptance")

### **10-5 CONTROL OF WATER IN THE WORK**

When groundwater or surface run-off water is encountered, the Contractor shall furnish, install, maintain, and operate all necessary machinery, appliances, and equipment to keep excavations and wet areas reasonably free from water for foundation construction. De-watering operations shall remain in effect until the Work has been completed, inspected, and approved, and all danger of flotation and other damage is eliminated. Water pumped from waterways, trenches, excavations, or low spots shall be disposed as specified in the Special Provisions or as directed by the Owner. The Contractor is not allowed to dispose of any water that contains sediment or other contaminants. The Contractor is responsible for providing filtration, settlement, or disposal facilities as required to comply with the requirements of Section 10-4,

“Erosion, Sediment, and Water Pollution Control.” Discharge of contaminated water to any storm drain or piping system that could convey such water to surface waters in are strictly prohibited.

## **10-6 NOISE CONTROL**

The Contractor shall comply with all Federal, State, and local noise control and noise level rules, regulations, and ordinances that apply to the Work. The Special Provisions may contain specific or additional requirements. Internal combustion engines used for any purpose on the Work must be equipped with a muffler recommended by the manufacturer.

## **10-7 CONTAMINATED AND HAZARDOUS MATERIALS OR ENVIRONMENTS**

### ***10-7.01 Contaminated or Hazardous Materials***

The Contractor shall comply with all Federal, State and local rules, regulations, ordinances, and statutes that apply to the handling, storage, and disposal of contaminated and hazardous materials.

### ***10-7.02 Hazardous Environments***

Existing sewers and appurtenances exposed to sewage and industrial wastes are considered contaminated with disease-causing organisms. The Contractor shall advise all personnel (including Subcontractor personnel) in contact with contaminated facilities, debris, wastewater, or similar items of the necessary precautions to avoid disease. It is the Contractor's responsibility to urge all personnel to observe a strict regimen of proper hygienic precautions, including any inoculations recommended by the local public health officer.

## **10-8 USE OF EXPLOSIVES**

The Contractor shall not use explosives on the Work unless the Owner grants permission in writing or the use of explosives is specified in the Contract Documents, and then only under such conditions as the Owner prescribes.

## **10-9 SANITARY REGULATIONS**

The Contractor shall comply with all Federal, State and local rules, regulations, ordinances, and statutes with respect to sanitation. The Contractor shall obey and enforce such sanitary requirements, and shall take precautions against contagious or infectious diseases.

Sanitary conveniences for the use of the workers shall be obscured from the public and constructed or installed and maintained by the Contractor. The Contractor shall strictly enforce use of such facilities.

## **10-10 CONFINED SPACES**

The Contractor shall comply with all confined space requirements of Connecticut Department of Labor Occupational Safety and Health Standards (Conn-OSHA).

Contractor shall provide all monitoring and safety equipment necessary to perform pre-entry checks of confined spaces. The Contractor shall also provide all monitoring, safety, and communications equipment required for confined space operations.

Existing sewers and storm drainpipes shall be treated as permit-required confined spaces unless it has been proven, through appropriate testing, that no hazards exist or are expected to develop.

## SECTION 11 PRECONSTRUCTION PHOTOGRAPHS AND RECORD DRAWINGS

### 11-1 PRECONSTRUCTION PHOTOGRAPHS

Preconstruction photographs shall be taken by the Contractor at one-hundred (100) foot intervals along the route of the Work before any construction begins. Photographs shall be in digital JPEG format with a resolution of at least 2288x1712 pixels.

Each photograph shall include a sign showing the date, name of the Project, lateral or street, and applicable station designation. The sign shall not block the important areas of the view and shall be legible in a three and one-half inch by five inch (3-1/2" x 5") print. Each photograph shall be taken from a point between four (4) feet and eight (8) feet above the ground. All prints shall show good details in both shadow and sunlit areas.

The views in preconstruction photographs shall include the entire construction zone and, in particular, show the interface between the right-of-way and construction zone, and abutting property features such as, but not limited to, condition of existing streets, sidewalks, driveways, fences, landscaping, buildings abutting work site, and existing surface utility facilities on and close to the Work.

All essential features of the project area shall be shown accurately. The Owner may order additional photographs showing additional features or orientations, if the Owner determines that all essential features are not accurately or adequately shown.

A sample of twenty-four (24) photographs shall be submitted to the Owner for approval before proceeding with the remaining photographs. All photographs which do not conform to these Specifications, as determined by the Owner, shall be retaken.

The Contractor shall submit to the Owner a CD or DVD containing the photos and a photo log of in either MS Word or Excel. The JPEG file names shall be named such that the location or subject of the photo can be easily determined. The log shall include JPEG filenames, date of photo, general location or station, and a brief description of photo subject. The CD or DVD shall be labeled with Contract and Contractor's name.

A video tape of the jobsite and entire route of work in a VHS format shall also be submitted. The timing, content and quality requirements for the photographs shall apply to the video tape.

### 11-2 RECORD DRAWINGS

Unless otherwise specified in the Special Provisions, the Contractor shall comply with the following requirements regarding record drawings.

The Contractor shall maintain a neat and accurately marked set of Record Drawings, which shall be provided to the Owner for review and approval prior to final acceptance of the Work. The Record Drawings shall represent the Work as constructed and document changes to the Work shown on the Project Plans, and shall show the actual as-constructed conditions of installed or modified systems, equipment, and material.

Record Drawings shall be produced by marking a full size copy of the Project Plans as follows:

**Red** – Additions including notes and dimensions.

**Green** – Deletions (by hash marks or appropriate lines through the deletion.)

**Graphite (gray)** – General comments and notes used by Contractor or Owner and not required on the as-built.

**Yellow** – Work completed as shown and used by Owner in field review of the as-built, during the submittal phase.

**Blue** – Owner verification and notes required to be added and noted by Owner in review of the as-built, during submittal phase.

The Record Drawings shall show, by field measured dimensions, the exact locations of all underground work, including all destroyed wells, piping and components, and the final elevations and locations of all improvements constructed, modified or adjusted.

Record Drawings shall be available for inspection by the Owner at all times and shall be updated at least weekly with all Field Instructions and other written directives, Contract Change Orders, and Contract adjustments shown thereon and initialed by the Owner. Progress payments or portions thereof may be withheld if Record Drawings are not kept up to date.

Unless otherwise specified in the Special Provisions, the Contractor shall submit two (2) sets of Record Drawings to the Owner at the pre-final inspection. These Record Drawings shall include certification by the Contractor that the Record Drawings are a true representation of the Work as actually constructed. The Work will not be formally accepted until the Record Drawings are provided to and approved by the Owner. Final payment or a portion thereof may be withheld if final Record Drawings are not provided.

## **SECTION 12 CONSTRUCTION AREA TRAFFIC CONTROL**

### **12-1 GENERAL**

Construction area traffic controls and devices shall conform to the requirements in the following Sections of these Specifications: Section 6-11, “General Safety Requirements”; Section 6-12, “Public Convenience and Safety”; Section 6-13, “Public Safety and Traffic Control”; Section 6-14, “Traffic Control Plans (TCP)”; and this Section (Section 12). All traffic controls and devices shall meet the requirements of the Connecticut Department of Transportation.

All traffic control devices including, but not limited to, traffic cones or portable delineators, telescoping flag trees, arrow boards, barricades, and signs shall be placed before beginning work and shall be removed from the right-of-way at the end of each day or shift, or, for long-term closures, when no longer needed, and shall be placed so as to not obstruct bicycle lanes and pedestrian facilities. All traffic control devices left in the right-of-way by the Contractor are subject to removal by the Owner. The Contractor shall be required to pay any costs incurred by the Owner associated with the removal of these devices.

No equipment shall be parked within any traffic lanes, medians, or within the public right-of-way at any time of day or night, including holidays and weekends, without an approved lane or road closure. The Contractor shall notify the Owner a minimum of five (5) Working Days in advance of any lane closure and twenty (20) Working Days in advance of any road closure. Attention is directed to Sections 6 and 7 of these Specifications for additional information.

# Attachment D – Special Provisions

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SP-11-2	RECORD DRAWINGS



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## **SPECIAL PROVISIONS**

### **SP-2-0 LOCATION OF WORK**

The project site is located on the east bank of the Connecticut River in East Hartford, Connecticut adjacent to 211 East River Drive.

### **SP-2-3 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK**

Before submitting his Bid, the Contractor shall visit the site and become thoroughly familiar with all existing conditions under which work will be installed. This Contract includes all modifications of existing systems required for the installation of new equipment. This Contract includes all necessary offsets, transitions and modifications required to install all new equipment in existing spaces. All new and existing equipment and systems shall be fully operational under this Contract before the job is considered complete. The Contractors shall be held responsible for any assumptions he makes, any omissions or errors he makes as a result of his failure to become fully familiar with the existing conditions at the site and the Contract Documents.

### **SP-2-4 SUBSURFACE CONDITIONS**

The Owner shall make available to the Contractor for review the following geotechnical reports:

- GEI Consultants (2009), Geotechnical Data Report, August
- GEI Consultants (2013), Supplemental Geotechnical and Environmental Data, March

It is the Contractor's responsibility to become acquainted and satisfied as to the character, quality, and quantity of surface and subsurface materials to be encountered by inspecting the site, by evaluating information derived from exploratory work that may have been accomplished by others or included in these Contract Documents, and by performing any additional subsurface explorations the Contractor deems necessary. Any failure to become acquainted with all the available information will not relieve the Contractor from responsibility for properly estimating the difficulty or cost of successfully performing the work.

### **SP-3-8 INSURANCE Article SP 3-8 is deleted under Addendum No. 3**

This section shall be amended to include the following:

An additional insured endorsement must be submitted with the insurance certificate. The following entities shall be named as an additional insured:

- The Town of East Hartford, CT
- Riverfront Recapture
- The Metropolitan District Commission

### **SP-4-11.01 RIGHT-OF-WAY AND TEMPORARY CONSTRUCTION EASEMENTS**

Nothing contained in the Contract shall be interpreted as giving the Contractor exclusive occupancy of the work areas shown on the project drawings. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the Owner to the Contractor so desiring, to the extent, amount, and in the manner and at the times permitted. No such decision as to the method or time of conducting the work or the use of territory shall be made the basis of any claim for delay or damage.

The Contractor shall not work outside of the work limits shown in the construction documents without first obtaining written approval from the appropriate landowner(s). Such written permission shall be approved by the Owner prior to the Contractor accessing the property outside the work limits.

All costs associated with access to areas outside the designated work limits, including any compensation to the landowner(s), property restoration, environmental protection, and compliance with all applicable permits, shall be the responsibility of the Contractor.

#### **SP-4-11.02 CONTRACTOR'S USE OF PREMISES**

The Owner will grant access to land at the locations shown on the Drawings for the Contractor's use in staging construction and for temporary facilities in accordance with Section 7 of the General Provisions. The Contractor shall not store materials or equipment within Town or State right-of-way. Evidence of agreement(s) with private property owner(s) for the storage of equipment and materials must be provided to the Town. The Contractor may be allowed to store materials or equipment on Town parcels with written permission from the Engineer. Terms and conditions of the use of Town parcels will be negotiated before the start of work. All construction equipment, temporary facilities, staging, materials handling and storage, and temporary rerouting of pedestrians shall be confined to the limits of work indicated on the Drawings and street rights-of-way, as permitted by the Owner. Premises used shall be maintained and cleaned up in accordance with Section 7 of the General Provisions. Contractor shall restore premises used to preconstruction condition or better before substantial completion of Work is granted.

Access to all businesses and residences within the project limits must be maintained at all times. The Contractor shall coordinate his/her work, provide safe and ready means of ingress and egress to all stores and shops, public and private professional offices, and any other businesses or residences in the project area, both day and night, for the duration of the project. As required by the Engineer, the Contractor shall install and maintain temporary ramps at driveways. If there is a lump sum bid price for the Maintenance and Protection of Traffic, the cost of installing, maintaining, and removing the temporary ramps shall be included in the lump sum price bid for Maintenance and Protection of Traffic. Otherwise, this Work will be performed without additional compensation.

#### **SP-5-2 ATTENTION AND COOPERATION OF CONTRACTOR**

The Contractor shall accommodate routine and emergency maintenance operations performed by the Town (i.e. refuse pickup, leaf collection, snow plowing, etc.) within the Work area.

#### **SP-5-7 EQUIPMENT AND MATERIALS FURNISHED BY THE CONTRACTOR**

The Contractor shall furnish all equipment, materials, tools, supplies and manufactured articles of all kinds whatsoever necessary or required for the completion of the work in accordance with the Contract, except for possible permission to utilize any acceptable materials that may be found on the site, and as may be herein specified. All tools and equipment that are the Contractor's property shall be clearly marked in a distinguishing manner such as paint, etc. to ease inspection when they are removed from the site. The Contractor shall take the necessary precautions to

secure tools and equipment from theft while on site. The Owner assumes no responsibility for lost, vandalized, or stolen equipment belonging to the Contractor, their subcontractors, or their employees.

**SP-5-9.01 OWNER / ENGINEER FURNISHED SURVEYS**

The Owner will show, to the best of its knowledge, the location and character of survey monuments within the construction area on the Drawings. Lost, broken or stolen monuments shall be replaced by the Contractor at the Contractor's expense, except where removal of the monuments is part of required project excavations. It is the Contractor's responsibility to confirm the accuracy of the survey monuments.

**SP-5-12 INSPECTION**

The Contractor shall always notify the Engineer of its intention to perform work on the Project, including notice of the particular work it intends to perform, at least 24 hours before the Contractor commences that work. The Engineering Division can be reached between 8:30 a.m. and 4:30 p.m. at (860) 291-7380.

In instances when it shall be necessary to utilize Department inspectors during other than normal Department working hours, the Contractor shall make payment to the Town of East Hartford for such use. Normal working hours for the Department are from 8:30 a.m. to 4:30 p.m. daily, Monday through Friday, excluding holidays. Payment will be made in accordance with the following:

- a. For each Department employee utilized by the Contractor, the Town shall receive the standard overtime rate paid to the employee by the Department.
- b. In the event a Department employee is called out after the end of normal working hours, minimum payment to the Town by the Contractor for each Department employee utilized shall be at the standard overtime rate for a period no less than four (4) hours. Payment for overtime that is a continuation of the normal working day shall be at the standard overtime rate for the actual hours worked. There will be no charge for use of Department personnel during normal working hours for services provided by the Department.

**SP-5-21 TEMPORARY SUSPENSION OR DELAY OF WORK**

If the time specified for completion of the Project, with time extensions, is due to expire after November 27<sup>TH</sup>, then contract time will not be charged during a winter shutdown period between November 27<sup>H</sup> and April 1<sup>ST</sup>. The Contractor will not be allowed to work during the winter shutdown (other than maintaining the project area) without the approval of the Engineer. Prior to a winter shutdown, the Contractor and the Town shall meet to discuss the Contractor's procedures for preparing the Work area for a winter shutdown. No additional compensation will be paid for demobilization, remobilization, or other costs associated with a winter shut down but these costs shall be included in the general cost of the Work.

However, if the time specified for completion of the Project, with time extensions, is due to expire before November 27<sup>TH</sup> and the Project is not completed before November 27<sup>TH</sup>, then the time charged to the Contractor will continue to run through the winter shutdown period.

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**SP-6-1.01 HOURS OF LABOR**

Unless specifically authorized by the Owner, the Work must be conducted during daylight hours on Monday through Friday between 7:00 a.m. and 5:00 p.m. and shall be coordinated with the Construction Manager. No work is to be done on Town of East Hartford holidays, Saturdays, Sunday or outside of the work hours described above, without prior written permission of the Owner.

**SP-6-1.02 WORKING AND NON-WORKING DAYS**

The following days are included as non-working days due to activities in and around Great River Park:

- Monday, May 25, 2020 – Memorial Day
- Friday and Saturday, July 3 and 4, 2020 – Independence Day
- Thursday to Saturday, July 9 to 11, 2020 – Riverfront Food Truck Festival
- Saturday, August 1, 2020 – Taste of the Caribbean & Jerk Festival
- Saturday, August 15, 2020 – Riverfront Dragon Boat and Asian Festival
- Monday, September 7, 2020 – Labor Day
- Saturday, September 12, 2020 – Heartbeat Music Festival
- Saturday and Sunday, October 3 and 4, 2020 – Head of the Riverfront
- Saturday, October 10, 2019 – Hartford Marathon
- Wednesday, November 11, 2020 – Veterans Day
- Thursday and Friday, November 26 and 27, 2020 – Thanksgiving Day and Friday
- Additional days beyond November 2020 will included, if required

**SP-6-2.01 CONTRACTOR'S PERFORMANCE**

Any claims received by the Owner for damage to private property as a result of the Contractor's operations, or lack of protective measures to prevent such damage, will be forwarded directly to the Contractor for resolution. For each claim, the Contractor shall provide to the Town evidence that the claim has been resolved.

**SP-6-10 PERMITS AND LICENSES**

The CT DEEP Dam Construction Permit has been obtained and is included in the Contract Documents in Attachment F. USACE Authorizations are not yet approved. The USACE has been reviewing progress submittals through the design process and is currently performing final review on the latest bid documents based on those previous reviews. The contractor is hereby notified that delays in receiving this authorization may result in delay of award or cancellation of this contract. There will be no compensation to the contractor in the event that the award of the contract is either delayed or cancelled.

A portion of the work area is located within Great River Park which is open to the public. The portion of the park between the Limits of Work Area identified on the drawings will be closed to the public during the performance of the work. Permits and licenses obtained by the Contractor prior to performing any Work and may include water and sewer permits (MDC), building

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permits, driveway and sidewalk permits, excavation permits, and Connecticut Department of Transportation Encroachment permits.

The Contractor will give all permit notices and comply with all laws, ordinances, rules and regulations applicable to the Work. If the Contractor observes that the Contract Drawings and Specifications are at variance therewith, he will give the Engineer prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate modification. If the Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, he will bear all costs arising there from.

For any Work within the Town right-of-way, on Town properties, or within the State highway right of way (for sidewalks only), the Contractor shall obtain a license and permit from the East Hartford Department of Public Works for the project. The license requires submission of a separate insurance certificate, a \$10,000 bond, and a hold harmless agreement. Licenses expire on December 31 of the year of issue. The Contractor is required to pay a \$35.00 license fee. Once the license has been obtained, the Contractor shall apply for a permit for this project. The \$50.00 permit fee will be waived for this project.

Prior to any construction involving or impacting facilities owned and/or operated by the Metropolitan District Commission (MDC), the Contractor must obtain all necessary permits pertinent to the work being performed.

Certain work including, but not limited to, retaining wall construction and electrical work, requires a building permit. The Contractor shall secure building permit(s) for such work at the Town of East Hartford Inspections and Permits Department. Unless otherwise noted in a "Notice to Contractor", the Town's portion of the permit fee will be waived. The Contractor will be required to pay the State of Connecticut portion of any building permit. Contact the Inspections and Permits office at 860-291-7345 for building permit information.

Some projects require special approval(s) from the Town of East Hartford Planning and Zoning Commission, the State of Connecticut Department of Environmental Protection (DEP), the United States Army Corps of Engineers or any other agency with jurisdictional rights. In most of these cases, separate plans have been approved and are on file. Any specific permit approval(s) by another agency or commission will be attached to the Contract Documents. If such permits are identified, then the approved permit plans are hereby made part of the Contract Documents and the Contractor represents that he/she is fully aware of all the requirements of the permit and his/her intention to comply with such requirements.

#### **SP-6-12.01 PUBLIC CONVENIENCE**

A portion of the work area is located within Great River Park which is open to the public. The portion of the park between the Limits of Work Area identified on the drawings will be closed to the public during the performance of the work.

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**SP-6-14.01 TRAFFIC PATTERN CHANGES**

A portion of the work area is located within Great River Park which is open to the public. The portion of the park between the Limits of Work Area identified on the drawings will be closed to the public during the performance of the work.

If the Contractor finds it necessary to close a portion of the road to vehicular traffic, then a Road Closure permit shall be obtained from the Engineer and the Chief of the East Hartford Police Department. The Contractor shall notify the Fire Department and any other concerned agencies of such road closing. Access shall be provided at all times to fire hydrants and precautions shall be taken to prevent freezing of any exposed or partially uncovered water lines.

**SP-6-20 PRESERVATION OF PROPERTY**

The Contractor shall be responsible for the protection and replacement of all survey markers, streetline monuments, and private property markers. Any survey markers, streetline monuments or private property markers disturbed or destroyed during construction will be replaced at the Contractor's own expense. Work must be performed by a Land Surveyor licensed in the State of Connecticut.

The Contractor shall protect his Work so as to prevent damage and/or vandalism to newly poured sidewalks and other concrete surfaces. Any newly poured sidewalks or ramps which are damaged or defaced shall be promptly repaired or replaced at the Contractor's expense. Determination to repair or replace will be at the sole discretion of the Engineer.

The Contractor will take precautionary measures to protect all public and private trees or shrubs remaining within or adjacent to the Project area. This also includes protection of root systems that may become damaged due to the excavation activities near or adjacent to vegetation designated to remain.

The Contractor shall be fully responsible for compensation, repair, or replacement of any damaged tree or shrub because of neglect by the Contractor or any of his/her assigned Subcontractors.

The Contractor's attention is called to the fact that there are underground traffic control facilities (e.g. loop detectors) at various intersections in the Town of East Hartford. Should these facilities become damaged during the course of the Work; the Contractor will be responsible for replacement of the equipment in accordance with the current Connecticut DOT installation standards. Splicing of the detector loops will not be permitted. Replacement of traffic control equipment will be at the Contractor's expense.

**SP-7-3 PROJECT COORDINATION MEETINGS**

Contractor shall attend weekly coordination meetings held by the Engineer to review Contractor's progress on the project and provide a forum to discuss and resolve various issues which may arise during the progress of the work. With reference to Section 4 of the General Provisions, requests for clarification of Contract Documents or other requests for information

regarding the progress of the work shall be submitted in writing to the Engineer on a suitable form provided by the Engineer.

**SP-7-7 FLOOD EMERGENCY**

In the event of a flood emergency requiring action by the jurisdictional flood control agencies prior to completion of the work, the Engineer shall have the right to suspend the work until the emergency is resolved. Such suspension includes the right of the Owner to take over the project area to conduct flood protection activities. The contractor may be required to suspend work, backfill open excavations, and remove equipment from the work zone as delineated in the approved flood contingency plan.

The Contractor shall backfill all open excavations on the landside toe of the levee or floodwall when the Connecticut River water level is above elevations specified in the flood contingency plan included within the CT DEEP Dam Construction Permit in Appendix “F”.

**SP-7-7.02 WINTER SHUTDOWN**

The winter shutdown period will be from December 1st through the following March 31st. No construction activities will be allowed onsite without written authorization by the OWNER.

**SP-7-11.02 UNAVOIDABLE DELAYS**

Additional construction days will be added to the contract time for every work day the Connecticut River water level is above El. 20 NGVD for at least 1 hour between 7 am and 5 pm, or other situations identified in the approved flood contingency plan. The Contractor will not receive any additional compensation for the delay other than the added contract time.

Water levels in the Connecticut River will be determined based on the USGS Gauge Station 01190070, Connecticut River at Hartford, CT. Water level information can be accessed at the following link:

<http://waterdata.usgs.gov/usa/nwis/uv?01190070>

**SP-7-14 START TIME AND TIME OF COMPLETION**

In general, the Contractor may start site work immediately following Notice to Proceed (NTP) and must complete the Work within the total Contract Time as listed below.

**Final Completion of Project .....129 Calendar Days**  
(Substantial Completion must be reached in 99 Calendar Days from start of Contract Time)

- Contract Time starts from NTP, and includes any non-working days as per Section SP-6-1.02 (i.e. weekends, holidays and park special activities).
- With the exception of site visits and administrative tasks, the Contractor may not begin construction until the NTP is issued and written authorization from the Owner or their representative is issued.
- If the contract time specified for final completion of the Project (including any approved time extensions) is due to expire on or before November 24 of a given year, but the Project has not been completed by that date; the contract time charged to the Contractor will continue through the winter shutdown period, unless specifically waived by the Town in writing.

**ADDENDUM NO. 2**

**SP-8-5 PROGRESS PAYMENT PROCEDURES**

The Contractor shall submit a list of claims, and their status, with each application for a progress payment.

**SP-8-10 LIQUIDATED DAMAGES FOR DELAY**

As set forth in Section 8 of the General Provisions, the liquidated damages for this contract shall be the sum of Two Thousand Dollars (\$2,000) per Calendar Day. This shall be applied to the total Contract Time specified in SP-07-14 above.

**SP-8-11 FINAL ESTIMATE AND PAYMENT**

The Town will not release final retainage for any project where there are any unresolved claims for private property damage, as described in the Supplemental Condition for Article 12.01.

**SP-9-7.03 TAXES**

Materials and equipment purchased for installation in this project will be exempt from the Connecticut Sales and Use Tax under the Connecticut Education, Welfare and Public Health Tax Act.

**SP-10-1 GENERAL DUST CONTROL**

Refer to Section 6 and Section 10 of the General Provisions. During the performance of the work, the Contractor shall assume all responsibility for dust control and shall furnish all labor, equipment, and means required and shall carry out proper and efficient measures wherever and as often as necessary to prevent the construction operations from producing dust in amounts harmful to persons, damaging to property, or causing a nuisance to roadway travel or persons living nearby or occupying buildings in the vicinity of the work. Dust control will be strictly enforced with particular emphasis on work areas adjacent to residential properties.

Responsibility for any injury to persons or damage to property, crops, or orchards from dust caused by the Contractor's operations shall be borne by the Contractor as provided in Section 6 of the General Provisions. The cost of water for dust control shall be included in prices bid for other items of work and no additional compensation will be made therefore. The loads of vehicles or equipment transporting earthen materials or other materials to and from off-site locations shall be covered with tarpaulins.

The curtailment of the construction activities as a result of the inadequate dust control measures or the lack of using tarpaulins will not be considered an unavoidable delay.

**SP-10-7.01 CONTAMINATED OR HAZARDOUS MATERIALS**

The Contractor shall comply with all Federal, State and local rules, regulations, ordinances, and statutes that apply to the handling, storage, and disposal of regulated and hazardous materials.

Hazardous waste has not been identified within the project limits. The Contractor shall immediately notify the CONSTRUCTION MANAGER if such materials are encountered and discontinue work in that area until the CONSTRUCTION MANAGER provides notification to resume work.



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The Contractor shall be aware that regulated soils have been identified within the limits of excavation in the onshore areas of the site. Available data is provided in the following report:

- GEI Consultants (2013), Supplemental Geotechnical and Environmental Data, March 26, 2013

**SP-10-10      CONFINED SPACES**

Several of the work areas in confined spaces. It is the Contractor's responsibility to identify the confined spaces and to follow all Conn-OSHA regulations.

**SP-11-1      PRECONSTRUCTION PHOTOGRAPHS**

In addition to the requirements of Section 11-1 of the General Conditions, Preconstruction photographs shall also be taken by the Contractor of the following

- Contractor parking, layout, material and equipment storage areas
- Parking lot, entrances, sidewalks, roadway, curb, drainage structures within the work zone
- Riverpoint Condominium Floodwall
- Riverpoint Condominium Building exterior
- Piktin Street Pump Station building exterior
- Founders Bridge east abutment
- Site lighting structures and foundations.
- Stairs and railings on the riverside of the dike adjacent to Founders Bridge

**SP-11-2      RECORD DRAWINGS**

In addition to the requirements of Section 11-2 of the General Conditions the following additional items apply:

- The Contractor shall submit the field marked Record Drawings with their request for final inspection.
- The Engineer will incorporate the Contractor's Record Drawings into a draft As-Built Drawing set.
- The Contractor shall work with the Engineer to resolve any discrepancies and assist in preparing the As-Built drawings.
- The Contractor shall review the draft As-Built drawings. Once the As-Built drawings are acceptable, the Contractor shall add his signature to the following statement: "I certify that this As-Built drawing is a true representation of the Work actually constructed."

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01 57 13	Temporary Erosion & Sediment Control
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02 61 15	Handling of Regulated Soil
02 61 50	Transportation and Disposal of Regulated Soil

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03 05 00	Basic Concrete Materials
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**DIVISION 31 – EARTHWORK**

31 10 00	Site Clearing
31 23 16	Excavation
31 23 23	Fill and Backfill
31 37 00	Riprap and Riprap Bedding

**DIVISION 32 – EXTERIOR IMPROVEMENTS**

32 12 00	Bituminous Concrete Pavement
32 16 13.43	Granite Curbing
32 16 23	Concrete Sidewalks
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33 01 33	Abandonment of Existing Utilities
33 05 13	Manholes and Catch Basins
33 46 16	Subdrainage

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**SECTION 01 11 00**  
**SUMMARY OF THE WORK**

**PART 1 GENERAL**

1.1 GENERAL

- A. The work to be done under this Contract and in accordance with these Contract Documents consists of performing all work, supplying all labor, and furnishing and installing all materials and incidentals necessary or convenient for completion of the construction of the site and carrying out all duties and obligations imposed upon the CONTRACTOR by the Contract Documents.
- B. Work includes replacing the existing toe drain along the landside toe of the levee between about Sta. 134+50 and 162+00. Work includes removal of the existing pipe and replacing with a new slotted PVC pipe with a graded filter. The main features of work include, but are not limited to, the following items:
1. Field engineering surveying and layout.
  2. Site preparation, clearing and grubbing, topsoil stripping, stockpiling and spreading.
  3. Selective demolition of sidewalks, curb, pavement.
  4. General site earthwork including excavation, stockpiling, disposal, backfilling and grading.
  5. Removing existing toe drain pipe and replacing pipe with new slotted PVC pipe, graded aggregate filters, and manholes.
  6. Abandoning select sections of the existing toe drain pipe by grout filling the pipe.
  7. Reconstructing sidewalks, bituminous pavement and curbs, and pavement markings.
  8. Site Restoration and seeding.
  9. Miscellaneous Construction: To include construction fencing, erosion and sediment control devices; slope protection, site maintenance.

1.2 LOCATION OF SITE

- A. Work site is located primarily within Town of East Hartford property along the eastern bank of the Connecticut River in East Hartford, Connecticut.
- B. Special regulations apply to work in the floodplain of the river, see Section 01575: PROJECT PERMITS AND ENVIRONMENTAL CONTROLS, for detailed requirements.

1.3 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

- A. Comply with codes and standards applicable to each type of work, and as listed in individual sections.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

**END OF SECTION**

**SECTION 01 22 00  
MEASUREMENT AND PAYMENT**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Measurement and payment criteria applicable to portions of the Work performed under a unit price payment method.
- B. Measurement and payment criteria applicable to portions of the Work performed under a lump sum payment method.

1.2 SUBMITTALS

- A. Administrative Submittals
  - 1. Schedule of Values, 14 days prior to first progress payment.
  - 2. Monthly Payment Application.
  - 3. Final Payment Application.

1.3 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the Bid Schedule are approximate and are given only for bidding and contract purposes only. OWNER does not either expressly or by implication warrant that the actual quantities will correspond to the estimated quantities. OWNER reserves the right to increase or decrease the amount of work performed under unit price items, or to omit work altogether. No adjustments in contract unit prices will be made except as provided in the General Conditions. Quantities and measurements supplied or placed in the Work and verified by the OWNER determine payment.

1.4 MEASUREMENT OF QUANTITIES

- A. Measurement Devices:
  - 1. Weigh Scales: Inspected, tested and certified by the applicable State Weights and Measures department within the past year.
  - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
- B. Measurement by Weight:
  - 1. Material paid for by weight shall be weighed on sealed scales certified and regularly inspected by the applicable department of weights and measures. Contractor shall provide weight tickets to Owner's Representative at the point of delivery of the material.
  - 2. Vehicles used to haul material being paid for by weight shall be weighed empty daily or at such additional times as require by the ENGINEER. Contractor shall provide empty vehicle weight ticket to Owner's Representative prior to using vehicle to provide delivery or at first delivery.
  - 3. Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights.
  - 4. Welded assemblies will be measured by handbook or scale weight.

- C. Measurement by Volume – Measured by cubic dimension using mean length, width, and height or thickness. Unless specified otherwise, volumes shall be computed using the average-end-area method with cross sections surveyed at maximum 100-foot spacing. On curved alignments, volume computations shall utilize the length between the centroid of each area at adjacent cross sections rather than the nominal cross section spacing along the alignment.
  - 1. Measurement will be made from the limit of the neat lines shown on the Drawings or to the approved limits of excavation.
- D. Measurement by Area – Measured by square dimensions using mean length and depth, width, or radius as applicable.
- E. Linear Measurements.
  - 1. Measured by linear dimension at the item centerline or mean chord.
  - 2. Based on a horizontal projection of the actual length except where specified as a vertical measurement.
- F. Perform surveys, field measurement and calculations to measure installed quantities for all Unit Price pay items in conformance with the attached Listing of Pay Items.
- G. Notify OWNER in advance, and obtain OWNER witness of daily field measurement for work performed under Unit Price Pay Items.
- H. Include backup data and calculations with application for payment.
- I. Measurement by the CONTRACTOR is subject to review, verification, and approval by the OWNER.
- J. Round to the nearest whole unit for pay quantities.

## 1.5 PAY ITEMS

- A. Payment for Unit Price Items
  - 1. Unit Price Work:
    - a. Reflect unit price quantity and price breakdown from the Schedule of Contract Items and Prices in the Bid Proposal.
    - b. Estimated quantities shown on the Bid Proposal are approximate and are given only for a comparison of bids. OWNER does not either expressly or by implication warrant that the actual quantities will correspond to the estimated quantities. OWNER reserves the right to increase or decrease the amount of work performed under unit price items, or to omit work altogether. No adjustments in contract unit prices will be made except as provided in the General Conditions.
  - 2. Final payment for Work governed by unit prices will be made based on the actual measurements and quantities accepted by the OWNER, multiplied by the unit price for Work that is incorporated in or made necessary by the Work.
- B. Payment for Lump Sum Items
  - 1. Payment for lump sum Work shall be made in accordance with the accepted schedule of values.
  - 2. An unbalanced or front-end loaded schedule will not be acceptable.

3. Payment for lump sum Work covers all Work required to complete the work as shown or specified that is not covered under the unit price items, and shall be based on the breakdown included in the approved Schedule of Values.
4. Summation of the complete Schedule of Values shall equal the Contract Price for the lump sum item.

C. Base Bid Pay Item Breakdown

ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
<b>1</b>	<b>Initial Items</b>			
1.01	Site Mobilization	Lump Sum	Work shall include, but not be limited to the acquisition of all required permits and approvals; preparation of Quality Control Plan, Health and Safety Plan, and all other preconstruction submittals; mobilization of all personnel, equipment, and materials; preparation of surveys and videos for existing access roads and facilities; installation of all temporary facilities; temporary utility connections, parking, sanitary facilities and establishment of staging/lay down areas, equipment servicing and maintenance facilities, access roads, safety items, etc.	Payment based on 100% completion of the work, or a mutually agreed percentage for progress payment defined in the approved Schedule of Values.
<b>2</b>	<b>Sediment and Erosion Control</b>			
2.01	Silt Fence	Linear Foot	Work includes, but is not limited to providing all labor, materials, layout and equipment required to furnish and install silt fence, haybales, or hard surface silt barrier as shown on the Drawings or as directed by the Engineer.	LINEAR FOOT installed and accepted as measured to the lines shown on the drawings or as directed by the Engineer.  Payment based on 100% completion of the work.
2.02	Anti-Tracking Pad	Each	Work shall include, but not be limited to providing all labor, materials, layout and equipment required to furnish and install construction entrance including anti-tracking pad and associated geotextile and stone as shown on the Drawings or as directed by the Engineer.	Measured as EACH completed and accepted anti-tracking pad.  Payment based on 100% completion of the work.



ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
2.03	Catch Basin Erosion Protection	Each	Work shall include, but not be limited to providing all labor, materials, layout and equipment required to furnish and install erosion protection at catch basins as shown on the Drawings or as directed by the Engineer.	Measured as EACH completed and accepted anti-tracking pad.  Payment based on 100% completion of the work.
2.04	Temporary Fencing	Linear Foot	Work includes, but is not limited to providing all labor, materials, layout and equipment required to furnish and install temporary construction fencing as shown on the Drawings or as directed by the Engineer.	LINEAR FOOT installed and accepted as measured to the lines shown on the drawings or as directed by the Engineer.  Payment based on 100% completion of the work.
2.05	Traffic Control/Signage	Lump Sum	Work includes, but is not limited to providing all labor, materials, layout and equipment required to furnish and install and maintain traffic control devices and signs required to complete the work.	Payment based on 100% completion of the work, or a mutually agreed percentage for progress payment defined in the approved Schedule of Values.
2.06	Traffic Control - Persons	Direct Cost Allowance	Work includes, but is not limited to providing Traffic Control Persons as defined in Section 01 55 26 - Traffic Control of the Specifications.	All costs in connection with Police Services for traffic control will be paid for by the Contractor with reimbursement by the Town of East Hartford as a direct cost with no mark-up. Contractor shall provide proof of payment for all Police Services prior to requesting reimbursement of these costs from the Town.  Reimbursement of costs in connection with Uniformed Flaggers shall be paid for as detailed in Article 9.70.05 of the CONNDOT Standard Specifications. A markup of 5% is permitted.

ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
3	<b>Site Improvements</b>			
3.01	Site Preparation and Maintenance	Lump Sum	<p>Work includes, but is not limited to providing all labor, materials, layout and equipment required to complete clearing, grubbing, selective trimming and disposal of relevant materials within the limits of the work area. Work also includes improvement and maintenance of haul roads; preparation of lay down and staging areas required to complete the work as defined on the construction drawings, and in any other areas which require clearing and grubbing.</p> <p>Work also includes maintenance of work area during performance of other work. Maintenance includes but is not limited to: mowing of grass; maintaining and replacing silt fence as directed; maintaining of silt fence and removal of accumulated sediment; maintaining and replacing construction entrances as directed; dust control; maintaining traffic control devices; maintaining haul roads; other maintenance items as directed by the Engineer.</p>	<p>Payment based on 100% completion of the work, or a mutually agreed percentage for progress payment defined in the approved Schedule of Values.</p>
3.02	Demolition of Pavement	Square Yard	<p>Work includes, but is not limited to providing all labor, materials, layout and equipment required for the removal of existing pavement and other buried material. Incidental to this item is pavement saw cutting; excavation; protection of existing utilities and disposal of all materials.</p>	<p>SQUARE YARD as measured to the lines shown on the Drawings or as directed by the Engineer.</p> <p>Payment based on 100% completion of the work.</p>

ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
3.03	Demolition of Curb	Linear Foot	Work includes, but is not limited to providing all labor, materials, layout and equipment required for the removal of granite and bituminous concrete curbing and other buried material. Incidental to this item is saw cutting, excavation, stockpiling of granite curb protection of existing utilities and all disposal.	LINEAR FOOT as measured to the lines shown on the Drawings or as directed by the Engineer.  Payment based on 100% completion of the work.
3.04	Demolition of Sidewalks	Square Yard	Work includes, but is not limited to providing all labor, materials, layout and equipment required for the demolition and removal of concrete sidewalk, driveway aprons, pedestrian walkways and other buried material. Incidental to this item is saw cutting, excavation, protection of existing utilities, protection of adjacent sidewalks and railings, and disposal. Also includes selectively removing portions of hand rail along pedestrian access ramp and storing the railing for reuse.	SQUARE YARD as measured to the lines shown on the Drawings or as directed by the Engineer.  Payment based on 100% completion of the work.
3.05	Excavation	Bank Cubic Yard	Work includes, but is not limited to providing all labor, materials, layout and equipment required for the excavation, handling, segregation and stockpiling of all soil and other buried material for all required project excavations. Includes excavation and removal of buried pipes and manholes.	BANK CUBIC YARD as measured to the lines shown on the Drawings or as directed by the Engineer.  Payment based on 100% completion of the work.
3.06	Backfill	Fill Cubic Yard	Work includes, but is not limited to providing all labor, materials, and equipment required to place on-site soils as backfill in excavation areas and at other locations shown on the Drawings. Item includes preparing the subgrade; placing, and compacting the fill, testing; and grading of the surface.	FILL CUBIC YARD as measured to the lines shown on the Drawings or as directed by the Engineer.  Payment based on 100% completion of the work.

ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
3.07	Imported Ordinary Fill	Fill Cubic Yard	Work includes, but is not limited to providing all labor, materials, and equipment required to furnish and install imported Ordinary Fill in excavation areas and at other locations shown on the Drawings. Item includes preparing the subgrade; furnishing, placing, and compacting the fill, testing; and grading of the surface.	FILL CUBIC YARD as measured to the lines shown on the Drawings or as directed by the Engineer.  Payment based on 100% completion of the work.
3.08	Imported Pervious Fill	Fill Cubic Yard	Work includes, but is not limited to providing all labor, materials, and equipment required to furnish and install imported Pervious Fill in excavation areas and at other locations shown on the Drawings. Item includes preparing the subgrade; furnishing, placing, and compacting the fill, testing; and grading of the surface.	FILL CUBIC YARD as measured to the lines shown on the Drawings or as directed by the Engineer.  Payment based on 100% completion of the work.
3.09	Filter Sand	Fill Cubic Yard	Work includes, but is not limited to providing all labor, materials, and equipment required to furnish and place Filter Sand backfill around the toe drain as shown on the Drawings and at other locations on the project. Item includes preparing the subgrade; furnishing, placing and compacting the aggregate fill; and final grading of the surface.	FILL CUBIC YARD as measured to the lines shown on the Drawings or as directed by the Engineer.  Payment based on 100% completion of the work.
3.10	Drain Aggregate	Fill Cubic Yard	Work includes, but is not limited to providing all labor, materials, and equipment required to furnish and place Drain Aggregate backfill around the toe drain as shown on the Drawings and at other locations on the project. Item includes preparing the subgrade; furnishing, placing and compacting the aggregate fill; and final grading of the surface.	Fill Cubic Yard as measured to the lines shown on the Drawings or as directed by the Engineer.  Payment based on 100% completion of the work.

ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
3.11	12" Diam. Slotted PVC Toe Drain Pipe	Linear Foot	Work includes, but is not limited to providing all labor, materials, layout and equipment required to furnish and install 12" diameter slotted PVC drainage pipe as shown on the Drawings or as directed by the Engineer. Incidental to this item is all pipe connections, fittings, couplings, manhole connections.	LINEAR FOOT installed and accepted as measured to the lines shown on the drawings or as directed by the Engineer.  Payment based on 100% completion of the work.
3.12	21" Diam. Slotted PVC Toe Drain Pipe	Linear Foot	Work includes, but is not limited to providing all labor, materials, layout and equipment required to furnish and install 21" diameter slotted PVC drainage pipe as shown on the Drawings or as directed by the Engineer. Incidental to this item is all pipe connections, fittings, couplings, manhole connections.	LINEAR FOOT installed and accepted as measured to the lines shown on the drawings or as directed by the Engineer.  Payment based on 100% completion of the work.
3.13	15" Diam. PVC Solid Drain Pipe	Linear Foot	Work includes, but is not limited to providing all labor, materials, layout and equipment required to furnish and install 15" diameter solid PVC drainage pipe as shown on the Drawings or as directed by the Engineer. Incidental to this item is all pipe connections, fittings, couplings, manhole connections, pipe bedding.	LINEAR FOOT installed and accepted as measured to the lines shown on the drawings or as directed by the Engineer.  Payment based on 100% completion of the work.
3.14	Manhole	Each	Work includes, but is not limited to providing all labor, materials, layout, and equipment required to install new manholes as shown on the Drawings. Incidental to this work is any excavation, bedding stone, pouring and forming of concrete, iron castings, concrete grade rings, gaskets, backfill and compaction, frames, covers and tops.	Measured as EACH completed and accepted manhole.  Payment based on 100% completion of the work.

ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
3.15	Manhole/Catch Basin Adjustment	Each	Work includes, but is not limited to providing all labor, materials, layout, and equipment required to adjust the existing manholes to match final grade. Work includes excavation to locate structure, backfilling, extension collars, bricks and mortar, and other items and work required to adjust the structure.	Measured as EACH completed and accepted manhole / catch basin adjustment.  Payment based on 100% completion of the work.
3.16	Subbase	Ton	Work includes, but is not limited to providing all labor, materials, layout and equipment required for furnishing and transporting subbase as shown on the Drawings or directed by the Engineer. Item includes preparing the subgrade; furnishing, placing, and compacting, testing; and grading of the surface.	Measure per TON based on weight tickets from an approved weight scale.  Payment based on 100% completion of the work. Item will be accepted once it is incorporated into the work, not when it is stockpiled on site.
3.17	Bituminous Concrete	Ton	Work shall include, but not be limited to, providing all labor, materials, and equipment required to construct bituminous concrete paving as shown on the Drawings or directed by the Engineer. Incidental to this item are surface preparation, final grading, compaction and testing.	Measure per TON based on weight tickets from an approved weight scale.  Payment based on 100% completion of the work. Item will be accepted once it is incorporated into the work, not when it is stockpiled on site.
3.18	Concrete Sidewalk	Square Foot	Work includes, but is not limited to providing all labor, materials, layout, and equipment required to install concrete sidewalks, driveway aprons and pedestrian walkways as shown on the Drawings or as directed by the Engineer. Work includes subgrade preparation, furnishing and placing reinforcement, and all necessary formwork, concrete, surface finishing and curing.  Work also includes restoring pedestrian walkway hand railing to match existing hand rail.	Measure per SQUARE FOOT as measured to the lines shown on the Drawings or as directed by the Engineer.  Payment based on 100% completion of the work.

ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
3.19	Concrete Dumpster Pad	Lump Sum	<p>Work includes, but is not limited to providing all labor, materials, layout, and equipment required to install concrete dumpster pads as shown on the Drawings or as directed by the Engineer.</p> <p>Work includes subgrade preparation, furnishing and placing reinforcement, and all necessary formwork, concrete, surface finishing and curing.</p>	<p>Payment based on 100% completion of the work, or a mutually agreed percentage for progress payment defined in the approved Schedule of Values</p>
3.20	Granite Curb	Linear Foot	<p>Work includes, but is not limited to providing all labor, materials, layout, and equipment required to reuse existing curb or furnish and install new granite curb as shown on the Drawings. Work includes excavation, subgrade preparation, backfilling, pointing joints with mortar, drainage openings, and disposal of surplus materials.</p>	<p>Measure per LINEAR FOOT installed and accepted as measured to the lines shown on the drawings or as directed by the Engineer.</p> <p>Payment based on 100% completion of the work.</p>
3.21	Bituminous Curb	Linear Foot	<p>Work includes, but is not limited to providing all labor, materials, layout, and equipment required to furnish and install bituminous curb as shown on the Drawings. Work includes surface preparation, tack coat, forming and placing curb.</p>	<p>Measure per LINEAR FOOT installed and accepted as measured to the lines shown on the drawings or as directed by the Engineer.</p> <p>Payment based on 100% completion of the work.</p>
3.22	Grouting of Existing Utilities	Linear Foot	<p>Work includes but is not limited to, providing all materials, equipment, layout, labor and expertise to locate and abandon utilities in accordance the Specifications, Drawings, or as directed by the Owner/Engineer. The work includes, but not limited cutting, cleaning, grouting, and capping of the pipes.</p>	<p>Measure per LINEAR FOOT as measured to the lines shown on the drawings or as directed by the Engineer.</p> <p>Payment based on 100% completion of the work.</p>

ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
3.23	Cleaning Existing Storm Drain	Linear Foot	<p>Work includes but is not limited to, providing all materials, equipment, layout, labor and expertise to remove sediment, debris, and other materials from existing storm drain pipes in accordance the Specifications, Drawings, or as directed by the Owner/Engineer. The work includes, but not providing water, collecting water, sediment, and other materials from the drain pipes and manholes.</p>	<p>Measure per LINEAR FOOT as measured to the lines shown on the drawings or as directed by the Engineer.</p> <p>Payment based on 100% completion of the work.</p>
3.24	Inspection of Existing Storm Drain	Linear Foot	<p>Work includes but is not limited to, providing all materials, equipment, layout, labor and expertise to video inspect existing storm drain pipes in accordance the Specifications, Drawings, or as directed by the Owner/Engineer. The work includes, performing inspection, preparing and submitting video footage in digital format, preparing and installing logs of inspection.</p>	<p>Measure per LINEAR FOOT as measured to the lines shown on the drawings or as directed by the Engineer.</p> <p>Payment based on 100% completion of the work.</p>
3.25	Disposal of Storm Drain Sediment	Ton	<p>Work includes, but is not limited to providing all labor, materials, layout, and equipment required to stabilize and remove sediment, debris and other solids removed during storm drain pipe and manhole cleaning. Work includes testing, characterization, loading, handling, treating, stabilization, transportation, preparation of manifests, bills of lading, and fees paid. .</p> <p>Includes providing water to remove sediment, collecting the water, separating the water from the solids, handling, transportation and disposal of the water.</p>	<p>Measure per TON of storm drain sediment based on weight tickets from an approved weight scale.</p> <p>Water will not be measured for payment.</p> <p>Payment based on 100% completion of the work.</p>



ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
3.26	Disposal of Excess Soil	Ton	Work includes, but is not limited to providing all labor, materials, layout, and equipment required to stabilize and remove excess soil from the construction site and dispose of at an off-site disposal facility. Work includes testing, characterization, loading, handling, treating, stabilization, transportation, preparation of manifests, bills of lading, and fees paid.	Measure per TON based on weight tickets from an approved weight scale.  Payment based on 100% completion of the work.
3.27	Disposal of Polluted Soil	Ton	Work includes, but is not limited to providing all labor, materials, layout, and equipment required to stabilize and remove excess soil from the construction site and dispose of at an off-site disposal facility. Work includes testing, characterization, loading, handling, treating, stabilization, transportation, preparation of manifests, bills of lading, and fees paid.	Measure per TON based on weight tickets from an approved weight scale.  Payment based on 100% completion of the work.
3.28	Disposal of Contaminated Soil	Ton	Work includes, but is not limited to providing all labor, materials, layout, and equipment required to stabilize and remove excess soil from the construction site and dispose of at an off-site disposal facility. Work includes testing, characterization, loading, handling, treating, stabilization, transportation, preparation of manifests, bills of lading, and fees paid.	Measure per TON based on weight tickets from an approved weight scale.  Payment based on 100% completion of the work.
4	<b>Site Restoration Items</b>			

ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
4.01	Topsoil	Square Yard	<p>Work includes, but is not limited to providing all labor, materials, layout, and equipment required to cover the areas as shown on the Drawings with a finish lift of stockpiled Topsoil. Work includes final grading, preparing the subgrade; reusing onsite topsoil and furnishing, transporting and installing imported topsoil.</p>	<p>Measure per SQUARE YARD as measured to the lines shown on the Drawings or as directed by the Engineer.</p> <p>Payment based on 100% completion of the work.</p>
4.02	Seeding	Square Yard	<p>Work includes, but is not limited to providing all labor, materials, layout, and equipment required for preparing the ground for seeding, placing Type 1 and Type 2 seeding, mulching, tackifier, temporary irrigation, weeding, maintaining, and related activities to adequately vegetate areas disturbed by construction.</p>	<p>Measure per SQUARE YARD as measured to the lines shown on the Drawings unless otherwise directed by the Engineer.</p> <p>Payment will be based on the following schedule: 25% complete once seeding has been placed; 50% complete once seeding is established; 100% completion upon final acceptance of the project.</p>
4.03	Erosion Control Matting	Square Yard	<p>Work includes, but is not limited to providing all labor, materials, layout, and equipment required for installing erosion control matting on disturbed slopes 3H:1V or steeper including the levee embankment slopes, staging/lay down areas, and other areas disturbed by construction.</p>	<p>Measure per SQUARE YARD as measured to the lines shown on the Drawings unless otherwise directed by the Engineer.</p> <p>Payment will be based on 100% completion of the work.</p>

ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
4.04	Riprap Restoration	Square Yard	<p>Work includes, but is not limited to providing all labor, materials, layout, and equipment required to strip and stockpile existing riprap and bedding, prepare and grade embankment soils, place the riprap bedding and riprap to the lines and grades shown on the drawings, to match the surrounding area.</p> <p>Includes furnishing, transporting and placing any imported riprap or bedding as necessary to supplement the onsite materials.</p>	<p>Measured per SQUARE YARD as to the lines shown on the Drawings or as directed by the Engineer.</p> <p>Payment based on 100% completion of the work.</p>
4.05	Pavement Markings	Linear Foot	<p>Work includes, but is not limited to providing all labor, materials, layout, and equipment required to place temporary and permanent pavement markings as shown on the Drawings or as directed by the Engineer. Included in this work is pre-marking layout, surface preparation, application, and protection of finished work.</p>	<p>Measure per LINEAR FOOT installed and accepted as measured to the lines shown on the drawings or as directed by the Engineer.</p> <p>Payment based on 100% completion of the work.</p>

ITEM NO.	ITEM	UNIT	DESCRIPTION	MEASUREMENT AND PAYMENT TERMS
<b>5</b>	<b>Project Closeout Items</b>			
5.01	Demobilization/ As-Built Drawings/Project Closeout	Lump Sum	<p>The work shall include, but not be limited to providing all labor, materials, layout, and equipment required to complete restoration of all areas disturbed during the project. Work includes removal of haul roads and lay down areas, re-establishment of all disturbed vegetation, reconstruction of pavement, sidewalks, curbs disturbed by construction, removal of all trash and debris, transportation, removal and disposal of all erosion and sediment controls and accumulated settlement, and grading and restoring the areas to the satisfaction of the Engineer.</p> <p>Work also includes submission of as-built drawings and coordination with the Engineer's preparation of Record Drawings.</p>	<p>Payment based on 100% completion and acceptance of the work.</p>

1.6 SCHEDULE OF VALUES

- A. Provide breakdown of lump sum pay items to facilitate review of progress payments. Breakdown by work items as requested by Owner/Engineer.
- B. Submit on CONTRACTOR's standard form.

1.7 PROGRESS PAYMENTS

- A. Submit progress payments monthly, in accordance with requirements of the Special Conditions.
- B. Include accepted schedule of values for each portion of Work and the unit price breakdown for Work to be paid on unit price basis, and allowances.
- C. Preparation:
  - 1. Round values to the nearest dollar.
  - 2. List each Change Order and Written Amendment executed prior to date of payment request as separate line items.

1.8 NONPAYMENT FOR REJECTED OR UNUSED

- A. Payment will not be made for the following:

1. Materials delivered to the site but not incorporated into the work unless otherwise approved by the OWNER.
2. Materials excavated and/or placed beyond the Design Lines shown on the Drawings, except as specifically required by the ENGINEER.
3. Loading, hauling, and disposing of rejected material.
4. Quantities of material wasted or disposed of in a manner not called for under Contract Documents.
5. Rejected loads of material, including material rejected after it has been placed by reason of failure of CONTRACTOR to conform to provisions of Contract Documents.
6. Material not unloaded from transporting vehicle.
7. Defective work not accepted by OWNER.
8. Material remaining on hand after completion of Work.

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

Not Used.

**END OF SECTION**

**SECTION 01 31 00  
PROJECT MANAGEMENT AND COORDINATION**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. Submittals.
- B. Project Meetings.
- C. Construction Sequence.
- D. Construction Schedule.
- E. Utility Notifications.
- F. Request for Information.
- G. Coordination with Owner Activities.

1.2 SUBMITTALS

- A. Shop Drawings:
  - 1. Initial overall project schedule shall be submitted 15 days after Notice to Proceed.
  - 2. A two week look ahead project schedule, including detailed projection of activities shall be submitted weekly.

1.3 PROJECT MEETINGS

- A. CONSTRUCTION MANAGER will schedule project meetings, prepare meeting agenda with participant input, preside at meetings, record meeting minutes to include significant proceedings and decisions, and distribute meeting minutes within 5 days after meeting.
- B. Preconstruction Conference
  - 1. Prior to starting Work at the site, meet with OWNER, CONSTRUCTION MANAGER, and ENGINEER to discuss the following items:
    - a. Project schedule
    - b. Bonds and insurance
    - c. Project permits
    - d. Administrative procedures
      - i. Submittals
      - ii. Progress payments
      - iii. Changes in the Work
      - iv. Weekly progress meetings
    - e. Construction sequence
    - f. Quality control and testing
    - g. Communication protocols
    - h. Site safety
    - i. Site access, security, and temporary facilities
    - j. Coordination with Riverfront Recapture Events
    - k. OWNER authority and responsibilities

- l. CONSTRUCTION MANAGER authority and responsibilities
  - m. CONTRACTOR authority and responsibilities
  - n. Engineer authority and responsibilities
2. The Preconstruction conference shall be attended by the following people:
    - a. OWNER's representative (attendance mandatory).
    - b. CONSTRUCTION MANAGER representative (attendance mandatory).
    - c. CONTRACTOR's office representative (attendance mandatory).
    - d. CONTRACTOR's resident superintendent (attendance mandatory).
    - e. CONTRACTOR's safety representative (attendance mandatory).
    - f. ENGINEER's representative (attendance mandatory).
    - g. Riverfront Recapture's representative (attendance mandatory).
    - h. Subcontractors whom CONTRACTOR, ENGINEER, CONSTRUCTION MANAGER, or OWNER request to attend.
    - i. Town of East Hartford Tree Warden
    - j. Others as appropriate.

#### C. Progress Meetings

1. Meet with OWNER, CONSTRUCTION MANAGER, and ENGINEER at the job site once a week during construction to discuss Work progress. Location and time of meeting shall be coordinated at the preconstruction conference. CONTRACTOR shall give verbal reports of the following items:
  - a. Progress of construction
  - b. Project schedule, including a detailed projection of activities for the next 2 weeks
  - c. Status of submittals
  - d. Status of progress payments
  - e. Any conflicts, discrepancies, or other difficulties requiring resolution
2. The progress meetings shall be attended by the following people:
  - a. OWNER's representative (attendance mandatory).
  - b. CONSTRUCTION MANAGER (attendance mandatory).
  - c. CONTRACTOR's resident superintendent (attendance mandatory).
  - d. ENGINEER's representative (attendance mandatory).
  - e. Riverfront Recapture's representative (shall be invited)
  - f. Subcontractors whom CONTRACTOR, ENGINEER, CONSTRUCTION MANAGER or OWNER request to attend.
  - g. Others as appropriate.

#### 1.4 CONSTRUCTION SEQUENCE

- A. General construction sequence shall be developed by the CONTRACTOR. The CONTRACTOR shall carry out the various elements of the work concurrently, as is practicable, and shall not defer construction of any portion of the work in favor of any other portion, without the express written approval of the OWNER.

### 1.5 CONSTRUCTION SCHEDULE

- A. Construction schedule shall include a bar chart or similar form of progress schedule. Unless otherwise agreed to by the OWNER, the latest version of Microsoft Project™ shall be used. The CONTRACTOR shall submit three (3) copies, plus an electronic copy, of a complete baseline progress schedule at the preconstruction conference. The baseline progress schedule shall show all major portions of the Work, the estimated dates on which the CONTRACTOR shall start and complete each portion.
- B. Unless agreed to by the OWNER, the progress schedule shall be updated and submitted to the OWNER with each Progress Payment request, at each progress meeting, or when requested by the OWNER.
- C. Despite the submission of a progress schedule, the CONTRACTOR shall be governed by the direction of the OWNER if, in the judgment of the OWNER, it becomes necessary to accelerate the Work or any part thereof, or cease work at any particular point and concentrate the CONTRACTOR's forces at such other point or points, with the intent of preventing delays.

### 1.6 UTILITY NOTIFICATION

- A. Coordinate Work with various utilities within Project limits. Notify applicable utilities prior to commencing Work, if damage occurs, or if conflicts or emergencies arise during Work. Contact the following:

- 1. Sanitary sewer and water  
The Metropolitan District (MDC)  
60 Murphy Road  
Hartford, CT 06114  
Telephone: (860) 278-7850 x3686
- 2. Drains  
Connecticut Department of Transportation  
2800 Berlin Turnpike  
Newington, CT 06131-7546  
Telephone: (203) 696-2685  
  
Town of East Hartford  
740 Main Street  
East Hartford, CT 06108  
Telephone: (860) 291-7361
- 3. Oil/Fuel pipelines  
Buckeye Pipeline  
5 TEK Park  
9999 Hamilton Blvd.  
Breingsville, PA 18031  
Telephone: (610) 904-4409
- 4. Telephone  
AT&T  
750 Main Street, 4th floor



Hartford, CT 06103  
Telephone: (860) 509-9985

5. Electric  
Northeast Utilities (Connecticut Light and Power)  
107 Selden Street  
Berlin, CT  
Telephone: (860) 280-2359
  
6. Telecommunications  
Level 3 Communications, Inc. (Williams Communications Group).  
1025 Eldorado Boulevard  
Broomfield, Colorado 80021  
Telephone: 720-888-1000

1.7 REQUEST FOR INFORMATION

- A. Submit questions and requests for clarifications to ENGINEER using the Request for Information (RFI) form attached at the end of this section. RFI's shall be used for clarification of information provided in the Specifications or shown on the Drawings, and to request substitutions for materials or methods.

1.8 COORDINATION WITH OWNER ACTIVITIES

- A. The OWNER will continue to operate the flood control system and will need to access the work areas during performance of the work. CONTRACTOR will provide OWNER or OWNER's subcontractor access to the work areas and shall coordinate with OWNER's activities.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

**END OF SECTION**

East Hartford Flood Control System  
Toe Drain Repair Project Phase 1

RFI Number:  
Date:

To: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

From: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Subject:	
Specification Section:	
Drawing Number:	

Question:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Written By: \_\_\_\_\_ Date: \_\_\_\_\_  
Attachments: \_\_\_\_\_

Response:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Written By: \_\_\_\_\_ Date: \_\_\_\_\_  
Attachments: \_\_\_\_\_

Contractor Acceptance: \_\_\_\_\_  
Title: \_\_\_\_\_ Date: \_\_\_\_\_

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**SECTION 01 33 00**  
**SUBMITTAL PROCEDURES**

**PART 1 GENERAL**

**1.1 SUBMITTAL PROCEDURES**

- A. The word "submittals" shall be interpreted to include Work plans or procedures, Drawings, shop drawings, schedules, data, manuals, certifications, test reports, curves, samples, brochures, and other items furnished by CONTRACTOR for approval, information, or other purposes.
- B. Each submittal will be returned within twenty-one (21) days following receipt of submittal, unless otherwise indicated in the Specification section. Resubmittals shall be subject to the same review time.
- C. Do not perform Work related to submittals prior to obtaining the required approval from CONSTRUCTION MANAGER.
- D. Utilize a 10-character submittal identification numbering system in the following manner:
  - 1. The first six digits shall be the applicable Specification section number.
  - 2. The next three digits shall be the numbers 001 to 999 to sequentially number each initial separate item or submittal under each specific section number.
  - 3. The last character shall be a letter (A to Z) indicating the submission, or resubmission of the same Submittal, i.e., "A = 1st submission, B = 2nd submission (first resubmission), C = 3rd submission, etc. A typical submittal number would be as follows: 03 05 00 - 008 - B
- E. Submittals will be reviewed no more than twice at OWNER's expense. Subsequent reviews will be performed by CONSTRUCTION MANAGER or ENGINEER at CONTRACTOR's expense. CONTRACTOR will be invoiced on a time and materials basis using the same hourly rates that are being charged to OWNER for engineering services. Invoice amounts will be deducted from amounts due, or to become due, to CONTRACTOR. Submittals are required until approved. Delays resulting from resubmittals will not entitle CONTRACTOR to a Contract Time extension or change in Contract Price.
- F. If the items as submitted describe variations and show a departure from the Contract requirements which CONSTRUCTION MANAGER finds to be in the interest of OWNER and to be so minor as not to involve a change in Contract Price or Contract Time, CONSTRUCTION MANAGER may return the reviewed submittals without noting an exception.
- G. Complete and submit a transmittal form with each submittal package. A copy of the form is attached at the end of this section.

**1.2 SUBMITTALS**

- A. Administrative:
  - 1. Schedule of Submittal Submission: Submit 14 days after Notice to Proceed. Include the following information:
    - a. List of submittals (group by Specification number)
    - b. Estimated submission date
    - c. Estimated start date for corresponding items of Work

### 1.3 SHOP DRAWINGS

- A. Copies: Submit seven paper copies of shop drawings and product data. Submit one copy electronically (PDF) format.
- B. Shop drawings are those submittals that reflect processes, layout, or method of construction. All shop drawing submittals shall contain the following information:
1. The date of submission and the dates of any previous submissions
  2. The project title and number
  3. The name of CONTRACTOR (and SUBCONTRACTOR where applicable)
  4. Identification of the items/submittal/product, with the Specification section number, page, and paragraph(s), and Drawing reference, if any
  5. Field dimensions, clearly identified as such
  6. Relation to adjacent or critical features of the Work or materials
  7. Design Data: show calculations, dimensions, logic, and assumptions upon which the design is based.
  8. Applicable standards, such as ASTM, ANSI, or Federal Specification numbers
  9. Identification of deviations from Contract Documents
  10. Identification of revisions on resubmittals
  11. A blank space suitably sized for CONTRACTOR and CONTRACTOR's engineer (if necessary) stamps
- C. Prepare the submittal as follows:
1. Present in a clear and thorough manner. Include sufficient detail to show the kind, size, arrangement, and function of components or materials and compliance with the Contract Documents.
  2. Include drawings that are to scale.
  3. Mark pertinent products or models and show performance characteristics, capacities, dimensions, clearances, anchorages, external connections, or supports required.
  4. Submit on 8-½- by 11-inch or 11- by 17-inch paper. If paper larger than 11- by 17-inch is required, use 22- by 34-inch paper.
- D. Disposition: CONSTRUCTION MANAGER will review and mark up submittals and distribute marked-up copies as described below.
1. Approved:
    - a. One copy to OWNER
    - b. One copy to CONSTRUCTION MANAGER
    - c. One copy to ENGINEER
    - d. One copy to CTDEEP
    - e. Once copy to USACE New England District
    - f. Remaining copies returned to CONTRACTOR
    - g. CONTRACTOR may begin Work described in the submittal
  2. Approved as Noted:
    - a. One copy to OWNER
    - b. One copy to CONSTRUCTION MANAGER

- c. One copy to ENGINEER
  - d. One copy to CTDEEP
  - e. Once copy to USACE New England District
  - f. Remaining copies returned to CONTRACTOR appropriately annotated.
  - g. CONTRACTOR may begin Work described in submittal in accordance with ENGINEER's notations, subject to CONTRACTOR's written verification and acceptance of ENGINEER's notations.
3. Disapproved:
    - a. One copy retained by CONSTRUCTION MANAGER.
    - b. One copy retained by ENGINEER.
    - c. Remaining copies returned to CONTRACTOR appropriately annotated.
    - d. CONTRACTOR shall make corrections or develop a replacement submittal and resubmit.
  4. Incomplete:
    - a. One copy retained by CONSTRUCTION MANAGER.
    - b. One copy retained by ENGINEER.
    - c. Remaining copies returned to CONTRACTOR appropriately annotated.
    - d. CONTRACTOR shall complete and resubmit or submit missing portions of the submittal.

#### 1.4 SAMPLES

- A. Unless otherwise noted, submit six samples for each required submittal.
- B. Sample submittals are those submittals that reflect type or quality of product. All sample submittals shall contain the following information:
  1. The date of submission and the dates of any previous submissions
  2. The project title and number
  3. The name of CONTRACTOR (and SUBCONTRACTOR where applicable)
  4. Identification of the items/submittal/product, with the Specification section number, page, and paragraph(s), and Drawing reference, if any
  5. Applicable standards, such as ASTM, ANSI, or Federal Specification numbers
  6. Identification of deviations from Contract Documents
  7. Identification of revisions on resubmittals
  8. Source, location, date obtained, and who obtained the sample
- C. Prepare the sample submittal as follows:
  1. Present in a clear and thorough manner. Include sufficient detail to show the kind, size, arrangement, and function of components or materials, and compliance with the Contract Documents.
  2. Mark pertinent products or models and show performance characteristics, capacities, dimensions, clearances, anchorages, external connections, or supports required.
- D. Disposition: CONSTRUCTION MANAGER will review and mark up submittals and distribute marked-up copies as described below.

1. No Exceptions Taken:
  - a. One copy of transmittal and one sample to OWNER.
  - b. One copy of transmittal and one sample to CONSTRUCTION MANAGER.
  - c. One copy of transmittal and one sample to ENGINEER.
  - d. One copy of transmittal and one sample to CONTRACTOR.
  - e. CONTRACTOR may begin Work described in the submittal.
2. Make Corrections Noted:
  - a. One copy of transmittal, with annotations, and one sample to OWNER.
  - b. One copy of transmittal, with annotations, and one sample to CONSTRUCTION MANAGER.
  - c. One copy of transmittal, with annotations, and one sample to ENGINEER.
  - d. One copy of transmittal, with annotations, and one sample to CONTRACTOR.
  - e. CONTRACTOR may begin Work described in submittal in accordance with ENGINEER's notations, subject to CONTRACTOR's written verification and acceptance of ENGINEER's notations.
3. Amend - Resubmit:
  - a. One copy of transmittal, with annotations, and one sample retained by CONSTRUCTION MANAGER.
  - b. One copy of transmittal, with annotations, and one sample retained by ENGINEER.
  - c. Remaining samples returned to CONTRACTOR appropriately annotated.
  - d. CONTRACTOR shall make corrections or develop a replacement submittal and resubmit.
4. Rejected - Resubmit:
  - a. One copy of transmittal, with annotations, and one sample retained by CONSTRUCTION MANAGER.
  - b. One copy of transmittal, with annotations, and one sample retained by ENGINEER.
  - c. Remaining samples returned to CONTRACTOR appropriately annotated.
  - d. CONTRACTOR shall develop a replacement submittal, or complete and resubmit or submit missing portions of an incomplete submittal.

## 1.5 ADMINISTRATIVE SUBMITTALS

- A. Copies: Submit seven paper copies of administrative submittals. Submit one copy electronically (PDF or otherwise acceptable) format.
- B. Administrative submittals are those submittals that do not reflect quality of product or method of construction. Administrative submittals include, but are not limited to, the following items:
  1. Preconstruction Photographs: In accordance with the applicable provisions of Section 11: Preconstruction Photographs and Record Drawings of the General Conditions.
  2. Video Recordings: In accordance with the applicable provisions of Section 11: Preconstruction Photographs and Record Drawings of the General Conditions.

3. Schedules: In accordance with the provisions of Section 7: PROSECUTION OF THE WORK of the General Conditions and Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION.
  4. Submittals Required By Law, Regulations or Governing Agencies.
  5. Operation and Maintenance Manuals: In accordance with the applicable provisions of Section 01 77 00: PROJECT CLOSEOUT.
  6. Record Documents: In accordance with the applicable provisions of Section 01 77 00: PROJECT CLOSEOUT.
- C. All administrative submittals shall contain the following information:
1. The date of submission and the dates of any previous submissions.
  2. The project title and number.
  3. The name of CONTRACTOR (and SUBCONTRACTOR where applicable).
  4. Identification of the items/submittal/product, with the Specification section number, page, and paragraph(s), and Drawing reference, if any.
  5. Identification of deviations from Contract Documents.
  6. Identification of revisions on resubmittals.
- D. Prepare the administrative submittal as follows:
1. Present in a clear and thorough manner. Include sufficient detail to show compliance with the Contract Documents.
  2. Include drawings that are to scale.
  3. Prepare schedules in accordance with the applicable requirements of Section 7: PROSECUTION OF THE WORK of the General Conditions.
  4. Submit on 8-½- by 11-inch or 11- by 17-inch paper. If paper larger than 11- by 17-inch is required, use 22- by 34-inch paper.
- E. Disposition: CONSTRUCTION MANAGER will review and mark up submittals and distribute marked-up copies as described below.
1. No Exceptions Taken:
    - a. Approval shall indicate that the submittal generally conforms to the requirements of the Contract Documents as to form and substance.
    - b. One copy to OWNER.
    - c. One copy to CONSTRUCTION MANAGER.
    - d. One copy to ENGINEER.
    - e. One copy to CTDEEP
    - f. Once copy to USACE New England District
    - g. Remaining copies returned to CONTRACTOR.
    - h. CONTRACTOR may begin Work described in the submittal.
  2. Make Corrections Noted:
    - a. One copy with annotations to OWNER.
    - b. One copy with annotations to CONSTRUCTION MANAGER.
    - c. One copy with annotations to ENGINEER.
    - d. One copy with annotations to CTDEEP.
    - e. One copy with annotations to USACE New England District.

- f. Remaining copies with annotations to CONTRACTOR.
  - g. CONTRACTOR may begin Work described in submittal in accordance with ENGINEER's notations, subject to CONTRACTOR's written verification and acceptance of ENGINEER's notations.
3. Amend - Resubmit:
- a. One copy with annotations retained by CONSTRUCTION MANAGER.
  - b. One copy with annotations retained by ENGINEER.
  - c. Remaining copies returned to CONTRACTOR appropriately annotated.
  - d. CONTRACTOR shall make corrections or develop a replacement submittal and resubmit.
4. Rejected - Resubmit:
- a. One copy with annotations retained by CONSTRUCTION MANAGER.
  - b. One copy with annotations retained by ENGINEER.
  - c. Remaining samples returned to CONTRACTOR appropriately annotated.
  - d. CONTRACTOR shall develop a replacement submittal, or complete and resubmit or submit missing portions of an incomplete submittal.

#### 1.6 QUALITY CONTROL SUBMITTALS

- A. Copies: Submit seven paper copies of administrative submittals. Submit one copy electronically (PDF or otherwise acceptable) format.
- B. Quality control submittals are those submittals that present results of inspections or tests or compliance with the Specifications. All quality control submittals shall contain:
- 1. The date of submission and the dates of any previous submissions.
  - 2. The project title and number.
  - 3. The name of CONTRACTOR (and SUBCONTRACTOR where applicable).
  - 4. Identification of the items/submittal/product, with the Specification section number, page, and paragraph(s), and Drawing reference, if any.
  - 5. Applicable standards, such as ASTM, ANSI, or Federal Specification numbers.
  - 6. Identification of deviations from Contract Documents.
  - 7. Identification of revisions on resubmittals.
- C. Prepare the quality control submittal as follows:
- 1. Certificates:
    - a. Manufacturer's Certificates of Compliance or Manufacturer's Certificate of Installation: Submit in accordance with the provisions of the individual Specification section.
    - b. Testing Certificates: Submit in accordance with the provisions of the individual Specification section.
  - 2. Statement of Qualifications: Evidence of qualification, certification, or registration.
  - 3. Inspection or Test Reports: Include the following information, as a minimum:
    - a. Test date, testing laboratory, name of inspector.
    - b. Date and time of test or sample, location of test or sample, temperature at time of the test, weather conditions at the time of the test.



- c. Related Specification section, type of test or inspection performed, results of test or inspection, and Specification requirement.
  - D. Disposition: CONSTRUCTION MANAGER will review and mark up submittals and distribute marked-up copies as described below.
    1. No Exceptions Taken:
      - a. Approval shall indicate that the submittal generally conforms to the requirements of the Contract Documents as to form and substance.
      - b. One copy to OWNER.
      - c. One copy to CONSTRUCTION MANAGER.
      - d. One copy to ENGINEER.
      - e. One copy to CTDEEP
      - f. Once copy to USACE New England District
      - g. Remaining copies returned to CONTRACTOR.
      - h. CONTRACTOR may begin Work described in the submittal.
    2. Make Corrections Noted:
      - a. One copy with annotations to OWNER.
      - b. One copy with annotations to CONSTRUCTION MANAGER.
      - c. One copy with annotations to ENGINEER.
      - d. One copy with annotations to CTDEEP.
      - e. One copy with annotations to USACE New England District.
      - f. Remaining copies with annotations to CONTRACTOR.
      - g. CONTRACTOR may begin Work described in submittal in accordance with ENGINEER's notations, subject to CONTRACTOR's written verification and acceptance of ENGINEER's notations.
    3. Amend - Resubmit:
      - a. One copy with annotations retained by CONSTRUCTION MANAGER.
      - b. One copy with annotations retained by ENGINEER.
      - c. Remaining copies returned to CONTRACTOR appropriately annotated.
      - d. CONTRACTOR shall make corrections or develop a replacement submittal and resubmit.
    4. Rejected - Resubmit:
      - a. One copy with annotations retained by CONSTRUCTION MANAGER.
      - b. One copy with annotations retained by ENGINEER.
      - c. Remaining samples returned to CONTRACTOR appropriately annotated.
      - d. CONTRACTOR shall develop a replacement submittal, or complete and resubmit or submit missing portions of an incomplete submittal.
      - e.
- 1.7 SUBSTITUTIONS
  - A. Equipment, material or devices submitted for review as a "substitution" shall meet the following requirements:
    1. Substitution Request Submittal: Requests for substitution will be considered if received in writing.

- a. Submit seven (7) copies of each request for substitution for consideration.
  - b. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
    - i. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
    - ii. Samples, where applicable or requested.
    - iii. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
    - iv. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the OWNER and separate Contractors, that will become necessary to accommodate the proposed substitution.
    - v. A statement indicating the substitution's effect on the CONTRACTOR's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
    - vi. Cost information, including a proposal of the net change, if any in the Contract Sum.
    - vii. Certification by the CONTRACTOR that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the CONTRACTOR's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.
2. ENGINEER's Action: Within one week of receipt of the request for substitution, the ENGINEER will notify the CONTRACTOR of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name.
3. Other Conditions: The CONTRACTOR's substitution request will be received and considered by the ENGINEER when one or more of the following conditions are satisfied, as determined by the ENGINEER; otherwise requests will be returned without action except to record noncompliance with these requirements.
- a. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
  - b. A substantial advantage is offered to the OWNER, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the OWNER may be required to bear. Additional responsibilities for the OWNER may include additional compensation to the ENGINEER for redesign and evaluation services, increased cost of other construction by the OWNER or separate Contractors, and similar considerations.

1.8 RECORD DRAWINGS

A. Submit record drawings at time of final acceptance and prior to final payment.

1.9 GUARANTEES, WARRANTIES, AND CERTIFICATES

A. Submit all guarantees, warranties, and certificates prior to final payment.

1.10 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Submit all operating and maintenance instructions to OWNER prior to final payment.
- B. Refer to Section 01 77 00: PROJECT CLOSEOUT.

1.11 TEST REPORTS

A. Refer to Section 01 45 00: QUALITY CONTROL AND ASSURANCE

1.12 DELIVERY TICKETS

A. Submit to ENGINEER one legible copy of each delivery ticket as required by the Specifications.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

**END OF SECTION**

**EAST HARTFORD FLOOD CONTROL SYSTEM TOE DRAIN REPAIR PROJECT PHASE 1  
TRANSMITTAL OF CONTRACTOR'S SUBMITTAL  
(ATTACH TO EACH SUBMITTAL)**

DATE: \_\_\_\_\_

TO: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SUBMITTAL NO.: \_\_\_\_\_

NEW SUBMITTAL  RESUBMITTAL

PREVIOUS SUBMITTAL NO.: \_\_\_\_\_

SPECIFICATION SECTION No.: \_\_\_\_\_

**(Cover only one section with each transmittal)**

FROM: \_\_\_\_\_

CONTRACTOR

SCHEDULE DATE OF SUBMITTAL:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SUBMITTAL TYPE:

SHOP DRAWING  
 QUALITY CONTROL

ADMINISTRATIVE  
 SAMPLE

**The following items are hereby submitted:**

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

CONTRACTOR hereby certifies that (i) CONTRACTOR has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By: \_\_\_\_\_  
CONTRACTOR (Authorized Signature)

Date Received: \_\_\_\_\_

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**SECTION 01 35 30**  
**HEALTH AND SAFETY**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Establishment and implementation of protocols and procedures to protect worker health and safety as it relates to activities when performed in the presence of Regulated Soil. All worker health and safety protocols that address potential and/or actual risk of exposure to site-specific hazards posed to CONTRACTOR employees and subcontractors are solely the responsibility of the CONTRACTOR. Regulated Soil is defined in Section 02 61 50: TRANSPORTATION AND DISPOSAL OF REGULATED SOIL.
- B. The Health and Safety Plan (HASP) shall comply with all federal, state, and local worker health and safety laws, regulations, ordinances, practices, and protocols (the "Safety Requirements").

1.2 GENERAL SAFETY PROVISIONS

- A. The CONTRACTOR shall be solely and completely responsible for conditions of the jobsite, including safety of all persons (including employees) and property during the performance of the Work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to all applicable federal and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent shall be followed. The CONTRACTOR's failure to thoroughly familiarize themselves with the aforementioned safety provisions shall not relieve them self from compliance with the obligations and penalties set forth therein.
- B. The CONTRACTOR shall develop and maintain for the duration of this Contract, a safety program that will effectively incorporate and implement all required safety provisions. The CONTRACTOR shall appoint an employee who is qualified and authorized to supervise and enforce compliance with the safety program.
- C. The duty of the OWNNER or ENGINEER does not include review or approval of the adequacy of the CONTRACTOR'S safety program, safety supervisor, or any safety measures taken in, on, or near the project site.
- D. The CONTRACTOR, as part of his safety program, shall maintain at his office or other well-known place at the Project site, safety equipment and instruments applicable to the work as prescribed by the aforementioned authorities, all articles necessary for giving first aid to the injured, and shall establish the procedure for the immediate removal to a hospital or a doctor's care of persons (including employees) who may be injured on the Project site.
- E. If death, or serious injuries, or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the ENGINEER and the OWNER. In addition, the CONTRACTOR shall promptly report in writing to the OWNER all accidents arising out of, or in connection with, the performance of the Work whether on, or adjacent to, the Project site, giving full details and statements of witnesses.
- F. If a claim is made by anyone against the CONTRACTOR or any subcontractor on account of any accident, the CONTRACTOR shall promptly report the facts in writing to the ENGINEER and the OWNER, giving full details of such claim.

1.3 SUBMITTALS

- A. At least three weeks prior to the start of construction activities, submit a Site Specific Health and Safety Plan (HASP) to the ENGINEER for review. The HASP shall specify the Health and Safety Officer (HSO). The HASP shall conform to all Safety Requirements, including, without limitation, those contained in the pertinent sections of 29 CFR 1926 and 29 CFR 1910.

1.4 RELATED SECTIONS

- A. Section 02 61 15: HANDLING OF REGULATED SOIL
- B. Section 02 61 50: TRANSPORTATION AND DISPOSAL OF REGULATED SOIL

1.5 SITE SPECIFIC HEALTH AND SAFETY PLAN (HASP)

**PART 2 PRODUCTS**

2.1 PERSONAL PROTECTIVE EQUIPMENT

- A. Provide chemical protective clothing (CPC) and personal protective equipment (PPE) as stipulated in the CONTRACTOR's HASP during the performance of work in areas identified as potentially posing a risk to worker health and safety for workers employed by the CONTRACTOR and all subcontractors.

2.2 SAFETY EQUIPMENT AND MONITORING INSTRUMENTS

- A. The CONTRACTOR shall provide and maintain all safety equipment and portable monitoring instruments required to safely perform the work and comply with State and Federal Regulations.

**PART 3 EXECUTION**

3.1 SITE SPECIFIC HEALTH AND SAFETY PLAN (HASP)

- A. Develop and maintain for the duration of this Contract, a written Site Specific Health and Safety Plan (HASP) which complies with all safety requirements and addresses those issues directly related to site conditions.
- B. No physical aspects of the Work shall begin until a HASP is submitted to the ENGINEER. However, the time to perform under the contract will begin on the date stipulated in the Notice to Proceed.
- C. Preparation of the Site Specific HASP is solely the CONTRACTOR's responsibility and no statement made in these provisions shall relieve CONTRACTOR of sole responsibility for information included and implementation of the Site Specific HASP.
- D. Submission of the Site Specific HASP is solely for evidence of compliance with the Contract Documents, and for reference and general information. Submission and subsequent review by ENGINEER or OWNER shall not relieve CONTRACTOR from sole responsibility as to the adequacy of its Site Specific HASP.
- E. The ENGINEER's or OWNER's review of the CONTRACTOR's performance is not intended to include a review or approval of the adequacy of the CONTRACTOR's safety supervisor, safety program or any safety measures taken in, on, or near the Site.
- F.

- 
- G. The HASP shall be developed by a qualified person working for and designated by the CONTRACTOR as the Hazardous Safety Manager (HSM). The HSM shall have review and acceptance authority over the HASP.
- H. The HASP, maintained on Site by the CONTRACTOR, shall be kept current with remediation/construction activities and actual site conditions. The following items, at a minimum, shall be addressed in the HASP:
1. Site description and project evaluation.
  2. Names of key personnel, and any alternates, responsible for site safety and health (including responsibilities, chain of command, and contact information).
  3. Safety and health hazard assessment for each site task and operator.
  4. Procedures for emergency medical treatment and first aid.
  5. Map indicating route to hospital for emergency medical care.
  6. Plan to carry out inspections, and pre-job, toolbox safety committee, incident review, and other meetings,
  7. Equipment decontamination procedures, if applicable,
  8. Air monitoring procedures and action levels, if applicable,
  9. Personal protective equipment, decontamination procedures and disposal procedures, if applicable
  10. Physical hazard evaluation including:
    - a. Equipment operation.
    - b. Confined space entry.
    - c. Slips and falls.
    - d. Falling debris.
    - e. Encountering unmarked utilities.
    - f. Cold and heat stress.
    - g. Hot work (cutting and welding).
    - h. Excavation entry.
  11. Training requirements.
  12. Medical surveillance.
  13. Recordkeeping requirements.
  14. Emergency response plan that includes:
    - a. Evacuation routes and procedures.
    - b. Emergency alerting and response procedures.
    - c. Emergency response plan to comply with 29 CFR 1910.120(l).
  15. Communication protocols for reporting to the OWNER and ENGINEER site safety issues or concerns, first aid incidents, emergencies, damage claims, and the like.
- I. The HASP shall also include All elements regulated by 29 CFR 1910.120(b)(4), including but not limited to the following, shall be addressed in the HASP:
1. Implementation schedule for HASP elements
  2. The assignment of a qualified HSM
  3. The assignment of a qualified HSO
  4. Health and safety personnel requirements, responsibilities, and authorities
  5. Relevant site information defining areas of environmental concerns

6. Hazard assessment of general site conditions, and hazard assessment of individual areas of environmental concern
  7. Personal protection equipment (PPE) and chemical protective clothing (CPC)
  8. Training requirements (OSHA 29 CFR 1910.120, 40-hour and 8-hour courses)
  9. Medical considerations/Medical Surveillance Program
  10. Monitoring procedures and exposure action levels
  11. Procedures for upgrading or downgrading CPC/PPE
  12. Operational health and safety requirements
  13. Contingency planning for emergency response procedures
  14. Work zone Site controls for areas of environmental concern
  15. Engineering controls
  16. Equipment support
  17. HASP revision, review, approval and coordination procedures
  18. Signature page for all on-Site workers subject to the HASP
- J. The HASP shall be recognized as a flexible document that shall be subject to revisions and amendments, as required, in response to actual Site conditions, changes in Work methods, and/or alterations in the relative risks and exposure present at the Site. Revisions shall require review by the ENGINEER prior to the implementation of such changes. Work cannot commence in areas requiring revision of the HASP, until revision to it by CONTRACTOR and review of it by the ENGINEER has been completed.
- K. Upon submittal of the HASP, the ENGINEER shall review the HASP and provide written comments as to deficiencies and/or exceptions in the plan(s), if any, to ensure consistency with applicable Safety Requirements, standards, policies and practices, and appropriateness given potential or known Site conditions.
- L. The CONTRACTOR shall provide a competent HSO on Site as identified in the HASP, who is capable of identifying existing and potential hazards at the Project Site or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization as identified in the HASP to take prompt corrective measures to eliminate or control such conditions. The qualifications of the HSO shall include completion of management and supervisory training requirements of 29 CFR 1910(e)(4) or 29 CFR 1926.65(e)(4). In addition, the HSO shall have a minimum of one year of working experience at regulated sites; a working knowledge of federal and state safety regulations; specialized training or documented experience (one year minimum) in personal and respiratory protective equipment program implementation; training in the proper use of air monitoring instruments, air sampling methods and procedures; and certification of training in first aid and CPR by a recognized accepted organization such as the American Red Cross. The CONTRACTOR shall submit to the ENGINEER for review the qualifications of the HSM and the HSO.
- M. The duties of the HSO shall be limited to those associated with worker health and safety. The CONTRACTOR's HSO responsibilities shall be detailed in the written HASP and shall include, but not be limited to, the following.
1. Directing and implementing the HASP.
  2. Ensuring that all Project personnel have been adequately trained in the recognition and avoidance of unsafe conditions and the regulations applicable to the Work environment to control or eliminate any hazards or other exposure to illness or injury



- (OSHA 29 CFR 1926.21). All personnel shall be adequately trained in procedures outlined in the CONTRACTOR's written HASP.
3. Authorizing Stop Work Orders which shall be executed by the HSO upon the determination of an imminent health and safety concern.
  4. Contacting the CONTRACTOR's safety management personnel and the ENGINEER immediately upon the issuance of a Stop Work Order when the HSO has made the determination of an imminent health and safety concern.
  5. Authorizing Work to resume upon approval from the CONTRACTOR's safety management personnel.
  6. Directing activities, as defined in the CONTRACTOR's written HASP, during emergency situations.
  7. Providing monitoring as identified in the HASP.
- N. The CONTRACTOR must provide CPC and PPE as stipulated in the CONTRACTOR's HASP during the performance of Work in an area identified as potentially posing a risk to worker health and safety for workers employed by the CONTRACTOR and subcontractors. The CONTRACTOR shall inform all on-Site workers and subcontractors of all Site safety rules, known or potential hazards, and emergency response procedures.
- O. All activities performed by the CONTRACTOR regarding management of Regulated Soil, or in other areas where Site conditions may pose a risk to worker health and safety and/or the environment, shall be performed in conformance with 29 CFR 1926, Safety and Health Regulations for Construction and 29 CFR 1910, Safety and Health Regulations for General Industry.
- P. The CONTRACTOR shall be responsible for the implementation of the HASP throughout the performance of Work regarding management of Contaminated Material, as identified by the Contract Documents, by the ENGINEER, or by the HASP. In work locations and areas identified as having a potential risk to worker health and safety, the CONTRACTOR shall be prepared to immediately implement the appropriate health and safety measures, including but not limited to the use of engineering controls, PPE and Site work zone controls. The CONTRACTOR shall be responsible for the health and safety of all on-Site workers during the progress of Work.

**END OF SECTION**

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**SECTION 01 42 00**  
**REFERENCES**

**PART 1 GENERAL**

1.1 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the generality of other requirements of the Specifications, all Work specified herein shall meet the requirements of applicable codes and the applicable requirements of the following documents.
- B. References herein to “ASTM” shall mean the American Society for Testing and Materials.
- C. References herein to “ACI” shall mean the American Concrete Institute.
- D. References herein to “OSHA Regulations for Construction” shall mean **Title 29, Part 1926, Construction Safety and Health Regulations for Construction**, Code of Federal Regulations (CFR), including all changes and amendments thereto.
- E. References herein to “OSHA Standards” shall mean **Title 29, Part 1910, Occupational Safety and Health Standards**, Code of Federal Regulations, including all changes and amendments thereto.
- F. Applied Standard Specifications: References in the Contract Documents to “Standard Specifications” or SSPWC shall mean the **Standard Specifications for Public Works Construction**, 1994 Edition.
- G. References herein to “CONNDOT” shall mean State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction, Form 816 or other State of Connecticut documents.

1.2 REGULATIONS RELATED TO HAZARDOUS MATERIALS

- A. All Work included in the Contract Documents, regardless if shown or not, shall comply with all EPA, OSHA, RCRA, NFPA, and any other Laws and Regulations governing the storage and conveyance of hazardous materials, including petroleum products.

1.3 ABBREVIATIONS

- A. Abbreviations used throughout the Specifications and the organization or document represented are:

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturer's Association
AASHTO	American Association of State Highway Transportation Officials
ACI	American Concrete Institute
ADM	Arrow Diagramming Method
AGA	American Gas Association
AGCA	Association of General Contractors of America
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALSC	American Lumber Standards Committee

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AMCA	Air Moving and Conditioning Association, Inc.
AMA	American Materials Association
ANSI	American National Standards Institute
APA	American Plywood Association (formerly DFPA)
APHA	American Public Health Association
ARI	Air-Conditioning and Refrigeration Institute
ASA	American Standards Association (now USAS)
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWPA	American Wood Preserver's Association
AWWA	American Water Works Association
CFR	Code of Federal Regulations
CPM	Critical Path Method
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards of U.S. Department of Standards
CSI	Construction Specifications Institute
DFPA	Douglas Fir Plywood Association (now APA)
EPA	Environmental Protection Agency
FAR	Federal Acquisition Regulations
FGMA	Flat Glass Marketing Association
FML	Factory Mutual Laboratories
FS	Federal Specifications
HVAC	Heating, Ventilating, and Air Conditioning
IBR	Institute of Boiler and Radiator Manufacturers
MBMA	Metal Building Manufacturer's Association
MLA	Metal Lath Association
MSHA	Mine Safety and Health Administration
NAAMM	National Association of Architectural Metal Manufacturers
NBC	National Building Code
NBFU	National Bureau of Fire Underwriters
NBS	National Bureau of Standards
NCMA	National Concrete Masonry Association
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFPS	National Forest Products Association
NPC	National Plumbing Code
NPDES	National Pollutant Discharge Elimination System
NRMCA	National Ready Mixed Concrete Association
NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturing Association
OSHA	Occupational Safety and Health Administration, U.S. Department of Labor
PCA	Portland Cement Association
PDM	Precedence Diagramming Method
PEI	Porcelain Enamel Institute

SBI	Steel Boiler Institute
SCPI	Structural Clay Products Institute
SDI	Steel Deck Institute
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPCC	Spill Prevention Control and Countermeasure
SPI	Steel Products Institute
SPR	Simplified Practice Recommendation
SSPC	Steel Structures Painting Council
TCA	Tile Council of America
UBC	Uniform Building Code
UL	Underwriters Laboratories
UPC	Uniform Plumbing Code
USAS	United States of America Standards (formerly ASA)
USBR	U.S. Bureau of Reclamation
USCOE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WPCF	Water Pollution Control Federation
WWPA	Western Wood Products Association

B. Additional abbreviations, if any, will be defined as they appear in the Specifications.

**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

Not used

**END OF SECTION**

**SECTION 01 45 00**  
**QUALITY CONTROL AND QUALITY ASSURANCE**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. CONTRACTOR Quality Control.
- B. OWNER/ENGINEER Quality Assurance.

1.2 DEFINITIONS

- A. Quality Control: Evaluations, observations, tests, and measurements performed by CONTRACTOR to control the quality of his work or to verify that the work is performed in accordance with the requirements of the contract documents.
- B. Quality Assurance: Independent evaluations, observations, tests, and measurements performed by OWNER or ENGINEER to verify the accuracy of CONTRACTOR's quality control data.

1.3 CONTRACTOR QUALITY CONTROL

A. General

- 1. Perform Quality Control activities as the minimum at the frequencies specified in the individual specification sections and as necessary to control the quality of the work within specified requirements.
- 2. Testing for quality control purposes shall be made by an independent testing laboratory or agency licensed or certified in accordance with Laws and Regulations and applicable state and local statutes. In the event state license or certification is not required, testing laboratories or agencies shall meet following applicable requirements.
  - a. "Recommended Requirements for Independent Laboratory Qualification," published by the American Council of Independent Laboratories.
  - b. Basic requirements of ASTM E 329, "Standard of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction.
  - c. Calibrate testing equipment at reasonable intervals by devices of accuracy traceable to either the National Bureau of Standards or accepted values of natural physical constants.

B. CONTRACTOR's Quality Control Responsibilities include:

- 1. Material property tests for all earthwork items imported from off-site sources.
- 2. Tests on items manufactured or fabricated off-site.
- 3. Field and laboratory quality control tests to control CONTRACTOR's fill and backfill placement operations.

C. Results of all Quality Control activities shall be made available to OWNER and ENGINEER at CONTRACTOR's site office by the end of the next working day.

#### 1.4 OWNER AND ENGINEER QUALITY ASSURANCE

##### A. General

1. OWNER will arrange for, and pay all costs in connection with Quality Assurance activities.
2. Quality Assurance activities performed by OWNER or ENGINEER will not in any way relieve CONTRACTOR of performing Quality Control activities required by the contract documents.
3. Quality Assurance activities will be performed at frequencies as determined appropriate by OWNER or ENGINEER.

##### B. Quality Assurance Testing may include:

1. Additional tests of earthwork materials from off-site sources.
2. Tests and observations of excavations and bearing surfaces for structures.
3. Field testing, laboratory testing, and visual observation of earthwork materials.

C. If requested, CONTRACTOR shall provide representative samples from off-site stockpiles or storage bin(s) for quality assurance testing. OWNER and ENGINEER reserves the right to sample materials at the source of production.

D. Acceptance of the Work will be based on ENGINEER's review of CONTRACTOR's quality control data and OWNER's and ENGINEER's quality assurance data, as well as on visual observation made by ENGINEER of CONTRACTOR's work, including any rework effort required to complete the project in compliance with these Contract Documents.

#### 1.5 TESTING STANDARDS

##### A. Earthwork testing:

1. Compaction - ASTM D 698 or ASTM D 1557, as specified.
2. Moisture Content, Oven Method - ASTM D 2216.
3. Moisture Content, Nuclear Gage Method - ASTM D 3017.
4. Specific Gravity - ASTM D 854.
5. Field Density, Sand Cone Method (plus one-point compaction and moisture content) - ASTM D 1556
6. Field Density, Drive Cylinder Method (plus one-point compaction and moisture content) - ASTM D 2937
7. Field Density, Nuclear Gage Method (plus one-point compaction and moisture content) - ASTM D 2922.
8. Maximum Index Density – ASTM D 4253.
9. Minimum Index Density – ASTM D 4254.
10. Particle Size Analysis - ASTM D 422.
11. Liquid Limit, Plastic Limit, and Plasticity Index - ASTM D 4318.
12. Resistance to Degradation - ASTM C 131.
13. Sodium Sulfate Soundness - ASTM C 88.
14. The percent compaction requirements for earthwork will be evaluated as follows:  
The in-place density as compacted by CONTRACTOR will be determined by the field density test using the sand-cone method (ASTM D 1556). Nuclear density method (ASTM D 2922) may be accepted provided that a correlation is established as

defined in Section 31 21 23: FILL AND BACKFILL. The maximum dry density of the fill at the location of the in-place density test will be estimated using one-point compaction tests and full-curve compaction tests (family of curves) of representative fill materials. Both the one-point compaction tests and the full-curve compaction tests will be performed according to ASTM D 698 or ASTM D 1557, as required by the individual specification section. The one-point compaction data will be used in conjunction with the representative compaction curves to estimate the maximum dry density of the compacted fill at the location of the in-place density test. The percent compaction in-place will be calculated as the ratio (in percent) of the in-place dry density of the compacted fill at the location of the in-place density test to the estimated maximum dry density of the material.

B. Other test requirements as described in individual Specification sections.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

**END OF SECTION**

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**SECTION 01 50 00**  
**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 GENERAL**

1.1 GENERAL

- A. Construction facilities and temporary controls include those items necessary for performance of the Work that are not part of the permanent construction.

1.2 SUBMITTALS

- A. Shop Drawings. Shop drawings submittals may require a review by Riverfront Recapture. Submit at least 21 days prior to start of work which will allow 7 days for Riverfront Recapture's review and 14 days for the ENGINEER/OWNER's subsequent review. The following shop drawings are required:
1. Project Identification Sign
  2. Plan for site access. The plan shall include permits and approvals for secondary site access roads.
  3. Plan for on-site security and fencing.
  4. Plan for staging and stockpile areas.
  5. Plan for obtaining water and delivering water to the necessary construction areas.
  6. Plan for sedimentation and erosion control.
  7. Implementation or control plans for meeting the requirements of OWNER-obtained permits as described in Section 01 57 19: PROJECT PERMITS AND ENVIRONMENTAL CONTROLS.
  8. Plan for temporary utilities
  9. Plan for temporary construction facilities
    - a. CONTRACTOR field office location and layout.
    - b. Temporary access roads, ramps and haul roads; including routes, cross sections, and drainage provisions.
    - c. Staging areas; including parking areas and storage yard layout.
    - d. Temporary fences, gates, and barriers.
    - e. Pedestrian detour routes, sequencing and signage.

B. Administrative:

1. Copies of permits obtained by CONTRACTOR.

1.3 MOBILIZATION AND PREPARATORY WORK

- A. For the purposes of providing for expenses incidental to the initiation of construction and of discouraging unbalanced bidding, an item has been included in the bidding schedule to provide for payment for mobilization and preparatory work. The item for payment for mobilization and preparatory work is intended to compensate the CONTRACTOR for operations including, but not limited to, the following items:
1. Obtaining project permits.
  2. Moving equipment, supplies, and incidentals to the site.
  3. Establishing field offices, buildings, plants, and other facilities at the site.



4. Installing temporary utilities at the site.
  5. Having CONTRACTOR's superintendent at the site full time.
  6. Site maintenance, cleaning and grass mowing.
- B. All facilities, plants, and equipment that are established at, or brought to, the work site shall be deemed to be subject to the provisions of this paragraph unless OWNER specifically provides otherwise in writing for a particular item or items. CONTRACTOR shall be solely responsible for the adequacy, efficiency, use, protection, maintenance, repair, and preservation of all facilities, plants, and equipment. No facilities, plants, or equipment shall be dismantled or removed from the work site prior to completion of the Work under the contract without the written permission of OWNER.

## **PART 2 PRODUCTS**

Not Used

## **PART 3 EXECUTION**

### **3.1 TEMPORARY UTILITIES**

#### **A. Power**

1. CONTRACTOR shall make arrangements and pay all costs for electrical service as required.

#### **B. Telephone**

1. CONTRACTOR shall coordinate and pay for installation of on-site telephone service. Service shall include hook-up to CONTRACTOR field offices.
2. CONTRACTOR shall pay monthly charges for CONTRACTOR's telephone service.

#### **C. Water**

1. The CONTRACTOR shall make arrangements and pay all costs for all water for use in construction activities
2. CONTRACTOR shall provide means to transport and store water to areas used for fill processing, dust control, or other construction activities.
3. CONTRACTOR shall provide and maintain adequate supplies of drinking water for personnel.

#### **D. Sanitary Facilities**

1. Provide and maintain suitable, weather-tight, painted, sanitary toilet facilities for all work persons during the construction period.
2. Existing facility use is not permitted. Provide facilities at time of project mobilization.
3. When toilet facilities are no longer required, promptly remove from site. Disinfect and clean or treat the area as required.
4. Keep all toilet facilities clean and supplied with toilet paper at all times.

#### **E. Lighting**

1. Provide temporary lighting to meet applicable safety requirements to allow erection, application, or installation of materials, and observation and inspection of the Work.

3.2 PROJECT IDENTIFICATION SIGN

A. Provide two project signs at each end of the project as shown on the drawings. Project signs must be posted a minimum of 2 weeks prior to closing the public walkway.

B. Project signs shall read:

YOUR TAX DOLLARS ARE WORKING ON

EAST HARTFORD FLOOD PROTECTION SYSTEM  
TOE DRAIN REPLACEMENT PROJECT PHASE 1

A PROJECT PLANNED AND IMPLEMENTED BY THE DEPARTMENT  
OF PUBLIC WORKS. PLEASE PARDON THE INCONVENIENCE  
WHILE WE IMPROVE THE SAFETY OF OUR COMMUNITY.

<TOWN SEAL>

MAYOR MARCIA A. LECLERC

C. Project sign shall follow the layout as shown on the example shown in Figures A at the end of this Section.

D. Confirm park close and reopening dates with the OWNER prior to fabricating and installing the sign.

E. The CONTRACTOR may install one project sign with the CONTRACTOR's name and phone number. No other signs are allowed without OWNER permission, except those required by law.

3.3 FIELD OFFICES

A. Provide separate CONTRACTOR and CONSTRUCTION MANAGER's Field Offices.

B. CONTRACTOR shall provide and maintain administrative field office facilities within the construction area or at a temporary location within the TOWN OF EAST HARTFORD. OWNER/CONSTRUCTION MANAGER office will not be available to the CONTRACTOR's personnel.

C. CONTRACTOR'S Field Offices shall include:

1. Conference room with table and chairs adequate to seat 12 people.
2. Office lighting and waste baskets.
3. Heating and cooling equipment. Equipment shall maintain an ambient air temperature of 70 degrees Fahrenheit.
4. Interior restroom with hot and cold water.
5. Bottle water cooler with chilled and hot drinking water and cups. CONTRACTOR shall supply bottled water and cups as required for the duration of the project.
6. All necessary utilities for equipment and offices, including internet service. Service shall not be terminated without express approval by the ENGINEER. Utilities shall be connected and disconnected in accordance with local codes. CONTRACTOR shall arrange for utility connections and pay for all utilities (power, water, heating, sewer service, phone, daily office cleaning, etc.) for the duration of the project.

7. High-speed copy / scanning machine with reduction, enlargement, and auto-document feed capable of utilizing at least the following paper sizes: letter, legal, and tabloid (11 X 17 inch)
8. Facsimile machine using 8-1/2 inch by 11 inch plain paper and separate telephone service.
9. Color printer capable of printing at least the following paper sizes: letter, legal, and tabloid (11 X 17 inch).
10. High speed black and white laser printer.
11. Maintain all facilities and keep all equipment in good working condition.

D. CONSTRUCTION MANAGER'S Field Office shall include:

1. An office trailer on blocks for the CONSTRUCTION MANAGER within the limits of work area.
2. Two (2) office spaces and one (1) conference room adjacent to each other with main outside entrance to conference. Minimum size of office 120 square feet each. Minimum size of conference room 160 square feet.
3. Two (2) pedestal desks.
4. One (1) drawing rack capable of supporting (2) sets of the construction drawings.
5. Ten (10) linear feet of 10-inch-deep shelving.
6. One (1) 48 X 48 inch tack board.
7. One (1) 60 X 48 inch blackboard in conference room.
8. One (1) 30 X 60 inch conference table with six additional conference chairs.
9. High-speed copy/scanning machine with reduction, enlargement, and auto-document feed capable of utilizing at least the following paper sizes: letter, legal, and tabloid (11 X 17 inch)
10. Color printer capable of printing at least the following paper sizes: letter, legal, and tabloid (11 X 17 inch).
11. Bottle water cooler with chilled and hot drinking water and cups. CONTRACTOR shall supply bottled water and cups as required for the duration of the project.
12. One (1) refrigerator (minimum of 3 cu. ft.)
13. OSHA approved First-Air Kit
14. Office lighting and waste baskets.
15. Fire Extinguisher
16. Indoor sanitary facilities for the private use of the CONSTRUCTION MANAGER.
17. All necessary utilities for equipment and offices, including internet service. Utilities shall be connected and disconnected in accordance with local codes. CONTRACTOR shall arrange for utility connections and pay for all utilities (power, water, heating, sewer service, daily office cleaning, etc.) for the duration of the project.
18. Heating and cooling equipment. Equipment shall maintain an ambient air temperature of 70 degrees Fahrenheit.

- E. Furnish and maintain light bulbs, toilet paper, paper towels, soap, and other items required to keep the field office clean and functional.

- F. Locate offices near the construction activities and outside of wetland areas. Submit proposed location of offices to CONSTRUCTION MANAGER at least 15 days before mobilization.
- G. Camping will not be allowed at the construction site.
- H. Preparation: Fill and grade sites for temporary structures sloped for drainage away from buildings.
- I. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas to same or better condition as original.

### 3.4 CONSTRUCTION ACCESS AND HAUL ROADS

- A. CONTRACTOR shall investigate the adequacy of existing roads and the allowable load limit on these roads. The CONTRACTOR shall, at its own expense, improve existing access roads and construct new access and haul roads necessary for proper prosecution of the work under this contract.
- B. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.
- C. The CONTRACTOR shall provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic.
- D. The method of dust control shall be adequate to ensure safe operation at all times.
- E. Location, grade, width, and alignment of construction and haul roads shall be subject to approval by the ENGINEER.
- F. Lighting shall be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations.
- G. Upon completion of the work, haul roads designated by the ENGINEER shall be removed.
- H. Access roads and ramps constructed on-site shall be constructed within the limit of work areas.
- I. Maintain drainage ways. Install culverts to allow water to pass without disturbing the roadway.
- J. Existing access roads shall be maintained at pre-construction condition or better throughout the contract period, including any portions of existing levees or levee ramps used for access or haul roads. The CONTRACTOR shall be responsible for the repair of any damage to roads caused by construction operations.
- K. The CONTRACTOR shall survey profiles and cross-sections and make videos of the portions of existing roads, levees, and levee ramps that will be used by the CONTRACTOR as access or haul roads. The surveyed profiles and cross-sections and the video documentation shall be submitted to the ENGINEER at least two weeks prior to use of the roads or levees. A second set of surveyed profiles and cross-sections and video documentation of the roads and levees used shall be made and submitted to the ENGINEER within two weeks after completion of the construction and levee and road restoration work. The survey and video shall demonstrate that the condition of the roads and levee segments after construction are at pre-construction condition or better, defined as follows:
  - 1. Road grade not lower than at pre-construction, per survey profile.
  - 2. Road width not less than pre-construction width, per surveyed cross-sections.

3. Road surfacing in equal or better condition than at pre-construction, per video documentation.

- L. Provide unimpeded access for emergency vehicles.
- M. Provide and maintain access to fire hydrants and control valves free of obstructions.
- N. Provide means of removing mud from vehicle wheels before entering streets.

### 3.5 PROTECTION OF EXISTING ROADS

- A. Obtain all permits required by the ConnDOT and Town of East Hartford during construction. Repair damage to public roads for 100 feet in each direction from the intersection with the project access road. Repairs shall be performed in accordance with the requirements of ConnDOT and the Town of East Hartford.
- B. Prior to using public and project access roads, perform a condition survey of these roads, including the existing culverts and head walls under these roads. The condition survey shall be performed by competent personnel that are qualified and experienced in this work. Sufficient notes, measurements, photographs, videotapes, or other documentation of the existing condition of the roads shall be performed. Survey of public roads shall extend 300 feet in each direction from the intersection with the project access road.
- C. To minimize tracking of mud or debris onto public roads construct anti-tracking pads at site access points for all construction traffic.

### 3.6 PARKING AREAS

- A. Arrange for temporary parking areas to accommodate construction personnel.
- B. Parking for the employees of CONTRACTOR and for OWNER personnel will be allowed in the staging and stockpile areas.
- C. When site space is not adequate, provide additional off-site parking.
- D. Use of existing on-site streets and driveways used for construction traffic is not permitted. Tracked vehicles not allowed on paved areas.
- E. Use of existing parking facilities by construction personnel is not permitted.
- F. Do not allow heavy vehicles or construction equipment in parking areas.
- G. Maintenance:
  - 1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
  - 2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.
- H. Removal, Repair:
  - 1. Remove temporary materials and construction equipment when permanent paving is usable.
  - 2. Repair existing facilities damaged by use, to original condition.
- I. Mud From Site Vehicles: Provide means of removing mud from vehicle wheels before entering streets.

3.7 STAGING AREA

- A. Stockpile equipment, supplies, imported earthfill materials, and other materials incidental to the construction in the staging or stockpile areas or other areas approved by ENGINEER.

3.8 STOCKPILE AREAS

- A. All earthfill, and other construction materials shall be stockpiled in CONTRACTOR staging area or borrow areas, or other areas approved by ENGINEER.
- B. Stockpiling of materials outside of the limits of CONTRACTOR staging area or borrow areas shall require the approval of OWNER.

3.9 WEATHER PROTECTION

- A. Provide protection against weather to maintain all materials, apparatus, fixtures, and work free from damage whether in shipment, in storage, or in place.
- B. Do not perform wet work when temperature is below 35°F or is forecast to be below 35°F within the ensuing 24 hours, except when work is properly protected and sufficient heat is provided.
- C. When heat is required for proper weather protection, provide temporary enclosures of work and acceptable means to provide sufficient heat to maintain a temperature of not less than 50°F. Provide higher temperatures when required by these Specifications.

3.10 FIRE PREVENTION FACILITIES

- A. Establish fire watch for cutting and welding and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.
- B. Portable Fire Extinguishers: NFPA 10; 10 pound capacity, 4A-60B: C UL rating. Provide minimum one fire extinguisher in every construction office, storage shed, and construction vehicle.

3.11 EXISTING FENCES AND GATES

- A. Do not remove existing fences or gates without authorization from OWNER. Where approved, and CONTRACTOR removes existing fences to facilitate the Work, temporary fence protection for lands adjacent to the right-of-way shall be provided at all times during the continuation of the Contract. CONTRACTOR shall rebuild fence in as good condition as found as part of the cleanup operations prior to final acceptance of the completed Work.

3.12 SITE SECURITY

- A. Provide adequate security for protection of OWNER's and CONTRACTOR's property, equipment, and facilities.
- B. All existing and temporary gates and fences shall be secured and locked during non-working hours. Provide padlocks at all gates. All gates shall be double padlocked to allow OWNER, CONSTRUCTION MANAGER, and ENGINEER access to the site without disturbing CONTRACTOR's locks.

3.13 OPERATIONS AND STORAGE AREAS

- A. Do not enter on or occupy with men, tools, equipment, or material any ground outside OWNER's property without the written consent of the owner of such ground.
- B. Other contractors and employees or agents of OWNER may for all necessary purposes enter upon the Work and premises used by CONTRACTOR. Conduct work so as not to impede unnecessarily any work being done by others on or adjacent to the site.

3.14 TEMPORARY FENCING AND BARRICADES

- A. CONTRACTOR shall erect and maintain temporary fencing and barricades to limit public access to the work area and to hazardous areas. Temporary fencing and barricades shall be required whenever safe public access to paved areas such as roads, parking areas, or sidewalks is prevented by construction activities or whenever necessary to ensure the safety of both pedestrian and vehicular traffic. Temporary Fencing and barricades shall be securely placed and shall be clearly visible and adequately illuminated to provide sufficient visual warning of the hazard during both day and night.

3.15 SITE MAINTENANCE

- A. Promptly remove materials or equipment that have served their use on the Site.
- B. At the end of each day, perform the following:
  - 1. Secure the site and work areas.
  - 2. Store equipment and materials in approved locations;
- C. The CONTRACTOR shall maintain all grassed areas between the limits of work area until final acceptance of the project and shall restore or replace any portion of the seeding work that is found defective or which becomes damaged prior to final acceptance. Maintenance shall include:
  - 1. Mow grass every two weeks unless greater interval allowed by OWNER due to slower seasonal growth rates. CONTRACTOR is responsible to mow all grass (new and existing) within the limits of the work area. The grass shall be mowed to a height of 4 to 8 inches. The maximum height of grasses shall be 8 inches.
  - 2. Restoration or replacement work shall include the reestablishment of the grade or profile of the area, replacement of topsoil, re-fertilization, reseeding and re-mulching as directed by the ENGINEER. When the damage consists only of the displacement of mulch, the mulch shall be replaced within 7 days.
  - 3. Reseed and mulch spots larger than 1 sq. ft. without uniform stand of grass.

3.16 CLEANUP AND DISPOSAL OF WASTE MATERIALS

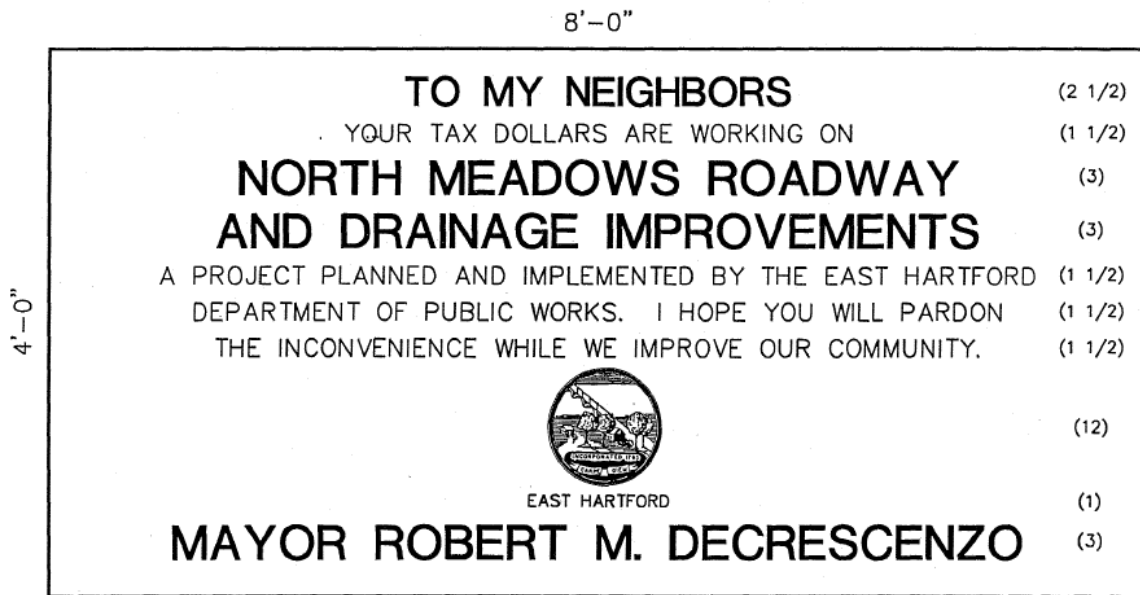
- A. The cleanup and disposal of waste materials and rubbish shall be in accordance with applicable Laws and Regulations. Should a conflict exist in the requirements for cleanup and disposal of waste materials, the most stringent requirement shall apply.
- B. Keep work and storage areas free from accumulations of waste materials and rubbish, and before completing the Work.
- C. Remove all plant and storage facilities, buildings, including concrete footings and slabs, rubbish, unused materials, concrete forms, and other materials that are not a part of the permanent Work.

- D. Upon completion of the Work, and following removal of construction facilities and required cleanup, work areas shall be regraded, reclaimed, and left in a neat manner conforming to the natural appearance of the landscape.
- E. Clean and repair damage caused by installation or use of temporary work.
- F. Waste materials, including but not restricted to, cleared and grubbed vegetation, refuse, garbage, sanitary wastes, chemical additives, industrial wastes, oil, and other petroleum products, shall be disposed of by CONTRACTOR by removal from the construction area. Dispose of material in an appropriate off-site waste disposal facility. The off-site waste disposal facility shall be approved by ENGINEER.
- G. Burning of cleared vegetation and waste materials shall not be permitted.

**END OF SECTION**



**Figure A – Example Project Identification Sign**



NOTE: NUMBERS IN PARENTHESIS REFER TO HEIGHT  
OF LETTERS AND SEALS IN INCHES.

COLORS: WHITE LETTERS  
BLUE BACKGROUND

## LAYOUT FOR PROJECT SIGN

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**SECTION 01 55 26**  
**TRAFFIC CONTROL**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to complete all traffic control required to complete the work as shown on the drawings.

1.2 REFERENCES

- A. Connecticut Department of Transportation, Standard Specification for Roads, Bridges and Incidental Construction, Form 816.
- B. Connecticut Department of Transportation, Highway Design Manual 2003 Edition (Including Revisions to January 2011)
- C. Connecticut Department of Transportation, Construction Manual Volume 2, Engineering and Highway Operations, Office of Construction Version 2.2 August 2010.

1.3 SUBMITTALS

- A. Administrative:
  - 1. Copies of Traffic Control permits obtained by CONTRACTOR.
  - 2. Traffic Control Plan (TCP) or Method of Handling Traffic (MHT) developed by the CONTRACTOR.
  - 3. Traffic Control Devices.

1.4 OTHER JURISDICTIONS

- A. Portions of the work are located outside property or right-of-ways owned by the Town of East Hartford. The CONTRACTOR shall secure all traffic control & permits required from other applicable jurisdictions
- B. Obtain traffic control permits as required by other municipal, county or state agencies when the Work requires traffic control devices to be installed within the limits of their respective jurisdictions.
- C. The CONTRACTOR shall contact other appropriate municipalities at least seventy-two (72) hours before starting work in any areas that will affect or change traffic flow within other jurisdiction(s). The CONTRACTOR shall obtain approval from the respective responsible representative of other jurisdictions for any lane or street closure, or any change or interruption of the flow of traffic within that respective Jurisdiction. If the CONTRACTOR desires to revise the approved TCP or MHT as a result of comments received from other jurisdictions, the CONTRACTOR shall submit such revisions to the OWNER and allow one (1) week for review and comment. The OWNER will approve a plan that, in his judgment, provides adequately for the safety and convenience of the public and provides the same or greater service as the previously approved plan.

## 1.5 SEQUENCE AND SCHEDULE OF WORK

- A. The CONTRACTOR shall work only between the hours of 9:00 a.m. and 4:00 p.m. on Arterial and Collector streets, with the stipulation that only one direction of travel be interrupted at any given time. Active traffic control devices shall be installed and removed between the hours of 9:00 a.m. and 4:00 p.m. The CONTRACTOR must maintain at least one (1) lane of traffic in each direction as well as a median lane for left turn movements on all Collector and Arterial Streets unless otherwise approved by the OWNER and incorporated into an approved MHT. Requests for other hours, special conditions or time allowances will be subject to approval by the OWNER.
- B. The CONTRACTOR will not be permitted to have construction equipment, personal vehicles, or materials in the lanes open to traffic unless permitted by the OWNER. The CONTRACTOR is cautioned that all personal vehicle and construction equipment parking will be prohibited where it conflicts with safety, access, or flow of traffic at any time. Personal vehicle and construction equipment parking will be prohibited on all private lots without the respective property owner's permission.
- C. In the event there is a violation of the working hour's limitations or any other Traffic Control requirement, the CONTRACTOR will automatically be subject to a "Stop Work Order" to be imposed at the beginning of the next working day. Work shall not resume until the CONTRACTOR assures the OWNER, in writing, that there will not be a reoccurrence of the violation.
- D. During non-construction periods (evenings, weekends, holidays, etc.), all Work shall be adequately protected to ensure the safety of vehicular and pedestrian traffic. Open trenches during non-construction periods are not permitted. The CONTRACTOR must periodically check on the condition of traffic control devices that may be utilized during the course of the Project on weekends or holidays as may be warranted to ensure that devices that are damaged or moved during non-work hours are restored in an expedient fashion.
- E. Three days prior to mobilization for all Arterial and Collector streets the CONTRACTOR shall install one changeable message sign in each direction or as approved by the engineer. The signs will advertise the anticipated start date, Project duration and description. The signs will be required to be updated should information expressed be changed during the course of the Project.

## PART 2 PRODUCTS

### 2.1 TRAFFIC PERSON

- A. The provision of Section 9.70 shall apply amended as follows:
  - 1. The CONTRACTOR shall be responsible for contacting the Town of East Hartford Police Department Safety Officer and coordinating and requesting police services required to direct traffic on existing roadways where traffic is maintained. Police Services will be required on all Collector and Arterial roadways. The CONTRACTOR may utilize uniformed flaggers or police officers (as defined by Section 9.70.01 of the Standard Specifications) on all other project roadways. If at any time the Police Department is unable to provide the necessary personnel, the CONTRACTOR shall be allowed to supplement as required with uniformed flaggers.
  - 2. All costs in connection with Police Services for traffic control will be paid for by the CONTRACTOR with reimbursement by the Town of East Hartford as a direct cost

with no mark-up. CONTRACTOR shall provide proof of payment for all Police Services prior to requesting reimbursement of these costs from the Town.

3. Reimbursement of costs in connection with Uniformed Flaggers shall be paid for as detailed in Article 9.70.05 of the Standard Specifications, which shall allow a markup of 5%.

## 2.2 TRAFFIC CONTROL DEVICES

- A. Construction area traffic controls and devices shall conform to the requirements in the Connecticut Department of Transportation Highway Design Manual, Standard Specification for Roads, Bridges and Incidental Construction, Form 816, Construction Manual Volume 2, and this specification. All traffic controls and devices shall be as specified in the Connecticut DOT references unless otherwise indicated herein or in the Contract. At no time shall the requirements in these Specifications be construed as to reduce the minimum standards set by the Connecticut DOT.
- B. Traffic Control Devices shall include but are not limited to the follow:
  1. Temporary Precast Concrete Barrier
  2. Construction Signs
  3. Changeable Message Signs
  4. Arrow Boards
  5. Traffic Barrels
  6. Traffic Cones
  7. Impact Attenuators
  8. Pavement Markings
  9. Barricades
- C. All traffic control devices shall be placed before beginning work and shall be removed from the right-of-way at the end of each day or shift, or, for long-term closures, when no longer needed, and shall be placed so as to not obstruct bicycle lanes and pedestrian facilities. All traffic control devices left in the right-of-way by the CONTRACTOR are subject to removal. The CONTRACTOR shall be required to pay any costs incurred by the agency associated with the removal of these devices. Traffic control plans shall be approved by the governing agency as required.
- D. No equipment shall be parked within any traffic lanes, medians, or within the public right-of-way at any time of day or night, including holidays and weekends, without an approved lane or road closure. The CONTRACTOR shall provide a minimum of five (5) Working Days in advance of any lane closure and twenty (20) Working Days in advance of any road closure.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. The CONTRACTOR is responsible to coordinate and obtain all traffic control permits from the Town of East Hartford and Connecticut Department of Transportation, unless otherwise noted.

### 3.2 INSTALLATION

- A. The CONTRACTOR is responsible for developing the exact sequence that will be followed to complete the work.
- B. Drums shall be placed at a maximum spacing of thirty (30) feet. Each barricade shall be furnished with two steady-burn beacons. Other construction traffic control devices shall be used where applicable.
- C. Traffic lanes through construction areas shall be maintained as shown on the approved traffic control plans or with a clear width of at least eleven (11) feet per lane. When directed by the OWNER, the CONTRACTOR shall provide and maintain an acceptable temporary asphalt surface for temporary roads or driveways.
- D. The CONTRACTOR shall designate a qualified and trained Traffic Control Supervisor (TCS) who will be responsible that all traffic control devices, signs, and when needed traffic persons are in their required location for the completion of the work. The TCS shall check the jobsite at the end of each work period before leaving the job site.
- E. Construction Parking Control:
  - 1. The CONTRACTOR shall control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, OWNER's operations, or construction operations.
  - 2. The CONTRACTOR shall monitor parking of construction personnel's private vehicles.
- F. Maintain free vehicular access to the staging areas.

### **END OF SECTION**

**SECTION 01 57 13**  
**TEMPORARY EROSION AND SEDIMENT CONTROL**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to complete all temporary erosion and sediment control required to complete the work as shown on the drawings and including the following:
1. Install and maintain erosion protection and sediment control.
    - a. Erosion protection and sediment control measures shall comply with the erosion, and sediment controls shown on the Drawings and approved by East Hartford Planning and Zoning, and all requirements for other local, state, and federal permits associated with erosion protection and sediment control. This shall include, but may not be limited to, the permits described in Section 01 57 19: PROJECT PERMITS AND ENVIRONMENTAL CONTROLS.

1.2 REFERENCES

- A. 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, State of Connecticut DEP Bulletin 34.

1.3 DEFINITIONS

- A. Sediment and Erosion Control devices as defined herein shall mean silt fences, hay bales, sediment control logs, catch basin inserts, erosion control blankets, anti-tracking pad , or other devices approved by ENGINEER.
- B. Plan: Stormwater Pollution Control Plan.
- C. General Permit: General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities.

1.4 SUBMITTALS

- A. Stormwater Pollution Control Plan (Plan) shall be submitted at least 45 days prior to commencing any activities that will disturb the ground surface. The Plan shall include, at a minimum, the following information:
1. Items required by Section 6(b) of the General Permit (if required).
  2. Products, and procedures to meet the requirements of erosion protection and sediment control requirements of all required project permits and requirements in these Specifications.
  3. Procedure, installation details of constructing all required erosion protection and sediment controls.
  4. Procedures and schedule to inspect, maintain, monitor, and repair erosion protection and sediment controls.
  5. Product data of proposed materials to be used to control erosion and sediment.
  6. Drawings that clearly show erosion and sediment control measures to be used for each stage of construction.
  7. Schedule of removal of sediment and erosion control devices.

- B. Registration. Registration form required by the General Permit at least 30 days prior commencing any activities that will disturb the ground surface.

**PART 2 PRODUCTS**

2.1 SILT FENCE

- A. Pervious Sheet: Polyester, polypropylene, or nylon filaments, woven into a uniform pattern, distinct and measurable openings.
- B. In accordance with requirements of Table 1:

TABLE 1

Physical Property	Required value	Test Method
Weight, oz./sq.yd., minimum	4	ASTM D 3776
Equivalent Opening Size, maximum	50 – 70	U.S. Standard Sieve
Grab Tensile Strength, lb., minimum	120	ASTM D 4632
Elongation, % maximum	15	ASTM D 4632
Mullen Burst Strength, psi, minimum	300	ASTM D 3786
Ultraviolet Radiation Resistance, % Strength Retention	70	ASTM D4355
Flow Rate, gal/minute/sq.ft, minimum	10	ASTM D 4491
Ultraviolet Radiation Stability, % minimum	90	ASTM G 26

- C. Support Fence:
  - 1. Wire Mesh Material: As recommended by manufacturer of geotextile; strong enough to support applied loads.
  - 2. Support Posts: As recommended by manufacturer of geotextile.
  - 3. Fasteners: Heavy-duty wire staples at least 1 inch long, tie wires or hog rings, as recommended by manufacturer of geotextile.

2.2 HAY BALES

- A. Hay bales or wattles used for short-term or long-term erosion control, silt fencing, and as vegetation aid shall be certified weed free.
- B. Hay bales shall be securely set in place by partially burying the bottoms and anchoring with redwood stakes per Urban Drainage Standards.

2.3 SEDIMENT CONTROL LOGS

- A. Straw-filled tube of flexible netting material. Machine-produced tube of compacted straw that is certified weed free. Netting shall consist of seamless, high-density polyethylene and ethyl vinyl acetate and contain ultraviolet inhibitors.
- B. Meet the minimum performance requirements in Table 2.

TABLE 2

Physical Property	Test Method	Required Value
Mass per Unit Weight, lbs/ft	Field Measured	1.6
Dimension, inch diameter	Field Measured	8.0 – 9.0
Net Strand Thickness, inch	Field Measured	0.030
Netting Unit Weight, ounces/ft.	Certified	0.35
Sediment Retention Capacity, lbs/ft	Rainfall Sim. <sup>(1)</sup>	30
Installed Free-Board Ht., inches	Field Measured	6.0 – 7.0
Soil Loss <sup>(1)</sup> , % effectiveness	Rainfall Sim. <sup>(1)</sup>	58 <sup>(2)</sup>
De-Stabilizing Moisture, % Retained (max.)	Rainfall Sim. <sup>(1)</sup>	11

Notes:

1. Minimum of three 10-year predicted storm events on 3H:1V slope with clayey sand type soil.
2. Minimum sediment yield reduction value.

#### 2.4 CATCH BASIN INSERT

- A. Catch basin insert shall be a Siltsack®, or approved equivalent.
- B. Catch basin insert shall be manufactured to fit the opening of the catch basin or drop inlet. Catch basin insert shall have the following features:
  1. Dump straps attached at the bottom to facilitate the emptying.
  2. Lifting loops as an integral part of the system to be used to lift the insert from the basin.
  3. Restraint cord approximately halfway up the sack to keep the sides away from the catch basin walls, this cord is also a visual means of indicating when the sack should be emptied. Once the strap is covered with sediment, the insert should be emptied, cleaned and placed back into the basin.

#### 2.5 EROSION CONTROL BLANKETS

- A. Erosion control blankets shall satisfy the requirements in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, State of Connecticut DEP Bulletin 34. Erosion control blankets shall be:
  1. Composed of fibers and/or filaments that are biodegradable or photodegradable within two years but without substantial degradation over the period of intended usage (five months maximum),
  2. Mechanically, structurally or chemically bound together to form a continuous matrix of even thickness and distribution that resists raindrop splash and when used with seeding allows vegetation to penetrate the blanket,
  3. Of sufficient structural strength to withstand stretching or movement by wind or water when installed in accordance with the manufacturer’s recommendations,
  4. Free of any substance toxic to plant growth and unprotected human skin or which interferes with seed germination,
  5. Contain no contaminants that pollute the air or waters of the State when properly applied, and
  6. Provide either 80%-95% soil coverage when used as a substitute for Mulch for Seed or 100% initial soil coverage when used as a substitute for Temporary Soil Protection measure.



2.6 ANTI-TRACKING PAD

- A. Construct anti-tracking gravel pad to dimensions shown on the drawing or as approved by the ENGINEER to control materials being transported onto public roads via vehicles leaving the site. Maintain proper operations of the anti-tracking pad for the duration of the project.

**PART 3 EXECUTION**

3.1 GENERAL PERMIT COMPLIANCE (ONLY IF REQUIRED)

- A. Submit the General Permit registration and fee to CTDEP at least 30 days prior commencing any activities that will disturb the ground surface. The CONTRACTOR is responsible for paying all permit and registration fees.
- B. Submit the Plan to CTDEP at least 30 days prior commencing any activities that will disturb the ground surface. The CONTRACTOR is responsible for this Plan. The ENGINEER will provide paper and electronic copies of the Sediment and Erosion Control plans approved by East Hartford Planning and Zoning.

3.2 SEDIMENT AND EROSION CONTROL

- A. Install erosion controls to the required lines, levels, contours, and datums shown on the Drawings.
- B. Install sediment and erosion controls prior to work involving site clearing, stripping and stockpiling topsoil, excavation, and earthwork.
- C. Maintain and repair sediment and erosion controls during course of construction.

3.3 SILT FENCE

- A. Silt fence shall be one-piece or continuously sewn to make one-piece geotextile for full height of the fence, including portion buried in the toe trench.
- B. When joints are necessary, splice geotextile together only at a support post, with a minimum 6-inch overlap, and securely fasten both ends to support post.
- C. Geotextile shall not extend more than 24 inches above the ground surface. Securely fasten to up slope side of each support post using ties or staples. Bottom portion of geotextile shall be securely backfilled in toe trench such that it is not easily pulled out by hand. Geotextile shall not be stapled to existing trees.
- D. Fasten wire mesh material support fence securely to up slope side of post fasteners. Extend wire into the trench a minimum of 4 inches, and not more than 36 inches above the ground surface.
- E. Take precaution not to puncture geotextile during installation. Repair or replace damaged area.

3.4 SEDIMENT CONTROL LOGS (SCL)

- A. Excavate a small trench, 2 to 3 inches in depth on the slope contour and perpendicular to water flow. Soil from the excavation should be placed down slope next to the trench.
- B. Install the SCL in the trench, ensuring that no gaps exist between the soil and the bottom of the SCL. The ends of adjacent SCLs should be tightly abutted so that no opening exists for water or sediment to pass through.

- C. Wooden stakes should be used to fasten the SCL to the soil. Place stakes at 4 feet on center.
  - D. Terminal ends of SCL should be doglegged upslope to ensure containment and prevent channeling of sedimentation.
- 3.5 CATCH BASIN INSERT
- A. Install catch basin insert in accordance with manufactures instructions.
- 3.6 EROSION CONTROL BLANKETS
- A. Install at locations where required or as shown on the drawings.
  - B. Install as shown on the drawings.
  - C. Install following seeding on slopes of at least 3H:1V, as directed by the ENGINEER, and in accordance with manufacturer's recommendations.
  - D. Staples shall be installed as per Manufacturer's recommendations.
  - E. Where two lengths are joined, the end of the up-grade strip shall overlap the down-grade strip.
  - F. The CONTRACTOR shall maintain and protect the areas with erosion control matting until such time as the turf grass is established.
- 3.7 ANTI-TRACKING PADS
- A. Construct anti-tracking pad as necessary to control sediment leaving the site.
- 3.8 DUST CONTROL
- A. Apply water uniformly over the surface when dust becomes a nuisance or when directed by the ENGINEER. Provide shut-off valve in convenient location on water truck, to allow for regulating water flow.
- 3.9 MAINTENANCE
- A. Inspect control system at least once per week, immediately after each rainfall and daily during prolonged rainfall. Make repairs immediately.
  - B. Remove and dispose of accumulated sediments when sediment reaches approximately one-third the height of the control system, or when directed by the ENGINEER.
  - C. Replace control system promptly if fabric decomposes or system becomes ineffective prior to the expected usable life.
  - D. Maintain or replace system until no longer necessary for the intended purpose.
- 3.10 REMOVAL OF TEMPORARY FACILITIES
- A. Do not remove erosion control facilities without written approval from Engineer.
  - B. All erosion control facilities will be the property of Contractor, and shall be removed and disposed of offsite after all Work is complete.
  - C. Remove and dispose of sediments collected in the sediment control systems in accordance with Section 01 50 0: TEMPORARY FACILITIES AND CONTROLS.

**END OF SECTION**

**SECTION 01 57 19**  
**PROJECT PERMITS AND ENVIRONMENTAL CONTROLS**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Project Permits
- B. Abatement of Air Pollution
- C. Abatement of Noise Pollution
- D. Abatement of Water Pollution
- E. Landscape Preservation
- F. Preservation of Trees and Shrubs
- G. Preservation of Historical And Archaeological Data
- H. Protection of Endangered Species

1.2 SUBMITTALS

A. Shop Drawings:

- 1. At least 30 days prior to the start of construction, provide copies of all necessary State and local permits required to complete the Work.
- 2. At least 30 days prior to the discharge or handling of any wastewaters, submit a detailed Water Quality Management Plan containing the following information:
  - a. Name of the person who will be responsible for implementing and carrying out the plan.
  - b. Precautions that will be taken to avoid discharge or accidental spills of oil or wastewater into river, stream, watercourse, or lake.
  - c. Methods of handling and treating wastewater, including locations for evaporation or settling ponds, treatment facilities, and discharge points. Estimates of the amount of wastewater that may be handled and treated at each location.
  - d. Methods for preventing or controlling runoff and erosion for all construction sites, both during and after construction, including the following areas:
    - i. Access roads
    - ii. Stockpile and waste areas
    - iii. Construction plant and equipment yards
    - iv. All excavated surfaces
    - v. Other impacted areas
  - e. The Water Quality Management Plan shall relate the methods and descriptions above to the conditions of required permits.

1.3 PROJECT PERMITS

- A. Comply with OWNER obtained permits. These include:
- Town of East Hartford - Planning and Zoning
  - Town of East Hartford - Natural Resource and Filling

- CT DEEP Dam Construction Permit
- Town of East Hartford - Sediment and Erosion Control
- Town of East Hartford – Major Flood Hazard Development

- B. Copies of OWNER-obtained permits are included in Attachment F.
- C. Obtain all other State and local permits required for the Work.
- D. If the aggregate storage of oil at the Site is over 1,320 gallons or a single container has a capacity in excess of 660 gallons, prepare a Spill Prevention Control and Countermeasure (SPCC) plan. The plan shall be prepared and certified by a Registered Professional Engineer registered in the State of Connecticut.
- E. All oil storage tanks shall be placed at least 20 feet from streams, flowing or dry watercourses, lakes, wetlands, reservoirs, and any other water source, and the area surrounding the tanks shall be diked to contain more than 1-1/2 times the volume of the largest tank, or more than half the volume of all tanks within the diked area, whichever is greater. Underground storage tanks shall be used only upon submission and approval of a written management plan documenting all necessary regulatory compliance.

#### 1.4 ABATEMENT OF AIR POLLUTION

- A. Abatement of air pollution shall be performed in accordance with the requirements of the Air Pollution Emission Permit and applicable Laws and Regulations concerning the prevention and control of air pollution. Use such methods and devices as are reasonably available to prevent, control, and otherwise minimize atmospheric emissions or discharges of air contaminants.
- B. Burning of cleared materials, combustible construction materials, and rubbish will not be allowed.
- C. Apply a dust-preventive treatment or periodically water access and haul roads to prevent dust.

#### 1.5 ABATEMENT OF NOISE POLLUTION

- A. Abatement of noise pollution shall be performed in accordance with applicable Laws and Regulations regarding the prevention, control, and abatement of harmful noise levels.

#### 1.6 ABATEMENT OF WATER POLLUTION

- A. CONTRACTOR shall register under and comply with State of Connecticut Department of Environmental Protection General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, if the contractor proposes activities that would trigger this permit.
- B. Excavated materials or other construction materials shall not be stockpiled or wasted near or on streambanks, lake shorelines, or other watercourse perimeters where they can be washed away by high water or storm runoff, or can in any way encroach upon the watercourse itself.
- C. Include prevention measures to control silting and erosion, and to intercept and settle any runoff of sediment-laden waters. Refer to Section 01 57 13: TEMPORARY EROSION AND SEDIMENT CONTROL. Wastewater from general construction activities, such as drain water collection, drilling, grouting, or other construction operations, shall not enter flowing or dry watercourses without the use of approved turbidity control methods. All such wastewaters discharged shall contain the least concentration of settleable material possible,

and shall meet all conditions of the DEEP General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities.

1.7 LANDSCAPE PRESERVATION

- A. Preserve the natural landscape, and conduct operations so as to prevent unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the Work. Movement of crews and equipment within the rights-of-way and over routes provided for access to the Work shall be performed in a manner to prevent damage to property. When no longer required, construction roads shall be restored to original contours and made impassable to vehicular traffic.

1.8 PRESERVATION OF TREES AND SHRUBS

- A. Preserve and protect existing vegetation not required or otherwise authorized to be removed. Vegetation shall be protected from damage or injury caused by CONTRACTOR construction operations, personnel, or equipment by the use of protective barriers or other methods. Removal of existing vegetation not specifically required to be removed will require prior approval by ENGINEER.

1.9 PRESERVATION OF HISTORICAL AND ARCHAEOLOGICAL DATA

- A. Should CONTRACTOR, or any of CONTRACTOR's employees, or parties operating or associated with CONTRACTOR, in the performance of this Contract discover evidence of possible scientific, prehistorical, historical, or archeological data, immediately cease work at that location and notify ENGINEER, giving the location and nature of the findings. Forward written confirmation to OWNER within 2 days. Exercise care so as not to disturb or damage artifacts or fossils uncovered during excavation operations, and provide such cooperation and assistance as may be necessary to preserve the findings for removal or other disposition by OWNER.
- B. Where appropriate by reason of discovery, ENGINEER may order delays in the time of performance or changes in the Work, or both. If such delays or changes are ordered, an equitable adjustment will be made in the Contract in accordance with the applicable clauses of the Contract.

1.10 PROTECTION OF THREATENED AND ENDANGERED SPECIES

- A. Conform to requirements of applicable project permits, approvals, and local, state and federal laws, regulations and ordinances.
- B. There are no known Threatened and Endangered Species on the project site.
- C. Unknown Threatened and Endangered Species
  - 1. If CONTRACTOR, any of CONTRACTOR's employees, or parties operating or associating with CONTRACTOR in the performance of this Contract, discover evidence of endangered or threatened species during construction:
    - a. Immediately cease work at that location.
    - b. Notify ENGINEER and OWNER of the location and nature of the findings within 24 hours.
    - c. Do not disturb the discovered species or damage habitat.
    - d. Cooperate and assist to relocate the species or other disposition by OWNER.

2. Where appropriate by reason of a discovery, ENGINEER may order delays in time of performance or changes in the Work, or both.
  - a. If such delays, or changes, or both, are ordered, the time of performance and Contract Price will be adjusted in accordance with the applicable clauses in the Contract.

#### 1.11 FLOOD CONTINGENCY PLAN

- A. As required under the CT DEEP Dam Construction Permit, a completed “Flood Contingency Plan” is required to be prepared and implemented by the CONTRACTOR. The CONTRACTOR’s final flood contingency plan must meet the minimum standards outlined in the Flood Contingency Plan included as Attachment 1 in the DEEP Dam Construction Permit. Application contained in Appendix F.
- B. At least 14 days prior to mobilizing to the site, submit a Flood Contingency Plan.
- C. The CONTRACTOR’s final flood contingency plan should also include, but not limited to the following:
  1. A list of equipment and materials that will be stored within the floodplain.
  2. A description of how river levels will be monitored at the site. Include the name of the person responsible for monitoring the river levels and forecasts and how they will communicate with staff.
  3. The measures to be undertaken before, during, and after a significant rainfall or flood event. Include information on how equipment or stockpiles within the flood plain will be removed or secured if their removal is impractical
  4. Identify contingency actions, procedures, and specific time factors for:
    - a. Informing persons at the project site at the onset of flooding
    - b. Securing the site during floods.
  5. The plan should identify the storm event and river levels that will adversely affect construction activities at the project site.
  6. Flood Contingency Plan is not in effect until approved by the Town.

### **PART 2 PRODUCTS**

Not Used

### **PART 3 EXECUTION**

Not Used

**END OF SECTION**

**SECTION 01 77 00**  
**PROJECT CLOSEOUT**

**PART 1 GENERAL**

1.1 SUBMITTALS

- A. Administrative:
  - 1. Record Drawings
  - 2. Operating and Maintenance Instructions
  - 3. Project Closeout Report

1.2 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean the site, sweep paved areas, and rake clean landscaped surfaces.
- C. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.3 FINAL INSPECTION

- A. Request a final inspection in writing at least ten (10) calendar days prior to the anticipated date of completion.
- B. Perform final inspection with CONTRACTOR, OWNER, CONSTRUCTION MANAGER, ENGINEER, a representative of the Connecticut Department of Energy and Environmental Protection, and a representative from the United States Army Corps of Engineers.
- C. Work will not be considered ready for final inspection until all Work has been completed, and CONTRACTOR has certified that all items are properly operating and in compliance with all Contract terms and conditions. CONTRACTOR's project manager or project superintendent shall be at the Site during the final inspection.

1.4 RECORD DRAWINGS

- A. Submit the record copy of the drawing set that was maintained at the site during construction.
- B. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the ENGINEER's reference during normal working hours.
- C. Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
- D. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
- E. Mark new information that is important to the OWNER, but was not shown on Contract Drawings or Shop Drawings.

- F. Note related Change Order numbers where applicable.
- G. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
- H. Submit record drawings at request for final inspection.

#### 1.5 AS-BUILT DRAWINGS

- A. The ENGINEER will incorporate the Contractor's Record Drawings into a draft As-Built Drawing set.
- B. The CONTRACTOR shall work with the ENGINEER to resolve any discrepancies and assist in preparing the As-Built drawings.
- C. The CONTRACTOR shall review the draft As-Built drawings. Once the As-Built drawings are acceptable, the CONTRACTOR shall add his signature to the following statement: "I certify that this As-Built drawing is a true representation of the Work actually constructed."

#### 1.6 PROJECT RECORD DOCUMENTS

- A. Maintain one set of the following record documents on site; record actual revisions to the Work:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. Change Orders and other modifications to the Contract.
  - 5. Reviewed Shop Drawings, Product Data, and Samples.
  - 6. Manufacturers' instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by the OWNER.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress. The ENGINEER will review record documents, as the Work progresses. Prior to applying for progress payments, submit record documents related to the work for which payment is being requested. The OWNER will not accept application for progress payment without the ENGINEER's verification of record documents.
- E. Specifications: Legibly mark and record at each product section the description of actual products installed including the following:
  - 1. Manufacturer's name and product model and number.
  - 2. Product substitutions or alternates used.
  - 3. Changes made by addenda and modifications.
- F. Record Documents and Shop Drawings: Legibly mark in red ink each item to record actual construction including:
  - 1. Measured depths of foundations in relation to project datum.
  - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  - 4. Field changes of dimensions and details.
  - 5. Details not on the original Contract Drawings.



- G. Record documents may be provided in electronic format. Coordinate with the ENGINEER prior to the start of Work.
- H. Label all documents as "Record" and remove the ENGINEER's title block and seal from all documents.
- I. Submit final documents to the ENGINEER with the claim for final Application for Payment.

#### 1.7 CLOSEOUT REPORT

- A. Complete a closeout report which shall include the following:
  - 1. Description of work
  - 2. Final Quantities and Backup Data
  - 3. Description of Variation of the Work
  - 4. Quality Control Testing Data
  - 5. Warranties and Guarantees for Planting and Products

#### 1.8 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for the ENGINEER's review.
- B. Provide OWNER with complete list of all products, spare parts, maintenance and extra materials, forms, and documentation delivered to the storehouse prior to final payment.
- C. Provide submittals to the ENGINEER and OWNER that are required by governing or other authorities.
- D. Submit final Application for Payment, identifying total adjusted contract sum, previous payments, and sum remaining due.

#### 1.9 WARRANTIES

- A. Provide duplicate copies.
- B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents and assemble in three-ring binders with durable plastic covers.
- D. Submit prior to final testing of equipment and training of OWNER.
- E. For items of Work delayed beyond the date of Substantial Completion, provide updated submittal within 10 workdays after acceptance, listing date of acceptance as start of warranty period.

### **PART 2 PRODUCTS**

Not Used

### **PART 3 EXECUTION**

Not Used

**END OF SECTION**

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**SECTION 02 41 13  
SELECTIVE SITE DEMOLITION**

**PART 1 GENERAL**

**1.1 WORK INCLUDES**

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to perform selective structure demolition as required to complete the selective site demolition as shown on the drawings and including the following:
  - 1. Bituminous pavement
  - 2. Curbs
  - 3. Concrete sidewalks, walkways,
  - 4. Handrails
  - 5. Manholes
  - 6. Existing utility piping
  - 7. Other items required to perform the work or as directed by the ENGINEER
- B. Dispose of all demolition material in accordance with the requirements of Section 01 50 00: TEMPORARY FACILITIES AND CONTROLS.

**1.2 SUBMITTALS**

- A. Demolition Schedule: Indicate overall schedule and interruptions required to utility, rail, road and sidewalk services.
- B. Selective Demolition Plan: Submit a comprehensive selective demolition plan, describing the proposed sequence, methods and equipment to be used for demolition, removal, and disposal of structures. Do not proceed with demolition work until the Selective Demolition Plan has been approved by the ENGINEER.

**1.3 MATERIALS OWNERSHIP**

- A. Unless otherwise indicated, demolition waste becomes property of the CONTRACTOR.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

**3.1 PREPARATION**

- A. Erect and maintain temporary lights, barricades, curtains, signs, and other measures as necessary to protect the public, workers, and adjoining properties from damage from demolition work, all in accordance with applicable codes and regulations.
- B. Protect active utilities as indicated, or when not indicated, found or otherwise made known to the CONTRACTOR before or during demolition work. If utility is damaged, immediately notify the ENGINEER.

- C. Notify affected utility companies before starting work and comply with their requirements. Mark location and termination of utilities.

### 3.2 DEMOLITION

- A. Perform demolition and removal work in accordance with the approved Selective Demolition Plan.
- B. Remove items indicated for demolition within the limits of the Work, as shown on the drawings. Do not remove anything beyond the limits of Work indicated without prior written approval of the ENGINEER.
- C. Neatly saw cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage existing structures beyond the limits of the Work.
- D. Remove materials in an orderly and careful manner, to the extent shown on the drawings, providing for neat and orderly junctions between existing and new materials.
- E. Protect existing structures, facilities, and landscaping from damage. Items damaged as a result of demolition operations shall be repaired or replaced at no additional cost to the OWNER.
- F. Cease operations immediately if the structure appears to be in danger and notify the ENGINEER.
- G. Remove temporary work.

### 3.3 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove sidewalks, walkways and pavement as indicated.
  - 1. Remove sidewalk and walkways at nearest construction joint.
  - 2. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.

### 3.4 STORAGE AND DISPOSAL OF DEMOLISHED MATERIALS

- A. Except for items or materials indicated to be recycled, reused, salvaged, reinstalled or otherwise indicated to remain the OWNER'S property, remove demolished materials from the projects site and dispose of in an approved disposal facility.
- B. Do not burn or bury materials on site.
- C. Remove materials from the site as the work progresses. Minimize on-site stockpiling of demolished materials.
- D. Keep demolish materials separated from excavated soils.
- E. Upon completion of the Work, leave areas in clean condition.

**END OF SECTION**

**SECTION 02 61 15  
HANDLING OF REGULATED SOIL**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. Provide all layout, products, materials, equipment, tools, services, testing, supervision, and labor to complete all handling of regulated soil required to complete the work.

1.2 RELATED WORK

- A. Section 01 35 30: HEALTH AND SAFETY
- B. Section 02 61 50: TRANSPORTATION AND DISPOSAL OF REGULATED SOIL
- C. Section 31 23 16: EXCAVATION
- D. Section 31 23 23: FILL AND BACKFILL
- E. Section 15 57 13: TEMPORARY EROSION AND SEDIMENTATION CONTROL

1.3 DEFINITIONS

- A. See Definitions in Section 02 61 50: TRANSPORTATION AND DISPOSAL OF REGULATED SOIL.

1.4 SUBMITTALS

- A. Submit the following prior to commencement of Work:
  - 1. Soil Management Plan: Submit a soil management plan at least 3 weeks prior to the start of construction activities, submit to the ENGINEER. The Soil Management Plan shall meet the requirements in Article 1.8 below.
- B. Submit the following during execution or Work in accordance with Section 01 3300: Submittal Procedures:
  - 1. All chemical analytical reports within 48 hours of the CONTRACTOR's receipt.
  - 2. Registrations, letters, forms or applications to be sent to Federal, State or Local environmental regulatory agencies to the ENGINEER for review prior to submittal. Allow 7 days for review. No adjustments for time or money will be made if re-submittals are required due to deficiencies.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Perform earthwork, handling, storage, transportation and disposal in compliance with applicable requirements of authorities having jurisdiction, including but not limited to the following:
  - 1. Connecticut Department of Environmental Protection
    - a. Connecticut Remediation Standard Regulations (RSRs), RCSA 22a-133k-1 to 3.
    - b. Connecticut Hazardous Waste Regulations, RCSA 22a-449(c)-100 to 119.
    - c. Connecticut Solid Waste Management Regulations, RCSA 22a-209-1 to 17.

- d. Connecticut DEP Bureau of Materials Management and Compliance Assurance - Disposal of Special Waste Authorization (DEP-WEED-APP-200).
2. United States Environmental Protection Agency (EPA)
  - a. Federal Hazardous Waste Regulations, 40 CFR 261-268.
- B. CONTRACTOR Qualifications: Conform to the following qualifications:
  1. Work must be performed by CONTRACTOR personnel formally trained in procedures for Regulated Soil with proven history of successfully executing similar projects.
  2. Work must be accomplished by CONTRACTOR with proper equipment and personnel experienced in similar work.
- C. CONTRACTOR's Qualified Environmental Professional shall be currently licensed as a Licensed Environmental Professional (LEP) in Connecticut.
- D. CONTRACTOR's Independent Analytical Laboratory: Conform to the following qualifications:
  1. Accredited by the State of Connecticut Department of Health Services.
  2. Have a minimum 5 years experience.
  3. Ability to perform all analyses and provide analytical reports in accordance with the CTDEP's Reasonable Confidence Protocols.

#### 1.6 PROJECT CONDITIONS

- A. See project conditions in Section 02 61 50: TRANSPORTATION AND DISPOSAL OF REGULATED SOIL.

#### 1.7 HEALTH AND SAFETY

- A. Conduct all Work regarding loading and on-site transportation of Regulated Soil in accordance with the Health and Safety Plan submitted under Section 01 35 30: HEALTH, SAFETY.

#### 1.8 SOIL MANAGEMENT PLAN

- A. Prepare a Soil Management Plan. The plan should be prepared and signed by the CONTRACTOR's Qualified Environmental Professional and at a minimum, this plan shall describe detailed procedures that the CONTRACTOR plans to follow regarding management of all soil and include the following components:
  1. Schedule of activities
  2. Soil characterization procedures including data quality management
  3. Storage area construction materials
  4. Storage location(s)
  5. Soil segregation procedures
  6. Soil loading location and method
  7. Operating log to track soil origin, storage location and final disposition
  8. Inspection and maintenance procedures
  9. Erosion control, dust control, and anti-tracking procedures
  10. Emergency and preparedness procedures

11. Transportation routes
  12. Proposed transporters and disposal facilities
  13. Site security
- B. No work shall be performed related to excavation and handling of any soil until the Soil Management Plan is submitted to and approved by the ENGINEER. However, the time to perform under the contract will begin on the date stipulated in the Notice to Proceed.
- C. Maintain the Soil Management Plan on site and keep it current with Regulated Soil management activities including loading for transportation and actual site conditions.
- D. Inform all on-site workers and subcontractors of all site safety rules, known or potential hazards, and emergency response procedures.

#### 1.9 SCHEDULING

- A. Notify the ENGINEER a minimum of 14 calendar days prior to the start of excavation of Regulated Soil. The ENGINEER will be responsible for contacting regulatory agencies in accordance with the applicable reporting requirements.

### **PART 2 PRODUCTS**

#### 2.1 MATERIALS

- A. Stockpile Liner: The stockpile liner shall be manufactured of new, first quality product designed and manufactured specifically for the intended use and have the following properties:
1. The material shall be U.V. resistant (black in color).
  2. The material shall be impervious to prevent precipitation from entering the stockpile or liquids from migrating to underlying soil.
  3. The material shall be 20 mil thickness (liner under stockpile) and 10 mil thickness (liner over stockpile.)
- B. Spill response materials: Provide appropriate spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. Spill response materials shall be available at all times when Regulated Soil is being handled or transported. Spill response materials shall be compatible with the type of soil and contaminants being handled and detailed in the Site-Specific HASP.

### **PART 3 EXECUTION**

#### 3.1 ONSITE REUSE

- A. Reusable Regulated Soil shall be:
1. Reused on site as backfill in locations above the water table and not in areas subject to erosion in accordance with requirements in Section 31 23 23: FILL AND BACKFILL. Document the backfill location and depth in a drawing for any Reusable Regulated Soil reused.
  2. Managed, disposed of, treated, or recycled in accordance with the requirements for Regulated Soil, if not suitable for reuse or surplus.
- B. Clean Fill shall be managed as specified in Section 31 23 23: FILL AND BACKFILL.

- C. Hazardous Soil is not expected to be encountered at the Site. Alternate arrangements will be required to handle such material. These arrangements shall be coordinated between the CONTRACTOR and ENGINEER.

### 3.2 REGULATED SOIL MANAGEMENT

- A. Manage Regulated Soil in accordance with the procedures in the approved Soil Management Plan, approved HASP and the CTDEEP General Permit for Contaminated Soil and/or Sediment Management (General Permit).
- B. Direct load Regulated Soil, which has been characterized in place, and ship it off site to the approved and permitted treatment, recycling or disposal facility. If Regulated Soil has not been pre-characterized or if direct loading is not otherwise feasible, place the Regulated Soil in temporary storage immediately after excavation.
- C. On-Site soil storage locations are limited to any indicated in the drawings or to off-site locations established by the CONTRACTOR per the approved Soil Management Plan. No other location other than those indicated will be allowed for the storage of soil. Complete the Work in a manner that the soil storage capacity will not be exceeded.
- D. Store Regulated soil in segregated bins within the soil stockpile or in separate stockpiles so that there is a discrete bin or stockpile represented by each characterization sample that is chemically analyzed.
- E. Storage units shall be in good condition and constructed of materials that are compatible with the soil to be stored. Each stockpile or bin shall be clearly labeled with an identification number and a written log shall be kept to track the source of Regulated Soil in each temporary storage unit.
- F. Stockpiles shall be constructed to isolate stored Regulated Soil from the environment. Stockpiles shall be constructed to include a chemically resistant geomembrane liner free of holes and other damage. The ground surface on which the geomembrane is to be placed shall be free of rocks greater than 0.5 inches in diameter and any other object which could damage the membrane.
- G. The maximum on-site stockpile size shall be 1,000 cubic yards for Regulated Soil that is also classified as Contaminated Soil unless a registration has been submitted to and approved by the CTDEEP under the General Permit.
- H. Contaminated Soil cannot be stockpiled off site unless a registration has been submitted to and approved by the CTDEEP under the General Permit.
- I. Provide a concrete barrier surrounding the stockpile and a gravel runoff barrier at vehicle access points.
- J. Cover stockpiles with a geomembrane cover free of holes or other damage to prevent precipitation from entering the stockpile. Extend the cover material over the bituminous runoff barrier or staked hay bales and anchor or ballast with sand bags or other suitable material to prevent it from being removed or damaged by wind.
- K. Roll-off units, if used to temporarily store Regulated Soil, shall be water tight. A cover shall be placed over the units to prevent precipitation from contacting the stored soil.
- L. Except for storm drain cleaning operations, liquids are not anticipated to be generated. If miscellaneous liquids such as rainwater that has contacted Regulated Soil or decontamination wastewaters from washing of Regulated soil from equipment or materials are generated, temporarily store them in containers that are water-tight and located in an area approved by

the ENGINEER. Dispose of liquids in a properly permitted off-site treatment, disposal or recycling facility approved by the ENGINEER. Dewatering discharge is not permitted to be directed to any storm drain or other system that could impact surface waters.

- M. Manage all materials in the stockpile to minimize tracking of potential contaminated materials across the site and minimize dust generation.

### 3.3 SPILLS

- A. Immediately notify the ENGINEER in the event of a spill or release of a hazardous substance, pollutant, contaminant, or oil. The OWNER will be responsible for any notifications to regulatory agencies. Follow the pre-established procedures as described in HASP and spill response plan in the Soil Management Plan. Immediately take containment actions to minimize the effect of any spill or leak. Cleanup in accordance with applicable federal, state, and local regulations. Perform extra sampling and testing as directed by the ENGINEER to verify spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the OWNER.

**END OF SECTION**



**SECTION 02 61 50**  
**TRANSPORTATION AND DISPOSAL OF REGULATED SOIL**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Provide all layout, products, materials, equipment, tools, services, testing, transportation, supervision, and labor to complete all transportation and disposal of regulated soil required to complete the work.

1.2 RELATED WORK:

- A. Section 01 35 30: HEALTH AND SAFETY
- B. Section 02 61 15: HANDLING OF REGULATED SOIL
- C. Section 31 23 16: EXCAVATION
- D. Section 31 23 23: FILL AND BACKFILL

1.3 DEFINITIONS

- A. Contaminated Soil: Treated or untreated soil and/or sediment affected by a known or suspected release and determined, or reasonably expected to contain substances exceeding Residential Direct Exposure Criteria or GA Pollutant Mobility Criteria, as these terms are defined in the Remediation Standard Regulations (RCSA Section 22a-133k-1).
- B. Hazardous Soil: Soil that is classified as a hazardous waste. Soil is classified as hazardous waste if it exhibits a hazardous waste characteristic or if it contains RCRA-listed hazardous constituents above Connecticut's RCRA "Contained-In" Policy dated May 2002.
- C. Hazardous Waste Disposal Area: Facility permitted for treatment, storage, or disposal of Hazardous Waste under RCRA and applicable Connecticut laws and regulations.
- D. Polluted Soil: Soil affected by a release of a substance at a concentration above the analytical detection limit for such substance in accordance with RCSA 22a-133k-1(a)(45) or for naturally occurring substance at a concentration that exceeds concentrations that naturally occur in the environment.
- E. Regulated Soil: Includes Polluted Soil and Contaminated Soil.
- F. Reusable Regulated Soil: Regulated Soil with substance concentrations above the analytical detection limit for such substance in accordance with RCSA 22a-133k-1(a)(45) and below the residential direct exposure criteria and the GB pollutant mobility criteria as these terms are described in the Remediation Standard Regulations (RCSA 22a-133k-1 through 3), which do not contain polychlorinated biphenyls.
- G. Soil: As used in this section soil includes natural soil, natural sediment, rock, brick, ceramics, concrete, asphalt paving fragments, and other miscellaneous debris and solid waste.
- H. Special Waste Disposal Area: Facility permitted to receive solid waste under RCSA Sections 22a-209-1 through 13, or for facilities not located in Connecticut, permitted by the state to receive solid or industrial waste.
- I. Treatment or Recycle Facility: Facility permitted to treat or recycle Regulated Soil that is permitted under RCSA 22a-174-3 and CGS Section 22a-454 or for facilities not located in

Connecticut, permitted by the state in which the facility is located to treat or recycle Regulated Soil.

1.4 SUBMITTALS:

A. Submit the following prior to commencement of Work:

1. Transporter Information:
  - a. The name and address of transporters to be used on the project to transport Regulated Soil.
  - b. Current licenses and permits to operate in all states affected by transport.
2. Facility Information:
  - a. General Information
    - i. Facility Name
    - ii. Facility Address
    - iii. Name of Contact Person
    - iv. Title of Contact Person
    - v. Telephone Number of Contact Person
    - vi. Permit Number
3. Written confirmation from the facility that they are permitted to accept and will accept material of the general quality and quantity described by these Specifications.
  - a. Facility permits
  - b. Facility acceptance criteria.
  - c. Written approval from Connecticut Department of Energy and Environmental Protection (CT DEEP) for disposal of Regulated Soil or use of Regulated Soil as cover soil in a solid waste disposal area or for beneficial reuse as fill at facilities located in Connecticut.
  - d. Facility sampling frequency and analytical testing requirements.

B. Submit the following during execution of Work:

1. Waste profile forms, material shipping records or any other forms, letters or documents that must be signed by the OWNER to obtain authorizations for disposal no less than 7 days in advance of shipping materials off site.
2. Shipping papers or manifests that must be signed by the OWNER no less than 48 hours in advance of shipping materials off site.
3. Certified manifests or shipping paper and weigh slips from the approved disposal facilities for Regulated Soil transported and disposed of offsite within 5 days of CONTRACTOR's receipt. At a minimum, manifests and weigh slips include the following:
  - a. Transporter name, address and telephone number.
  - b. Truck number, date and time of load-out.
  - c. Gross weight, tare weight and net weight of truck.
4. All chemical analytical reports within 48 hours of the CONTRACTOR's receipt.
5. Registrations, letters, forms or applications to be sent to Federal, State or Local environmental regulatory agencies to the ENGINEER for review prior to submittal. Allow 7 days for review. No adjustments for time or money will be made if re-submittals are required due to deficiencies.

## 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Perform earthwork, storage, transportation and disposal in compliance with applicable requirements of authorities having jurisdiction, including but not limited to the following:
1. Connecticut Department of Energy and Environmental Protection
    - a. Connecticut Remediation Standard Regulations (RSRs), RCSA 22a-133k-1 to 3.
    - b. Connecticut Hazardous Waste Regulations, RCSA 22a-449(c)-100 to 119.
    - c. Connecticut Solid Waste Management Regulations, RCSA 22a-209-1 to 17.
    - d. CT DEEP Bureau of Materials Management and Compliance Assurance - Disposal of Special Waste Authorization (DEP-WEED-APP-200).
  2. Massachusetts Department of Environmental Protection (MassDEP),
    - a. Massachusetts Solid Waste Management Regulations, 310 CMR 19.000.
    - b. Reuse and Disposal of Contaminated Soil at Massachusetts Landfills, DEP Policy No. COMM-97-001.
    - c. MassDEP Bureau of Waste Prevention – Solid Waste Management – Special Waste Determination (BWP SW 14, 31).
    - d. MassDEP Bureau of Waste Prevention – Solid Waste Management – Beneficial Use Determination (BUD) (BWP SW 40).
  3. United States Environmental Protection Agency (EPA)
    - a. Federal Hazardous Waste Regulations, 40 CFR 261-268.
  4. The OWNER will be the “generator” of all Regulated Soil. OWNER information is as follows:
    - a. Owner’s Name: The Town of East Hartford
    - b. ATTN: Ms. Denise Horan, P.E., Town Engineer
    - c. Owner’s Address: 740 Main Street, East Hartford, Connecticut 06108
    - d. Owner’s Telephone Number: (860) 291-7380
    - e. Owner’s Facsimile Number: (860) 289-0831
    - f. Project Name: Toe Drain Repair Project Phase 1
    - g. Site Address: 211 East River Drive, East Hartford, CT 06108
- B. CONTRACTOR Qualifications: Conform to the following qualifications:
1. Work must be performed by CONTRACTOR personnel formally trained in procedures for Regulated Soil with proven history of successfully executing similar projects.
  2. Work must be accomplished by CONTRACTOR with proper equipment and personnel experienced in similar work.
- C. CONTRACTOR’s Qualified Environmental Professional shall be or work under the direct supervision of a currently licensed as a Licensed Environmental Professional (LEP) in Connecticut and, if applicable, Licensed Site Professional (LSP) in Massachusetts.
- D. CONTRACTOR’s Independent Analytical Laboratory: Conform to the following qualifications:
1. Accredited by the State of Connecticut Department of Health Services.
  2. Have a minimum 5 years of experience.

3. Ability to perform all analyses and provide analytical reports in accordance with the CTDEEP's Reasonable Confidence Protocols.

#### 1.6 PROJECT CONDITIONS

- A. The geotechnical and environmental reports listed below provide soil chemical analysis, and boring logs showing subsurface conditions. Information regarding the approximate ground water elevations is also included. Information attached to the Contract Documents as follows:
  1. GEI Consultants (2013), Supplemental Geotechnical and Environmental Data, March.
- B. Notify the ENGINEER if unexpected subsurface conditions are encountered and discontinue work in that area until ENGINEER provides notification to resume work.
- C. The ENGINEER shall be notified within 24 hours if Regulated Soil is discovered that has not been previously identified or if other discrepancies between data provided and actual field conditions are discovered.
- D. Do not remediate, excavate, treat, or delineate Regulated soil, not previously identified, without consent from the ENGINEER.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

- A. Spill response materials: Provide appropriate spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. Spill response materials shall be available at all times when Regulated Soil is being handled or transported. Spill response materials shall be compatible with the type of soil and contaminants being handled and detailed in the Site-Specific Health and Safety Plan.
- B. Packaging, Labeling, Marking and Placarding Materials: The CONTRACTOR shall provide all of the materials required for the packaging, labeling, marking, placarding and transportation of contaminated materials in conformance with Department of Transportation standards. Details in this specification shall not be construed as establishing the limits of the CONTRACTOR's responsibility

### PART 3 EXECUTION

#### 3.1 SAMPLING AND ANALYSIS

- A. The CONTRACTOR's Qualified Environmental Professional shall sample Regulated Soil and have the samples analyzed as required by the treatment, recycling or disposal facility to supplement existing data. This analysis can be performed on samples of in-situ soil collected prior to excavation or on samples of excavated soil that has been stockpiled. The frequency of sampling and parameters analyzed shall be performed as required by the treatment, recycling or disposal facility.
- B. Submit a copy of all analytical results to the ENGINEER within 24 hours of the CONTRACTOR's receipt of the laboratory report. Analytical data shall only be distributed to the OWNER and ENGINEER.
- C. Coordinate schedule so that ENGINEER may observe sample collection activities.

- D. All chemical analysis shall be performed by a laboratory certified by the State of Connecticut Department of Health Services and as applicable in accordance with the CT DEEP Reasonable Confidence Protocols.

### 3.2 FACILITY APPROVAL

- A. Upon receipt of the final approval from the treatment, recycling or disposal facility, the CONTRACTOR shall immediately forward a copy of said approval to the ENGINEER. The CONTRACTOR shall be responsible for coordinating facility approval, loading, transportation, and ultimate disposal of the material at the facility.

### 3.3 REUSE AND DISPOSAL

- A. Surplus or unsuitable Regulated Soil shall be:
  - 1. Used as cover or disposed of in a Special Waste Disposal Area provided written approval is obtained from CT DEEP under RCSA Sec.22a-209-8 for use in an in-state facility.
  - 2. Beneficially reused at a Massachusetts permitted lined or unlined landfill under Massachusetts Department of Environmental Protection Policy # COMM-97-001.
  - 3. Taken to a Special Waste Disposal area for disposal or use as cover in a facility not located in Massachusetts or Connecticut.
  - 4. Taken to a properly permitted Treatment or Recycling Facility for thermal treatment or recycling.
  - 5. Reused at an off-site location in accordance with RCSA Sec. 22a-133k-2(h)(3) provided that written approval is obtained from CT DEEP for such reuse.
  - 6. Disposed in a Hazardous Waste Disposal Area.

### 3.4 WASTE PROFILES, SHIPPING RECORDS AND MANIFESTS

- A. Prepare and submit to the ENGINEER for review all waste profiles or material shipping records and coordinate with disposal facilities.
- B. Prepare all manifests and shipping documents required to the ENGINEER for review. ENGINEER will be responsible for obtaining OWNER's signature. For most types of Regulated Soil signed documents are not required for each load.
- C. Submit to OWNER and the ENGINEER, prior to receiving progress payment, documentation certifying that all materials were transported to, accepted, and disposed of, at the selected receiving facility, including but not limited to:
  - 1. Facility signed manifests.
  - 2. Weight slips. Provide certified tare and gross weights for each load.

### 3.5 LOADING

- A. Load Regulated Soil for transport from the project site to the facility following approval by the ENGINEER.
- B. Load all Regulated Soil into the transportation vehicle.
- C. Following load-out from the stockpile or direct loading each day, remove residual Regulated Soil resulting from spillage from the loading area and return it to appropriate stockpile.

3.6 TRANSPORTATION

- A. The Transporter shall adhere to all pertinent Federal, State, and local laws or regulatory agency policies.
- B. No material shall leave the site until the treatment, recycling or disposal facility has approved shipments.
- C. Cover transported Regulated Soil prior to leaving the point of generation and until its arrival at the treatment, recycling or disposal facility.
- D. All vehicles departing the Site are to be properly logged to show the vehicle identification number, driver's name, time of departure, destination, and approximate volume and content of materials.
- E. All transportation vehicles are to have secure bodies and be free of defects for material transportation.

3.7 SPILLS

- A. Immediately notify the ENGINEER in the event of a spill or release of a hazardous substance, pollutant, contaminant, or oil. The OWNER or ENGINEER will be responsible for any notifications to regulatory agencies. Follow the pre-established procedures as described in HASP. Immediately take containment actions to minimize the effect of any spill or leak. Cleanup in accordance with applicable federal, state, and local regulations. Perform extra sampling and testing as directed by the ENGINEER to verify spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the OWNER.

**END OF SECTION**

**SECTION 03 05 00**  
**BASIC CONCRETE MATERIALS**

**PART 1 GENERAL**

**1.1 WORK INCLUDES**

A. Material and mix requirements for concrete.

**1.2 REFERENCES**

A. The following is a list of standards that may be referenced in this Section:

1. American Concrete Institute (ACI):
  - a. ACI 117 – Standard Specifications for Tolerances for Concrete Construction and Materials.
  - b. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
  - c. ACI 301 - Specifications for Structural Concrete
  - d. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
  - e. ACI 304.2R - Placing Concrete by Pumping Methods
  - f. ACI 311.5R - Batch Plant Inspection and Field Testing of Ready-Mixed Concrete.
  - g. ACI 318/318R - Building Code Requirements for Structural Concrete and Commentary.
2. American Society for Testing and Materials (ASTM):
  - a. ASTM C 33 - Standard Specifications for Concrete Aggregates.
  - b. ASTM C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - c. ASTM C 88 - Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
  - d. ASTM C 94 - Standard Specifications for Ready-Mixed Concrete.
  - e. ASTM C109 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
  - f. ASTM C 143 - Standard test Method for Slump of Hydraulic-Cement Concrete.
  - g. ASTM C 150 - Standard Specifications for Portland Cement.
  - h. ASTM C 157 - Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
  - i. ASTM C 192 - Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
  - j. ASTM C 231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
  - k. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete.

- l. ASTM C 311 - Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete.
  - m. ASTM C 452 - Standard Test Method for Potential Expansion of Portland-Cement Mortars Exposed to Sulfate.
  - n. ASTM C 494 - Standard Specification for Chemical Admixtures for Concrete.
  - o. ASTM C 531 – Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
  - p. ASTM C 595 - Standard Specification for Blended Hydraulic Cements.
  - q. ASTM C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
  - r. ASTM C 672 – Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.
  - s. ASTM C 882 – Standard Test Method for Bond Strength of Epoxy Resin Systems Used With Concrete By Slant Shear.
  - t. ASTM C 1012 - Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution.
  - u. ASTM C 1218 - Standard Test Method for Water-Soluble Chloride In Mortar and Concrete.
  - v. ASTM C 1202 – Standard Test Method for Electrical Indication of Concrete’s Ability to Resist Chloride Ion Penetration.
  - w. ASTM C 1240 - Standard Specification for Silica Fume for Use as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar, and Grout.
3. State of Connecticut Department of Transportation (ConnDOT), Standard Specifications for Roads Bridges, and Incidental Construction, Form 816.
  4. Where these Specifications differ from the requirements, the more stringent requirements shall apply.

### 1.3 DEFINITIONS

- A. Design Strength: Required minimum compressive strength of concrete at respective age, as specified in this Section.

### 1.4 SUBMITTALS

#### A. Shop Drawings:

1. Product Data: Cement materials, aggregates, admixtures, and water.
  - a. Cement Materials: indicate sources of materials: include certification(s) of compliance with specified requirements.
  - b. Coarse and fine aggregates; include sources of materials and test data demonstrating compliance with specified gradation and quality requirements.
  - c. Admixtures; include manufacturers and certification(s) of compliance with specified requirements.
  - d. Indicate source(s) and chemical test results of water source(s) for use in all concreting operations.



2. Mix Design Data: Include mix proportions and complete test results demonstrating compliance with specified requirements. Include mix design provisions for pumping concrete if applicable to proposed means and methods for construction.
- B. Administrative:
1. Statement of Qualifications:
    - a. Mix designer.
    - b. Batch plant.
- C. Quality Control:
1. Manufacturers' Certificates of Compliance:
    - a. Cement Materials.
    - b. Coarse Aggregate.
    - c. Fine Aggregate.
    - d. Admixtures.

## 1.5 QUALIFICATIONS

- A. Mix Designer: Licensed professional engineer registered in the State of Connecticut or a Connecticut Department of Transportation approved concrete mix designer, with a minimum of 5 years of experience in the design of concrete mixes.
- B. Batch Plant: Currently certified by the National Ready Mixed Concrete Association.

## PART 2 PRODUCTS

### 2.1 CONCRETE MATERIALS

- A. Cement:
1. Cement materials shall conform to the requirements of Article M.03.01 of ConnDOT, Standard Specifications for Roads Bridges, and Incidental Construction, Form 816..
  2. Furnish from one source.
- B. Aggregates:
1. Fine and coarse aggregates shall conform to applicable requirements of Article M.03.01 of ConnDOT, Standard Specifications for Roads Bridges, and Incidental Construction, Form 816.
- C. Admixtures:
1. Admixtures shall conform to applicable requirements of Article M.03.01 of ConnDOT, Standard Specifications for Roads Bridges, and Incidental Construction.
  2. Furnish each admixture from a single manufacturer.
  3. Air-Entraining Admixture:
    - a. ASTM C 260.
  4. Water-reducing Admixture:
    - a. ASTM C 494, Type A or Type D.
  5. High Range Water Reducing Admixture (Superplasticizer):
    - a. ASTM C 494, Type F or Type G.
- D. Water:

1. Water shall conform to applicable requirements of Article M.03.01 of ConnDOT, Standard Specifications for Roads Bridges, and Incidental Construction.

## 2.2 CONCRETE MIX PROPORTIONS

A. Provide the following classes of concrete for use in the Work:

1. CLASS F: Shall be used for all concrete on the project.
  - a. Meeting the requirements of ConnDOT Standard Specifications for Roads Bridges, and Incidental Construction, Form 816 Section M.03 for Class "F" Concrete.
  - b. Minimum Compressive Strength = 4,000 psi at 28 days.
  - c. Slump Range at Placement = 3 to 5 inches.
  - d. Maximum Water – Cementitious Ratio = 0.44.
  - e. Minimum Cementitious Cement = 658 lbs per cubic yard.
  - f. The mix shall be designed utilizing a nominal maximum size of No. 6 Aggregate.
  - g. Concrete shall be air-entrained. Air content at the point of placement shall be 6 percent plus 2 percent or minus 1 percent, and shall conform to the requirements of ACI 301. Unless otherwise approved by ENGINEER, all exposures shall be considered "Severe."
  - h. Color: Gray

B. Use set-retarding admixtures during hot weather only when approved by ENGINEER.

## 2.3 CONCRETE TEMPERATURE

A. Use materials and/or procedures necessary to achieve required placement temperatures; including, but not limited to, the following:

1. Replace all or a part of the mixing water with chilled water.
2. Replace all or a part of the mixing water with ice.
3. Introduce liquid nitrogen into the concrete as it is batched.

## 2.4 BATCHING, MIXING AND TRANSPORTING

A. Batch, mix, and deliver to placement site in accordance with Section 6.01 of the ConnDOT Standard Specifications for Roads Bridges, and Incidental Construction..

# PART 3 EXECUTION

## 3.1 MIX DESIGN

- A. Develop mix design for each type of structural concrete required for the Work.
- B. Supporting test data and documentation must represent the actual mix proportions proposed, including all admixtures.

**END OF SECTION**

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**SECTION 31 10 00**  
**SITE CLEARING**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to clearing and grubbing where required to perform the Work.
- B. Dispose of all cleared and grubbed material in accordance with the requirements of Section 01 50 00: TEMPORARY FACILITIES AND CONTROLS.

1.2 SUBMITTALS

- A. Shop Drawings:
  - 1. Drawings showing limits of site disturbance required to install diversions and erosion and sediment control facilities.

1.3 SCHEDULE AND SEQUENCE

- A. Begin site clearing and grubbing only after erosion and sediment control provisions are in place.
- B. Haul roads, access roads, and additional staging areas needed by CONTRACTOR not shown on the Drawings may be cleared upon approval of ENGINEER and after CONTRACTOR submits and implements a revised Erosion and Sediment Control Plan.
- C. The removal and/or replanting of trees, shrubs, and other plant material shall be coordinated with the Town of East Hartford's Tree Warden. Coordination will include posting of vegetation and 10-day notice period. If there is public objection to during the notice period a public hearing may be required.

1.4 PROTECTION OF EXISITING PLANT MATERIALS

- A. The CONTRACTOR shall be responsible for taking all reasonable steps for protecting, transplanting, and replanting existing trees, shrubs, and other plant materials which may be affected by the Work. Plants designated to remain shall be protected by construction fencing or barriers at all times during the entire contract period. No material shall be stockpiled and no equipment shall be parked or repaired within twenty-five (25) feet of existing trees unless it is impossible to avoid doing so. No oil, gasoline, concrete, or other materials shall be dumped or temporarily stockpiled anywhere on site unless permission is first obtained from the OWNER. Any plants damaged or scarred during construction shall be mitigated immediately at the CONTRACTOR'S expense.

**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

3.1 PREPARATION

- A. Verify that existing plant life and features designated to remain or to be protected are tagged or identified.

3.2 PROTECTION

- A. Protect any trees, plant growth, and features not requiring removal for the Work.
- B. Protect benchmarks and survey monuments from damage or displacement. Repair or replace all benchmarks and survey monuments damaged during clearing and grubbing.
- C. The limits of site disturbance to install measures such as silt fences and diversions shall be held to a minimum and be in accordance with the approved submittal.
- D. The limits of site disturbance shall be contained within designated work areas as shown on the Drawings or otherwise approved by ENGINEER.

3.3 CLEARING

- A. Clearing shall mean removing, hauling, and disposing of all trees, shrubs, grasses, weeds, debris, trash, rubble, downed timber, branches and other materials on the surface.
- B. Clear adjacent to cut or fill sections to 10 feet outside of slope lines or as shown on the Drawings.

3.4 GRUBBING

- A. Grubbing shall mean the removal of stumps, main root balls, and root systems so that no vegetative matter remains.

3.5 DISPOSAL

- A. Dispose of all brush, tree trunks, stumps, roots, and debris from clearing operations as required by Section 01 50 00: TEMPORARY FACILITIES AND CONTROLS.

3.6 MAINTENANCE OF CLEARED AREAS

- A. Maintain cleared work areas in a condition free from additional vegetation growth for the duration of the project. Use of herbicides to discourage plant growth shall not be allowed. CONTRACTOR shall be compensated for clearing each work area only once.

**END OF SECTION**

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**SECTION 31 23 16  
EXCAVATION**

**PART 1 GENERAL**

**1.1 WORK INCLUDES**

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to complete all excavation required to complete the work as shown on the drawings and including the following:
1. Stripping and stockpiling topsoil.
  2. Excavation for the toe drain.
  3. Required excavation for pipe abandonment.
  4. Required excavation for site grading.
  5. Incidental items not covered under other items specifications such as, grading and restoration and survey and mapping of excavation surfaces.

**1.2 DEFINITIONS**

- A. Refer to applicable definitions of Section 31 10 00: SITE CLEARING, and Section 31 23 23: FILL AND BACKFILL.
- B. Unsuitable Foundation Soils: Soils that display yielding, excessive rutting, excessive water content, or have desiccated.

**1.3 SUBMITTALS**

- A. Excavation Plan: Submit at least 21 days prior to start of excavation. The plans shall include:
1. Methods and sequencing of excavation in the various excavation areas.
  2. Numbers, types and sizes of equipment proposed to perform excavations.
  3. Anticipated difficulties and proposed resolutions.
  4. Proposed uses of various excavated materials.
  5. Conceptual plans and sections showing sloping or shoring of temporary slopes as necessary for construction.
  6. Proposed locations of stockpiled excavated material.
  7. Proposed offsite disposal sites and anticipated volumes.
- B. Excavation Protection Plan: The plan shall describe sloping, shoring, sheeting, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan. The plan must be stamped by a Professional Engineer, registered State of Connecticut.
- C. Topsoil Stockpile Plan: The plan shall include:
1. Proposed methods and sequencing of stockpiling topsoil stripped from excavation areas.
  2. Proposed size and locations of topsoil stockpiles. Stockpiles shall be within the limit of work area.
- D. Administrative:

1. Copy of excavation permit(s) as required by law.
2. Certified products used in the design of sloping, bracing or shoring of temporary excavation slopes as required by OSHA.

1.4 QUALITY CONTROL

- A. Provide adequate survey control to avoid unauthorized over excavation.

1.5 EXCAVATION SAFETY

- A. CONTRACTOR is solely responsible for making all excavations in a safe manner. Provide appropriate measures to retain excavation side slopes and prevent rockfalls and ensure that persons in or near the excavation are protected.
- B. Stability of all temporary slopes and areas within the excavation zone of influence identified on the Drawings is solely CONTRACTOR's responsibility. Shore, sheet, brace, or slope temporary slopes to conform to all applicable regulations.
- C. Install and maintain shoring, sheeting, bracing, and sloping necessary to support the sides of the excavation, to keep and prevent any movement that may damage adjacent structures, embankments or foundations, damage or delay the Work, or endanger life and health. Install and maintain shoring, sheeting, bracing, and sloping as required by OSHA and other applicable governmental regulations or agencies.

1.6 WEATHER LIMITATIONS

- A. Material excavated when frozen or when air temperature is less than 32°F shall not be used as fill or backfill until material completely thaws.
- B. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently or is appropriately moisture conditioned for proper compaction.

1.7 SEQUENCING AND SCHEDULING

- A. Clearing and Grubbing: Complete applicable Work specified in Section 31 10 00: SITE CLEARING, prior to excavating.
- B. Stripping and Stockpiling Topsoil: Complete applicable work specified herein prior to excavating.
- C. Dewatering: Manage water as necessary to maintain in a dewatered state throughout the period of excavation so excavation is completed in the dry.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

3.1 PREPARATION

- A. Coordinate utility clearance through Call Before You Dig (1-800-922-4455) one-call system.
- B. Request underground utilities to be located and marked within and surrounding construction areas.

- C. Identify required lines, levels, contours, and datum.
- D. Protect utilities indicated to remain from damage.
- E. Protect plant life, lawns, and other features remaining as portion of final landscaping.
- F. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

### 3.2 PROTECTION

- A. Maintain soil and excavation stability.
- B. Prevent displacement or loose soil from falling into excavation.
- C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

### 3.3 STRIPPING AND STOCKPILING TOPSOIL

- A. Remove grass, weeds, and topsoil in all areas excavated within the limit of work area. CONTRACTOR shall remove roots larger than 1 inch, rocks larger than 3 inches, and debris prior to stockpiling the topsoil.
- B. Segregate and stockpile topsoil at locations where it does not interfere with other items of the Work.
- C. Stockpile topsoil to a height not exceeding 30 feet. Protect stockpiles topsoil from erosion.

### 3.4 EXCAVATION

- A. Complete all excavation regardless of the type, nature, or condition of the materials encountered.
- B. Excavate to lines, grades, and dimensions shown and as necessary to accomplish Work. Excavate to within tolerance of plus or minus 0.1 foot except where dimensions or grades are shown or specified as maximum or minimum. Allow for forms, working space, protective coating, granular base, filter/drain material, topsoil, slope protection, and similar items, wherever applicable. Trim to neat lines where concrete is to be deposited against earth.
- C. Do not excavate to beyond the lines and grades shown without written authorization of ENGINEER.
- D. Excavations shall be performed in the dry.
- E. Selectively excavate, handle, haul, stockpile and process materials as necessary to yield suitable types and sufficient quantities of the various fill and backfill materials required for construction of the Work.

### 3.5 FINAL EXCAVATION FOR FOUNDATIONS

- A. Take all necessary precautions to preserve the material below and beyond the established lines of all excavation in the soundest possible condition. Repair any damage to foundation material beyond the required excavation lines due to frost, wetting, drying, cracking, erosion, physical disturbance, ineffective dewatering, inadequate slope stability, or CONTRACTOR's operations.

B. ENGINEER Evaluation:

1. ENGINEER will observe and document excavations.
2. Keep exposed finished excavated surface moist at all times to prevent evaporation of the natural moisture in the exposed material until placement of overlying materials.

3.6 PERMANENT EXCAVATION SLOPES

- A. Shape, trim, and finish cut slopes to conform with lines, grades, and cross sections shown, with proper allowance for topsoil or slope protection, where shown.
- B. Remove stones and rock that exceed 6-inch diameter and that are loose and may roll down slope. Remove exposed roots from cut slopes.
- C. Round tops of cut slopes in soil, provided such rounding does not extend offsite or outside easements and right-of-ways, or adversely impacts existing facilities, adjacent property, or completed Work.

3.7 STOCKPILING EXCAVATED MATERIAL

- A. Stockpile excavated material that is suitable for use as fill or backfill until material is needed.
- B. Stockpile regulated soil in accordance with Section 02 61 15: HANDLING OF REGULATED SOIL. Regulated and unregulated soils must be stockpiled separately.
- C. Post signs indicating proposed use of material stockpiled. Post signs that are readable from all directions of approach to each stockpile. Signs should be clearly worded and readable by equipment operators from their normal seated position.
- D. Confine stockpiles to within approved work areas.
- E. Protect stockpiles from erosion.
- F. Do not stockpile excavated material adjacent to trenches and other excavations unless excavation sideslopes and excavation support systems are designed, constructed, and maintained for stockpile loads.
- G. Do not stockpile excavated materials near or over existing facilities, adjacent property, or completed work, if weight of stockpiled material could induce settlement.

3.8 DISPOSAL OF UNSUITABLE AND EXCESS EXCAVATION

- A. Dispose of excavated materials, which are unsuitable or exceed quantity needed for fill or backfill as a Regulated Soil in accordance with Section 02 61 50: TRANSPORTATION AND DISPOSAL OF REGULATED SOIL.
- B. Moisture content of excavated materials alone shall not be reason for wasting material. Moisten or dry material to the specified moisture content and use in permanent construction as specified in Section 31 23 23: FILL AND BACKFILL.
- C. Dispose of debris resulting from removal of organic matter, trash, refuse, and junk as specified in Section 01 50 00: TEMPORARY FACILITIES AND CONTROLS.

3.9 OVEREXCAVATION OF UNSUITABLE FOUNDATION SOILS

- A. Unsuitable foundation materials shall be removed. Excavate down to the top of suitable foundation material as determined by ENGINEER. Backfill the excavated area using



materials and placement procedures for the materials that are to be placed above the excavated area.

**END OF SECTION**

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**SECTION 31 23 23  
FILL AND BACKFILL**

**PART 1 GENERAL**

**1.1 WORK INCLUDES**

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to complete all fill and backfill required to complete the work as shown on the drawings and including the following:
1. Fill and backfill associated with but not limited to:
    - a. Subdrainage
    - b. Manholes and Catch Basins
    - c. Concrete Sidewalks
    - d. Miscellaneous fill or backfill not specifically covered in other sections.
  2. Does not include special earth materials covered in other Specification Sections, including Section 31 37 00: RIPRAP AND RIPRAP BEDDING, and Section 32 92 00 Seeding.

**1.2 REFERENCES**

- A. The following is a list of standards which may be referenced in this Section:
1. American Society for Testing and Materials (ASTM):
    - a. ASTM C 33, Standard Specification for Concrete Aggregates
    - b. ASTM C 88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
    - c. ASTM C 117, Standard Test Method for Materials Finer Than 75-Micrometers (No. 200) Sieve in Mineral Aggregates by Washing
    - d. ASTM C 136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates
    - e. ASTM D 75, Standard Practice for Sampling Aggregates
    - f. ASTM D 422, Test Method for Particle-Size Analysis of Soils
    - g. ASTM D 698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>))
    - h. ASTM D 1556, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
    - i. ASTM D 1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>))
    - j. ASTM D 2216, Laboratory Determination of Water (Moisture) Content of Soil Rock, and Soil-Aggregate Mixtures
    - k. ASTM D 2488 - Practice for Description and Identification of Soils (Visual-Manual Procedure)
    - l. ASTM D 2922, Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
    - m. ASTM D 4959 - Test Method for Determination of Water Content (Moisture) by Direct Heating Method

- n. ASTM D 2937 - Test method for Density of Soil in Place by the Drive-Cylinder Method
  - o. ASTM D 3017, Moisture Content of Soil and Soil-Aggregates in Place by Nuclear Methods (Shallow Depth)
  - p. ASTM D 3740, Practice for the Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
  - q. ASTM D 4318, Standard Test Method for Liquid Limit, Plastic Limit, Plasticity Index of Soils
  - r. ASTM D 5084, Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
2. American Association of State Highway and Transportation Officials (AASHTO):
    - a. AASHTO T27, Standard Method of Test for Family of Curves-One Point Method, in the Standard Specifications for Transportation Materials and Methods of Sampling and Testing, Part II Tests
  3. Connecticut Department of Transportation (CONNDOT), Standard Specifications for Roads, Bridges, and Incidental Construction, Form 816.
  4. American National Standards Institute (ANSI): Z35.1, Safety Color Red
  5. American Public Works Association (APWA): Uniform Color Code for Temporary Marking of Underground Utility Locations

### 1.3 DEFINITIONS

- A. Refer to applicable definitions of Section 31 23 16: EXCAVATION.
- B. Backfill: Fill materials placed in trenches, overexcavated areas, and around structures, pipes and other facilities.
- C. Certified/Certification: Review, approved, stamped, and signed by a Professional Engineer registered in the State of Connecticut.
- D. Completed Course: A course or layer that is ready for next layer or next phase of Work.
- E. Coverage: One coverage is defined as the requirement for successive trips of a piece of compaction equipment, which by means of sufficient overlap, will ensure contact on the entire surface of the layer by the equipment.
- F. Deleterious Materials: Organic matter, trash, rubbish, debris, oversize materials, and soluble materials.
- G. Fill: All materials used to raise existing grade where not defined as backfill.
- H. Fines: Material passing the No. 200 sieve as determined in accordance with ASTM D 422.
- I. Imported Material: Material obtained from sources off site.
- J. Lift: Loose (uncompacted) layer of material.
- K. Optimum Water Content:
  1. Determined in accordance with ASTM Standard specified to determine maximum dry density for relative compaction.
  2. Determine field water content on basis of fraction passing 3/4-inch sieve.

- L. Oversize Materials: Soil particles, soil clods, sedimentary fragments, rocks, and other materials having a maximum dimension in excess of the specified limits.
- M. Particle Size: The size of a particle before compaction measured parallel to its longest dimension.
- N. Period of Inactivity or Extended Shutdown: Four days.
- O. Prepared Foundation: Ground surface after completion of required clearing and grubbing, stripping of topsoil, excavation to grade, and foundation preparation.
- P. Processed Fill: Fill material that is physically modified by CONTRACTOR to derive a material that is suitable for a specific use.
- Q. Relative Compaction:
  - 1. Ratio, in percent, of as-compacted field dry density to laboratory maximum dry density as determined in accordance with ASTM D 1557.
  - 2. Apply corrections for oversize material to either as-compacted field dry density or maximum dry density, as determined by ENGINEER.
- R. Relative Density: Calculated in accordance with ASTM D 4254 based on maximum index density determined in accordance with ASTM D 4253 and minimum index density determined in accordance with ASTM D 4254.
- S. Well-Graded:
  - 1. A mixture of particle sizes with no specific concentration or lack thereof of one or more sizes.
  - 2. Does not define numerical value that must be placed or coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.
  - 3. Used to define material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.

#### 1.4 SUBMITTALS

- A. Administrative
  - 1. Contractors Fill and Backfill quality control plan. Plan shall include name of person or firm who will perform quality control testing, their qualifications, types and frequency of quality control testing.
- B. Shop Drawings:
  - 1. Catalog and manufacturer's data sheets for all equipment to be used to compact fill and backfill.
- C. Samples:
  - 1. Imported material taken at source.
- D. Quality Control Submittals:
  - 1. Certified test results documenting conformance with all Specification requirements for:
    - a. Imported materials.
    - b. Onsite materials proposed for reuse onsite

## 1.5 CONTRACTOR QUALITY CONTROL

- A. Provide certified quality control test results for all imported material. Provide submittal prior to importing materials. Provide tests as specified during production.
- B. Perform water content, field density, gradation, and other tests during borrow materials development and fill placement as needed to develop and manage operations and produce consistent embankment fill and backfill meeting the Specifications.
- C. Notify ENGINEER when any one of the following occur:
  - 1. Backfill is about to be placed on prepared foundation, or backfill operations are about to be resumed after a period of inactivity.
  - 2. Structures are ready for backfilling, or backfilling operations are about to be resumed after a period of inactivity.
  - 3. Soft or loose surface is encountered where fill or backfill is to be placed.
  - 4. Materials appear to be deviating from the Specifications.
  - 5. Initial sampling of imported material is to be conducted or importing of a material to the site is about to begin.

## 1.6 OWNER QUALITY ASSURANCE

- A. OWNER will perform field quality assurance tests to measure density and water content of soil in place, laboratory full compaction and associated one-point compaction tests, and gradation or index tests to confirm that materials placed meet the requirements of these Specifications.
- B. CONTRACTOR shall remove surface material and provide assistance as necessary with sampling and testing.

## **PART 2 PRODUCTS**

### 2.1 SOURCE QUALITY CONTROL

- A. Source(s) of imported material must be approved by ENGINEER before material is imported to the site.
- B. Samples:
  - 1. Provide one 50-pound sample of each imported material, collected in accordance with ASTM D 75, at least 28 days before importing to the site.
  - 2. Clearly mark to show source of material and intended use.
  - 3. Provide certified test results to document conformance with Specification requirements.
- C. Tests:
  - 1. As necessary to locate acceptable sources of imported material and to develop and manage borrow areas.
  - 2. During production of imported material, perform gradation test and Atterberg limits test in accordance with ASTM D422 and ASTM D 4318, respectively at a minimum frequency of one per every 150 cubic yards of imported material delivered to the site.
  - 3. Perform a minimum of one laboratory compaction test per ASTM D 1557 for every 300 cubic yards of material delivered to the site.

4. During production of imported material, perform soundness testing in accordance with ASTM C 88.
  5. Clearly mark test results to show source of material date tested and intended use.
  6. Provide gradation test results to ENGINEER within 48 hours of sampling; provide all other test results to ENGINEER upon test completion.
- D. Fill materials that are derived from processing of on-site borrow rather than being imported, shall meet the requirements under SOURCE QUALITY CONTROL.

2.2 PERVIOUS FILL

- A. Clean sands and sands with silt and clay derived from excavated soils or imported materials, well graded, and having a maximum particle size of 3 inches, fines and plasticity characteristics noted below for each zone, and free of deleterious materials.
- B. Maximum Fines Content: 10 percent after placement and compaction in the fill.
- C. Maximum plasticity index: 10
- D. Allowable USCS classifications: SP, SW, SW-SC, SP-SC, SW-SM, and SP-SM
- E. Blend adequately during placement such that the compacted material forms a uniform, homogeneous, dense, void free, and relatively pervious compacted fill.
- F. Remove cobbles, boulders, hard bedrock fragments, or other particles larger than 6 inches.

2.3 TRENCH BACKFILL (ORDINARY FILL)

- A. On-site soils from excavations are generally acceptable as Ordinary fill unless deemed unacceptable by the ENGINEER.
- B. Ordinary fill shall consist of hard, durable sand and gravel, free of clay, organic matter, surface coatings, and other deleterious materials.
- C. Materials will be well graded, having a maximum particle size of 3 inches. Remove cobbles, boulders or other particles larger than 3 inches.
- D. Soil finer than the No. 200 sieve shall be non-plastic.
- E. Gradation Limits:

Sieve Size	Percent Passing (%)
3-inch	100
2-inch	80-100
No. 4	20-100
No. 200	0-20

- F. On-site soils that do not meet these gradation limits may be used as ordinary fill if approved by the ENGINEER.

2.4 FILTER SAND

- A. Imported fine aggregate conforming to the requirements of ConnDOT M.03.01.2.

2.5 DRAIN AGGREGATE (NO. 89 AGGREGATE)

- A. Imported coarse aggregate conforming to the requirements of ASTM C 33, Gradation of Aggregate, No. 89 Aggregate.

2.6 PIPE BEDDING

- A. Pipe bedding material shall conform to the requirements of ConnDOT M.08.01. This material shall be sand or sandy soil, all of which passes a 3/8-inch (9.5-millimeter) sieve, and not more than 10% passes a No. 200 (75-micron) sieve.
- B. When ground water is encountered, the Engineer may allow No. 6 stone conforming to ConnDOT M.01.01 to be used instead of sand or sandy soil.

2.7 SUBBASE

- A. Imported coarse aggregate conforming to the requirements of ConnDOT M.02.02 Subbase, Type 2 Crusher-Run Stone.
- B. Gradation meeting:

Sieve Size	Percent Passing by Weight
3½-inch	100
1½-inch	55 - 100
1/4-inch	25 - 60
No. 10	15 - 45
No. 40	5 - 25
No. 100	0 - 10
No. 200	0 - 5

- C. Abrasion Resistance: Granular base shall show a loss on abrasion of not more than 50% using AASHTO Method T 96.
- D. Plasticity: Granular base shall meet the following requirements for plasticity:
  - 1. When the fraction of the dry sample passing the No. 100 sieve is 4% or less by weight, no plastic limit test will be made.
  - 2. When the fraction of the dry sample passing the No. 100 sieve is greater than 4% and not greater than 8% by weight, that fraction shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T 90.
  - 3. When the fraction of the dry sample passing the No. 100 sieve is greater than 8% by weight, the sample will be washed; and the additional material passing the No. 100 sieve shall be determined by AASHTO Method T 146, except that the No. 100 sieve will be substituted for the No. 40 mesh sieve where the latter is specified in AASHTO Method T 146. The combined materials that passed the No. 100 sieve shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T 90.
- E. Free from thin or elongated pieces, lumps of clay, loam, or other deleterious material.

2.8 TOPSOIL

- A. Topsoil shall meet requirements of CONNDOT M.13.01-1. Topsoil shall meet the soil textural classes established by the USDA Classification System based upon the proportion of sand, silt, and clay size particles after passing a No. 10 (2 millimeter) sieve and subjected to a

particle size analysis. The topsoil shall not contain less than 6% nor more than 20% organic matter as determined by loss on ignition of oven-dried samples dried at 221° F (105° C).

1. The following textural classes shall be acceptable:
  - a. Loamy sand, including coarse, loamy fine, and loamy very fine sand
  - b. Sandy loam, including coarse, fine and very fine sandy loam
  - c. Loam
  - d. Silt loam, with not more than 60% silt
- B. The topsoil to be furnished by the CONTRACTOR shall be loose and friable and free from refuse, stumps, roots, brush, weeds, rocks and stones over 1 1/4 inches (30 millimeters) in diameter. The topsoil shall also be free from any material that will prevent the formation of a suitable seedbed or prevent seed germination and plant growth.
- C. The CONTRACTOR shall notify the ENGINEER of the location from which he proposes to furnish topsoil to the project at least 15 calendar days prior to delivery.
- D. The CONTRACTOR will be allowed to strip and re-use existing topsoil.
- E. Topsoil which does not meet specifications or which has become mixed with undue amounts of subsoil during any operation at the source or during placing and spreading, will be rejected and shall be replaced by the CONTRACTOR with acceptable material at his expense.

## 2.9 WATER FOR MOISTURE CONDITIONING

- A. Free of hazardous or toxic contaminates, or contaminants deleterious to proper compaction.

## 2.10 MOISTURE CONDITIONING EQUIPMENT

- A. Provide water trucks and/or tankers and other supplemental equipment necessary to uniformly apply water in excavation areas and to loose lifts of material for proper compaction and for watering of completed courses until overlying courses are placed.
- B. Watering equipment shall be equipped with pressurized distributor bars or other means necessary to assure uniform application of water.
- C. Provide blades, discs, and other supplemental equipment necessary to process, blend non-uniform fill and backfill materials, for aerating and drying out wet materials, and for scarification of completed courses.
- D. Discs shall be of sufficient type, size and power to blend the full depth of the loose lifts, and to cut into and scarify the underlying completed course to a depth of 2 inches to allow bonding of successive lifts. In addition, discs shall be adjustable to allow light scarification of completed courses or haul roads that require reconditioning prior to placement of overlying fill.

## 2.11 COMPACTION EQUIPMENT

- A. Provide dedicated compaction equipment of suitable type, capable of achieving the requirements of the Specifications, and which provide a satisfactory uniform, homogeneous fill for each zone of material.
- B. Hauling or placement equipment shall not be considered compaction equipment except under special circumstances as specified below.



- C. Provide hand-operated equipment for use in confined areas not accessible to regular compaction equipment or where regular compaction equipment might damage structures or piping. Compaction equipment shall be subject to the approval of ENGINEER.

### **PART 3 EXECUTION**

#### **3.1 GENERAL**

- A. Scarify, moisture condition, and compact top 8 inches of subgrade.
- B. Where subgrade cannot be compacted as specified, or in areas identified by ENGINEER that display yielding or excessive rutting during construction activities, adjust moisture content and recompact, Bridge by adding crushed rock at ENGINEER'S direction or overexcavate and replace overexcavated material
- C. Prior to beginning placement of fill or backfill, the CONTRACTOR shall notify the ENGINEER in writing that an area is ready to receive fill. No fill or backfill shall be placed until final approval has been given by the ENGINEER.
- D. Keep placement surfaces free of water, debris, and foreign material during placement and compaction of fill and backfill materials.
- E. Place and spread fill and backfill materials in horizontal lifts of uniform thickness in a manner that avoids segregation.
- F. Compact each lift at the specified moisture content, using the specified equipment, and to specified densities, prior to placing succeeding lifts.
- G. Slope lifts only where necessary to conform to final grades or as necessary to keep placement surfaces drained of water.
- H. The maximum allowable particle size delivered in the fill and backfill at placement location and prior to any compaction shall be no larger than the maximum specified in Part 2.
- I. Maintain moisture content of delivered materials and compact materials in the lift to produce the specified fill characteristics.
- J. During filling and backfilling around structures, keep level of fill and backfill even on all sides of structure.
- K. Do not place fill or backfill if fill or backfill material is frozen, or if surface upon which fill or backfill is to be placed is frozen.
- L. Tolerances:
  - 1. Final Lines and Grades: Within a tolerance of 0.1-foot unless dimensions or grades are shown or specified otherwise.
  - 2. Grade to establish and maintain slopes and drainage as shown. Reverse slopes are not permitted.
- M. Settlement: Correct and repair any subsequent damage to walls, bulkhead, toe drains, cutoff wall, and other facilities caused by settlement of fill or backfill.

#### **3.2 MOISTURE CONDITIONING AND PROCESSING**

- A. Provide supplemental sprinkling on the fill to keep material within specified moisture content limits throughout the placement and compaction process, and to preserve moisture in completed courses until placement of overlying courses.

- B. Blend material by disking, blading, or harrowing to maintain uniform moisture content throughout the lift.
- C. Do not attempt to compact material that contains excessive moisture. Material that becomes too wet shall be removed or reworked. Aerate material by blading, disking, harrowing, or other methods to hasten the drying process.
- D. Provide suitable types and numbers of watering and blending equipment to keep pace with fill and backfill placement activities. Provide additional equipment or restrict material placement rates if watering and blending equipment cannot keep pace with fill and backfill placement.
- E. Maintain moisture conditions of the fill surface during nights, weekends, holidays, and other periods of temporary work stoppage.

### 3.3 COMPACTION

- A. Compact all material by mechanical means. If tests indicate that compaction or moisture content is not as specified, or if compaction equipment being used is not as specified, terminate material placement and take corrective action prior to resuming material placement.
- B. Operate compaction equipment in strict accordance with manufacturer's instructions and recommendations. Maintain equipment in such condition that it will deliver the manufacturer's rated compactive effort.
- C. Operate tamping foot rollers at a speed less than 5 miles per hour, and vibratory drum roller at a speed less than 3 miles per hour.
- D. Operate sheepsfoot and tamping foot rollers to maintain the spaces between the individual feet clear of adherent materials that impair the effectiveness of the roller.
- E. Where a minimum number of coverages is specified, provide 20 percent overlapping roller passes for each complete roller coverage per lift.
- F. Provide suitable numbers of equipment to keep pace with fill and backfill placement activities. Restrict material placement rates if compaction equipment cannot keep pace with fill and backfill placement.

### 3.4 PERVIOUS FILL, TRENCH BACKFILL (ORDINARY FILL)

- A. Maximum Lift Thickness: 8 inches
- B. Compaction: Not less than 92 percent relative compaction (ASTM D 1557).
- C. Compaction Moisture: Between 2 percent below and 2 percent above optimum water content.

### 3.5 FILTER SAND

- A. Maximum Lift Thickness: 8 inches
- B. Compaction: Not less than 92 percent relative compaction (ASTM D 1557).
- C. Compaction Moisture: Between 2 percent below and 2 percent above optimum water content.

3.6 DRAIN AGGREGATE (NO. 89 AGGREGATE):

- A. Place crushed rock material in maximum 12-inch lifts and compact to a minimum number of passes of a rubber-wheeled compactor.
- B. Crushed rock may be used to stiffen soft subgrades when identified by the ENGINEER. Use and compaction will be at the discretion of the ENGINEER.

3.7 PIPE BEDDING

- A. Maximum Lift Thickness: 8 inches
- B. Compaction: Not less than 92 percent relative compaction (ASTM D 1557).
- C. Compaction Moisture: Between 2 percent below and 2 percent above optimum water content.

3.8 SUBBASE

- A. Maximum Lift Thickness: 6 inches after final compaction. However, if the required thickness of subbase does not exceed 8 inches, it may be placed in one course.
- B. Compaction: Not less than 95 percent relative compaction (ASTM D 1557).
- C. Compaction Moisture: Between 2 percent below and 2 percent above optimum water content.
- D. After each course has been placed as specified above, its entire area shall be compacted with equipment specifically manufactured for that purpose. The sole use of hauling and spreading equipment shall not be considered as a substitute for compacting equipment. Compaction shall be continued until the entire course is uniformly compacted to the required minimum density.
- E. Should the foundation material beneath the subbase become churned up and mixed with subbase material at any time, the Contractor shall, without additional compensation, remove the mixture and replace it with new subbase material to the required thickness shown on the plans or as previously required by the Engineer. Such replaced subbase material shall be compacted to the required minimum density.

3.9 REPLACING OVEREXCAVATED MATERIAL

- A. Replace excavation carried below grade lines shown or established by ENGINEER as follows:
  - 1. Beneath Fill or Backfill: Same material as specified for overlying fill or backfill.
  - 2. Beneath pavement, sidewalks, and curbs: Subbase.

3.10 SITE GRADING

- A. Grade surface to drain uniformly and to a smooth, uniform appearance.
- B. Place Topsoil as specified in Section 32 90 00: SITE RESTORATION.

3.11 QUALITY CONTROL

- A. CONTRACTOR shall perform quality control tests prior to and during fill and backfill placement. Test frequencies specified are minimums. Additional testing may be performed where minimum frequencies are unrepresentative for variable materials or inconsistent

construction operations, and to retest previously failed materials after corrective actions have been implemented.

**B. Field Quality Control Tests**

1. An initial number of tests are required prior to placement of fill or backfill as specified below; additional tests are required during construction at the specified frequency and whenever material variation occurs such that existing information is not representative.
2. CONTRACTOR will perform Moisture-Density Relationship:
  - a. Prior to placement of fill and backfill, a minimum of (4) four laboratory compaction density tests in accordance with ASTM D 1557 for each different soil and weathered bedrock material used.
  - b. Apply rock corrections to density and moisture content determinations for oversize materials larger than 3/4-inch.
  - c. During fill and backfill placement, additional laboratory compaction tests are required whenever material variation occurs such that the existing relationships are not representative, and at the following minimum frequencies.
    - i. One laboratory compaction test per 1,000 cy material that is placed.
    - ii. One-point laboratory compaction tests in conjunction with in-place field density and moisture tests.
3. CONTRACTOR will perform Gradation and Atterberg Limits:
  - a. Prior to placement of fill and backfill, four gradation tests and (4) four Atterberg limit tests for each different soil material used; tests shall correspond with samples used for initial laboratory compaction and minimum/maximum density tests. Gradation test shall be performed in accordance with ASTM D 422, and Atterberg limits test shall be performed in accordance with ASTM D 4318.
  - b. During fill and backfill placement, additional gradation and Atterberg limit tests are required whenever material variation occurs and appears to deviate from the Specifications, and at the following minimum frequencies:
    - i. One per 1,000 cy, each material
4. CONTRACTOR will perform In-Place Density and Moisture Content:
  - a. During fill and backfill placement, in-place density testing shall be performed once per day per material placed but not less than once per 200 cy. In-place density testing shall use one, or a combination of the following methods: ASTM D 2922, D 1556, D 2216, and D 3017.
  - b. A minimum of 20 percent of the in-place density and moisture content tests for each material will be made in accordance with the following methods: ASTM D 1556 (sand cone) and ASTM D 2216 (laboratory moisture). A one-point compaction test will be performed for every sand cone test.
  - c. The maximum dry density and optimum water content at the location of the in-place density test shall be evaluated using the one-point compaction test and full-curve compaction tests (family of curves) of representative fill materials. Determine the maximum dry density and optimum water content in accordance with the Maximum Density and Optimum Water Content Calculation section and the Appendix section of AASHTO T272.

- d. Retests of failed areas after corrective measures have been implemented are required; retests will reference the prior failing test number.
5. Test Reporting:
- a. Written copies of all Field Quality Control Tests shall be available on site at all times.
  - b. Written copies of all field quality control tests shall be submitted to the ENGINEER within 3 days of testing.

**END OF SECTION**

**SECTION 31 37 00  
RIPRAP AND RIPRAP BEDDING**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to complete all riprap and riprap bedding required to complete the work as shown on the drawings.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
1. C 127, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.
  2. C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  3. C 535, Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  4. D 2938, Standard Test Method for Unconfined Compressive Strength of Intact Rock Core Specimens
- B. Connecticut Department of Transportation (ConnDOT)
1. Connecticut Department of Transportation, Standard Specifications for Road and Bridge Construction (CONNDOT) Standard Specifications, Form 816.

1.3 SUBMITTALS

- A. Samples:
1. Notify ENGINEER at least 48 hours prior to the date of sampling to allow optional observation of sampling by ENGINEER.
  2. Deliver to site at location designated by ENGINEER.
  3. Incorporate samples into Work after material placement is nearly complete.
  4. Imported Riprap:
    - a. Sample shall be a minimum 500 pounds.
    - b. Sample shall be representative in size, shape and color of material to be furnished for incorporation into Work. .
  5. Imported Riprap Bedding:
    - a. 50 pounds of imported riprap bedding material.
    - b. Each sample shall meet gradation requirements specified and be representative of material to be furnished for incorporation into Work.
- B. Administrative:
1. Submit the following:
    - a. Description and location of proposed sources of riprap bedding and riprap.
  2. Trip tickets showing source, type, and weight of each load of material delivered to site.
- C. Quality Control:

1. Certified Test Results:

- a. Riprap Bedding: provide test results prior to importing, and at least one test per 5,000 tons during production.
  - i. Gradation.
  - ii. Abrasion resistance.
- b. Riprap: material sample of size, shape and color to be approved by the ENGINEER.

1.4 SCHEDULING AND SEQUENCING

- A. Complete subgrade preparation as specified in Section 31 10 00: SITE CLEARING, Section 31 23 16: Excavation, Section 31 23 23: FILL AND BACKFILL and prior to placing riprap bedding and riprap.

**PART 2 PRODUCTS**

2.1 RIPRAP BEDDING

- A. Imported, well-graded crushed rock meeting the following:

- 1. Gradation meeting ConnDOT M.01.01 No. 6 Coarse Aggregate:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1-inch	100
3/4-inch	90 – 100
1/2-inch	20 – 55
3/8-inch	0 – 15
No. 4	0 – 5
No. 200	0 – 3

- 2. Abrasion Resistance: Maximum 35 percent wear when tested in accordance with ASTM C 535.
- 3. Minimum specific gravity of 2.65 when tested in accordance with ASTM C 127.

- B. Free from deleterious matter.

2.2 RIPRAP

- A. Re-use existing riprap where possible.
- B. Imported riprap shall be hard and durable quarry stone free from fractures, bedding planes, pronounced weathering, and earth or other adherent coatings.
- C. Imported riprap shall match size, shape, color, and appearance of existing riprap.
- D. Abrasion Resistance: Maximum 35 percent wear as determined in accordance with ASTM C 535.
- E. Bulk Density: Minimum 165 pounds per dry cubic foot (minimum specific gravity of 2.65 per ASTM C 127).

- F. Free from dirt and deleterious materials.

### **PART 3 EXECUTION**

#### **3.1 PLACING RIPRAP BEDDING**

- A. Place riprap bedding on prepared foundation to lines, grades and thickness shown.
- B. No mechanical compaction of riprap bedding is required; however, work riprap bedding as necessary to distribute it and to eliminate detrimental voids. Avoid overworking or long pushes that result in segregation of particle sizes.
- C. Grade surface of riprap bedding free from irregularities and to tolerances of 0.2 foot from established grade.
- D. Place and grade riprap bedding in a manner that avoids subgrade disturbance. Do not push material down slope

#### **3.2 RIPRAP**

- A. Place riprap over riprap bedding to the lines, grades and thickness shown.
- B. Final appearance of riprap surface shall match the surrounding riprap surfaces.
- C. Placement tolerance for riprap is 0.25 foot above established grade. No tolerance below established grade will be allowed.

**END OF SECTION**



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**SECTION 32 12 00**  
**BITUMINOUS CONCRETE PAVING**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Provide all layout, labor, equipment, materials, tools, transportation, supervision and incidentals necessary for the placement of new bituminous concrete pavement on a prepared sub-base as shown on the Drawings or as directed by the ENGINEER. All work shall be to the lines, grades, and compacted thickness indicated in these Specifications and on the Contract Drawings.

1.2 REFERENCES

- A. State of Connecticut Department of Transportation (CONNDOT), Standard Specifications for Road, Bridges and Incidental Construction, Form 816.
- B. AASHTO M 140 – Standard Specification for Emulsified Asphalt

1.3 SUBMITTALS

- A. The CONTRACTOR shall submit the following items to the ENGINEER for review and approval in accordance with Section 01 33 00: SUBMITTAL PROCEDURES:
1. Submit proposed mix design of each class of mix for review prior to commencement of work.
  2. Material Certificates: Provide copies of material certificates signed by material producer and CONTRACTOR certifying that each material item complies with or exceeds specified requirements.
  3. At least 48 hours prior to paving, the CONTRACTOR shall submit a plan and schedule of the proposed paving operations. The plan and schedule shall contain detailed information on the following: width and direction of each pass, number of trucks and plant location, number of rollers, method of staggering joints, and typical traffic control measures to be utilized (if applicable). The plan and schedule shall be submitted to, and approved by, the ENGINEER prior to the beginning of paving operations.

**PART 2 PRODUCTS**

2.1 MATERIALS

- A. All work and materials shall conform to the relevant provisions of the CONNDOT Standard Specifications for Roads, Bridges, and Incidental Construction and as specified herein.
- B. Bituminous Concrete Pavement shall conform to the requirements of M.04 of the CONNDOT Standard Specifications.
- C. Tack Coat shall be emulsified asphalt grade RS-1 conforming to the requirements of AASHTO M140. Viscosity determination will not be required for material sampled at the point of delivery.
- D. Bituminous concrete curbing shall consist of machine laid bituminous concrete, constructed on the pavement to the dimensions and details shown on the plans, or as ordered, and in

conformity with the specifications. Materials, including tack coat, for this work shall conform to the requirements of Section M.04, Bituminous Class 3.

### **PART 3 EXECUTION**

#### **3.1 GENERAL**

- A. Work shall conform to the applicable requirements of Sections 4.06, 8.03, 8.15 and 9.22 of the CONNDOT Standard Specifications and as specified herein.
- B. Subgrade and Existing Surface Preparation.
  - 1. All surfaces to receive pavements shall be examined by the ENGINEER to see that they in proper condition to receive the work specified. The ENGINEER shall review and mark all deteriorated areas to be removed in the field with the CONTRACTOR.
  - 2. At locations where new pavement is to abut existing, the edge of all deteriorated pavements shall be cut back from exposed edges a sufficient distance to form a clean, sharp straight edge. Cut back pavement shall be carefully removed to minimize any disturbance to foundation materials. After this has been performed, cut back existing pavement 12 inches from the edge of existing base. No ragged or irregular edges will be permitted. The exposed surface of the foundation material shall then be rolled with a power tandem roller, weighing 150 to 240 pounds per inch width of tread, wetting the surface as necessary to obtain a firm, even surface. Any depressions or uneven areas shall be re-graded and re-rolled until the surface is smooth and compacted as specified.
- C. Adjusting of Utility Structures
  - 1. Existing-to-remain water, sewer, drainage, and communications structures which are located in proposed roadway areas shall be made to conform to the newly proposed final grade. Work shall be performed in accordance with the requirements of Sections 5.07 of the CONNDOT Standard Specifications.

#### **3.2 PLACEMENT**

- A. The mixtures shall be placed and compacted to provide a smooth and dense surface with a uniform texture. When overtaken by sudden storms, the ENGINEER may permit placement of the bituminous concrete to continue up to the quantity of material that is in transit from the plant.
- B. The mixture shall be placed at a temperature that is within 25°F (15°C) of the approved job mix formula.
- C. Before rolling is started, the mat shall be checked for defects in material or placement. Such defects shall be corrected to the satisfaction of the ENGINEER. Where it is impracticable due to physical limitations to operate the paving equipment, the ENGINEER may permit the use of other methods or equipment. Where hand spreading is permitted, the mixture shall be placed by means of suitable shovels and other tools, and in a uniformly loose layer at a depth that will result in a completed pavement having the designed depth. Any deviation from standard crown or section shall be immediately remedied by placing additional material or removing surplus as directed by the ENGINEER. The ENGINEER may direct that other means of spreading be used to ensure a better control of the depths of material and the finished surface.

- D. A thin uniform coating of tack coat shall be applied to the pavement immediately before overlaying and be allowed sufficient time to break (set). All surfaces that have been in place longer than five calendar days shall have an application of tack coat. A tack coat shall be applied to all contact surfaces such as gutters, manholes and concrete barriers. The tack coat shall be applied by a non-gravity pressurized spray system that results in uniform overlapping coverage at an application rate of 0.05 to 0.15 gallons per square yard (140 to 450 milliliters per square meter). Gravity-fed systems are not acceptable for tack coat application. The ENGINEER must approve the equipment and the method of measurement prior to use. The material for tack coat shall not be heated in excess of 160°F (70°C) and shall not be further diluted.
- E. Refueling of equipment is prohibited in any location on the paving project where fuel might come in contact with bituminous concrete mixtures already placed or to be placed. Solvents for use in cleaning mechanical equipment or hand tools shall be stored clear of areas paved or to be paved. Before any such equipment and tools are cleaned, they shall be moved off the paved or to-be-paved area; and they shall not be returned for use until after they have been allowed to dry.
- F. Temporary and permanent transverse joints shall be formed by saw-cutting a sufficient distance back from the previous run, existing bituminous concrete pavement, or bituminous concrete driveways to expose the full depth of the course. On any cold joint, immediately prior to additional bituminous concrete materials being placed, a brush of tack coat shall be used on all contact surfaces.
- G. The longitudinal joint shall be made with a Notch Wedge as detailed on the Drawings.

### 3.3 COMPACTION

- A. Compaction: In general, rolling shall consist of initial or breakdown rolling, intermediate rolling and final or finish rolling. The CONTRACTOR shall furnish a sufficient number and type(s) of rollers for each paving machine to properly compact the mat. When operating the roller in the vibratory (dynamic) mode, the operator shall maintain a minimum of ten to twelve impacts per foot (30 to 40 impacts per meter). All vibratory rollers shall be shut off from the vibrating mode when reversing directions and be equipped with automatic reversing eccentrics (weights). The use of a vibratory roller in the dynamic or vibratory mode is prohibited on concrete structures such as bridges and catch basins.
- B. If the ENGINEER determines that the use of vibratory compaction equipment may damage roadway components, utilities or adjacent property, the CONTRACTOR shall provide alternate compaction equipment to meet specification requirements unless otherwise approved by the ENGINEER. The completed pavement course on roadways will have the mat and longitudinal joints tested for compaction in accordance with the "Density Testing Procedure" established by CONNDOT's Director of Research and Materials. Each course placed at a depth of one and one-half inches (40 mm) or greater shall have the mat and longitudinal joints compacted to a minimum of 92.0 percent and no more than 97.0 percent density as determined by AASHTO T209 (modified). Class 4 bituminous concrete is excluded from the joint density requirements.

### 3.4 PROTECTION OF THE WORK

- A. All sections of the newly finished pavement shall be protected by the CONTRACTOR from damage by the CONTRACTOR's equipment and traffic.

### 3.5 CORRECTIVE WORK PROCEDURES

- A. Any portion of the completed pavement determined by the ENGINEER to be defective in surface texture, density or composition, or that does not comply with the requirements of the specifications shall be corrected at the expense of the CONTRACTOR. Any corrective courses placed as the final wearing surface shall not be less than one and one-half inches (40mm) in depth after compaction.

### 3.6 BITUMINOUS CONCRETE CURB PAVING

- A. The provisions of CONNDOT Section 4.06, and 8.15 shall govern except that the requirements pertaining to density will not apply. In addition, the curbing shall be constructed in accordance with the following requirements:
1. Prior to the arrival of the mixture on the Project site, the surface of the pavement where the curbing is to be constructed shall be cleaned of all loose and foreign material. The surface, which shall be perfectly dry and clean at the time the mix is placed, shall be coated with an approved tack coat just prior to placing the mixture.
  2. On arrival at the site, the mixture shall be transferred from the truck to the hopper of the curbing machine; and the mixture shall be kept clean and free from dirt and foreign materials at all times.
  3. The surface of the curbing shall be tested with a 10-foot (3-meter) straightedge, and any variation from a true line exceeding 1/4 inch (6 millimeters) shall be satisfactorily corrected at the CONTRACTORS expense. The only compaction required shall be that obtained by the approved mechanical curbing machine.
  4. Where machine work is impractical, the ENGINEER may permit hand-laid curbing to be constructed.
  5. If the design of the curbing machine is such that the outside wheels operate outside of the curb, the CONTRACTOR will be required to obtain a smooth surface by grading and consolidating the area on which the outside wheel of the machine rides, and this work shall be done at the CONTRACTOR's expense.
  6. After the completion of curbing, traffic shall be kept at a safe distance for a period of not less than 24 hours and until the curbing has set sufficiently to prevent injury or damage to the work.

### 3.7 CONSTRUCTION TOLERANCES

- A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:
1. Base Course: Plus or minus 1/2 inch.
  2. Top and Binder Course: Plus 1/4 inch, no minus.
- B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:
1. Base Course: 3/8 inch.
  2. Top and Binder Course: 1/4 inch.

**END OF SECTION**

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**SECTION 32 16 13.43  
GRANITE CURBING**

**PART 1 GENERAL**

**1.1 WORK INCLUDES**

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to furnish and install or reset granite curb as required to complete the work as shown on the drawings.

**1.2 REFERENCES**

- A. The following is a list of standards which may be referenced in this Section:
1. American Association of State Highway and Transportation Officials (AASHTO):
    - a. AASHTO Method T 90, Determining the Plastic Limit and Plasticity Index of Soils
    - b. AASHTO Method T 96, Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
    - c. AASHTO Method T 146, Wet Preparation of Disturbed Soil Samples for Test
  2. American Society for Testing and Materials (ASTM):
    - a. ASTM C 131, Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
    - b. ASTM C 615, Granite Dimension Stone
    - c. ASTM C 206, Standard Specification for Finishing Hydrated Lime
  3. Connecticut Department of Transportation (ConnDOT), Standard Specifications for Roads, Bridges, and Incidental Construction, Form 816.

**1.3 SUBMITTALS**

- A. Samples:
1. Granite Curbing: The CONTRACTOR shall submit for approval, the name of the quarry and the type of curb which the CONTRACTOR proposes to use.
  2. Samples of curbing shall be submitted for approval if requested by the ENGINEER. Such submission shall be made sufficiently in advance of ordering so that the ENGINEER may have an opportunity to judge the stone, both as to quality and appearance. No stone from any other quarry shall be used unless it has been properly approved.

**1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Granite curbing that is to be removed and reset shall be handled with care to avoid damage during removal, stockpiling and installation. Any granite curbing that is damaged by the Contractor due to neglect by the Contractor will be replaced with new granite curbing at the Contractors expense.
- B. Granite curbing shall be delivered to the site adequately protected from damage during transit. If granite curbing is stockpiled, protect from staining, chipping, and other damage.

Cracked, badly chipped, stained, or otherwise damaged granite curb units will be rejected and shall not be used to complete the work.

## 1.5 SEQUENCING AND SCHEDULING

- A. Place granite curbing after subbase has attained acceptable density as specified in Section 31 23 23: FILL AND BACKFILL. Obtain ENGINEER's acceptance of the subbase prior to placing granite curbing.

## PART 2 PRODUCTS

### 2.1 SUBBASE

- A. Material for subbase shall conform to the requirements of Section 31 23 23: FILL AND BACKFILL.

### 2.2 GRANITE CURB

- A. Granite curb shall meet the requirements of ConnDOT M.12.06 for granite curbing.
- B. The finish and surface dimensions for the curb shall conform to the following requirements:
  - 1. The curbstone shall have a top surface free from wind; it shall be pointed, peen-hammered or sawed to an approximately true plane, and shall have no projections or depressions greater than 1/8 inch. The front and back arris lines shall be pitched straight and true.
  - 2. On the back surface of the curbstone there shall be no projection for 3 inches down from the top which would fall outside of a plane having a batter of 4 inches in 12 inches from the back arris line.
  - 3. The front face shall be at right angles to the plane of the top and shall be smooth quarry-split, free from drill holes in the exposed face. There shall be no projections greater than 3/4 inch, or depressions greater than 1/2 inch, measured from the vertical plane of the face through the top arris line for a distance of 8 inches down from the top. For the remaining distance, there shall be no projections or depressions greater than 1 inch measured in the same manner. The arris lines at the ends shall be pitched with no variation from the plane of the face greater than 1/8 inch.
  - 4. The ends of all stones shall be square with the planes of the top and face and so finished that, when the stones are placed end to end as closely as possible, no space more than 1/2 inch shall show in the joint for the full width of the top or down on the face for 8 inches. On curbstones having a length of 6 feet or more, the remainder of the end may break back not over 9 inches; whereas, on shorter curbstones, they shall not break back more than 6 inches.
  - 5. If sawed, the curbstones shall be thoroughly cleaned of any iron rust or iron particles.
  - 6. For straight curbing, 80% of the stones shall be furnished in lengths of not less than 6 feet, and the remaining 20% in lengths of not less than 4 feet, interspersed at random, to allow for closures.

### 2.3 CEMENT MORTAR

- A. Mortar shall meet the requirements of ConnDOT Article M.11.04.
- B. Mortar shall be composed of one part Portland cement and two parts, by volume, of surface dry fine aggregate. Hydrated lime, in an amount not to exceed 4 pounds (1.8 kilograms) of

lime to each bag of cement, may be added at the option of the Engineer. Cement and hydrated lime shall conform to the following requirements:

1. Portland cement, Types I, II or IS, and water shall conform to the requirements of CONNDOT Article M.03.01.
2. Hydrated lime shall conform to the requirements of ASTM C 6.
3. For laying stone, fine aggregate shall conform to Grading A, table below. In all other respects, it shall conform to the requirements of CONNDOT Article M.03.01-2.
4. For pointing stone the fine aggregate shall conform to Grading B, table below. In all other respects it shall conform to the requirements of Article M.03.01-2.
5. Table of Gradation, Fine Aggregate for Mortar:

Sieve Size	Percent Passing by Weight (Mass)	
	Grading A	Grading B
3/8-inch	100	--
No. 4	95 - 100	--
No. 8	80 - 100	100
No. 16	50 - 85	--
No. 30	25 - 60	--
No. 50	10 - 30	10 - 40
No. 100	2 - 10	0 - 10

### **PART 3 EXECUTION**

#### **3.1 PREPARATION OF SUBGRADE**

- A. Excavation shall be made to the bottom of the subbase below the curbing, the trench being wide enough to permit thorough compaction. The subgrade shall be free of water, debris, and foreign material, and compacted to a firm, even surface and shall be approved by the ENGINEER.
- B. Existing subgrade material that will not readily compact shall be removed and replaced with satisfactory materials.

#### **3.2 SUBBASE**

- A. Subbase shall be placed in one uniform lift and compacted to a minimum number of passes of a vibratory plate compactor.

#### **3.3 INSTALLING GRANITE CURBING**

- A. Re-use existing granite curbing where possible.
- B. The curbing shall be set on edge and settled into place with a heavy wooden hand-rammer, to the line and grade required, straight and true for the full depth.
- C. The joints of the stone curbing shall be pointed with mortar for the full depth of the curbing. At approximately 50-foot intervals, a 1/2-inch joint shall not be filled with mortar but left free for expansion.
- D. The ends of the stone curbing at driveways and intersections shall be cut at a bevel or rounded, as directed by the ENGINEER.

3.4 BACKFILLING

- A. The trench for the granite curbing shall be backfilled with approved material; the first layer to be 4-inches in depth, thoroughly compacted; the remaining layers to be not more than 6-inches in depth and thoroughly compacted until the trench is filled.

**END OF SECTION**



**SECTION 32 16 23  
CONCRETE SIDEWALKS**

**PART 1 GENERAL**

**1.1 WORK INCLUDES**

- A. Installation of concrete sidewalks.

**1.2 REFERENCES**

- A. State of Connecticut Department of Transportation (ConnDOT)
  - 1. Standard Specifications for Roads Bridges, and Incidental Construction, Form 816.

**1.3 SUBMITTALS**

- A. Product data for preformed expansion joint material.

**PART 2 PRODUCTS**

**2.1 CLASS F CONCRETE**

- A. Class F Concrete shall meet the requirements of Specification Section 03 05 00: Basic Concrete Materials.

**2.2 PREFORMED EXPANSION JOINT MATERIAL**

- A. Preformed expansion joint material shall meet the requirements of Article M.03.01-05 of ConnDOT, Standard Specifications for Roads Bridges, and Incidental Construction, Form 816 and AASHTO M 213 for Preformed Bituminous Cellular Type or approved equal.
- B. Expansion joint material shall be ½” thick and be the full depth of the concrete slab.

**2.3 SUBBASE**

- A. Subbase shall meet the requirements of Specification Section 31 23 23: FILL AND BACKFILL for Subbase.

**2.4 ACCESSORIES**

- A. Forms: Side forms and transverse forms shall be smooth, free from warp, of sufficient strength to resist springing out of shape, of a depth to conform to the thickness of the proposed sidewalk and made of wood or metal. If forms are made of wood, they shall be of 2-inch surfaced plank except that at sharp curves.

**PART 3 EXECUTION**

**3.1 SUBGRADE PREPARATION**

- A. The subgrade for the sidewalks shall be shaped parallel to the proposed surface of the walks and thoroughly compacted. All depressions shall be filled with subbase and the subgrade compacted until the surface is smooth and hard.

3.2 SUBBASE FOUNDATION

- A. After the subgrade has been prepared, a foundation of subbase shall be placed upon it. After being compacted thoroughly, the foundation shall be at least 12 inches thick and parallel to the proposed surface of the walk.

3.3 FORMS

- A. All mortar or dirt shall be completely removed from forms that have been previously used.
- B. The forms shall be well staked and graded to the established lines with their upper edge conforming to the grade of the finished sidewalk and be sufficiently tight to prevent leakage of mortar.
- C. All forms shall be oiled before placing concrete.

3.4 PLACING AND FINISHING CEMENT CONCRETE

- A. Preformed expansion joint filler shall be placed adjacent to existing concrete, at 15foot intervals, and as directed by the Engineer.
- B. The concrete shall be placed in such quantity that after being consolidated in place it shall be the minimum thickness shown on the drawings.
- C. No finishing operations shall be performed while free water is present. Finishing operations shall be delayed until all bleed water and water sheen has left the surface and the concrete has started to stiffen.
- D. Concrete sidewalks shall be uniformly scored into blocks approximately 5 feet long.
- E. Edging of concrete shall match the existing sidewalk. The depth of scoring shall be at least one quarter the sidewalk depth and no more than ½ inch wide.
- F. After edging and joining operations, the surface shall be floated then immediately steel-troweled. If necessary tooled joints and edges shall be rerun before and after troweling to maintain uniformity.
- G. After troweling, the surface shall be brushed by drawing a soft-bristled push broom with a long handle over the surface of the concrete perpendicular to the length of the sidewalk to produce a nonslip surface.
- H. Sidewalk shall be constructed to a cross slope of 1.5% with a construction tolerance of +/- 0.5% to provide for surface drainage. The finished cross slope shall not exceed 2.0%.
- I. When completed the walks shall be kept moist and protected from traffic and weather for at least 3 days.

**END OF SECTION**

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**SECTION 32 17 23  
PAVEMENT MARKINGS**

**PART 1 GENERAL**

**1.1 WORK INCLUDES**

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to complete all painted pavement markings required to complete the work as shown on the drawings and including the following:
1. Traffic lines and markings.
  2. Parking lot lines and markings.

**1.2 REFERENCES**

- A. The following is a list of standards which may be referenced in this Section:
1. American Association of State Highway and Transportation Officials (AASHTO):
    - a. AASHTO M247 - Standard Specification for Glass Beads Used in Traffic Paint
  2. American Society for Testing and Materials (ASTM):
    - a. ASTM D562 - Standard Test Methods for Consistency of Paints Using the Stormer Viscometer
    - b. ASTM D711 - Standard Test Methods for No-Pick-Up Time of Traffic Paint
    - c. ASTM D1475 - Standard Test Methods for Density of Liquid Coatings, Inks, and Related Products
    - d. ASTM D2486 – Standard Test Methods for Scrub Resistance of Wall Paints
  3. State of Connecticut Department of Transportation (ConnDOT), Standard Specifications for Roads, Bridges, and Incidental Construction.

**1.3 PERFORMANCE REQUIREMENTS**

- A. Paint Adhesion: Adhere to road surface forming smooth and continuous film one minute after application.
- B. Paint Drying: Tack free by touch so as not to require coning or other traffic control devices to prevent transfer by vehicle tires within two minutes after application.

**1.4 SUBMITTALS**

- A. Product Data: Submit paint formulation for each type of paint.
- B. Samples:
  1. Submit four sample plates of each color of material. Prepare two plates without glass beads and four plates with glass beads for each different batch of material. After approval, OWNER will retain these plates for field comparisons of applied paint.
- C. Test Reports: Submit source and acceptance test results in accordance with AASHTO M247.
- D. Manufacturer's Installation Instructions: Submit instructions for application temperatures, eradication requirements, application rate, line thickness, type of glass beads, bead embedment and bead application rate, and any other data on proper installation.
- E. Manufacturer's Certificate: Certify paint products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with State of Connecticut Department of Transportation (ConnDOT) Standards and Specifications.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified with a minimum of three years documented experience.
- B. Applicator: Company specializing in performing work of this section with a minimum of three years of documented experience.

1.7 STORAGE AND HANDLING

- A. Paint: Invert containers several days prior to use when paint has been stored more than 2 months. Minimize exposure to air when transferring paint. Seal drums and tanks when not in use.
- B. Glass Beads: Store glass beads in cool, dry place. Protect from contamination by foreign substances.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint product manufacturer.
- B. Do not apply exterior coatings during rain or snow when relative humidity is outside humidity ranges, or moisture content of surfaces exceed those required by paint product manufacturer.
- C. Do not apply paint when temperatures are expected to fall below 50 degrees Fahrenheit for 24 hours after application.
- D. Volatile Organic Content (VOC): Do not exceed State of Connecticut Department of Energy and Environmental Protection or Environmental Protection Agency maximum VOC on traffic paint.

1.9 WARRANTY

- A. Furnish three year Manufacturer's warranty for traffic paints.

1.10 MAINTENANCE SERVICE

- A. Furnish service and maintenance of traffic paints for three years from the Date of Substantial Completion.

**PART 2 PRODUCTS**

2.1 PAINTED PAVEMENT MARKINGS

- A. Hot-Applied Waterborne Pavement Marking Paint: For white and yellow fast-drying waterborne pavement marking paint to be applied to bituminous concrete and Portland cement concrete pavements. This paint shall be capable of being applied with paint striping equipment at an application temperature of 130° F to 145° F. All requirements shall be as specified below:

1. General: The paint shall be formulated and manufactured from first-grade raw materials and shall be free from defects and imperfections that might adversely affect the serviceability of the finished product. The materials shall not exhibit settling or jelling after storage in the sealed containers as received that will affect the performance of the products. The paint shall provide the proper anchorage, refraction and reflection for the finished glass beads when applied as specified.
2. Composition: The composition of the paint shall be at the discretion of the manufacturer, provided that the finished product meets the requirements of any applicable Federal, State or Local regulations for products of this type and the requirements as follows:
  - a. Paint shall not contain more than 0.06% lead;
  - b. Total nonvolatile shall not be less than 76% by weight;
  - c. Pigment shall be 58 – 63% by weight;
  - d. Resin solids shall be composed of 100% acrylic emulsion polymer;
  - e. Volatile organic compounds shall not exceed 150 grams/liter, excluding water;
  - f. Closed-cup flash point shall not be less than 100° F, and weight per gallon shall not be less than 12.5 pounds/gallon when tested in accordance with ASTM D 1475.
3. Viscosity: The consistency of the paint shall not be less than 80, nor more than 90 Krieb units when tested in accordance with ASTM D562. The paint shall have good spraying characteristics when the material is heated to application temperature of 130° F to 145° F.
4. Flexibility: The paint shall not show cracking or flaking when subjected to the TT-P-1952D flexibility test in which the panels used shall be tin plates that are 3 inches x 5 inches (76 millimeters x 127 millimeters) in area and 35 - 31 U.S. Gauge in thickness. The tin panels shall be lightly buffed with steel wool and thoroughly cleaned with solvent before being used for tests.
5. Dry Opacity: Both white and yellow paints shall have a minimum contrast ratio of 0.96. Contrast ratio shall be determined by applying a wet film thickness of 0.005 inches (127 microns) to a standard hiding power chart. After drying, the black and white reflectance values shall be determined using a suitable reflectometer and the contrast ratio determined.
6. Bleeding: The paints shall have a minimum bleeding ratio of 0.97 when tested in accordance with FS TT-P-1952D. The asphalt-saturated felt shall conform to FS HH-R-590.
7. Abrasion Resistance: No less than 210 liters of sand shall be required to remove paint film when tested in accordance with TT-P-1952D.
8. Color: The paint shall not discolor in sunlight and shall maintain colorfastness throughout its life, approximately two years. Color determination shall be made without beads, after a minimum of 24 hours. Color for yellow paint shall be a visual match for 595-13538. If not a visual match, the diffuse day color of the paint shall conform to the CIE Chromaticity coordinate limits as follows:

<u>Paint</u>	<u>X,Y</u>	<u>X,Y</u>	<u>X,Y</u>	<u>X,Y</u>	<u>Brightness</u>
White	0.305,0.295	0.360,0.360	0.388,0.377	0.280,0.310	84.0 min
Yellow	0.485,0.455	0.506,0.452	0.484,0.428	0.477,0.438	50.0 min

9. Glass Bead Adhesion: The paint with glass beads conforming to M.07.30 of the State of Connecticut Department of Transportation (ConnDOT), Standard Specifications for Roads, Bridges, and Incidental Construction and AASHTO M 247, Type 1, applied at the rate of 6.0 pounds/gallon (0.72 kilograms/liter) of paint, shall require not less than 150 liters of sand to remove paint film and glass beads.
  10. Scrub Resistance: The paint shall pass 300 cycles minimum when tested in accordance with ASTM D2486.
  11. Drying Time: The reflectorized line shall dry to no pick up in 120 seconds or less when applied at the ratio provided for specified glass spheres to paint (the paint at 15+ 1 mil (381 millimeters  $\pm$  25 millimeters) wet film thickness equivalent to 100-115 square foot/gallon (2.45-2.82 square meters/liter) and the glass spheres at the equivalent rate of 6.0 pounds/gallon (0.72 kilograms/liter). The paint shall be applied with equipment so as to have the paint at a temperature of 130° F to 145° F (54° C to 63° C) at the spray gun.
- B. Waterborne Pavement Marking Paint: For white and yellow waterborne pavement marking paint that is to be applied to bituminous concrete and portland cement concrete pavements. This paint shall be capable of being applied with paint striping equipment that does not require heating above ambient temperatures. All requirements shall be as specified above for Hot-Applied Waterborne Pavement Marking Paint, except as follows:
1. Total nonvolatile shall not be less than 70% by weight;
  2. Pigment shall be 45 – 55% by weight;
  3. Weight per gallon (Mass per liter) shall not be less than 12.5 pounds/gallon (1.50 kilograms/liter) when tested in accordance with ASTM D 1475;
  4. Drying time to no pick up shall be 15 minutes or less when tested in accordance with ASTM D 711.
- C. Glass Beads: The glass beads shall conform to the requirements of M.07.30 of the State of Connecticut Department of Transportation (ConnDOT), Standard Specifications for Roads, Bridges, and Incidental Construction and AASHTO M 247, Type 1.

## 2.2 EQUIPMENT

- A. Continuous Longitudinal Line Application Machine: Use application equipment with following capabilities:
1. Dual nozzle paint gun to simultaneously apply parallel lines of indicated width in solid or broken patterns or various combinations of those patterns.
  3. Pressurized bead-gun to automatically dispense glass beads onto painted surface, at required application rate.
  4. Measuring device to automatically and continuously measure length of each line placed, to nearest foot.
  5. Device to heat paint to 130 to 145 degrees Fahrenheit for fast dry applications.
- B. Machine Calibration:
1. Paint Line Measuring Device: Calibrate automatic line length gauges to maintain tolerance of plus or minus 25 feet per mile.

2. Cycle Length/Paint Line Length Timer: Calibrate cycle length to maintain tolerance of plus or minus 6 inches per 40 feet; calibrate paint line length to maintain tolerance to plus or minus 3 inches per 10 feet.
  3. Paint Guns: Calibrate to simultaneously apply paint binder at uniform rates as specified with an allowable tolerance of plus or minus 1 mil.
  4. Bead Guns: Calibrate to dispense glass beads simultaneously at specified rate. Check guns by dispensing glass beads into gallon container for predetermined fixed period of time. Verify weight of glass beads.
- C. Other Equipment: For application of parking stalls, crosswalks, intersections, stop lines, legends and other miscellaneous items by walk behind strippers, hand spray or stencil trucks, apply with equipment meeting requirements of this section. Do not use hand brushes or rollers. Optionally apply glass beads by hand.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Do not apply paint to concrete surfaces until concrete has cured for 28 days.

#### **3.2 PREPARATION**

- A. Maintenance and Protection of Traffic: Provide traffic control in accordance with Section 01 55 26: TRAFFIC CONTROL.
- B. Surface Preparation:
  1. Pavement areas to be painted shall be dry and sufficiently cleaned of sand and debris so as to provide an acceptable bond between the paint and the pavement.
  2. Spot location of final pavement markings as specified and as indicated on Drawings by applying pavement spots every 25 feet on center.
  3. Notify the ENGINEER after placing pavement spots a minimum of 3 days prior to applying traffic lines.

#### **3.3 APPLICATION**

- A. Agitate paint for 15 minutes prior to application to ensure even distribution of paint pigment.
- B. Paint shall be applied at a rate of 100 to 115 square feet per gallon, with glass beads applied at a rate of 6 pounds per gallon of paint for painted pavement markings and painted legend, arrows, and markings, and 8 pounds per gallon of paint for hot-applied painted pavement markings.
- C. Hot-applied paint shall be applied at a temperature of 130 to 145 degrees Fahrenheit at the spray gun.
- D. All painting shall be performed in a neat and workmanlike manner. The lines shall be sharp and clear with no feathered edging or fogging and precautions shall be taken to prevent tracking by tires of the striping equipment. Paint shall be applied parallel to the centerline or as shown on the drawings with no unsightly deviations.
- E. Unless material is track free at end of paint application convoy, use traffic cones to protect markings from traffic until track free. When vehicle crosses a marking and tracks it or when splattering or over spray occurs, eradicate affected marking and resultant tracking and apply new markings.

- F. Collect and legally dispose of residues from painting operations.

### 3.4 APPLICATION TOLERANCES

- A. Maximum Variation from Wet Film Thickness: 1 mil.
- B. Maximum Variation from Wet Paint Line Width: Plus or minus 1/8 inch.
- C. Maintain cycle length for skip lines at tolerance of plus or minus 6 inches per 40 feet and line length of plus or minus 3 inches per 10 feet.
- D. Maximum Variation from Specified Application Temperature: Plus or minus 5 degrees Fahrenheit.

### 3.5 FIELD QUALITY CONTROL

- A. Inspect for incorrect location, insufficient thickness, line width, coverage, retention, uncured or discolored material, and insufficient bonding.
- B. Repair lines and markings, which after application and curing do not meet following criteria:
  - 1. Incorrect Location: Remove and replace incorrectly placed patterns.
  - 2. Insufficient Thickness, Line Width, Paint Coverage, Glass Bead Coverage or Retention: Prepare defective material by acceptably grinding or blast cleaning to remove substantial amount of beads and to roughen marking surface. Remove loose particles and debris. Apply new markings on cleaned surface in accordance with this Section.
  - 3. Uncured or Discolored Material, Insufficient Bonding: Remove defective markings in accordance with this Section and clean pavement surface one foot beyond affected area. Apply new markings on cleaned surface in accordance with this Section.
- C. Replace defective pavement markings as specified throughout 3 year warranted period. Replace markings damaged by anti-skid materials, studded tires, tire chains, chemical deicers, snow plowing or other loss of marking material regardless of cause. When markings are damaged by pavement failure or by OWNERS's painting, crack sealing, or pavement repair operations, CONTRACTOR is released from warranty requirements for damaged work.
- D. Prepare list of defective areas and areas requiring additional inspection and evaluation to decide where material may need replaced. Provide traffic control as necessary if markings require more detailed evaluation.
- E. Replace failed or defective markings in entire section of defective markings within 30 days after notification when any of the following exists during warranty period:
- F. Replace pavement marking material under warranty using original or better type material. Continue warranty to end of original 3 year period even when replacement materials have been installed as specified.
- G. When eradication of existing paint lines is necessary, eradicate by shot blast or water blast method. Do not gouge or groove pavement more than 1/16 inch during removal. Limit area of removal to area of marking plus 1 inch on all sides.
- H. Maintain daily log showing work completed, results of above inspections or tests, pavement and air temperatures, relative humidity, presence of any moisture on pavement, and any material or equipment problems. Make legible entries in log in ink, sign and submit by end of each work day. Enter environmental data into log prior to starting work each day and at two additional times during day.



3.6 PROTECTION OF FINISHED WORK

- A. Protect painted pavement markings from vehicular and pedestrian traffic until paint is dry and track free. Follow manufacturer's recommendations or use minimum of 30 minutes. Consider barrier cones as satisfactory protection for materials requiring more than 2 minutes dry time.

**END OF SECTION**

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**SECTION 32 90 00  
SITE RESTORATION**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to complete all site restoration required to complete the work as shown on the drawings or as directed by the ENGINEER.

1.2 DEFINITIONS

- A. Reclaiming disturbed areas shall mean regrading and preparing disturbed surfaces for designated planting, and completing seeding/plantings as indicated on the drawings.

1.3 SUBMITTALS

- A. Shop Drawings: Sequence and limits of site reclamation, and materials to be used for site reclamation.

1.4 PROTECTION

- A. Protect from damage areas outside the approved limits of site disturbance.
- B. Reclaim any disturbance of vegetation or native ground outside of the limits of site disturbance.
- C. Pay the cost of any fines incurred by OWNER due to work being performed by CONTRACTOR outside the limits of site disturbance.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

3.1 GENERAL

- A. Reclaim areas where construction work has been completed as soon as possible after completion of the Work.
- B. Grade all areas to drain. The maximum slope steepness shall be 3H:1V unless otherwise shown on the Drawings or approved in writing by ENGINEER.
- C. Remove all CONTRACTOR's equipment, debris, office, temporary fences or gates, and all other CONTRACTOR's properties in accordance with Section 01 50 00: TEMPORARY FACILITIES AND CONTROLS.
- D. Eliminate uneven areas and low spots. Remove debris, roots, branches and stones in excess of 3-inch size.

3.2 TOPSOIL PLACEMENT

- A. Topsoil shall meet specifications defined in Section 31 23 23: FILL AND BACKFILL.

- B. The areas on which topsoil is to be placed shall be graded to a reasonably true surface. Topsoil shall be spread and shaped:
  - 1. To the lines and grades shown on the plans,
  - 2. To match the original grades, or as directed by the ENGINEER.
  - 3. or as directed by the ENGINEER.
- C. The required depth to which the topsoil is to be placed is to be the depth after settlement of the material has taken place. If not indicated on the plans, place topsoil to a minimum depth of 6 inches.
- D. All stones, roots, debris, sod, weeds and other undesirable material shall be removed.
- E. After shaping and grading, all trucks and other equipment shall be excluded from the topsoiled area to prevent excessive compaction. The Contractor shall perform such work as required to provide a friable surface for seed germination and plant growth prior to seeding.
- F. During hauling and spreading operations, the Contractor shall immediately remove any material dumped or spilled on the shoulders or pavement.
- G. It shall be the Contractor's responsibility to restore to the line, grade and surface all eroded areas with approved material and to keep topsoiled areas in acceptable condition until the completion of the construction work or grass is established.

### 3.3 PREPARATION FOR SEED PLACEMENT

- A. In no event will seeding be permitted on hard or crusted soil surface.
- B. Level areas: These areas shall be made friable and receptive for seeding by disking or by other approved methods to the satisfaction of the ENGINEER. In all cases the final prepared and seeded soil surface shall meet the lines and grades for such surface as shown in the plans, or as directed by the ENGINEER.
- C. Slope and Embankment Areas: These areas shall be made friable and receptive to seeding by approved methods which will not disrupt the line and grade of the slope surface.
- D. All areas to be seeded shall be reasonably free from weeds taller than 3 inches. Removal of weed growth from the slope areas shall be by approved methods, including hand-mowing, which do not rut or scar the slope surface, or cause excessive disruption of the slope line or grade. Seeding on level areas shall not be permitted until substantially all weed growth is removed. Seeding on slope areas shall not be permitted without removal or cutting of weed growth except by written permission of the ENGINEER.

### 3.4 FENCING RESTORATION

- A. Restore fencing and gates temporarily removed to facilitate construction. Restored fencing and gates to condition that meets or exceeds pre-construction condition.

### 3.5 HANDRAIL RESTORATION

- A. Restore handrails temporarily removed to facilitate construction. Restored handrails to condition that meets or exceeds pre-construction condition.

**END OF SECTION**

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**SECTION 32 92 00**  
**SEEDING**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to complete all seeding required to complete the work as shown on the drawings and including the following:
  - 1. Seeding, erosion-control mats, mulching, and fertilizing.
  - 2. Maintenance.

1.2 REFERENCES

- A. FS O-F-241 - Fertilizers, Mixed, Commercial.
- B. Connecticut Department of Transportation (ConnDOT)
  - 1. Connecticut Department of Transportation, Standard Specifications for Road and Bridge Construction (CONNDOT) Standard Specifications, Form 816.

1.3 SUBMITTALS

- A. Landscape CONTRACTOR Qualifications including:
  - 1. Name, address, and telephone number of landscaping CONTRACTOR
  - 2. Resume of proposed landscaping CONTRACTOR superintendent.
- B. Topsoil test data with fertilizer recommendations from certified testing laboratory or local agricultural agency.
- C. Provide Manufacturer's analysis of fertilizer, describing percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
- D. Product Data: Seed inspection certificate, fertilizer data,

1.4 SUBMITTALS AT PROJECT CLOSEOUT

- A. Maintenance Data: Include maintenance instructions, cutting method, and maximum grass height, types, application frequency, and recommended coverage of fertilizer.

1.5 SCHEDULE

- A. Planting shall be completed during the following periods:
  - 1. Spring Planting: March 15 to June 15
  - 2. Fall Planting: August 15 to October 15.

1.6 QUALITY ASSURANCE

- A. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

1.7 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer composition.

1.8 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of Manufacturer.

1.9 MAINTENANCE SERVICE

- A. The CONTRACTOR shall maintain all seeded areas until final acceptance of the project and shall restore or replace any portion of the seeding work that is found defective or which becomes damaged prior to final acceptance.

1.10 ACCEPTANCE

- A. Seeding shall be accepted under the following schedule:
  - 1. Seeding may be considered 25% complete once seeding has been placed.
  - 2. Seeding may be considered 50% complete once seeding is established and approved by the ENGINEER. An establishment inspection for acceptance will be made within 60 days after seeding, excluding seeding dates that fall between September 30 and March 1. Seeding dates that fall between September 30 and March 1 will not be inspected earlier than May 1.
  - 3. Seeding may be considered 100% complete upon final acceptance of the project

**PART 2 PRODUCTS**

2.1 SEED MIXTURE

- A. Provide seed mixture meeting the requirements:
  - 1. Type 1 Mix – Seed mix shall meet the requirements of CONNDOT M.13.04.
- B. Follow recommendations contained in ConnDOT Standard Specifications for Road and Bridge Construction Section M.13 for seed types and mixture ratios for slopes and shoulders. Provide a minimum of 120 percent of the recommended seed application rate.

2.2 ACCESSORIES

- A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.
- B. Fertilizer: Provide fertilizer that meets the recommendations of the certified testing laboratory or local agricultural agency based on the results of the topsoil testing. Fertilizer should meet recommendations of ConnDOT Standard Specifications for Road and Bridge Construction Section M.13.03 - Fertilizer. Use slow release sources of Nitrogen (IBDU or Urea Formaldehyde) with a minimum of 50% of the nitrogen as water insoluble nitrogen (WIN).
- C. Water: Clean, fresh, and free of substances or matter that could inhibit vigorous growth of grass.
- D. Herbicide: Not allowed.
- E. Stakes: Softwood lumber, chisel pointed.
- F. String: Organic fiber.

- G. Tackifiers: Water soluble materials that cause mulch particles to adhere to one another, generally consisting of either a natural vegetable gum blended with gelling and hardening agents or a blend of hydrophilic polymers, resins, viscosifiers, sticking aids and gums. Emulsified asphalts are specifically prohibited for use as tackifiers due to their potential for causing water pollution following its application.
- H. Erosion Control Blankets: As specified in Section 02370: EROSION PROTECTION AND SEDIMENT CONTROL.

### **PART 3 EXECUTION**

#### **3.1 TOPSOIL EVALUATION**

- A. Collect topsoil samples for testing to develop soil fertilizer recommendations from certified testing laboratory or local agricultural agency. Collect a minimum of 10 samples for every acre of topsoil to be placed.
- B. Develop fertilizer recommendations from certified testing laboratory or local agricultural agency.

#### **3.2 FERTILIZING**

- A. Apply fertilizer in accordance with recommendations from the ConnDOT standards.
- B. Apply fertilizer in granular form. Liquid emulsions shall not be allowed. Follow Manufacturer's recommendations.
- C. Apply after smooth raking of soil and prior to compaction.
- D. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
- E. Mix thoroughly into upper 4 inches of soil. After vigorous grass growth has been established, fertilizer may be applied to the surface.
- F. Lightly water to aid the dissolving of fertilizer.
- G. Do not apply if rain is forecast for the next 24 hours.

#### **3.3 SEEDING**

- A. Apply seed at recommended rate evenly in two intersecting directions. Rake in lightly.
  - 1. Minimum rate of application is 50 pounds per acre for Type 1 Mix
- B. Do not seed areas in excess of that which can be mulched on same day.
- C. Hydroseeding will be allowed, however no fertilizer will be allowed in the hydroseed mixture.
- D. Do not sow immediately following rain, when ground is too dry, or during windy periods.
- E. Provide mulch at a rate of one pound per square yard, or as necessary to protect and promote seed growth.
- F. Apply water with a fine spray immediately after each area has been mulched. Saturate the top 4 inches of soil.

#### **3.4 SEED PROTECTION**

- A. Identify seeded areas with stakes and string around area periphery.

- B. Apply tackifier to secure mulch.

### 3.5 EROSION CONTROL BLANKETS

- A. Following seeding on slopes of 3H:1V or steeper, install erosion control blankets in accordance with manufacturer's recommendations or as directed by the ENGINEER.
- B. Staples shall be installed as per Manufacturer's recommendations.
- C. Where two lengths are joined, the end of the up-grade strip shall overlap the down-grade strip.
- D. The CONTRACTOR shall maintain and protect the areas with erosion control matting until such time as the turf grass is established.

### 3.6 TURF ESTABLISHMENT

- A. The Contractor shall keep all seeded areas free from weeds and debris, such as stones, cables, baling wire.
- B. The Contractor shall maintain turf established (seeded) areas until the grass growth attains a height of 6 inches (150 millimeters).
- C. Clean-up shall include, but not be limited to, the removal of all debris from the turf establishment operations in the work area and on adjacent properties publicly and privately owned.

### 3.7 MAINTENANCE

- A. Mow grass at least every two weeks or at regular intervals to maintain at a maximum height of 2½ inches. Do not cut more than 1/3 of grass blade at any one mowing.
- B. Water to prevent grass and soil from drying out.
- C. Immediately reseed areas that show bare spots until dense grass growth is established.
- D. Protect seeded areas with warning signs during maintenance period.

**END OF SECTION**

**SECTION 33 01 30**  
**STORM DRAIN CLEANING AND INSPECTION**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Provide all layout, products, materials, equipment, tools, services, labor, transportation, and supervision required for the complete cleaning or cleaning and internal inspection and video monitoring of the storm drain pipe, manholes and structures. Includes bypass plumbing, drain dewatering and associated work. Includes removing and disposing of all deposits cleaned from the drains. The work shall include the thorough cleaning of storm drains in order to permit an unrestricted inspection by closed circuit television (CCTV). All storm drains will be cleared prior to television inspection. If the television inspection shows drains were improperly cleaned, the ENGINEER will direct the appropriate cleaning and re-cleaning. Re-cleaning shall be done at no additional cost.

1.2 REFERENCES

- A. National Association of Sewer Service Companies (NASSCO):
1. Pipe Assessment Certification Program (PACP).

1.3 SUBMITTALS

- A. Qualifications: Submit the following qualifications for review and approval by the OWNER:
1. Storm pipe drain cleaning company and foreman. Submittal must include resume and list of projects of similar size and complexity.
  2. CCTV inspection company and foreman. Submittal must include resume and list of projects of similar size and complexity.
- B. Work Plans: Submit a detailed work plan for the cleaning and inspection including but not limited to the following information:
1. Proposed equipment and method for cleaning.
  2. Proposed plan for debris, sediment and water collection, separation and disposal
  3. Proposed staging plan and locations
  4. Proposed equipment and method for inspection
  5. Proposed bypass pumping system to including written description, quantity, capacity, and location of pumping equipment.
- C. Cleaning and Inspection Logs: Submit cleaning and inspection logs for each section of storm drain line. Include the following as minimum information: project name, run manhole numbers, distance and location of lateral services, wyes or tees, clock references, pipe joints, infiltration/inflow defects, cracks, leaks, offset joints, and other information required to assess condition of sewer.
- D. Video Recording Records: Submit completed a digital record of each CCTV Inspection on DVD, identify project name, street name, right-of-way property name, and manhole numbers.

1.4 QUALIFICATIONS

- A. Company specializing in performing work of this section must have a minimum 3 years of documented experience performing storm drain pipe cleaning and CCTV inspections on projects of similar size and complexity.



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**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

3.1 CLEANING PROCEDURES AND EQUIPMENT.

- A. Verify existing conditions before starting work.
- B. Clean storm drains prior to internal inspection, utilizing cleaning equipment approved for use by the ENGINEER. The CONTRACTOR shall ensure that the unit price bid for the cleaning item shall be sufficient payment for removing all shapes, sizes and quantities of debris.
- C. Cleaning equipment may consist of hydraulic high pressure jet machines, heavy duty power rodding machines capable of cleaning distances covered under the Contract in one step and heavy duty bucket machines that can be used to drag line work with buckets, brushes, scrapers, swabs or other similar devices. The heavy duty equipment may be necessary for the removal of heavy debris.
- D. Power rodding equipment shall have the capability of spinning the rod either clockwise or counter-clockwise. The equipment shall also be capable of pushing or pulling the rod without rotating the machine.
- E. The equipment utilized shall be capable of removing all sand, dirt, rocks and other debris, including roots (where ordered by the ENGINEER), from the storm drain line to allow adequate internal inspection (in the opinion of the ENGINEER) of all internal surfaces. The equipment used shall suit the conditions and size of the structure to be cleaned and the nature of the sediment and debris to be removed.
- F. Cleaning shall be performed in the seventy-two (72) hour period immediately before closed circuit television inspection.
- G. All precautions shall be taken by the CONTRACTOR to protect the storm drain from damage that might result from the use of unsuitable equipment or improper use of approved cleaning equipment. Any drains damaged during the cleaning operations as a result of the CONTRACTOR's operations shall be promptly repaired to an acceptable condition (as determined by the ENGINEER) by and at the expense of the CONTRACTOR. If the CONTRACTOR's cleaning equipment becomes immobilized within a storm drain, exits the line through broken pipe or portions break off within a storm drain, said equipment shall be retrieved at the CONTRACTOR's expense. The CONTRACTOR shall act immediately to remedy problems created by the cleaning procedure, which represent a hazard to the general public, such as the collapse of the ground surface above a storm drain. If equipment retrieval necessitates excavation, the CONTRACTOR shall be responsible for accomplishing the work at his own expense. Following removal of the equipment, the CONTRACTOR shall restore the line and the site to the approval of the OWNER.

3.2 DEBRIS REMOVAL & DISPOSAL

- A. Remove, collect and dispose of sediment, debris, liquid and material of any kind from within the storm drain pipe and manholes, including any liquids or other materials used to clean the storm drain pipe.
- B. Prevent material from being discharged into the drainage system.
- C. Do not stockpile or combine solids from storm drain cleaning with excavated soils from other work elements.

- D. Dispose of solids as Regulated Soil in accordance with Section 02 61 50: TRANSPORTATION AND DISPOSAL OF REGULATED SOIL.
- E. Contractor is responsible for testing and disposal of liquids generated during storm drain pipe cleaning. Liquids must be managed and disposed of in accordance with local, state and federal regulations.

### 3.3 CLOSED CIRCUIT TELEVISION INSPECTION PROCEDURE AND EQUIPMENT

- A. Inspection shall only be performed in the presence of the ENGINEER.
- B. Inspection shall be performed to NASSCO PACP Standards, descriptions and ratings.
- C. Perform the inspection on one (1) reach (distance between two consecutive manholes) at a time. The reach being inspected will be suitably isolated from the remainder of the storm drain system by restricting all upstream flows to allow maximum exposure of the pipe being inspected.
- D. In some instances, more than one (1) storm drain reach may have to be inspected per set-up (buried manholes). In these instances, the CONTRACTOR shall have adequate cable to deploy the television camera.
- E. Television equipment used for the inspection shall be specifically designed and constructed for storm drain inspection. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera shall be operative in 100 percent humidity conditions. The camera shall develop and transmit a sharp picture on video bandwidths only. Picture transmission systems that require the use of R.F. suppressors and are subject to local transmitters' interference shall not be used. The camera shall be equipped with an automatic light compensating iris, adjustable optical focus and automatic white balancing circuitry. The camera adjustments shall be set to produce a clear, sharp picture of the internal conditions within the storm drain. The camera lens shall be cleaned prior to each deployment in the storm drain. A television picture with interferences, lines, blurry vision or distortions will not be acceptable. Television equipment, if determined to be unsatisfactory by the ENGINEER, shall be removed from the job site and replaced with acceptable equipment at no additional cost. The CONTRACTOR shall have backup equipment available and can be delivered to the site within twenty-four (24) hours.
- F. The camera shall be moved through the storm drain in either direction (dependent upon the site's condition) at a uniform, slow rate (no greater than thirty (30) feet per minute) that will allow a clear visual picture to be obtained. The camera shall pause for a minimum of three (3) seconds at every joint or defect observed with the storm drain to allow proper observation. Camera movement through the storm drain shall be accomplished by means of a winch and cables or by a motorized transporter (self-propelled camera). The movement of the camera shall be remotely controlled by the television inspection operator from the inspection vehicle.
- G. The CONTRACTOR shall provide a mobile vehicle large enough to accommodate at least four (4) people at any one time for the purpose of viewing the monitor while the inspection is in progress. The ENGINEER shall have access to view the television screen and observe all operations at all times.

### 3.4 RECORD OF INSPECTION

- A. The CONTRACTOR will log the results of all observations and prepare appropriate data may be required for record purposes. Measurement for location of features along the pipe alignment shall be at ground level by means of a counting meter to be provided and operated by the CONTRACTOR. The counting meter shall be mounted on the television reel power

- winding assembly. The meter shall be equipped with a local mechanical readout for use at the rear of the television vehicle and an electronic counter which is connected to the data view system for display on the video tape. Marking on cable, or the like, which would require interpolation for depth of manhole will not be allowed. The counting meter shall accurately record the distance in feet, which the video cable has traveled. The measurement will be accurate to three-tenths (0.3) of a foot per ten (10) feet of inspected storm drain reach length.
- B. The CONTRACTOR shall furnish all equipment for digital video recording. All storm drain inspections shall be recorded on DVD and provided to the OWNER for future reference. The video recording shall begin at the center of the manhole of camera entry. The CONTRACTOR shall describe all features encountered while moving the camera from the center of the entry manhole to the distance in the pipe where he sets his footage meter. An audio recording of estimated footages shall be made for all features described prior to setting the footage meter. On the DVD, the CONTRACTOR shall provide during the actual television inspection an audio description of all defects, service connections, joints, discharges or other features considered important by the ENGINEER.
  - C. The date of the CCTV inspection and the distance that the camera has traveled through a particular storm drain reach shall be continuously displayed on the recorded DVD. All DVDs obtained during the work shall be turned over to the ENGINEER and shall become the property of the OWNER. All costs for DVD recordings shall be included in the prices bid. If the DVD recording is not complete or the quality is not satisfactory, the storm drain shall be re-inspected at the CONTRACTOR's expense.
  - D. The CONTRACTOR shall make a recording, audio and video, of any defects encountered in manholes designated as ingress and egress locations for internal inspection.

### 3.5 OBSTRUCTIONS

- A. Obstructions may be encountered during the course of the internal inspection that prevent the travel of the camera. Each occurrence shall be considered separately. Generally, however, the CONTRACTOR shall first attempt to pass the obstruction, and if failing in his attempt or if equipment damage may occur, withdraw the equipment and attempt internal inspections from the opposite end of the storm drain under inspection. Should additional obstructions be encountered after the first re-employment and no means are available for passing the obstructions without damage to the equipment, then the remaining sections of the storm drain not inspected shall be excluded from the work requirements of the Contract. No additional payment shall be made due to difficulties encountered during internal inspection. In addition, the CONTRACTOR shall have no claim for payment for internal inspection not completed due to obstructions.
- B. Some obstructions may be encountered which prevent the CONTRACTOR from stringing the cables used to move a television camera deployed by winches. An alternate method of moving the camera shall be employed. The internal inspection shall be attempted to determine the condition of as much of the storm drain as possible. The CONTRACTOR shall select the method of performing the internal inspection, i.e., pushing the camera with rods or a jet cleaning machine, or use of a self-propelled camera approved by the ENGINEER. The extent of the internal inspection accomplishment shall be at the discretion of the ENGINEER.
- C. Should the CONTRACTOR's internal inspection equipment become immobilized within a storm drain, said equipment shall be removed from the line. If excavation is required to retrieve the CONTRACTOR's equipment, the excavation shall be accomplished by the CONTRACTOR at his expense.

3.6 STORM DRAIN DEWATERING.

- A. During the CCTV inspection process, every effort shall be exerted to obtain a full view of the pipe interior. For instances where the camera lens becomes submerged or where a large portion of the pipe shall contain water, and these conditions persist for significant portions of the storm drain being inspected, the CONTRACTOR shall attempt to dewater the pipe. The ENGINEER shall determine when dewatering procedures are necessary.
- B. Dewatering can be accomplished with a pump and discharge hose or by the nozzle of a hydraulic high-pressure jet machine. If the jet machine is used, it shall precede the television camera through the sewer pipe. The nozzle of the jet machine shall work in conjunction with the television camera's motion and be positioned so that several feet of pipe length can be viewed by the camera. The dewatering procedure shall move standing or ponded water through the storm drain to a point within the storm drain downstream of the reach being inspected.

**END OF SECTION**

**SECTION 33 01 33**  
**ABANDONMENT OF EXISTING UTILITIES**

**PART 1 GENERAL**

1.1 WORK INCLUDES

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to complete all abandonments of existing utilities required to complete the work as shown on the drawings. The intent is to grout fill pipes in place to:
1. Prevent future collapse of the conduits.
  2. Prevent future seepage through the conduits.

1.2 REFERENCES

- A. State of Connecticut Department of Transportation (ConnDOT)
1. Standard Specifications for Roads Bridges, and Incidental Construction, Form 816.

1.3 SUBMITTALS

- A. Conform to requirements of Section 01 33 00 - SUBMITTAL PROCEDURES.
- B. At least 10 days prior to commencing abandonment activities, submit an Abandonment Plan, describing proposed methods of:
1. Locating the utility.
  2. Confirming the utility is not in service.
  3. Excavation.
  4. Cutting pipe.
  5. Cleaning of pipe.
  6. Grouting sequence including technical information for equipment and operational procedures including projected grout injection rate, grout pressure, method of controlling grout pressure, and number of stages of grout application.
  7. Other information pertinent to completion of work.
- C. At least 10 days prior to commencing abandonment activities, submit the following materials:
1. Grout mix design.
  2. Pipe cap cut sheets.

**PART 2 PRODUCTS**

2.1 GROUT MIX DESIGN

- A. Grout shall conform to Section M.03.01.12 of the CTDOT Standard Specifications
- B. Compressive Strength: No less than 2,000 psi at 28 days.
- C. Shrinkage: Plus 0.01 percent (net shrinkage) to minus 0.01 percent (net expansion) at 28 days.
- D. Temperature: Placement temperature shall not exceed 65 degrees F.
- E. Mix Proportions:

1. As necessary to meet Specification requirements and consistent with CONTRACTOR's approved submittal.
- 2.2 PIPE EXTENSIONS, CAPS AND ACCESSORIES:
- A. Pipe elbow, extensions and accessories shall be compatible with existing pipe.
  - B. Pipe cap shall be manufactured specifically for the existing pipe's size and material type.
- 2.3 EQUIPMENT
- A. Pumping Equipment
    1. Suitable for pumping grout into conduits at rates and pressures required by CONTRACTOR's approved submittal
    2. Include suitable flow meter, gauges, and valves for controlling the flow and pressure of the placements.
    3. Pressure gauges shall read pumping pressures to an accuracy of plus or minus 1 psi. Gauges shall be new and shall be replaced immediately if broken or defective.
    4. Equipment and procedures shall prevent the introduction of oil, air, or other foreign substances into the conduit fill concrete.

### **PART 3 EXECUTION**

- 3.1 PREPARATORY WORK
- A. Perform all operations in accordance with approved submittal.
  - B. Perform localized excavations on both ends of section of pipe to be abandoned where accessible.
  - C. Cut pipe and install pipe elbows and extensions to retain grout.
- 3.2 EQUIPMENT
- A. Mix grout in automated batch plant and deliver it to site in ready-mix trucks. Performance additives may be added at placement site if required by mix design.
  - B. Use concrete or grout pumps capable of continuous delivery at planned placement rate.
- 3.3 GROUTING
- A. Completely fill one pipe before beginning fill operations for another conduit.
  - B. Place Grout:
    1. Tremie place grout from lower end of each utility.
  - C. Continue placement operation until approximately 100 percent of estimated conduit volume has been placed based on pump flow meter readings.
  - D. Do not remove bulkheads, flanges, valves, fittings, or other equipment that is required to retain freshly placed grout until concrete has reached final set but not less than 24 hours after completion of placement.
  - E. Collect and dispose of excess grout material and other debris.

3.4 CAP

- A. Cap all open ends with approved cap.
- B. Cap concrete pipe ends with brick and mortar.

**END OF SECTION**

**SECTION 33 05 13  
MANHOLES, CATCH BASINS, FRAMES AND COVERS**

**PART 1 GENERAL**

**1.1 WORK INCLUDES**

- A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to furnish and install all manhole, catch basins, frames and cover required to complete the work as shown on the drawings and including the following:

**1.2 REFERENCES**

- A. American Society for Testing and Materials (ASTM):
1. ASTM A48: Gray Iron Castings (Class 35 minimum).
  2. ASTM A536: Standard Specification for Ductile Iron Castings
  3. ASTM C206: Standard Specifications for Finishing Hydrated Lime
  4. ASTM C32: Standard Specification for Sewer and Manhole Brick (Made From Clay or Shale)
  5. ASTM C478: Standard Specification for Precast Reinforced Concrete Manhole Sections.
  6. ASTM C923: Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.
  7. ASTM D1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- B. Connecticut Department of Transportation (ConnDOT)
1. Standard Specifications for Road and Bridge Construction (CONNDOT) Standard Specifications, Form 816.

**1.3 SUBMITTALS**

- A. Product Data: Indicate product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material proposed for use. Include manufacturer's catalog data and descriptive literature. Show materials of construction by ASTM reference and grade.
- B. Provide a work plan describing construction of cast-in-place channel in manhole/catch basin base section, attachment of inlet and outlet pipes, sequence of assembly of manhole riser sections, and backfilling schedule. Include a narrative of proposed means and methods
- C. Sequence of assembly of manhole frames and covers, and backfilling schedule: Submit narrative of proposed means and methods.

**PART 2 PRODUCTS**

**2.1 MANHOLE AND CATCH BASINS**

- A. Precast Manhole and Catch Basin Sections: Shall meet CONNDOT manhole requirements obtained from a CONNDOT approved manufacturer. Reinforced precast concrete, conforming to ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections. Manhole steps shall be cast integrally with the manhole riser sections.



- B. Frame and Cover: Frames and Covers shall meet CONNDOT Standard Frame and Cover requirements obtained from an approved manufacturer. ASTM A48, Class 35 (minimum), Cast or ductile iron construction, machined flat bearing surface, removable bolttable lid, solid lid design by Neenah Foundry Company or approved equal.
- C. Brick Units: Shall conform to ASTM C-32, Grade MS
- D. Manhole Rungs (Steps): Shall be 14 inches x 10 7/8 inches forged aluminum safety rung fabricated from 6061-T6 aluminum alloy as manufactured by ALCOA, or equal; or copolymer polypropylene steps in conformance with ASTM D4101, Grade 60 steel reinforcing rod, ASTM A615, with epoxy coating, ASTM A-934/M-95. The steps shall be either Model PS-1B or PS2-PFSL as manufactured by M.A. Industries, Inc. or equal.
- E. Manhole Extension Rings: Shall conform to Article M.08.02-5 Metal for Drainage Structures. The type of manhole extension rings will be designed so that the existing manhole cover, when set in place, will have substantially the same bearing, fitness and load carrying capacity as existed in the existing manhole frame. The extension rings shall be designed to fit into the original manhole frame resting specifically on the flange area that originally supported the manhole cover.

## 2.2 MANHOLE CONFIGURATION

- A. Shaft Construction: Concentric with concentric cone top section; lipped male/female joints; sleeved to receive pipe sections.
- B. Shape: Cylindrical.
- C. Clear Inside Dimensions: 48 inches diameter.
- D. Design Depth: 15 feet maximum.
- E. Minimum Wall Thickness: 5 inches.
- F. Clear Lid Opening: 30 inches diameter.
- G. Pipe Entry: Provide openings as required.
- H. Steps: 18 inches wide, 12 inches on center vertically, cast into manhole wall, 3-3/8 inch min. embedment.

## 2.3 MORTAR

- A. Mortar shall be composed of one part Portland cement and two parts, by volume, of surface dry fine aggregate. Hydrated lime, in an amount not to exceed 4 pounds (1.8 kilograms) of lime to each bag of cement, may be added at the option of the Engineer. Cement and hydrated lime shall conform to the following requirements:
  - 1. Portland cement, Types I, II or IS, and water shall conform to the requirements of CONNDOT Article M.03.01.
  - 2. Hydrated lime shall conform to the requirements of ASTM C 206.
  - 3. For laying stoneprecast units, or for shotcrete, fine aggregate shall conform to Grading A, table below. In all other respects, it shall conform to the requirements of CONNDOT Article M.03.01-2.
- B. For pointing stone or the precast units and for laying brick or sealing pipe joints, the fine aggregate shall conform to Grading B, table below. In all other respects it shall conform to the requirements of Article M.03.01-2.

C. Table of Gradation, Fine Aggregate for Mortar

Square Mesh Sieves	Percentage Passing by weight (mass) Grading	
	A	B
Pass 3/8 inch (9.5 millimeters)	100	
Pass #4 (4.75 millimeters)	95-100	
Pass #8 (2.36 millimeters)	80-100	100
Pass #16 (1.18 millimeters)	50-85	
Pass #30 (600 microns)	25-60	
Pass #50 (300 microns)	10-30	10-40
Pass #100 (150 microns)	2-10	0-10

**PART 3 EXECUTION**

**3.1 TOLERANCES**

- A. Upon completion of backfilling, no part of the manhole structure shall deviate from plumb by more than 1.0 inch from any other part of the manhole structure. This deviation shall be measured by dropping a plumb line along the inside edge of the manhole at each of the four cardinal directions from the top to the concrete prior to installing the top slab.
- B. The mudslab, the manhole base section, the top of the concrete inside the manhole base section, and the top slab of the manhole shall deviate from level by no more than one-quarter-inch over ten feet, as measured with a ten-foot-long straightedge.
- C. The cast-in-place concrete channel inside the manhole base section shall deviate in invert elevation, alignment, and cross-section by no more than plus or minus one-eighth-inch from the elevation, alignment, and cross-section shown on the drawings.

**3.2 EXAMINATION**

- A. Verify items provided by other sections of the work are properly sized and located.
- B. Verify that built-in items are in proper location.
- C. Verify excavations for manholes and cleanout are at correct elevations and that subgrades are approved by the ENGINEER. Place crushed stone as shown on the Contract Drawings.
- D. Verify that the mudslab, if needed for other sections of the work, meets the tolerances described above, is free from large cracks, gouges, or other deformities, and is at the elevation shown on the drawings. If necessary to meet the specifications, remove and replace the mudslab.

3.3 PREPARATION

- A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

3.4 PLACING MANHOLE

- A. Place manhole sections plumb and level, trim to correct elevations.
- B. Place base on minimum of six inches of 3/4-inch Crushed Stone or compacted Structural Fill (Type 4) unless otherwise indicated on the Drawings. If Crushed Stone is used, provide a filter fabric separation layer between the Crushed Stone and underlying native soil.
- C. Connect inlet and outlet pipes.
- D. Set cover frames and covers level without tipping, to correct elevations.
- E. Coordinate with other sections of work to provide correct size, shape, and location.

3.5 ANCHOR HOUSING ACCESS FRAMES AND COVERS

- A. The CONTRACTOR shall verify frame locations will not conflict with stop log structure struts prior to setting the frames in mortar.

3.6 CATCH BASINS AND CLEANOUTS

- A. Form bottom of excavation clean and smooth to correct elevation.
- B. Form and place Cast-In-Place Concrete base pad, with provision for storm sewer pipe end sections.
- C. Level top surface of base pad; sleeve concrete shaft sections to receive storm sewer pipe sections.
- D. Establish elevations and pipe inverts for inlets and outlets as indicated on Drawings.
- E. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

3.7 MANHOLE ADJUSTMENTS/RECONSTRUCTION

- A. The CONTRACTOR shall carefully excavate the manhole frame and cover and add or delete brick masonry as necessary to reset the frame and cover to the final grade.
- B. The present cover slab or cone section may be reused if it is not damaged. If the cover slab or cone section is damaged, it shall be replaced by the CONTRACTOR at his expense.
- C. The CONTRACTOR may be required to “un-stack” the existing cone section so that riser sections can be added or deleted, where the change in grade is greater than 12 inches.
- D. The distance between the proposed elevation of the manhole cover and the first manhole step shall be a minimum of 12 inches and a maximum of 16 inches.
- E. Any material damaged by the CONTRACTOR shall be repaired or replaced by the CONTRACTOR at no cost to the Town, State or District.
- F. Where the change in grade is 3 inches or less, metal manhole extension rings shall be used to raise and support the existing manhole covers to the grade of the proposed roadway surface without disturbing the existing manhole frame.
- G. Adjust/reconstruct existing manholes as necessary so the top cover will sit flush with the surrounding ground surface. Adjustments/Reconstruction may be made with brick, manhole adapter rings or precast reinforced concrete manhole sections as necessary.

- H. Frames, covers and tops which are to be reset shall be removed from their present beds, the walls or sides shall be rebuilt to conform to the requirements of the new construction and the tops, frames and covers reset, or the grates or covers may be raised by extensions of suitable height approved by the ENGINEER.
- I. If the frames, covers or tops are broken or so damaged as to be unfit for further use, they shall be replaced with new, sound material conforming to the above requirements for the material involved.

**END OF SECTION**

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**SECTION 33 46 16**  
**SUBDRAINAGE**

**PART 1 GENERAL**

1.1 WORK INCLUDES

A. Provide all layout, products, materials, equipment, tools, services, transportation, supervision, and labor to complete all subdrainage required to complete the work as shown on the drawings and including the following:

1. Subdrainage piping and laterals for the toe drain system.

1.2 REFERENCES

A. ASTM International (ASTM)

1. ASTM A536 - Standard Specification for Ductile Iron Castings
2. ASTM D638: Standard Test Method for Tensile Properties of Plastics
3. ASTM D790: Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
4. ASTM D2583: Test Method of Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
5. ASTM D 1784 – Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
6. ASTM D 1785 – Standard Specification for Poly (Vinyl Chloride) (PVC) plastic pipe, schedule 40, 80, 120.
7. ASTM D 2241 - Specification for Poly (PVC) Pressure-Rated Pipe (SDR Series)
8. ASTM D 3034 – Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
9. ASTM D 3139 - Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
10. ASTM F 679 - Standard Specification for Poly (Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings

B. American Water Works Association (AWWA)

1. AWWA C900-07 – Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. For Water Distribution

1.3 SUBMITTALS

A. Subdrainage System Work Plan. The plan shall include installation procedures for the subdrainage piping, lateral piping, pipe fabricated fittings, grout, and other materials necessary for installation; and other work incidental to installation of the subdrainage systems.

B. Shop Drawings:

1. Submit details for the pipe slot pattern and manufacturer's drawings and literature of all fabricated fittings, couplings, and fasteners to be used as part of the subdrainage piping systems.

C. Samples: Slotted and unslotted pipe.

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## **PART 2 PRODUCTS**

### **2.1 PVC SUBDRAINAGE PIPE**

- A. Solid and slotted subdrainage pipe and fittings shall be manufactured from a Type I, Grade I Polyvinyl Chloride (PVC) compound with a Cell Classification of 12454-B or 12364 per ASTM D 1784.
- B. Solid and slotted subdrainage piping shall consist of PVC gravity sewer pipe and fabricated fittings with a minimum wall-thickness dimension ratio (DR) of 26.
- C. Conform to ASTM D 3034 or F 679.
- D. The pipe shall be manufactured in standard 20-foot lengths unless otherwise approved by ENGINEER. Pipe and fabricated fittings shall be manufactured by the same manufacturer.
- E. Subdrainage pipe couplings shall be watertight bell and spigot connections with elastomeric gaskets and shall be free of imperfections that might cause leakage at joints.
- F. Slotted subdrainage pipe shall have a minimum open area of 25.0 square inches per lineal foot with a maximum slot width of 0.10 inches. The rows shall be in the longitudinal direction of the pipe and the slots shall be cut in the circumferential direction of the pipe. The rows shall be centered on the circumference. Slots shall be spaced uniformly along the pipe. The minimum opening will be measured on the inner surface of the pipe.
- G. Slotted subdrainage pipe shall be slotted prior to arrival at the site. Field cutting of slots will not be allowed.
- H. Gaskets and lubricants shall be compatible with the pipe, couplings, and with each other when used together. One gasket shall be furnished with each bell end of every pipe, fitting, and coupling.

## **PART 3 EXECUTION**

### **3.1 STORAGE AND HANDLING OF MATERIALS**

- A. Store all pipe and fittings delivered to the site to prevent damage.
- B. Inspect the pipe and fittings at the time of delivery. Any pipe or fittings, which are found to be defective shall be rejected and removed immediately from the site.
- C. Pipe shall be unloaded, stored, and handled so as to avoid damage to the pipe, lining, coating, and gaskets.
- D. Any damage to the pipe, lining, or coating incurred as a result of unloading, storage, or handling shall be repaired by CONTRACTOR to the satisfaction of OWNER, at no additional expense to OWNER.
- E. Any pipe that is damaged during unloading, storage, handling, or installation, which cannot be repaired to the satisfaction of OWNER, shall be immediately removed from the site by CONTRACTOR.

### **3.2 INSTALLING SUBDRAINAGE PIPING**

- A. Install subdrainage piping in a manner consistent with the manufacturer's recommendations and these Specifications.

- B. Use long radius PVC sweep fittings or series of 22.5-degree fittings at any location where subdrainage piping changes direction by more than 22.5 degrees. Use standard angle and elbow configurations for bends and branch where subdrainage piping changes direction by less than 22.5 degrees. Do not bend straight pipe segments or angle joints to accommodate changes in direction.
- C. Excavation for drain collection trenches shall conform to Section 31 23 16: EXCAVATION.
- D. Pipe installation shall be performed in the dry. Dewatering as necessary.
- E. Backfill for subdrainage piping shall conform to Section 31 23 17: FILL AND BACKFILL.
- F. Pipe Cutting
  - 1. Cut pipe smooth, straight and at right angles to the pipe axis with saws or pipe cutters designed specifically for the material.
  - 2. Do not damage the pipe, coating, or lining.
  - 3. Remove burrs and wipe off all dust from the jointing surfaces.
  - 4. Bevel the cut end in accordance with manufacturer's recommendations.
  - 5. Do not disturb previously installed joints during cutting operations.

**END OF SECTION**

# Attachment F – Permits

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## Local Permits - Town of East Hartford

- Planning & Zoning Commission Soil Erosion and Sedimentations
- Zoning Board of Appeals Variance
- Inland Wetlands Authorization

## State Permits

- CTDEEP Dam Construction Permit

## Federal Permits –

- To Be Determined (USACE Approval Pending, see Special Provision SP-6-10)





Town of East Hartford  
740 Main Street  
East Hartford, CT 06108  
Attn: Douglas Wilson

Application No.: DS-201903811  
Town: East Hartford  
Waters: Connecticut River  
Permit type: Dam Safety  
Project: East Hartford Flood Control Levee Upgrades (DEEP ID #4313; Hazard Class C, High Hazard)

Dear Dam Owner:

The Commissioner of the Department of Energy and Environmental Protection has approved your application to conduct certain regulated activities. Your attention is directed to the conditions of the enclosed permit. You should read your permit carefully. Construction and other work must conform to that which is authorized. Please pay particular attention to items 16, which states conditions specific to dam safety for the project site.

If you have not already done so, you should contact your local Planning and Zoning Office and the U. S. Army Corps of Engineers to determine local and federal permit requirements on your project, if any. Write the Corps' New England District, Regulatory Branch, 696 Virginia Road, Concord, MA 01742-2751; <http://www.nae.usace.army.mil/> or call 1-800-343-4789.

Please do not file the permit on the municipality's Land Records.

If you have any questions concerning your permit, please contact the Water Planning and Management Division at 860-424-3704.

8/27/2019  
DATE

  
\_\_\_\_\_  
Anna Laskin, Civil Engineer  
Water Planning & Management Division

COPIES FURNISHED TO:

GEI Consultants, Inc., 455 Winding Brook Drive, Glastonbury, CT 06033, attn: John McGrane  
Town of East Hartford Town Clerk

## PERMIT

Permittee: Town of East Hartford  
740 Main Street  
East Hartford, CT 06108

Permit No: DS-201903811

Town: East Hartford

Project: East Hartford Flood Control Levee (DEEP ID #4313; Hazard Class C,  
High Hazard)

Waters: Connecticut River

Pursuant to Connecticut General Statutes Section 22a-403, the Commissioner of Energy and Environmental Protection (“Commissioner”) hereby grants a permit to the Town of East Hartford (“the Permittee”) to conduct regulated activities associated with the East Hartford Levee modifications. The purpose of said activities is to replace an existing levee toe drain system.

### AUTHORIZED ACTIVITY

Specifically, the permittee is authorized to do the following: replacing and improving an existing levee toe drain system within the Town of East Hartford flood control system between the Bulkeley Bridge (I-84) on the north and extending southerly to the intersection of East River Drive and Hartland Street. The new toe drain will replace approximately 2,500 linear feet of existing toe drain system essentially within the footprint of existing toe drain system. The full extent of the project is within an urbanized area west of East River Drive.

All activities shall be conducted in accordance with plans entitled: “East Hartford Flood Control System, Toe Drain Repair Project Phase 1, East Hartford Levee, East Hartford, Connecticut”, dated March 9, 2019, prepared and stamped by John H. McGrane, P.E., and submitted as a part of the application.

This authorization constitutes the licenses and approvals required by Section 22a-403 of the Connecticut General Statutes.

This authorization is subject to and does not derogate any present or future property rights or other rights or powers of the State of Connecticut, conveys no property rights in real estate or material nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state, or local laws or regulations pertinent to the property or activity affected thereby.

*The permittee's failure to comply with the terms and conditions of this permit shall subject the permittee, including the permittee's agents or contractor(s) to enforcement actions and penalties as provided by law.*

This authorization is subject to the following conditions:

**CONDITIONS:**

1. **Expiration.** This permit shall expire three years following the date of issue unless this permit is specifically renewed.
2. **Construction Commencement and Completion.** If construction of any structures or facilities authorized herein is not completed within three years of issuance of this permit or within such other time as may be provided by this permit, or if any activity authorized herein is not commenced within three years of issuance of this permit or within such other time as may be provided by this permit, this permit shall expire three years after issuance or at the end of such time as may be authorized by the Commissioner.
3. **Notification of Project Initiation.** The permittee shall notify the Commissioner in writing no less than seven (7) days prior to commencement of permitted activities and no less than seven (7) days following completion of permitted activities.
4. **De minimis Alteration.** The permittee may not make any alterations, except de minimis alterations, to any structure, facility, or activity authorized by this permit unless the permittee applies for and receives a modification of this permit. A de minimis alteration means a change in the design, construction or operation authorized under this permit that does not increase environmental impacts or substantively alter the construction of the project as permitted.
5. **In-Water Work.** Confinement of a work area by cofferdam techniques using sand bag placement, sheet pile installation (vibratory method only), portadam, or similar confinement devices is allowed any time of the year unless specifically prohibited by a permit condition. The removal of such confinement devices is allowed any time of the year unless specifically prohibited by a permit condition. Once a work area has been confined, in-water work within the confined area is allowed any time of the year. The confinement technique used shall completely isolate and protect the confined area from all flowing water. The use of silt boom/curtain or similar technique as a means for confinement is prohibited.
6. **Maintenance of Structures.** All structures, facilities, or activities constructed, maintained, or conducted pursuant hereto shall be consistent with the terms and conditions of this permit, and any structure, facility or activity not specifically authorized by this permit, or exempted pursuant to section 22a-377 of the General Statutes or section

22a-377(b)-1 of the Regulations of Connecticut State Agencies, or otherwise exempt pursuant to other General Statutes, shall constitute a violation hereof which may result in modification, revocation or suspension of this permit or in the institution of other legal proceedings to enforce its terms and conditions.

7. **Accuracy of Documentation.** In issuing this permit, the Commissioner has relied on information provided by the permittee. If such information was false, incomplete, or misleading, this permit may be modified, suspended or revoked and the permittee may be subject to any other remedies or penalties provided by law.
8. **Best Management Practices & Notification of Adverse Impact.** In constructing or maintaining any structure or facility or conducting any activity authorized herein, the permittee shall employ best management practices to control storm water discharges, to prevent erosion and sedimentation, and to otherwise prevent pollution of wetlands and other waters of the State. Best Management Practices include, but are not limited, to practices identified in the *Connecticut Guidelines for Soil Erosion and Sediment Control* as revised, *2004 Connecticut Stormwater Quality Manual*, Department of Transportation's *ConnDOT Drainage Manual* as revised, and the Department of Transportation Standard Specifications as revised.

The permittee shall immediately inform the Commissioner of any adverse impact or hazard to the environment which occurs or is likely to occur as the direct result of the construction, maintenance, or conduct of structures, facilities, or activities authorized herein.

9. **Reporting of Violations.** The permittee shall, no later than 48 hours after the permittee learns of a violation of this permit, report same in writing to the Commissioner. Such report shall contain the following information:
  - a. the provision(s) of this permit that has been violated;
  - b. the date and time the violation(s) was first observed and by whom;
  - c. the cause of the violation(s), if known
  - d. if the violation(s) has ceased, the duration of the violation(s) and the exact date(s) and times(s) it was corrected;
  - e. if the violation(s) has not ceased, the anticipated date when it will be corrected;
  - f. steps taken and steps planned to prevent a reoccurrence of the violation(s) and the date(s) such steps were implemented or will be implemented;
  - g. the signatures of the permittee and of the individual(s) responsible for actually preparing such report, each of whom shall certify said report in accordance with condition 12 of this permit.
10. **Material Storage in the Floodplain.** The storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which

could in the event of a flood be injurious to human, animal or plant life, below the elevation of the five-hundred (500) year flood is prohibited. Any other material or equipment stored at the site below said elevation by the permittee or the permittee's contractor must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel stored below such elevation for equipment used at the site shall not exceed the quantity of fuel that is expected to be used by such equipment in one day.

11. **Permit Transfer.** This permit is not transferable without the prior written consent of the Commissioner.
12. **Contractor Notification.** The permittee shall give a copy of this permit to the contractor(s) who will be carrying out the activities authorized herein prior to the start of construction and shall receive a written receipt for such copy, signed and dated by such contractor(s). The permittee's contractor(s) shall conduct all operations at the site in full compliance with this permit and, to the extent provided by law, may be held liable for any violation of the terms and conditions of this permit.
13. **Certification of Documents.** Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under this permit shall be signed by the permittee or a responsible corporate officer of the permittee, a general partner of the permittee, and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement in the submitted information may be punishable as a criminal offense in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53a-157b and in accordance with any other applicable statute."

14. **Submission of Documents.** Any document or notice required to be submitted to the Commissioner under this permit shall, unless otherwise specified in writing by the Commissioner, be directed to:

Director, Water Planning & Management Division  
Department of Energy and Environmental Protection  
79 Elm Street  
Hartford, CT 06106-5127

The date of submission to the Commissioner of any document required by this permit shall be the date such document is received by the Commissioner. The date of any notice

by the Commissioner under this permit, including but not limited to notice of approval or disapproval on any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the Commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means any calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

- 15. Rights.** This permit is subject to and does not derogate any rights or powers of the State of Connecticut, conveys no property rights or exclusive privileges, and is subject to all public and private rights and to all applicable federal, state, and local law. In constructing or maintaining any structure or facility or conducting any activity authorized herein, the permittee may not cause pollution, impairment, or destruction of the air, water, or other natural resources of this State. The issuance of this permit shall not create any presumption that this permit should be renewed.


**16. Dam Safety Conditions**

- a. This permit and a copy of the approved plans and specifications shall be kept at the project site and made available to the Commissioner at any time during the construction of permitted activities.
- b. Permitted activities shall be performed under the supervision of an engineer who is licensed to practice in the State of Connecticut and who is familiar with dam construction. Said engineer shall, upon completion of the permitted activities, certify to the Commissioner in writing that the permitted activities have been completed according to the approved plans and specifications.
- c. Within thirty (30) days of completion of the permitted activities, permittee shall submit to the Commissioner record drawings depicting the dam construction as completed, including any deviations from the approved plans and specifications. Said drawings shall be prepared and sealed by the engineer who oversaw the construction. In addition, the permittee shall arrange for submission of an electronic copy of the final record drawings in Adobe Acrobat "pdf" format.
- d. Nothing in this chapter and no order, approval or advice of the Commissioner, shall relieve any owner or operator of this dam from his legal duties, obligations and liabilities resulting from such ownership or operation. No action for damages sustained through the partial or total failure of any structure or its maintenance shall be brought or maintained against the state, the Commissioner of Energy and Environmental Protection, or his employees or agents.
- e. If during the process of construction, unforeseen conditions are found on the site and the permittee and their engineer determine that it would be appropriate to modify the design, then the permittee shall notify DEEP within 24 hours of any potential design changes to determine if the design modifications will be an activity that can be categorized as a de minimis activity when compared to the

permitted design. No work shall take place which was not included as part of the permitted design until DEEP responds to this determination request.

Issued by the Commissioner of Energy and Environmental Protection on:

August 26, 2019  
Date

  
Brian P. Thompson  
Acting Bureau Chief  
Water Protection and Land Reuse

# CT DEEP IWRD Application Dam Construction Permit

## Town of East Hartford Flood Control System Toe Drain Replacement Phase 1

March 2019

### Application Documents Submitted

- Permit Application Transmittal Form
- *Certification of Notice Form-Notice of Application (to be submitted separately after application)*
- Permit Application for Programs Administered by the IWRD (Type of Permit- Dam Construction)

Attachment A: Executive Summary

Attachment B: USGS Quad Map

Attachment C: *Doc. Form Inland Wetlands, SCEL, etc. - Not Applicable*

Attachment D: *Doc. Form for Water Diversion Permit - Not Applicable*

Attachment E: Documentation Form for a Dam Construction Permit

Attachment F: *Doc. Form for Flood Management Cert. - Not Applicable*

Attachment G: Plan Sheets and Drawings

Attachment H: Engineering Documentation

Part 1 Engineering Report Checklist and Engineering Report

Part 2 Hydrologic and Hydraulic Consistency Worksheet

Attachment I: Flood Contingency Plan

Attachment J: *Soil Scientist Report - Not Applicable*

Attachment K: *Environmental Report - Not Applicable*

Attachment L: *Mitigation Report - Not Applicable*

Attachment M: Alternatives Analysis

Attachment N: Applicant Compliance Form

Attachment O: Applicant Background Information

Attachment Q: Other Information (Dam Safety Permit DS-200900926  
& NDDB NOD 201901835)





**Connecticut Department of  
Energy & Environmental Protection**

CPPU USE ONLY

App #: \_\_\_\_\_  
 Doc #: \_\_\_\_\_  
 Check #: \_\_\_\_\_

# Permit Application Transmittal Form

Please complete this transmittal form in accordance with the instructions in order to ensure the proper handling of your application(s) and the associated fee(s). Print legibly or type.

## Part I: Applicant Information:

- *\*If an applicant is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. If applicable, applicant's name shall be stated **exactly** as it is registered with the Secretary of State.*
- *If an applicant is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).*

Applicant: **Town of East Hartford**  
 Mailing Address: **740 Main Street**  
 City/Town: **East Hartford** State: **CT** Zip Code: **06108**  
 Business Phone: **860-291-7383** ext.: \_\_\_\_\_  
 Contact Person: **Douglas Wilson** Phone: **860-291-7383** ext. \_\_\_\_\_  
 E-Mail: **dwilson@easthartfordct.gov**

Applicant (check one):  individual  \*business entity  federal agency  state agency  municipality  tribal  
 \*If a business entity, list type (e.g., corporation, limited partnership, etc.): \_\_\_\_\_  
 Check if any co-applicants. If so, attach additional sheet(s) with the required information as supplied above.

Please provide the following information to be used for *billing purposes only*, if different:  
 Company/Individual Name: \_\_\_\_\_  
 Mailing Address: \_\_\_\_\_  
 City/Town: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
 Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_ ext. \_\_\_\_\_

## Part II: Project Information

Brief Description of Project: *(Example: Development of a 50 slip marina on Long Island Sound)*  
**Replacement of existing levee toe drain system within the Town of East Hartford flood control system. New toe drain will replace 2,500 +/-ft. of existing toe drain system within the footprint of existing toe drain system.**  
 Location (City/Town): **East Hartford**

Other Project Related Permits (*not* included with this form):

Permit Description	Issuing Authority	Submittal Date	Issuance Date	Denial Date	Permit #
N/A					
N/A					

### Part III: Individual Permit Application and Fee Information

New, Mod. or Renew	Individual Permit Applications	Initial Fees	No. of Permits Applied For	Total Initial Fees	Original + Required Copies
	<b>AIR EMISSIONS</b>				
	New Source Review <input type="checkbox"/> Revision <input type="checkbox"/> minor mod	\$940.00			1 + 0
	Title V Operating Permits <input type="checkbox"/> Revision <input type="checkbox"/> minor mod <input type="checkbox"/> non-minor mod	none			1 + 0
	Title IV	none			1 + 0
	Clean Air Interstate Rule (CAIR)	none			1 + 0
	<b>WATER DISCHARGES</b>				
	To Groundwater	\$1300.00			1 + 1
	To Sanitary Sewer (POTW)	\$1300.00			1 + 1
	To Surface Water (NPDES)	\$1300.00			1 + 1
	<b>WATER PLANNING AND MANAGEMENT</b>				
(X)	Dam Safety	none	1	0	1 + 2
	Domestic Sewage Treatment Works (For municipal and private sewage treatment facilities discharging to surface waters)	\$1300.00/ Mod = \$940			1 + 1
	Water Diversion (consumptive) and Registrations	★			1 + 5
	<b>LAND AND WATER RESOURCES</b>				
	Flood Management Certification	none			1 + 1
	Flood Management Certification Exemption	none			1 + 1
	Inland Wetlands and Watercourses (State Agencies Only)	none			1 + 5
	Inland 401 Water Quality Certification	none			1 + 5
	FERC- Hydropower Projects- 401 Water Quality Certification	none			
	Water Diversion (non-consumptive)	★			1 + 5
	Certificate of Permission	\$375.00			1 + 2
	Coastal 401 Water Quality Certification	none			1 + 2
	Structures and Dredging/and Fill/Tidal Wetlands	\$660.00			1 + 2
	<b>WASTE MANAGEMENT</b>				
	Aerial Pesticide Application	★			1 + 2
	Aquatic Pesticide Application	\$200.00			1 + 0
	CGS Section 22a-454 Waste Facilities	★			1 + 1
	Disruption of a Solid Waste Disposal Area	\$0			1 + 1
	Hazardous Waste Treatment, Storage and Disposal Facilities	★			1 + 1
	Marine Terminal License	\$100.00			1 + 0
	Stewardship	\$4000.00			1 + 1
	Solid Waste Facilities	★			1 + 1
	Waste Transportation	★			1 + 0
		Subtotal ➡	1		
GENERAL PERMITS and AUTHORIZATIONS		Subtotals Page 3 & 4 ➡	0		
Enter subtotals from Part IV, pages 3 - 6 of this form		Subtotals Page 5 ➡	0		
		Subtotals Page 6 ➡	0		
		<b>TOTAL ➡</b>	<b>1</b>	<b>0</b>	
<input checked="" type="checkbox"/> Indicate whether municipal discount or state waiver applies. Less Applicable Discount ➡				n/a	
		<b>AMOUNT REMITTED ➡</b>		<b>0</b>	
Check # ➡	<input type="text"/>	Check or money order should be made payable to: "Department of Energy and Environmental Protection"			

★ See fee schedule on individual application.

**Part IV: General Permit Registrations and Requests for Other Authorizations  
Application and Fee Information**

✓	General Permits and Other Authorizations	Initial Fees	No. of Permits Applied For	Total Initial Fees	Original + Required Copies
<b>AIR EMISSIONS</b>					
<input type="checkbox"/>	Limit Potential to Emit from Major Stationary Sources of Air Pollution	\$2760.00			1 + 0
<input type="checkbox"/>	Diagnostic and Therapeutic X-Ray Devices (Medical X-Ray) Registration	\$190.00/Xray device			1 + 0
<input type="checkbox"/>	Radioactive Materials and Industrial Device Registration (Ionizing Radiation)	\$200.00			1 + 0
<input type="checkbox"/>	Emergency/Temporary Authorization	★★			★★
<input type="checkbox"/>	License Revocation Request	\$0			★★
<input type="checkbox"/>	Other, (please specify):				
<b>WATER DISCHARGES</b>					
<b>Categorical Industry User to a POTW</b>					
<input type="checkbox"/>	Discharges ≥ 10,000 gpd	\$6250.00			1 + 0
<input type="checkbox"/>	Discharges < 10,000 gpd	\$3125.00			
<b>Comprehensive Discharges to Surface Water and Groundwater</b>					
<input type="checkbox"/>	Registration Only	\$625.00			1 + 0
<input type="checkbox"/>	Approval of Registration by DEEP	\$1250.00			
<input type="checkbox"/>	Domestic Sewage	\$625.00			1 + 0
<input type="checkbox"/>	Food Service Establishment Wastewater		No Registration		
<b>Groundwater Remediation Wastewater</b>					
<input type="checkbox"/>	Registration Only	\$625.00			1 + 0
<input type="checkbox"/>	Approval of Registration by DEEP	\$1250.00			
<b>Miscellaneous Discharges of Sewer Compatible Wastewater</b>					
<input type="checkbox"/>	Registration Only	\$500.00			1 + 0
<input type="checkbox"/>	Approval of Registration by DEEP	\$1000.00			
<input type="checkbox"/>	Nitrogen Discharges		No Registration		
<input type="checkbox"/>	Point Source Discharges from Application of Pesticides	\$200.00			1 + 0
<input type="checkbox"/>	Stormwater Associated with Commercial Activities	\$300.00			1 + 0
<b>Stormwater Associated with Industrial Activities</b>					
<input type="checkbox"/>	No Exposure Certification	\$250.00			1 + 0
<input type="checkbox"/>	<50 employees—see general permit for additional requirements	\$500.00			
<input type="checkbox"/>	>50 employees—see general permit for additional requirements	\$1000.00			
<input type="checkbox"/>	Stormwater & Dewatering Wastewaters-Construction Activities	★			1 + 0
<input type="checkbox"/>	Stormwater from Small Municipal Separate Storm Sewer Systems (MS4)	\$625.00			1 + 0
<input type="checkbox"/>	Stormwater from DOT Separate Storm Sewer Systems (DOT MS4)	\$0			1 + 0
<input type="checkbox"/>	Subsurface Sewage Disposal Systems Serving Existing Facilities	★★			1 + 0
<input type="checkbox"/>	Swimming Pool Wastewater - Public Pools and Contractors	\$500.00			1 + 0
<b>Vehicle Maintenance Wastewater</b>					
<input type="checkbox"/>	Registration Only	\$625.00			1 + 0
<input type="checkbox"/>	Approval of Registration by DEEP	\$1250.00			
<input type="checkbox"/>	Emergency/Temporary Authorization - Discharge to POTW	\$1500.00			1 + 0
<input type="checkbox"/>	Emergency/Temporary Authorization - Discharge to Surface Water	\$1500.00			1 + 0
<input type="checkbox"/>	Emergency/Temporary Authorization - Discharge to Groundwater	\$1500.00			1 + 0
<input type="checkbox"/>	Other, (please specify):				
Note: Carry subtotals over to Part III, page 2 of this form.		Subtotal ➡			

★ See fee schedule on registration/application.

★★ Contact the specific permit program for this information.  
(Contact numbers are provided in the instructions)

**Part IV: General Permit Registrations and Requests for Other Authorizations (continued)**

<input checked="" type="checkbox"/> General Permits and Other Authorizations	Initial Fees	No. of Permits Applied For	Total Initial Fee	Original + Required Copies
<b>AQUIFER PROTECTION PROGRAM</b>				
<input type="checkbox"/> Registration for Regulated Activities	\$625.00			1 + 0
<input type="checkbox"/> Permit Application to Add a Regulated Activity	\$1250.00			1 + 0
<input type="checkbox"/> Exemption Application from Registration	\$1250.00			1 + 0
<b>WATER PLANNING AND MANAGEMENT</b>				
<input type="checkbox"/> Dam Safety Repair and Alteration: Non Filing	No Registration			
<input type="checkbox"/> Dam Safety Repair and Alteration: Filing – No PE	\$100.00			1 + 0
<input type="checkbox"/> Dam Safety Repair and Alteration: Filing – PE	\$200.00			1 + 0
<input type="checkbox"/> Dam Safety Repair and Alteration: Approval of Filing	\$250.00			1 + 0
<input type="checkbox"/> Diversion of Remediation Groundwater	No Registration			
<input type="checkbox"/> Diversion of Water for Consumptive Use: Reauthorization Categories	\$2500.00			1 + 0
<input type="checkbox"/> Diversion of Water for Consumptive Use: Authorization Required	\$2500.00			1 + 4
<input type="checkbox"/> Diversion of Water for Consumptive Use: Filing Only	\$1500.00			1 + 1
<input type="checkbox"/> Water Resource Construction Activities	★			1 + 0
<input type="checkbox"/> Emergency/Temporary Authorization	★★			★★
<input type="checkbox"/> Notice of High Hazard Dam or a Significant Hazard Dam	\$0			1 + 0
<input type="checkbox"/> Other, (please specify):				
<b>LAND AND WATER RESOURCES</b>				
<b>Minor Coastal Structures</b>				
<input type="checkbox"/> 4/40 Docks/Access Stairs	\$700.00			1 + 1
<input type="checkbox"/> Beach Grading	No Registration			
<input type="checkbox"/> Buoys or Markers	No Registration			
<input type="checkbox"/> Experimental Activities/Scientific Monitoring Devices	No Registration			
<input type="checkbox"/> Harbor Moorings	No Registration			
<input type="checkbox"/> Non-harbor Moorings	\$250.00			1 + 1
<input type="checkbox"/> Osprey Platforms and Perch Poles	No Registration			
<input type="checkbox"/> Pump-out Facilities	No Registration			
<input type="checkbox"/> Swim Floats	No Registration			
<b>Coastal Maintenance</b>				
<input type="checkbox"/> Backflow Prevention Structure	No Registration			
<input type="checkbox"/> Beach Grading/Raking	No Registration			
<input type="checkbox"/> Catch Basin Cleaning	No Registration			
<input type="checkbox"/> Coastal Remedial Activities Required by Order	\$700.00			1 + 1
<input type="checkbox"/> Coastal Restoration	No Registration			
<input type="checkbox"/> DEEP Boat Launch Infrastructures	No Registration			
<input type="checkbox"/> DOT Infrastructures	No Registration			
<input type="checkbox"/> Marina and Mooring Field Reconfiguration	\$700.00			1 + 1
<input type="checkbox"/> Minor Seawall Repair	No Registration			
<input type="checkbox"/> Placement of Cultch	No Registration			
<input type="checkbox"/> Reconstruction of Legally Existing Structure/Obstruction/Encroachment	\$300.00			1 + 1
<input type="checkbox"/> Removal of Derelict Structures	No Registration			
<input type="checkbox"/> Residential Flood Hazard Mitigation	\$100.00			1 + 1
<input type="checkbox"/> Temporary Access of Construction Vehicles/Equipment	No Registration			
<input type="checkbox"/> Programmatic General Permit	★			1 + 1
<input type="checkbox"/> Emergency/Temporary Authorization				
<input type="checkbox"/> Other, (please specify):				
<b>Note: Carry subtotals over to Part III, page 2 of this form.</b>		<b>Subtotal</b> ➔		

★ See fee schedule on registration/application.

★★ Contact the specific permit program for this information.  
(Contact numbers are provided in the instructions)

**Part IV: General Permit Registrations and Requests for Other Authorizations (continued)**

<input checked="" type="checkbox"/> General Permits and Other Authorizations	Initial Fees	No. of Permits Applied For	Total Initial Fee	Original + Required Copies
<b>WASTE MANAGEMENT</b>				
<input type="checkbox"/> Addition of Grass Clippings at Registered Leaf Composting Facilities	\$500.00			1 + 0
<input type="checkbox"/> Beneficial Use Determination	★			1 + 0
<input type="checkbox"/> Collection and Storage of Post Consumer Paint	\$0			1 + 0
<input type="checkbox"/> Connecticut Solid Waste Demonstration Project	\$1000.00			1 + 0
<b>Construct and Operate a Commercial Facility for the Management of Recyclable Materials and Certain Solid Wastes (Commercial GP)</b>				
<input type="checkbox"/> Asbestos Containing Materials	\$1,250.00/\$ 625			1 + 0
<input type="checkbox"/> Ash Residue	\$1,250.00/\$ 625			1 + 0
<input type="checkbox"/> Clean Wood: Tier III	\$500.00/\$250			1 + 0
<input type="checkbox"/> Clean Wood: Tier II	\$250.00/\$125			1 + 0
<input type="checkbox"/> Construction and Demolition Waste: Tier III	\$1,250.00/\$625			1 + 0
<input type="checkbox"/> Construction and Demolition Waste: Tier II	\$500.00/\$250			1 + 0
<input type="checkbox"/> Non-RCRA Hazardous Waste/Compatible Solid Wastes	\$1,250.00/\$625			1 + 0
<input type="checkbox"/> Recyclables	\$500.00/\$250			1 + 0
<input type="checkbox"/> Universal Wastes/Compatible Solid Wastes	\$1,250.00/\$625			1 + 0
<b>Contaminated Soil and/or Staging Management (Staging/Transfer)</b>				
<input type="checkbox"/> New Registrations	\$250.00			1 + 0
<input type="checkbox"/> New Approval of Registrations	\$1500.00			1 + 0
<input type="checkbox"/> Renewal of Registrations	\$250.00			1 + 0
<input type="checkbox"/> Renewal of Approval of Registrations	\$750.00			1 + 0
<input type="checkbox"/> Disassembling Used Electronics	\$2000.00			1 + 0
<input type="checkbox"/> Leaf Composting Facility	\$0			1 + 1
<input type="checkbox"/> Municipal Transfer Station	\$800.00			1 + 1
<input type="checkbox"/> One Day Collection of Certain Wastes and Household Hazardous Waste	\$1000.00			1 + 0
<input type="checkbox"/> Sheet Leaf Composting Notification	\$0			★★
<b>Special Waste Authorization</b>				
<input type="checkbox"/> Landfill or RRF Disposal	\$660.00			1 + 0
<input type="checkbox"/> Asbestos Disposal	\$300.00			
<input type="checkbox"/> homeowner	\$0			
<input type="checkbox"/> Storage and Processing of Asphalt Roofing Shingle Waste	\$2500.00			1 + 0
<input type="checkbox"/> Storage and Processing of Scrap Tires for Beneficial Use	\$1250.00			1 + 0
<input type="checkbox"/> Emergency/Temporary Authorization	★★			★★
<input type="checkbox"/> Other, (please specify):				
<b>REMEDIATION</b>				
<input type="checkbox"/> In Situ Groundwater Remediation: Enhance Aerobic Biodegradation	★			1 + 2
<input type="checkbox"/> In Situ Groundwater Remediation: Chemical Oxidation	\$500.00			1 + 0
<input type="checkbox"/> Emergency/Temporary Authorization	★			★★
Note: Carry subtotals over to Part III, page 2 of this form.		Subtotal →		

★ See fee schedule on registration/application.

★★ Contact the specific permit program for this information.

(Contact numbers are provided in the instructions)

**Affirmative Action, Equal Employment Opportunity and Americans with Disabilities**

The Connecticut Department of Energy and Environmental Protection is an Affirmative Action/Equal Opportunity Employer that is committed to complying with the requirements of the Americans with Disabilities Act (ADA). Please contact us at (860) 418-5910 or [deep.accommodations@ct.gov](mailto:deep.accommodations@ct.gov) if you: have a disability and need a communication aid or service; have limited proficiency in English and may need information in another language; or if you wish to file an ADA or Title VI discrimination complaint.



# Permit Application for Programs Administered by the Inland Water Resources Division

Please complete this application form in accordance with the instructions (DEP-IWRD-INST-100) in order to ensure the proper handling of your application. Print or type unless otherwise noted. You must submit the *Permit Application Transmittal Form* (DEP-APP-001) and the initial fee along with this form.

**DEP USE ONLY**

## Part I: Application Type

Check the appropriate box identifying the application type.

<p>This application is for (check one):</p> <p><input checked="" type="checkbox"/> A <i>new</i> application</p> <p><input type="checkbox"/> A <i>renewal</i> of an existing permit</p> <p><input type="checkbox"/> A <i>modification</i> of an existing permit</p>	<p>Please identify any previous or existing permit/authorization/registration number in the space provided.</p> <p>Existing permit/authorization/registration number:</p> <p>Expiration Date:</p>
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## Part II: Permit Type and Fee Information

Please note: effective August 21, 2003, the application fees for the programs administered by the Inland Water Resources Division have increased as listed in the following table. The fee for municipalities is 50% of the listed rates.

Type of Permit (check <i>all</i> that apply):	Fee to submit with application:
<input type="checkbox"/> <b>Inland Wetlands &amp; Watercourses</b> CGS Sec. 22a-36 et seq.	none
<input checked="" type="checkbox"/> <b>Dam Construction</b> CGS Sec. 22a-403	none
<input type="checkbox"/> <b>401 Water Quality Certificate</b> 33 U.S.C. 1341	none
<input type="checkbox"/> <b>Flood Management Certification</b> CGS Sec. 25-68(b) - (h)	none
<b>Stream Channel Encroachment</b> CGS Sec. 22a-342	
<input type="checkbox"/> No change in grade and no construction of above-ground structures	\$470.00
<input type="checkbox"/> A change in grade and no construction of above-ground structures	\$940.00
<input type="checkbox"/> A change in grade and above-ground structures or buildings	\$4,000.00
<b>Water Diversion: Consumptive Use</b> CGS Sec. 22a-372(e)	
<input type="checkbox"/> Withdrawal > 0.05 and < 0.5 mgd	\$2,050.00
<input type="checkbox"/> Withdrawal ≥ 0.5 and < 2.0 mgd	\$4,000.00
<input type="checkbox"/> Withdrawal ≥ 2.0 mgd	\$6,250.00
<b>Water Diversion: Nonconsumptive Use</b> CGS Sec. 22a-372(e)	
<input type="checkbox"/> Watershed < 0.5 sq mi	\$2,050.00
<input type="checkbox"/> Watershed ≥ 0.5 sq mi and < 2.0 sq mi	\$4,000.00
<input type="checkbox"/> Watershed ≥ 2.0 sq mi	\$6,250.00

### Part III: Applicant Information

1. Fill in the name of the applicant(s) as indicated on the *Permit Application Transmittal Form* (DEP-APP-001):  
Applicant: **Town of East Hartford**  
Phone: **860-291-7380** ext. Fax:  
 Check here if there are co-applicants. If so, label and attach additional sheet(s) with the required information to this sheet.

2. Applicant's interest in property at which the proposed activity is to be located:  
 site owner       option holder       lessee  
 easement holder       operator       other (specify):

3. List primary contact for departmental correspondence and inquiries, if different than the applicant.  
Name: **John McGrane, PE, CFM, GEI Consultants, Inc.**  
Mailing Address: **455 Winding Brook Drive**  
City/Town: **Glastonbury** State: **CT** Zip Code: **06033**  
Business Phone: **860-368-5426** ext. Fax:  
Contact Person: **John McGrane** Title:

4. List attorney or other representative, if applicable:  
Firm Name:  
Mailing Address:  
City/Town: State: Zip Code:  
Business Phone: ext. Fax:  
Attorney:

5. Facility or Property Owner, if different than the applicant:  
Name:  
Mailing Address:  
City/Town: State: Zip Code:  
Business Phone: ext. Fax:  
Contact Person: Title:  
  
Home address of owner (for Inland Wetlands applications only):  
Mailing Address:  
City/Town: State: Zip Code:  
Home Phone:

### Part III: Applicant Information (continued)

6. List any engineer(s) or other consultant(s) employed or retained to assist in preparing the application or in designing or constructing the activity.  Check here if additional sheets are necessary, and label and attach them to this sheet.

Name: **GEI Consultants, Inc.**

Mailing Address: **455 Winding Brook Drive**

City/Town: **Glastonbury**

State: **CT**

Zip Code: **06033**

Business Phone: **860-368-5426**

ext.

Fax:

Contact Person: **John McGrane, PE, CFM**

Title: **Sr. Consultant**

Service Provided: **Project designer**

### Part IV: Site Information

#### 1. Site Location:

- a. Name of facility, if applicable: **East Hartford Flood Control System**

Street Address or Description of Location: **211 & 301 East River Drive**

City/Town: **East Hartford**

State: **CT**

Zip Code: **06108**

Project No., if applicable:

- b. Tax Assessor's Reference: Map **1**

Block **na**

Lot **2&3**

(Assessor's reference is not required if requester is an agency of the State of Connecticut.)

- c. Latitude and Longitude of the approximate "center of the site" in *degrees, minutes, and seconds*:

Latitude: **41.765**

Longitude: **-72.664**

Method of determination (check one):

GPS  USGS Map  Other (please specify): **CT ECO Mapping**

If a USGS Map was used, provide the quadrangle name:

- d. Drainage Basin number(s) wherein the proposed activity will take place: **4000-00-6+ R7**

- e. Flood Insurance Rate Map Panel Number: **09003C0368G**

Date of the map referenced: **9/16/2011**

- f. If applying for a SCEL permit, identify the property wherein the proposed activity will take place by indicating the following:

SCEL Map number(s):

Property Identifier:

Date of the map referenced:

2. **COASTAL BOUNDARY:** Is the activity which is the subject of this application located within the coastal boundary as delineated on DEP approved coastal boundary maps?  Yes  No

If yes, and this application is for a new permit or for a modification of an existing permit, you must submit a *Coastal Consistency Review Form* (DEP-APP-004) with your application as Attachment P.

Information on the coastal boundary is available at the local town hall or on the "Coastal Boundary Map" available at DEP Maps and Publications (860-424-3555).



## Part IV: Site Information (continued)

- 3. ENDANGERED OR THREATENED SPECIES:** Is the project site located within an area identified as a habitat for endangered, threatened or special concern species as identified on the "State and Federal Listed Species and Natural Communities Map"?  Yes  No Date of Map: **December 2018**

If yes, complete and submit a *Connecticut Natural Diversity Data Base (CT NDDB) Review Request Form* (DEP-APP-007) to the address specified on the form. **Please note NDDB review generally takes 4 to 6 weeks and may require additional documentation from the applicant. DEP strongly recommends that applicants complete this process before submitting the subject application.**

When submitting this application form, include copies of any correspondence to and from the NDDB, including copies of the completed *CT NDDB Review Request Form*, as Attachment K (Environmental Report) or in Attachment Q if no environmental report is required.

For more information visit the DEP website at [www.ct.gov/dep/endorangeredspecies](http://www.ct.gov/dep/endorangeredspecies) (Review/Data Requests) or call the NDDB at 860-424-3011.

- 4. AQUIFER PROTECTION AREAS:** Is the site located within a town required to establish Aquifer Protection Areas, as defined in section 22a-354a through 354bb of the General Statutes (CGS)?

Yes  No

If yes, is the site within an area identified on a Level A or Level B map?  Yes  No

To view the applicable list of towns and maps visit the DEP website at [www.ct.gov/dep/aquiferprotection](http://www.ct.gov/dep/aquiferprotection)

To speak with someone about the Aquifer Protection Areas, call 860-424-3020.

- 5. CONSERVATION OR PRESERVATION RESTRICTION:** Is the property subject to a conservation or preservation restriction?  Yes  No

If Yes, proof of written notice of this application to the holder of such restriction or a letter from the holder of such restriction verifying that this application is in compliance with the terms of the restriction, must be submitted as Attachment Q.

- 6. Other Permits:** List any previous federal, state or local permits or certificates that have already been issued for the site or for the proposed activity:

<u>Type or Nature of Permit</u>	<u>Permit No. Issuing Authority</u>	<u>Date Issued</u>	<u>Expiration Date</u>	<u>Permittee Name</u>
CT DEEP Dam Safety	200900926	2010	2012	Town E. Hartford
USACE	NAE2008-1144	2013	n/a	Town E. Hartford
P&Z	n/a	2009	n/a	Town E. Hartford

## Part V: Supporting Documents

Please check the attachments submitted as verification that *all* applicable attachments have been submitted with this application form. When submitting any supporting documents, please label the documents as indicated in this part (e.g., Attachment A, etc.) and be sure to include the applicant's name as indicated on the *Permit Application Transmittal Form*. The specific information required in each attachment is described in the *Instructions for Completing A Permit Application for Inland Water Resources Division Activities* (DEP-IWRD-INST-100).

- Attachment A: Executive Summary
- Attachment B: An 8 1/2" x 11" copy of a United States Geological Survey (USGS) Topographic Quadrangle Map (scale: 1:24,000) with the regulated activity or project site outlined or pinpointed, as appropriate.
- Attachment C: *Documentation Form for: Inland Wetlands and Watercourses Permit, Stream Channel Encroachment Line Permit, and 401 Water Quality Certification* (DEP-IWRD-APP-101)

## Part V: Supporting Documents (continued)

- Attachment D: *Documentation Form for Water Diversion Permit* (DEP-IWRD-APP-102)
- Attachment E: *Documentation Form for a Dam Construction Permit* (DEP-IWRD-APP-103)
- Attachment F: *Documentation Form for Flood Management Certification* (DEP-IWRD-APP-104) (State Agencies Only)
- Attachment G: Plan Sheets and Drawings
- Attachment H: Engineering Documentation
  - Part 1: *Engineering Report Checklist* (DEP-IWRD-APP-105A) and an Engineering Report
  - Part 2: *Hydrologic and Hydraulic Consistency Worksheet* (DEP-IWRD-APP-105B)
    - Section I: Floodplain Management
    - Section II: Stormwater Management
    - For state agencies only:*
    - Section III: State Grants and Loans
    - Section IV: Disposal of State Land
- Attachment I: Flood Contingency Plan
- Attachment J: Soil Scientist Report (not required for Flood Management Certification)
- Attachment K: Environmental Report (not required for Flood Management Certification)
- Attachment L: Mitigation Report - wetlands and watercourses, fish and wildlife (not required for Flood Management Certification)
- Attachment M: Alternatives Assessment (not required for Flood Management Certification)
- Attachment N: *Applicant Compliance Information Form* (DEP-APP-002) (not required for Flood Management Certification or 401 Water Quality Certification Approvals)
- Attachment O: *Applicant Background Information Form* (DEP-APP-008) (not required for Flood Management Certification)
- Attachment P: *Coastal Consistency Review Form* (DEP-APP-004) (if applicable)
- Attachment Q: Other Information: any other information the applicant deems relevant or is required by DEP.

### *Number of Copies of Application:*

Submit one original of all application forms, certifications, reports and supporting documents and the number of photocopies of all such materials as noted on the *Permit Application Transmittal Form*. When applying for more than one permit, you should submit the original and no more than six copies.

**Part VI: Application Certification**

The applicant *and* all individuals responsible for actually preparing the application or supporting documentation must sign this part. An application will be considered insufficient unless all required signatures are provided. You must include signatures of any person preparing any report or parts thereof filed in support of this application (i.e., professional engineers, surveyors, soil scientists, biologists, environmental and other consultants, etc.).

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief.

I understand that a false statement in the submitted information may be punishable as a criminal offense, in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53a-157b of the General Statutes, and in accordance with any other applicable statute.

I certify that this application is on complete and accurate forms as prescribed by the commissioner without alteration of the text.


I certify that I will comply with all notice requirements as listed in Section 22a-6g of the General Statutes."

  
 \_\_\_\_\_  
 Signature of Applicant

\_\_\_\_\_ 3/5/19  
 Date

**Douglas Wilson, PE**  
 \_\_\_\_\_  
 Name of Applicant (print or type)

**Interim Town Engineer**  
 \_\_\_\_\_  
 Title (if applicable)

  
 \_\_\_\_\_  
 Signature of Preparer (if different than above)

\_\_\_\_\_ 3/5/2019  
 Date

**John McGrane, PE, CFM**  
 \_\_\_\_\_  
 Name of Preparer (print or type)

**Sr. Consultant, GEI Consultants, Inc.**  
 \_\_\_\_\_  
 Title (if applicable)

Check here if additional signatures are required.  
 If so, please reproduce this sheet and attach signed copies to this sheet.

Reminder: After submitting this application to DEP, except in the case of a Flood Management Certification, you must publish a notice of the application immediately and submit a certified copy of this published notice to DEP. See "Notice of Permit Application" section in the instructions (DEP-IWRD-INST-100).

List the name of the newspaper the Notice of Permit Application will be published in: **Hartford Courant**

Note: Please submit the *Permit Application Transmittal Form*, Application Form, Fee, and all Supporting Documents to:

CENTRAL PERMIT PROCESSING UNIT  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 79 ELM STREET  
 HARTFORD, CT 06106-5127

# **Attachment A: Executive Summary**

## Attachment A Executive Summary

Consulting  
Engineers and  
Scientists

### Town of East Hartford Flood Control System Toe Drain Replacement Phase 1 IWRD Application Dam Construction Permit Request March 2019

The Town of East Hartford is undertaking this project as part of its long-term program to upgrade and maintain the integrity of its flood control system that was initiated through the FEMA Levee Accreditation process. The Town has continued with this program to meet ongoing levee safety compliance standards of the U.S Army Corps of Engineers.

This project involves replacement of and improvement to an existing levee toe drain system within the Town of East Hartford flood control system between the Bulkeley Bridge (I-84) on the north and extending southerly to the intersection of East River Drive and Hartland Street. The new toe drain will replace approximately 2,500 feet of existing toe drain system essentially within the footprint of existing toe drain system.

The existing Toe Drain for East Hartford Levee system has failed due to deterioration of the internal pipe system and intrusion of fine sediments into the toe drain system. The new Toe Drain system will involve installation of new PVC slotted piping and concrete manholes. The Toe Drains will be in the range of 6 to 10 feet in depth and will be excavated using standard excavating equipment to remove the old piping and backfill. New piping and backfill will be installed predominantly within the existing toe drain trench. Surfaces will be restored in-kind with existing materials, which entirely consist of asphalt pavement, gravel, and mowed grass surfaces.

The project is on the landward fringe of an NDDB as shown on the December 2018 NDDB mapping. The Town submitted a request to Ct DEEP for an NDDB determination and received **NDDB Notice of Determination 201901835** which is attached. The Determination indicated no anticipated negative impacts to State listed species as a result of the project.

The full extent of the project is within an urbanized area west of East River drive. Land uses consist of include office and high-rise residential. Existing surface consist of asphalt pavement, gravel surface under the Riverpoint Condominiums parking deck, and mowed grassed surface on the levee toe and roadside adjacent to East River Drive.

The work is limited to replacement of an existing Toe Drain system which is on the land side of the East Hartford Earthen Levee and Concrete Floodwall system. All work is

Town of East Hartford Flood Control System  
Toe Drain Replacement Phase 1  
IWRD Application  
Dam Construction Permit Request

landward of the levee centerline. The entire footprint of the proposed Toe Drain replacement is urbanized parking areas, driveways, and roadside areas adjacent to the levee. The on-site and off-site surface conditions will remain the same as a result of this project and thus there are no impacts to report.

Based on CT ECO mapping (see attached) and visual observation, there are no identified wetlands or surface water bodies or watercourses within the project limits or in the vicinity of the project area. The Toe Drain system is designed to collect subsurface water which will discharge into an existing storm drain system. There are no provisions in the project to collect surface drainage.

The project area is shown as "Shaded Zone X " meaning that it is protected by an accredited levee. The Town of East Hartford obtained Levee Accreditation in 2010 and it remains a currently accredited levee system.

This project was part of a comprehensive levee repair project within the East Hartford Flood Protection system, which was previously authorized under a CT DEP Dam Safety Permit in 2010. Although other components of the comprehensive project were constructed under this Dam Safety Permit, the Toe Drain Replacement portion did not commence within the permit specified time frame, and thus is the subject of this application as a stand-alone project. Also, the project did receive several local and federal authorizations for this project. These permits include the following:

- CT DEEP Dam Safety Permit 200900926 (see copy Attachment Q - Other Information)
- U.S. Army Corps of Engineers (USACE), Title 33 CFR 208.10 Authorization, as per permit # NAE-2008-1144 dated July 23, 2008; and including approved extension letters dated most recently, December 23, 2013.
- Town of East Hartford Zoning Board of Appeals Variance dated June 4, 2009– A variance from Section 601.10 to permit filling minor amounts of fill within the floodplain without adding compensatory storage capacity.

Work is scheduled to commence by July 1, 2019 and completed by December 31, 2019.

**Appendices to Executive Summary:**

Appendix 1: Photos of the project area

Appendix 2: CT ECO map for Poorly or Very Poorly Drained (i.e. Wetlands) Soils

Appendix 3: NDDB Notice of Determination 201901835

# Appendix 1:

## APPENDIX 1

### Supplemental Project Information

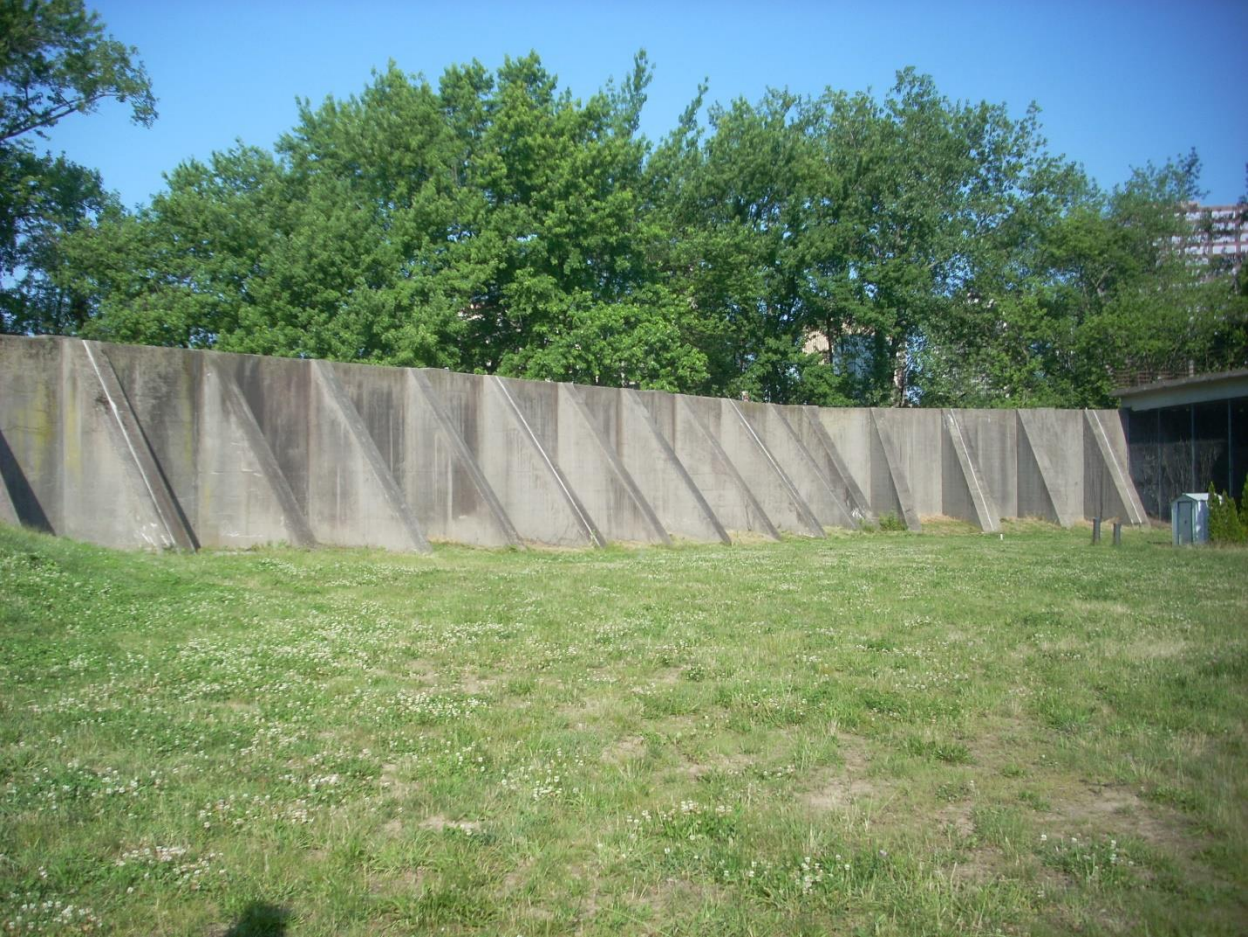


**Photo looking North from southern limit of project. Toe drain replacement proposed for levee toe area to the left of paved street (East River Drive)**





**Photo looking North. Toe drain replacement proposed for levee toe area to the left of paved street (East River Drive)**



**Photo looking North. Toe drain replacement proposed for floodwall toe to right of buttressed concrete floodwall.**



**Photo looking North. Toe drain replacement proposed for floodwall toe to right of buttressed concrete floodwall (under Riverpoint Condominium deck).**

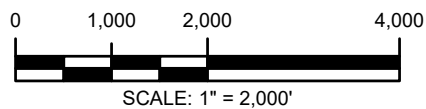


**Photo looking North (north of Founder Bridge) to northern terminus of project. Toe drain replacement proposed for levee toe area to left of paved parking area.**



## **Appendix 2:**



SOURCE:  
1. SSURGO USDA NRCS SOILS  
ACCESSED VIA CT DEEP GIS



**LEGEND:**

-  Poorly Drained and Very Poorly Drained Soils
-  Alluvial and Floodplain Soils

Town of East Hartford  
Levee Toe Drain System Phase 1 Repairs  
East Hartford, Connecticut



WETLAND SOILS

Town of East Hartford  
East Hartford, Connecticut

Project 124390

February 2019

Attachment A

## **Appendix 3:**

February 8, 2019

John McGrane, PE, CFM  
GEI Consultants Inc, as agent for Town of East Hartford  
455 Winding Brook Drive  
Glastonbury, CT 06033  
[jmcgrane@geiconsultants.com](mailto:jmcgrane@geiconsultants.com)

Project: Levee toe drain system Phase 1 repairs, East River Drive and Pitkin St, East Hartford, CT  
NDDDB Determination No.: 201901835

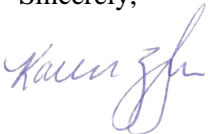
Dear Mr. McGrane,

I have reviewed Natural Diversity Database (NDDDB) maps and files regarding the area of work provided for the proposed levee toe drain system Phase 1 repairs in East Hartford, Connecticut. I do not anticipate negative impacts to State-listed species (RCSA Sec. 26-306) resulting from your proposed activity at the site based upon the information contained within the NDDDB. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits. This determination is good for two years. Please re-submit a new NDDDB Request for Review if the scope of work changes or if work has not begun on this project by February 8, 2021.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey, cooperating units of DEEP, landowners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDDB should not be substitutes for on-site surveys necessary for a thorough environmental impact assessment. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the database as it becomes available.

Please contact me if you have further questions at (860) 424-3378, or [karen.zyko@ct.gov](mailto:karen.zyko@ct.gov) . Thank you for consulting the Natural Diversity Database.

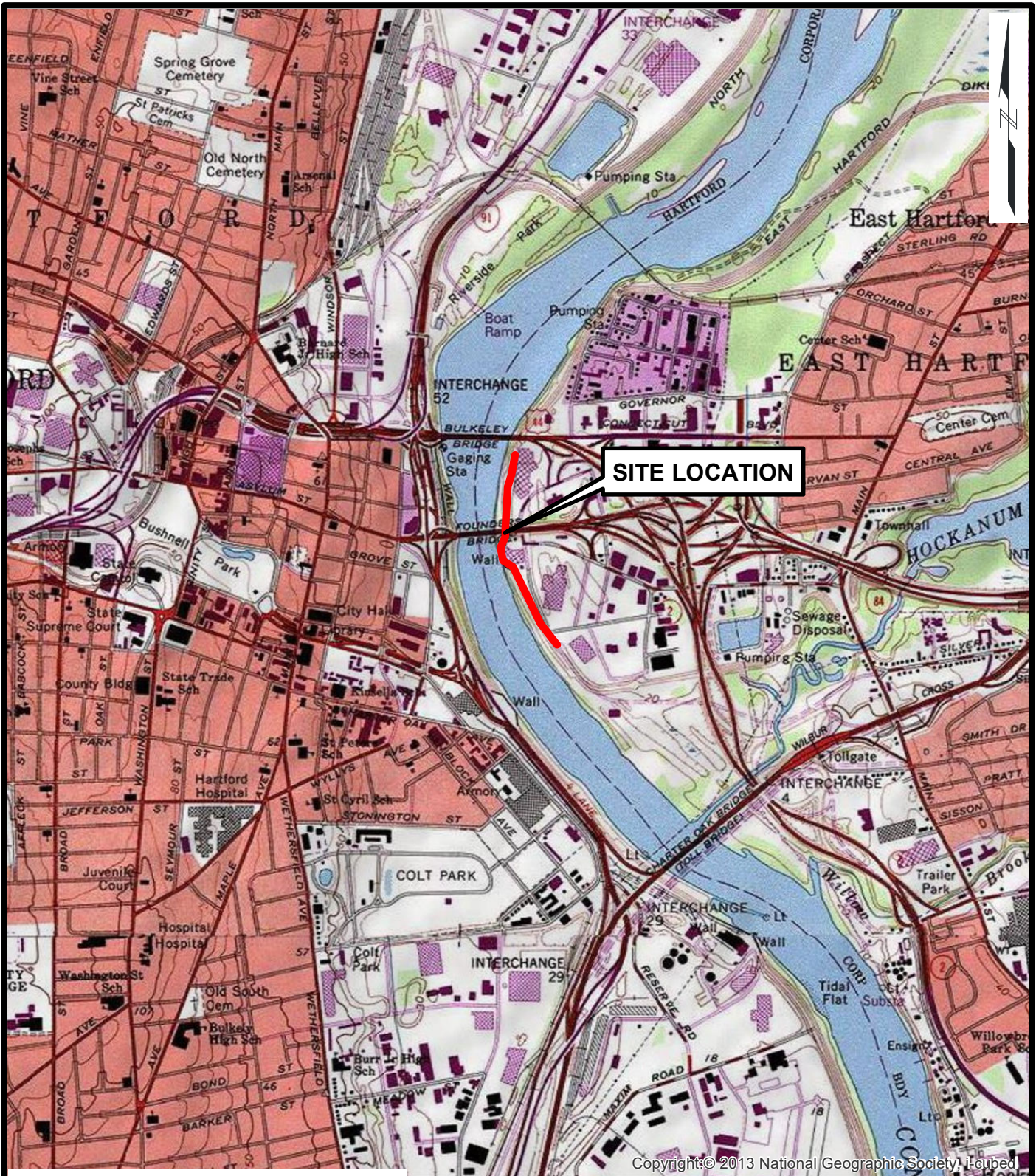
Sincerely,



Karen Zyko  
Environmental Analyst

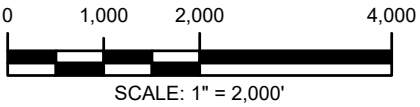


# **Attachment B: USGS Quad Map**



Copyright © 2013 National Geographic Society, Inc.

SOURCE:  
 1. NATIONAL GEOGRAPHIC TOPO!  
 ACCESSED VIA  
 ARCGIS ONLINE.COM



<p>Town of East Hartford          Levee Toe Drain System Phase 1 Repairs          East Hartford, Connecticut</p>		<p>SITE LOCATION/OVERVIEW          MAP</p>
<p>Town of East Hartford          East Hartford, Connecticut</p>	<p>Project 124390</p>	<p>February 2019      Attachment A</p>

**Attachment E:  
Documentation Form for a Dam Construction  
Permit**

# Attachment E: Documentation Form for a Dam Construction Permit (CGS Section 22a-403)

Applicants should review the application instructions (DEP-IWRD-INST-100) and CGS Sections 22a-401 through 22a-411.

1. Applicant Name: **Town of East Hartford**  
(as indicated on the *Permit Application Transmittal Form*)

2. Name of watercourse affected by dam: **CT River**  
Name of dam: **East Hartford Flood Control System**  
Name of impoundment: **n/a**  
CT Dam Inventory Number, if known: **4313**

3. Description of proposed activity:  
 New construction       Repair       Modification       Removal

4. Description of the proposed/current uses of the proposed/existing dam and impoundment:

**The East Hartford Flood Control System is owned and operated by the Town of East Hartford (Fig. 1). The levee associated with the flood control system consists of an embankment with a clean sand core and waterside clay blanket. The levee is located on the left bank of the Connecticut River (looking downstream) and extends along several segments beginning at a location north of Green Terrace. The levee continues for about 4 miles along the banks of the Connecticut River past the Connecticut Southern Railroad Bridge, Bulkelley Bridge, Founders Bridge, along East River Drive and south of Hartland Street where the levee proceeds east along the floodplain on the north side of the Hockanum River, past Interstate 84, and terminating at Brewer Lane. The flood protection system also includes concrete floodwalls and pump stations.**

**The levee protects a land side area of about 1 sq. mile from potential flood waters originating from the Connecticut River and Hockanum River. The crest elevation of the levee varies from a maximum of about El. 47.0 at the northern end of the system to a minimum elevation of about El. 35.9 North American Vertical Datum of 1988 (NAVD88). The land area protected by the levee includes residential, commercial, and insitutional land uses as well as roads and highways.**

**In 2013 Connecticut’s dam safety statutes were modified to require owners of Class C High Hazard dams to prepare EAPs. “Dams” in Connecticut are defined as barriers capable of impounding or controlling the flow of water including flood control structures and levees such as the East Hartford Flood Control System. The East hartford Levee is rated as a Class C dam (high hazard potential dam) which, if it were to fail, would result in probable loss of life, major damage to property, utilities, and roadways, and great economic loss.**

**An analysis of estimated flooding damage from a 500-year flood calculated that the avoided damages were approximately \$364,200,000.**

**Attachment E: Documentation Form (continued)**

5. Characteristics of proposed or existing impoundment:

- a. Surface area: **n/a** acres
- b. Drainage area: **n/a** (check one):  acres or  square miles
- c. Volume at spillway height: **n/a** (check one):  acre-feet or  cubic feet
- d. Volume at top of dam: **n/a** (check one):  acre-feet or  cubic feet

6. Characteristics of proposed or existing dam:

- a. Maximum height at centerline: **47** feet
- b. Total length: **21,000+** feet

7. Characteristics of proposed or existing spillway:

- a. Type: **n/a**
- b. Capacity:           cubic feet/second (cfs) at design storm elevation  
                              cfs at top of dam
- c. Length:            feet
- d. Height above stream bed:       feet
- e. Amount of freeboard:       feet
- f. Existing water surface elevation:       feet NGVD
- g. Historic water surface elevation:       feet NGVD  
  
Historic water surface elevation maintained until:       (year)  
Provide documentation supporting historic data as Attachment E7g.
- h. Proposed water surface elevation:       feet NGVD

8. Type of proposed or existing construction:

- a. Dam:  
**n/a**

b. Dike:

**The levee associated with the flood control system consists of an embankment with a clean sand core and waterside clay blanket. Portions of the dike consist of reinforced concrete floodwall.**

## Attachment E: Documentation Form (continued)

8. c. Spillway:

**n/a**

9. Hydraulic factors:

a. Spillway design storm (return frequency, e.g., 100 yr., ½ PMF, PMF, Other): **n/a**

b. Design storm duration:            hours.

c. Peak inflow:            cfs

d. Peak outflow:            cfs

e. Impoundment elevation at peak outflow:            feet

10. Use of fill material:

Will fill material be placed in a watercourse or in wetlands?             Yes             No

If Yes, the volume to be placed is:            cubic yards and the area to be filled is:            acres.

The fill must be delineated on application plans submitted as Attachment G.

11. Rate of flow to be passed on an uninterrupted instantaneous basis through the dam during filling or refilling is: **n/a** cfs.

12. If the impoundment will be drawn down, will potable water supply wells be adversely affected by such drawdown?             Yes             No

If yes, provide plan for potable water supply as Attachment E12.

13. Submit as Attachment E13, a Dam Operations Maintenance Manual and Flood Emergency Operations Plan. See instructions (DEP-IWRD-INST-100) for this manual and plan.

14. Summary of Documents submitted with Attachment E: Check each document being submitted under Attachment E as verification that all applicable documents have been submitted.

Attachment E7g:    Supporting documentation for historic data

Attachment E12:    Plan for potable water supply, if applicable.

Attachment E13:    Dam Operations Maintenance Manual and Flood Emergency Operations Plan.

Other, please specify:

**Attachment H:**  
**Engineering Documentation**  
**Part 1 Engineering Report Checklist and**  
**Engineering Report**  
**Part 2 Hydrologic and Hydraulic**  
**Consistency Worksheet**

# Attachment H: Engineering Documentation

## Part 1: Engineering Report Checklist

The following is a checklist of requirements that need to be completed, included and submitted as part of the Engineering Report. Please complete this checklist by identifying where each requirement listed is addressed in the Engineering Report (report title and page numbers). If an item is not applicable, place "NA" in the box. Attach the completed checklist as the cover sheet to engineering reports, as applicable, which fully describe the design of the proposed facilities or other actions and the hydraulic and hydrologic effects thereof. The application instructions (DEP-IWRD-INST-100) should be consulted for a complete description of each item listed. This checklist is required to be signed and sealed by a professional engineer licensed in the State of Connecticut.

### Stormwater Management

Location of Item	Item Description
n/a	Description of the design storm frequency intensity, volume and duration
n/a	Watershed maps, existing and proposed
n/a	Computations for Tc
n/a	Imperviousness calculations
n/a	NRCS runoff curve numbers, volumetric runoff coefficients
n/a	Computations used to determine peak runoff rates, and velocities for each watershed area (24-hour storm): <ul style="list-style-type: none"> <li>• Stream Channel Protection: 2-year frequency ("over-control" of 2-year storm)</li> <li>• Conveyance Protection: 10-year frequency</li> <li>• Peak Runoff Attenuation: 2-year, 10-year, and 100-year frequency</li> <li>• Emergency Outlet Sizing: safely pass the 100-year frequency or larger storm</li> </ul>
n/a	Hydrograph routing calculations
n/a	Description, schematics, and calculations for drainage and stormwater management systems, bridges and culverts
n/a	Infiltration rates
n/a	Documentation of sources
n/a	Computer disk containing input and output data and the associated program for all computer models used in the analyses
n/a	Hard copy of input and output data including input/output tables
n/a	Detention basin analysis including timing and duration of expected outflow, stream stability analysis and hydrograph summation



## Flood Plain Assessment

Location of Item	Item Description
n/a	Description or simulation of existing and proposed conditions upstream and downstream of the proposed activity
n/a	(For SCEL applications only) A determination of the effect of the proposed activity on flooding and flood hazards together with an equivalent encroachment on the opposite bank for the flood event establishing the encroachment lines
n/a	For any bridge or culvert placement or replacement with a drainage area of 100 acres or more, plan sheets showing the existing and proposed inundation area for the 2, 10, 25, 50, and 100 year discharges, carried to convergence
n/a	A description and analysis of the floodplain modifications required to restore any flood conveyance and flood storage capacity
n/a	Demonstration that backwater from the proposed activity will not impact an existing dam, dike, or similar structure
n/a	Backup data and complete hydraulic analysis for proposed modifications to the floodplain including location plan and plot for sections, profile sheet, summary sheet

## Dams, Dikes, Diversion Channels, Similar Structures

Location of Item	Item Description
n/a	Primary and emergency spillway and outlet structure erosion protection
Appendix 1	Dam breach analysis
Appendix 2	Geotechnical evaluation
Appendix 3	Construction Specifications for foundation preparation, embankment material, outlet structure, and construction inspection

## Soil Erosion and Sediment Control Plan

Location of Item	Item Description
Sec 5 of Rpt	Narrative
Appendix 4	Drawings
Appendix 4	Details
n/a	Calculations for Engineered Measures

# Professional Certification

For any Engineering Report submitted as part of the IWRD permit application, the following certification must be signed and sealed by a professional engineer licensed to practice in Connecticut and submitted with the Engineering Report Checklist and Report.

"I certify that in my professional judgement, each requirement listed in the Engineering Report Checklist has been addressed in the Engineering Report submitted as part of the IWRD permit application as Attachment H, Part 1 and that the information is true, accurate and complete to the best of my knowledge and belief.

This certification is based on my review of the Engineering Report.

I understand that a false statement made in the submitted information may, pursuant to Section 22a-6 of the General Statutes, be punishable as a criminal offense under Section 53a-157b of the General Statutes, and may also be punishable under Section 22a-438 of the General Statutes."

*Douglas Wilson*

Signature of Applicant

3/5/19

Date

**Douglas Wilson, PE**

Name of Applicant (print or type)

**Interim Town Engineer**

Title (if applicable)

*John McGrane*

Signature of Professional Engineer

3-5-2019

Date

**John McGrane, PE, CFM**

Name of Professional Engineer (print or type)

**13678**

P.E. Number (if applicable)

Affix P.E. Stamp Here  
(if applicable)



## **Attachment H Engineering Report**

### **Town of East Hartford Flood Control System Toe Drain Replacement Phase 1 IWRD Application Dam Construction Permit Request March 2019**

#### **1.0 Project Description**

This project involves replacement of and improvement to an existing levee toe drain system within the Town of East Hartford flood control system between the Bulkeley Bridge (I-84) on the north and extending southerly to the intersection of east River Drive and Hartland Street. The new toe drain will replace approximately 2,500 feet of existing toe drain system essentially within the footprint of existing toe drain system.

The existing Toe Drain for East Hartford Levee system has failed due to deterioration of the internal pipe system and intrusion of fine sediments into the toe drain system. The new Toe Drain system will involve installation of new PVC slotted piping and concrete manholes. The Toe Drains will be in the range of 6 to 10 feet in depth and will be excavated using standard excavating equipment to remove the old piping and backfill. New piping and backfill will be installed predominantly within the existing toe drain trench. Surfaces will be restored in-kind with existing materials, which entirely consist of asphalt pavement, gravel, and mowed grass surfaces.

The full extent of the project is within an urbanized area west of East River drive. Land uses consist of include office and high-rise residential. Existing surface consist of asphalt pavement, gravel surface under the Riverpoint Condominiums parking deck, and mowed grassed surface on the levee toe and roadside adjacent to East River Drive.

The work is limited to replacement of an existing Toe Drain system which is on the land side of the East Hartford Earthen Levee and Concrete Floodwall system. All work is landward of the levee centerline. The entire footprint of the proposed Toe Drain replacement is urbanized parking areas, driveways, and roadside areas adjacent to the levee. The on-site and off-site surface conditions will remain the same as a result of this project and thus there are no impacts to report.

Complete Engineered Plans for the Toe Drain Phase 1 Project are included in Attachment G of this application.

Town of East Hartford Flood Control System  
Toe Drain Replacement Phase 1  
IWRD Application  
Dam Construction Permit  
Appendix H - Engineering Report

## **2.0 Flood Plain Designation**

The project area is shown as "Shaded Zone X " meaning that it is protected by an accredited levee. The Town of East Hartford obtained Levee Accreditation in 2010 and it remains a currently accredited levee system.

## **3.0 Existing Permits**

This project was part of a comprehensive levee repair project within the East Hartford Flood Protection system, which was previously authorized under a CT DEP Dam Safety Permit in 2010. Although other components of the comprehensive project were constructed under this Dam Safety Permit, the Toe Drain Replacement portion did not commence within the permit specified time frame, and thus is the subject of this application as a stand-alone project. Also, the project did receive several local and federal authorizations for this project. These permits include the following:

- CT DEEP Dam Safety Permit 200900926 (See copy Attachment Q – Other Information)
- U.S. Army Corps of Engineers (USACE), Title 33 CFR 208.10 Authorization, as per permit # NAE-2008-1144 dated July 23, 2008; and including approved extension letters dated most recently, December 23, 2013.
- Town of East Hartford Zoning Board of Appeals Variance dated June 4, 2009– A variance from Section 601.10 to permit filling minor amounts of fill within the floodplain without adding compensatory storage capacity.

## **4.0 Schedule**

Work is scheduled to commence by July 1, 2019 and completed by December 31, 2019.

## **5.0 Erosion and Sediment Control Narrative**

Excavation will be limited to trench excavations in uplands areas at the toe of the levee. Sediment and erosion controls will consist primarily of Filter Fabric Barrier Fence for soft surfaces, and Hard Surface Barriers, both of which are shown to installed parallel to the toe drain trench system. Staked Hay Bales will also be used in used in selected areas, such as at catch basins, to control release of sediments. In addition to the project plans, the Construction Specifications (Appendix 3) contain details on the installation and maintenance of E&S measures.

Town of East Hartford Flood Control System  
Toe Drain Replacement Phase 1  
IWRD Application  
Dam Construction Permit  
Appendix H - Engineering Report

**Appendices to Executive Summary:**

Appendix 1: Dam Breach Analysis

Appendix 2: Geotechnical Evaluation

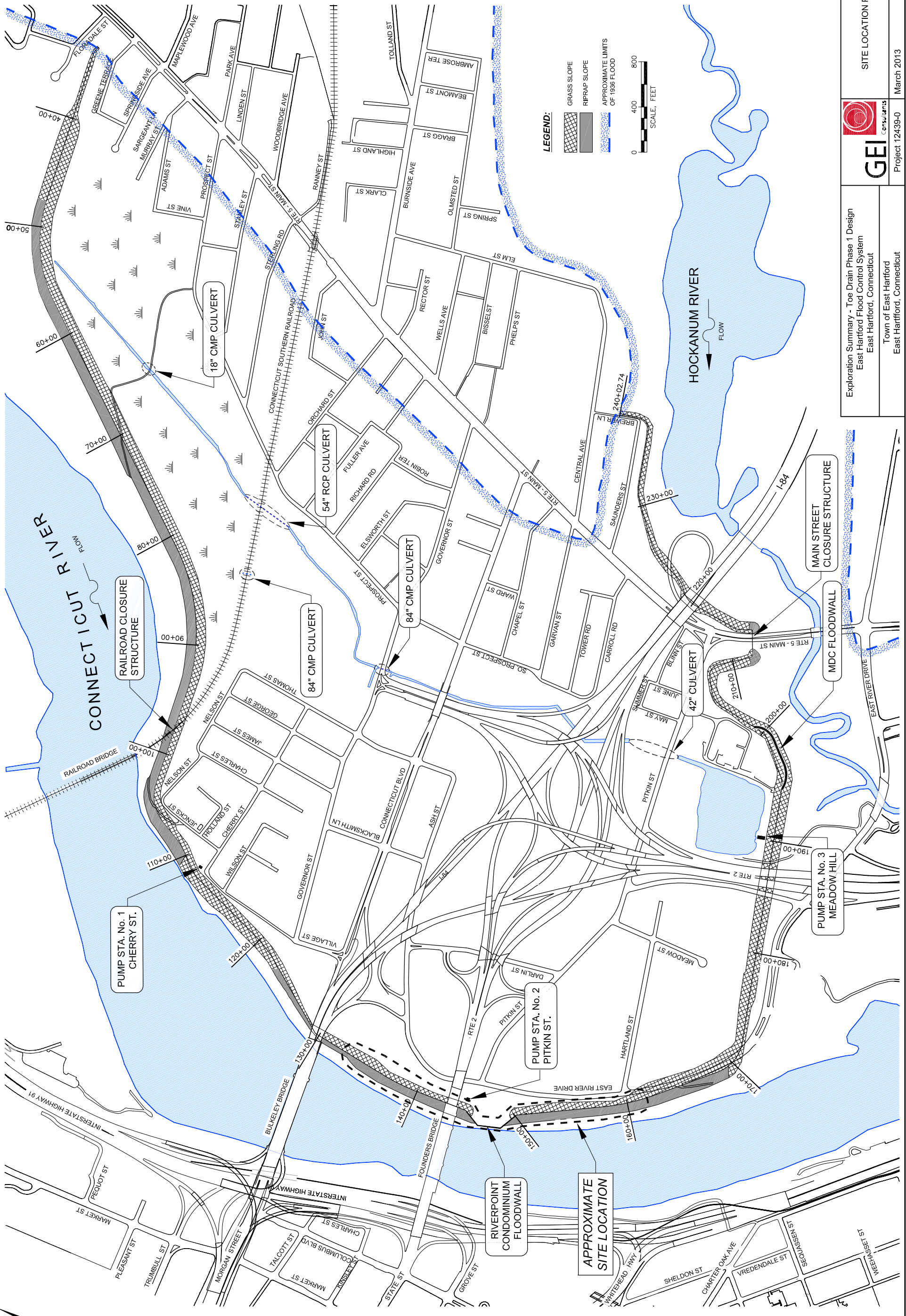
Appendix 3: Construction Specifications

Appendix 4: E&S Drawings and Details (See Attachment G of this application for full plan set including E&S Measures)

H:\TECH\project\East Hartford\2019 Projects\Phase 1 Toe Drain Dam Safety Permit\1. Dam Constr Permit\Attach H Engr Report Checklist\Attach H Engineering Report.docx

# Figures

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**LEGEND:**

- GRASS SLOPE
- RIPRAP SLOPE
- APPROXIMATE LIMITS OF 1936 FLOOD

0 400 800  
SCALE, FEET

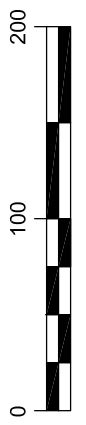
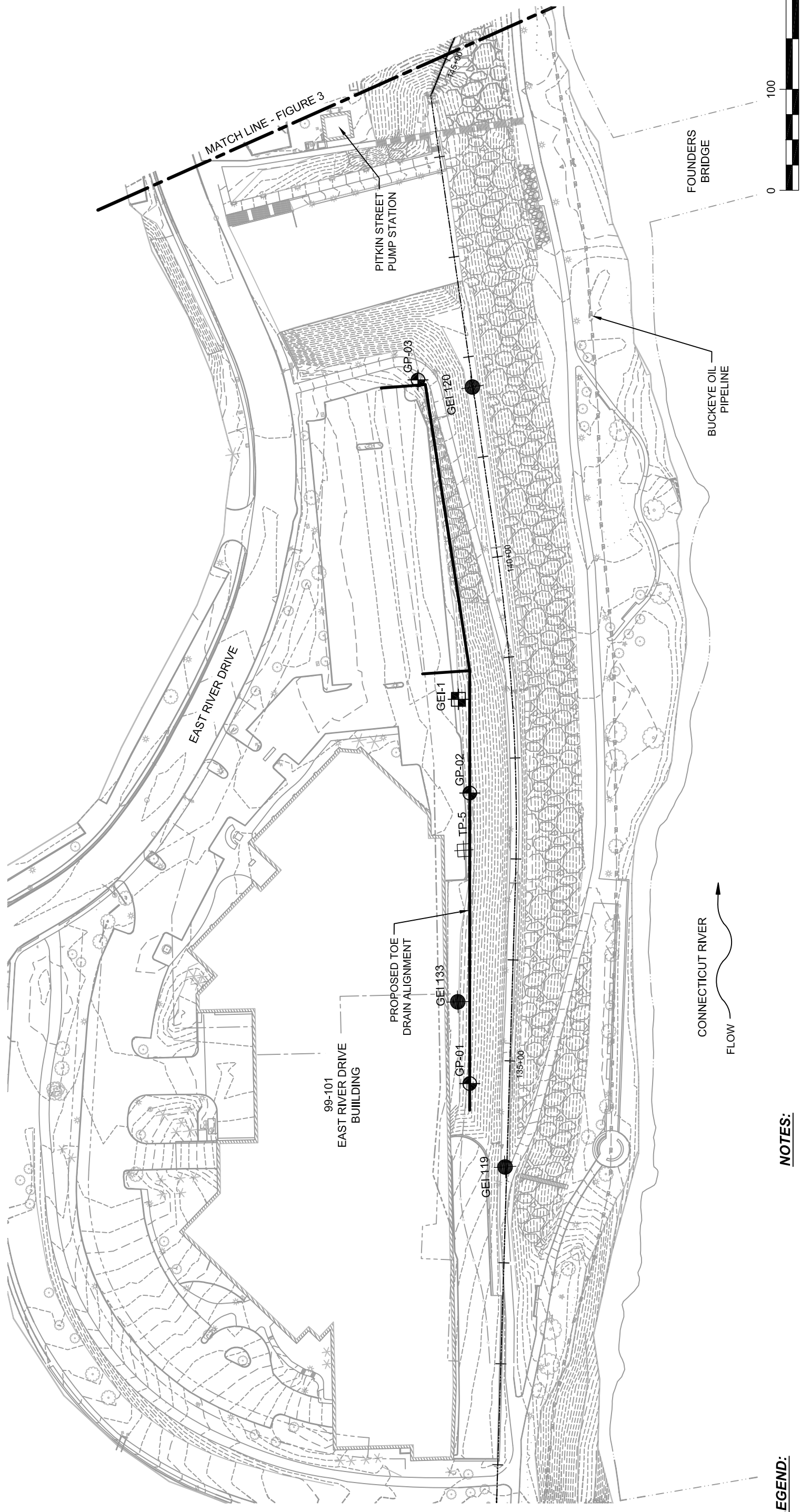
Exploration Summary - Toe Drain Phase 1 Design  
East Hartford Flood Control System  
East Hartford, Connecticut  
Town of East Hartford  
East Hartford, Connecticut

**GEI** Consultants

SITE LOCATION PLAN

Project 12439-0 March 2013 Fig. 1

M:\DATA\2012\12439 East Hartford Toe Drain Design Phase 1\Drawings\Working Drawings\Fig 1 - Flood Control System Overview.dwg 11/28/2012




**LEGEND:**

- PROPOSED TOE DRAIN ALIGNMENT
- GP-01 DIRECT PUSH BORING LOCATION (2012)
- GEI-119 EXISTING BORING LOCATION (PRE-2012)
- GEI-01 TEST PIT LOCATION (2012)
- TP-5 EXISTING TEST PIT LOCATION (PRE-2012)

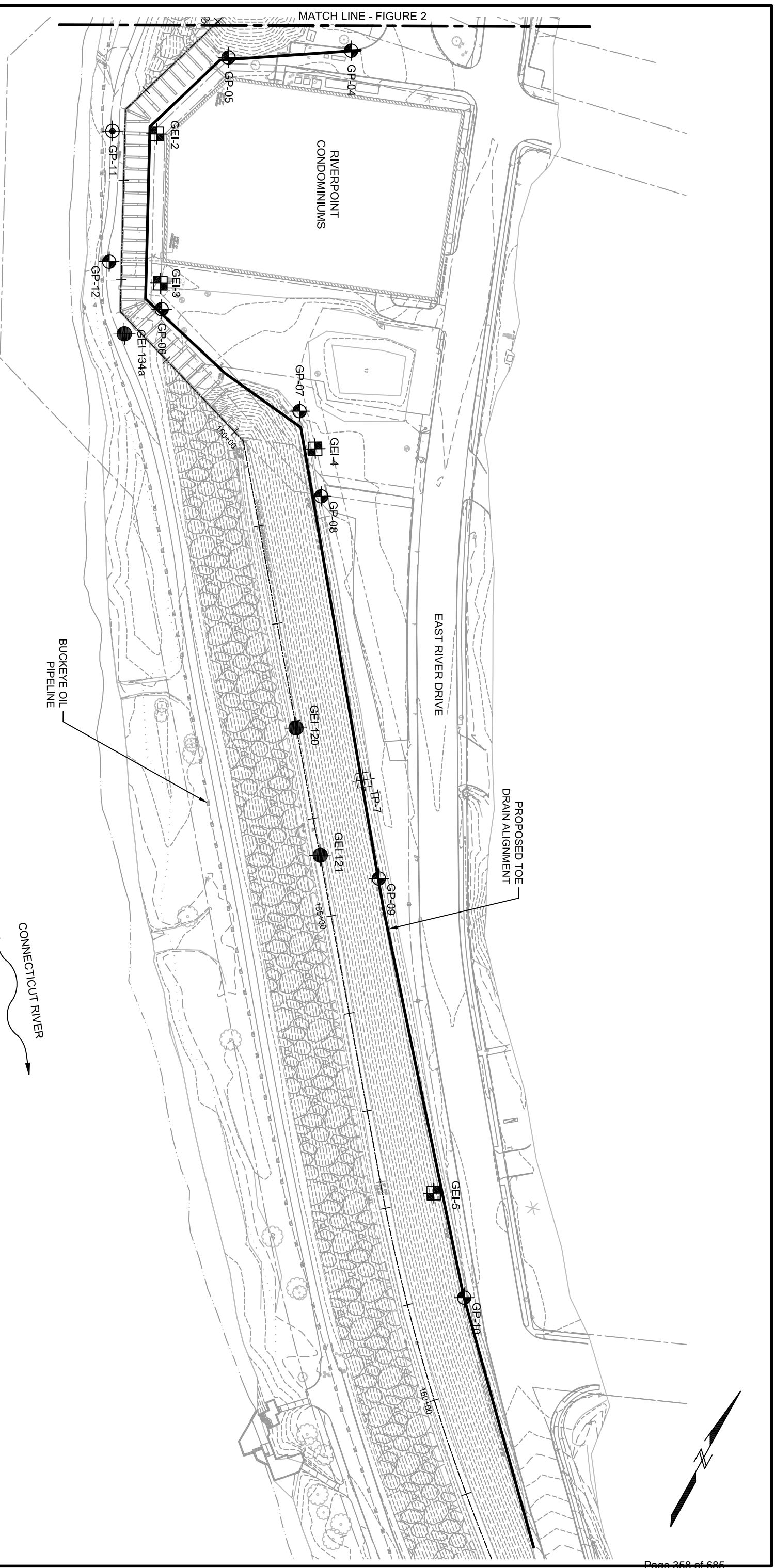
**NOTES:**

1. BASE MAP PREPARED BY BSC GROUP INC. (JULY 2012).
2. LOCATIONS OF 2012 TEST PITS AND 2013 BORINGS ARE APPROXIMATE.

 <b>GEI</b> Consultants	<b>EXPLORATION LOCATION PLAN (1 OF 2)</b>
Subsurface Exploration - Toe Drain Phase 1 Design East Hartford Flood Control System East Hartford, Connecticut Town of East Hartford East Hartford, Connecticut	Project 12439-0 March 2013 Fig. 2

M:\DATA\2012\12439 East Hartford Toe Drain Design Phase 1\Drawings\Working Drawings\Fig. 2 and 3 - DRAFT Geoprobe Location Plan





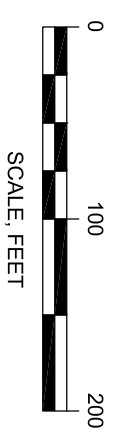
**LEGEND:**

- PROPOSED TOE DRAIN ALIGNMENT
- GP-01 DIRECT PUSH BORING LOCATION (2012)
- GEI 119 EXISTING BORING LOCATION (PRE-2012)
- GEI-01 TEST PIT LOCATION (2012)
- TP-5 EXISTING TEST PIT LOCATION (PRE-2012)

**NOTES:**

1. BASE MAP PREPARED BY BSC GROUP INC. (JULY 2012).
2. LOCATIONS OF 2012 TEST PITS AND 2013 BORINGS ARE APPROXIMATE.

Subsurface Exploration - Toe Drain Phase 1 Design			<b>EXPLORATION</b> LOCATION PLAN (2 OF 2)
East Hartford Flood Control System East Hartford, Connecticut Town of East Hartford East Hartford, Connecticut			
Project 12439-0		March 2013	Fig. 3



# Attachment H: Engineering Documentation

## Part 2: Hydrologic and Hydraulic Consistency Worksheet

### *Inland Water Resources Division Permit Activities*

This worksheet has four sections; only complete the section(s) applicable to the proposed project. Where a question requires a "Yes" or "No" answer, select the appropriate response and explain your response, if required, in the space provided.

**Section I: Floodplain Management** *(if the proposed project involves a structure, obstruction, encroachment or work in a watercourse, floodplain, or coastal high hazard area)*

**Section II: Stormwater Management** *(if the proposed project involves stormwater drainage or stormwater runoff)*

**Sections III: State Grants and Loans** and **Section IV: Disposal of State Land** *(only if the applicant is a state agency seeking flood management certification approval for state grants and loans or disposal of state land)*

#### Contents:

Section I:	Floodplain Management	Page No.
<b>1. General Criteria</b>		
a. Critical Activity .....		3
b. Nonintensive Floodplain Uses .....		3
c. National Flood Insurance Program (NFIP) .....		3
d. Municipal Regulations .....		3
<b>2. Flooding and Flood Hazards</b>		
a. Flooding .....		4
b. Flood Velocities .....		4
c. Flood Storage .....		4
d. Degrading or Aggrading Stream Beds .....		4
e. Ice Jams .....		4
f. Storage of Materials & Equipment .....		5
g. Floodwater Loads .....		5
<b>3. Standards for Structures in Floodplains or Coastal High Hazard Areas</b>		
a. Structures in Coastal High Hazard Areas .....		5
b. Structures in Floodplain Areas .....		6
c. Residential Structures .....		6
d. Non-residential Structures .....		6
e. Utilities .....		6
f. Water Supply Systems .....		6
g. Sanitary Sewage Systems .....		6
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Definitions of terms used in these worksheets are found in Section 25-68b of the Connecticut General Statutes and Section 25-68h-1 of the Regulations of Connecticut State Agencies and in the National Flood Insurance Program Regulations (44 CFR, Chapter 1, Subchapter B, Part 59.1).

**Section I: Floodplain Management**

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## Section I: Floodplain Management

Name of Applicant: **Town of East Hartford**

Name of Proposed Project: **Toe Drain Replacement Phase 1**

### 1. General Criteria

- a. *Critical Activity* - Does the proposed project involve the treatment, storage and disposal of hazardous waste or the siting of hospitals, housing for the elderly, schools or residences, in the 0.2 per cent [500 year] floodplain?     Yes     No

If yes, the base flood for the critical activity shall have a recurrence interval equal to the 500 year flood event; if no, the base flood for the activity shall have a recurrence interval equal to the 100 year flood event.

- b. *Nonintensive Floodplain Uses* - Will the proposed project promote development in floodplains or will utilities servicing the project be located so as to enable floodplain development?

Yes     No

Explain:

- c. *National Flood Insurance Program (NFIP)* - Will the proposed project be located within an area of special flood hazard designated by the Federal Emergency Management Agency (FEMA)?

Yes     No    If yes, list the FEMA flood zone(s):

**Site is not within a Special Flood Hazard Area. Site is located in a "Shaded Zone X" area (other flood areas) under the classification of "Areas protected by levees from 1% annual chance flood".**

Does the proposed project meet the NFIP minimum standards established in 44 CFR, Chapter 1, Subchapter B, Part 60.3, floodplain management criteria for flood-prone areas?

Yes     No

- d. *Municipal Regulations* - Has the municipality in which the proposed project is to be located adopted floodplain regulations containing requirements that are more restrictive than the NFIP floodplain management criteria for flood-prone areas?     Yes     No

If yes, describe the more restrictive requirements:

Does the proposed project comply with the more restrictive standards of the municipality?

Yes     No

## Section I: Floodplain Management (continued)

### 2. Flooding and Flood Hazards

- a. *Flooding* - Will the proposed project pose any hazard to human life, health or property in the event of a base flood?  Yes  No

If yes, explain:

- b. *Flood Velocities* - Will the proposed project cause an increase in flow velocity or depth during the base flood discharge?  Yes  No

If yes, the increase in velocity is:            fps  
and/or the increase in depth is:            ft.

Will such increase in velocity or depth cause channel erosion or pose any hazard to human life, health or property?  Yes  No

Explain:

- c. *Flood Storage* - Will the proposed project affect the flood storage capacity or flood control value of the floodplain?  Yes  No

If yes, describe the effects:

- d. *Degrading or Aggrading Stream Beds* - Is the streambed currently degrading or aggrading?

Degrading                       Aggrading                       Neither

Has the project design addressed degrading or aggrading streambed conditions?

Yes             No

- e. *Ice Jams* - Is the watercourse prone to ice jams or floods due to ice?  Yes  No

Has the project design considered ice jams or floods due to ice?  Yes  No

## Section I: Floodplain Management (continued)

- f. *Storage of Materials & Equipment* - Will the construction or use of the proposed project involve the storage of materials below the 500 year flood elevation that are buoyant, hazardous, flammable, explosive, soluble, expansive or radioactive, or the storage of any other materials which could be injurious to human, animal or plant life in the event of a flood?

Yes       No

If yes, describe the materials and how such materials will be protected from flood damage, secured or removed from the floodplain to prevent pollution and hazards to life and property.

Storage of materials that could be injurious to human health or the environment in the event of flooding is prohibited below the elevation of the 500 year flood. Other material or equipment may be stored below the 500 year flood elevation provided that such material or equipment is not subject to major damage by floods, and provided that such material or equipment is firmly anchored, restrained or enclosed to prevent it from floating away or that such material or equipment can be removed prior to flooding.

- g. *Floodwater Loads* - Will structures, facilities and stored materials be anchored or otherwise designed to prevent floatation, collapse, or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy?       Yes       No

### 3. Standards for Structures in Floodplains or Coastal High Hazard Areas

Does the proposed project involve a new or substantially improved structure or facility located within a floodplain or coastal high hazard area?       Yes       No

If yes, complete this subsection; if no, skip to subsection 4 (***Topography Changes within Floodplain***).

- a. *Structures in Coastal High Hazard Areas* - Will the structure or facility be located within an NFIP coastal high hazard area?       Yes       No

If no, skip to paragraph 3(b); if yes:

1. Will the structure or facility be located landward of the reach of mean high tide?

Yes       No

2. Will a new structure or facility be located on an undeveloped coastal barrier beach designated by FEMA?       Yes       No

3. If the structure or facility is/will be located within a coastal high hazard area, the structure or facility must be elevated on pilings or columns so that the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to at least one foot above the base flood level and the pile or column foundation and structure attached thereto must be anchored to resist floatation, collapse and lateral movement due to the effects of wind, velocity waters, hurricane wave wash, and base flood water loads acting simultaneously on all building components.

Does the proposed structure or facility meet these standards?       Yes       No

The base flood elevation is:      ft.      (Datum:      )

The elevation of the lowest horizontal structural member is:      ft.      (Datum:      )

## Section I: Floodplain Management (continued)

4. Will the space below the lowest floor be either free of obstruction or constructed with non-supporting breakaway walls?  Yes  No

5. Will fill be used for structural support of any buildings within coastal high hazard areas?  
 Yes  No

b. *Structures in Floodplain Areas* - Are the structures residential or nonresidential?

Residential  Nonresidential If *nonresidential*, skip to paragraph 3(d) below.

c. *Residential Structures* - If the structure or facility is for human habitation will the lowest floor of such structure or facility, including its basement, be elevated one foot above the level of the 500 year flood?

Yes  No

The 500 year flood elevation is:           ft.           (Datum:        )

The elevation of the lowest floor, including basement, is:           ft.           (Datum:        )

d. *Non-residential Structures* - If the structure or facility is not intended for residential uses, will the lowest floor of such structure or facility, including its basement, be elevated to or above the 100 year flood height or be floodproofed to that height, or in the case of a critical activity, the 500 year flood height?

Yes  No

If yes, the structure will be:  Elevated  Floodproofed

The base flood elevation is:           ft.           (Datum:        )

The elevation of the lowest floor, including basement, is:           ft.           (Datum:        )

The structure is floodproofed to:           ft.           (Datum:        )

Note: for insurance purposes nonresidential structures must be floodproofed to at least one foot above the base flood elevation. DEP strongly encourages that the height of floodproofing incorporate one foot of freeboard.

e. *Utilities* - Will service facilities such as electrical, heating, ventilation, plumbing, and air conditioning equipment be constructed at or above the elevation of the base flood or floodproofed with a passive system?  Yes  No

f. *Water Supply Systems* - Does the proposed project include a new or replacement water supply system?  
 Yes  No

If yes, is the water supply system designed to prevent floodwaters from entering and contaminating the system during the base flood?  Yes  No

g. *Sanitary Sewage Systems* - Does the proposed project include a new or replacement sanitary sewage or collection system?  Yes  No

If yes, is the sanitary sewage system designed to minimize or eliminate the infiltration of flood waters into the systems and discharges from the systems into flood waters during the base flood?

Yes  No

h. *Foundation Drains* - Are foundation drains of buildings designed to prevent backflow from the 100 year frequency flood into the building?

Yes  No  No foundation drains

## Section I: Floodplain Management (continued)

### 4. Activity within Floodplain

Does the proposed project involve activity in a floodplain including but not limited to filling, dumping, construction, excavating, or grading?

Yes     No    If no, skip to subsection 5 (**Alterations of Watercourses**).

If yes, does the proposed project include encroachments, including fill, new construction, substantial improvements, or other development within a NFIP adopted regulatory floodway?

Yes     No    If yes, skip to paragraph 4(b) below.

- a. *No Regulatory Floodway* - The NFIP requires that until a regulatory floodway is designated, that no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point. (If no regulatory floodway has been adopted, project impacts may be evaluated by considering an equivalent conveyance loss on the opposite side of the river from the proposed project.)

Is the proposed project consistent with this requirement?     Yes     No

- b. *Floodway Encroachments* - Will the proposed encroachment into the floodway result in any increase in flood levels during either the 100 year or 10 year discharges?

100 year:     Yes; the increase is:    (in 1/100ths of a foot)     No

If yes, has the applicant received approval of such increase in accordance with 44 CFR, Chapter 1, Subchapter B, Part 65.12?     Yes     No

10 year:     Yes; the increase is:    (in 1/100ths of a foot)     No

- c. *Coastal Areas* - Flood hazard potential in coastal areas shall be evaluated considering surface profiles of the combined occurrence of tides, storm surges, and peak runoff. The starting water surface elevation for the base flood in watersheds with time of concentrations of over 6 hours shall be the 10 year frequency tidal surge level.

If the proposed project is in a coastal area, have the hydraulic analyses incorporated these criteria?

Yes     No     Not in Coastal Area

### 5. Alterations of Watercourses

Does the proposed project include the construction or alteration to a natural perennial watercourse or man-made channel?

Yes     No    If no, skip to subsection 6 (**Culverts and Bridges**); if yes, complete the following subsection:

- a. *Topography Change* - Is the watercourse or channel located within a regulatory floodway or Zone A1-30 or AE as designated by the NFIP?     Yes     No

- b. *Hydraulic Capacity* - Does the channel have a minimum flow capacity of a flood equal to at least the 25 year frequency flood?     Yes     No

The channel capacity is designed for the: **500+** year flood.

Does the channel have an inner channel with a capacity of a 2 year frequency flood?     Yes     No



## Section I: Floodplain Management (continued)

- c. *Aquatic Habitat* - Channel alterations should be designed to create aquatic habitats suitable for fisheries, including suitable habitat for maintaining fish populations and to enable fish passage, and to maintain or improve water quality, aesthetics, and recreation.

Has the applicant had any pre-application meetings or correspondence with DEP Fisheries?

Yes       No

Check each of the following criteria that have been incorporated into the project design:

- 1. artificial channel linings have been avoided;
- 2. the channel will encourage ecological productivity and diversity;
- 3. the channel and its banks will be compatible with their surroundings;
- 4. the channel will vary in its width, depth, invert elevations, and side slopes to provide diverse aquatic habitat;
- 5. straightening existing channels and thereby decreasing their length has been avoided;
- 6. the channel will not create barriers to upstream and downstream fish passage;
- 7. the channel will contain pools and riffles and a low flow channel to concentrate seasonal low water flows;
- 8. the channel will contain flow deflectors, boulders and low check dams to enhance aquatic habitat;
- 9. stream bank vegetation will be preserved where feasible and disturbed stream bank areas will be replanted with suitable vegetation;
- 10. clean natural stream bed materials of a suitable size will be incorporated in the new channel; and
- 11. construction of the proposed project will be scheduled to minimize conflicts with spawning, stocking, and recreational fishing seasons.

Describe how the above aquatic habitat design criteria have been incorporated into the project design:

**The toe drain improvements are on the land side of the levee and will not be in contact with any open water bodies.**

## Section I: Floodplain Management (continued)

### 6. Culverts and Bridges

Does the proposed project involve the repair or new construction of a culvert or bridge?

Yes     No    If no, go to subsection 7 (**Temporary Hydraulic Facilities**).

If yes, complete this subsection:

- a. *Fish Passage* - Does the culvert design allow for the passage of fish?     Yes     No

If yes, describe the specific design provisions for fish passage:

- b. *Depressed Structural Floors* - Is the rigid structural floor of the culvert or bridge depressed below the normal stream bed to allow a natural stream bed to form over the floor?

Yes     No     No rigid structural floor

- c. *Multiple Openings* - The use of a single large culvert or bridge opening is preferred over the use of multiple small openings. Has the design minimized the use of multiple small openings?

Yes     No

If no, explain:

- d. *Sag Vertical Curves* - Does the design utilize solid parapet walls in the sag part of a vertical curve?

Yes     No     Not located in a sag vertical curve

- e. *Debris Blockage* - Is the culvert or bridge prone to blockage by debris?     Yes     No

If yes, has the project design incorporated measures to minimize the potential for debris blockage?

Yes     No

- f. *Topography Change* - Is the culvert or bridge located within a regulatory floodway or Zone A1-30 or AE as designated by the NFIP?     Yes     No

**Section I: Floodplain Management (continued)**

g. *State Highways* - Does the watercourse pass under a state roadway?

- Yes     No    If no, skip to paragraph 6(g)(2).

If yes, culverts and bridges for state highways shall be designed in accordance with the Connecticut Department of Transportation (DOT) Drainage Manual and all applicants should refer to it for specific design criteria. In general, however, the Drainage Manual requires the following:

(Place a check mark for all applicable criteria utilized)

- Minor Structures* - Minor structures have a drainage area of less than one square mile in which there is no established watercourse. They shall be designed to pass the 25 year frequency discharge.
- Small Structures* - Small structures have a drainage area of less than one square mile in which there is an established watercourse. They shall be designed to pass the 50 year frequency discharge.
- Intermediate Structures* - Intermediate structures have a drainage area greater than one square mile and less than 10 square miles. They shall be designed to pass the 100 year frequency discharge with reasonable underclearance.
- Large Structures* - Large structures have a drainage area greater than 10 square miles and less than 1000 square miles. They shall be designed to pass the 100 year frequency discharge with an underclearance not less than two feet.
- Monumental Structures* - Monumental structures have a drainage area greater than 1000 square miles. They shall be designed to meet the requirements of the Connecticut Department of Environmental Protection, U.S. Army Corps of Engineers, and the U.S. Coast Guard.
- Tidal Structures* - Tidal structures are subject to tidal action and shall be classified as minor, small, intermediate, etc. depending on their drainage area. These structures shall be designed in accordance with the previously listed *classifications*. However if the highway is subject to frequent tidal flooding, the design storm may be made consistent with the frequency of flooding by tidal action. The proposed culvert or bridge is classified as:
  - Tidal, minor
  - Tidal, small
  - Tidal, intermediate
  - Tidal, large
  - Tidal, monumental

1. Has the structure been designed in accordance with the criteria established in the DOT Drainage Manual?     Yes     No

If no, describe the lower design standards and the reasons for not complying with the DOT Drainage Manual:

**Section I: Floodplain Management (continued)**

2. Will the proposed culvert or bridge increase upstream water surface elevations in the event of a base flood above that which would have been obtained in the natural channel if the highway embankment were not constructed?  Yes  No

If yes, is the increase in elevation more than one foot? Describe:

3. Will the proposed culvert or bridge be designed so that flooding during the design discharge does not endanger the roadway or cause damage to upstream developed property? (NOTE: The design discharge for culverts and bridges on state highways should be that which was determined by FEMA. If the applicant judges that the FEMA discharge is inappropriate, the project should be analyzed for both the applicant's computed flow and the FEMA discharge. The project, however, must still meet the standards of the NFIP.)  Yes  No

Explain:

- h. *Local Roads & Driveways* - Local roads (not state highways) and driveways may be designed for flood frequencies and underclearances less stringent than those specified in the DOT Drainage Manual when (check all that have been incorporated into the project design):

- 1. the road is at or close to the floodplain grade
- 2. water surface elevations are not increased by more than one foot nor cause damage to upstream properties
- 3. provisions are made to barricade the road when overtopped
- 4. the road or driveway is posted as being subject to flooding
- 5. the road or driveway has low traffic volume
- 6. alternate routes are available

The culvert or bridge has been designed to pass the: \_\_\_\_\_ year frequency discharge with an underclearance of: \_\_\_\_\_ feet.

Utilizing the DOT Drainage Manual classifications listed under paragraph 6(g) above, the culvert or bridge is classified as a: \_\_\_\_\_ structure.

**Section I: Floodplain Management (continued)**

h. If the culvert or bridge is designed to standards lower than which is stipulated in the DOT Drainage Manual, list such standards and the reasons for the lower design standards:

i. *Downstream Peak Flows* - Will the proposed culvert or bridge increase downstream peak flows by decreasing existing headwater depths during flooding events?  Yes  No

If yes, describe the selected design criteria and the impacts to downstream properties:

**7. Temporary Hydraulic Facilities**

Temporary hydraulic facilities include all channels, culverts or bridges which are required for haul roads, channel relocations, culvert installations, bridge construction, temporary roads, or detours. They are to be designed with the same care which is used for the primary facility.

If the proposed activity involves a temporary hydraulic facility(s), has such facility been designed in accordance with Chapter 6, Appendix F, "Temporary Hydraulic Facilities," of the DOT Drainage Manual?

Yes  No  No temporary hydraulic facilities

If yes, the design flood frequency is the: \_\_\_\_\_ year flood.

Describe the temporary facilities:

## Section II: Stormwater Management

Name of Applicant:

Name of Proposed Project:

### 1. *Stormwater Runoff*

The proposed project will (check all that apply):

- Increase the area of impervious surfaces
- Increase runoff coefficients
- Alter existing drainage patterns
- Alter time of concentrations
- Change the timing of runoff in relation to adjacent watersheds

Will the proposed project impact downstream areas by increasing peak flow rates, the timing of runoff, or the volume of runoff?     Yes     No

If yes, describe the downstream impacts for the 2, 10 and 100 year frequency discharges:

The pre and post development peak flow rates at the downstream design point are as follows:

Return Frequency (Year)	Peak Discharges (CFS)	
	Pre-Development	Post-Development
<b>2</b>		
<b>10</b>		
<b>100</b>		

The above peak discharges were computed utilizing the: \_\_\_\_\_ hour duration storm. This duration storm was selected because:

**Section II: Stormwater Management (continued)**

Describe the location of the design point and why this location was chosen:

**2. Stormwater Detention Facilities**

Does the proposed project include the construction of any stormwater detention facilities?

Yes       No      If no, skip to subsection 3 (**Storm Drainage Systems**).

If yes, has the DEP determined whether a dam construction permit is required?     Yes     No

The pre and post development peak flow rates at the downstream design point are as follows:

Return Frequency (Year)	Peak Discharges (CFS)		
	Pre-Development	Post-Development (without detention)	Post-Development (with detention)
<b>2</b>			
<b>10</b>			
<b>100</b>			

The above peak discharges were computed utilizing the: \_\_\_\_\_ hour duration storm. This duration storm was selected because:

Describe the location of the design point and why this location was chosen:

## Section II: Stormwater Management (continued)

If the proposed project increases peak flow rates for the 2, 10 or 100 year frequency discharges, describe the impacts to downstream areas:

Will the detention facility aggravate erosion along the downstream channel?  Yes  No

In certain situations, detention of stormwater aggravates downstream flooding. This occurs when the discharge from a subwatershed is delayed by a detention facility so that it adds to the peak discharge from another subwatershed. Adding the hydrographs of the two subwatersheds results in a higher peak discharge over that which would occur if detention were not present.

Is the location of the detention facility within the watershed suitable for detention?  Yes  No

Explain:

### 3. Storm Drainage Systems

Does the proposed project include the construction of subsurface storm drainage systems?

Yes  No If no, you have completed Section II of the worksheets.

If yes, complete this subsection:

- a. *DOT Standards* - Is the proposed storm drainage system designed in accordance with the Connecticut Department of Transportation's (DOT) Drainage Manual?  Yes  No

If no, describe the lower design standards and the reasons for not complying with the Drainage Manual:

- b. *Design Storm* - Is the storm drainage system designed for a ten year frequency storm without closing the use of the facility?  Yes  No

- c. *Future Development* - Has the design of the system considered future development of adjacent properties?  Yes  No



## Section II: Stormwater Management (continued)

- d. *Outlet Protection* - Have the outlets from the system been designed to minimize the potential for downstream erosion?       Yes       No
- e. *Overland Flow* - Has the use of curbing been minimized to encourage overland dispersed flow through stable vegetated areas?       Yes       No
- f. *Vegetated Filter Strips* - Has the design incorporated the use of vegetated filter strips or grass swales to improve the quality of water outletting from the storm drainage system?       Yes       No
- g. *Stormwater Treatment* - Describe features of the stormwater collection system intended to improve the quality of stormwater runoff prior to its discharge to surface waters.

- h. *E & S Control Plan* - Has the design and installation of the storm drainage system been coordinated with the soil erosion and sediment control plan prepared in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control?       Yes       No

Explain:

### Section III: State Grants and Loans

Name of Applicant:

Name of Proposed Project:

1. This Flood Management Certification concerns a:       grant       loan

2. Total amount of grant or loan: \$

3. The recipient of the grant or loan will be:

Name:

Mailing Address:

City/Town:

State:

Zip Code:

Phone:

ext.

Fax:

Recipient Contact person:

Name:

Mailing Address:

City/Town:

State:

Zip Code:

Phone:

ext.

Fax:

4. The recipient will use the grant or loan to (check all that apply):

- construct a structure, obstruction or encroachment or conduct other work within a floodplain or coastal high hazard area.
- construct a facility or develop a site affecting drainage and stormwater runoff.
- conduct a study or prepare a report concerning land use or land use planning affecting a floodplain, drainage or stormwater runoff.

5. If the grant or loan is for a study or report, describe the anticipated effects on floodplains, drainage or stormwater runoff if the recommendations are implemented:

6. Will the proposed project promote development in floodplains or will utilities servicing the project be located so as to enable floodplain development?       Yes       No

Explain:

If the grant or loan is for construction of a structure, obstruction or encroachment or other work within a floodplain, or if it is for construction of a facility or development of a site that will affect drainage and stormwater runoff, Sections I and/or II of this Worksheet must be completed and the engineering report (Attachment H) and plans (Attachment G) must be provided as part of this application.

## Section IV: Disposal of State Land

Name of Applicant:

Name of Proposed Project:

1. The grantee will be:

Name:

Mailing Address:

City/Town:

State:

Zip Code:

Phone:

ext.

Fax:

Contact Person:

Phone:

2. Describe the current state of development and use of the land to be disposed.

3. Why is the agency disposing of the land?

4. Describe the grantee's intended use of the land.

5. Will the disposal of the land promote development in floodplains?  Yes  No

Explain:

6. Will the grantee's use of the land be consistent with the state's flood management statutes and regulations?

Yes  No Explain:

# **Attachment I: Flood Contingency Plan**

**ATTACHMENT I Flood Contingency Plan**

**Town of East Hartford Flood Control System**

**Toe Drain Phase 1 Project**

**Dam Construction Permit Request**

**March 2019**

**1. Flood Preparedness Overview**

This Flood Contingency Plan is provided to protect the Town of East Hartford flood control system from damage, failure, or impairment of its ability to control flooding resulting from activities undertaken to complete this project. It has also been prepared to minimize the potential for construction activities to create additional flood risks within the levee protected area as a result of excavations and other constructions activities that could pose new seepage pathways or potential failure mechanisms.

This Flood Contingency Plan has been created to be in general conformance with the Town of East Hartford Operation and Maintenance (O&M manual) which has been approved by the U.S. Army Corps of Engineers (USACE). Conformance with the O&M manual is considered important so that any potential flood contingency measures undertaken by the CONTRACTOR as part of the Flood Contingency Plan are consistent with the recognized and accepted methods for such actions. The O&M states that “It is critical to establish flood fight plans, conduct training, and stockpile needed materials in order to be prepared for flood fighting activities during high water events. A high level of preparedness will facilitate a timely and more effective flood response with a greater chance of success.” This Flood Contingency Plan is intended to assist in meeting these overall goals.

Based on prior evaluations of the Town of East Hartford Flood Control System, a flood risk exists with respect relates to potential levee under-seepage, which has been recognized by the U.S. Army Corp of Engineers as a typical flood risk. Excavations for this project will be minimal, however the potential for boils or seepage to appear within these excavations is the primary area of concern addressed in this Flood Contingency Plan. The potential for excavations to cause lateral movement at the levee toe is also a concern, however, the excavation support systems and the associated monitoring plans being implemented separately from this Flood Contingency Plan, are expected to minimize this risk.

**2. Toe Drain Replacement Project Requirements General Description**

The Town of East Hartford is undertaking this project as part of its long-term program to upgrade and maintain the integrity of its flood control system that was initiated through the FEMA Levee Accreditation process. The Town has continued with this program to meet ongoing levee safety compliance standards of the U.S Army Corps of Engineers.

This project involves replacement of and improvement to an existing levee toe drain system within

Town of East Hartford Flood Control System  
Toe Drain Phase 1 Project  
Flood Contingency Plan

the Town of East Hartford flood control system between the Bulkeley Bridge (I-84) on the north and extending southerly to the intersection of east River Drive and Hartland Street. The new toe drain will replace approximately 2,500 feet of existing toe drain system essentially within the footprint of existing toe drain system.

The existing Toe Drain for East Hartford Levee system has failed due to deterioration of the internal pipe system and intrusion of fine sediments into the toe drain system. The new Toe Drain system will involve installation of new PVC slotted piping and concrete manholes. The Toe Drains will be in the range of 6 to 10 feet in depth and will be excavated using standard excavating equipment to remove the old piping and backfill. New piping and backfill will be installed predominantly within the existing toe drain trench. Surfaces will be restored in-kind with existing materials, which entirely consist of asphalt pavement, gravel, and mowed grass surfaces.

The work is limited to replacement of an existing Toe Drain system which is on the land side of the East Hartford Earthen Levee and Concrete Floodwall system. All work is landward of the levee centerline. The entire footprint of the proposed Toe Drain replacement is urbanized parking areas, driveways, and roadside areas adjacent to the levee. The on-site and off-site surface conditions will remain the same as a result of this project and thus there are no impacts to report.

### 3. Flood Contingency Plan Overview

This Flood Contingency Plan provides the overall parameters that will be implemented during construction. The selected CONTRACTOR will be required to submit additional details to be included in the final Flood Contingency Plan, and must submit these to the Town for approval. The final Flood Contingency Plan is not considered in effect until the Town has approved the plan. Work tasks that are relevant to Plan shall not commence until the Town of East Hartford has provided written approval of the Plan.

Excavations will be supported using a combination of shoring, trench boxes, and other support methods. Excavations will consist primary of shallow tranches along the landside levee toe. Dewatering may be required during the course of construction to keep the excavation dry. CONTRACTOR will proceed with excavation and any dewatering in accordance with the plans and specifications.

The following Flood Contingency Plan provisions and Plan actions are included to address each requirement in the Plan:

- A. Staff responsible for monitoring the Connecticut River levels, implementing the Flood Contingency Plan, and coordination of agency responses are included in **Appendix A – Project Coordination Contact List**. Staff included in this list will be required to be available personally, or must have a responsible designee, at all times when the project is active and the potential for flood risk is present.
- B. Details and frequency of routine inspections: CONTRACTOR will implement all controls required by the contract. At any time the CT River is at or above flood stage, daily inspections shall be made of the excavation and support systems. Visual inspection of

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excavations on site will be made for unusual boils or seepages into the excavation.

- C. At any time that open excavations exist on site, CONTRACTOR staff will monitor CT River levels using the on-line National Weather Service gage on the Bulkeley Bridge (see below for website link to NWS website). Using this method, CONTRACTOR will have the ability to obtain flood stage data on an advance basis that will allow CONTRACTOR personnel sufficient time to secure the site, implement flood contingency measures, and assist with worker safety issues.
  
- D. Requirements for monitoring during flood stage (Elevation 16, NGVD 29 ) include 24 hours a day, seven day a week where warranted. This includes weekends, nights, and holidays regardless of whether work is being performed at the site. For current Connecticut River elevations, the National Weather Service, Advanced Hydrologic Prediction Service (NOAA), CT River Gage Bulkeley Bridge East Hartford will be used. The website for this information is:

<http://water.weather.gov/ahps2/hydrograph.php?wfo=box&gage=hfdc3>

The monitoring efforts shall follow the following criteria are from the Town’s Flood Control O&M Manual as summarized below:

<b>Table 1 - Town of East Hartford Flood Response Action Levels</b>		
<i>Action Level</i>	<i>Connecticut River stage at Bulkeley Bridge (NGVD29)</i>	<i>Monitoring Effort</i>
Monitoring	All	Monitoring of the river level forecast should be conducted daily
Alert	Forecast indicates potential for river to exceed Action Stage (El. 12 NGVD29)	Planning and preparation for flood fighting activity
Surveillance Level 1	River exceeds Flood Stage (El. 16 NGVD29)	Physical inspection of entire system and reporting once every 24 hours
Surveillance Level 2	River exceeds Moderate Flood Stage (El. 24 NGVD29)	Physical inspection of entire system and reporting once every 8 hours
Surveillance Level 3	River exceeds Major Flood Stage (El. 28 NGVD29)	Physical inspection of entire system and reporting once every 4 hours
Cessation	River drops below flood stage (El. 16 NGVD29) and risk of flood damage has passed	Systematic inspections and summary of repair needs (if any)

**NOTES:**

*Excerpted from Section 9 “Emergency Operation” of the Town’s Flood Control System Operations and Maintenance (O&M) Manual.*

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*Elevations reported in NGVD29, to convert to NAVD88 use the conversion: NGVD29 – 0.88 ft. = NAVD88*

Table 2 is based on the Town’s actions and identifies CONTRACTOR’S flood response action levels and summarizes the activities associated with each level. Exceptions to following actions may be made on case by case basis only upon review of the particular circumstances and express approval from the Town of East Hartford and/or its Engineer.

<b>Table 2 - CONTRACTOR Flood Response Action Levels</b>		
<i>Action Level</i>	<i>Connecticut River stage at Bulkeley Bridge (NGVD29)<sup>2</sup></i>	<i>Actions</i>
Monitoring	At all times when excavation operations are in progress	<p>Monitoring of the river level forecast and weather conditions will be conducted daily and will not rely solely on notices from the East Hartford Emergency Alert System. The following resources will be used to do so, at a minimum:</p> <ul style="list-style-type: none"> <li>– The East Hartford Alert Network:  <a href="http://www.easthartfordct.gov/emergency-management/pages/east-hartford-alert-network">http://www.easthartfordct.gov/emergency-management/pages/east-hartford-alert-network</a></li> <li>– The Connecticut River stage at the Bulkeley Bridge in Hartford is available at:  <a href="http://water.weather.gov/ahps2/hydrograph.php?gage=hf_dc3&amp;wfo=box">http://water.weather.gov/ahps2/hydrograph.php?gage=hf_dc3&amp;wfo=box</a> or  <a href="http://waterdata.usgs.gov/ct/nwis/uv/?site_no=01190070&amp;PARAMeter_cd=00065,00060">http://waterdata.usgs.gov/ct/nwis/uv/?site_no=01190070&amp;PARAMeter_cd=00065,00060</a></li> <li>– The Hockanum River stage near Arbutus Street, East Hartford is available at:  <a href="http://waterdata.usgs.gov/ct/nwis/uv/?site_no=01192500&amp;PARAMeter_cd=00065,00060">http://waterdata.usgs.gov/ct/nwis/uv/?site_no=01192500&amp;PARAMeter_cd=00065,00060</a></li> <li>– The National Weather Service’s daily briefing available at: <a href="http://www.weather.gov/briefing/">http://www.weather.gov/briefing/</a></li> <li>– The US Army Corps of Engineers operates flood control reservoirs in the Connecticut River Basin. Information regarding river stage and storage is available at: <a href="http://www.nae.usace.army.mil/Missions/Reservoir-Control-Center/">http://www.nae.usace.army.mil/Missions/Reservoir-Control-Center/</a></li> </ul>
Alert	Forecast indicates potential for river to exceed Action Stage (El. 12 NGVD29)	Planning and preparation for flood fighting activity
Surveillance Level 1	River exceeds Flood Stage (El. 16 NGVD29)	Physical inspection of construction activities and reporting once every 24 hours
Surveillance Level 2	River exceeds Moderate Flood Stage (El. 24 NGVD29)	Physical inspection of construction activities and reporting once every 8 hours
Surveillance	River exceeds Major Flood Stage (El. 28	Physical inspection of construction activities and reporting



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Level 3	NGVD29)	once every 4 hours
Cessation	River drops below flood stage (El. 16 NGVD29) and risk of flood damage has passed	Systematic inspections and summary of mitigation needs (if any)

**NOTES:**

*Information contained within Section 9 and Appendix D “**Flood Fighting Techniques on Levees**” of the Town’s Flood Control System O&M Manual was used to facilitate the development of Table 2 and this FCP. Included herein as **Attachment B**.*

*Elevations reported in NGVD29, to convert to NAVD88 use the conversion: NGVD29 – 0.88 ft. = NAVD88*

- E. When the river is at flood stage, all monitoring information and reports shall be submitted on a daily basis.
  
- F. Training will be provided for key supervisory personnel who will be overseeing the monitoring, inspection, and patrolling of the excavation sites and adjacent flood control works. Training will include an overview of the plan, designated on-site location of the plan itself, and the Flood Contingency Measures described in this plan.

#### **4. Minimum Flood Mitigation Response Actions**

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Note: Exceptions to following actions may be made on case by case basis only upon review of the particular circumstances and express approval from the Town of East Hartford and/or its Engineer.

##### **Action Stage (El. 12 NGVD29)**

CONTRACTOR will take the following steps when the Connecticut River is in the Action Stage:

- Based on actual and forecasted conditions of river stage and weather, determine what active tasks can be completed before river reaches flood stage and what tasks may need to be delayed;
- Complete work at any open excavations or temporarily back fill excavations and compact them in accordance with the materials and methods detailed in the specifications contained in the construction contract documents.
- Stabilize work areas and begin demobilization of equipment and materials; and
- Coordinate all efforts with Town.

##### **Flood Stage (El. 16 NGVD29)**

CONTRACTOR will take the following steps when the Connecticut River is in the Flood Stage:

- Remove equipment, materials and personnel from the floodplain;
- Demobilization will be coordinated with the Town to ensure that activities don't interfere with the pump station operation and flood fighting efforts;
- Secure any materials that are to remain in floodplain so that that are not displaced by flood waters; and
- Coordinate all efforts with Town.

##### **Moderate Flood Stage (El. 24 NGVD29)**

As the Connecticut River approaches moderate flood stage, CONTRACTOR should have completed the following:

- Install stabilization measures to minimize erosion/scour;
- Securing of all active construction accesses and removal of all materials and equipment from the flood zone;

## **5. Additional Flood Response and Mitigation Actions**

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A. CONTRACTOR will have personnel, equipment, and material available to respond to boils, or seeps, or other early signs of levee compromise that may occur. The following is a listing of the materials and equipment that CONTRACTOR will have available to address flooding issues:

- Track Excavator
- Plate Compactor
- Sand bags (150 empty bags)
- Clean Sand (50 CY) or other granular material including direct buried foundation processed traprock backfill as listed in the construction specifications
- Plastic Sheeting (500 SY)
- Geotextile Fabric (500 SY)
- Concrete Blocks or Barriers (20 ea.)
- Low Permeability Soil meeting the requirement listed in the construction specifications contained in Appendix L of the 408 application (100 CY)

B. If evidence of seepage or other signs of potential flooding problems are evident, CONTRACTOR supervisory staff and Eversource will make a quick determination about the extent of the problem and will proceed with response actions. If there is any evidence of distress to the levee system. CONTRACTOR will promptly proceed with the following action:

- Immediately notify the Town so that they will have the maximum amount of time to evaluate the extent of the problem, mobilize their personnel, and implement their own contingency or flood operation plans. This effort is intended to determine whether the problem noted is due to a possible breach in the levee or an issue within the construction work zone.
- CONTRACTOR must coordinate with the Town concerning immediate mitigation by the CONTRACTOR and /or Town flood fighting activities to be undertaken in response to the potential threat.

Once communication has been established with the Town, and flood response actions have been agreed upon, the CONTRACTOR shall take the following actions in coordination with any Town flood fighting activities undertaken:

- CONTRACTOR shall immediately begin addressing any problem within its work area. CONTRACTOR shall mobilize its forces to address the problem ahead of the Town staff arrival on site. The Town staff shall be consulted and briefed of the situation upon arrival.

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- If needed to assess the extent of the potential flooding problem, CONTRACTOR may engage, or Town may at its discretion require, that the services of a Professional Engineer with expertise and knowledge of the site, excavation supports, and the adjacent flood control system be employed. If utilized, the Engineer will assist CONTRACTOR, Eversource, and Town personnel in diagnosing the problem and implementing the appropriate contingency measures.
- C. If indications of seepage, boils, or other flooding is observed within the affected excavations, all materials and equipment will be anchored or restrained to prevent displacement or flotation, or will be removed from the potentially flooded excavations prior to flooding occurring.
- D. Seeps and Boils can develop rapidly and therefore knowledge and vigilance will be one of CONTRACTOR'S best tools to prevent failure by seepage or boils. Daily active monitoring of site conditions will be an important remedy to minimize seepage or boil problems. Because the type and extent of seepage or boils is somewhat unpredictable, the contingency measure employed will need to be implemented on a case by case basis. The following is a list of typical flood fighting techniques that can be employed to solve seepage problems during the project.
- In the case of very minor seeps that are reasonably believed to result from groundwater infiltration, and not flood induced seepage, it is anticipated that water would be directed to the dewatering pumps for removal from the excavation. Any seep suspected in the judgement of either the CONTRACTOR'S on-site personnel, Town personnel, or the Engineer to be flood induced seepage, shall not be addressed by the dewatering operation as noted above. If flood induced seepage is suspected, then any dewatering efforts shall be ceased and the concern shall be immediately reported as described elsewhere in this plan. Further, the control measures as per the Flood Fighting Techniques described in Attachment B shall be promptly implemented to control the seepage.
  - Boils typically occur in sandy soils that have high seepage gradients. In the event of a boil, CONTRACTOR plans to determine the direction the boil is traveling under the soil layer and excavate to create a relief point with stone and try to pump locally to redirect water to our dewatering system. The CONTRACTOR shall be prepared to construct dikes around the boil as well.
  - CONTRACTOR may shut off the dewatering pumps, if deemed appropriate, which will begin to flood the excavation. This action could be taken in the event of uncontrolled seepage into the excavation or the failure of CONTRACTOR'S excavation support system. The build-up of water in the excavation will help to equalize pressure and suppress seepage. If further suppression is needed, CONTRACTOR will use external sources of water to raise the water level within the excavation until seepage is controlled.

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- CONTRACTOR will have sufficient materials on hand to place sandbag rings around boils or large seeps where needed.
- CONTRACTOR will evaluate and implement, if appropriate, filling portions of the excavation with low permeability earthen materials, and will properly compact to suppress seepage.

**6. Conformance with Town of East Hartford Operations and Maintenance Manual (O&M)**

This Flood Contingency Plan (Plan) incorporates by reference the Town's O&M Manual. CONTRACTOR is also required to be familiar with Flood Fighting Techniques in Appendix D in addition to "industry standard" flood fighting actions that may be utilized by the CONTRACTOR. These methods are to be implemented as needed in the vent that flooding conditions are present. Appendix D to the Town's O&M Manual is attached to this Flood Contingency Plan.

## **Project Coordination Contact List**

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### **East Hartford**

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Email: [pforrest@easthartfordct.gov](mailto:pforrest@easthartfordct.gov)

Ron Arpin, Highway Services Supervisor

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Captain Brian Jenness, Emergency Management Coordinator

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### **Metropolitan District Commission (MDC)**

NAME, Title: 24 Hour Emergency Command Center

Phone: (860) 513-3388

**CONTRACTOR:** \_\_\_\_\_ **TBD** \_\_\_\_\_

Project Manager, Title

Office phone:

Cell phone:

Email:

**CONTRACTOR:** \_\_\_\_\_ **TBD** \_\_\_\_\_

Site Foreman, Title

Office phone:

Cell phone:

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Email:

24-hour contact number:

**Project SubCONTRACTOR**

# 1 TBD

Role on project

Supervisor, Title

Office phone:

Cell phone:

Email:

**Project SubCONTRACTOR**

#2 TBD

Role on project:

Supervisor, Title:

Office phone:

Cell phone:

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**Engineering and Construction Monitoring Firm**

GEI Consultants, Inc.

Project Manager: John McGrane, PE

Office phone: 860-368-5426

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## Appendix D

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### Flood Fighting Techniques



# APPENDIX D: Flood Fighting Techniques on Levees

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# 1. Introduction

If a well-constructed levee of correct cross section is properly maintained and is not overtopped, it should hold throughout any major flood event. However, the levee is still in potential danger whenever there is water against it. The danger increases with the height of water, the duration of the flood stage, the intensity of the current, and the wave action against the levee face. There are three primary factors that lead to levee failures.

1. Overtopping
2. Seepage problems such as sandboils or slides
3. Erosion from the current or waves

Potential levee failures may be prevented if prompt action is taken and proper methods of treatment are employed. This appendix describes some of the general actions that should be taken to raise the crown of a levee or to respond to sandboils, seepage problems, or wave wash if these problems are identified during a patrol. The methods described have been developed from many years of experience in dealing with problems that arise as a result of high water, and should be followed as closely as possible. (The intent of this isn't to destroy personal initiative when dealing with unusual emergencies. On the contrary, if a dangerous situation occurs along a levee line, immediate action is demanded using the materials and labor at hand. However, an emergency is not a time in which to experiment, and these proven methods should be employed wherever possible.) Conditions and problems may arise which are not adequately covered by the suggestions provided or if there's any doubt as to the proper procedure that should be taken, the local U.S. Army Corps of Engineers district Emergency Management Office should immediately be consulted for advice and assistance.

## 2. Overtopping

A levee is overtopped when water flows over the levee crown. Low reaches in the levee crown must be identified as early as possible and raised to a uniform level. If the stream is predicted to approach or exceed the height of the existing levee, immediate attention should be given to raising the levee crown.

On the other hand, if the stream is likely to crest many feet beyond the elevation of the levee, the best approach may be to simply allow the levee to overtop, so that flood fight efforts can be redirected to other areas. If this is the case, low reaches in the levee crown need to be raised, leveled or otherwise prepared so that it overtops uniformly, to keep the damage to a minimum. Ideally, the levee should be allowed to overtop uniformly along the downstream portion of the system, so the protected area is "backfilled" with flood water. If the levee is breached due to the overtopping along the downstream portion of the FCW, it prevents the full force of the river's current from flowing into the protected area. An upstream breach will allow the river current to bring in much more debris (for example, entire trees), and would possibly cause much more scouring damage to the protected area than a downstream overtopping breach. It's very important that you contact the Corps district office when faced with decisions relating to the overtopping of a levee, as the Corps has a great deal of experience with flood fighting and can provide technical assistance and guidance as needed.

Generally, emergency barriers are constructed 2 feet above the current predicted river crest. For example, if the river is predicted to rise 1 1/2 feet beyond the elevation of the levee, then a 3 1/2 foot capping would be necessary in order to maintain two feet of freeboard as a factor of safety. If the crest prediction increases during construction, additional height must be added.

### 2.1 Options for Raising a Levee

There are a number of ways that the levee crown can be raised. Provided the work is done well in advance of the high water, in areas where there is sufficient space for construction and with the proper equipment, the most efficient means of raising low stretches of the levee is to scarify the surface, haul in fill material and compact it in place, as discussed in section 2.2, below. However, this is not always possible. No heavy equipment should be used on a levee when water is near the top, as the vibration may cause a failure. In no case should such equipment be allowed on an earthen levee after the levee has commenced to seep. For these reasons, raising the elevation with compacted earthen fill may not be an option. The levee crown may alternately be raised with a sandbag capping or with flashboard structures. Jersey barriers have also successfully been converted into floodwalls during emergency situations.

Additionally, there are a large number of contemporary technologies that may be used to raise an emergency levee; including bladders, structurally supported membranes, and lightweight shells that are filled with sand from a bucket loader. The Corps' Engineer Research and Development Center has recently completed a rigorous and impartial study on several of these flood fight technologies. You are encouraged to visit <http://chl.erd.c.usace.army.mil/ffs> for details on the tests and products, since this site will have the Corps' most current information on the subject, and the website will be updated as additional products are tested.

With so many options available for raising a flood barrier, there are several things you should consider as you decide how to best protect your community:

**a. Cost of materials and labor**

The materials for sandbag construction are generally much less expensive than the alternatives. Sandbag construction is very labor intensive, but at the same time, volunteer labor is often readily available during high water.

**b. Available time**

Flashboards or contemporary options are better suited to conditions when there is little time available for the construction, because they typically require less labor and can be put in place much faster than sandbag levees.

**c. Allowable seepage**

Most construction methods will allow some degree of seepage through the structure. As is the case with sandbags, modifications may be made to the basic designs so that the seepage is reduced, but these modifications usually take additional time to construct.

**d. Suitability for construction in the given area**

Sandbags are extremely versatile and sandbag structures can be constructed almost anywhere. Sandbags can be used to close small roads or to fill gaps, or can be built into long stretches of levees if there is adequate time and manpower. Flashboards and newer technologies are generally not as versatile, but depending on the technology and the construction, they are typically well suited for raising the elevation over longer stretches.

**e. Equipment requirements**

Sandbag structures can be built without heavy machinery, which may be required for some other options. There are a number of situations where it's not possible to use even light earthmoving machinery. For example, there might not be enough space for the machinery, or the foundations might be too unstable. Also, individual landowners may object to the use of machinery over their properties.

**f. Necessary elevation**

Though sandbag levees are best suited for elevations of 3 feet or less, they have successfully been used to raise elevations by 20 feet or more in extreme flooding situations. Flashboards are typically only built to a maximum of 3 feet, and the elevation provided by other technologies varies. In deciding between the various options, it's important to consider how reliably they can forecast the crest height of the river. If the river stage might rise several feet beyond what is currently predicted, a sandbag levee could be raised higher, while it would be much more difficult to raise something like a flashboard or Jersey barrier structure.

**g. Disposal**

Burlap sandbags are biodegradable and relatively easy to remove and dispose of. Other options typically take much longer to remove and create more waste. Some are reusable.

Situations may arise when one of the more contemporary products may be readily available and appropriate for the given conditions, when there would be insufficient workers available to protect the area with sandbags or when time was extremely limited; and in these situations the cost of using these products may be justified. While it would be prohibitively expensive for the Corps to stockpile enough inventories to adequately address all problems that might be faced across the country, the Corps may purchase such items and make them available for public sponsors if conditions warrant. However, in the majority of situations, sandbags are almost always preferred and recommended during flood fights when construction with earthen fill is not possible. The following sections provide specific guidance on raising levees using earthen fill, sandbags, and flashboards.

**2.2 Raising a Levee with Earthen Fill**

**a. Borrow Area and Haul Road**

Borrow material can become a critical item of supply in some areas due to long haul, project isolation, or for other reasons. The two prime requisites for a borrow area are that adequate material be available and that the site be accessible at all times. The quantity estimate plus an additional 50 percent should provide the basis for the area requirement, in order to provide suitable materials for levee construction as covered below. The area must be located so that it will not become isolated from the project by high water. Local contractors and local officials are the best source of information on available borrow areas. In undeveloped areas, the area should be cleared of brush, trees, and debris, with topsoil and humus being stripped. In early spring, it will probably be necessary to rip the area to remove frozen material. An effort should be made to borrow from the area in such a manner that the area will be relatively smooth and free draining when the operation is complete. The haul road may be an existing road or street, or it may have to be constructed. To mitigate damages, it is highly desirable to use unpaved trails and roads, or to construct a road if the haul distance is short. In any case, the road should be maintained to avoid unnecessary traffic delays. The use of flagmen and warning signs is mandatory at major crossings, such as highways, near schools, and at major pedestrian crossings. It may become necessary to stockpile material near anticipated trouble areas.

**b. Equipment**

One of the important considerations in earthwork construction is the selection of proper equipment to do the work. Under emergency conditions, obtaining normally specified earthwork equipment will be difficult and the work will generally be done with locally available equipment. It may be wise to call for technical assistance in the early contract stage to ensure that proper and efficient equipment use is proposed. If possible, compaction equipment should be used in flood barrier construction. This may

involve sheepsfoot, rubber-tired, or vibratory rollers. Scrapers should be used for hauling when possible because of speed (on short haul) and large capacity. Truck haul, however, has been the most widely used. A ripper is almost essential for opening borrow areas in the early spring. A bulldozer of some size is mandatory on the job to help spread dumped fill and provide some compaction.

**c. Foundation preparation**

One of the primary differences in the construction of emergency levees and the construction of permanent levees lies in the preparation of the foundation. Prior to any embankment construction, it's very important that the foundation is prepared, particularly if the levee is to be left in place. For emergency construction during spring flooding, the first item of work will probably be snow removal. The snow should be pushed riverward so as to decrease ponding when it melts. Any trees that might be present should be cut and the stumps removed. If at all possible, any obstructions above the ground (brush or similar debris) should be removed. The foundation should then be stripped of topsoil and surface humus. (Clearing and grubbing, structure removal and stripping should be performed only if time permits.) Stripping may be impossible if the ground is frozen, and in this case, the foundation should be ripped or scarified, if possible, to provide a tough surface for the material to bond to. Every effort should be made to remove all ice or soil containing ice lenses. Frost or frozen ground can give a false sense of security in the early stages of a flood fight. It can act as a rigid boundary and support the levee, but when it thaws, the soil strength may be reduced sufficiently for cracking or the development of slides. The ice also forms an impervious barrier to prevent seepage. This may result in a considerable build-up in pressure under the soils landward of the levee and, upon thawing, pressure may be sufficient to cause sudden blowouts. If this condition exists, it must be monitored, and one must be prepared to act quickly if sliding or boiling starts. If stripping is possible, the material should be pushed landward and riverward of the toe of levee and windrowed. After the flood, this material can be spread on the slopes to provide topsoil for vegetation.

**d. Materials**

Earth fill materials for emergency levees will come from local borrow areas. An attempt should be made to utilize materials which are compatible with the foundation materials as explained below. However, due to time limitation, any local materials may be used if reasonable construction procedures are followed. The materials should not contain large frozen pieces of earth.

**i. Clay**

Clay is preferred because the section can be made smaller (steeper side slopes). Also, clay is relatively impervious, and has relatively high resistance to erosion when it's compacted. A disadvantage in using clay is that adequate compaction is difficult to obtain without proper equipment. Additionally, the water content in impervious fill can impact the compaction needs. Efforts are typically made at the borrow site to obtain material with the optimal moisture; otherwise, if that is not

possible, more time may be required for compaction. Another disadvantage is that the clay may be wet and sub-freezing temperatures may cause the material to freeze in the borrow pit and in the hauling equipment. Weather could cause delays and should definitely be considered in the overall construction effort.

**ii. Sand**

If sand is used, the section should comply as closely as possible with recommendations in the paragraph titled Levee Section, below. Flat slopes are important, as steep slopes without poly coverage will cause seepage through the levee to outcrop high on the landward slope, and may cause the slope to slump.

**iii. Silt**

Material that is primarily silt should be avoided, and if it is used, poly facing must be applied to the river slope. Silt, upon wetting, tends to collapse under its own weight and is very susceptible to erosion.

**e. Levee Section**

In standard levees, the foundation soils and available construction materials generally dictate the design configuration of the levee. Therefore, even under emergency conditions, an attempt should be made to make the embankment compatible with the foundation. Information on foundation soils may be available from local officials or engineers, and it should be utilized. The three foundation conditions and the levee sections cited below are classical and idealized, and usual field conditions depart from them to various degrees. However, they should be used as a guide so that possible serious flood fight problems might be lessened during high water. In determining the top width of any type of section, consideration should be given as to whether a revised forecast will require additional fill to be placed. A top width adequate for construction equipment will facilitate raising the levee. Finally, actual levee construction will in cases, depend on time, materials, and right-of-way available.

**i. Sand Foundation**

If the foundation material under the emergency levee is sand or some other pervious material, the following guidance is provided:

- If the levee section is to be made of sand, use a minimum of 1V (Vertical) on 3H (Horizontal) river slopes. A 1V on 4H river slope is preferable, and will be less susceptible to erosion, but a 1V on 3H slope is considered an adequate minimum for emergency purposes. Use 1V on 5H for the landward slope, and 10-foot top width.
- If the levee section is to be made of clay, use 1V on 2 1/2 H for both slopes. 1V on 3H slopes are preferable, but 1V on 1 1/2 H is an acceptable minimum for emergency purposes. The bottom width should comply with creep ratio criteria; i.e., L (across bottom) should be equal to C x H; where C=9 for fine gravel and 15 for fine sand in the foundation, and H is levee height.

This criteria can be met by using berms either landward or riverward of the levee. Berm thickness should be 3 feet or greater. Berms are used mainly to control or to relieve uplift pressures and will not reduce seepage significantly.

## **ii. Clay Foundation**

If the foundation material under the emergency levee is clay, the following guidance is provided:

- If the levee section is to be made of sand, it should be constructed with 1V on 3H for the river slope. Again, a 1V on 4H is preferable, but the steeper slope is considered adequate for emergency purposes. Use 1V on 5H for the landward slope, and a 10-foot top width, as described in the previous section.
- If the levee section is to be made of clay, use 1V on 2 1/2 H for both slopes. 1V on 3H slopes are preferable for clay levees, but 1V on 1 1/2 H is an acceptable minimum for emergency purposes. With a clay foundation, there is no need to construct additional berms.

## **iii. Clay Layer over a Sand Foundation**

If the foundation material is such that there is an impervious clay layer resting over a pervious sand layer, the following guidance is provided:

- If the levee section is to be made of sand, use a minimum of 1V (Vertical) on 3H (Horizontal) river slopes for emergency purposes. A 1V on 4H slope is preferable, if this construction is possible. 1V on 5H landward slope, and 10-foot top width. In addition, a landside berm of sufficient thickness may be necessary to prevent rupture of the clay layer. The berm may be constructed of sand, gravel, or clay, but since berms made of clay generally need to be wider and thicker than those made of pervious materials, it would probably reduce the construction effort to build the berm with sand or gravel, if these materials were available. Standard design of berms requires considerable information and detailed analysis of soil conditions. However, prior technical assistance may reduce berm construction requirements in any emergency situation.
- If the levee section is to be made of clay, use 1 V on 2 1/2 H for both slopes. Again, 1V on 3H slopes are preferable, but 1V on 1 1/2 H is an acceptable minimum for emergency purposes. Additionally, a berm may be necessary to prevent rupture of the impervious top stratum.

## **f. Placement**

Layers should be started out to the full width of the embankment base, and subsequent lifts shall be placed so that the tops are substantially horizontal. In general, the levee



section should be homogeneous. However, when materials of varying permeability are encountered in the borrow area, the more pervious material should be placed on the landside of the embankment.

**g. Compaction**

As stated above, obtaining proper compaction equipment for a given soil type will be difficult. It is expected in most cases that the only compaction will be from that due to the hauling and spreading equipment, i.e., construction traffic routed over the fill. It is to be realized that even the minimum requirements may not be possible or feasible, and, if situation demands, material should be placed and compacted in any way possible and the levee observed closely for signs of distress. A construction engineer should ideally oversee the design of emergency levees. Use of these guidelines should not be taken as a guarantee that a safe structure will be constructed.

**i. Pervious Fill**

Material shall be placed in layers not more than 12 inches in thickness prior to compaction. In emergency situations, each layer should be compacted at the very minimum by one pass of the hauling equipment. However, whenever time, cost and availability of equipment will permit, a much safer structure will result if each layer gets compacted by a minimum of 3 complete passes of a crawler-type tractor, or by 2 passes of a vibratory roller.

**ii. Impervious Fill**

Fill material shall be placed in layers not exceeding 9 inches prior to compaction. In emergency situations, each layer should receive at least one complete coverage of the track or wheel of the placing equipment or equivalent. However, whenever time, cost and availability of equipment will permit, a much safer structure will result if each layer gets compacted by a minimum of 4-6 complete passes of a tamping type roller or 4 complete passes of a rubber-tired roller.

**2.3 Raising a Levee with Sandbags**

**a. Sandbags**

Sandbags are available in plastic and in burlap. The preferred bags are untreated, close weave burlap sacks available at feed or hardware stores. Empty bags should be stockpiled for emergency use, and can be stored for approximately 8 years in a rodent-free environment with low humidity. Don't fill the bags ahead of time, because they will deteriorate quickly. Commercial polypropylene sandbags are also effective in a flood fight, but since plastic bags are not readily biodegradable, burlap bags will allow more options for disposal if the bags are not going to be reused. (No sandbags should be left in place after the flood fight, regardless of whether they are burlap or plastic.) Do not use garbage bags, as they are too slick to stack; and don't use feed sacks, as they are too large to handle. Experience shows that bags work well if they are approximately 14 inches wide and 24 inches deep.

## b. Fill Material

A sandy soil is most desirable for filling sandbags, as it's easiest to shovel, and the bags can most easily be shaped as needed. Fine sand tends to leak through the weave in the bag, and if it is used it should be double bagged. Silty soils also tend to leak through the bags, and both silty soils and clays are difficult to shape into place. Gravelly or rocky soils are generally poor choices for sandbag structures because of their permeability, though rocks and gravel may be used in sandbags in order to divert water flows, to fill holes, or to hold objects in position. However, any usable material at or near the site has definite advantages. Material should generally not be removed from within 500 feet of the landward toe of a levee, except for in extreme emergency situations.

## c. Sandbag Filling

Filling sandbags manually requires two people. One member of the team folds the throat of the bag outward to form a collar, and holds it open so that the other person can shovel in material. The one holding the bag should hold it between or slightly in front of his or her feet, either crouching with his elbows resting on his knees or standing with his knees slightly flexed, while keeping his head and face as far away from the shovel as possible. Both people should be wearing gloves to protect their hands, and safety goggles may also be desirable, especially on dry or windy days.



*Figure D.1 This two-person team is positioned properly for sandbag filling.*

If they are available during large-scale operations, bag-holding racks and power loading equipment can expedite the operation. Sandbag filling machines can be very effective if they are functioning correctly. Alternately, some people have reported success with improvised sandbag filling devices during a flood response. Inverted traffic cones or large metal funnels have been placed into holes in a table, and feeding bins with doors in their bases have been used to pour sand into bags.

Regardless of what method you use to fill them, bags should be filled between one-half (1/2) to two-thirds (2/3) of their capacity. This keeps the bag from getting too heavy, but more importantly, sandbag structures do not seal or keep out water as well if the bags are more than 2/3 full. Be very careful not to overfill or under fill the bags.

## d. Tied vs. Untied Bags

Although tied sandbags are generally easier to handle and stockpile, untied sandbags are recommended for most situations, because untied bags make a better seal when they're stacked. Since the bags aren't more than 2/3 full, they can be transported almost as easily whether they're tied or untied. Tied sandbags should be used only for

special situations when the bags need to be pre-filled and stockpiled, or for specific purposes such as filling holes or for holding objects in position.

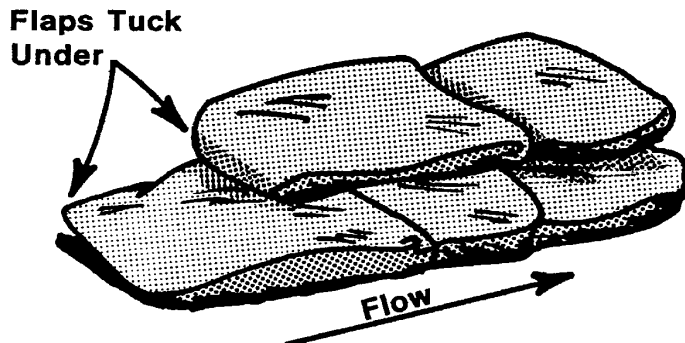
**e. Preparing the Ground**

Any debris must be removed from the area before the bags are laid in place. Typically, flat headed shovels are used to scrape up (“scarp”) the sod or gravel where they are to be laid, to get down to the solid ground where the bags are to be laid. Do not scarp the ground beyond the area directly under the sandbags, because the sod cover in other areas is needed to protect the ground from erosion.

Before laying the bags along the entire length of an area to raise the levee, it’s important that you first fill in any low areas with sandbags or with tightly packed earth, so that subsequent sandbag layers will be kept level.

**f. Sandbag Placement**

When laying the sandbags, the open end of the unfilled portion of the bag is folded over to form a triangle. If tied bags are used, flatten or flare the tied end. Place the partially filled bags lengthwise and parallel to the direction of flow, so the bottom of the bag faces downstream and the folded end faces upstream. (This positioning reduces the chance that floating debris will snag on the tucks and open the bags.)



*Figure D.2 Sandbag placement – tucking in the flaps.*

Tuck the flaps under, keeping the unfilled portion under the weight of the sack. Overlap the next bag slightly over the one before it, so that the top of that sandbag layer can be flattened without leaving any gaps between the bags. Once a bag is placed, it’s very important that you then walk over it, stomp on it, or maul it into place to eliminate voids and form a tight seal.



*Place each succeeding bag tightly against and partially overlapping the previous one. Compact and shape each bag by walking on it.*

*Figure D.3 Sandbag placement – compacting bags together.*

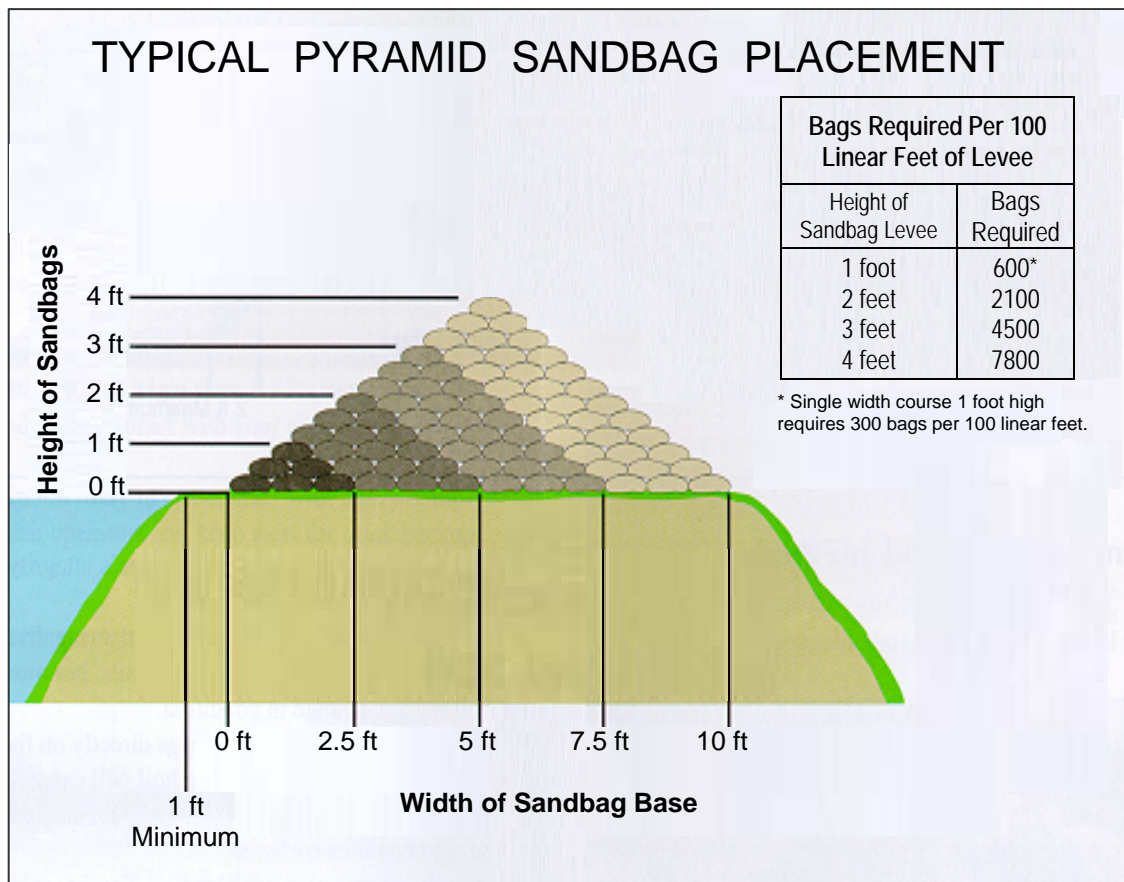
When succeeding layers are added, stagger the bags like bricks, so that each one is placed over the gap between the two below it. This ensures that each seam is interlocked between bags and strengthens the structure. (There should never be less than 1/3 the length of a bag overlapping with the ones beneath it.) When placed properly, each bag should raise the elevation of the structure by 4 inches.

**g. Sandbag Levees**

Sandbags can be used to raise the height of an existing levee or can be used over open ground to protect an area with no levee at all. Any time a sandbag levee will be constructed over one layer high; the bag should be stacked in a pyramid structure to ensure stability. The basic rule of thumb in constructing these structures is that they must be approximately three times as wide as they are high, and the sandbags should be staggered within each layers just as they are staggered from one layer to the next. The directions of the bags (transverse or longitudinal) may be alternated, as long as no loose ends are left exposed. Use this rule of thumb in determining the dimensions of the pyramid:

- 1 bag in length equals about 1 foot
- 3 bags in width equals about 2 ½ feet
- 3 bags in height equals about 1 foot

When building these structures on top of an existing levee, the bags should begin 1 foot from the riverward crown (shoulder) of the levee. Where space is extremely limited on the levee crown, this distance may be reduced but the structure should never be built less than 6 inches from the edge of the levee crown. Stamp each bag in place, overlap sacks, maintain staggered joint placement, and tuck in any loose ends.



*Figure D.4 Pyramid sandbag placement.*

**h. Material, Tools, and Labor Requirements for Sandbag Levee**

Listed below are the materials, tools, and labor required to construct 100 linear feet of sandbag levee, two feet high, with a haul distance of 1 mile round trip.

**i. Materials and Tools**

- 1,800 Sandbags
- 10 Shovels
- 27 Flash lights
- 10 Tons sand (approx)
- 2 Emergency light sets
- 2 Radios or cell phones (one at filling site; one at laying site)
- 6 Pickup trucks

**ii. Labor Requirements:**

- 10 Filling sandbags
- 5 Loading
- 6 Hauling
- 5 Laying
- 2 Foremen (1 at sandbag filling site, 1 at work site)
- 28 People required, total**

**iii. Time Requirements:**

With given resources, the time for completion is estimated at 2 ½ hours, from start to finish.

**i. Bonding Trench and Plastic Sheetting**

Seepage through a sandbag structure can be kept to a minimum if the structure is built carefully using untied bags. One method that's been successfully used to reduce the seepage through a sandbag levee and to increase the horizontal stability is to construct a bonding trench under the structure before the sandbags are laid in place, as pictured below. An additional precaution is to build the structure over some plastic sheetting, which is pulled up and over the structure once it's complete.

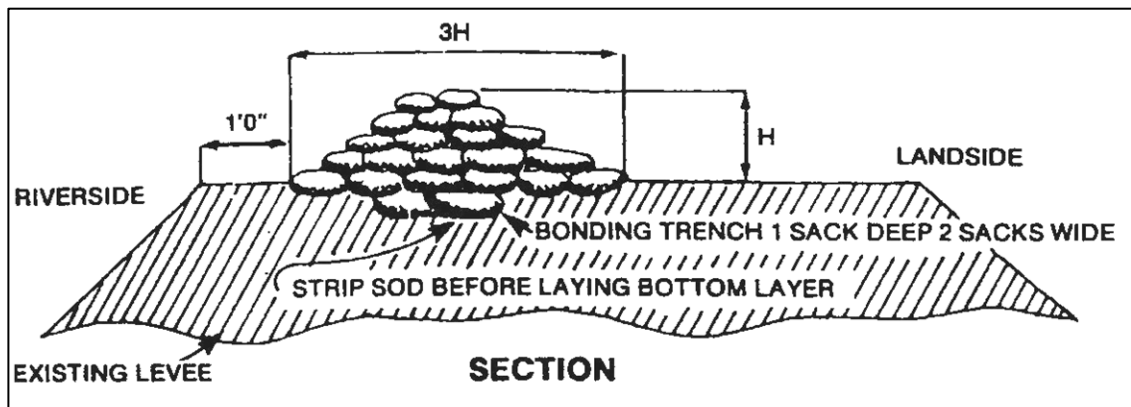


Figure D.5 Sketch of a typical levee raise with bonding trench.

While it's always recommended at least to scarp the ground before the bags are laid, the decision to dig this trench or use the plastic sheeting depends on local conditions, as well as on the expected height of the structure and the time that's available to build it. One of the primary concerns when considering bonding trenches and/or plastic sheeting is the amount of time that's available. If there's sufficient time and adequate material, the seepage can be reduced, but if there is very little time available, the ground should be scarped and a typical sandbag structure constructed with no bonding trench at all. An additional concern is whether the sandbag levee would have to be raised in the future, because any plastic sheeting has to be removed before the structure can be raised.

If plastic sheeting is to be used in conjunction with the sandbag levee, begin by digging a bonding trench 2 sandbags wide and one sandbag deep. The edge of the plastic is placed in the hole and weighed down with sandbags, with most of the plastic laying out in the direction of the river. It's very important that the plastic is never laid across the entire width of the sandbag levee base. Sandbag levees are held together by frictional forces between the bags and with the ground surface; sandbag structures are much less stable when wrapped with plastic, and can slide apart under high water. Construct the sandbag levee over the sheeting, pull the plastic up and overtop of the structure and weigh it down with sandbags on the landward side. Always work from downstream to upstream so that the upstream plastic seams all overlap the ones downstream, in order to prevent debris from snagging the plastic and pulling the sandbag levee apart.

#### **2.4 Raising the levee with Flashboards or Lumber and Sack Cappings**

If it appears that the levee raise would have to hold back more than 18 inches of water, consideration should be given to use of a lumber and sack capping or a flashboard capping. A lumber and sack capping is shown in plate 3, which may be used as a guide to estimate the materials required for a levee raise of about 3 feet. A flashboard structure is very similar, but the face of the structure is constructed of plywood instead of boards. These wooden facings provide a more positive control against excessive through seepage than is provided by sandbags alone. Either structure can be supported from behind with either sandbags or with compacted earthen fill, depending on how accessible the crown of the levee is to earthmoving machinery.

Additionally, plastic sheeting may be installed on the riverside face of the plywood or flashboards, to protect the wood and reduce seepage through the flashboards. Flashboards do tend to leak a little, depending on how they are constructed and how the boards expand when they're wet; though these structures are never constructed without a sandbag backing. If plastic sheeting is to be used, it should extend 1' riverward from the riverside bottom of the plywood/flashboard. A row of sandbags should then be stamped into place along the riverside bottom edge of the plywood/flashboards to help prevent seepage under the flashboard system. The plastic is brought up the riverside of the plywood/flashboards and over the top to the landside supports and held in place by sandbags or nails where necessary. Field conditions, the available time, and the availability of materials would dictate the actual requirements.

### **3. Seepage**

As a river or stream rises, the hydrostatic pressure against a levee slope increases significantly and can force water into and under the levee embankment. Even when a levee is properly constructed and of such mass to resist the destructive action of flood water, this seepage tends to push its way through regions of least resistance (such as sandy layers under the levee or animal burrows) out to the surface on the landward side of the structure. If there isn't sufficient pressure on the landward side to hold back the seepage water, it will break through the ground surface on the landward side, in the form of bubbling springs, which erode and carry soil particles from under the levee.

Seepage is almost impossible to eliminate and attempt to do so may create a much more severe condition. Seepage is generally not a problem unless 1) the landward levee slope becomes saturated over a large area, 2) seepage water is carrying material from the levee, or 3) pumping capacity is exceeded. Pumping of seepage should be held to a minimum, and ponding should be allowed during high water to the extent that it doesn't cause damages. Several levees were endangered during past floods by attempts to keep low areas pumped dry, and additional time and effort were expended in controlling sandboils caused by pumping. Therefore, seepage should be permitted if no apparent ill-effects are observed and if adequate pumping capacity is available.

#### **3.1 Effects of Underseepage**

Underseepage can produce three distinctly different effects on a levee, depending upon the condition of flow under the levee.

##### **a. Piping Flow**

In extreme conditions of excessive underseepage, the movement of seepage water erodes the foundation materials, and a clearly defined pipe or tube develops under the levee. Unless corrective actions are taken, water continues to erode and enlarge this pipe, so that a cavern develops under the levee, and levee material collapses to fill in the void. In an advanced state, piping under the levee can be identified by a slumping of the levee crown, and the levee can quickly fail if it's overtopped through this low spot. To prevent this condition from developing, any boils found to be transporting soil material need to be treated as early as possible.

##### **b. Non-Piping Flow**

In this case, seepage water flows under the levee without following a well-defined path, and results in one or more boils outcropping at or near the landside toe. The flow from these boils tends to undercut and ravel the landside toe, resulting in sloughing of the landward slope. Sloughing is the movement of small amounts of soils from the embankment slopes. Sloughing may also occur if the levee embankment becomes saturated as a result of prolonged high creek stages. Evidence of this type of failure is found in undercutting and raveling at the landside toe.

### **c. Saturating Flow**

In this case, numerous small boils, many of which are scarcely noticeable, outcrop at or near the landside toe. While no boil may appear dangerous in itself, a group of boils may cause significant damage. The flowing water may erode away supporting material and/or keep the area saturated and cause flotation ("quickness") of the soil, reducing the shearing strength of the material at the toe (where maximum shearing stress occurs) which could lead to slope failure. In a slope failure condition, a substantial section of the levee embankment breaks away along a clearly defined crack and slides away from the levee. The displacement of the soil will result in a reduction in the cross sectional area of the levee and poses a major threat to the integrity of the structure.

## **3.2 Sandboils**

### **a. Identification of Sand Boils**

Sandboils usually occur within 10 to 300 feet from the landside toe of the levee and, in some instances, have occurred up to 1,000 feet away. Boils will have an obvious exit (such as a rodent hole), but the hole may be very small. When material is carried upward through a boil, it is deposited in a circular pattern around the exit location, and is comparable to an ant hill or volcano. Alternately, sandboils may exit into standing water. In this case, they may be difficult to identify, especially if the hole is small and the water cloudy from siltation. If you see any movement in what appears to be standing water on the landward side of the structure, this may be the exit point for a sandboil. Carefully approach the site, disturbing the water as little as possible, and let the water settle in order to look for the exit point. If there is no distinct hole, the water flow is not a threat. All boils should be conspicuously marked with flagging so that patrols can locate them without difficulty and observe changes in their condition.

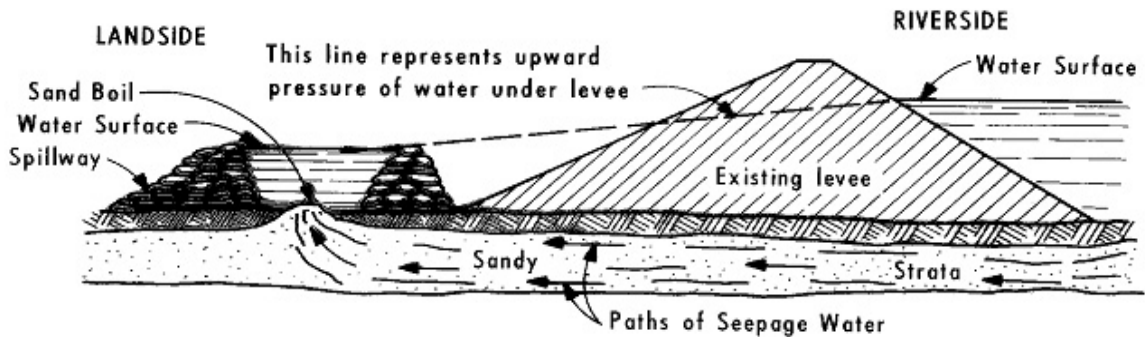
You can tell how serious a boil is by the color of the water that is coming out. If the water is relatively clear, it means that there is relatively little material being eroded away through the boil. The site should be monitored regularly for changes, but nothing else should be done to treat the clear boil. If it's dark or muddy, then it's full of material that's been eroded away from under the levee, and must be treated immediately. Boils may quickly grow very large, and boils, which are discharging clear water, may suddenly begin to discharge soil materials along with the seepage flows. For this reason, any boil, whether the flow is clear or muddy, can potentially lead to the failure of the levee and must be monitored closely.

### **b. Treatment of Sandboils**

The most common and accepted method of treating sandboils that are displacing soil is to construct a ring of sandbags around the boil(s) as illustrated in Figure D.7. The purpose of the ring is to raise a head of water over the boil to counterbalance the upward pressure of the seepage flow. The height of the water column is adjusted so that the water exiting the boil runs clear and no longer removes soil from the levee foundation. It's extremely important that the flow of water is never stopped

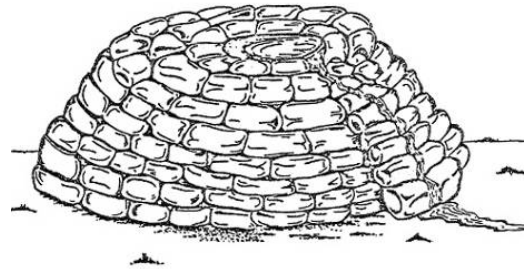


completely, as this may cause additional boils to break out nearby. Treated areas should be kept under constant surveillance until the water recedes.

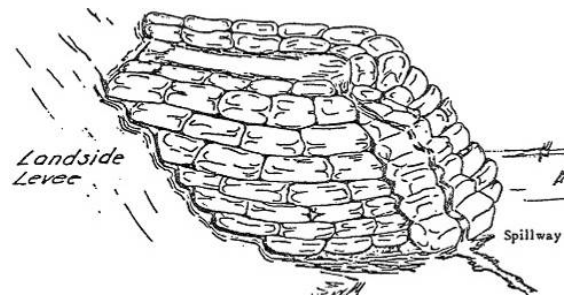


**Figure D.6** To treat the sandboil, the pressure of the seepage water is counterbalanced by hydrostatic pressure from the column of water in the ring levee.

The diameter and height of the ring will depend on the actual conditions at each sandboil. The base width should be at least 1½ times the contemplated height, and the inner ring of sandbags should begin between one and three feet from outer edge of the sandboil. "Weak" or "quick" ground near a boil should be included within the sack ring to prevent these areas from developing into new boils when the active boil is treated. Where several sandboils develop in a localized area, a ring levee of sandbags should be constructed around the entire area. The ring should ideally be of sufficient diameter to permit sacking operations to keep ahead of the flow of water. When a sandboil is located near the levee toe, the sandbag ring may be tied into the landside slope of the levee, as shown in Figure D.8.



**Figure D.7** Sketch of a typical ring levee with spillway.



**Figure D.8** Sketch of ring levee tied to a levee slope, with spillway. Construction against the levee slope results in a U-shaped sandbag "chimney."

The base or foundation for the sack ring should be cleared of debris and scarified to provide a reasonably watertight bond between the ground surface and the sandbags. The ring is constructed with sacks filled approximately two-thirds (2/3) full of sand, and tamped firmly into place. Do not tie the ends of the sacks. When adding subsequent layers, the joints should be staggered for stability and water tightness. The untied ends of sandbags should be laid towards the inside of the ring and folded under. The height of the sack ring should be only sufficient to slow the flow until the water

exiting the boil runs clean. Never place sandbags directly over the sandboil or attempt to completely stop the flow through the boils, as this may result in other boils developing nearby.

A spillway or exit channel should be constructed on the top of the sack ring so that the level of the water in the ring levee can be adjusted, and the overflow water can be carried a safe distance from the boil, away from the direction of the levee. Because the height of the water is the critical factor in adjusting the rate of flow through the boil, the spillway will require constant monitoring and adjustment once the sandbag ring levee is filled with water. This spillway is normally constructed of sandbags, but alternately, a V-shaped drain can be constructed of two boards; or PVC pipe, plastic sheeting, or other materials may be helpful in building the spillway.

**c. Material, Tools, and Labor Requirements for Sandbag Ring Levee:**

Materials, tools, and labor required to construct a Sandbag Ring Levee 2½ feet high and 10 feet in diameter with a haul distance of 1 mile round trip.

**i. Materials and Tools:**

- 1,125 Sandbags
- 5 Shovels, long or short handle
- 9 Tons of sand (approximately)
- 5 Pick up trucks
- 2 Radios or cell phones (one at filling site; one at laying site)
- 2 Emergency light sets
- 15 Flashlights
- 15 Pairs of work gloves

**ii. Labor Requirements:**

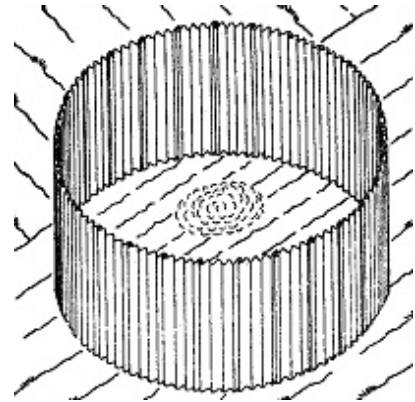
- 4 Filling sandbags
- 3 Loading/ carrying
- 5 Hauling to work site
- 3 Laying (placement)
- 2 Foremen (1 at sandbag filling site 1 at work site)
- 17 People required, total**

**iii. Time Requirements:**

With given resources, time for construction is estimated to be 1-½ hours from start to finish.

#### **d. Alternate Methods of Treating Sandboils**

An alternate method of ringing sandboils is by use of corrugated sheet-steel piling, as shown in Figure D.9. The area is cleared of debris, and the piling is driven about 1-½ feet into the ground around the boil. This method accomplishes the same task faster than sandbagging, but is limited in use by the availability of material, equipment, and the location and foundation condition of boils. Expedient methods can be improvised in other ways, to include using sections of corrugated metal piping. Special care must be taken with the design of these structures to make sure there is a reliable means for adjusting the water level, so the water column doesn't completely stop the flow of water through the boil.



**Figure D.9** A ring of steel-sheet piling can alternately be used to ring the boil, if conditions permit.

Alternately, it may sometimes be possible to locate the inlet side of a boil under the water on the riverward bank of the levee. A swirl may be observed in the water at this point, or the location of the entry point may have been identified after a previous high water event. Sometimes, because of the current, the swirling vortex appears on the water's surface slightly downstream of the actual opening. If the opening is located, it may be possible to block the seepage flow at its entry point, since blocking the entry point may take much less time than constructing a sandbag ring levee. If the entry point is located, it can be blocked by anchoring a sheet of plastic over the area, using rope and sandbags. It may sometimes be possible to plug a flooded animal burrow by placing a mixture of manure and straw or dry hay into the water at the burrow entrance. If the entry point is blocked, both the blockage and the location of boil need to be closely monitored for any changes.

### **3.3 Sloughs**

If seepage causes saturation and sloughing of the landward slope, the slope should ideally be flattened to 1V (vertical) on 4H (horizontal) or flatter. Material for flattening should be at least as pervious as the embankment material. If any sloughs develop in the levee, all soft areas should be thoroughly drained by excavating shallow ditches in the side slopes, as shown in Plate 4. Contact your Corps district office before undertaking this method.

### **3.4 Floating Soil Conditions**

When seepage exits landward of the levee toe at a pressure that creates a sensation like the soil is fluid, the levee and foundation become susceptible to sliding and/or sloughing which can lead to an embankment failure. A fluid soil condition is an indicator that soil particles or the soil mass is floating, and the soil's ability to support a load such as a vehicle or heavy equipment and/or the levee embankment itself has been reduced. When this condition is observed, the safety, health and welfare of those individuals who are responding to the flood fight and/or those who live within the protected area must come first. Consideration must be given to evacuating the area. If the sod layer appears to pop loose or lift up, evacuate the area immediately. In a past flood, this condition was observed and successfully solved with the placement of clean, free-draining sand fill, classified as SP medium to fine sand, with less than 5 percent fines passing the number 200 sieve. The sand was brought in from another location (away from the levee), and a bulldozer was used to push the sand over the area, creating a blanket some 3 feet in thickness and some 20 feet in width. The thickness and width necessary may vary depending on the observed conditions.

### **3.5 Other Seepage Related Considerations**

Any basement or similar depression near the levee should be closely watched for heaving of floors, caving of walls, and boil activity. It may become necessary to support basement walls or weight down basement floors by intentionally flooding the basement with clean water, to prevent walls from caving in, piping, or excessive seepage.

## 4. Erosion

### 4.1 Wave Wash

During high water, continuing wave action against a levee slope can erode wide terraces along the length of the levee. This causes scour or beaching along the riverward slope of the levee and reduces the cross sectional area, which can potentially lead to a failure. This type of damage doesn't typically arise during short (hour-long) storms, especially if the slope has good sod cover. However, during longer periods of high water, especially during windy or icy conditions, the damage can develop very rapidly. The section leader should study the levee beforehand to assess the potential for wave wash. All potential trouble areas should be located well in advance, and section leaders should assemble a reserve supply of materials (filled sandbags, lumber, stakes, plastic sheeting, rock, etc) close to locations most likely to experience such damage. During periods of high wind and high water, when waves attack a levee, ample labor should be assembled and experienced personnel should patrol the areas to identify the beginnings of scour, washouts, or breaching. Because wave wash damage can spread rapidly, it is important that damaged areas are treated as soon as they are identified. There are a number of accepted methods of protecting a levee against wave wash.

#### a. Sandbags

In emergency situations, the preferred treatment method is to place sandbags in to the cut as shown in Plate 5. The filled sacks should be laid in sections of sufficient length to give protection well above the anticipated rise.

#### b. Plastic Sheeting and Sandbags

Experience has shown that a combination of plastic sheeting and sandbags is one of the most expedient, effective and economical methods of combating slope attack in a flood situation. Other materials such as snow fence, cotton, or burlap have successfully been used in place of the plastic in the past. Poly and sandbags can be used in a variety of combinations, and time becomes the factor that may determine which combination to use. Ideally, poly and sandbag protection should be placed in the dry. However, many cases of unexpected slope attack will occur during high water, and a method for placement in the wet is covered below. See Plates 6 and 7 for recommended methods of laying poly and sandbags. Plate 8 shows a minimal configuration for emergency use. Since each flood fight project is generally unique (river, personnel available, materials, etc.), specific details of placement and materials handling will not be covered, though some guidelines are provided below. Field personnel must be aware of resources available when using poly and sandbags.

#### i. Dry Placement

Anchoring the poly along the riverward toe is important for a successful job. It may be done in three different ways: 1) after completion of the levee, a trench excavated along the toe, poly placed in the trench, and the trench backfilled; 2) poly placed flat-out away from the toe, and earth pushed over the flap; 3) poly placed flat-out from the toe and one or more rows of sandbags placed over the flap. The poly should then be unrolled up the slope and over the top enough to allow for

anchoring with sandbags. Poly should be placed from downstream to upstream along the slopes and overlapped at least two feet. The poly is now ready for the "hold-down" sandbags.

It is mandatory that poly placed on levee slopes be held down along the slopes as well. An effective method of anchoring poly is a grid system of sandbags, unless extremely high velocities, heavy debris or a large amount of ice is anticipated. Then, a solid blanket of bags over the poly should be used. A grid system can be constructed faster and requires fewer bags and much less labor than a total covering. Various grid systems include vertical rows of lapped bags, two-by-four lumber held down by attached bags, and rows of bags held by a continuous rope tied to each bag. Poly has been held down by a system using two bags tied with rope and the rope saddled over the levee crown with a bag on each slope.

### **ii. Placement in the Wet**

In many situations during high water, poly and sandbags placed in the wet must provide the emergency protection. Wet placement may also be required to replace or maintain damaged poly or poly displaced by current action. Plate 7 shows a typical section of levee covered in the wet. Sandbag anchors are formed at the bottom edge and ends of the poly by bunching the poly around a fistful of sand or rock, and tying the sandbags to this fist-sized ball. Counterweights consisting of two or more sandbags connected by a length of 1/4-inch rope are used to hold the center portion of the poly down. The number of counterweights will depend on the uniformity of the levee slope and current velocity. Placement of the poly consists of first casting out the poly sheet with the bottom weights and then adding counterweights to slowly sink the poly sheet into place. The poly, in most cases, will continue to move down slope until the bottom edge reaches the toe of the slope. Sufficient counterweights should be added to insure that no air voids exist between the poly and the levee face and to keep the poly from flapping or being carried away in the current. For this reason, it is important to have enough counterweights prepared prior to the placement of the sheet.

### **iii. Overuse of Plastic Sheeting**

In past floods, there has been a tendency to overuse and in some cases misuse poly on slopes. For example, on well-compacted clay embankments, in areas of relatively low velocities, use of poly would be excessive. Plastic should never be used on the landward slopes, as it holds through-seepage against the levee slope. A critical analysis of a situation should be made before poly and sandbags are used, with a view toward less waste and more efficient use of these materials and available manpower. However, if a situation is doubtful, poly should be used rather than risk a failure. Critical areas should have priority.

**c. Moveable Panels**

Wave wash may also be effectively checked by the use of movable panels constructed of lumber. These panels are anchored in place on the levee slope with stakes and are weighted down with sandbags or stone as shown on Plate 9. A portable bulkhead constructed with lumber and staked into place is another alternate type of wave wash protection.

**d. Miscellaneous Measures**

Several other methods of slope protection have been used. Straw bales pegged into the slope were successful against wave action, as was straw spread on the slope and overlain with snow fence.

**4.2 Scours**

Scouring occurs when the current velocity against the levee is adequate to remove levee embankment materials. Once scouring begins to occur, the protective sod cover is damaged or destroyed and additional scour may develop very quickly. Careful observation should be made along the entire length of the riverside of the levee during high water periods, and especially in locations where the current flow is two feet per second or more. Scouring will most likely develop at road crossing ramps and at locations where pipes, sewers, and other structures penetrate the levee. It may also develop in ditches, excavations or building basements near the levee, around riverside stability berms, or in other locations where there is an obstruction to the smooth flow of water along the levee face. If any scour is observed, soundings should be taken if possible to determine the extent of damage and the amount of treatment required.

**a. Deflection Weirs**

Deflection weirs (also known as bendway weirs), extending 10 feet or more into the channel have been effective in deflecting current away from the levees. These emergency structures can be constructed using lumber, stakes, brush, sandbags, and stone, and are tied in place as shown on Plates 10 and 11. Snow fence, plain riprap, compacted earth or any other substantial materials available may also be used; even old car bodies have been used in the past. Preferably, the weirs should be placed in the dry at locations where severe scour may be anticipated, because construction during high water will be very difficult. A series of weirs may be needed to protect the area, or a longer weir may be constructed in the water parallel to the levee. Care should be given in the placement of weirs, because haphazard placement may shift the current towards other banks and lead to even worse scouring. Hydraulic technical assistance should be sought if questions arise in the use of emergency weirs.

**b. Plastic Sheeting**

Plastic sheeting may be useful in protecting the embankment from scouring, as described under the previous section on wave wash.

### c. Other Protection

If scour begins to take place after water is up on the levee, a protective berm should be constructed over the entire scour area using stone, slag, or other durable material with sufficient size and weight withstand the erosive velocity of the current. Construction of this berm will generally require equipment capable of operating from the levee crown. Riprap has been used to provide slope protection where erosive forces were too large to be effectively controlled by other means. Objections to using riprap when flood fighting include the cost and the large quantities that are typically necessary to protect a given area. It's usually very difficult to control the placement of the riprap, particularly during times of high water, but careful use of an excavator has been effective even in difficult conditions.

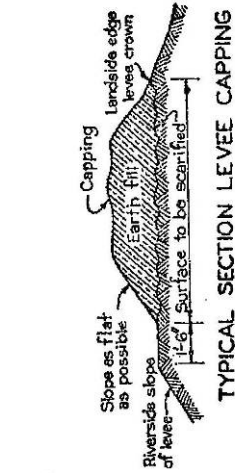


**Figure D.10** Placement of Riprap. Careful use of an excavator may allow for more accurate placement than is shown above.

### 4.3 Ice and Floating Debris

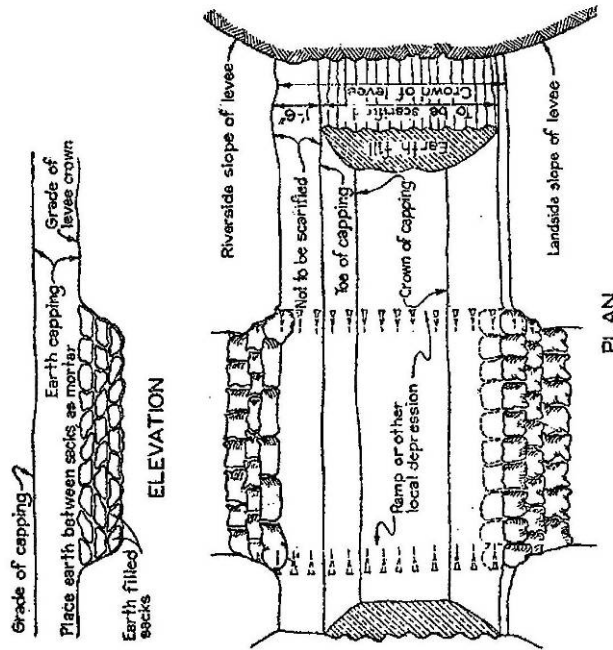
Sometimes ice conditions are such that protection provided by the methods outlined above will not be totally effective. The primary method for protecting a levee slope from debris or ice attack is to construct a floating boom parallel to the levee embankment. Logs, driftwood, or any available timber are cabled together end to end and moored to the ground in such a way that they float out in the current about 15 feet from the water's edge. Depending on the size of the logs, the boom will deflect floating objects. Since a detailed discussion of ice jams lies beyond the scope of this manual, please refer to the references in Appendix I for additional information.





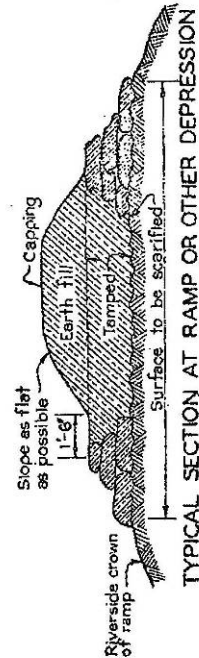
TYPICAL SECTION LEVEE CAPPING

NOTE: This type of capping not to be used on levees with crown less than 10' wide or on levees exposed to wave wash.



PLAN

EMERGENCY FLOOD FIGHTING  
**EARTH CAPPING**  
 FOR RAISING DEPRESSIONS AND LEVEE CAPPING  
 (THIS DESIGN IS ADEQUATE FOR HEIGHTS UP TO 1½')  
 U.S. ARMY CORPS OF ENGINEERS



TYPICAL SECTION AT RAMP OR OTHER DEPRESSION

Plate 1

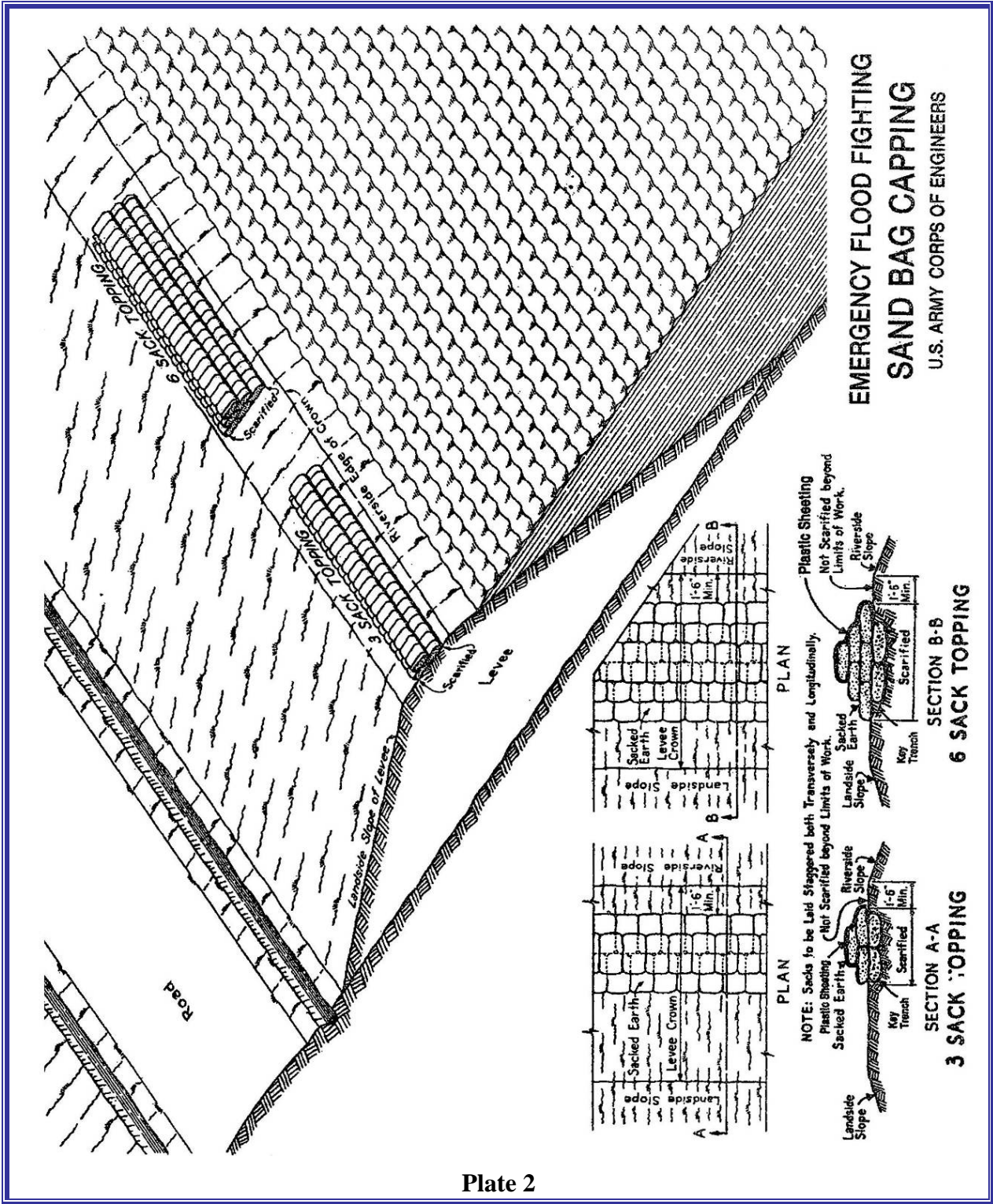
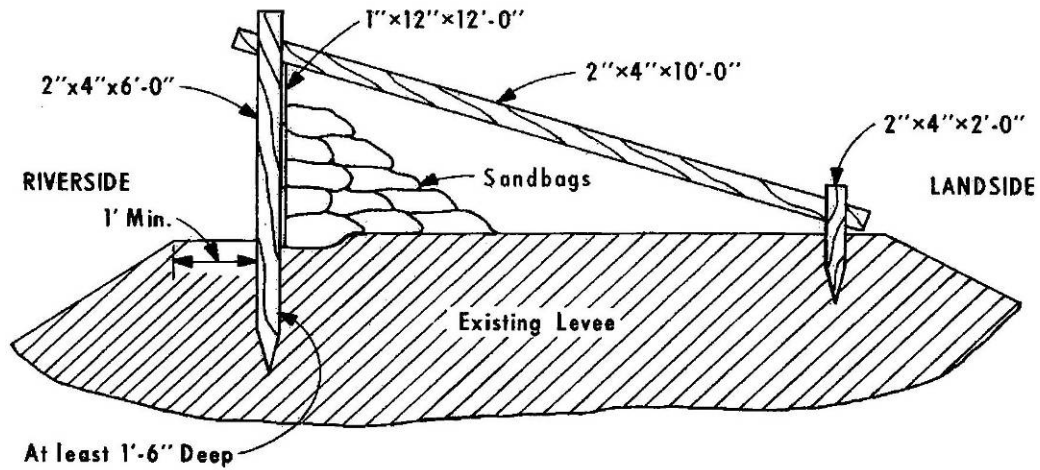
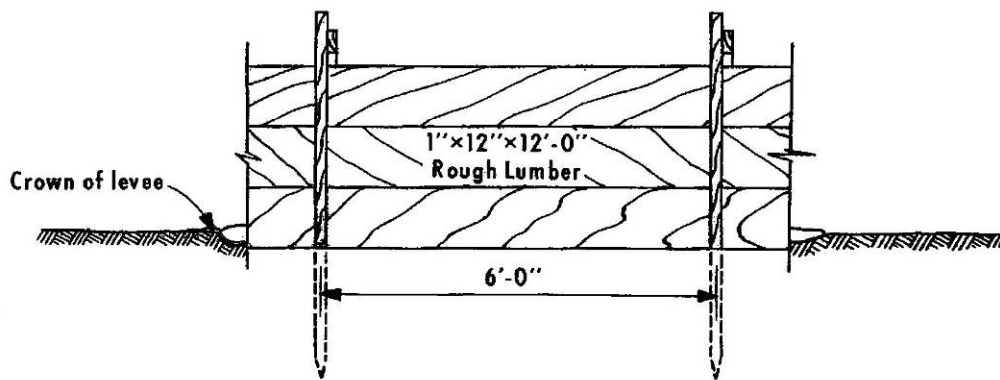


Plate 2



**SECTION**



**FRONT ELEVATION**

BILL OF MATERIAL FOR 100 FT.	
<b>LUMBER</b>	
25 pieces	1" x 12" x 12'-0"
17 pieces	2" x 4" x 10'-0"
17 pieces	2" x 4" x 6'-0"
17 pieces	2" x 4" x 2'-0"
<b>NAILS</b>	
2 lbs	8d Common
2 lbs	16d Common
<b>SANDBAGS</b>	
1100	Filled Bags

**CONSTRUCTION METHODS  
FOR  
HIGH WATER  
LUMBER AND SACK TOPPING  
U. S. ARMY CORPS OF ENGINEERS**

**Plate 3**

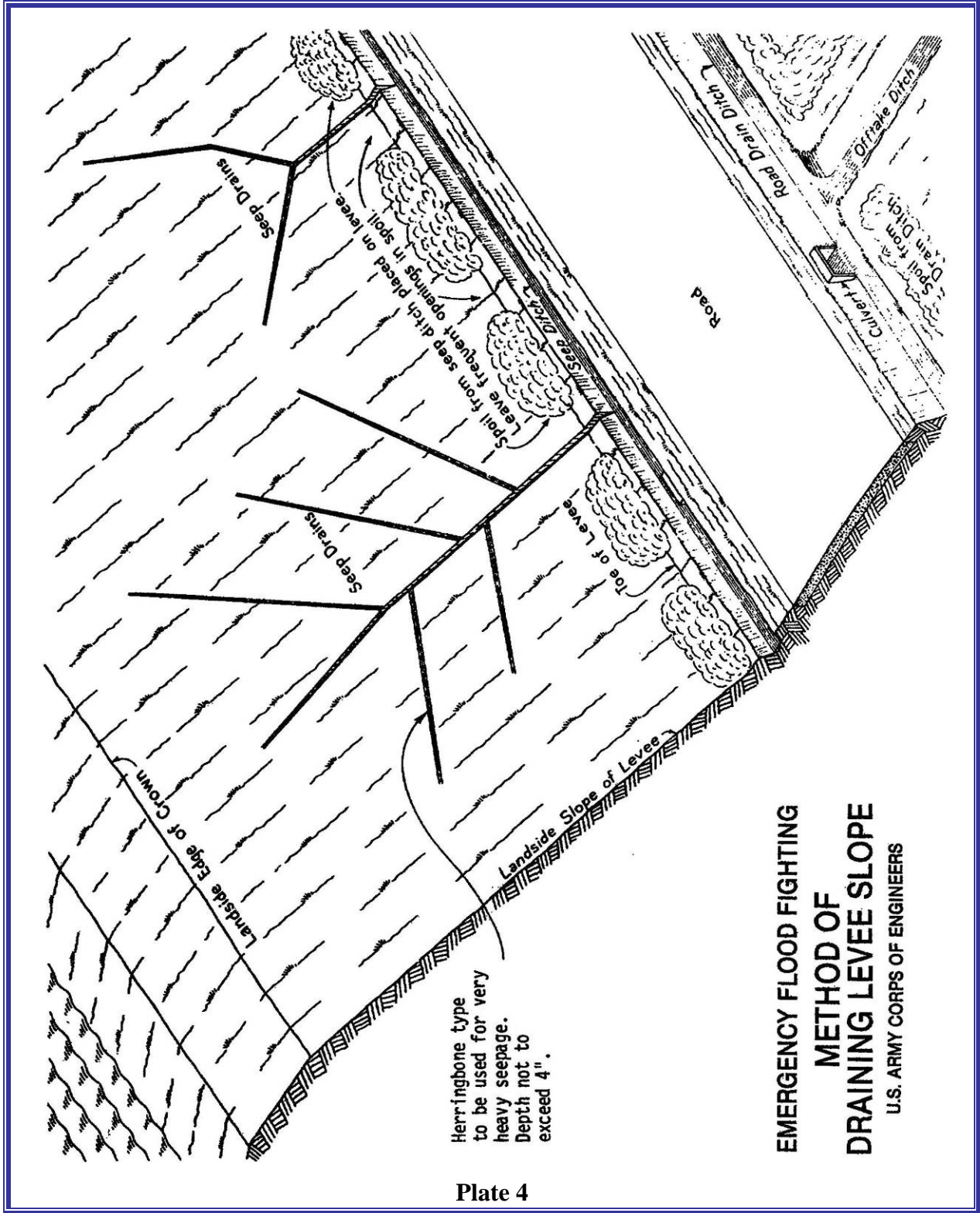


Plate 4

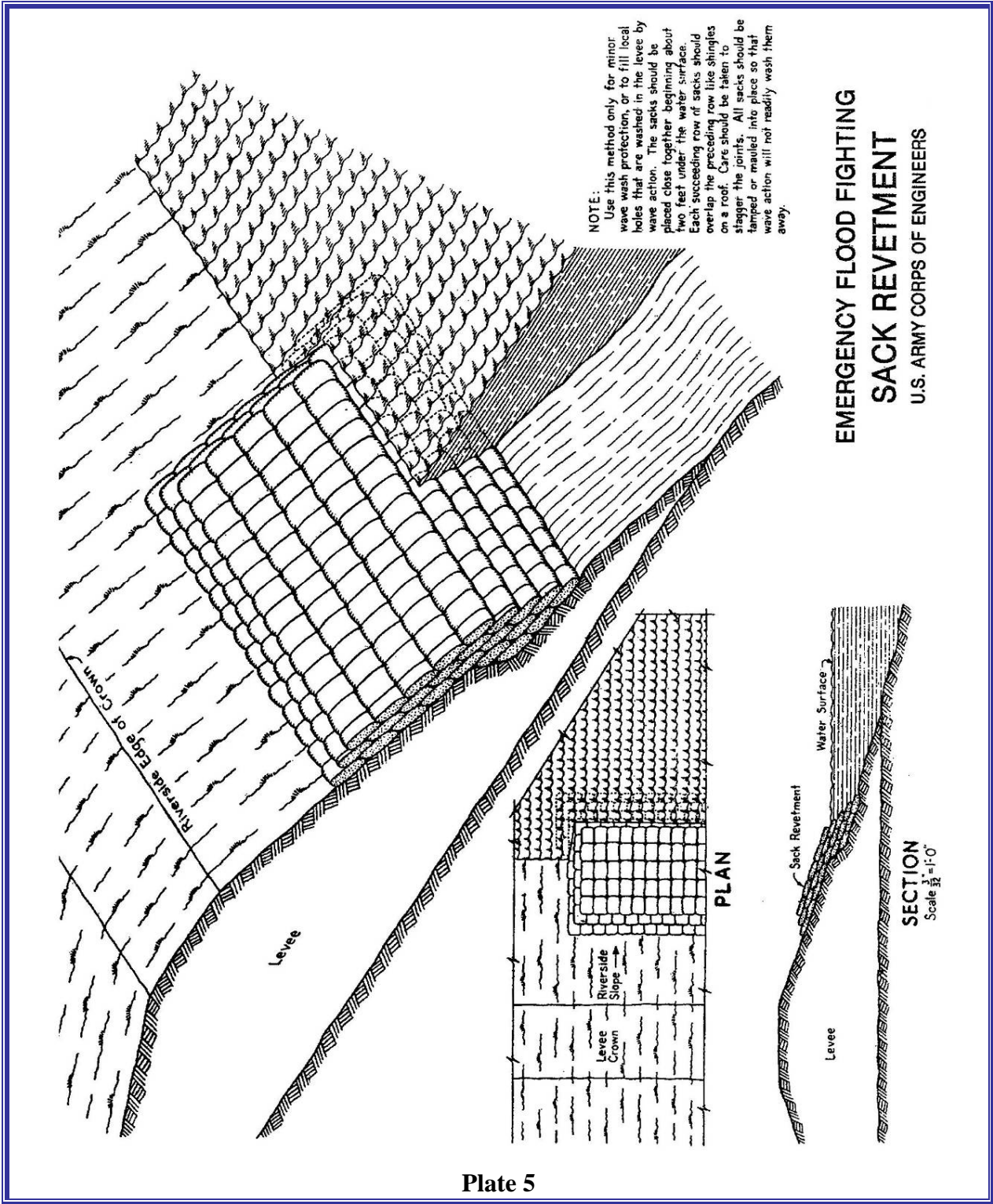
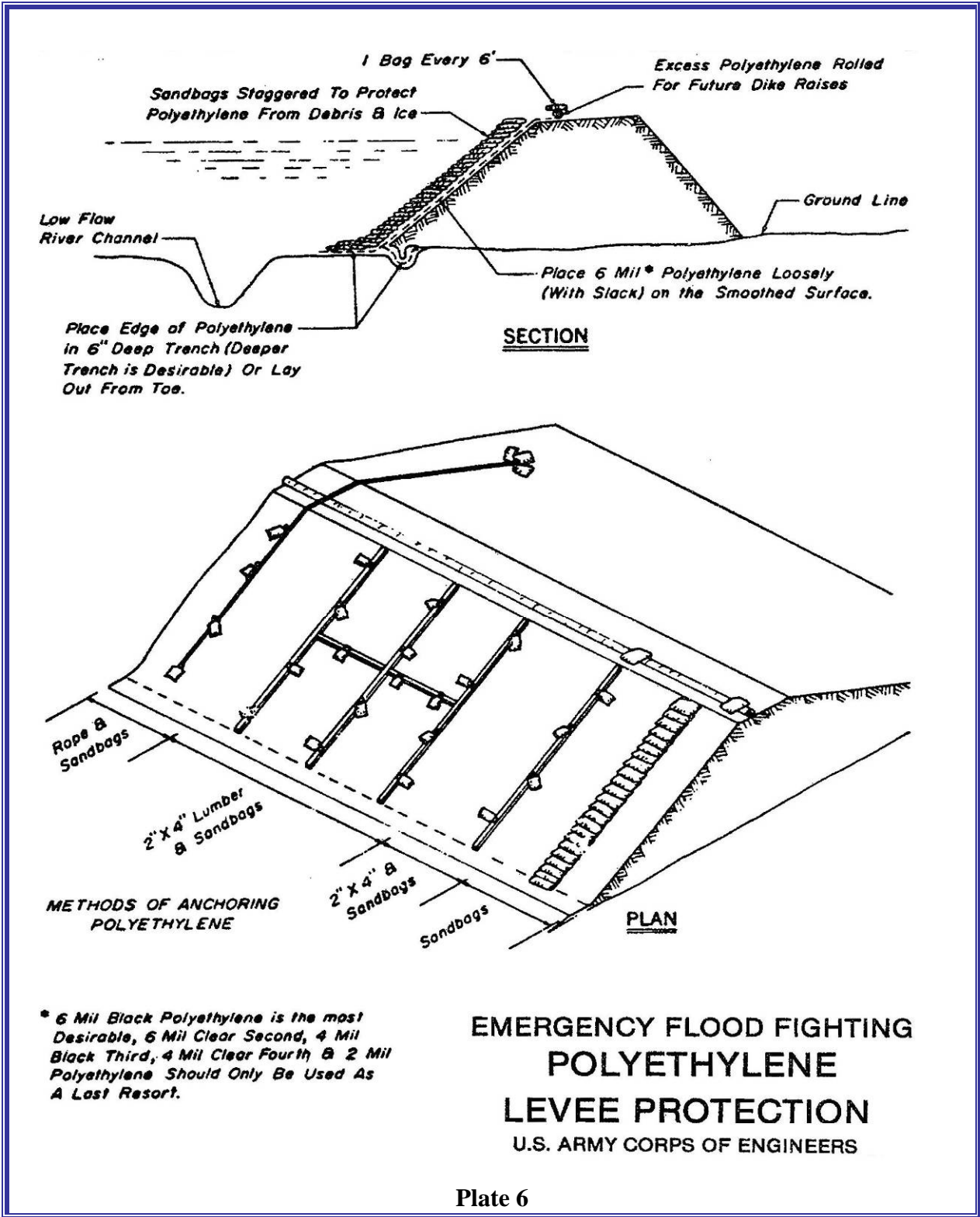
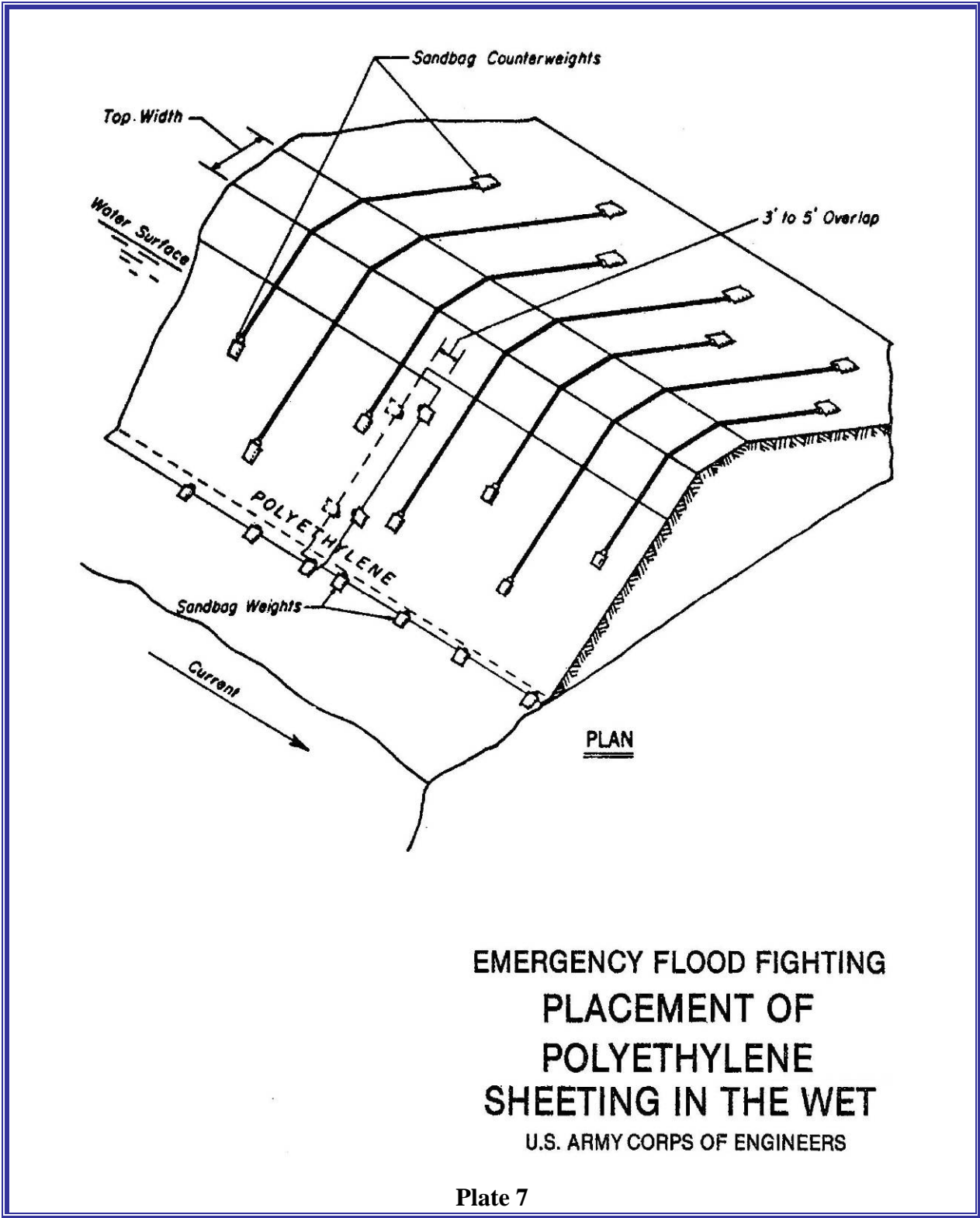
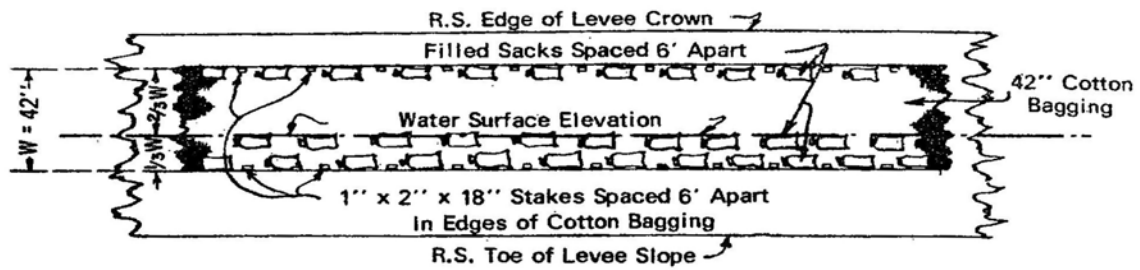


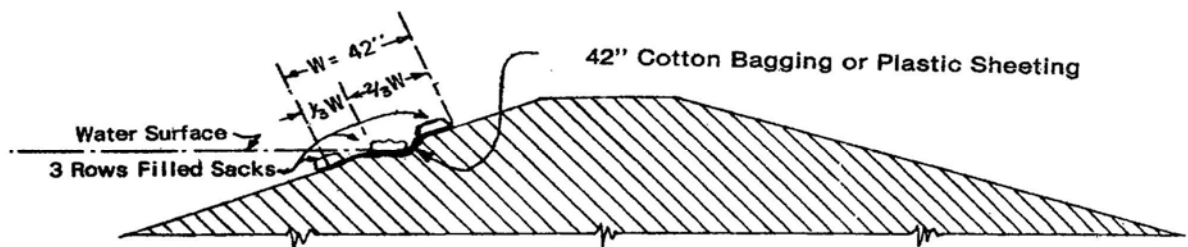
Plate 5







PLAN



CROSS SECTION

BILL OF MATERIAL  
TO CONSTRUCT 180 FT.

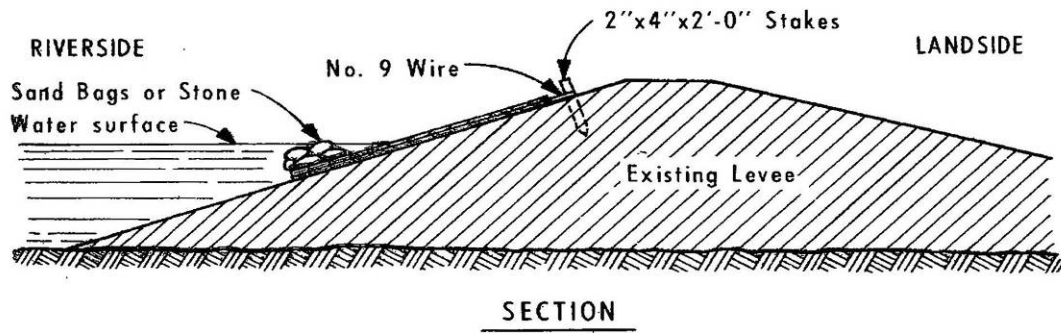
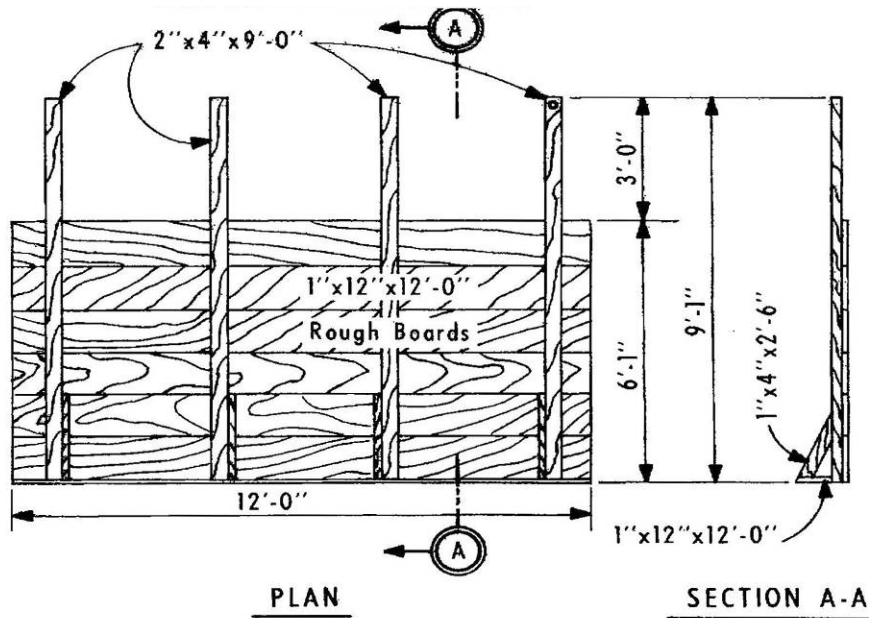
- 1 Roll Jute Cotton Bagging 42" x 180'
- 90 Filled Sacks
- 60 Stakes 1" x 2" x 18" = 15 Bd. Ft.

INSTRUCTIONS

Lay 42" cotton bagging (Jute) longitudinally along riverside slope of levee with approximate 2/3 width above water surface.  
Weight bagging along edges and at water surface with filled sacks spaced approximately 6' apart. Drive stakes alternately between sacks along both edges of bagging.  
If additional width is required, lace two or more widths of bagging together and lay as desired.

**EMERGENCY FLOOD FIGHTING  
TYPE OF WAVEWASH PROTECTION  
U.S. ARMY CORPS OF ENGINEERS**





BILL OF MATERIAL FOR 100 FT.	
<b>LUMBER</b>	
55 Pieces	1" x 12" x 12'-0"
32 Pieces	1" x 4" x 2'-6"
32 Pieces	2" x 4" x 9'-0"
32 Pieces	2" x 4" x 2'-0"
<b>WIRE</b>	
100 Ft.	No. 9
<b>NAILS</b>	
6lbs.	8d Common

**CONSTRUCTION METHODS**  
 FOR  
**HIGH WATER**  
**WAVE WASH PROTECTION**  
**MOVABLE**  
 U. S. ARMY CORPS OF ENGINEERS

**Plate 9**

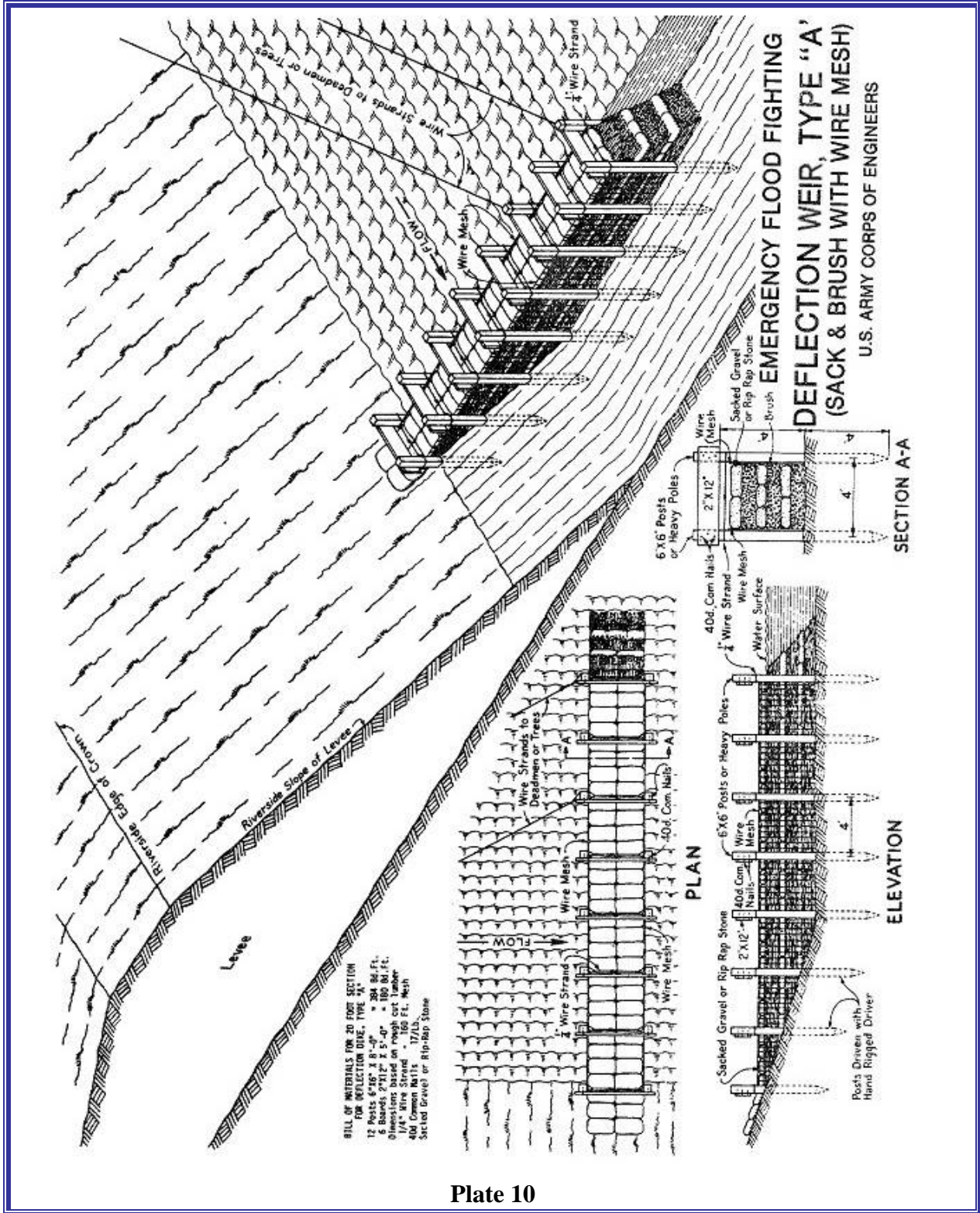


Plate 10

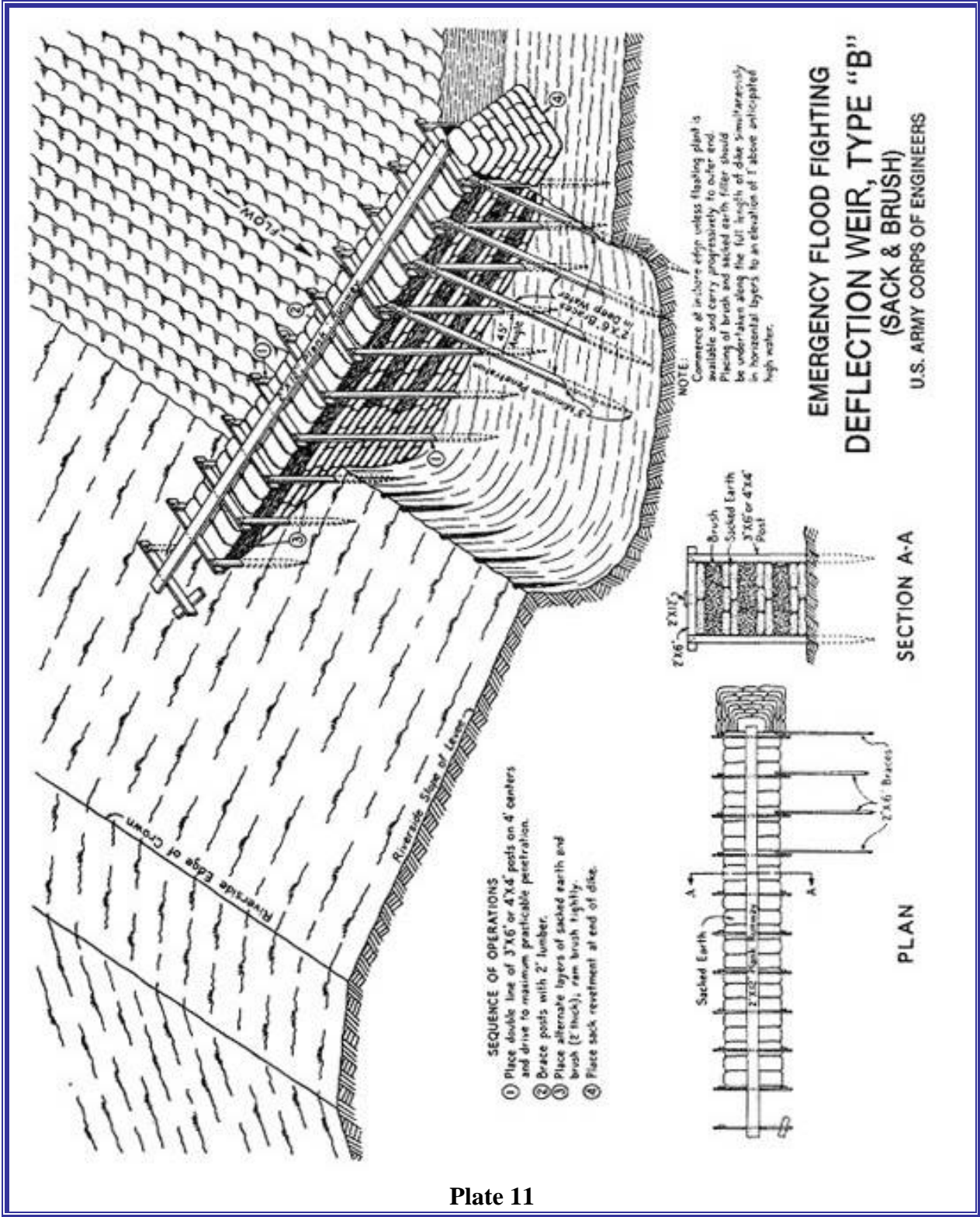
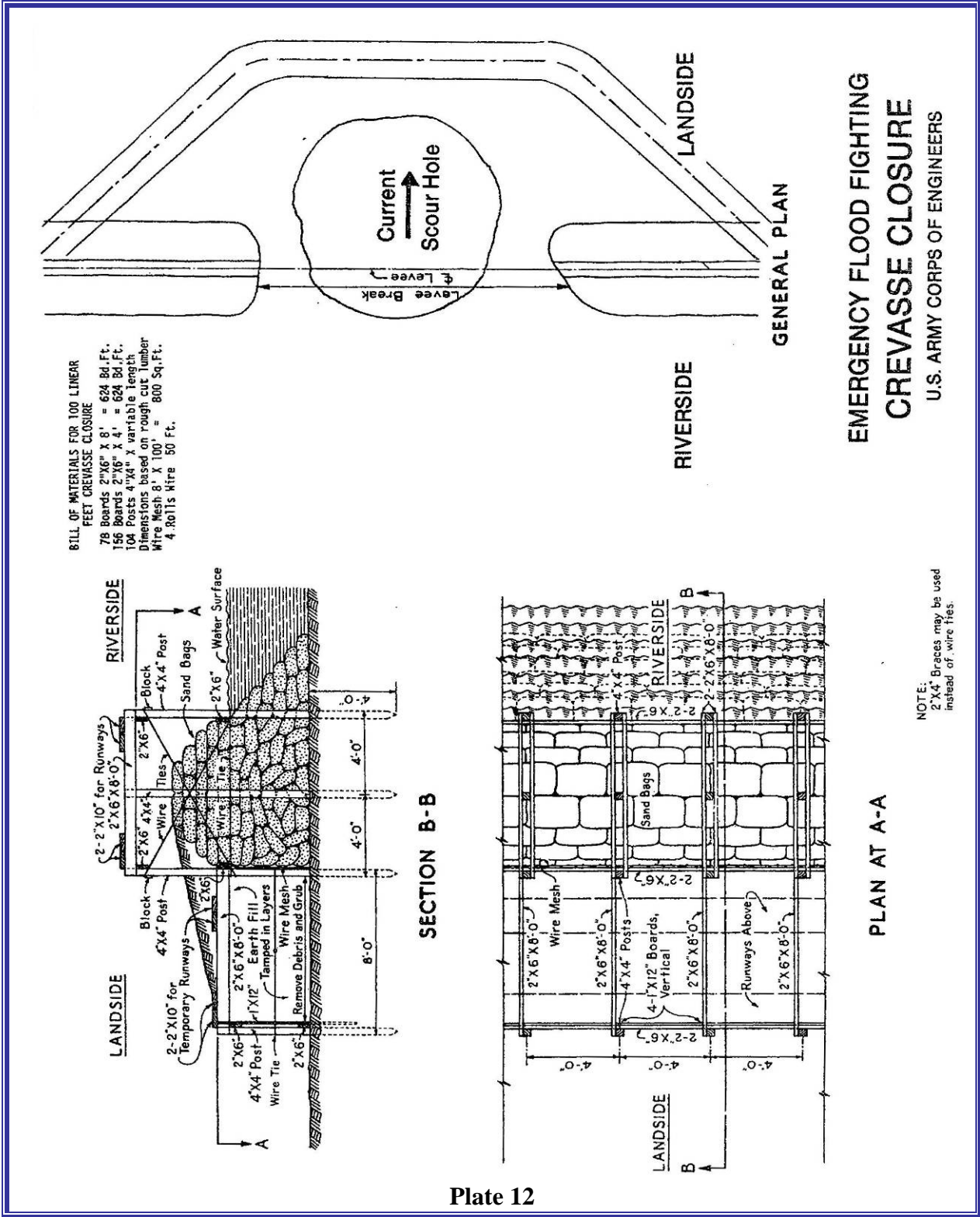
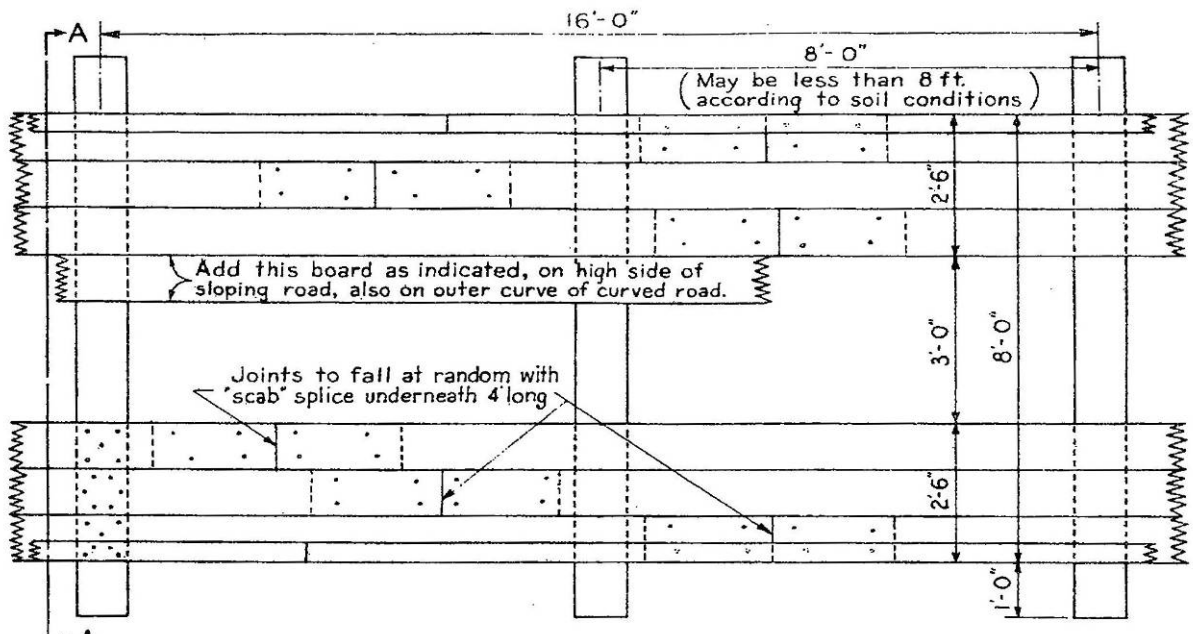


Plate 11

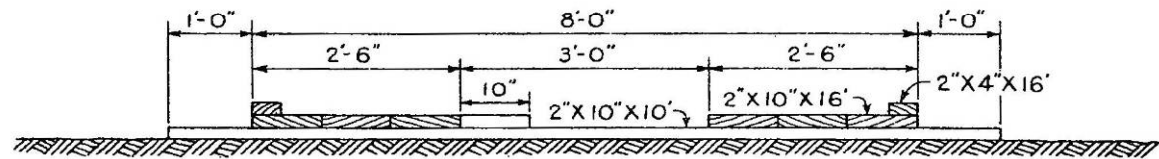


**EMERGENCY FLOOD FIGHTING  
CREVASSE CLOSURE**  
U.S. ARMY CORPS OF ENGINEERS

Plate 12



**PLAN**  
Scale  $\frac{3}{8}'' = 1'-0''$



**SECTION A-A**  
Scale  $\frac{1}{2}'' = 1'-0''$

**BILL OF MATERIALS FOR  
100 LINEAR FEET OF ROADWAY**

Cross Members	13 Pcs.	2" X 10" X 10'	=	217 Bd. Ft.
Road Bed	38 Pcs.	2" X 10" X 16'	=	1014 Bd. Ft.
Guard Rail	13 Pcs.	2" X 4" X 16'	=	139 Bd. Ft.
				<u>Total 1370 Bd. Ft.</u>

18 Lbs. 30d. Common Nails  
10 Lbs. 60d. Common Nails

Kind of Lumber: Hardwood, Rough.

Actual quantities. No allowance made for waste.

**NOTE:**  
Where foundation is very soft, 12 ft. flooring should be used with cross members at 6 ft. centers. In this case add approximately  $33\frac{1}{3}\%$  or  $\frac{1}{3}$  to Bill of Materials at left, for 100 ft. of roadway.

\* Random not less than 12'

**EMERGENCY FLOOD FIGHTING  
PLANK ROAD**  
U.S. ARMY CORPS OF ENGINEERS

**Plate 13**

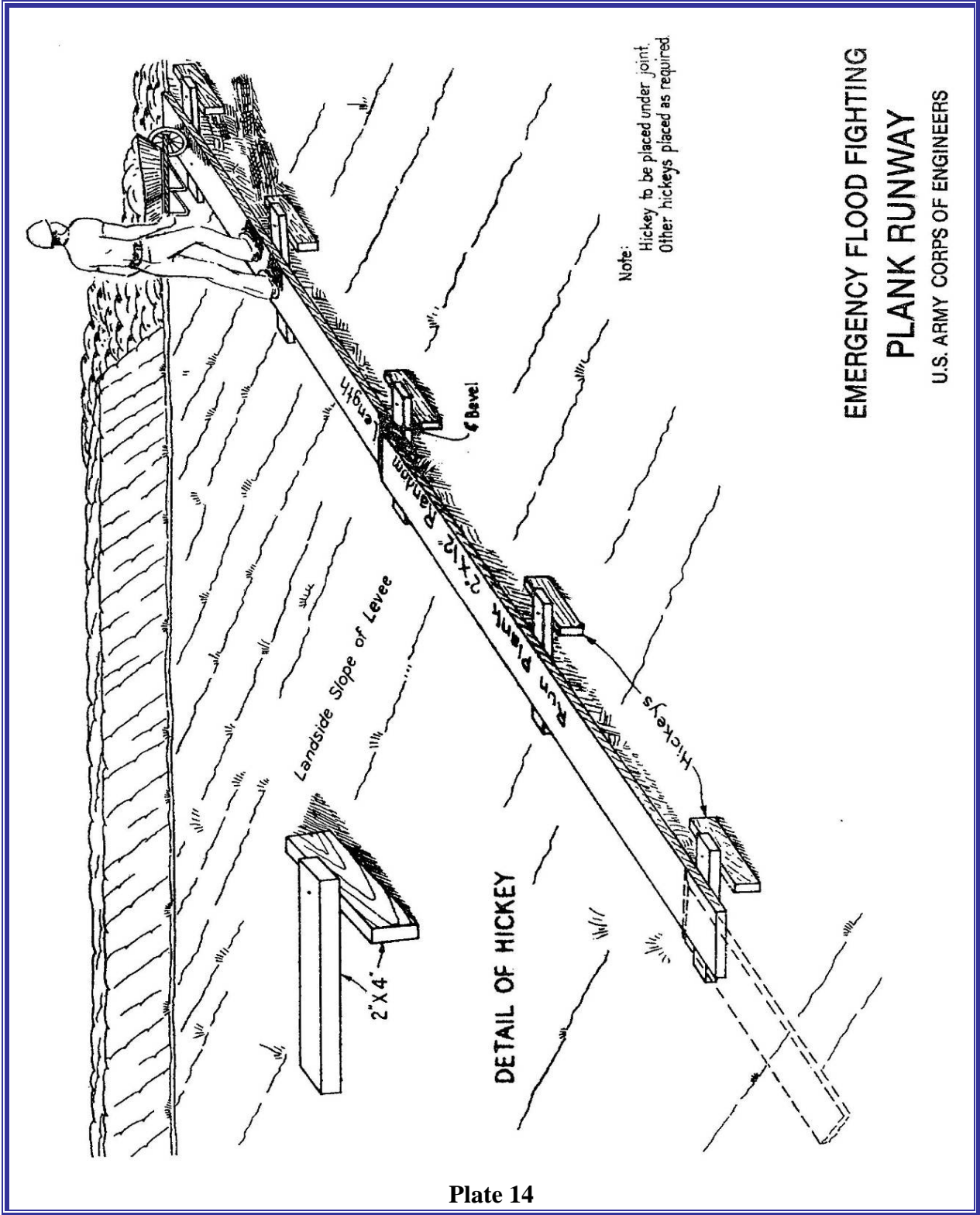


Plate 14

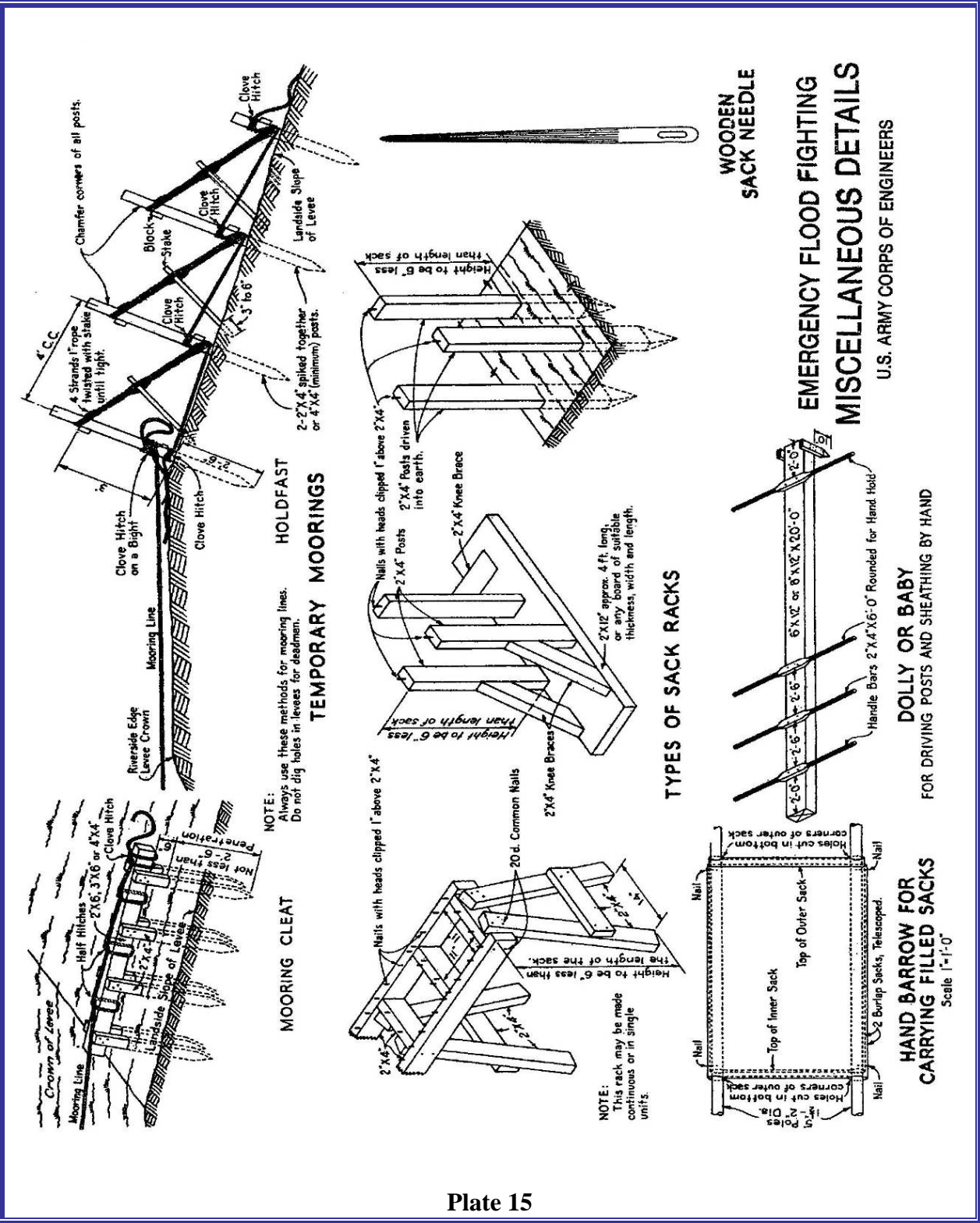


Plate 15

MELODY A. CURREY  
MAYOR

# TOWN OF EAST HARTFORD

740 Main Street  
East Hartford, Connecticut 06108

(860) 291-7340

FAX (860) 289-0831

INSPECTIONS & PERMITS

June 4, 2009

Town of East Hartford  
740 Main Street  
East Hartford, CT 06108

1. Town of East Hartford, **East Hartford Flood Control System**, Requests a variance from Section 601.10 to permit the filling of minor amounts of fill within the floodplain without adding compensatory storage capacity for that additional fill. (Zones R-1, R-4, B-2, B-3, B-4)[Approved by a vote of 5-0]

## ZBA DECISION

Dear Applicant,

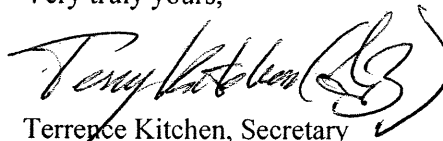
This is to advise you that the above request, at a Public Hearing held on May 28, 2009, was approved by a vote of 5-0.

The decision of the Zoning Board of Appeals may be appealed by a proper party within fifteen (15) days of the date when said decision is published in a newspaper, as required by law. See Section 8-8 (Appeals from board to court) of the Connecticut General Statutes for appeals.

Section 8-7 of the Connecticut General Statutes provides that **"no variance shall be effective until it is filed in the Office of the Town Clerk and the land records" of the Town of East Hartford.** You may obtain the certified variance approval in the office of the Department of Inspections and Permits 15 Days after publication (see dates below) in the newspaper. **It is your responsibility to file the certified variance approval in the Office of the Town Clerk and pay the \$43.00 fee.**

If you have any questions regarding this process, please contact the ZBA Office at 291-7334.

Very truly yours,



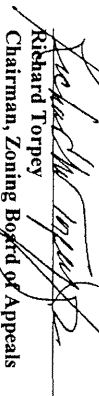
Terrence Kitchen, Secretary  
Zoning Board of Appeals

**Publication Date:** June 5, 2009  
**Recording Date:** June 22, 2009



Town of East Hartford Connecticut  
Zoning Board of Appeals  
Recording of Zoning Variances on the Land Records

Pursuant to Section 3-4 of the Connecticut General Statutes, this is certification that the following Zoning Variance has been approved by the East Hartford Zoning Board of Appeals at its meeting of May 28, 2009 and can be recorded in the land records of the Town of East Hartford, Connecticut.

  
Richard Torpey  
Chairman, Zoning Board of Appeals

Volume: 112 Page: 97 Zones: R-1, R-4, B-2, B-3, B-4 Map: 13 Lot: 467/PT

Property Address: Town of East Hartford Flood Control System

Description of Property (Deed Description):

Beginning at a point on the east line of Main Street on the division line between land of the Releasee and land now or formerly of H. Roberts; thence southwesterly along the said easterly line of Main Street, four hundred (400) feet; thence southeasterly, making an angle of ninety (90) degrees with said east line of Main Street, along other land of the Releasee, seven hundred fifty (750) feet more or less to land now or formerly of E. A. Anderson; thence easterly along land now or formerly of said Anderson, forty (40) feet more or less to land now or formerly of B. H. Adams; thence northerly along land now or formerly of said Adams, four hundred eighty-nine and seven tenths (489.7) feet more or less; thence northeasterly along land now or formerly of said Adams, thirty-four and three tenths (34.3) feet more or less; thence easterly along land now or formerly of said Adams, thirty-four and three tenths (34.3) feet more or less; thence northerly along land now or formerly of H. Roberts; thence westerly along land now or less to land now or formerly of H. Roberts; thence westerly along land now or formerly of said Roberts four hundred eighty-four and four tenths (484.4) feet more or less to the point of beginning.

All as shown on a map entitled: "THE CONNECTICUT COMPANY - HARTFORD LINES - OFFICE OF ENGINEER - NEW HAVEN, CONN. - CARHOUSE PROPERTY - EAST HARTFORD, CONN. - SCALE 1" = 100' DEB. 17, 1925 - CERTIFIED SUBSTANTIALLY CORRECT & APPROVED CHARLES RUFUS HARTZ - ENGINEER V-29"

Nature of variance granted: A variance to permit filling minor amounts of fill within the floodplain without adding compensatory storage capacity.

Stipulations: None.

Section of Zoning Regulations under which relief was sought: Section 601.10 [Town of East Hartford Zoning Regulations, revised to December 31, 2008.]

Town of East Hartford  
Name of Owner of Record

RECEIVED FOR RECORD  
Jun 24 2009 11:48A  
SHARON A. MILLER  
TOWN CLERK  
EAST HARTFORD, CT

**CERTIFIED MAIL  
RETURN RECEIPT REQUESTED**

June 18, 2009

Town of East Hartford  
Bill Taylor, Director of Public Works  
740 Main Street  
East Hartford, CT 06108

Mr. Bill Taylor:

This letter is to notify you of the results of the Town Planning and Zoning Commission's meeting on June 10, 2009 regarding the following:

**SOIL EROSION AND SEDIMENTATION CONTROL APPLICATION – To allow required improvements to the East Hartford Flood Protection system comprised of approximately 20,000 linear feet long.**


**Assessors Map #1, 4, 13, 15 Lots # 2, 31, 468, 1**

**Applicant: Town of East Hartford**

Please be advised that the Commission *Voted (7-0) to Approve* the above Site Plan Application with no conditions.

Please contact me at (860) 291-7301 if you should have any questions.

Sincerely,

  
Michael J. Dayton  
Town Planner

Cc: James Arsenault, Sr., Inspections & Permits  
File

**CERTIFIED MAIL  
RETURN RECEIPT REQUESTED**

June 18, 2009

Town of East Hartford  
Bill Taylor, Director of Public Works  
740 Main Street  
East Hartford, CT 06108

Mr. Bill Taylor:

This letter is to notify you of the results of the Town Planning and Zoning Commission's meeting on June 10, 2009 regarding the following:

**APPLICATION FOR NATURAL RESOURCES REMOVAL AND FILLING  
PERMIT – Under section 218 to allow excavation and filling as part of required  
improvements to the East Hartford flood protection system comprised of  
approximately 20,000 linear feet long.  
Assessors Map # 1,4,13,15 Lots# 2,31,468,1  
Applicant: Town of East Hartford**

Please be advised that the Commission *Voted (7-0)* to *Approve* the above Site Plan Application .

Please contact me at (860) 291-7301 if you should have any questions.

Sincerely,



Michael J. Dayton  
Town Planner

Cc: James Arsenault, Sr., Inspections & Permits  
File

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

June 18, 2009

Town of East Hartford  
Bill Taylor, Director of Public Works  
740 Main Street  
East Hartford, CT 06108

Mr. Bill Taylor:


This letter is to notify you of the results of the Town Planning and Zoning Commission's meeting on June 10, 2009 regarding the following:

**MAJOR FLOOD HAZARD DEVELOPMENT APPLICATION –**  
**Under Section 601 to allow required improvements to the East Hartford**  
**flood protection system comprised of approximately 20,000 linear feet long.**  
**Assessors Map # 1,4,13,15 Lots# 2,31,468,1**  
**Applicant: Town of East Hartford**

Please be advised that the Commission *Voted (7-0)* to *Approve* the above Site Plan Application with no conditions.

Please contact me at (860) 291-7301 if you should have any questions.

Sincerely,

  
Michael J. Dayton  
Town Planner

Cc: James Arsenault, Sr., Inspections & Permits  
File

MARCIA A. LECLERC  
MAYOR

# TOWN OF EAST HARTFORD

Phone: 860 291-7380  
Fax: 860 289-0831

740 Main Street  
East Hartford, Connecticut 06108



ENGINEERING DIVISION

## CERTIFIED MAIL

May 6, 2019

Mr. Keith Chapman, Director of Public Works  
Town of East Hartford  
740 Main Street  
East Hartford, CT 06108

RE: Inland Wetland File #2019-007

Dear Mr. Davis:

This letter is to certify that the Designated Agent for the Inland-Wetlands-Environment Commission of the Town of East Hartford has approved the following:

Application of The Town of East Hartford (File #2019-007) to conduct a regulated activity within the Inland Wetlands Upland Review area in conjunction with the replacement of the Levee Toe Drain along East River Drive.

Approval is granted with the following conditions:

- 1) The permit is non-transferable without the written consent of the Designated Agent.
- 2) Proper erosion controls acceptable to the Town Engineer are to be maintained at all times.
- 3) All work in the Inland Wetlands and/or buffer zone must be commenced within five (5) years from the effective date. The activity must be completed within one (1) year from the commencement of the activity.
- 4) Written notice shall be submitted to the Town Engineer 48 hours prior to the starting date of the approved activity.
- 5) In evaluating this application, the Inland Wetlands Commission has relied on information provided by the applicant, and if such information subsequently proves to be false, deceptive, incomplete and/or inaccurate, this permit shall be modified, suspended or revoked.
- 6) Approval is granted as per plans submitted with the application dated 4/19/19.
- 7) Excess excavated materials, if any, are to be disposed off-site.

Sincerely,

A handwritten signature in blue ink, appearing to read "Warren W. Disbrow". The signature is fluid and cursive, with a large, prominent "W" and "S" at the beginning and end.

Warren W. Disbrow, PE, Assistant Town Engineer  
And Designated Agent for the Inland Wetlands Commission

CC: Jeffrey Cormier, Town Planner  
M. Gregory Grew, Director of Inspections & Permits.

# **Attachment G – Connecticut Department of Labor Prevailing Wage Information**

---

**Minimum Rates and Classifications for  
Heavy/Highway Construction**

ID# 20-10411

**Connecticut Department of Labor  
Wage and Workplace Standards**

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay

Project Number: Toe Drain Repair

Project Town: East Hartford

State#: Toe Drain Repair

FAP#: Toe Drain Repair

Project: Toe Drain Repair

<b>CLASSIFICATION</b>	<b>Hourly</b>	<b>Benefits</b>
1) Boilermaker	33.79	34% + 8.96
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	35.72	33.16
2) Carpenters, Piledrivermen	33.53	25.66
2a) Diver Tenders	33.53	25.66
3) Divers	41.99	25.66
03a) Millwrights	34.94	26.19
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	51.0	21.80
4a) Painters: Brush and Roller	34.62	21.80
4b) Painters: Spray Only	36.62	21.80
4c) Painters: Steel Only	35.62	21.80
4d) Painters: Blast and Spray	37.62	21.80
4e) Painters: Tanks, Tower and Swing	36.62	21.80



Project: Toe Drain Repair

5) Electrician (Trade License required: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	40.0	27.67+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	36.67	35.77 + a
7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9)	43.62	32.06
----LABORERS-----		
8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	30.75	20.84
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	31.0	20.84
10) Group 3: Pipelayers	31.25	20.84
11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators	31.25	20.84
12) Group 5: Toxic waste removal (non-mechanical systems)	32.75	20.84
13) Group 6: Blasters	32.5	20.84
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	31.75	20.84
Group 8: Traffic control signalmen	18.0	20.84
Group 9: Hydraulic Drills	29.3	18.90
----LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and Liner Plate Tunnels in Free Air.----		
13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders	32.98	20.84 + a
13b) Brakemen, Trackmen	32.01	20.84 + a
----CLEANING, CONCRETE AND CAULKING TUNNEL----		

As of: February 25, 2020

14) Concrete Workers, Form Movers, and Strippers	32.01	20.84 + a
15) Form Erectors	32.34	20.84 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		
16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	32.01	20.84 + a
17) Laborers Topside, Cage Tenders, Bellman	31.9	20.84 + a
18) Miners	32.98	20.84 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	39.47	20.84 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	39.27	20.84 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	37.29	20.84 + a
21) Mucking Machine Operator	40.06	20.84 + a
----TRUCK DRIVERS----(*see note below)		
Two axle trucks	29.51	24.52 + a
Three axle trucks; two axle ready mix	29.62	24.52 + a
Three axle ready mix	29.67	24.52 + a
Four axle trucks, heavy duty trailer (up to 40 tons)	29.72	24.52 + a
Four axle ready-mix	29.77	24.52 + a
Heavy duty trailer (40 tons and over)	29.98	24.52 + a

Project: Toe Drain Repair

Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	29.77	24.52 + a
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----POWER EQUIPMENT OPERATORS----

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Group 1: Crane handling or erecting structural steel or stone, hoisting engineer (2 drums or over), front end loader (7 cubic yards or over), Work Boat 26 ft. & Over, Tunnel Boring Machines. (Trade License Required)	40.97	24.80 + a
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Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver (\$3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	40.64	24.80 + a
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Group 3: Excavator/Backhoe under 2 cubic yards; Cranes (under 100 ton rated capacity), Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required)	39.88	24.80 + a
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Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper)	39.48	24.80 + a
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Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24	38.87	24.80 + a
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Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	38.87	24.80 + a
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Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	38.55	24.80 + a
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Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24	38.2	24.80 + a
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Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	37.79	24.80 + a
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Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder).	37.34	24.80 + a
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Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	35.24	24.80 + a
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Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	35.24	24.80 + a
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As of: February 25, 2020

Project: Toe Drain Repair

Group 12: Wellpoint Operator.	35.18	24.80 + a
Group 13: Compressor Battery Operator.	34.58	24.80 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	33.41	24.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	32.99	24.80 + a
Group 16: Maintenance Engineer/Oiler	32.32	24.80 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	36.76	24.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	34.26	24.80 + a

\*\*NOTE: SEE BELOW

----LINE CONSTRUCTION----(Railroad Construction and Maintenance)---

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20) Lineman, Cable Splicer, Technician	48.19	6.5% + 22.00
21) Heavy Equipment Operator	42.26	6.5% + 19.88
22) Equipment Operator, Tractor Trailer Driver, Material Men	40.96	6.5% + 19.21
23) Driver Groundmen	26.5	6.5% + 9.00
23a) Truck Driver	40.96	6.5% + 17.76

----LINE CONSTRUCTION----

24) Driver Groundmen	30.92	6.5% + 9.70
25) Groundmen	22.67	6.5% + 6.20
26) Heavy Equipment Operators	37.1	6.5% + 10.70

Project: Toe Drain Repair

27) Linemen, Cable Splicers, Dynamite Men	41.22	6.5% + 12.20
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28) Material Men, Tractor Trailer Drivers, Equipment Operators	35.04	6.5% + 10.45
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Project: Toe Drain Repair

Welders: Rate for craft to which welding is incidental.

\*Note: Hazardous waste removal work receives additional \$1.25 per hour for truck drivers.

**ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra \$4.00 premium in addition to the hourly wage rate and benefit contributions:**

- 1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)**
- 2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson**

Crane with 150 ft. boom (including jib) - \$1.50 extra

Crane with 200 ft. boom (including jib) - \$2.50 extra

Crane with 250 ft. boom (including jib) - \$5.00 extra

Crane with 300 ft. boom (including jib) - \$7.00 extra

Crane with 400 ft. boom (including jib) - \$10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work

--Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing

*The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.*

*Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.*

*It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.*

*The annual adjustments will be posted on the Department of Labor's Web page: [www.ct.gov/dol](http://www.ct.gov/dol). For those without internet access, please contact the division listed below.*

*The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.*

*All subsequent annual adjustments will be posted on our Web Site for contractor access.*

*Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.*

*Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage*

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

**As of:** February 25, 2020

Project: Toe Drain Repair

**~~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 clause (29 CFR 5.5 (a) (1) (ii)).**

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.



Opportunity \* Guidance \* Support



# **THIS IS A PUBLIC WORKS PROJECT**

## **Covered by the**

# **PREVAILING WAGE LAW**

## **CT General Statutes Section 31-53**

**If you have QUESTIONS regarding your wages  
CALL (860) 263-6790**

Section 31-55 of the CT State Statutes requires every contractor or subcontractor performing work for the state to post in a prominent place the prevailing wages as determined by the Labor Commissioner.



**Sec. 31-53b. Construction safety and health course. New miner training program. Proof of completion required for mechanics, laborers and workers on public works projects. Enforcement. Regulations. Exceptions.** (a) Each contract for a public works project entered into on or after July 1, 2009, by the state or any of its agents, or by any political subdivision of the state or any of its agents, described in subsection (g) of section 31-53, shall contain a provision requiring that each contractor furnish proof with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

(b) Any person required to complete a course or program under subsection (a) of this section who has not completed the course or program shall be subject to removal from the worksite if the person does not provide documentation of having completed such course or program by the fifteenth day after the date the person is found to be in noncompliance. The Labor Commissioner or said commissioner's designee shall enforce this section.

(c) Not later than January 1, 2009, the Labor Commissioner shall adopt regulations, in accordance with the provisions of chapter 54, to implement the provisions of subsections (a) and (b) of this section. Such regulations shall require that the ten-hour construction safety and health courses required under subsection (a) of this section be conducted in accordance with federal Occupational Safety and Health Administration Training Institute standards, or in accordance with Federal Mine Safety and Health Administration Standards or in accordance with 29 CFR 1910.268, as appropriate. The Labor Commissioner shall accept as sufficient proof of compliance with the provisions of subsection (a) or (b) of this section a student course completion card issued by the federal Occupational Safety and Health Administration Training Institute, or such other proof of compliance said commissioner deems appropriate, dated no earlier than five years before the commencement date of such public works project.

(d) This section shall not apply to employees of public service companies, as defined in section 16-1, or drivers of commercial motor vehicles driving the vehicle on the public works project and delivering or picking up cargo from public works projects provided they perform no labor relating to the project other than the loading and unloading of their cargo.

(P.A. 06-175, S. 1; P.A. 08-83, S. 1.)

History: P.A. 08-83 amended Subsec. (a) by making provisions applicable to public works project contracts entered into on or after July 1, 2009, replacing provision re total cost of work with reference to Sec. 31-53(g), requiring proof in certified payroll form that new mechanic, laborer or worker has completed a 10-hour or more construction safety course and adding provision re new miner training program, amended Subsec. (b) by substituting "person" for "employee" and adding "or program", amended Subsec. (c) by adding "or in accordance with Federal Mine Safety and Health Administration Standards" and setting new deadline of January 1, 2009, deleted former Subsec. (d) re "public building", added new Subsec. (d) re exemptions for public service company employees and delivery drivers who perform no labor other than delivery and made conforming and technical changes, effective January 1, 2009.

# **Informational Bulletin**

## **THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE**

(applicable to public building contracts entered into *on or after July 1, 2007*, where the total cost of all work to be performed is at least \$100,000)

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is [http://www.osha.gov/fso/ote/training/edcenters/fact\\_sheet.html](http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html);
- (6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;
- (7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;
- (8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;
- (9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;

- (10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;
- (11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;
- (12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;
- (13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;
- (14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and
- (15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.
- (16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of <http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm>; or by telephone at (860)263-6790.

**THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.**

November 29, 2006

**Notice**  
**To All Mason Contractors and Interested Parties**  
**Regarding Construction Pursuant to Section 31-53 of the**  
**Connecticut General Statutes (Prevailing Wage)**

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute.

Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute.

The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

**Forklift Operator:**

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.
- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

***Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.***

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

## STATUTE 31-55a

### - SPECIAL NOTICE -

**To: All State and Political Subdivisions, Their Agents, and Contractors**

**Connecticut General Statute 31-55a - Annual adjustments to wage rates by contractors doing state work.**

*Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54 of the general statutes, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.*

- The prevailing wage rates applicable to any contract or subcontract awarded on or after October 1, 2002 are subject to annual adjustments each July 1st for the duration of any project which was originally advertised for bids on or after October 1, 2002.
- Each contractor affected by the above requirement shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the **contractor's** responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's Web Site. The annual adjustments will be posted on the Department of Labor Web page: [www.ctdol.state.ct.us](http://www.ctdol.state.ct.us). For those without internet access, please contact the division listed below.
- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project. All subsequent annual adjustments will be posted on our Web Site for contractor access.

**Any questions should be directed to the Contract Compliance Unit, Wage and Workplace Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd., Wethersfield, CT 06109 at (860)263-6790.**

CONNECTICUT DEPARTMENT OF LABOR  
WAGE AND WORKPLACE STANDARDS DIVISION

**CONTRACTORS WAGE CERTIFICATION FORM**  
**Construction Manager at Risk/General Contractor/Prime Contractor**

I, \_\_\_\_\_ of \_\_\_\_\_  
Officer, Owner, Authorized Rep. Company Name

do hereby certify that the \_\_\_\_\_  
Company Name  
\_\_\_\_\_  
Street  
\_\_\_\_\_  
City

and all of its subcontractors will pay all workers on the  
\_\_\_\_\_  
Project Name and Number  
\_\_\_\_\_  
Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is attached hereto).

\_\_\_\_\_  
Signed

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
Notary Public

Return to:  
Connecticut Department of Labor  
Wage & Workplace Standards Division  
200 Folly Brook Blvd.  
Wethersfield, CT 06109

Rate Schedule Issued (Date): \_\_\_\_\_





**\*FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker’s compensation, income taxes, etc.).

Please specify the type of benefits provided:

- 1) Medical or hospital care \_\_\_\_\_ 4) Disability \_\_\_\_\_
- 2) Pension or retirement \_\_\_\_\_ 5) Vacation, holiday \_\_\_\_\_
- 3) Life Insurance \_\_\_\_\_ 6) Other (please specify) \_\_\_\_\_

**CERTIFIED STATEMENT OF COMPLIANCE**

For the week ending date of \_\_\_\_\_,

I, \_\_\_\_\_ of \_\_\_\_\_, (hereafter known as Employer) in my capacity as \_\_\_\_\_ (title) do hereby certify and state:

**Section A:**

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

- a) The records submitted are true and accurate;
- b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;
- c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);
- d) Each such person is covered by a worker’s compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;
- e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and
- f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA~The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such persons name first appears.

\_\_\_\_\_ (Signature)                      \_\_\_\_\_ (Title)                      \_\_\_\_\_ Submitted on (Date)

**\*\*\*THIS IS A PUBLIC DOCUMENT\*\*\*  
\*\*\*DO NOT INCLUDE SOCIAL SECURITY NUMBERS\*\*\***

**PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS**

**WEEKLY PAYROLL**

PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION  Trade License Type & Number - OSHA 10 Certification Number	DAY AND DATE							Total ST Hours  Total O/T Hours	BASE HOURLY RATE  TOTAL FRINGE BENEFIT PLAN CASH	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS				GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
				S	M	T	W	TH	F	S					FICA	FEDERAL WITH- HOLDING	STATE WITH- HOLDING	LIST OTHER		
				HOURS WORKED EACH DAY																
											\$ Base Rate	1. \$ 2. \$ 3. \$								
											\$ Cash Fringe	4. \$ 5. \$ 6. \$								
											\$ Base Rate	1. \$ 2. \$ 3. \$								
											\$ Cash Fringe	4. \$ 5. \$ 6. \$								
											\$ Base Rate	1. \$ 2. \$ 3. \$								
											\$ Cash Fringe	4. \$ 5. \$ 6. \$								
											\$ Base Rate	1. \$ 2. \$ 3. \$								
											\$ Cash Fringe	4. \$ 5. \$ 6. \$								

\*IF REQUIRED



# CONNECTICUT DEPARTMENT OF LABOR

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## OCCUPATIONAL CLASSIFICATION BULLETIN

The Connecticut Department of Labor has the responsibility to properly determine "job classification" on prevailing wage projects covered under C.G.S. Section 31-53.

*Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification.*

**Below are additional clarifications of specific job duties performed for certain classifications:**

- **ASBESTOS WORKERS**

- Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

- **ASBESTOS INSULATOR**

- Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

- **BOILERMAKERS**

- Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

- **BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS**

- Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

- **CARPENTERS, MILLWRIGHTS. PILEDRIVERMEN. LATHERS. RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS**

- Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

- **CLEANING LABORER**

- The clean up of any construction debris and the general cleaning, including sweeping, wash down, mopping, wiping of the construction facility, washing, polishing, dusting, etc., prior to the issuance of a certificate of occupancy falls under the *Labor classification*.

- **DELIVERY PERSONNEL**

- If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator,

electrician, ironworker, plumber, etc.

- An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer/tradesman and not a delivery personnel.

#### • **ELECTRICIANS**

- Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. **\*License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.**

#### • **ELEVATOR CONSTRUCTORS**

- Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. **\*License required by Connecticut General Statutes: R-1,2,5,6.**

#### • **FORK LIFT OPERATOR**

- Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.
- Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

#### • **GLAZIERS**

- Glazing wood and metal sash, doors, partitions, and 2 story aluminum storefronts. Installs glass windows, skylights, store fronts and display cases or surfaces such as building fronts, interior walls, ceilings and table tops and metal store fronts. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which requires either a blended rate or equal composite workforce.

#### • **IRONWORKERS**

- Erection, installation and placement of structural steel, precast concrete, miscellaneous iron, ornamental iron, metal curtain wall, rigging and reinforcing steel. Handling, sorting, and installation of reinforcing steel (rebar). Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which requires either a blended rate or equal composite workforce. Insulated metal and insulated composite panels are still installed by the Ironworker.

#### • **INSULATOR**

- Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings. Past practice using the applicable licensed trades, Plumber, Sheet Metal, Sprinkler Fitter, and Electrician, is not inconsistent with the Insulator classification and would be permitted.

#### • **LABORERS**

- Acetylene burners, asphalt rakers, chain saw operators, concrete and power buggy operator, concrete saw operator, fence and guard rail erector (except metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation.), hand operated concrete vibrator operator, mason tenders, pipelayers (installation of storm drainage or sewage lines on the street only), pneumatic drill operator, pneumatic gas and electric drill operator, powermen and wagon drill operator, air track operator, block paver, curb setters, blasters, concrete spreaders.

#### • **PAINTERS**

- Maintenance, preparation, cleaning, blasting (water and sand, etc.), painting or application of any protective coatings of every description on all bridges and appurtenances of highways, roadways, and railroads. Painting, decorating, hardwood finishing, paper hanging, sign writing, scenic art work and drywall hanging+ for any and all types of building and residential work.

#### • **LEAD PAINT REMOVAL**

- Painter's Rate
  1. Removal of lead paint from bridges.
  2. Removal of lead paint as preparation of any surface to be repainted.
  3. Where removal is on a Demolition project prior to reconstruction.
- Laborer's Rate
  1. Removal of lead paint from any surface NOT to be repainted.
  2. Where removal is on a *TOTAL* Demolition project only.

#### • **PLUMBERS AND PIPEFITTERS**

- Installation, repair, replacement, alteration or maintenance of all plumbing, heating, cooling and piping. **\*License required per Connecticut General Statutes: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.**

## . POWER EQUIPMENT OPERATORS

- Operates several types of power construction equipment such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and maintains equipment. **\*License required, crane operators only, per Connecticut General Statutes.**

## . ROOFERS

- Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and gravel to waterproof roofs, including preparation of surface. (tear-off and/or removal of any type of roofing and/or clean-up of any and all areas where a roof is to be relaid)

## . SHEETMETAL WORKERS

- Fabricate, assemble, install and repair sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters. Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, fascia, louvers, partitions, wall panel siding, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Insulated metal and insulated composite panels are still installed by the Iron Worker. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers.

## . SPRINKLER FITTERS

- Installation, alteration, maintenance and repair of fire protection sprinkler systems. **\*License required per Connecticut General Statutes: F-1,2,3,4.**

## . TILE MARBLE AND TERRAZZO FINISHERS

- Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

## . TRUCK DRIVERS

### ◦ Definitions:

- 1) "Site of the work" (29 Code of Federal Regulations (CFR) 5.2(l)(b) is the physical place or places where the building or work called for in the contract will remain and any other site where a significant portion of the building or work is constructed, provided that such site is established specifically for the performance of the contract or project;
  - (a) Except as provided in paragraph (l) (3) of this section, job headquarters, tool yards, batch plants, borrow pits, etc. are part of the "site of the work"; provided they are dedicated exclusively, or nearly so, to the performance of the contract or project, and provided they are adjacent to "the site of work" as defined in paragraph (e)(1) of this section;
  - (b) Not included in the "site of the work" are permanent home offices, branch plant establishments, fabrication plants, tool yards etc, of a contractor or subcontractor whose location and continuance in operation are determined wholly without regard to a particular State or political subdivision contract or uncertain and indefinite periods of time involved of a few seconds or minutes duration and where the failure to count such time is due to consideration justified by industrial realities (29 CFR 785.47)
- 2) "Engaged to wait" is waiting time that belongs to and is controlled by the employer which is an integral part of the job and is therefore compensable as hours worked. (29 CFR 785.15)
- 3) "Waiting to be engaged" is waiting time that an employee can use effectively for their own purpose and is not compensable as hours worked. (29 CFR 785.16)
- 4) "De Minimus" is a rule that recognizes that unsubstantial or insignificant periods of time which cannot as a practical administrative matter be precisely recorded for payroll purposes, may be disregarded. This rule applies only where there are uncertain and indefinite periods of time involved of a short duration and where the failure to count such time is due to consideration justified by worksite realities. For example, with respect to truck drivers on prevailing wage sites, this is typically less than 15 minutes at a time.

### ◦ Coverage of Truck Drivers on State or Political subdivision Prevailing Wage Projects

- Truck drivers **are covered** for payroll purposes under the following conditions:
  - Truck Drivers for time spent working on the site of the work.
  - Truck Drivers for time spent loading and/or unloading materials and supplies on the site of the work, if such time is not de minimus
  - Truck drivers transporting materials or supplies between a facility that is deemed part of the site of the work and the actual construction site.

- Truck drivers transporting portions of the building or work between a site established specifically for the performance of the contract or project where a significant portion of such building or work is constructed and the physical places where the building or work outlined in the contract will remain.

*For example: Truck drivers delivering asphalt are covered under prevailing wage while "engaged to wait" on the site and when directly involved in the paving operation, provided the total time is not "de minimus"*

- Truck Drivers **are not** covered in the following instances:
  - Material delivery truck drivers while off "the site of the work"
  - Truck Drivers traveling between a prevailing wage job and a commercial supply facility while they are off the "site of the work"
  - Truck drivers whose time spent on the "site of the work" is de minimus, such as under 15 minutes at a time, merely to drop off materials or supplies, including asphalt.

*These guidelines are similar to U.S. Labor Department policies. The application of these guidelines may be subject to review based on factual considerations on a case by case basis.*

**For example:**

- Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
- Hauling material off site is not covered provided they are not dumping it at a location outlined above.
- Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

*Any questions regarding the proper classification should be directed to:*

Public Contract Compliance Unit  
Wage and Workplace Standards Division  
Connecticut Department of Labor  
200 Folly Brook Blvd, Wethersfield, CT 06109  
(860) 263-6543

200 Folly Brook Boulevard, Wethersfield, CT 06109 / Phone: 860-263-6000  
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**Connecticut Department of Labor  
Wage and Workplace Standards Division  
FOOTNOTES**

⇒ Please Note: If the “Benefits” listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the “Benefits” section for the occupation lists only a dollar amount, disregard the information below.

**Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons**  
(Building Construction) and  
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

- a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

**Elevator Constructors: Mechanics**

- a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Veterans’ Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.
- b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

**Glaziers**

- a. Paid Holidays: Labor Day and Christmas Day.

**Power Equipment Operators**  
(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year’s Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

**Ironworkers**

- a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

**Laborers (Tunnel Construction)**

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

**Roofers**

- a. Paid Holidays: July 4<sup>th</sup>, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

**Sprinkler Fitters**

- a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

**Truck Drivers**

(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.



# Attachment H – Supplemental Geotechnical and Environmental Data

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Geotechnical  
Environmental  
Water Resources  
Ecological

March 26, 2013  
Project 124390

Mr. Nick Casparino, P.E.  
Civil Engineer  
Town Hall  
740 Main Street  
East Hartford, CT 06108

Dear Mr. Casparino:

**Re: Supplemental Geotechnical and Environmental Data Report  
Toe Drain Design – Phase 1  
East Hartford Flood Control System  
East Hartford, Connecticut**

The purpose of this letter report is to summarize the results of our subsurface exploration program for Phase 1 of the East Hartford Flood Control System Toe Drain Design. The purpose of the subsurface exploration program was to assist in characterizing the levee and foundation materials at the proposed toe drain locations and aid in the engineering design of the toe drain. We also assessed the current condition of the collector drain within the repair area. The repair area is located between Sta. 132+24 (south of the Bulkeley Bridge) and Sta. 161+50 (near the East River Drive crossing) as shown on Figure 1.

Work was performed in accordance with our subsurface exploration work plan dated June 4, 2012 and our supplemental environmental characterization work plan dated December 13, 2012.

### **Scope of Work**

We performed the following:

- Reviewed existing boring logs, test pits logs, and geotechnical lab data.
- Performed five test pit excavations along the proposed toe drain alignment.
- Performed twelve direct-push borings.
- Installed a groundwater observation well in one of the borings.
- Performed geotechnical and environmental lab testing on soil samples collected.
- Performed groundwater sampling from the installed well.
- Performed closed circuit television (CCTV) inspection of collector drain pipes.
- Prepared this report presenting the data.

A GEI representative was on site full time during the work.

## **Existing Information**

In 2008 we completed a field exploration program as part of the FEMA Accreditation program. The results of the field exploration program, as well as a compilation of other subsurface explorations performed along and near the levee alignment were summarized in our Geotechnical Data Report (GEI, 2009). Existing subsurface information includes borings and test pits along the toe drain alignment at the locations shown in Figures 2 and 3 and associated geotechnical lab testing on the proposed toe drain foundation and adjacent soils.

## **Test Pits**

We engaged Geologic Earth-Explorations, Inc. to perform two days of test pit excavations with a hydraulic excavator to expose levee and foundation material along the landside toe of the levee and proposed locations of the toe drain. Additionally, the test pits exposed buried manholes adjacent to the Riverpoint Condominium Floodwall.

Geologic excavated five test pits (GEI-01 to GEI-05) on July 11 and 12, 2012 at the locations shown on Figures 2 and 3. Geologic separated the top layer of loamy soil from the remainder of the excavated soil and stockpiled it separately. We collected soil samples from the test pits to be used for laboratory testing (see Laboratory Testing below). Once logging and sampling was completed, test pits were backfilled with the excavated materials and compacted in 12-inch-loose lifts with a vibratory compactor. GEI's field engineer observed and documented the compaction. After the test pit was backfilled, the separated loamy soil and additional topsoil, as needed, was placed on the top of the test pit backfill. Grassy areas were raked and reseeded, as needed.

Logs of the test pits, including measured dimensions, soil classification and descriptions, and additional observations are included in Attachment 1.

## **Direct-Push and Hand Augers Borings**

As a result of observed environmental-impacted soil in GEI-02 and GEI-03, we engaged American Environmental Assessment Corp. (AES) to drill direct-push borings to evaluate the nature and extent of environmental impacts.

AES drilled twelve borings (GP-01 to GP-12) using a track-mounted Geoprobe® drill rig on February 6 and 7, 2013 as shown on Figures 2 and 3. Soil samples were collected in continuous 5-foot intervals. We selected soil samples from the borings to be used for environmental laboratory testing (see Laboratory Testing below).

A monitoring well was installed in one of the borings (GP-11). The boring with the installed well was marked with an (MW) suffix. The depth of the well was approximately 15 feet and a 10-ft-long screen was set at the bottom of the well.

On February 22, 2013, we performed two hand-augered borings near GP-11 and GP-12 to 4 feet below ground surface. The hand-augered borings were offset within approximately 2-feet from the respective Geoprobe® boring. The offset boring was named similar to the adjacent boring with an alphabetical suffix (e.g. GP-12 and GP-12A).

Boring and well logs are included in Attachment 1.

## Groundwater Sampling

On February 2, 2013, we sampled groundwater from GP-11(MW) to characterize water for discharge.

Prior to sampling, depths to groundwater were gauged in the monitoring well with a water level indicator. Low-flow sampling and purging was performed using a peristaltic pump with dedicated tubing in each monitoring well. Each well was purged at approximately 300 milliliter (mL) per minute to minimize draw-down of the static water level.

Groundwater purged from each well was monitored for field parameters (temperature, pH, conductivity, dissolved oxygen [DO], oxidation/reduction potential [ORP], and turbidity) to evaluate the representativeness of the sampled formation water.

After each groundwater sample location was purged, a groundwater sample was collected and placed into preserved containers for environmental lab testing (see below).

## Laboratory Testing

We performed geotechnical lab testing on test pit soil samples. Particle size analysis was performed in accordance with ASTM D422 on selected soil samples. The results of the analyses are included in Attachment 2.

Environmental lab sampling was performed on the soil samples collected in GEI-03. Additionally, environmental lab sampling was performed on at least one soil sample from each of the borings (GP-1 to GP-12). One groundwater sample was collected and tested from GP-11(MW). The analyses were performed by Phoenix Environmental Laboratories, Inc. of Manchester, Connecticut.

Soil samples were analyzed for the following parameters in accordance with the methods indicated.

- Volatile organic compounds (VOCs) – EPA Method 8260.
- Semi-volatile organic compounds (SVOCs) – EPA Method 8270.
- Polychlorinated biphenyls (PCBs) – EPA Method 8082.
- Total petroleum hydrocarbons, (TPH) – CT DEEP Extractable TPH Method.
- Total metals (RCRA-8).
- TCLP metals, if total metal concentrations in ppm exceed twenty times the hazardous waste criteria in ppm.
- Waste characterization parameters (pH, flash point, reactivity and conductivity).

Groundwater samples were analyzed for the same parameters listed above excluding PCBs, TCLP metals, and waste characterization parameters.

Soil and groundwater results are summarized in Tables 1 and 2, respectively. The raw data is included in Attachment 3.

## Collector Drain Inspection

We engaged New England Pipe Cleaning Company (NEPCCO) to CCTV the collector drains near Pitkin Street Pump Station and north of the Founders Bridge.

NEPCCO accessed the collector drain pipes via manholes and catch basins from the parking areas near Pitkin Street Pump Station and 99-101 East River Drive. We did not observe deficiencies (i.e. cracking, joint separation, etc.) in the pipe inspected. However, sections of pipe were unable to be inspected due to the accumulation of deposits in the pipe. Particularly, a section of collector drain beneath the 99-101 East River Drive Parking lot was filled with approximately 30% debris and soil.

A summary of our CCTV inspection observations and NEPCCO's CCTV inspection report is presented in Attachment 4. Recordings of the CCTV inspections are provided in Attachment 5 in DVD format.

## Limitations and Closure

The data presented in this report are based on a limited number of explorations and tests performed by GEI and on previous explorations performed by others. Subsurface conditions and material properties presented in this report are known only at the exploration locations. Conditions between explorations may vary. The nature and extent of the variations may not become evident until subsequent phases of investigation or future construction.

Our work was performed in accordance with generally accepted engineering practices. No warranty, express or implied, is made.

Please contact me at 781-721-4023 if you have any questions.

Sincerely,

GEI CONSULTANTS, INC.



Jim Nickerson, P.E., Project Manager

JFN:mrh

Attachments:

- Figure 1: Site Location Plan
- Figure 2: Exploration Location Plan (1 of 2)
- Figure 3: Exploration Location Plan (2 of 2)
- Table 1: Summary of Detected Soil Analytes
- Table 2: Summary of Detected Groundwater Analytes
- Attachment 1: Boring, Test Pit, and Well Logs
- Attachment 2: Geotechnical Lab Testing
- Attachment 3: Environmental Lab Testing
- Attachment 4: CCTV Inspection
- Attachment 5: DVD – CCTV Recordings

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# Tables

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**Table 1  
Summary of Detected Soil Analytes  
Town of East Hartford  
Toe Drain Design Phase 1  
East Hartford, CT**

Sample Name	GEI-03	GP-1	GP-2	GP-3	GP-4		
Sample Interval	S1 (4-6')	S2 (6-8')	S2 (6-8')	S2 (6-8')	S2 (9-10')		
Sample Date	7/11/2012	2/7/2013	2/7/2013	2/7/2013	2/6/2013		
<b>Volatile Organic Compounds (VOC) (µg/kg)</b>							
	R-DEC (µg/kg)	GA-PMC (µg/kg)					
1,2,4-Trimethylbenzene	NE	NE	12000	ND	ND	ND	ND
1,3,5-Trimethylbenzene	NE	NE	2400	ND	ND	ND	ND
Naphthalene	NE	NE	4900	ND	ND	ND	ND
n-Butylbenzene	NE	NE	1800	ND	ND	ND	ND
n-Propylbenzene	NE	NE	1400	ND	ND	ND	ND
<b>Semi-Volatile Organic Compounds (SVOC) (µg/kg)</b>							
	R-DEC (µg/kg)	GA-PMC (µg/kg)					
2-Methylnaphthalene	NE	NE	26000	ND	ND	ND	ND
Acenaphthene	NE	NE	2100	ND	ND	ND	ND
Benz(a) anthracene	1000	1000	ND	ND	ND	320	350
Benzo(a)pyrene	1000	1000	ND	ND	ND	360	610
Benzo(b) flouranthene	1000	1000	ND	ND	ND	440	1000
Benzo(ghi) perylene	1000000	4200	ND	ND	ND	ND	600
Benzo(k) fluoranthene	8400	1000	ND	ND	ND	ND	380
Chrysene	84000	1#	ND	ND	ND	330	720
Flourene	1000000	5600	4300	ND	ND	ND	ND
Flouranthene	1000000	5600	ND	ND	ND	420	1100
Indeno(1,2,3-cd) pyrene	1000	1000	ND	ND	ND	ND	460
Napthalene	1000	5.6	<b>3500</b>	ND	ND	ND	ND
Phenanthrene	1000000	4000	<b>13000</b>	ND	ND	ND	310
Pyrene	1000000	4000	ND	ND	ND	430	900
<b>Total Metals (mg/kg)</b>							
	R-DEC (mg/kg)	GA-PMC (mg/kg)					
Silver	340	---	<0.42	<0.36	<0.34	<0.42	<0.36
Arsenic	10	---	3.5	<0.7	1.9	2.7	0.8
Barium	4700	---	45.6	62.4	14.8	61.1	24.7
Cadmium	34	---	<0.42	<0.36	<0.34	<0.42	<0.36
Chromium	NE	---	20.4	15.8	8.4	25.9	15.1
Mercury	20	---	0.16	<0.08	<0.08	0.2	<0.08
Lead	500	---	36.0	3.64	7.12	55	20.1
Selenium	340	---	<1.7	<1.4	<1.3	<1.7	<1.5
<b>Total Petroleum Hydrocarbons (Extractable Product)</b>							
	R-DEC (mg/kg)	GA-PMC (mg/kg)					
Ext Petroleum HC	500	500	<b>3500</b>	ND	ND	ND	12
<b>Waste Characterization Parameter</b>							
	Hazardous Waste Criteria						
pH - Soil (S.U.)	<2 or >12.5		6.79	8.48	8.41	7.84	7.66
Conductivity - Soil Matrix (umhos/cm)	---		17	26	17	39	91
Flash Point (degrees F)	<140° F		>200	>200	>200	>200	>200
Reactivity			Neg	Neg	Neg	Neg	Neg

**Notes;**

VOC's - volatile organic compounds

SVOC's - semivolatile organic compounds

mg/kg - milligrams/ kilogram or parts per million

ug/kg - micrograms/ kilogram or parts per billion

mg/L - milligrams per liter or parts per million

umhos/cm - micromhos per centimeter

1#- Criteria based on detection limit

Bolded and shaded areas denote concentrations above applicable criteria

R-DEC - Residential Direct exposure Criteria for Soil

GA-PMC - Pollutant Mobility Criteria for Soil in GA areas

NE- Not established

ND- Not detected, total concentration is listed as ND because no compounds were detected in the group

**Table 1  
Summary of Detected Soil Analytes  
Town of East Hartford  
Toe Drain Design Phase 1  
East Hartford, CT**

Sample Name	GP-5	GP-6	GP-7	GP-8	GP-9	GP-10
Sample Interval	S2 (9-10')	S2 (9-10')	S2 (9-10')	S2 (9-10')	S2 (7-8')	S2 (5-6')
Sample Date	2/6/2013	2/6/2013	2/6/2013	2/6/2013	2/6/2013	2/6/2013
<b>Volatile Organic Compounds (VOC) (µg/kg)</b>						
	R-DEC (µg/kg)	GA-PMC (µg/kg)				
1,2,4-Trimethylbenzene	NE	NE	ND	ND	ND	ND
1,3,5-Trimethylbenzene	NE	NE	ND	ND	ND	ND
Naphthalene	NE	NE	ND	ND	ND	ND
n-Butylbenzene	NE	NE	ND	ND	ND	ND
n-Propylbenzene	NE	NE	ND	ND	ND	ND
<b>Semi-Volatile Organic Compounds (SVOC) (µg/kg)</b>						
	R-DEC (µg/kg)	GA-PMC (µg/kg)				
2-Methylnaphthalene	NE	NE	ND	ND	ND	ND
Acenaphthene	NE	NE	ND	ND	ND	ND
Benz(a) anthracene	1000	1000	ND	ND	ND	ND
Benzo(a)pyrene	1000	1000	ND	ND	ND	ND
Benzo(b) flouranthene	1000	1000	330	ND	ND	ND
Benzo(ghi) perylene	1000000	4200	ND	ND	ND	ND
Benzo(k) fluoranthene	8400	1000	ND	ND	ND	ND
Chrysene	84000	1#	ND	ND	ND	ND
Flourene	1000000	5600	ND	1800	ND	ND
Flouranthene	1000000	5600	400	ND	ND	ND
Indeno(1,2,3-cd) pyrene	1000	1000	ND	ND	ND	ND
Napthalene	1000	5.6	ND	ND	ND	ND
Phenanthrene	1000000	4000	ND	<b>5600</b>	ND	ND
Pyrene	1000000	4000	390	ND	ND	ND
<b>Total Metals (mg/kg)</b>						
	R-DEC (mg/kg)	GA-PMC (mg/kg)				
Silver	340	---	<0.39	<0.43	<0.44	<0.39
Arsenic	10	---	1.7	2.6	<0.09	1
Barium	4700	---	58.8	55.4	30.2	37.2
Cadmium	34	---	<0.39	<0.43	<0.44	<0.39
Chromium	NE	---	20	21.6	12.1	13.5
Mercury	20	---	0.54	0.27	<0.08	<0.07
Lead	500	---	57.6	40.7	2.52	3.22
Selenium	340	---	<1.5	<1.7	<1.8	<1.5
<b>Total Petroleum Hydrocarbons (Extractable Product)</b>						
	R-DEC (mg/kg)	GA-PMC (mg/kg)				
Ext Petroleum HC	500	500	<b>1300</b>	<b>8400</b>	ND	ND
<b>Waste Characterization Parameter</b>						
	Hazardous Waste Criteria					
pH - Soil (S.U.)	<2 or >12.5		7.46	7.06	6.56	6.3
Conductivity - Soil Matrix (umhos/cm)	---		66	42	15	11
Flash Point (degrees F)	<140° F		>200	>200	>200	>200
Reactivity			Neg	Neg	Neg	Neg

**Notes;**

- VOC's - volatile organic compounds
- SVOC's - semivolatile organic compounds
- mg/kg - milligrams/ kilogram or parts per million
- ug/kg - micrograms/ kilogram or parts per billion
- mg/L - milligrams per liter or parts per million
- umhos/cm - micromhos per centimeter
- 1#- Criteria based on detection limit
- Bolded and shaded areas denote concentrations above applicable criteria

R-DEC - Residential Direct exposure Criteria for Soil  
GA-PMC - Pollutant Mobility Criteria for Soil in GA areas

NE- Not established  
ND- Not detected, total concentration is listed as ND because no compounds wer



**Table 1  
Summary of Detected Soil Analytes  
Town of East Hartford  
Toe Drain Design Phase 1  
East Hartford, CT**

	Sample Name	GP-11	GP-11A	GP-12	GP-12A
	Sample Interval	S3 (13-15')	S1 (2-4')	S3 (13-15')	S1 (2-4')
	Sample Date	2/6/2013	2/22/2013	2/6/2013	2/22/2013
<b>Volatile Organic Compounds (VOC) (µg/kg)</b>					
	R-DEC (µg/kg)	GA-PMC (µg/kg)			
1,2,4-Trimethylbenzene	NE	NE	ND	ND	ND
1,3,5-Trimethylbenzene	NE	NE	ND	ND	ND
Naphthalene	NE	NE	ND	ND	ND
n-Butylbenzene	NE	NE	ND	ND	ND
n-Propylbenzene	NE	NE	ND	ND	ND
<b>Semi-Volatile Organic Compounds (SVOC) (µg/kg)</b>					
	R-DEC (µg/kg)	GA-PMC (µg/kg)			
2-Methylnaphthalene	NE	NE	ND	ND	ND
Acenaphthene	NE	NE	ND	ND	ND
Benz(a) anthracene	1000	1000	ND	410	300
Benzo(a)pyrene	1000	1000	350	510	350
Benzo(b) fluoranthene	1000	1000	430	580	420
Benzo(ghi) perylene	1000000	4200	ND	270	ND
Benzo(k) fluoranthene	8400	1000	ND	270	ND
Chrysene	84000	1#	ND	500	330
Flourene	1000000	5600	ND	ND	320
Flouranthene	1000000	5600	340	440	360
Indeno(1,2,3-cd) pyrene	1000	1000	ND	ND	ND
Napthalene	1000	5.6	ND	ND	ND
Phenanthrene	1000000	4000	ND	ND	370
Pyrene	1000000	4000	410	510	450
790					
<b>Total Metals (mg/kg)</b>					
	R-DEC (mg/kg)	GA-PMC (mg/kg)			
Silver	340	---	<0.44	NA	<0.43
Arsenic	10	---	4.9	NA	4.3
Barium	4700	---	57.1	NA	57.6
Cadmium	34	---	0.49	NA	<0.43
Chromium	NE	---	27.6	NA	22.4
Mercury	20	---	0.18	NA	0.27
Lead	500	---	28.8	NA	36.3
Selenium	340	---	<1.8	NA	<1.7
NA					
<b>Total Petroleum Hydrocarbons (Extractable Product)</b>					
	R-DEC (mg/kg)	GA-PMC (mg/kg)			
Ext Petroleum HC	500	500	500	22	<b>2000</b>
67					
<b>Waste Characterization Parameter</b>					
	Hazardous Waste Criteria				
pH - Soil (S.U.)	<2 or >12.5		7.12	NA	7.64
Conductivity - Soil Matrix (umhos/cm)	---		100	NA	140
Flash Point (degrees F)	<140° F		>200	NA	>200
Reactivity			Neg	NA	Neg

**Notes;**

- VOC"s - volatile organic compounds
- SVOC"s - semivolatile organic compounds
- mg/kg - milligrams/ kilogram or parts per million
- ug/kg - micrograms/ kilogram or parts per billion
- mg/L - milligrams per liter or parts per million
- umhos/cm - micromhos per centimeter
- 1#- Criteria based on detection limit
- Bolded and shaded areas denote concentrations above applicable criteria

R-DEC - Residential Direct exposure Criteria for Soil  
GA-PMC - Pollutant Mobility Criteria for Soil in GA areas

NE- Not established  
ND- Not detected, total concentration is listed as ND because no compounds were

**Table 2**  
**Summary of Detected Groundwater Analytes**  
**Town of East Hartford**  
**Toe Drain Design Phase 1**  
**East Hartford, CT**

		Sample Name	GP-11-MW
		Sample Date	2/12/2013
<b><i>Semi-Volatile Organic Compounds (SVOC) (µg/kg)</i></b>			
	Effluent Standards (ug/L)	SWPC (ug/L)	
Acenaphthene	NE	0.3	0.2
Benz(a) anthracene	0.49	0.3	0.08
Benzo(b) flouranthene	NE	0.3	0.13
Chrysene	NE	NE	0.1
Dibenz(a,h)anthracene	0.01	NE	<b>0.02</b>
Indeno(1,2,3-cd) pyrene	0.49	NE	0.05
Phenanthrene	NE	0.3	0.07
<b><i>Total Metals (mg/L)</i></b>			
	Effluent Standards (ug/L)	SWPC (ug/L)	
	Dilution factor 100:1		
Silver	48	12	<0.001
Arsenic	0.021	4	0.006
Barium	NE	NE	0.189
Cadmium	95.9	6	<0.001
Chromium	1000	NE	<0.001
Mercury	9.7	0.4	<0.0002
Lead	93.6	13	<0.002
Selenium	390	50	<0.01
<b><i>Total Petroleum Hydrocarbons (mg/L)</i></b>			
	GA-PMC (mg/L)		
Ext Petroleum HC	5	NE	0.28

**Notes;**

SVOC's - semivolatile organic compounds

ug/kg - micrograms/ kilogram or parts per billion

mg/L - milligrams per liter or parts per million

SS- if statewide criteria has not been established, but site specific criteria are available,

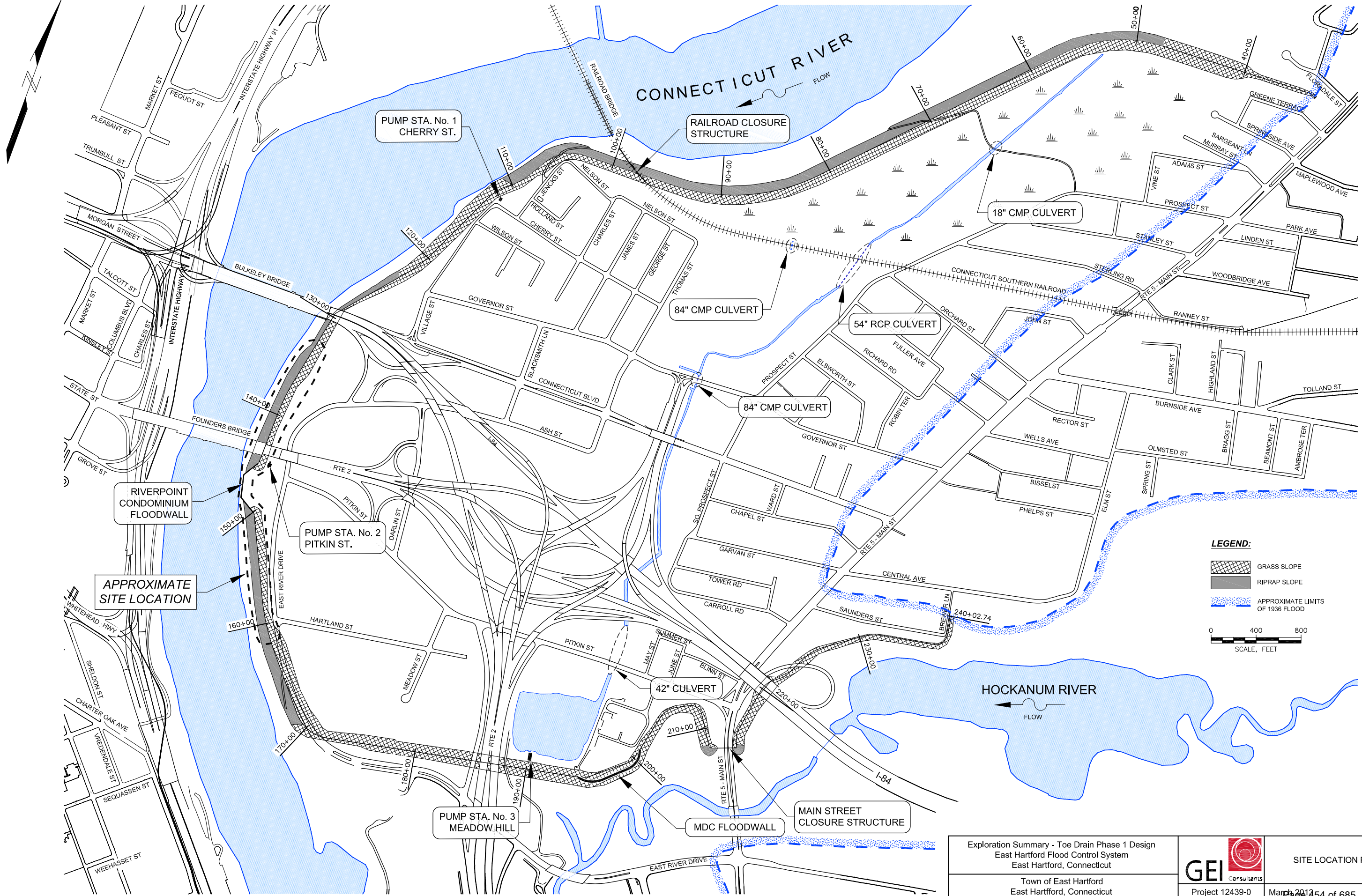
Bolded and shaded areas denote concentrations above applicable criteria

SWPC - Surface Water Protection Criteria

NE- Not established

# Figures

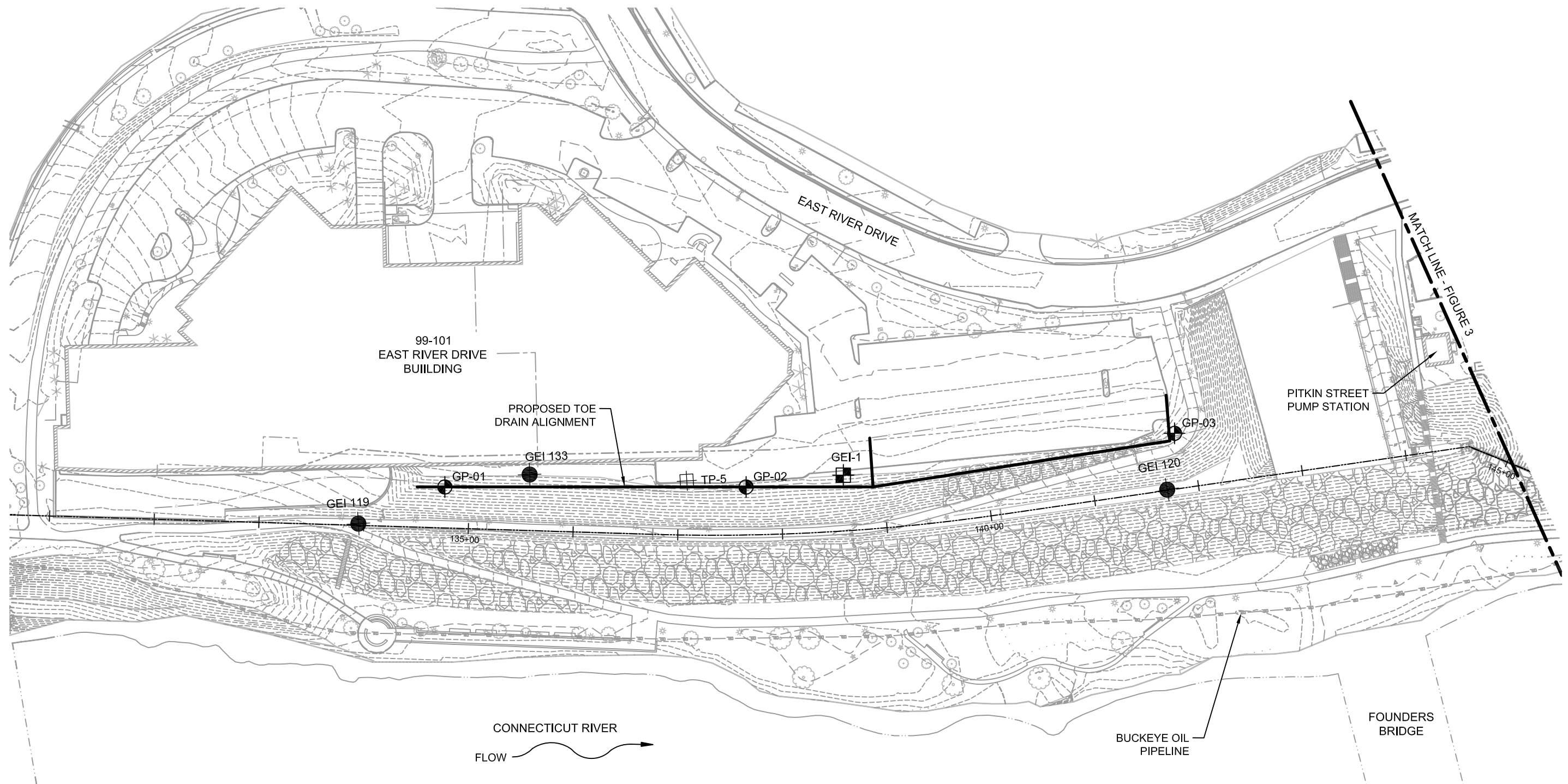
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Exploration Summary - Toe Drain Phase 1 Design  
 East Hartford Flood Control System  
 East Hartford, Connecticut  
 Town of East Hartford  
 East Hartford, Connecticut



SITE LOCATION PLAN

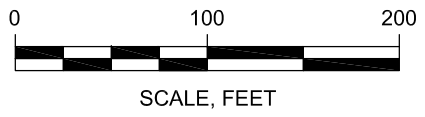


**LEGEND:**

-  PROPOSED TOE DRAIN ALIGNMENT
-  GP-01 DIRECT PUSH BORING LOCATION (2012)
-  GEI-119 EXISTING BORING LOCATION (PRE-2012)
-  GEI-01 TEST PIT LOCATION (2012)
-  TP-5 EXISTING TEST PIT LOCATION (PRE-2012)

**NOTES:**

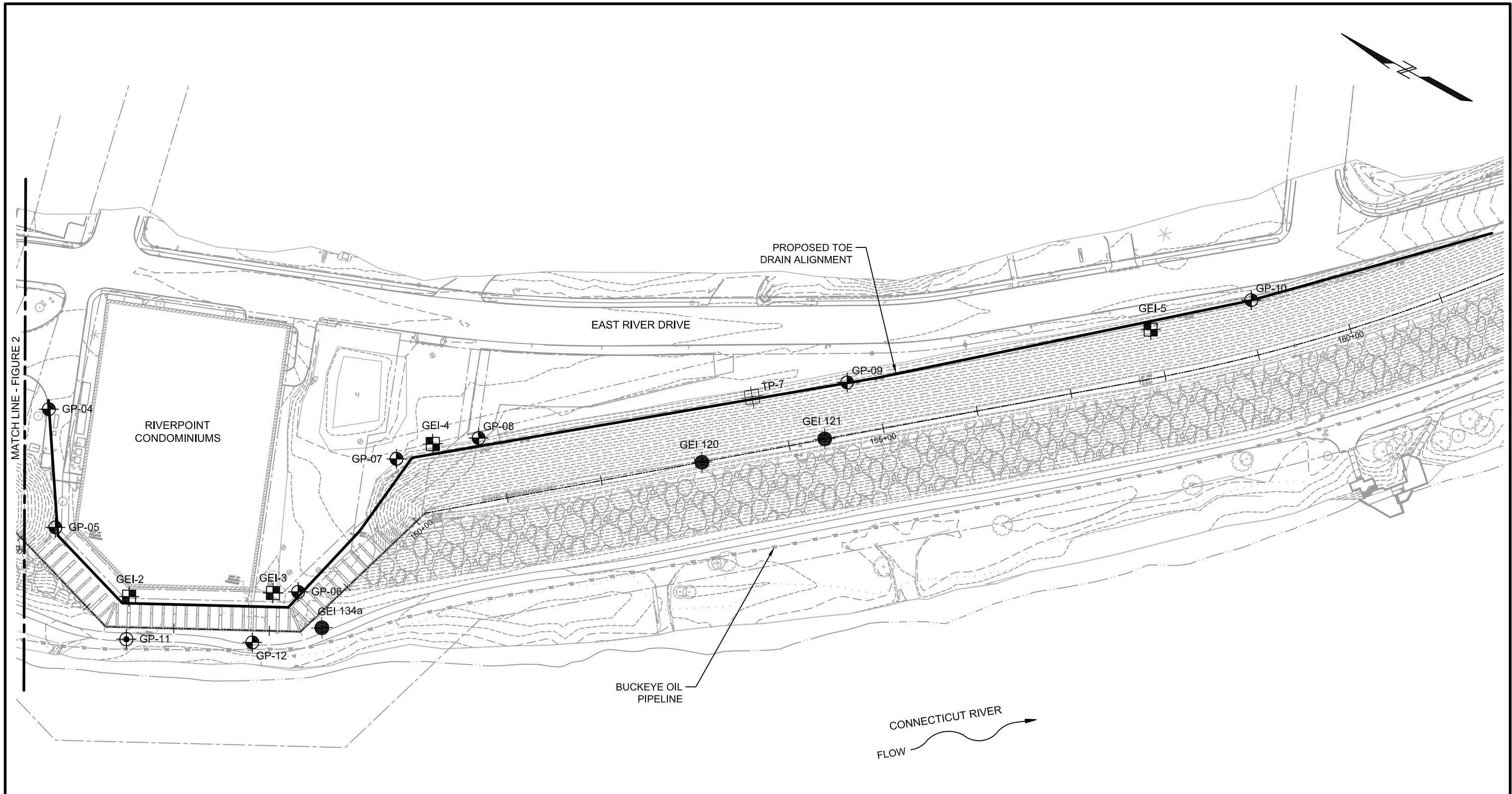
1. BASE MAP PREPARED BY BSC GROUP INC. (JULY 2012).
2. LOCATIONS OF 2012 TEST PITS AND 2013 BORINGS ARE APPROXIMATE.



Subsurface Exploration - Toe Drain Phase 1 Design  
 East Hartford Flood Control System  
 East Hartford, Connecticut  
 Town of East Hartford  
 East Hartford, Connecticut



EXPLORATION  
 LOCATION PLAN (1 OF 2)  
 Project 12439-0 March 2013 Fig. 2

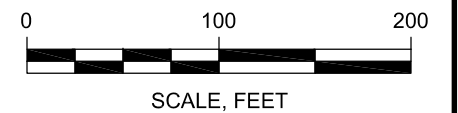


**LEGEND:**

- PROPOSED TOE DRAIN ALIGNMENT
- GP-01 DIRECT PUSH BORING LOCATION (2012)
- GEI 119 EXISTING BORING LOCATION (PRE-2012)
- GEI-01 TEST PIT LOCATION (2012)
- TP-5 EXISTING TEST PIT LOCATION (PRE-2012)

**NOTES:**

1. BASE MAP PREPARED BY BSC GROUP INC. (JULY 2012).
2. LOCATIONS OF 2012 TEST PITS AND 2013 BORINGS ARE APPROXIMATE.



Subsurface Exploration - Toe Drain Phase 1 Design  
 East Hartford Flood Control System  
 East Hartford, Connecticut  
 Town of East Hartford  
 East Hartford, Connecticut



EXPLORATION  
 LOCATION PLAN (2 OF 2)  
 March 2013 Fig. 3

# Attachment 1

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## Boring, Test Pit, and Well Logs

**Test Pit Information**  
**LOCATION:** Landside Toe  
**DATE START / END:** 7/12/2012 - 7/13/2012 **TOTAL DEPTH (FT):** 7.0  
**CONTRACTOR:** Geologic, Inc. **OPERATOR:** Damien Jacobs  
**EQUIPMENT:** Bobcat E50 Track Excavator **LOGGED BY:** Michael Flynn  
**METHOD:** Open Excavation  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Test Pit Dimensions: L = 10 ft, W = 4 ft, D = 7 ft.

**TEST PIT**  
**GEI - 1**  
**PAGE 1 of 1**

**ABBREVIATIONS:**  
in = inches      ft = feet      ppm = Parts Per Million      OVM = Organic Vapor Meter      NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	SAMPLE INFORMATION			GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
		Sample No.	Depth (ft)	Field Test Data				
		S1	0 to 0.5				(0'-0.5') Grass and Topsoil	
		S2	0.5 to 4				(0.5'-4') WIDELY GRADED SAND (SW): ~95% fine to coarse SAND, ~5% nonplastic fines, brown, dry.	
	5	S3	4 to 7	Sample collected for grain size analysis			(4'-7') WIDELY GRADED SAND with SILT: ~90% SAND, mostly fine to medium, ~10% nonplastic fines, brown, dry.	
	10						Bottom of test pit at 7 ft. Geologic used the back of the excavator to compact 5-7 feet deep and vibratory plate compactor from 0-5 ft. Soil was compacted in 12" loose lifts. Manhole 12 was left exposed for survey. upon completion.	

TEST PIT LOG 02 GEI EAST HARTFORD BORING LOGS (CURRENT).GPJ GEI DATA TEMPLATE.GDT 3/7/13

Strata lines represent the approximate boundaries between soil types. Actual transitions may be gradual. Water level readings have been made at times stated. Water levels may be different at other times.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0

**GEI Consultants, Inc.**  
400 Unicorn Park Drive  
Woburn, MA 01801



**Test Pit Information**  
**LOCATION:** Landside Toe  
**DATE START / END:** 7/12/2012 - 7/13/2012 **TOTAL DEPTH (FT):** 7.0  
**CONTRACTOR:** Geologic, Inc. **OPERATOR:** Damien Jacobs  
**EQUIPMENT:** Bobcat E50 Track Excavator **LOGGED BY:** Michael Flynn  
**METHOD:** Open Excavation  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Test Pit Dimensions: L = 10 ft, W = 4 ft, D = 7 ft.

**TEST PIT**  
**GEI - 2**  
**PAGE 1 of 1**

**ABBREVIATIONS:**  
in = inches      ft = feet      ppm = Parts Per Million      OVM = Organic Vapor Meter      NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	SAMPLE INFORMATION			GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
		Sample No.	Depth (ft)	Field Test Data				
		S1	0 to 1				Located MH12 (catch basin), at the northeast corner of the test pit. Exposed 5'x5' concrete frame. Interior of manhole appear to be dry and relatively empty.  Petroleum-like-odor	
		S2	1 to 5					
	5	S3	5 to 7	Sample collected for grain size analysis				
	10				Bottom of test pit at 7 ft. Geologic used the back of the excavator to compact 5-7 feet deep and vibratory plate compactor from 0-5 ft. Soil was compacted in 12" loose lifts. Manhole 12 was left exposed for survey. upon completion.			

TEST PIT LOG 02 GEI EAST HARTFORD BORING LOGS (CURRENT).GPJ GEI DATA TEMPLATE.GDT 3/7/13

Strata lines represent the approximate boundaries between soil types. Actual transitions may be gradual. Water level readings have been made at times stated. Water levels may be different at other times.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0

**GEI Consultants, Inc.**  
 400 Unicorn Park Drive  
 Woburn, MA 01801

**Test Pit Information**  
**LOCATION:** Landside Toe  
**DATE START / END:** 7/12/2012 - 7/13/2012 **TOTAL DEPTH (FT):** 5.0  
**CONTRACTOR:** Geologic, Inc. **OPERATOR:** Damien Jacobs  
**EQUIPMENT:** Bobcat E50 Track Excavator **LOGGED BY:** Michael Flynn  
**METHOD:** Open Excavation  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Test Pit Dimensions: L = 7 ft, W = 3 ft, D = 5 ft.

**TEST PIT**  
**GEI - 3**  
**PAGE 1 of 1**

**ABBREVIATIONS:**  
in = inches      ft = feet      ppm = Parts Per Million      OVM = Organic Vapor Meter      NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	SAMPLE INFORMATION			GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
		Sample No.	Depth (ft)	Field Test Data				
		S1	0 to 1					
		S2	1 to 2					Observed a non-woven geotextile below the 3/4" stone
		S3	2 to 5	Sample collected for grain size analysis				Slight Petroleum-like-odor  Strong Petroleum-like-odor
	5							Bottom of test pit at 5 ft. Geologic used a vibratory plate compactor to compact the soil in 12" loose lifts. Manhole 13 was left exposed for survey. upon completion.
	10							

TEST PIT LOG 02 GEI EAST HARTFORD BORING LOGS (CURRENT).GPJ\_GEI DATA TEMPLATE.GDT\_3/7/13

Strata lines represent the approximate boundaries between soil types. Actual transitions may be gradual. Water level readings have been made at times stated. Water levels may be different at other times.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0

**GEI Consultants, Inc.**  
400 Unicorn Park Drive  
Woburn, MA 01801

**Test Pit Information**  
**LOCATION:** Landside Toe  
**DATE START / END:** 7/12/2012 - 7/13/2012 **TOTAL DEPTH (FT):** 8.0  
**CONTRACTOR:** Geologic, Inc. **OPERATOR:** Damien Jacobs  
**EQUIPMENT:** Bobcat E50 Track Excavator **LOGGED BY:** Michael Flynn  
**METHOD:** Open Excavation  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Test Pit Dimensions: L = 8 ft, W = 4 ft, D = 8 ft.

**TEST PIT**  
**GEI - 4**  
**PAGE 1 of 1**

**ABBREVIATIONS:**  
in = inches      ft = feet      ppm = Parts Per Million      OVM = Organic Vapor Meter      NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	SAMPLE INFORMATION			GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
		Sample No.	Depth (ft)	Field Test Data				
		S1	0 to 0.5				Scraped around the surface with excavator bucket to locate MH14, but did not locate.	
		S2	0.5 to 1.5			(0.5'-1.5') WIDELY GRADED SAND with SILT and GRAVEL (SW-SM): ~75% fine to coarse SAND, ~15% GRAVEL, max size 1", ~10% nonplastic fines, brown, dry		
		S3	1.5 to 4			(1.5-4') WIDELY GRADED SAND (SW): ~95% fine to coarse SAND, ~5% nonplastic fines, brown, dry.		
	5	S4	4 to 8	Sample collected for grain size analysis		(4'-8') SILTY SAND (SM): ~70% SAND, mostly fine, ~25% nonplastic fines, ~5% gravel, fine, brown dry.		
	10				Bottom of test pit at 8 ft. Geologic used the back of the excavator to compact 5-8 feet deep and vibratory plate compactor from 0-5 ft. Soil was compacted in 12" loose lifts. upon completion.			

TEST PIT LOG 02 GEI EAST HARTFORD BORING LOGS (CURRENT).GPJ\_GEI DATA TEMPLATE.GDT 3/7/13

Strata lines represent the approximate boundaries between soil types. Actual transitions may be gradual. Water level readings have been made at times stated. Water levels may be different at other times.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0

**GEI Consultants, Inc.**  
400 Unicorn Park Drive  
Woburn, MA 01801

**Test Pit Information**  
**LOCATION:** Landside Toe  
**DATE START / END:** 7/12/2012 - 7/13/2012 **TOTAL DEPTH (FT):** 8.0  
**CONTRACTOR:** Geologic, Inc. **OPERATOR:** Damien Jacobs  
**EQUIPMENT:** Bobcat E50 Track Excavator **LOGGED BY:** Michael Flynn  
**METHOD:** Open Excavation  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Test Pit Dimensions: L = 10 ft, W = 4 ft, D = 8 ft.

**TEST PIT**  
**GEI - 5**  
**PAGE 1 of 1**

**ABBREVIATIONS:**  
in = inches      ft = feet      ppm = Parts Per Million      OVM = Organic Vapor Meter      NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	SAMPLE INFORMATION			GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
		Sample No.	Depth (ft)	Field Test Data				
		S1	0 to 0.5		[Symbol]	(0'-0.5') Grass and Topsoil		Operator indicated it was difficult excavating through the reddish clay soils.
		S2	0.5 to 2		[Symbol]	(0.5'-2') SILT with SAND (ML): 80% FINES, nonplastic, no dry strength, ~20% fine SAND, gray, dry (FILL).		
		S3	2 to 3		[Symbol]	(2'-3') CLAY (CL): 90% FINES, low plasticity, high dry strength, ~10% fine SAND, dry, reddish brown (FILL).		
		S4	3 to 3.5		[Symbol]	(3'-3.5') SILT (ML): 80% FINES, nonplastic, no dry strength, ~20% fine SAND, gray, dry (FILL).		
		S5	3.5 to 5		[Symbol]	(3.5'-5') SILTY SAND (SM): 60% fine to coarse SAND, mostly fine grained, ~40% nonplastic fines, brown, dry (FILL).		
	5	S6	5 to 5.5		[Symbol]	(5'-5.5') Ash and clinkers, gray		
		S7	5.5 to 8	Sample collected for grain size analysis	[Symbol]	(5.5'-8') SILT with SAND (ML): 80% FINES, nonplastic, no dry strength, ~20% fine SAND, brown, dry.		
	10					Bottom of test pit at 8 ft. Geologic used the back of the excavator to compact 5-8 feet deep and vibratory plate compactor from 0-5 ft. Soil was compacted in 12" loose lifts. upon completion.		

TEST PIT LOG 02 GEI EAST HARTFORD BORING LOGS (CURRENT).GPJ\_GEI DATA TEMPLATE.GDT 3/7/13

Strata lines represent the approximate boundaries between soil types. Actual transitions may be gradual. Water level readings have been made at times stated. Water levels may be different at other times.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0

**GEI Consultants, Inc.**  
400 Unicorn Park Drive  
Woburn, MA 01801

**Boring Location**  
**NORTHING:** 840,623 **EASTING:** 1,023,629 **STATION:** \_\_\_\_\_ **OFFSET:** \_\_\_\_\_  
**HORIZONTAL DATUM:** NAD 83 **STATION CENTERLINE:** \_\_\_\_\_  
**VERTICAL DATUM:** NAVD 1988 **ESTIMATED GROUND SURFACE EL. (FT)** 25.0  
**LOCATION:** Landside Toe

**BORING**  
**GP - 01**  
 PAGE 1 of 1

**Drilling Information**  
**DATE START / END:** 2/7/2013 - 2/7/2013 **TOTAL DEPTH (FT):** 10.0  
**CONTRACTOR:** AES **DRILLER:** Max Figueroa **LOGGED BY:** Russ Morang  
**EQUIPMENT:** Geoprobe 7822 DT **BORING METHOD:** Geoprobe  
**AUGER ID/OD:** N/A / N/A **CASING ID/OD:** N/A / N/A **CORE INFO:** \_\_\_\_\_  
**HAMMER TYPE:** N/A **HAMMER WEIGHT (lbs):** N/A **HAMMER DROP (inch):** N/A  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Location is approximate.

**ABBREVIATIONS:** ID = Inside Diameter    bpf = Blows per Foot    U = Undisturbed Tube Sample    WOR = Weight of Rods    Q<sub>v</sub> = Pocket Penetrometer Strength  
 OD = Outside Diameter    mpf = Minute per Foot    C = Rock Core    WOH = Weight of Hammer    S<sub>v</sub> = Pocket Torvane Shear Strength  
 Pen. = Penetration Length    S = Split Spoon    V = Field Vane Shear    RQD = Rock Quality Designation    F<sub>v</sub> = Field Vane Shear Strength  
 Rec. = Recovery Length    DP = Direct Push Sample    SC = Sonic Core    OVM = Organic Vapor Meter    NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION					GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blows Count or RQD				
			S1		0 to 5	60/30		PID=0ppm			
									S1(0-0.5'): TOPSOIL		
									S1(0.5-2'): SILTY SAND (SM) ~85% fine sand, ~15% fines, brown, moist.		
									S1(2-5'): SILTY SAND WITH GRAVEL (SM) ~70% fine-coarse sand, ~15% fines, ~15% fine-coarse gravel, sub-angular, maximum size to 0.75", brown, moist.		
20	5		S2		5 to 10	60/31		PID=0ppm			Sampled 6-8' interval for lab analysis
									S2(5-7'): SILTY SAND WITH GRAVEL (SM) ~70% fine-coarse sand, ~15% fines, ~15% fine-coarse gravel, sub-rounded, maximum size to 0.5", brown, moist.		
									S2(7-10'): SILTY SAND WITH GRAVEL (SM) ~55% fine-medium sand, ~15% fines, ~30% fine-coarse gravel, sub-angular, maximum size to 2", brown, moist.		Wet at 8' BGS
15	10								Borehole terminated at 10 ft. Filled with grout. upon completion		

GEOTECHNICAL BORING LOG 02 - GEI EAST HARTFORD BORING LOGS (CURRENT), GPJ GEI DATA TEMPLATE.GDT 3/7/13

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0


**GEI Consultants, Inc.**  
 455 Winding Brook Drive  
 Glastonbury, CT 06033  
 (860) 368-5300

**Boring Location**  
**NORTHING:** 840,339 **EASTING:** 1,023,583 **STATION:** \_\_\_\_\_ **OFFSET:** \_\_\_\_\_  
**HORIZONTAL DATUM:** NAD 83 **STATION CENTERLINE:** \_\_\_\_\_  
**VERTICAL DATUM:** NAVD 1988 **ESTIMATED GROUND SURFACE EL. (FT)** 22.0  
**LOCATION:** Landside Toe

**BORING**  
**GP - 02**  
 PAGE 1 of 1

**Drilling Information**  
**DATE START / END:** 2/7/2013 - 2/7/2013 **TOTAL DEPTH (FT):** 10.0  
**CONTRACTOR:** AES **DRILLER:** Max Figueroa **LOGGED BY:** Russ Morang  
**EQUIPMENT:** Geoprobe 7822 DT **BORING METHOD:** Geoprobe  
**AUGER ID/OD:** N/A / N/A **CASING ID/OD:** N/A / N/A **CORE INFO:** \_\_\_\_\_  
**HAMMER TYPE:** N/A **HAMMER WEIGHT (lbs):** N/A **HAMMER DROP (inch):** N/A  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Location is approximate.

**ABBREVIATIONS:** ID = Inside Diameter    bpf = Blows per Foot    U = Undisturbed Tube Sample    WOR = Weight of Rods    Q<sub>v</sub> = Pocket Penetrometer Strength  
 OD = Outside Diameter    mpf = Minute per Foot    C = Rock Core    WOH = Weight of Hammer    S<sub>v</sub> = Pocket Torvane Shear Strength  
 Pen. = Penetration Length    S = Split Spoon    V = Field Vane Shear    RQD = Rock Quality Designation    F<sub>v</sub> = Field Vane Shear Strength  
 Rec. = Recovery Length    DP = Direct Push Sample    SC = Sonic Core    OVM = Organic Vapor Meter    NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION					GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blows Count or RQD				
			S1		0 to 5	60/41		PID=0ppm			
									S1(0-0.5'): TOPSOIL		
									S1(0.5-2.5'): SILTY SAND (SM) ~60% fine sand, ~40% fines, brown, moist.		
									S1(2.5-5'): SILTY SAND (SM) ~85% fine-medium sand, ~15% fines, brown, moist.		
	5		S2		5 to 10	60/51		PID=0ppm			
									S2(5-5.5'): SILTY SAND (SM) ~85% fine-medium sand, ~15% fines, brown, moist.		
									S2(5.5-6.5'): SILTY SAND (SM) ~85% fine sand, ~15% fines, brown, moist.		Sampled 6-8' interval for lab analysis
	15								S2(6.5-8.5'): NARROWLY GRADED SAND WITH SILT (SP-SM) ~90% fine-medium sand, ~10% fines, brown, moist.		Wet at 8' BGS
									S2(8.5-9.5'): LEAN CLAY (CL) ~100% fines, medium plasticity, brown, wet.		
	10								S2(9.5-10'): SILTY SAND (SM) ~85% fine sand, ~15% fines, light brown, moist. Borehole terminated at 10 ft. Filled with grout. upon completion		

GEOTECHNICAL BORING LOG 02 - GEI EAST HARTFORD BORING LOGS (CURRENT), GPJ GEI DATA TEMPLATE.GDT 3/7/13

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0


**GEI Consultants, Inc.**  
 455 Winding Brook Drive  
 Glastonbury, CT 06033  
 (860) 368-5300

<b>Boring Location</b>		<b>BORING</b>
<b>NORTHING:</b> 839,927	<b>EASTING:</b> 1,023,568	<b>STATION:</b> _____
<b>HORIZONTAL DATUM:</b> NAD 83	<b>STATION CENTERLINE:</b> _____	
<b>VERTICAL DATUM:</b> NAVD 1988	<b>ESTIMATED GROUND SURFACE EL. (FT)</b> 22.0	
<b>LOCATION:</b> Landside Toe		<b>GP - 03</b>
		PAGE 1 of 1

<b>Drilling Information</b>		
<b>DATE START / END:</b> 2/7/2013 - 2/7/2013	<b>TOTAL DEPTH (FT):</b> 10.0	
<b>CONTRACTOR:</b> AES	<b>DRILLER:</b> Max Figueroa	<b>LOGGED BY:</b> Russ Morang
<b>EQUIPMENT:</b> Geoprobe 7822 DT	<b>BORING METHOD:</b> Geoprobe	
<b>AUGER ID/OD:</b> N/A / N/A	<b>CASING ID/OD:</b> N/A / N/A	<b>CORE INFO:</b> _____
<b>HAMMER TYPE:</b> N/A	<b>HAMMER WEIGHT (lbs):</b> N/A	<b>HAMMER DROP (inch):</b> N/A
<b>WATER LEVEL DEPTHS (ft):</b> _____		
<b>GENERAL NOTES:</b> Location is approximate.		

<b>ABBREVIATIONS:</b>	ID = Inside Diameter OD = Outside Diameter Pen. = Penetration Length Rec. = Recovery Length	bpf = Blows per Foot mpf = Minute per Foot S = Split Spoon DP = Direct Push Sample	U = Undistrubed Tube Sample C = Rock Core V = Field Vane Shear SC = Sonic Core	WOR = Weight of Rods WOH = Weight of Hammer RQD = Rock Quality Designation OVM = Organic Vapor Meter	Q <sub>p</sub> = Pocket Penetrometer Strength S <sub>v</sub> = Pocket Torvane Shear Strength F <sub>v</sub> = Field Vane Shear Strength NA, NM = Not Applicable, Not Measured
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Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION					GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blows Count or RQD				
			S1		0 to 5	60/38		PID=0ppm			
									S1(0-0.5'): TOPSOIL		
									S1(0.5-2.5'): SILTY SAND (SM) ~ 75% fine-medium sand, ~25% fines, brown, moist.		
									S1(2.5-3.5'): SILTY SAND WITH GRAVEL (SM) ~60% fine-coarse sand, ~15% fines, ~25% fine-coarse gravel, sub-rounded, maximum size 1.25", brown, moist.		
									S1(3.5-5'): SANDY SILT WITH GRAVEL (ML) ~70% fines, ~15% fine sand, ~15% fine-coarse gravel, sub-angular, maximum size 1.5", brown, moist.		
	5		S2		5 to 10	60/52		PID=0ppm			
									S2(5-6'): SANDY SILT WITH GRAVEL (ML) ~70% fines, nonplastic, ~15% fine sand, ~15% fine-coarse gravel, sub-angular, maximum size 1.5", brown, moist.		
									S2(6-8'): SILT WITH SAND (ML) ~85% fines, ~15% fine sand, brown, moist.		Sampled 6-8' interval for lab analysis
									S2(8-10'): SILT (ML) ~ 90% fines, ~20% fine sand, light brown, wet.		
	10								Borehole terminated at 10 ft. Filled with grout. upon completion		

GEOTECHNICAL BORING LOG 02 - GEI EAST HARTFORD BORING LOGS (CURRENT), GPJ GEI DATA TEMPLATE.GDT 3/7/13

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

<b>CLIENT:</b> Town of East Hartford
<b>PROJECT NAME:</b> EHFCS Toe Drain Design
<b>CITY/STATE:</b> East Hartford, Connecticut
<b>GEI PROJECT NUMBER:</b> 12439-0

	<b>GEI Consultants, Inc.</b> 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300
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**Boring Location**  
**NORTHING:** 839,624 **EASTING:** 1,023,627 **STATION:** \_\_\_\_\_ **OFFSET:** \_\_\_\_\_  
**HORIZONTAL DATUM:** NAD 83 **STATION CENTERLINE:** \_\_\_\_\_  
**VERTICAL DATUM:** NAVD 1988 **ESTIMATED GROUND SURFACE EL. (FT)** 17.0  
**LOCATION:** Landside Toe

**BORING**  
**GP - 04**  
 PAGE 1 of 1

**Drilling Information**  
**DATE START / END:** 2/6/2013 - 2/6/2013 **TOTAL DEPTH (FT):** 10.0  
**CONTRACTOR:** AES **DRILLER:** Max Figueroa **LOGGED BY:** Russ Morang  
**EQUIPMENT:** Geoprobe 7822 DT **BORING METHOD:** Geoprobe  
**AUGER ID/OD:** N/A / N/A **CASING ID/OD:** N/A / N/A **CORE INFO:** \_\_\_\_\_  
**HAMMER TYPE:** N/A **HAMMER WEIGHT (lbs):** N/A **HAMMER DROP (inch):** N/A  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Location is approximate.

**ABBREVIATIONS:** ID = Inside Diameter    bpf = Blows per Foot    U = Undisturbed Tube Sample    WOR = Weight of Rods    Q<sub>p</sub> = Pocket Penetrometer Strength  
 OD = Outside Diameter    mpf = Minute per Foot    C = Rock Core    WOH = Weight of Hammer    S<sub>v</sub> = Pocket Torvane Shear Strength  
 Pen. = Penetration Length    S = Split Spoon    V = Field Vane Shear    RQD = Rock Quality Designation    F<sub>v</sub> = Field Vane Shear Strength  
 Rec. = Recovery Length    DP = Direct Push Sample    SC = Sonic Core    OVM = Organic Vapor Meter    NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION					GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blows Count or RQD				
			S1		0 to 5	60/39		PID=0ppm			
									S1(0-0.5'): TOPSOIL		
									S1(0.5-1.5'): SILTY SAND WITH GRAVEL (SM) ~70% fine-coarse sand, ~15% fines, ~15% fine-coarse gravel, sub-rounded, maximum size 1.5", reddish brown, moist.		
									S1(1.5-2.5'): SILTY SAND WITH GRAVEL (SM) ~70% fine-coarse sand, ~15% fines, ~15% fine-coarse gravel, sub-rounded, maximum size 1.5", dark brown, moist.		
									S1(2.5-5'): SILT WITH SAND (ML) ~75% fines, nonplastic, ~20% fine sand, ~5% fine gravel, sub-rounded, maximum size 0.25", brown, moist.		
	5		S2		5 to 10	60/45		PID=0ppm			
									S2(5-10'): SANDY SILT (ML) ~70% fines, nonplastic, ~30% fine sand, brown, moist.		
	10										Sampled 9-10' interval for lab analysis
											Borehole terminated at 10 ft. Filled with grout. upon completion

GEOTECHNICAL BORING LOG 02 - GEI EAST HARTFORD BORING LOGS (CURRENT), GPJ GEI DATA TEMPLATE.GDT 3/7/13

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0


**GEI Consultants, Inc.**  
 455 Winding Brook Drive  
 Glastonbury, CT 06033  
 (860) 368-5300



**Boring Location**  
**NORTHING:** 839,586 **EASTING:** 1,023,509 **STATION:** \_\_\_\_\_ **OFFSET:** \_\_\_\_\_  
**HORIZONTAL DATUM:** NAD 83 **STATION CENTERLINE:** \_\_\_\_\_  
**VERTICAL DATUM:** NAVD 1988 **ESTIMATED GROUND SURFACE EL. (FT):** 17.0  
**LOCATION:** Landside Toe

**BORING**  
**GP - 05**  
 PAGE 1 of 1

**Drilling Information**

**DATE START / END:** 2/6/2013 - 2/6/2013 **TOTAL DEPTH (FT):** 10.0  
**CONTRACTOR:** AES **DRILLER:** Max Figueroa **LOGGED BY:** Russ Morang  
**EQUIPMENT:** Geoprobe 7822 DT **BORING METHOD:** Geoprobe  
**AUGER ID/OD:** N/A / N/A **CASING ID/OD:** N/A / N/A **CORE INFO:** \_\_\_\_\_  
**HAMMER TYPE:** N/A **HAMMER WEIGHT (lbs):** N/A **HAMMER DROP (inch):** N/A  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Location is approximate.

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 OD = Outside Diameter    mpf = Minute per Foot    C = Rock Core    WOH = Weight of Hammer    S<sub>v</sub> = Pocket Torvane Shear Strength  
 Pen. = Penetration Length    S = Split Spoon    V = Field Vane Shear    RQD = Rock Quality Designation    F<sub>v</sub> = Field Vane Shear Strength  
 Rec. = Recovery Length    DP = Direct Push Sample    SC = Sonic Core    OVM = Organic Vapor Meter    NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION					GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blows Count or RQD				
			S1		0 to 5	60/53		PID=0ppm			
15								PID=3.1ppm			High petroleum-like-odor.
	5		S2		5 to 10	60/43		PID=6.8ppm			Light petroleum-like-odor.
											Moderate petroleum-like-odor.
10								PID=23.2ppm			Wet at 7' BGS.
											Sampled 9-10' interval for lab analysis.
											Borehole terminated at 10 ft. Filled with grout. upon completion

GEOTECHNICAL BORING LOG 02 - GEI EAST HARTFORD BORING LOGS (CURRENT), GPJ GEI DATA TEMPLATE.GDT 3/7/13

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0


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 455 Winding Brook Drive  
 Glastonbury, CT 06033  
 (860) 368-5300

**Boring Location**  
**NORTHING:** 839,323 **EASTING:** 1,023,510 **STATION:** \_\_\_\_\_ **OFFSET:** \_\_\_\_\_  
**HORIZONTAL DATUM:** NAD 83 **STATION CENTERLINE:** \_\_\_\_\_  
**VERTICAL DATUM:** NAVD 1988 **ESTIMATED GROUND SURFACE EL. (FT)** 17.5  
**LOCATION:** Landside Toe

**BORING**  
**GP - 06**  
 PAGE 1 of 1

**Drilling Information**  
**DATE START / END:** 2/6/2013 - 2/6/2013 **TOTAL DEPTH (FT):** 10.0  
**CONTRACTOR:** AES **DRILLER:** Max Figueroa **LOGGED BY:** Russ Morang  
**EQUIPMENT:** Geoprobe 7822 DT **BORING METHOD:** Geoprobe  
**AUGER ID/OD:** N/A / N/A **CASING ID/OD:** N/A / N/A **CORE INFO:** \_\_\_\_\_  
**HAMMER TYPE:** N/A **HAMMER WEIGHT (lbs):** N/A **HAMMER DROP (inch):** N/A  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Location is approximate.

**ABBREVIATIONS:** ID = Inside Diameter    bpf = Blows per Foot    U = Undisturbed Tube Sample    WOR = Weight of Rods    Q<sub>p</sub> = Pocket Penetrometer Strength  
 OD = Outside Diameter    mpf = Minute per Foot    C = Rock Core    WOH = Weight of Hammer    S<sub>v</sub> = Pocket Torvane Shear Strength  
 Pen. = Penetration Length    S = Split Spoon    V = Field Vane Shear    RQD = Rock Quality Designation    F<sub>v</sub> = Field Vane Shear Strength  
 Rec. = Recovery Length    DP = Direct Push Sample    SC = Sonic Core    OVM = Organic Vapor Meter    NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION					GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blows Count or RQD				
			S1		0 to 5	60/43		PID=40.7ppm			
									S1(0-0.5'): TOPSOIL		
									S1(0.5-3'): SILTY SAND WITH GRAVEL (SM) ~70% fine-medium sand, ~15% fines, ~15% fine-coarse gravel, sub-angular, maximum size 1.75", brown, moist.		
									S1(3-5'): SILT WITH SAND (ML) ~80% fines, nonplastic, ~20% fine sand, black, moist.		Strong petroleum-like-odor and staining observed.
	5		S2		5 to 10	60/40		PID=19.6ppm			
									S2(5-6'): SILT WITH SAND (ML) ~80% fines, nonplastic, ~20% fine sand, black, moist.		
									S2(6-7'): SILTY SAND (SM) ~85% fine-medium sand, ~15% fines, brown, moist.		
									S2(7-9'): SILTY SAND WITH GRAVEL (ML) ~70% fines, nonplastic, ~15% fine sand, ~15% fine gravel, rounded, maximum size 0.25", black, moist.		
	10							PID=56.7ppm	S2(9-10'): SILTY SAND WITH GRAVEL (ML) ~70% fines, nonplastic, ~15% fine sand, ~15% fine gravel, rounded, maximum size 0.25", black, moist.		Sampled 9-10' interval for lab analysis. Staining observed. Wet at 10' BGS
									Borehole terminated at 10 ft. Filled with grout. upon completion		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0


**GEI Consultants, Inc.**  
 455 Winding Brook Drive  
 Glastonbury, CT 06033  
 (860) 368-5300

GEOTECHNICAL BORING LOG 02 - GEI EAST HARTFORD BORING LOGS (CURRENT), GPJ GEI DATA TEMPLATE.GDT 3/7/13



**Boring Location**  
**NORTHING:** 839,182 **EASTING:** 1,023,714 **STATION:** \_\_\_\_\_ **OFFSET:** \_\_\_\_\_  
**HORIZONTAL DATUM:** NAD 83 **STATION CENTERLINE:** \_\_\_\_\_  
**VERTICAL DATUM:** NAVD 1988 **ESTIMATED GROUND SURFACE EL. (FT)** 18.0  
**LOCATION:** Landside Toe

**BORING**  
**GP - 08**  
 PAGE 1 of 1

**Drilling Information**  
**DATE START / END:** 2/6/2013 - 2/6/2013 **TOTAL DEPTH (FT):** 10.0  
**CONTRACTOR:** AES **DRILLER:** Max Figueroa **LOGGED BY:** Russ Morang  
**EQUIPMENT:** Geoprobe 7822 DT **BORING METHOD:** Geoprobe  
**AUGER ID/OD:** N/A / N/A **CASING ID/OD:** N/A / N/A **CORE INFO:** \_\_\_\_\_  
**HAMMER TYPE:** N/A **HAMMER WEIGHT (lbs):** N/A **HAMMER DROP (inch):** N/A  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Location is approximate.

**ABBREVIATIONS:** ID = Inside Diameter    bpf = Blows per Foot    U = Undistrubed Tube Sample    WOR = Weight of Rods    Q<sub>p</sub> = Pocket Penetrometer Strength  
 OD = Outside Diameter    mpf = Minute per Foot    C = Rock Core    WOH = Weight of Hammer    S<sub>p</sub> = Pocket Torvane Shear Strength  
 Pen. = Penetration Length    S = Split Spoon    V = Field Vane Shear    RQD = Rock Quality Designation    F<sub>v</sub> = Field Vane Shear Strength  
 Rec. = Recovery Length    DP = Direct Push Sample    SC = Sonic Core    OVM = Organic Vapor Meter    NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION					GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blows Count or RQD				
			S1		0 to 5	60/49		PID=0ppm			
									S1(0-0.5'): TOPSOIL		
									S1(0.5-2.5'): SILT (ML) ~90% fines, nonplastic, ~10% fine sand, brown, moist.		
									S1(2.5-3'): SILTY SAND (SM) ~80% fine-coarse sand, ~15% fines, ~5% fine gravel, sub rounded, maximum size 0.25", brown, moist.		
									S1(3-4'): SILT (ML) ~95% fines, nonplastic, ~5% fine sand, brown, moist.		
	5		S2		5 to 10	60/50		PID=0ppm	S1(4-5'): SILTY SAND (SM) ~75% fine sand, ~25% fines, brown, moist.		
									S2(5-10'): SILT (ML) ~90% fines, nonplastic, ~10% fine sand, brown, moist.		
	10							PID=.5ppm			Sampled 9-10' interval for lab analysis.
									Borehole terminated at 10 ft. Filled with grout. upon completion		Wet at 10' BGS.

GEOTECHNICAL BORING LOG 02 - GEI EAST HARTFORD BORING LOGS (CURRENT), GPJ GEI DATA TEMPLATE.GDT 3/7/13

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0

**GEI Consultants, Inc.**  
 455 Winding Brook Drive  
 Glastonbury, CT 06033  
 (860) 368-5300

**Boring Location**  
**NORTHING:** 838,825 **EASTING:** 1,023,870 **STATION:** \_\_\_\_\_ **OFFSET:** \_\_\_\_\_  
**HORIZONTAL DATUM:** NAD 83 **STATION CENTERLINE:** \_\_\_\_\_  
**VERTICAL DATUM:** NAVD 1988 **ESTIMATED GROUND SURFACE EL. (FT)** 21.5  
**LOCATION:** Landside Toe

**BORING**  
**GP - 09**  
 PAGE 1 of 1

**Drilling Information**  
**DATE START / END:** 2/6/2013 - 2/6/2013 **TOTAL DEPTH (FT):** 10.0  
**CONTRACTOR:** AES **DRILLER:** Max Figueroa **LOGGED BY:** Russ Morang  
**EQUIPMENT:** Geoprobe 7822 DT **BORING METHOD:** Geoprobe  
**AUGER ID/OD:** N/A / N/A **CASING ID/OD:** N/A / N/A **CORE INFO:** \_\_\_\_\_  
**HAMMER TYPE:** N/A **HAMMER WEIGHT (lbs):** N/A **HAMMER DROP (inch):** N/A  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Location is approximate.

**ABBREVIATIONS:** ID = Inside Diameter    bpf = Blows per Foot    U = Undistrubed Tube Sample    WOR = Weight of Rods    Q<sub>p</sub> = Pocket Penetrometer Strength  
 OD = Outside Diameter    mpf = Minute per Foot    C = Rock Core    WOH = Weight of Hammer    S<sub>v</sub> = Pocket Torvane Shear Strength  
 Pen. = Penetration Length    S = Split Spoon    V = Field Vane Shear    RQD = Rock Quality Designation    F<sub>v</sub> = Field Vane Shear Strength  
 Rec. = Recovery Length    DP = Direct Push Sample    SC = Sonic Core    OVM = Organic Vapor Meter    NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION				Blows Count or RQD	Field Test Data	GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)						
			S1		0 to 5	60/49	PID=0ppm		S1(0-0.5'): TOPSOIL			
									S1(0.5-1'): SILT (ML) ~95% fines, nonplastic, ~5% fine sand, brown, moist.			
									S1(1-1.25'): SILTY SAND (SM) ~85% fine-medium sand, ~15% fines, reddish brown, moist.			
									S1(1.25-2'): SILT (ML) ~90% fines, nonplastic, ~10% fine sand, brown, moist.			
	5		S2		5 to 10	60/55			S1(2-3'): SILT WITH GRAVEL (ML) ~80% fines, nonplastic, ~5% fine sand, ~15% coarse gravel, sub-rounded, maximum size 2", reddish-brown, moist.			
									S1(3-5'): SILTY SAND (SM) ~60% fine sand, ~40% fines, tannish brown, moist.			
	15						PID=0.6ppm		S2(5-5.5'): SILTY SAND (SM) ~60% fine sand, ~40% fines, tannish brown, moist.		Sampled 7-8' interval for lab analysis.  Wet at 8' BGS.	
									S2(5.5-8'): SILT (ML) ~95% fines, nonplastic, ~5% fine sand, brown, moist.			
									S2(8-10'): SILT (ML) ~95% fines, nonplastic, ~5% fine sand, brown, wet.			
	10								Borehole terminated at 10 ft. Filled with grout. upon completion			
	10											

GEOTECHNICAL BORING LOG 02 - GEI EAST HARTFORD BORING LOGS (CURRENT), GPJ GEI DATA TEMPLATE.GDT 3/7/13

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0

**GEI Consultants, Inc.**  
 455 Winding Brook Drive  
 Glastonbury, CT 06033  
 (860) 368-5300

**Boring Location**  
**NORTHING:** 838,438 **EASTING:** 1,024,063 **STATION:** \_\_\_\_\_ **OFFSET:** \_\_\_\_\_  
**HORIZONTAL DATUM:** NAD 83 **STATION CENTERLINE:** \_\_\_\_\_  
**VERTICAL DATUM:** NAVD 1988 **ESTIMATED GROUND SURFACE EL. (FT)** 20.0  
**LOCATION:** Landside Toe

**BORING**  
**GP - 10**  
 PAGE 1 of 1

**Drilling Information**

**DATE START / END:** 2/6/2013 - 2/6/2013 **TOTAL DEPTH (FT):** 10.0  
**CONTRACTOR:** AES **DRILLER:** Max Figueroa **LOGGED BY:** Russ Morang  
**EQUIPMENT:** Geoprobe 7822 DT **BORING METHOD:** Geoprobe  
**AUGER ID/OD:** N/A / N/A **CASING ID/OD:** N/A / N/A **CORE INFO:** \_\_\_\_\_  
**HAMMER TYPE:** N/A **HAMMER WEIGHT (lbs):** N/A **HAMMER DROP (inch):** N/A  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Location is approximate.

**ABBREVIATIONS:** ID = Inside Diameter    bpf = Blows per Foot    U = Undisturbed Tube Sample    WOR = Weight of Rods    Q<sub>v</sub> = Pocket Penetrometer Strength  
 OD = Outside Diameter    mpf = Minute per Foot    C = Rock Core    WOH = Weight of Hammer    S<sub>v</sub> = Pocket Torvane Shear Strength  
 Pen. = Penetration Length    S = Split Spoon    V = Field Vane Shear    RQD = Rock Quality Designation    F<sub>v</sub> = Field Vane Shear Strength  
 Rec. = Recovery Length    DP = Direct Push Sample    SC = Sonic Core    OVM = Organic Vapor Meter    NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION				Field Test Data	GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)					
			S1		0 to 5	60/42	PID=0ppm	S1(0-0.5'): TOPSOIL			
								S1(0.5-2'): SILTY SAND WITH GRAVEL (SM) ~65% fine-medium sand, ~20% fines, ~15% fine-coarse gravel, sub-rounded, maximum size 2", brown, moist.			
								S1(2-4.5'): NARROWLY GRADED SAND WITH SILT (SP-SM) ~90% fine-medium sand, ~10% fines, brown, moist.			
15	5		S2		5 to 10	60/48	PID=1.4ppm	S1(4.5-5'): SILT (ML) ~90% fines, nonplastic, ~10% fine sand, grey-brown, moist.		Sampled 5-6' interval for lab analysis.	
								S2(5-5.5'): SILTY SAND (SM) ~85% fine-medium sand, ~15% fines, brown, moist.		Wet at 6' BGS.	
								S2(5.5-10'): SILT (ML) ~90% fines, nonplastic, ~10% fine sand, brown, moist.			
10	10							Borehole terminated at 10 ft. Filled with grout. upon completion			

GEOTECHNICAL BORING LOG 02 - GEI EAST HARTFORD BORING LOGS (CURRENT), GPJ GEI DATA TEMPLATE.GDT 3/7/13

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0


**GEI Consultants, Inc.**  
 455 Winding Brook Drive  
 Glastonbury, CT 06033  
 (860) 368-5300

**Boring Location**  
**NORTHING:** 839,484 **EASTING:** 1,023,415 **STATION:** \_\_\_\_\_ **OFFSET:** \_\_\_\_\_  
**HORIZONTAL DATUM:** NAD 83 **STATION CENTERLINE:** \_\_\_\_\_  
**VERTICAL DATUM:** NAVD 1988 **ESTIMATED GROUND SURFACE EL. (FT)** 16.0  
**LOCATION:** Waterside Floodwall

**BORING**  
**GP - 11**  
 PAGE 1 of 2

**Drilling Information**  
**DATE START / END:** 2/6/2013 - 2/6/2013 **TOTAL DEPTH (FT):** 15.0  
**CONTRACTOR:** AES **DRILLER:** Max Figueroa **LOGGED BY:** Russ Morang  
**EQUIPMENT:** Geoprobe 7822 DT **BORING METHOD:** Geoprobe  
**AUGER ID/OD:** N/A / N/A **CASING ID/OD:** N/A / N/A **CORE INFO:** \_\_\_\_\_  
**HAMMER TYPE:** N/A **HAMMER WEIGHT (lbs):** N/A **HAMMER DROP (inch):** N/A  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Location is approximate.

**ABBREVIATIONS:** ID = Inside Diameter    bpf = Blows per Foot    U = Undisturbed Tube Sample    WOR = Weight of Rods    Q<sub>v</sub> = Pocket Penetrometer Strength  
 OD = Outside Diameter    mpf = Minute per Foot    C = Rock Core    WOH = Weight of Hammer    S<sub>v</sub> = Pocket Torvane Shear Strength  
 Pen. = Penetration Length    S = Split Spoon    V = Field Vane Shear    RQD = Rock Quality Designation    F<sub>v</sub> = Field Vane Shear Strength  
 Rec. = Recovery Length    DP = Direct Push Sample    SC = Sonic Core    OVM = Organic Vapor Meter    NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION					GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blows Count or RQD				
15	0 to 5		S1		60/43		PID=0ppm	S1(0-0.5'): TOPSOIL			
							S1(0.5-2.5'): SILTY SAND WITH GRAVEL (SM) ~65% fine-coarse sand, ~15% fines, ~20% fine-coarse gravel, sub-angular, maximum size 1.75", reddish brown, moist.				
							S1(2.5-5'): SILT (ML) ~90% fines, nonplastic, ~10% fine sand, brown, moist.				
5	5 to 10		S2		60/42		PID=0ppm	S2(5-10'): SILT WITH SAND (ML) ~75% fines, nonplastic, ~15% fine sand, ~10% coarse gravel, sub-rounded, maximum size 2", brown, moist.			
10	10 to 15		S3		60/52		PID=4.6ppm	S3(10-12.5'): SILT WITH SAND (ML) ~75% fines, nonplastic, ~25% fine-medium sand, brown, wet.		Wet at 10' BGS.	

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0


**GEI Consultants, Inc.**  
 455 Winding Brook Drive  
 Glastonbury, CT 06033  
 (860) 368-5300

GEOTECHNICAL BORING LOG 02\_GEI EAST HARTFORD BORING LOGS (CURRENT),GPJ\_GEI DATA TEMPLATE.GDT\_3/7/13

**Boring Location**  
**NORTHING:** 839,484 **EASTING:** 1,023,415 **STATION:** \_\_\_\_\_ **OFFSET:** \_\_\_\_\_  
**HORIZONTAL DATUM:** NAD 83 **STATION CENTERLINE:** \_\_\_\_\_  
**VERTICAL DATUM:** NAVD 1988 **ESTIMATED GROUND SURFACE EL. (FT)** 16.0  
**LOCATION:** Waterside Floodwall

**BORING**  
**GP - 11**  
**PAGE 2 of 2**

Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION					GRAPHIC LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blows Count or RQD				
							PID=4.6ppm				
	15								S3(12.5-15'): SILT (ML) ~90% fines, nonplastic, ~10% fine sand, grey, wet.		Light petroleum odor and staining observed. Sampled 13-15' interval for lab analysis.
	0								Borehole terminated at 15 ft. Converted to 1" monitoring well. See well log for details. upon completion		
	20										
	-5										
	25										
	-10										

GEOTECHNICAL BORING LOG 02 - GEI EAST HARTFORD BORING LOGS (CURRENT), GPJ - GEI DATA TEMPLATE.GDT 3/7/13

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0



**GEI Consultants, Inc.**  
 455 Winding Brook Drive  
 Glastonbury, CT 06033  
 (860) 368-5300



**Boring Location**  
**NORTHING:** 839,355 **EASTING:** 1,023,446 **STATION:** \_\_\_\_\_ **OFFSET:** \_\_\_\_\_  
**HORIZONTAL DATUM:** NAD 83 **STATION CENTERLINE:** \_\_\_\_\_  
**VERTICAL DATUM:** NAVD 1988 **ESTIMATED GROUND SURFACE EL. (FT)** 16.0  
**LOCATION:** Waterside Floodwall

**BORING**  
**GP - 12**  
 PAGE 1 of 2

**Drilling Information**  
**DATE START / END:** 2/6/2013 - 2/6/2013 **TOTAL DEPTH (FT):** 15.0  
**CONTRACTOR:** AES **DRILLER:** Max Figueroa **LOGGED BY:** Russ Morang  
**EQUIPMENT:** Geoprobe 7822 DT **BORING METHOD:** Geoprobe  
**AUGER ID/OD:** N/A / N/A **CASING ID/OD:** N/A / N/A **CORE INFO:** \_\_\_\_\_  
**HAMMER TYPE:** N/A **HAMMER WEIGHT (lbs):** N/A **HAMMER DROP (inch):** N/A  
**WATER LEVEL DEPTHS (ft):** \_\_\_\_\_  
**GENERAL NOTES:** Location is approximate.

**ABBREVIATIONS:** ID = Inside Diameter    bpf = Blows per Foot    U = Undisturbed Tube Sample    WOR = Weight of Rods    Q<sub>p</sub> = Pocket Penetrometer Strength  
 OD = Outside Diameter    mpf = Minute per Foot    C = Rock Core    WOH = Weight of Hammer    S<sub>v</sub> = Pocket Torvane Shear Strength  
 Pen. = Penetration Length    S = Split Spoon    V = Field Vane Shear    RQD = Rock Quality Designation    F<sub>v</sub> = Field Vane Shear Strength  
 Rec. = Recovery Length    DP = Direct Push Sample    SC = Sonic Core    OVM = Organic Vapor Meter    NA, NM = Not Applicable, Not Measured

Elev. (ft)	Depth (ft)	Casing Pen. (bpf) or Core Rate (mpf)	SAMPLE INFORMATION				FIELD LOG	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)				
15	0 to 5		S1		60/54		PID=0ppm	S1(0-0.5'): TOPSOIL		
								S1(0.5-2'): SILTY SAND WITH GRAVEL (SM) ~70% fine-medium sand, ~15% fines, ~15% fine to coarse gravel, sub-angular, maximum size 1.5", brown, moist.		
								S1(2-3.5'): SILT (ML) ~90% fines, nonplastic, ~10% fine sand, brown, moist.		
								S1(3.5-5'): SILT (ML) ~95% fines, nonplastic, ~5% fine sand, brown, moist.		
5	5 to 10		S2		60/46		PID=0ppm	S2(5-10'): NARROWLY GRADED SAND (SP) ~95% fine-medium sand, ~5% fines, brown, moist.		
10	10 to 15		S3		60/57		PID=0ppm	S3(10-11'): NARROWLY GRADED SAND (SP) ~95% fine-medium sand, ~5% fines, brown, moist.		
								S3(11-12.5'): NARROWLY GRADED SAND		Wet at 11' BGS.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**CLIENT:** Town of East Hartford  
**PROJECT NAME:** EHFCS Toe Drain Design  
**CITY/STATE:** East Hartford, Connecticut  
**GEI PROJECT NUMBER:** 12439-0


**GEI Consultants, Inc.**  
 455 Winding Brook Drive  
 Glastonbury, CT 06033  
 (860) 368-5300

GEOTECHNICAL BORING LOG 02\_GEI EAST HARTFORD BORING LOGS (CURRENT),GPJ\_GEI DATA TEMPLATE.GDT\_3/7/13



# Groundwater Well Installation Log

## GP - 11 (MW)

**Project** Toe Drain Design Phase I  
**City / Town** East Hartford, CT  
**Client** Town of East Hartford  
**Contractor** AES  
**Driller** Max Figuerra **GEI Rep.** Russ Morang

**GEI Proj. No.** 124390  
**Location** East River Drive  
**Install Date** 2/6/2013

Survey Datum: <u>NAVD88</u>		Length of Surface Casing above Ground	<u>0.0 ft</u>
Ground Elevation: <u>16'</u>		Dist. Top of Surf. Casing to Top of Riser Pipe	<u>2.0 in</u>
	<u>0.6'</u>	Type and Thickness of Seal around Surface Casing	<u>6 in. concrete</u>
Sand		ID of Surface Casing	<u>5 in</u>
		Type of Surface Casing	<u>Steel curb box</u>
		Depth Bottom of Surface Casing	<u>8 in</u>
2.5'		ID and OD of Riser Pipe	<u>1 in. ID / 0.75 in. OD</u>
		Type of Riser Pipe	<u>PVC</u>
		Type of Backfill around Riser Pipe	<u>Sand</u>
		Diameter of Borehole	<u>2.5 in</u>
Silt		Depth Top of Seal	<u>3 ft</u>
		Type of Seal	<u>Bentonite</u>
		Depth Bottom of Seal	<u>4 ft</u>
		Depth Top of Screened Section	<u>5 ft</u>
		Type of Screen	<u>Slotted PVC</u>
		Description of Screen Openings	<u>10 Slot</u>
		ID and OD of Screened Section	<u>1 in. ID / 0.75 in. OD</u>
		Type of Filter Material	<u>sand</u>
		Depth Bottom of Screened Section	<u>14.8 ft</u>
		Depth Bottom of Silt Trap	<u>15 ft</u>
		Depth Bottom of Filter Material	<u>15 ft</u>
		Depth Top of Seal	<u>N.A.</u>
		Type of Seal	<u>N.A.</u>
		Depth Bottom of Seal	<u>N.A.</u>
		Type of Backfill below Filter Material	<u>N.A.</u>
		Bottom of Borehole	<u>15 ft</u>

General Soil Conditions (Not to Scale)

Date	Time	Distance to $\blacktriangledown$ below top of riser pipe

**Notes:**

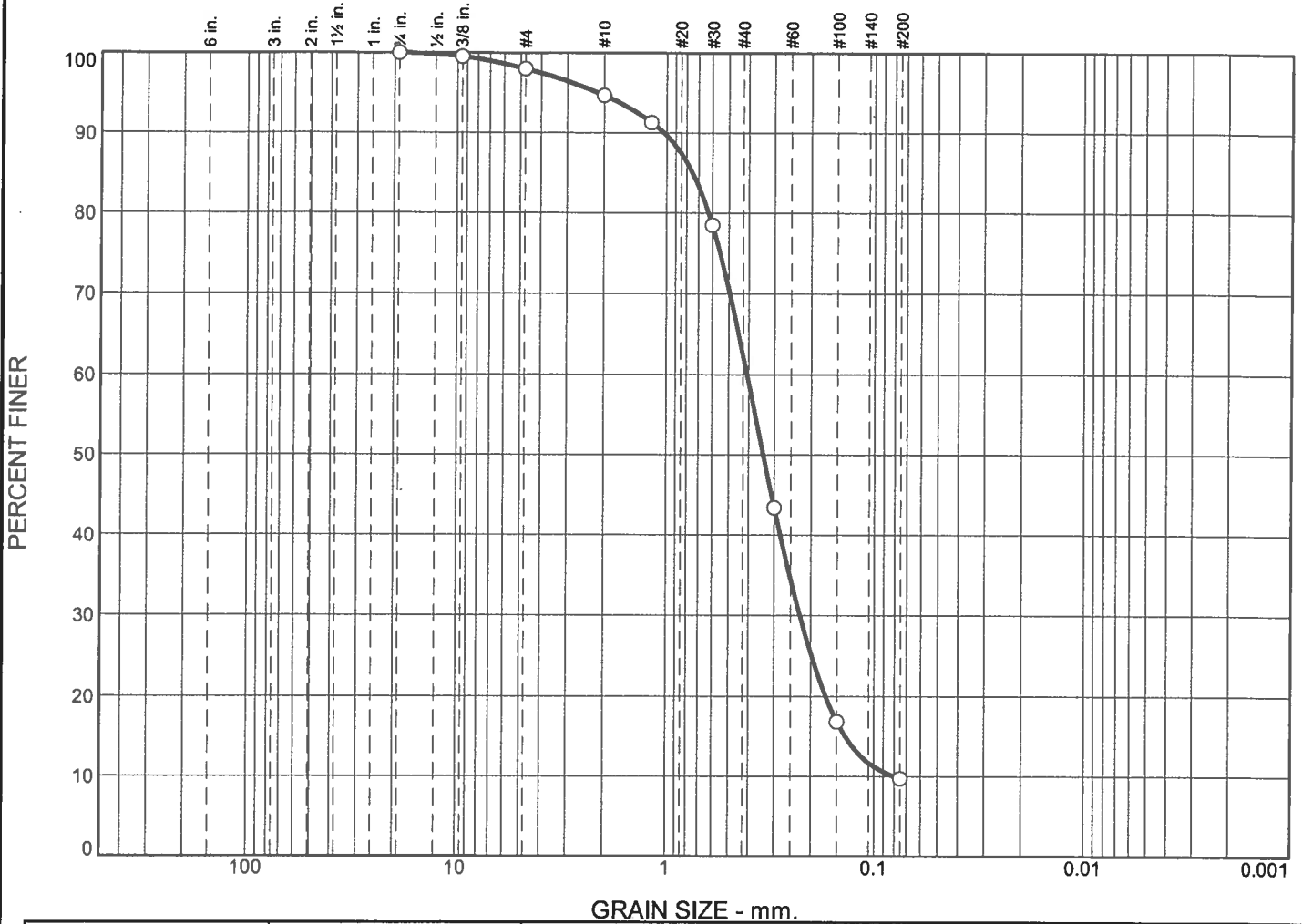


# Attachment 2

---

## Geotechnical Lab Testing

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines			
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
0.0	0.0	2.0	3.3	32.4	52.6	9.7			
LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
NV	NP	0.7483	0.4071	0.3394	0.2254	0.1368	0.0798	1.56	5.10

Material Description	USCS	AASHTO
○ Narrowly graded SAND with silt	SP-SM	A-3

**Project No.** 124390      **Client:** Town of East Hartford  
**Project:** Toe Drain Deisgn Phase 1 -- EHFCS  
  
**Source of Sample:** GEI-1      **Depth:** Bottom      **Sample Number:** Bulk

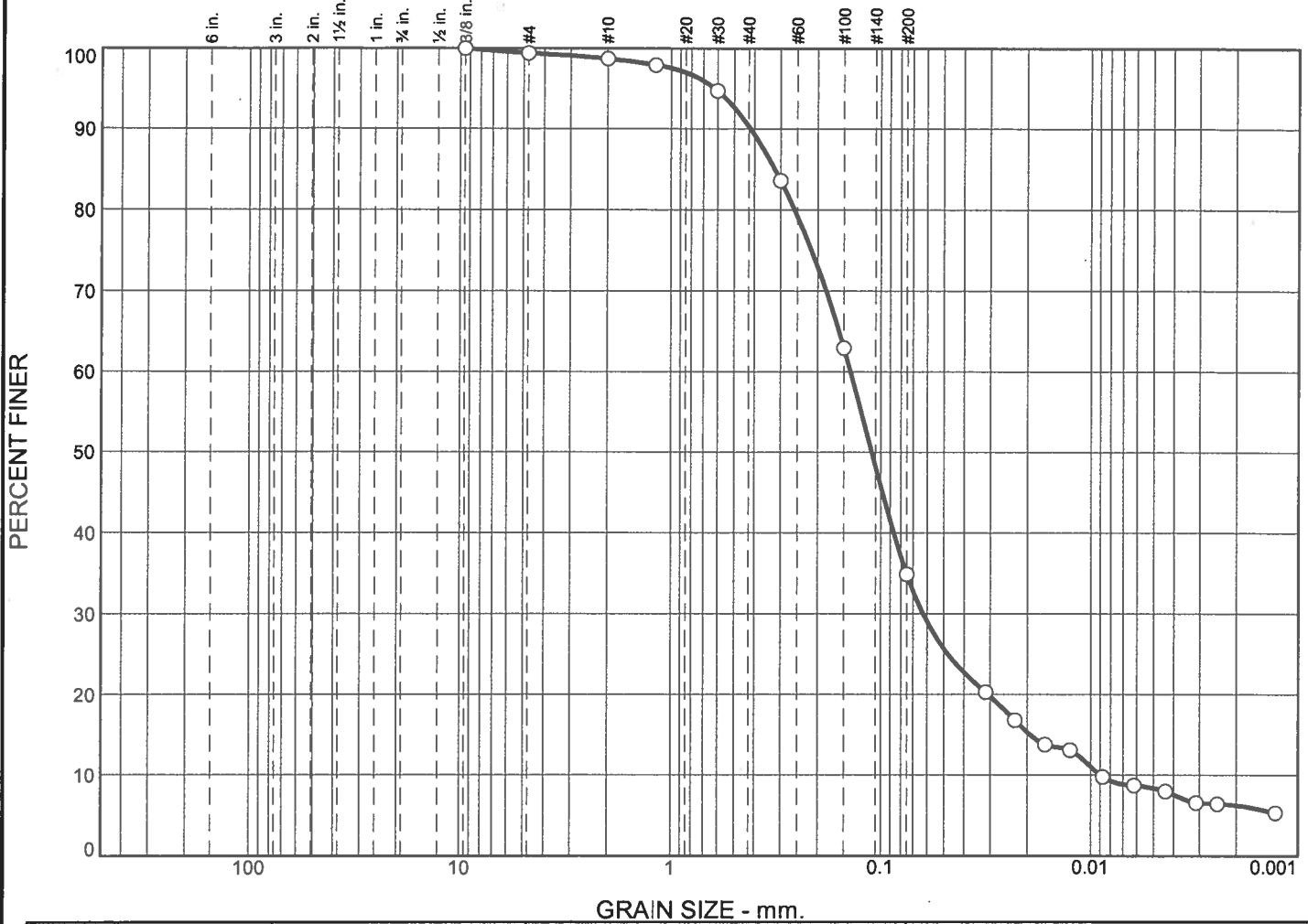
**Remarks:**  
 ○ Test Date: 7/24/2012

GEI Consultants, Inc.  
 400 Unicorn Park Drive  
 Woburn, MA 01801



**Figure**

# Particle Size Distribution Report



%	% Gravel		% Sand			% Fines				
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay			
○	0.0	0.6	0.7	8.4	55.4	26.5	8.4			
×	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○	NV	NP	0.3194	0.1394	0.1103	0.0626	0.0195	0.0090	3.14	15.55

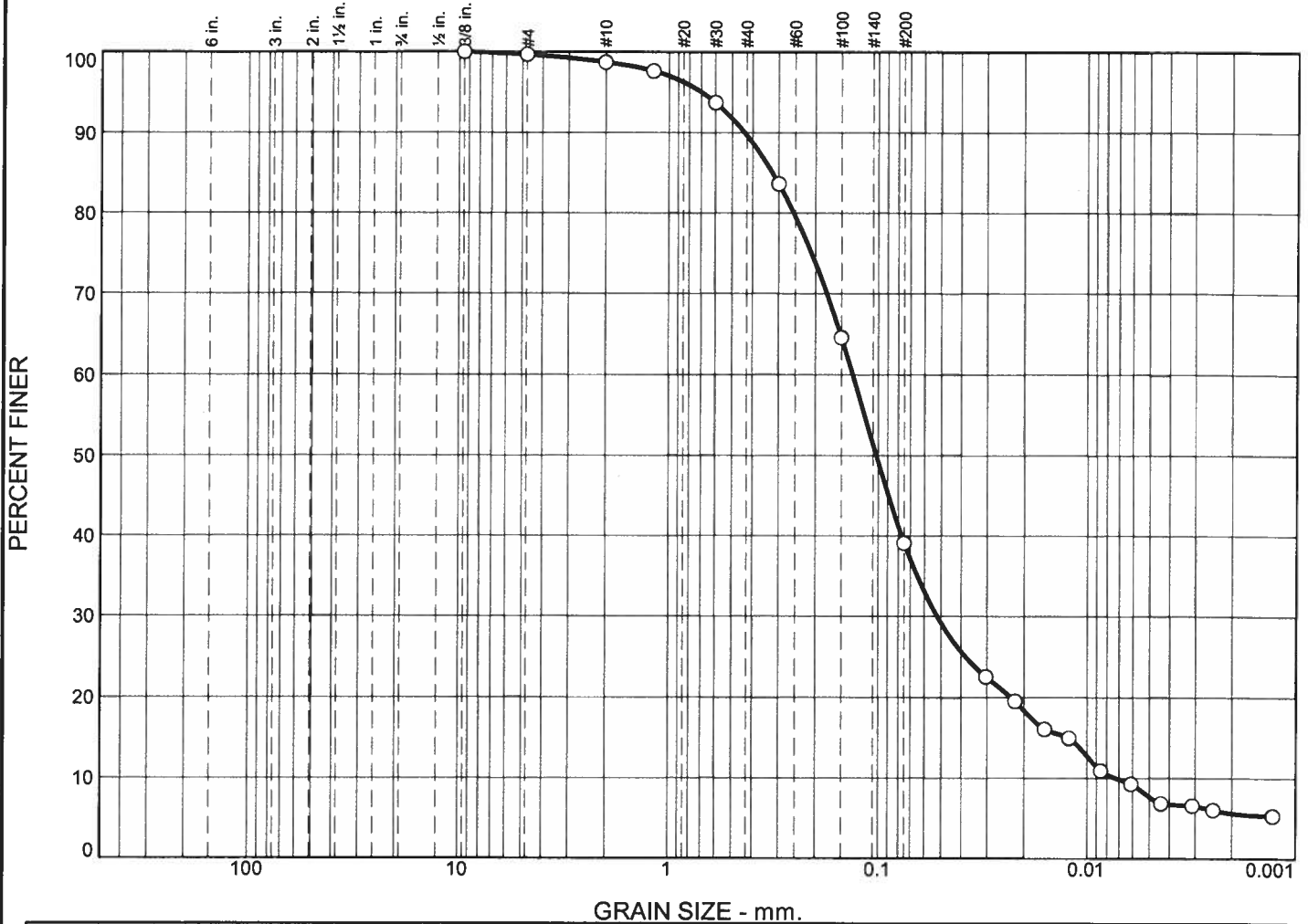
Material Description	USCS	AASHTO
○ Silty SAND	SM	A-2-4(0)

**Project No.** 124390      **Client:** Town of East Hartford  
**Project:** Toe Drain Deisgn Phase 1 -- EHFCS  
 ○ **Source of Sample:** GEI-2      **Depth:** Bottom      **Sample Number:** Bulk

**Remarks:**  
 ○ Test Date: 7/17/2012

**Figure**

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines			
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
○ 0.0	0.0	0.3	1.0	9.0	50.6	31.4	7.7		
⊗ LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○ NV		0.3210	0.1323	0.1020	0.0521	0.0122	0.0072	2.83	18.28

Material Description	USCS	AASHTO
○ Silty SAND	SM	A-4(0)

**Project No.** 124390      **Client:** Town of East Hartford  
**Project:** Toe Drain Deisgn Phase 1 -- EHFCS

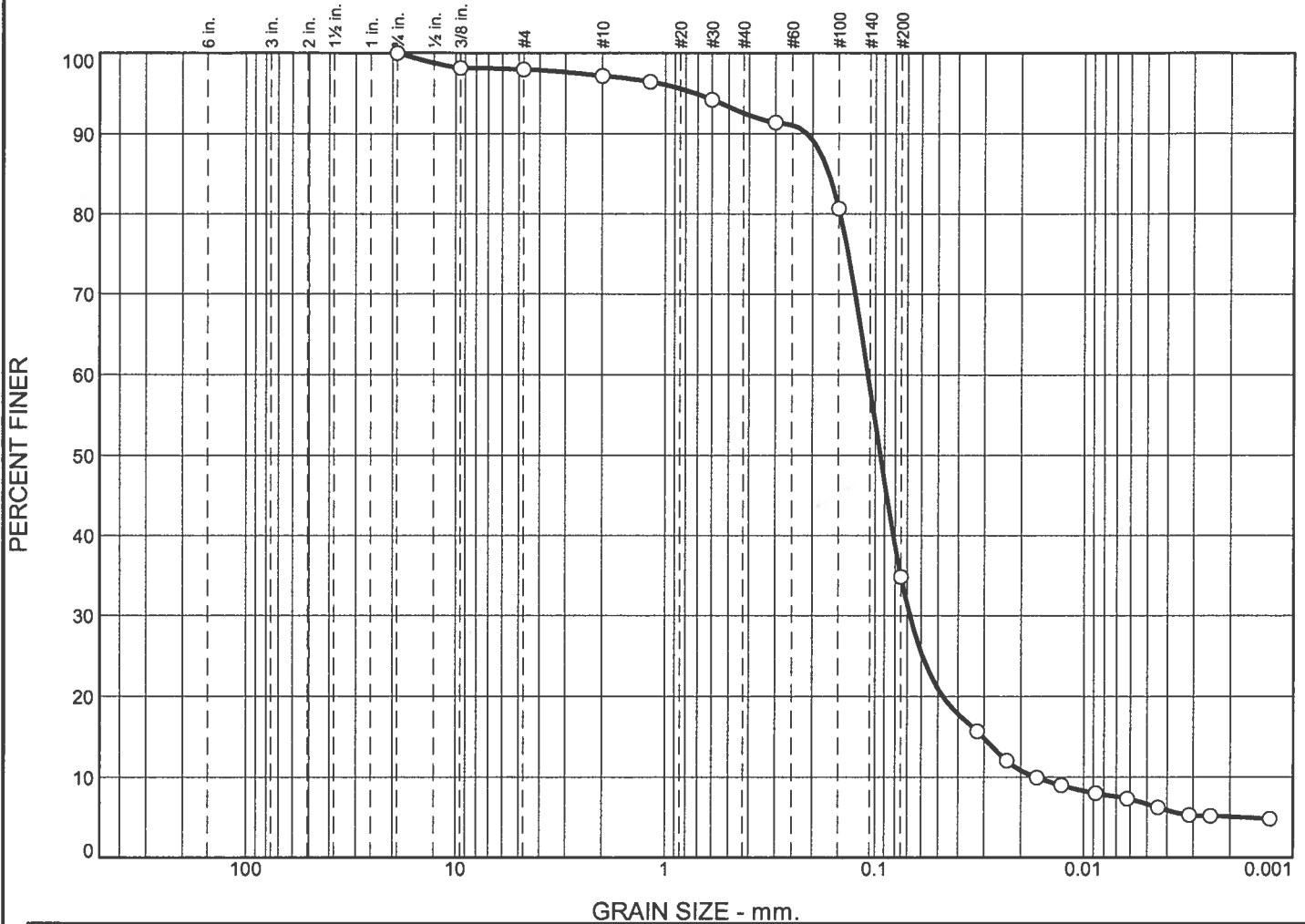
○ **Source of Sample:** GEI-3      **Depth:** Bottom      **Sample Number:** Jar

GEI Consultants, Inc.  
 400 Unicorn Park Drive  
 Woburn, MA 01801

**Remarks:**  
 ○ Test Date: 7/24/2012  
 Sample had strong petroleum odor and sheen.

**Figure**

# Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
<input type="radio"/>	0.0	0.0	2.1	0.7	4.6	57.7	28.2	6.7		
<input checked="" type="checkbox"/>	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
<input type="radio"/>	NV		0.1671	0.1084	0.0946	0.0678	0.0304	0.0169	2.52	6.42

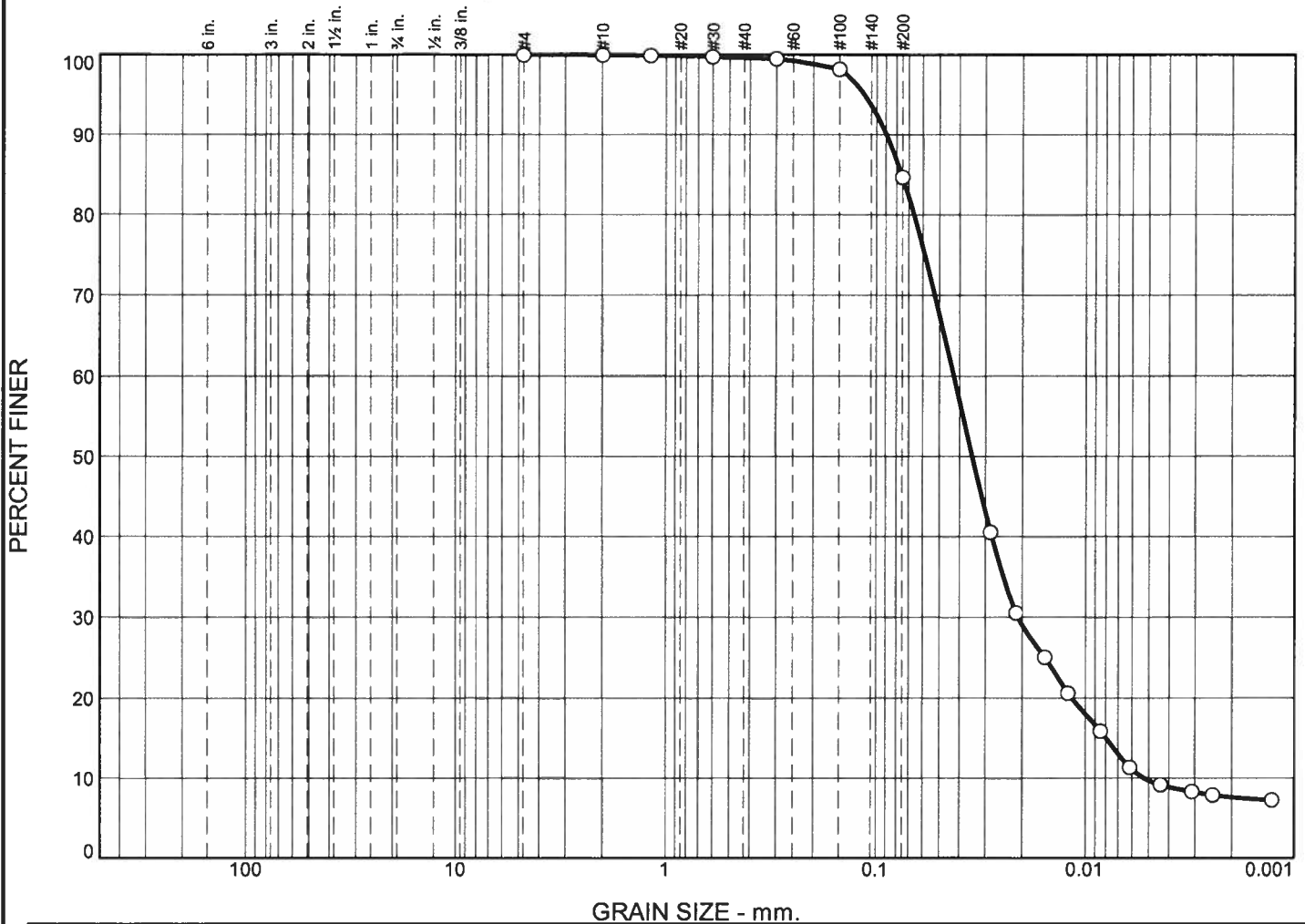
Material Description	USCS	AASHTO
<input type="radio"/> Silty SAND	SM	A-2-4(0)

<b>Project No.</b> 124390 <b>Client:</b> Town of East Hartford <b>Project:</b> Toe Drain Deisgn Phase 1 -- EHFCS  <input type="radio"/> <b>Source of Sample:</b> GEI-4 <b>Depth:</b> Bottom <b>Sample Number:</b> Bulk	<b>Remarks:</b> <input type="radio"/> Test Date: 7/24/2012
 GEI Consultants, Inc. 400 Unicorn Park Drive Woburn, MA 01801	

**Figure**



# Particle Size Distribution Report



% +3"		% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
<input type="radio"/>	0.0	0.0	0.0	0.0	0.4	14.9	75.0	9.7		
<input checked="" type="checkbox"/>	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
<input type="radio"/>	NV	NP	0.0757	0.0427	0.0348	0.0209	0.0080	0.0053	1.95	8.12
<b>Material Description</b>								<b>USCS</b>	<b>AASHTO</b>	
<input type="radio"/> SILT								ML	A-4(0)	

<p><b>Project No.</b> 124390      <b>Client:</b> Town of East Hartford</p> <p><b>Project:</b> Toe Drain Deisgn Phase 1 -- EHFCS</p> <p><input type="radio"/> <b>Source of Sample:</b> GEI-5      <b>Depth:</b> Bottom      <b>Sample Number:</b> Bulk</p>	<p><b>Remarks:</b></p> <p><input type="radio"/> Test Date: 7/24/2012</p>
<p>GEI Consultants, Inc. 400 Unicorn Park Drive Woburn, MA 01801</p>	
<p><b>Figure</b></p>	

# Attachment 3

---

## Environmental Lab Testing



Wednesday, July 18, 2012

Attn: Mr. Barry Giroux  
GEI Consultants  
455 Winding Brook Drive  
Suite 201  
Glastonbury, CT 06033

Project ID: TOE DRAIN INSPECTION TOEH  
Sample ID#s: BC08798

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. All soils and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Phyllis Shiller".

Phyllis Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #MA-CT-007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
VT Lab Registration #VT11301



**Environmental Laboratories, Inc.**

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**

July 18, 2012

FOR: Attn: Mr. Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

Sample Information

Matrix: SOIL  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#: 124390-1002

Custody Information

Collected by:  
 Received by: LB  
 Analyzed by: see "By" below

Date                      Time  
 07/11/12                      11:30  
 07/11/12                      13:06

Laboratory Data

SDG ID: GBC08798  
 Phoenix ID: BC08798

Project ID: TOE DRAIN INSPECTION TOEH  
 Client ID: SOIL PRE CHAR

Parameter	Result	RL	Units	Date/Time	By	Reference
Silver	< 0.42	0.42	mg/Kg	07/12/12	LK	SW6010
Arsenic	3.5	0.8	mg/Kg	07/12/12	LK	SW6010
Barium	45.6	0.42	mg/Kg	07/12/12	LK	SW6010
Cadmium	< 0.42	0.42	mg/Kg	07/12/12	LK	SW6010
Chromium	20.4	0.42	mg/Kg	07/12/12	LK	SW6010
Mercury	0.16	0.08	mg/Kg	07/12/12	RS	SW-7471
Lead	36.0	0.42	mg/Kg	07/12/12	LK	SW6010
Selenium	< 1.7	1.7	mg/Kg	07/12/12	LK	SW6010
TCLP Lead	0.14	0.10	mg/L	07/12/12	EK	SW6010
TCLP Metals Digestion	Completed			07/12/12	X/X	SW3005
Percent Solid	82		%	07/11/12	JL	E160.3
Conductivity - Soil Matrix	17	5	umhos/cm	07/11/12	RWR	SM2510B
Flash Point	>200	200	degree F	07/12/12	Y	SW1010
Ignitability	Passed	140	deg F	07/12/12	Y	SW1010
pH - Soil	6.79	0.10	pH Units	07/11/12 20:00	O/EG	4500-H B/9045
Reactivity Cyanide	< 6.1	6.1	mg/Kg	07/12/12	JL/GD	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	07/12/12	JL/GD	SW846-7.3
Reactivity	Negative		Pos/Neg	07/12/12	JL/GD	SW 846-7.3
Soil Extraction for PCB	Completed			07/11/12	JB/F	SW3545
Soil Extraction for SVOA	Completed			07/11/12	RJ/f	SW3545
Extraction of CT ETPH	Completed			07/11/12	JJ/F	3545
Mercury Digestion	Completed			07/12/12	X/X	SW7471
TCLP Extraction for Metals	Completed			07/11/12	X	EPA 1311
Total Metals Digest	Completed			07/11/12	N/AG	SW846 - 3050
Field Extraction	Completed			07/11/12	GEI	SW5035

**TPH by GC (Extractable Products)**

Ext. Petroleum HC	3500	120	mg/Kg	07/13/12	JRB	CT ETPH/8015
Identification	**		mg/Kg	07/13/12	JRB	CT ETPH/8015

Parameter	Result	RL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	Diluted Out		%	07/13/12	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	400	ug/Kg	07/13/12	KCA	SW 8082
PCB-1221	ND	400	ug/Kg	07/13/12	KCA	SW 8082
PCB-1232	ND	400	ug/Kg	07/13/12	KCA	SW 8082
PCB-1242	ND	400	ug/Kg	07/13/12	KCA	SW 8082
PCB-1248	ND	400	ug/Kg	07/13/12	KCA	SW 8082
PCB-1254	ND	400	ug/Kg	07/13/12	KCA	SW 8082
PCB-1260	ND	400	ug/Kg	07/13/12	KCA	SW 8082
PCB-1262	ND	400	ug/Kg	07/13/12	KCA	SW 8082
PCB-1268	ND	400	ug/Kg	07/13/12	KCA	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	106		%	07/13/12	KCA	30 - 150 %
% TCMX	88		%	07/13/12	KCA	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,1,1-Trichloroethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,1,2,2-Tetrachloroethane	ND	790	ug/Kg	07/14/12	R/J	SW8260
1,1,2-Trichloroethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,1-Dichloroethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,1-Dichloroethene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,1-Dichloropropene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,2,3-Trichlorobenzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,2,3-Trichloropropane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,2,4-Trichlorobenzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,2,4-Trimethylbenzene	12000	1300	ug/Kg	07/14/12	R/J	SW8260
1,2-Dibromo-3-chloropropane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,2-Dibromoethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,2-Dichlorobenzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,2-Dichloroethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,2-Dichloropropane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,3,5-Trimethylbenzene	2400	1300	ug/Kg	07/14/12	R/J	SW8260
1,3-Dichlorobenzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,3-Dichloropropane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
1,4-Dichlorobenzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
2,2-Dichloropropane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
2-Chlorotoluene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
2-Hexanone	ND	6600	ug/Kg	07/14/12	R/J	SW8260
2-Isopropyltoluene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
4-Chlorotoluene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
4-Methyl-2-pentanone	ND	6600	ug/Kg	07/14/12	R/J	SW8260
Acetone	ND	26000	ug/Kg	07/14/12	R/J	SW8260
Acrylonitrile	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Benzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Bromobenzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Bromochloromethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Bromodichloromethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Bromoform	ND	1300	ug/Kg	07/14/12	R/J	SW8260

Parameter	Result	RL	Units	Date/Time	By	Reference
Bromomethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Carbon Disulfide	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Carbon tetrachloride	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Chlorobenzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Chloroethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Chloroform	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Chloromethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
cis-1,2-Dichloroethene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
cis-1,3-Dichloropropene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Dibromochloromethane	ND	790	ug/Kg	07/14/12	R/J	SW8260
Dibromomethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Dichlorodifluoromethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Ethylbenzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Hexachlorobutadiene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Isopropylbenzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
m&p-Xylene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Methyl Ethyl Ketone	ND	7900	ug/Kg	07/14/12	R/J	SW8260
Methyl t-butyl ether (MTBE)	ND	2600	ug/Kg	07/14/12	R/J	SW8260
Methylene chloride	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Naphthalene	4900	1300	ug/Kg	07/14/12	R/J	SW8260
n-Butylbenzene	1800	1300	ug/Kg	07/14/12	R/J	SW8260
n-Propylbenzene	1400	1300	ug/Kg	07/14/12	R/J	SW8260
o-Xylene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
p-Isopropyltoluene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
sec-Butylbenzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Styrene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
tert-Butylbenzene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Tetrachloroethene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Tetrahydrofuran (THF)	ND	2600	ug/Kg	07/14/12	R/J	SW8260
Toluene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Total Xylenes	ND	1300	ug/Kg	07/14/12	R/J	SW8260
trans-1,2-Dichloroethene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
trans-1,3-Dichloropropene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
trans-1,4-dichloro-2-butene	ND	2600	ug/Kg	07/14/12	R/J	SW8260
Trichloroethene	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Trichlorofluoromethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Trichlorotrifluoroethane	ND	1300	ug/Kg	07/14/12	R/J	SW8260
Vinyl chloride	ND	1300	ug/Kg	07/14/12	R/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	108		%	07/14/12	R/J	70 - 130 %
% Bromofluorobenzene	117		%	07/14/12	R/J	70 - 130 %
% Dibromofluoromethane	98		%	07/14/12	R/J	70 - 130 %
% Toluene-d8	120		%	07/14/12	R/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
1,2,4-Trichlorobenzene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
1,2-Dichlorobenzene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
1,3-Dichlorobenzene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
1,4-Dichlorobenzene	ND	1400	ug/Kg	07/13/12	DD	SW 8270

Parameter	Result	RL	Units	Date/Time	By	Reference
2,4,5-Trichlorophenol	ND	1400	ug/Kg	07/13/12	DD	SW 8270
2,4,6-Trichlorophenol	ND	1400	ug/Kg	07/13/12	DD	SW 8270
2,4-Dichlorophenol	ND	1400	ug/Kg	07/13/12	DD	SW 8270
2,4-Dimethylphenol	ND	1400	ug/Kg	07/13/12	DD	SW 8270
2,4-Dinitrophenol	ND	3200	ug/Kg	07/13/12	DD	SW 8270
2,4-Dinitrotoluene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
2,6-Dinitrotoluene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
2-Chloronaphthalene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
2-Chlorophenol	ND	1400	ug/Kg	07/13/12	DD	SW 8270
2-Methylnaphthalene	26000	1400	ug/Kg	07/13/12	DD	SW 8270
2-Methylphenol (o-cresol)	ND	1400	ug/Kg	07/13/12	DD	SW 8270
2-Nitroaniline	ND	3200	ug/Kg	07/13/12	DD	SW 8270
2-Nitrophenol	ND	1400	ug/Kg	07/13/12	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	2000	ug/Kg	07/13/12	DD	SW 8270
3,3'-Dichlorobenzidine	ND	1400	ug/Kg	07/13/12	DD	SW 8270
3-Nitroaniline	ND	3200	ug/Kg	07/13/12	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	5700	ug/Kg	07/13/12	DD	SW 8270
4-Bromophenyl phenyl ether	ND	2000	ug/Kg	07/13/12	DD	SW 8270
4-Chloro-3-methylphenol	ND	1400	ug/Kg	07/13/12	DD	SW 8270
4-Chloroaniline	ND	1400	ug/Kg	07/13/12	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	1400	ug/Kg	07/13/12	DD	SW 8270
4-Nitroaniline	ND	3200	ug/Kg	07/13/12	DD	SW 8270
4-Nitrophenol	ND	5700	ug/Kg	07/13/12	DD	SW 8270
Acenaphthene	2100	1400	ug/Kg	07/13/12	DD	SW 8270
Acenaphthylene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Acetophenone	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Aniline	ND	5700	ug/Kg	07/13/12	DD	SW 8270
Anthracene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Azobenzene	ND	2000	ug/Kg	07/13/12	DD	SW 8270
Benz(a)anthracene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Benzidine	ND	2400	ug/Kg	07/13/12	DD	SW 8270
Benzo(a)pyrene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Benzo(b)fluoranthene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Benzo(ghi)perylene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Benzo(k)fluoranthene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Benzoic acid	ND	5700	ug/Kg	07/13/12	DD	SW 8270
Benzyl butyl phthalate	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Bis(2-chloroethyl)ether	ND	2000	ug/Kg	07/13/12	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Carbazole	ND	3000	ug/Kg	07/13/12	DD	SW 8270
Chrysene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Dibenz(a,h)anthracene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Dibenzofuran	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Diethyl phthalate	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Dimethylphthalate	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Di-n-butylphthalate	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Di-n-octylphthalate	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Fluoranthene	ND	1400	ug/Kg	07/13/12	DD	SW 8270

Parameter	Result	RL	Units	Date/Time	By	Reference
Fluorene	4300	1400	ug/Kg	07/13/12	DD	SW 8270
Hexachlorobenzene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Hexachlorobutadiene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Hexachlorocyclopentadiene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Hexachloroethane	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Isophorone	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Naphthalene	3500	1400	ug/Kg	07/13/12	DD	SW 8270
Nitrobenzene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
N-Nitrosodimethylamine	ND	2000	ug/Kg	07/13/12	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	1400	ug/Kg	07/13/12	DD	SW 8270
N-Nitrosodiphenylamine	ND	2000	ug/Kg	07/13/12	DD	SW 8270
Pentachloronitrobenzene	ND	2000	ug/Kg	07/13/12	DD	SW 8270
Pentachlorophenol	ND	2000	ug/Kg	07/13/12	DD	SW 8270
Phenanthrene	13000	1400	ug/Kg	07/13/12	DD	SW 8270
Phenol	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Pyrene	ND	1400	ug/Kg	07/13/12	DD	SW 8270
Pyridine	ND	2000	ug/Kg	07/13/12	DD	SW 8270
<b>QA/QC Surrogates</b>						
% 2,4,6-Tribromophenol	106		%	07/13/12	DD	15 - 130 %
% 2-Fluorobiphenyl	75		%	07/13/12	DD	30 - 130 %
% 2-Fluorophenol	79		%	07/13/12	DD	15 - 130 %
% Nitrobenzene-d5	89		%	07/13/12	DD	30 - 130 %
% Phenol-d5	79		%	07/13/12	DD	15 - 130 %
% Terphenyl-d14	41		%	07/13/12	DD	30 - 130 %

RL=Reporting Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

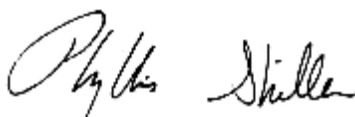
Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

\*\*Petroleum hydrocarbon chromatogram was not a perfect match with any of the standards, but contains a distribution in the C9 to C26 range. The sample was quantitated against a C9-C36 standard.

\* Due to a matrix interference and/or the presence of a large amount of non-target material in the sample, an elevated RL was reported for the semivolatle analysis.

All soils and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200. This report must not be reproduced except in full as defined by the attached chain of custody.



**Phyllis Shiller, Laboratory Director**

**July 18, 2012**

**Reviewed and Released by: Bobbi Aloisa, Vice President**





Environmental Laboratories, Inc.  
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# QA/QC Report

July 18, 2012

## QA/QC Data

SDG I.D.: GBC08798

Parameter	Blank	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 204584, QC Sample No: BC08639 (BC08798)												
Mercury - Soil	BRL	0.24	0.18	NC	103	106	2.9	101	88.0	13.8	70 - 130	30
Comment: Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%.												
QA/QC Batch 204542, QC Sample No: BC08798 (BC08798)												
<u>ICP Metals - Soil</u>												
Arsenic	BRL	3.5	3.78	NC	96.6	93.1	3.7	94.2	92.1	2.3	75 - 125	30
Barium	BRL	45.6	48.6	6.40	101	96.3	4.8	102	97.0	5.0	75 - 125	30
Cadmium	BRL	<0.42	<0.37	NC	95.8	94.0	1.9	94.8	91.4	3.7	75 - 125	30
Chromium	BRL	20.4	21.0	2.90	102	99.0	3.0	98.7	93.1	5.8	75 - 125	30
Lead	BRL	36.0	54.2	40.4	95.0	93.5	1.6	92.1	88.9	3.5	75 - 125	30
Selenium	BRL	<1.7	<1.5	NC	86.5	83.0	4.1	84.2	82.5	2.0	75 - 125	30
Silver	BRL	<0.42	<0.37	NC	96.5	92.0	4.8	97.0	93.9	3.2	75 - 125	30
QA/QC Batch 204603, QC Sample No: BC09169 (BC08798)												
<u>ICP Metals - TCLP Extraction</u>												
Lead	BRL	<0.010	<0.010	NC	99.2	98.4	0.8	99.0	98.8	0.2	75 - 125	20

r = This parameter is outside laboratory rpd specified recovery limits.



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# QA/QC Report

July 18, 2012

## QA/QC Data

SDG I.D.: GBC08798

Parameter	Blank	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 204479, QC Sample No: BC08421 (BC08798)												
Reactivity Cyanide	BRL	<5.6	<5.7	NC	103						85 - 115	30
QA/QC Batch 204490, QC Sample No: BC08422 (BC08798)												
Flash Point		>200	>200	NC	101						85 - 115	30
QA/QC Batch 204564, QC Sample No: BC08798 (BC08798)												
Conductivity - Soil Matrix	BRL	17	16	NC	100						85 - 115	30
QA/QC Batch 204597, QC Sample No: BC08799 (BC08798)												
pH - Soil		7.45	7.43	0.30	98.3						85 - 115	20



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# QA/QC Report

July 18, 2012

## QA/QC Data

SDG I.D.: GBC08798

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
QA/QC Batch 204449, QC Sample No: BC08575 (BC08798)										
<b>Semivolatiles - Soil</b>										
1,2,4,5-Tetrachlorobenzene	ND	46	46	0.0	47	47	0.0	30 - 130	30	
1,2,4-Trichlorobenzene	ND	69	69	0.0	72	71	1.4	30 - 130	30	
1,2-Dichlorobenzene	ND	67	68	1.5	69	70	1.4	30 - 130	30	
1,3-Dichlorobenzene	ND	65	65	0.0	68	68	0.0	30 - 130	30	
1,4-Dichlorobenzene	ND	66	66	0.0	68	68	0.0	30 - 130	30	
2,4,5-Trichlorophenol	ND	82	80	2.5	85	85	0.0	30 - 130	30	
2,4,6-Trichlorophenol	ND	69	67	2.9	71	72	1.4	30 - 130	30	
2,4-Dichlorophenol	ND	75	75	0.0	77	77	0.0	30 - 130	30	
2,4-Dimethylphenol	ND	50	49	2.0	47	47	0.0	30 - 130	30	
2,4-Dinitrophenol	ND	<5	<5	NC	16	16	0.0	30 - 130	30	I,m
2,4-Dinitrotoluene	ND	73	71	2.8	75	75	0.0	30 - 130	30	
2,6-Dinitrotoluene	ND	77	76	1.3	79	78	1.3	30 - 130	30	
2-Chloronaphthalene	ND	73	72	1.4	75	75	0.0	30 - 130	30	
2-Chlorophenol	ND	70	70	0.0	72	72	0.0	30 - 130	30	
2-Methylnaphthalene	ND	69	69	0.0	71	70	1.4	30 - 130	30	
2-Methylphenol (o-cresol)	ND	75	74	1.3	69	72	4.3	30 - 130	30	
2-Nitroaniline	ND	>150	>150	NC	>150	>150	NC	30 - 130	30	I,m
2-Nitrophenol	ND	69	68	1.5	76	76	0.0	30 - 130	30	
3&4-Methylphenol (m&p-cresol)	ND	74	72	2.7	70	71	1.4	30 - 130	30	
3,3'-Dichlorobenzidine	ND	48	49	2.1	52	51	1.9	30 - 130	30	
3-Nitroaniline	ND	83	79	4.9	84	84	0.0	30 - 130	30	
4,6-Dinitro-2-methylphenol	ND	39	34	13.7	77	75	2.6	30 - 130	30	
4-Bromophenyl phenyl ether	ND	72	76	5.4	74	74	0.0	30 - 130	30	
4-Chloro-3-methylphenol	ND	80	79	1.3	82	81	1.2	30 - 130	30	
4-Chloroaniline	ND	99	103	4.0	85	90	5.7	30 - 130	30	
4-Chlorophenyl phenyl ether	ND	72	72	0.0	74	73	1.4	30 - 130	30	
4-Nitroaniline	ND	83	79	4.9	84	84	0.0	30 - 130	30	
4-Nitrophenol	ND	76	60	23.5	80	85	6.1	30 - 130	30	
Acenaphthene	ND	73	73	0.0	76	75	1.3	30 - 130	30	
Acenaphthylene	ND	72	72	0.0	74	74	0.0	30 - 130	30	
Acetophenone	ND	40	39	2.5	40	40	0.0	30 - 130	30	
Aniline	ND	46	46	0.0	23	25	8.3	30 - 130	30	m
Anthracene	ND	72	72	0.0	74	75	1.3	30 - 130	30	
Azobenzene	ND	41	40	2.5	42	42	0.0	30 - 130	30	
Benz(a)anthracene	ND	76	77	1.3	81	82	1.2	30 - 130	30	
Benzidine	ND	<5	<5	NC	<5	<5	NC	30 - 130	30	I,m
Benzo(a)pyrene	ND	69	69	0.0	70	70	0.0	30 - 130	30	
Benzo(b)fluoranthene	ND	72	74	2.7	79	80	1.3	30 - 130	30	
Benzo(ghi)perylene	ND	80	75	6.5	76	67	12.6	30 - 130	30	
Benzo(k)fluoranthene	ND	70	73	4.2	71	72	1.4	30 - 130	30	
Benzyl butyl phthalate	ND	72	79	9.3	75	76	1.3	30 - 130	30	

QA/QC Data

SDG I.D.: GBC08798

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
Bis(2-chloroethoxy)methane	ND	73	75	2.7	75	75	0.0	30 - 130	30
Bis(2-chloroethyl)ether	ND	68	68	0.0	69	69	0.0	30 - 130	30
Bis(2-chloroisopropyl)ether	ND	69	70	1.4	71	72	1.4	30 - 130	30
Bis(2-ethylhexyl)phthalate	ND	68	77	12.4	71	72	1.4	30 - 130	30
Carbazole	ND	119	115	3.4	122	124	1.6	30 - 130	30
Chrysene	ND	69	71	2.9	74	74	0.0	30 - 130	30
Dibenz(a,h)anthracene	ND	80	76	5.1	79	73	7.9	30 - 130	30
Dibenzofuran	ND	72	71	1.4	74	74	0.0	30 - 130	30
Diethyl phthalate	ND	75	76	1.3	77	76	1.3	30 - 130	30
Dimethylphthalate	ND	76	76	0.0	77	77	0.0	30 - 130	30
Di-n-butylphthalate	ND	71	75	5.5	74	75	1.3	30 - 130	30
Di-n-octylphthalate	ND	72	77	6.7	76	76	0.0	30 - 130	30
Fluoranthene	ND	73	71	2.8	78	78	0.0	30 - 130	30
Fluorene	ND	72	70	2.8	74	73	1.4	30 - 130	30
Hexachlorobenzene	ND	72	76	5.4	74	75	1.3	30 - 130	30
Hexachlorobutadiene	ND	68	69	1.5	71	70	1.4	30 - 130	30
Hexachlorocyclopentadiene	ND	76	73	4.0	74	71	4.1	30 - 130	30
Hexachloroethane	ND	66	67	1.5	69	69	0.0	30 - 130	30
Indeno(1,2,3-cd)pyrene	ND	80	76	5.1	78	72	8.0	30 - 130	30
Isophorone	ND	73	74	1.4	75	74	1.3	30 - 130	30
Naphthalene	ND	69	70	1.4	71	71	0.0	30 - 130	30
Nitrobenzene	ND	70	69	1.4	71	72	1.4	30 - 130	30
N-Nitrosodimethylamine	ND	70	70	0.0	71	71	0.0	30 - 130	30
N-Nitrosodi-n-propylamine	ND	76	77	1.3	76	78	2.6	30 - 130	30
N-Nitrosodiphenylamine	ND	93	90	3.3	92	92	0.0	30 - 130	30
Pentachloronitrobenzene	ND	40	42	4.9	41	41	0.0	30 - 130	30
Pentachlorophenol	ND	63	45	33.3	77	78	1.3	30 - 130	30
Phenanthrene	ND	73	73	0.0	76	77	1.3	30 - 130	30
Phenol	ND	73	79	7.9	76	79	3.9	30 - 130	30
Pyrene	ND	75	73	2.7	79	79	0.0	30 - 130	30
Pyridine	ND	33	33	0.0	32	30	6.5	30 - 130	30
% 2,4,6-Tribromophenol	73	73	75	2.7	75	78	3.9	15 - 130	30
% 2-Fluorobiphenyl	66	68	69	1.5	70	70	0.0	30 - 130	30
% 2-Fluorophenol	65	67	67	0.0	68	68	0.0	15 - 130	30
% Nitrobenzene-d5	70	70	69	1.4	71	72	1.4	30 - 130	30
% Phenol-d5	67	71	71	0.0	71	72	1.4	15 - 130	30
% Terphenyl-d14	73	75	73	2.7	77	77	0.0	30 - 130	30

Comment:

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

QA/QC Batch 204443, QC Sample No: BC08639 (BC08798)

TPH by GC (Extractable Products) - Soil

Ext. Petroleum HC	ND	84			109	90	19.1	50 - 150	30
% n-Pentacosane	67	76			133	49	92.3	50 - 150	30

QA/QC Batch 204442, QC Sample No: BC08644 (BC08798)

Polychlorinated Biphenyls - Soil

PCB-1016	ND	76	81	6.4	93	101	8.2	40 - 140	30
PCB-1221	ND							40 - 140	30
PCB-1232	ND							40 - 140	30
PCB-1242	ND							40 - 140	30
PCB-1248	ND							40 - 140	30
PCB-1254	ND							40 - 140	30

QA/QC Data

SDG I.D.: GBC08798

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
PCB-1260	ND	73	78	6.6	92	97	5.3	40 - 140	30
PCB-1262	ND							40 - 140	30
PCB-1268	ND							40 - 140	30
% DCBP (Surrogate Rec)	77	73	80	9.2	102	110	7.5	30 - 150	30
% TCMX (Surrogate Rec)	79	77	84	8.7	103	103	0.0	30 - 150	30

QA/QC Batch 204841, QC Sample No: BC09132 (BC08798)

Volatiles - Soil

1,1,1,2-Tetrachloroethane	ND	102	106	3.8	103	102	1.0	70 - 130	30	
1,1,1-Trichloroethane	ND	110	110	0.0	116	118	1.7	70 - 130	30	
1,1,2,2-Tetrachloroethane	ND	100	103	3.0	135	136	0.7	70 - 130	30	m
1,1,2-Trichloroethane	ND	105	111	5.6	101	91	10.4	70 - 130	30	
1,1-Dichloroethane	ND	110	113	2.7	119	118	0.8	70 - 130	30	
1,1-Dichloroethene	ND	110	121	9.5	137	114	18.3	70 - 130	30	m
1,1-Dichloropropene	ND	99	100	1.0	93	93	0.0	70 - 130	30	
1,2,3-Trichlorobenzene	ND	107	97	9.8	46	<40	NC	70 - 130	30	m
1,2,3-Trichloropropane	ND	97	106	8.9	132	117	12.0	70 - 130	30	m
1,2,4-Trichlorobenzene	ND	105	97	7.9	54	44	20.4	70 - 130	30	m
1,2,4-Trimethylbenzene	ND	100	98	2.0	106	114	7.3	70 - 130	30	
1,2-Dibromo-3-chloropropane	ND	102	108	5.7	136	120	12.5	70 - 130	30	m
1,2-Dibromoethane	ND	103	111	7.5	94	84	11.2	70 - 130	30	
1,2-Dichlorobenzene	ND	98	99	1.0	88	82	7.1	70 - 130	30	
1,2-Dichloroethane	ND	103	109	5.7	102	99	3.0	70 - 130	30	
1,2-Dichloropropane	ND	103	104	1.0	100	99	1.0	70 - 130	30	
1,3,5-Trimethylbenzene	ND	100	98	2.0	110	121	9.5	70 - 130	30	
1,3-Dichlorobenzene	ND	99	99	0.0	90	85	5.7	70 - 130	30	
1,3-Dichloropropane	ND	100	107	6.8	103	98	5.0	70 - 130	30	
1,4-Dichlorobenzene	ND	100	99	1.0	90	85	5.7	70 - 130	30	
2,2-Dichloropropane	ND	120	119	0.8	123	125	1.6	70 - 130	30	
2-Chlorotoluene	ND	99	97	2.0	110	114	3.6	70 - 130	30	
2-Hexanone	ND	129	144	11.0	114	103	10.1	70 - 130	30	l
2-Isopropyltoluene	ND	99	95	4.1	103	113	9.3	70 - 130	30	
4-Chlorotoluene	ND	99	97	2.0	110	114	3.6	70 - 130	30	
4-Methyl-2-pentanone	ND	107	117	8.9	110	96	13.6	70 - 130	30	
Acetone	ND	132	144	8.7	127	104	19.9	70 - 130	30	l
Acrylonitrile	ND	119	131	9.6	124	98	23.4	70 - 130	30	l
Benzene	ND	101	103	2.0	97	95	2.1	70 - 130	30	
Bromobenzene	ND	97	97	0.0	99	102	3.0	70 - 130	30	
Bromochloromethane	ND	103	112	8.4	105	97	7.9	70 - 130	30	
Bromodichloromethane	ND	101	103	2.0	98	96	2.1	70 - 130	30	
Bromoform	ND	108	117	8.0	102	92	10.3	70 - 130	30	
Bromomethane	ND	101	80	23.2	109	110	0.9	70 - 130	30	
Carbon Disulfide	ND	109	124	12.9	125	99	23.2	70 - 130	30	
Carbon tetrachloride	ND	100	99	1.0	101	105	3.9	70 - 130	30	
Chlorobenzene	ND	98	100	2.0	94	87	7.7	70 - 130	30	
Chloroethane	ND	104	124	17.5	137	115	17.5	70 - 130	30	m
Chloroform	ND	111	113	1.8	118	116	1.7	70 - 130	30	
Chloromethane	ND	106	107	0.9	114	117	2.6	70 - 130	30	
cis-1,2-Dichloroethene	ND	111	112	0.9	107	104	2.8	70 - 130	30	
cis-1,3-Dichloropropene	ND	102	106	3.8	95	89	6.5	70 - 130	30	
Dibromochloromethane	ND	101	110	8.5	98	96	2.1	70 - 130	30	
Dibromomethane	ND	101	107	5.8	98	90	8.5	70 - 130	30	
Dichlorodifluoromethane	ND	110	111	0.9	120	116	3.4	70 - 130	30	

QA/QC Data

SDG I.D.: GBC08798

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
Ethylbenzene	ND	99	100	1.0	97	97	0.0	70 - 130	30	
Hexachlorobutadiene	ND	93	83	11.4	61	55	10.3	70 - 130	30	m
Isopropylbenzene	ND	99	96	3.1	121	140	14.6	70 - 130	30	m
m&p-Xylene	ND	98	98	0.0	95	93	2.1	70 - 130	30	
Methyl ethyl ketone	ND	127	139	9.0	127	111	13.4	70 - 130	30	l
Methyl t-butyl ether (MTBE)	ND	86	91	5.6	93	88	5.5	70 - 130	30	
Methylene chloride	ND	106	119	11.6	115	91	23.3	70 - 130	30	
Naphthalene	ND	116	101	13.8	69	54	24.4	70 - 130	30	m
n-Butylbenzene	ND	107	99	7.8	101	107	5.8	70 - 130	30	
n-Propylbenzene	ND	99	95	4.1	118	132	11.2	70 - 130	30	m
o-Xylene	ND	96	98	2.1	92	90	2.2	70 - 130	30	
p-Isopropyltoluene	ND	107	102	4.8	107	117	8.9	70 - 130	30	
sec-Butylbenzene	ND	97	94	3.1	110	120	8.7	70 - 130	30	
Styrene	ND	97	100	3.0	86	75	13.7	70 - 130	30	
tert-Butylbenzene	ND	97	94	3.1	113	126	10.9	70 - 130	30	
Tetrachloroethene	ND	94	95	1.1	91	91	0.0	70 - 130	30	
Tetrahydrofuran (THF)	ND	108	118	8.8	127	106	18.0	70 - 130	30	
Toluene	ND	102	102	0.0	94	92	2.2	70 - 130	30	
trans-1,2-Dichloroethene	ND	102	106	3.8	103	102	1.0	70 - 130	30	
trans-1,3-Dichloropropene	ND	104	108	3.8	92	84	9.1	70 - 130	30	
trans-1,4-dichloro-2-butene	ND	121	119	1.7	127	134	5.4	70 - 130	30	m
Trichloroethene	ND	96	99	3.1	88	87	1.1	70 - 130	30	
Trichlorofluoromethane	ND	125	129	3.1	142	133	6.5	70 - 130	30	m
Trichlorotrifluoroethane	ND	119	132	10.4	149	126	16.7	70 - 130	30	l,m
Vinyl chloride	ND	117	111	5.3	121	133	9.4	70 - 130	30	m
% 1,2-dichlorobenzene-d4	104	100	102	2.0	105	102	2.9	70 - 130	30	
% Bromofluorobenzene	97	98	99	1.0	92	86	6.7	70 - 130	30	
% Dibromofluoromethane	96	94	96	2.1	97	94	3.1	70 - 130	30	
% Toluene-d8	107	101	101	0.0	100	100	0.0	70 - 130	30	

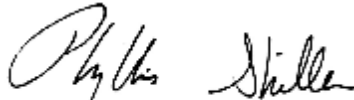
Comment:

Additional 8260 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is 40-160%.

l = This parameter is outside laboratory lcs/lcsd specified recovery limits.  
 m = This parameter is outside laboratory ms/msd specified recovery limits.  
 r = This parameter is outside laboratory rpd specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference

  
 Phyllis Shiller, Laboratory Director  
 July 18, 2012

# Sample Criteria Exceedences Report

**GBC08798**

SampNo	LocCode	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
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\*\*\* No Data to Display \*\*\*

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

## Reasonable Confidence Protocol Laboratory Analysis QA/QC Certification Form

**Laboratory Name:** Phoenix Environmental Labs, Inc. **Client:** GEI

**Project Location:** TOE DRAIN INSPECTION TOEH **Project Number:**

**Laboratory Sample ID(s):** BC08798

**Sampling Date(s):** 7/11/2012

**RCP Methods Used:**

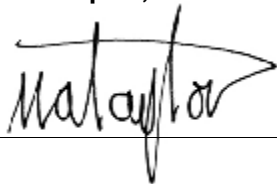
1311/1312     6010     7000     7196     7470/7471     8081     EPH     TO15  
 8082     8151     8260     8270     ETPH     9010/9012     VPH

1.	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1a.	Were the method specified preservation and holding time requirements met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1b.	EPH and VPH methods only: Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
2.	Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3.	Were samples received at an appropriate temperature (< 6 Degrees C)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
4.	Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? See Sections: SVOA Narration, VOA Narration.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5a.	Were reporting limits specified or referenced on the chain-of-custody?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5b.	Were these reporting limits met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
6.	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
7.	Are project-specific matrix spikes and laboratory duplicates included in the data set?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA

**Note:** For all questions to which the response was "No" (with the exception of question #5a, #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence".

**I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.**

Authorized  
Signature: \_\_\_\_\_



Date: Wednesday, July 18, 2012  
 Printed Name: Maryam Taylor  
 Position: Project Manager





**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



# RCP Certification Report

July 18, 2012

SDG I.D.: GBC08798

The client requested a shorter list of elements than the 6010 RCP list.  
The following analytes from the 6010 RCP Metals list were not reported: Antimony, Beryllium, Copper, Nickel, Thallium, Vanadium, Zinc.

## ETPH Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Au-fid84 07/13/12-2 (BC08798)

Initial Calibration (FID84 - ETPH\_13) - The initial calibration curve was within method criteria and had a %RSD less than 30%.

The daily continuing calibration standard was within method criteria of +/- 30% RSD.

As per section 7.2.3, a discrimination check standard was run and contained the following outliers:C36

**Printed Name** Jeff Bucko  
**Position:** Chemist  
**Date:** 7/13/2012

## QC (Batch Specific)

----- Sample No: BC08639, QA/QC Batch: 204443 -----

All LCS recoveries were within 50 - 150 with the following exceptions: None.

## Mercury Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Merlin 07/12/12-1 (BC08798)

The method preparation blank contains all of the acids and reagents as the samples; the instrument blanks do not.

The initial calibration met all criteria including a standard run at or below the reporting level.

All calibration verification standards (ICV, CCV) met criteria.

All calibration blank verification standards (ICB, CCB) met criteria.

The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.

**Printed Name** Rick Schweitzer  
**Position:** Chemist  
**Date:** 7/12/2012



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# RCP Certification Report

July 18, 2012

SDG ID.: GBC08798

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## QC (Batch Specific)

----- Sample No: BC08639, QA/QC Batch: 204584 -----

All LCS recoveries were within 70 - 130 with the following exceptions: None.

All LCSD recoveries were within 70 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%.

## ICP Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

### **Instrument:** Icp9 07/11/12-1 (BC08798)

The initial calibration met criteria.

The continuing calibration standards met criteria for all the elements reported. The linear range is defined daily by the calibration range.

The continuing calibration blanks were less than the reporting level for the elements reported.

The ICSA and ICSAB were analyzed at the beginning and end of the run and were within criteria.

**Printed Name** Laura Kinnin

**Position:** Chemist

**Date:** 7/11/2012

### **Instrument:** Icp9 07/12/12-1 (BC08798)

The initial calibration met criteria.

The continuing calibration standards met criteria for all the elements reported. The linear range is defined daily by the calibration range.

The continuing calibration blanks were less than the reporting level for the elements reported.

The ICSA and ICSAB were analyzed at the beginning and end of the run and were within criteria.

**Printed Name** Laura Kinnin

**Position:** Chemist

**Date:** 7/12/2012



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# RCP Certification Report

July 18, 2012

SDG ID.: GBC08798

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## QC (Site Specific)

----- Sample No: BC08798, QA/QC Batch: 204542 -----

All LCS recoveries were within 75 - 125 with the following exceptions: None.

All LCSD recoveries were within 75 - 125 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

All MS recoveries were within 75 - 125 with the following exceptions: None.

All MSD recoveries were within 75 - 125 with the following exceptions: None.

All MS/MSD RPDs were less than 30% with the following exceptions: None.

A matrix effect is suspected when a MS/MSD recovery is outside of criteria. No further action is required if LCS/LCSD compounds are within criteria.

## QC (Batch Specific)

----- Sample No: BC09169, QA/QC Batch: 204603 -----

All LCS recoveries were within 75 - 125 with the following exceptions: None.

All LCSD recoveries were within 75 - 125 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

## PCB Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Au-ecd5 07/12/12-1 (BC08798)

8082 Narration:

The initial calibration RSD for the compound list was less than 15% except for the following compounds: none

The continuing calibration standards were within acceptance criteria except for the following compounds: none

**Printed Name** Keith Aloisa

**Position:** Chemist

**Date:** 7/12/2012



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# RCP Certification Report

July 18, 2012

SDG ID.: GBC08798

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## QC (Batch Specific)

----- Sample No: BC08644, QA/QC Batch: 204442 -----

All LCS recoveries were within 40 - 140 with the following exceptions: None.

All LCSD recoveries were within 40 - 140 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

## SVOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

**QC Batch 204449 (Samples: BC08798): -----**

**The LCS and/or LCSD recovery for one or more analytes is below method criteria. A low bias for these analytes is likely. (2,4-Dinitrophenol, Benzidine)**

**The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (Pentachlorophenol)**

**The QC recovery for one or more analytes is above the upper range but were not reported in the sample(s), therefore no significant bias is suspected. (2-Nitroaniline)**

**Instrument:** Chem07 07/13/12-1 (BC08798)

The DDT breakdown and pentachlorophenol & benzidine peak tailing were not evaluated in the DFTPP tune.

Initial Calibration (Chem07/SV\_0712)

Greater than 90% of the target compounds met calibration criteria with a RSD <20% or >0.99 correlation coefficient. The following compounds had RSDs >20% and <0.99 correlation coefficient: Hexachlorocyclopentadiene, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4,6-dinitro-2-methylphenol, Pentachlorophenol, 3,3'-dichlorobenzidine

The following compounds failed to meet the minimum required response factor: 2-nitrophenol, Hexachlorobenzene

Continuing Calibration:

Greater than 80% of target compounds met continuing calibration criteria with a %D <20. The following compounds had >20% difference from the initial calibration: Aniline, 3-Nitroaniline, Pentachlorophenol, Parathion, Fluoranthene, Pyrene, % Terphenyl-d14

**Printed Name** Damien Drobinski

**Position:** Chemist

**Date:** 7/13/2012

**Instrument:** Chem12 07/12/12-1 (BC08798)

The DDT breakdown and pentachlorophenol & benzidine peak tailing were not evaluated in the DFTPP tune.

Initial Calibration (Chem12/SV\_0710):



**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



# RCP Certification Report

July 18, 2012

SDG ID.: GBC08798

Greater than 90% of the target compounds met calibration criteria with a RSD <20% or >0.99 correlation coefficient. The following compounds had RSDs >20% and <0.99 correlation coefficient: Benzaldehyde, Atrazine, Carbazole

The following compounds failed to meet the minimum required response factor: 2-nitrophenol, Hexachlorobenzene, % 2,4,6-tribromophenol

**Continuing Calibration:**

Greater than 80% of target compounds met continuing calibration criteria with a %D <20. The following compounds had >20% difference from the initial calibration:

**Printed Name** Damien Drobinski  
**Position:** Chemist  
**Date:** 7/12/2012

**QC (Batch Specific)**

----- Sample No: BC08575, QA/QC Batch: 204449 -----

All LCS recoveries were within 30 - 130 with the following exceptions: 2,4-Dinitrophenol(<5%), 2-Nitroaniline(>150%), Benzidine(<5%)

All LCSD recoveries were within 30 - 130 with the following exceptions: 2,4-Dinitrophenol(<5%), 2-Nitroaniline(>150%), Benzidine(<5%)

All LCS/LCSD RPDs were less than 30% with the following exceptions: Pentachlorophenol(33.3%)

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

**VOA Narration**

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

**QC Batch 204841 (Samples: BC08798): -----**

**The LCS and/or the LCSD recovery is above the upper range for one or more analytes that were not reported in the sample(s), therefore no significant bias is suspected. (2-Hexanone, Acetone, Acrylonitrile, Methyl ethyl ketone)**

**The QC recovery for one or more analytes is above the upper range but were not reported in the sample(s), therefore no significant bias is suspected. (Trichlorotrifluoroethane)**

**Instrument:** Chem03 07/13/12-2 (BC08798)

Initial Calibration Verification (RCPS\_0627):  
>90% of target compounds met method criteria.  
The following compounds had %RSDs >20%: Bromomethane, Acetone

Continuing Calibration Verification:  
>80% of target compounds met method criteria. Internal standards were within the 50%-200% deviation from the initial calibration.  
The following compounds had % Deviations >20%: Trichlorofluoromethane, Tetrahydrofuran (THF)



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Tel. (860) 645-1102 Fax (860) 645-0823



# RCP Certification Report

July 18, 2012

SDG ID.: GBC08798

---

**Printed Name** Johanna Harrington  
**Position:** Chemist  
**Date:** 7/13/2012

## QC (Batch Specific)

----- Sample No: BC09132, QA/QC Batch: 204841 -----

All LCS recoveries were within 70 - 130 with the following exceptions: Acetone(132%)

All LCSD recoveries were within 70 - 130 with the following exceptions: 2-Hexanone(144%), Acetone(144%), Acrylonitrile(131%), Methyl ethyl ketone(139%), Trichlorotrifluoroethane(132%)

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

Additional 8260 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is 40-160%.





Tuesday, February 19, 2013

Attn: Mr Barry Giroux  
GEI Consultants  
455 Winding Brook Drive  
Suite 201  
Glastonbury, CT 06033

Project ID: TOE DRAIN DESIGM  
Sample ID#s: BD28385 - BD28396

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style.

Phyllis Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #MA-CT-007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
VT Lab Registration #VT11301





Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

## Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

## Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date Time  
 02/06/13 8:25  
 02/07/13 13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28385

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-10 (5-6)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.42	0.42	mg/Kg	02/08/13	LK	SW6010
Arsenic	1.6	0.8	mg/Kg	02/08/13	LK	SW6010
Barium	42.3	0.42	mg/Kg	02/08/13	LK	SW6010
Cadmium	< 0.42	0.42	mg/Kg	02/08/13	LK	SW6010
Chromium	17.6	0.42	mg/Kg	02/08/13	LK	SW6010
Mercury	< 0.08	0.08	mg/Kg	02/11/13	RS	SW-7471
Lead	45.9	0.42	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.7	1.7	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	76		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	22	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/08/13	Y	SW1010
Ignitability	Passed	140	degree F	02/08/13	Y	SW846
pH - Soil	7.02	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 6.6	6.6	mg/Kg	02/08/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/11/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/06/13		SW5035

## TPH by GC (Extractable Products)

Ext. Petroleum HC	ND	13	mg/Kg	02/08/13	JRB	CT ETPH/8015
Identification	ND		mg/Kg	02/08/13	JRB	CT ETPH/8015

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	122		%	02/08/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	440	ug/Kg	02/11/13	AW	SW 8082
PCB-1221	ND	440	ug/Kg	02/11/13	AW	SW 8082
PCB-1232	ND	440	ug/Kg	02/11/13	AW	SW 8082
PCB-1242	ND	440	ug/Kg	02/11/13	AW	SW 8082
PCB-1248	ND	440	ug/Kg	02/11/13	AW	SW 8082
PCB-1254	ND	440	ug/Kg	02/11/13	AW	SW 8082
PCB-1260	ND	440	ug/Kg	02/11/13	AW	SW 8082
PCB-1262	ND	440	ug/Kg	02/11/13	AW	SW 8082
PCB-1268	ND	440	ug/Kg	02/11/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	83		%	02/11/13	AW	30 - 150 %
% TCMX	80		%	02/11/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,1,1-Trichloroethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,1,2,2-Tetrachloroethane	ND	4.6	ug/Kg	02/08/13	R/J	SW8260
1,1,2-Trichloroethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,1-Dichloroethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,1-Dichloroethene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,1-Dichloropropene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,2,3-Trichlorobenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,2,3-Trichloropropane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,2,4-Trichlorobenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,2,4-Trimethylbenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,2-Dibromo-3-chloropropane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,2-Dibromoethane	ND	7	ug/Kg	02/08/13	R/J	SW8260
1,2-Dichlorobenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,2-Dichloroethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,2-Dichloropropane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,3,5-Trimethylbenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,3-Dichlorobenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,3-Dichloropropane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
1,4-Dichlorobenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
2,2-Dichloropropane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
2-Chlorotoluene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
2-Hexanone	ND	38	ug/Kg	02/08/13	R/J	SW8260
2-Isopropyltoluene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
4-Chlorotoluene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
4-Methyl-2-pentanone	ND	38	ug/Kg	02/08/13	R/J	SW8260
Acetone	ND	150	ug/Kg	02/08/13	R/J	SW8260
Acrylonitrile	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Benzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Bromobenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Bromochloromethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Bromodichloromethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Bromomethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Carbon Disulfide	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Carbon tetrachloride	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Chlorobenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Chloroethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Chloroform	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Chloromethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
cis-1,2-Dichloroethene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
cis-1,3-Dichloropropene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Dibromochloromethane	ND	4.6	ug/Kg	02/08/13	R/J	SW8260
Dibromomethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Dichlorodifluoromethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Ethylbenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Hexachlorobutadiene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Isopropylbenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
m&p-Xylene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Methyl Ethyl Ketone	ND	46	ug/Kg	02/08/13	R/J	SW8260
Methyl t-butyl ether (MTBE)	ND	15	ug/Kg	02/08/13	R/J	SW8260
Methylene chloride	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Naphthalene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
n-Butylbenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
n-Propylbenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
o-Xylene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
p-Isopropyltoluene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
sec-Butylbenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Styrene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
tert-Butylbenzene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Tetrachloroethene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Tetrahydrofuran (THF)	ND	15	ug/Kg	02/08/13	R/J	SW8260
Toluene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Total Xylenes	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
trans-1,2-Dichloroethene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
trans-1,3-Dichloropropene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
trans-1,4-dichloro-2-butene	ND	15	ug/Kg	02/08/13	R/J	SW8260
Trichloroethene	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Trichlorofluoromethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Trichlorotrifluoroethane	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
Vinyl chloride	ND	7.6	ug/Kg	02/08/13	R/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	102		%	02/08/13	R/J	70 - 130 %
% Bromofluorobenzene	89		%	02/08/13	R/J	70 - 130 %
% Dibromofluoromethane	97		%	02/08/13	R/J	70 - 130 %
% Toluene-d8	96		%	02/08/13	R/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	430	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	690	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	300	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	300	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	300	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	300	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	690	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	430	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	300	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	690	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1300	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	430	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	300	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	300	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	690	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1300	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	300	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1300	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benzidine	ND	520	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1300	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	300	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	430	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	300	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	650	ug/Kg	02/08/13	DD	SW 8270
Chrysene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	300	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Fluorene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	300	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	300	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	430	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	300	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	430	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	430	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	430	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
Pyrene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	430	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	81		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	84		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	75		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	78		%	02/08/13	DD	30 - 130 %
% Phenol-d5	75		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	97		%	02/08/13	DD	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

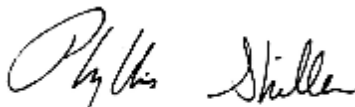
Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

### Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

### Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date Time  
 02/06/13 9:00  
 02/07/13 13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28386

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-9 (7-8)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.39	0.39	mg/Kg	02/08/13	LK	SW6010
Arsenic	2.0	0.8	mg/Kg	02/08/13	LK	SW6010
Barium	52.8	0.39	mg/Kg	02/08/13	LK	SW6010
Cadmium	< 0.39	0.39	mg/Kg	02/08/13	LK	SW6010
Chromium	20.0	0.39	mg/Kg	02/08/13	LK	SW6010
Mercury	< 0.08	0.08	mg/Kg	02/11/13	RS	SW-7471
Lead	13.2	0.39	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.6	1.6	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	81		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	30	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/08/13	Y	SW1010
Ignitability	Passed	140	degree F	02/08/13	Y	SW846
pH - Soil	6.91	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 5.7	5.7	mg/Kg	02/08/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/11/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/06/13		SW5035

### TPH by GC (Extractable Products)

Ext. Petroleum HC	ND	12	mg/Kg	02/08/13	JRB	CT ETPH/8015
Identification	ND		mg/Kg	02/08/13	JRB	CT ETPH/8015

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	113		%	02/08/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	400	ug/Kg	02/11/13	AW	SW 8082
PCB-1221	ND	400	ug/Kg	02/11/13	AW	SW 8082
PCB-1232	ND	400	ug/Kg	02/11/13	AW	SW 8082
PCB-1242	ND	400	ug/Kg	02/11/13	AW	SW 8082
PCB-1248	ND	400	ug/Kg	02/11/13	AW	SW 8082
PCB-1254	ND	400	ug/Kg	02/11/13	AW	SW 8082
PCB-1260	ND	400	ug/Kg	02/11/13	AW	SW 8082
PCB-1262	ND	400	ug/Kg	02/11/13	AW	SW 8082
PCB-1268	ND	400	ug/Kg	02/11/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	89		%	02/11/13	AW	30 - 150 %
% TCMX	83		%	02/11/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,1,1-Trichloroethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,1,2,2-Tetrachloroethane	ND	3.7	ug/Kg	02/08/13	R/J	SW8260
1,1,2-Trichloroethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,1-Dichloroethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,1-Dichloroethene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,1-Dichloropropene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,2,3-Trichlorobenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,2,3-Trichloropropane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,2,4-Trichlorobenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,2,4-Trimethylbenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,2-Dibromo-3-chloropropane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,2-Dibromoethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,2-Dichlorobenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,2-Dichloroethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,2-Dichloropropane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,3,5-Trimethylbenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,3-Dichlorobenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,3-Dichloropropane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
1,4-Dichlorobenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
2,2-Dichloropropane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
2-Chlorotoluene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
2-Hexanone	ND	31	ug/Kg	02/08/13	R/J	SW8260
2-Isopropyltoluene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
4-Chlorotoluene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
4-Methyl-2-pentanone	ND	31	ug/Kg	02/08/13	R/J	SW8260
Acetone	ND	120	ug/Kg	02/08/13	R/J	SW8260
Acrylonitrile	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Benzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Bromobenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Bromochloromethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Bromodichloromethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Bromomethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Carbon Disulfide	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Carbon tetrachloride	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Chlorobenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Chloroethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Chloroform	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Chloromethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
cis-1,2-Dichloroethene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
cis-1,3-Dichloropropene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Dibromochloromethane	ND	3.7	ug/Kg	02/08/13	R/J	SW8260
Dibromomethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Dichlorodifluoromethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Ethylbenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Hexachlorobutadiene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Isopropylbenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
m&p-Xylene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Methyl Ethyl Ketone	ND	37	ug/Kg	02/08/13	R/J	SW8260
Methyl t-butyl ether (MTBE)	ND	12	ug/Kg	02/08/13	R/J	SW8260
Methylene chloride	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Naphthalene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
n-Butylbenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
n-Propylbenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
o-Xylene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
p-Isopropyltoluene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
sec-Butylbenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Styrene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
tert-Butylbenzene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Tetrachloroethene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Tetrahydrofuran (THF)	ND	12	ug/Kg	02/08/13	R/J	SW8260
Toluene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Total Xylenes	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
trans-1,2-Dichloroethene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
trans-1,3-Dichloropropene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
trans-1,4-dichloro-2-butene	ND	12	ug/Kg	02/08/13	R/J	SW8260
Trichloroethene	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Trichlorofluoromethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Trichlorotrifluoroethane	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
Vinyl chloride	ND	6.1	ug/Kg	02/08/13	R/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	101		%	02/08/13	R/J	70 - 130 %
% Bromofluorobenzene	93		%	02/08/13	R/J	70 - 130 %
% Dibromofluoromethane	92		%	02/08/13	R/J	70 - 130 %
% Toluene-d8	98		%	02/08/13	R/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	290	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	290	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	290	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	410	ug/Kg	02/08/13	DD	SW 8270



Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	290	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	290	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	290	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	290	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	290	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	290	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	660	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	290	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	290	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	290	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	290	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	290	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	290	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	660	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	290	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	410	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	290	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	660	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1200	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	410	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	290	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	290	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	290	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	660	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	290	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Benzidine	ND	490	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	290	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	290	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	410	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	290	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	290	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	610	ug/Kg	02/08/13	DD	SW 8270
Chrysene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	290	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	290	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	290	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	290	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	290	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Fluorene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	290	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	290	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	290	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	410	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	290	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	410	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	410	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	410	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	290	ug/Kg	02/08/13	DD	SW 8270
Pyrene	ND	290	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	410	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	76		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	83		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	71		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	79		%	02/08/13	DD	30 - 130 %
% Phenol-d5	71		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	104		%	02/08/13	DD	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

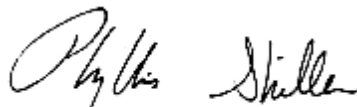
Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.



**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

### Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

### Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date Time  
 02/06/13 10:00  
 02/07/13 13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28387

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-8 (9-10)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.39	0.39	mg/Kg	02/08/13	LK	SW6010
Arsenic	1.0	0.8	mg/Kg	02/08/13	LK	SW6010
Barium	37.2	0.39	mg/Kg	02/08/13	LK	SW6010
Cadmium	< 0.39	0.39	mg/Kg	02/08/13	LK	SW6010
Chromium	13.5	0.39	mg/Kg	02/08/13	LK	SW6010
Mercury	< 0.07	0.07	mg/Kg	02/11/13	RS	SW-7471
Lead	3.22	0.39	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.5	1.5	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	90		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	11	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/08/13	Y	SW1010
Ignitability	Passed	140	degree F	02/08/13	Y	SW846
pH - Soil	6.30	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 5.4	5.4	mg/Kg	02/08/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/11/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/06/13		SW5035

### TPH by GC (Extractable Products)

Ext. Petroleum HC	ND	11	mg/Kg	02/08/13	JRB	CT ETPH/8015
Identification	ND		mg/Kg	02/08/13	JRB	CT ETPH/8015

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	113		%	02/08/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1221	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1232	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1242	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1248	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1254	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1260	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1262	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1268	ND	370	ug/Kg	02/08/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	76		%	02/08/13	AW	30 - 150 %
% TCMX	93		%	02/08/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,1,1-Trichloroethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,1,2,2-Tetrachloroethane	ND	3.3	ug/Kg	02/13/13	R/J	SW8260
1,1,2-Trichloroethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,1-Dichloroethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,1-Dichloroethene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,1-Dichloropropene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,2,3-Trichlorobenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,2,3-Trichloropropane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,2,4-Trichlorobenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,2,4-Trimethylbenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,2-Dibromo-3-chloropropane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,2-Dibromoethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,2-Dichlorobenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,2-Dichloroethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,2-Dichloropropane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,3,5-Trimethylbenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,3-Dichlorobenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,3-Dichloropropane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
1,4-Dichlorobenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
2,2-Dichloropropane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
2-Chlorotoluene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
2-Hexanone	ND	28	ug/Kg	02/13/13	R/J	SW8260
2-Isopropyltoluene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
4-Chlorotoluene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
4-Methyl-2-pentanone	ND	28	ug/Kg	02/13/13	R/J	SW8260
Acetone	ND	130	ug/Kg	02/13/13	R/J	SW8260
Acrylonitrile	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Benzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Bromobenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Bromochloromethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Bromodichloromethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Bromomethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Carbon Disulfide	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Carbon tetrachloride	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Chlorobenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Chloroethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Chloroform	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Chloromethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
cis-1,2-Dichloroethene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
cis-1,3-Dichloropropene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Dibromochloromethane	ND	3.3	ug/Kg	02/13/13	R/J	SW8260
Dibromomethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Dichlorodifluoromethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Ethylbenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Hexachlorobutadiene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Isopropylbenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
m&p-Xylene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Methyl Ethyl Ketone	ND	33	ug/Kg	02/13/13	R/J	SW8260
Methyl t-butyl ether (MTBE)	ND	11	ug/Kg	02/13/13	R/J	SW8260
Methylene chloride	ND	11	ug/Kg	02/13/13	R/J	SW8260
Naphthalene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
n-Butylbenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
n-Propylbenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
o-Xylene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
p-Isopropyltoluene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
sec-Butylbenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Styrene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
tert-Butylbenzene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Tetrachloroethene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Tetrahydrofuran (THF)	ND	11	ug/Kg	02/13/13	R/J	SW8260
Toluene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Total Xylenes	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
trans-1,2-Dichloroethene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
trans-1,3-Dichloropropene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
trans-1,4-dichloro-2-butene	ND	11	ug/Kg	02/13/13	R/J	SW8260
Trichloroethene	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Trichlorofluoromethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Trichlorotrifluoroethane	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
Vinyl chloride	ND	5.6	ug/Kg	02/13/13	R/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	101		%	02/13/13	R/J	70 - 130 %
% Bromofluorobenzene	96		%	02/13/13	R/J	70 - 130 %
% Dibromofluoromethane	100		%	02/13/13	R/J	70 - 130 %
% Toluene-d8	100		%	02/13/13	R/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	370	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	590	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	260	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	260	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	260	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	260	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	590	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	370	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	260	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	590	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1100	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	370	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	260	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	260	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	590	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1100	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	260	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1100	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Benzidine	ND	440	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1100	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	260	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	370	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	260	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	550	ug/Kg	02/08/13	DD	SW 8270
Chrysene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	260	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Fluorene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	260	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	260	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	370	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	260	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	370	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	370	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	370	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
Pyrene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	370	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	75		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	84		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	75		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	80		%	02/08/13	DD	30 - 130 %
% Phenol-d5	75		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	102		%	02/08/13	DD	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

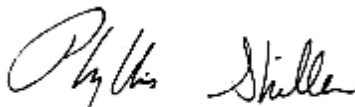
Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

### Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

### Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date Time  
 02/06/13 10:00  
 02/07/13 13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28388

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-7 (9-10)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.44	0.44	mg/Kg	02/08/13	LK	SW6010
Arsenic	< 0.9	0.9	mg/Kg	02/08/13	LK	SW6010
Barium	30.2	0.44	mg/Kg	02/08/13	LK	SW6010
Cadmium	< 0.44	0.44	mg/Kg	02/08/13	LK	SW6010
Chromium	12.1	0.44	mg/Kg	02/08/13	LK	SW6010
Mercury	< 0.08	0.08	mg/Kg	02/11/13	RS	SW-7471
Lead	2.52	0.44	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.8	1.8	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	74		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	15	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/08/13	Y	SW1010
Ignitability	Passed	140	degree F	02/08/13	Y	SW846
pH - Soil	6.56	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 6.6	6.6	mg/Kg	02/11/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/11/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/06/13		SW5035

### TPH by GC (Extractable Products)

Ext. Petroleum HC	ND	13	mg/Kg	02/08/13	JRB	CT ETPH/8015
Identification	ND		mg/Kg	02/08/13	JRB	CT ETPH/8015



Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	113		%	02/08/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1221	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1232	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1242	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1248	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1254	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1260	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1262	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1268	ND	440	ug/Kg	02/08/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	85		%	02/08/13	AW	30 - 150 %
% TCMX	95		%	02/08/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,1,1-Trichloroethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,1,2,2-Tetrachloroethane	ND	4.3	ug/Kg	02/13/13	H/J	SW8260
1,1,2-Trichloroethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloroethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloroethene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloropropene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,2,3-Trichlorobenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,2,3-Trichloropropane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,2,4-Trichlorobenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,2,4-Trimethylbenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,2-Dibromo-3-chloropropane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,2-Dibromoethane	ND	7	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichlorobenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichloroethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichloropropane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,3,5-Trimethylbenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,3-Dichlorobenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,3-Dichloropropane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
1,4-Dichlorobenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
2,2-Dichloropropane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
2-Chlorotoluene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
2-Hexanone	ND	36	ug/Kg	02/13/13	H/J	SW8260
2-Isopropyltoluene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
4-Chlorotoluene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
4-Methyl-2-pentanone	ND	36	ug/Kg	02/13/13	H/J	SW8260
Acetone	ND	140	ug/Kg	02/13/13	H/J	SW8260
Acrylonitrile	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Benzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Bromobenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Bromochloromethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Bromodichloromethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Bromomethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Carbon Disulfide	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Carbon tetrachloride	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Chlorobenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Chloroethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Chloroform	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Chloromethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
cis-1,2-Dichloroethene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
cis-1,3-Dichloropropene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Dibromochloromethane	ND	4.3	ug/Kg	02/13/13	H/J	SW8260
Dibromomethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Dichlorodifluoromethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Ethylbenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Hexachlorobutadiene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Isopropylbenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
m&p-Xylene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Methyl Ethyl Ketone	ND	43	ug/Kg	02/13/13	H/J	SW8260
Methyl t-butyl ether (MTBE)	ND	14	ug/Kg	02/13/13	H/J	SW8260
Methylene chloride	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Naphthalene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
n-Butylbenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
n-Propylbenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
o-Xylene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
p-Isopropyltoluene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
sec-Butylbenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Styrene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
tert-Butylbenzene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Tetrachloroethene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Tetrahydrofuran (THF)	ND	14	ug/Kg	02/13/13	H/J	SW8260
Toluene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Total Xylenes	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
trans-1,2-Dichloroethene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
trans-1,3-Dichloropropene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
trans-1,4-dichloro-2-butene	ND	14	ug/Kg	02/13/13	H/J	SW8260
Trichloroethene	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Trichlorofluoromethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Trichlorotrifluoroethane	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
Vinyl chloride	ND	7.2	ug/Kg	02/13/13	H/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	97		%	02/13/13	H/J	70 - 130 %
% Bromofluorobenzene	91		%	02/13/13	H/J	70 - 130 %
% Dibromofluoromethane	103		%	02/13/13	H/J	70 - 130 %
% Toluene-d8	95		%	02/13/13	H/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	440	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	710	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	310	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	310	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	310	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	310	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	710	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	440	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	310	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	710	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1300	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	440	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	310	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	310	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	710	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1300	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	310	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1300	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Benzidine	ND	530	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1300	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	310	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	440	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	310	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	670	ug/Kg	02/08/13	DD	SW 8270
Chrysene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	310	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Fluorene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	310	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	310	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	440	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	310	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	440	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	440	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	440	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
Pyrene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	440	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	76		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	85		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	75		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	81		%	02/08/13	DD	30 - 130 %
% Phenol-d5	72		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	103		%	02/08/13	DD	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

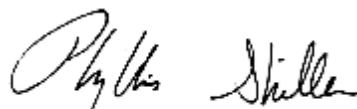
Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

## Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

## Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date                      Time  
 02/06/13                      10:30  
 02/07/13                      13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28389

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-6 (9-10)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.43	0.43	mg/Kg	02/08/13	LK	SW6010
Arsenic	2.6	0.9	mg/Kg	02/08/13	LK	SW6010
Barium	55.4	0.43	mg/Kg	02/08/13	LK	SW6010
Cadmium	< 0.43	0.43	mg/Kg	02/08/13	LK	SW6010
Chromium	21.6	0.43	mg/Kg	02/08/13	LK	SW6010
Mercury	0.27	0.08	mg/Kg	02/11/13	RS	SW-7471
Lead	40.7	0.43	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.7	1.7	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	79		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	42	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/11/13	Y	SW1010
Ignitability	Passed	140	degree F	02/11/13	Y	SW846
pH - Soil	7.06	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 5.5	5.5	mg/Kg	02/11/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/11/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/06/13		SW5035

## TPH by GC (Extractable Products)

Ext. Petroleum HC	8400	120	mg/Kg	02/11/13	JRB	CT ETPH/8015
Identification	**		mg/Kg	02/11/13	JRB	CT ETPH/8015

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	Diluted Out		%	02/11/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	420	ug/Kg	02/08/13	AW	SW 8082
PCB-1221	ND	420	ug/Kg	02/08/13	AW	SW 8082
PCB-1232	ND	420	ug/Kg	02/08/13	AW	SW 8082
PCB-1242	ND	420	ug/Kg	02/08/13	AW	SW 8082
PCB-1248	ND	420	ug/Kg	02/08/13	AW	SW 8082
PCB-1254	ND	420	ug/Kg	02/08/13	AW	SW 8082
PCB-1260	ND	420	ug/Kg	02/08/13	AW	SW 8082
PCB-1262	ND	420	ug/Kg	02/08/13	AW	SW 8082
PCB-1268	ND	420	ug/Kg	02/08/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	104		%	02/08/13	AW	30 - 150 %
% TCMX	83		%	02/08/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,1,1-Trichloroethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,1,2,2-Tetrachloroethane	ND	170	ug/Kg	02/13/13	H/J	SW8260
1,1,2-Trichloroethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloroethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloroethene	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloropropene	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,2,3-Trichlorobenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,2,3-Trichloropropane	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,2,4-Trichlorobenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,2,4-Trimethylbenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,2-Dibromo-3-chloropropane	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,2-Dibromoethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichlorobenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichloroethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichloropropane	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,3,5-Trimethylbenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,3-Dichlorobenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,3-Dichloropropane	ND	290	ug/Kg	02/13/13	H/J	SW8260
1,4-Dichlorobenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
2,2-Dichloropropane	ND	290	ug/Kg	02/13/13	H/J	SW8260
2-Chlorotoluene	ND	290	ug/Kg	02/13/13	H/J	SW8260
2-Hexanone	ND	1400	ug/Kg	02/13/13	H/J	SW8260
2-Isopropyltoluene	ND	290	ug/Kg	02/13/13	H/J	SW8260
4-Chlorotoluene	ND	290	ug/Kg	02/13/13	H/J	SW8260
4-Methyl-2-pentanone	ND	1400	ug/Kg	02/13/13	H/J	SW8260
Acetone	ND	5700	ug/Kg	02/13/13	H/J	SW8260
Acrylonitrile	ND	290	ug/Kg	02/13/13	H/J	SW8260
Benzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Bromobenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Bromochloromethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
Bromodichloromethane	ND	290	ug/Kg	02/13/13	H/J	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	290	ug/Kg	02/13/13	H/J	SW8260
Bromomethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
Carbon Disulfide	ND	290	ug/Kg	02/13/13	H/J	SW8260
Carbon tetrachloride	ND	290	ug/Kg	02/13/13	H/J	SW8260
Chlorobenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Chloroethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
Chloroform	ND	290	ug/Kg	02/13/13	H/J	SW8260
Chloromethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
cis-1,2-Dichloroethene	ND	290	ug/Kg	02/13/13	H/J	SW8260
cis-1,3-Dichloropropene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Dibromochloromethane	ND	170	ug/Kg	02/13/13	H/J	SW8260
Dibromomethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
Dichlorodifluoromethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
Ethylbenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Hexachlorobutadiene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Isopropylbenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
m&p-Xylene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Methyl Ethyl Ketone	ND	1700	ug/Kg	02/13/13	H/J	SW8260
Methyl t-butyl ether (MTBE)	ND	570	ug/Kg	02/13/13	H/J	SW8260
Methylene chloride	ND	290	ug/Kg	02/13/13	H/J	SW8260
Naphthalene	ND	290	ug/Kg	02/13/13	H/J	SW8260
n-Butylbenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
n-Propylbenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
o-Xylene	ND	290	ug/Kg	02/13/13	H/J	SW8260
p-Isopropyltoluene	ND	290	ug/Kg	02/13/13	H/J	SW8260
sec-Butylbenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Styrene	ND	290	ug/Kg	02/13/13	H/J	SW8260
tert-Butylbenzene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Tetrachloroethene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Tetrahydrofuran (THF)	ND	570	ug/Kg	02/13/13	H/J	SW8260
Toluene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Total Xylenes	ND	290	ug/Kg	02/13/13	H/J	SW8260
trans-1,2-Dichloroethene	ND	290	ug/Kg	02/13/13	H/J	SW8260
trans-1,3-Dichloropropene	ND	290	ug/Kg	02/13/13	H/J	SW8260
trans-1,4-dichloro-2-butene	ND	570	ug/Kg	02/13/13	H/J	SW8260
Trichloroethene	ND	290	ug/Kg	02/13/13	H/J	SW8260
Trichlorofluoromethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
Trichlorotrifluoroethane	ND	290	ug/Kg	02/13/13	H/J	SW8260
Vinyl chloride	ND	290	ug/Kg	02/13/13	H/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	93		%	02/13/13	H/J	70 - 130 %
% Bromofluorobenzene	101		%	02/13/13	H/J	70 - 130 %
% Dibromofluoromethane	100		%	02/13/13	H/J	70 - 130 %
% Toluene-d8	94		%	02/13/13	H/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	420	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	670	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	300	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	300	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	300	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	300	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	300	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	670	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	420	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	300	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	670	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1200	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	420	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	300	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	300	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	670	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	300	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benzidine	ND	510	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	300	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	420	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	300	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	630	ug/Kg	02/08/13	DD	SW 8270
Chrysene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	300	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	300	ug/Kg	02/08/13	DD	SW 8270



Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Fluorene	1800	300	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	300	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	300	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	300	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	420	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	300	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	420	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	420	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	420	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	5600	300	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	300	ug/Kg	02/08/13	DD	SW 8270
Pyrene	ND	300	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	420	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	28		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	46		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	37		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	52		%	02/08/13	DD	30 - 130 %
% Phenol-d5	32		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	48		%	02/08/13	DD	30 - 130 %

3

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
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3 = This parameter exceeds laboratory specified limits.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

\* Poor surrogate recovery was observed for semivolatiles. The other surrogates associated with this sample were within QA/QC criteria. No significant bias suspected.

\*\*Petroleum hydrocarbon chromatogram contains a multicomponent hydrocarbon distribution in the range of C9 to C24. The sample was quantitated against a C9-C36 alkane hydrocarbon standard.

Elevated reporting limits for volatiles due to the presence of non-target compounds.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.

**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



**Environmental Laboratories, Inc.**  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date                      Time  
 02/06/13                      11:55  
 02/07/13                      13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28390

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-5 (9-10)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.39	0.39	mg/Kg	02/08/13	LK	SW6010
Arsenic	1.7	0.8	mg/Kg	02/08/13	LK	SW6010
Barium	58.8	0.39	mg/Kg	02/08/13	LK	SW6010
Cadmium	< 0.39	0.39	mg/Kg	02/08/13	LK	SW6010
Chromium	20.0	0.39	mg/Kg	02/08/13	LK	SW6010
Mercury	0.54	0.08	mg/Kg	02/11/13	RS	SW-7471
Lead	57.6	0.39	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.5	1.5	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	84		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	66	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/11/13	Y	SW1010
Ignitability	Passed	140	degree F	02/11/13	Y	SW846
pH - Soil	7.46	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 5.8	5.8	mg/Kg	02/11/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/11/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/06/13		SW5035

**TPH by GC (Extractable Products)**

Ext. Petroleum HC	1300	12	mg/Kg	02/08/13	JRB	CT ETPH/8015
Identification	**		mg/Kg	02/08/13	JRB	CT ETPH/8015

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	96		%	02/08/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	390	ug/Kg	02/08/13	AW	SW 8082
PCB-1221	ND	390	ug/Kg	02/08/13	AW	SW 8082
PCB-1232	ND	390	ug/Kg	02/08/13	AW	SW 8082
PCB-1242	ND	390	ug/Kg	02/08/13	AW	SW 8082
PCB-1248	ND	390	ug/Kg	02/08/13	AW	SW 8082
PCB-1254	ND	390	ug/Kg	02/08/13	AW	SW 8082
PCB-1260	ND	390	ug/Kg	02/08/13	AW	SW 8082
PCB-1262	ND	390	ug/Kg	02/08/13	AW	SW 8082
PCB-1268	ND	390	ug/Kg	02/08/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	92		%	02/08/13	AW	30 - 150 %
% TCMX	90		%	02/08/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,1,1-Trichloroethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,1,2,2-Tetrachloroethane	ND	160	ug/Kg	02/13/13	H/J	SW8260
1,1,2-Trichloroethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloroethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloroethene	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloropropene	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,2,3-Trichlorobenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,2,3-Trichloropropane	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,2,4-Trichlorobenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,2,4-Trimethylbenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,2-Dibromo-3-chloropropane	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,2-Dibromoethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichlorobenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichloroethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichloropropane	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,3,5-Trimethylbenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,3-Dichlorobenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,3-Dichloropropane	ND	260	ug/Kg	02/13/13	H/J	SW8260
1,4-Dichlorobenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
2,2-Dichloropropane	ND	260	ug/Kg	02/13/13	H/J	SW8260
2-Chlorotoluene	ND	260	ug/Kg	02/13/13	H/J	SW8260
2-Hexanone	ND	1300	ug/Kg	02/13/13	H/J	SW8260
2-Isopropyltoluene	ND	260	ug/Kg	02/13/13	H/J	SW8260
4-Chlorotoluene	ND	260	ug/Kg	02/13/13	H/J	SW8260
4-Methyl-2-pentanone	ND	1300	ug/Kg	02/13/13	H/J	SW8260
Acetone	ND	5200	ug/Kg	02/13/13	H/J	SW8260
Acrylonitrile	ND	260	ug/Kg	02/13/13	H/J	SW8260
Benzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Bromobenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Bromochloromethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
Bromodichloromethane	ND	260	ug/Kg	02/13/13	H/J	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	260	ug/Kg	02/13/13	H/J	SW8260
Bromomethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
Carbon Disulfide	ND	260	ug/Kg	02/13/13	H/J	SW8260
Carbon tetrachloride	ND	260	ug/Kg	02/13/13	H/J	SW8260
Chlorobenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Chloroethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
Chloroform	ND	260	ug/Kg	02/13/13	H/J	SW8260
Chloromethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
cis-1,2-Dichloroethene	ND	260	ug/Kg	02/13/13	H/J	SW8260
cis-1,3-Dichloropropene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Dibromochloromethane	ND	160	ug/Kg	02/13/13	H/J	SW8260
Dibromomethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
Dichlorodifluoromethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
Ethylbenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Hexachlorobutadiene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Isopropylbenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
m&p-Xylene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Methyl Ethyl Ketone	ND	1600	ug/Kg	02/13/13	H/J	SW8260
Methyl t-butyl ether (MTBE)	ND	520	ug/Kg	02/13/13	H/J	SW8260
Methylene chloride	ND	260	ug/Kg	02/13/13	H/J	SW8260
Naphthalene	ND	260	ug/Kg	02/13/13	H/J	SW8260
n-Butylbenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
n-Propylbenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
o-Xylene	ND	260	ug/Kg	02/13/13	H/J	SW8260
p-Isopropyltoluene	ND	260	ug/Kg	02/13/13	H/J	SW8260
sec-Butylbenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Styrene	ND	260	ug/Kg	02/13/13	H/J	SW8260
tert-Butylbenzene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Tetrachloroethene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Tetrahydrofuran (THF)	ND	520	ug/Kg	02/13/13	H/J	SW8260
Toluene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Total Xylenes	ND	260	ug/Kg	02/13/13	H/J	SW8260
trans-1,2-Dichloroethene	ND	260	ug/Kg	02/13/13	H/J	SW8260
trans-1,3-Dichloropropene	ND	260	ug/Kg	02/13/13	H/J	SW8260
trans-1,4-dichloro-2-butene	ND	520	ug/Kg	02/13/13	H/J	SW8260
Trichloroethene	ND	260	ug/Kg	02/13/13	H/J	SW8260
Trichlorofluoromethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
Trichlorotrifluoroethane	ND	260	ug/Kg	02/13/13	H/J	SW8260
Vinyl chloride	ND	260	ug/Kg	02/13/13	H/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	99		%	02/13/13	H/J	70 - 130 %
% Bromofluorobenzene	118		%	02/13/13	H/J	70 - 130 %
% Dibromofluoromethane	95		%	02/13/13	H/J	70 - 130 %
% Toluene-d8	95		%	02/13/13	H/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	270	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	270	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	270	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	390	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	270	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	270	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	270	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	270	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	270	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	270	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	630	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	270	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	270	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	270	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	270	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	270	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	270	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	630	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	270	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	390	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	270	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	630	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1100	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	390	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	270	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	270	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	270	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	630	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1100	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	270	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1100	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Benzidine	ND	470	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	330	270	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1100	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	270	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	270	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	390	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	270	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	270	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	590	ug/Kg	02/08/13	DD	SW 8270
Chrysene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	270	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	270	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	270	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	270	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	270	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	400	270	ug/Kg	02/08/13	DD	SW 8270
Fluorene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	270	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	270	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	270	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	390	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	270	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	390	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	390	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	390	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	ND	270	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	270	ug/Kg	02/08/13	DD	SW 8270
Pyrene	390	270	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	390	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	74		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	83		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	80		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	75		%	02/08/13	DD	30 - 130 %
% Phenol-d5	79		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	100		%	02/08/13	DD	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

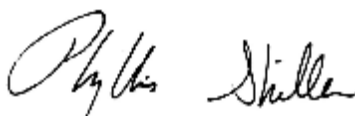
The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

Elevated reporting limits for volatiles due to the presence of non-target compounds.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

### Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

### Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date                      Time  
 02/06/13                      11:25  
 02/07/13                      13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28391

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-4 (9-10)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.36	0.36	mg/Kg	02/08/13	LK	SW6010
Arsenic	0.8	0.7	mg/Kg	02/08/13	LK	SW6010
Barium	24.7	0.36	mg/Kg	02/08/13	LK	SW6010
Cadmium	< 0.36	0.36	mg/Kg	02/08/13	LK	SW6010
Chromium	15.1	0.36	mg/Kg	02/08/13	LK	SW6010
Mercury	< 0.08	0.08	mg/Kg	02/08/13	RS	SW-7471
Lead	20.1	0.36	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.5	1.5	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	89		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	91	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/11/13	Y	SW1010
Ignitability	Passed	140	degree F	02/11/13	Y	SW846
pH - Soil	7.66	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 5.3	5.3	mg/Kg	02/11/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/08/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/06/13		SW5035

### TPH by GC (Extractable Products)

Ext. Petroleum HC	12	11	mg/Kg	02/08/13	JRB	CT ETPH/8015
Identification	**		mg/Kg	02/08/13	JRB	CT ETPH/8015



Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	105		%	02/08/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1221	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1232	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1242	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1248	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1254	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1260	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1262	ND	370	ug/Kg	02/08/13	AW	SW 8082
PCB-1268	ND	370	ug/Kg	02/08/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	88		%	02/08/13	AW	30 - 150 %
% TCMX	93		%	02/08/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,1,1-Trichloroethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,1,2,2-Tetrachloroethane	ND	4.0	ug/Kg	02/13/13	R/J	SW8260
1,1,2-Trichloroethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,1-Dichloroethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,1-Dichloroethene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,1-Dichloropropene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,2,3-Trichlorobenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,2,3-Trichloropropane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,2,4-Trichlorobenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,2,4-Trimethylbenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,2-Dibromo-3-chloropropane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,2-Dibromoethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,2-Dichlorobenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,2-Dichloroethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,2-Dichloropropane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,3,5-Trimethylbenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,3-Dichlorobenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,3-Dichloropropane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
1,4-Dichlorobenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
2,2-Dichloropropane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
2-Chlorotoluene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
2-Hexanone	ND	33	ug/Kg	02/13/13	R/J	SW8260
2-Isopropyltoluene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
4-Chlorotoluene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
4-Methyl-2-pentanone	ND	33	ug/Kg	02/13/13	R/J	SW8260
Acetone	ND	130	ug/Kg	02/13/13	R/J	SW8260
Acrylonitrile	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Benzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Bromobenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Bromochloromethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Bromodichloromethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Bromomethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Carbon Disulfide	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Carbon tetrachloride	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Chlorobenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Chloroethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Chloroform	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Chloromethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
cis-1,2-Dichloroethene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
cis-1,3-Dichloropropene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Dibromochloromethane	ND	4.0	ug/Kg	02/13/13	R/J	SW8260
Dibromomethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Dichlorodifluoromethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Ethylbenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Hexachlorobutadiene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Isopropylbenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
m&p-Xylene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Methyl Ethyl Ketone	ND	40	ug/Kg	02/13/13	R/J	SW8260
Methyl t-butyl ether (MTBE)	ND	13	ug/Kg	02/13/13	R/J	SW8260
Methylene chloride	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Naphthalene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
n-Butylbenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
n-Propylbenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
o-Xylene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
p-Isopropyltoluene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
sec-Butylbenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Styrene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
tert-Butylbenzene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Tetrachloroethene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Tetrahydrofuran (THF)	ND	13	ug/Kg	02/13/13	R/J	SW8260
Toluene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Total Xylenes	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
trans-1,2-Dichloroethene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
trans-1,3-Dichloropropene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
trans-1,4-dichloro-2-butene	ND	13	ug/Kg	02/13/13	R/J	SW8260
Trichloroethene	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Trichlorofluoromethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Trichlorotrifluoroethane	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
Vinyl chloride	ND	6.7	ug/Kg	02/13/13	R/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	99		%	02/13/13	R/J	70 - 130 %
% Bromofluorobenzene	95		%	02/13/13	R/J	70 - 130 %
% Dibromofluoromethane	103		%	02/13/13	R/J	70 - 130 %
% Toluene-d8	101		%	02/13/13	R/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	370	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	590	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	260	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	260	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	260	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	260	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	260	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	590	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	370	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	260	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	590	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1100	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	370	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	260	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	260	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	590	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1100	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	260	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1100	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	350	260	ug/Kg	02/08/13	DD	SW 8270
Benzidine	ND	440	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	610	260	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	1000	260	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	600	260	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	380	260	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1100	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	260	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	370	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	260	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	560	ug/Kg	02/08/13	DD	SW 8270
Chrysene	720	260	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	260	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	260	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	1100	260	ug/Kg	02/08/13	DD	SW 8270
Fluorene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	260	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	460	260	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	260	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	260	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	260	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	370	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	260	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	370	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	370	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	370	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	310	260	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	260	ug/Kg	02/08/13	DD	SW 8270
Pyrene	900	260	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	370	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	83		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	87		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	78		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	78		%	02/08/13	DD	30 - 130 %
% Phenol-d5	80		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	99		%	02/08/13	DD	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

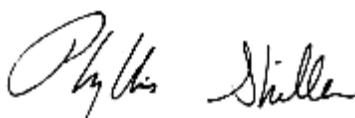
The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

\*\*Petroleum hydrocarbon chromatogram contains a multicomponent hydrocarbon distribution in the range of C14 to C36. The sample was quantitated against a C9-C36 alkane hydrocarbon standard.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

### Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

### Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date Time  
 02/07/13 8:30  
 02/07/13 13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28392

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-3 (6-8)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.42	0.42	mg/Kg	02/08/13	LK	SW6010
Arsenic	2.7	0.8	mg/Kg	02/08/13	LK	SW6010
Barium	61.1	0.42	mg/Kg	02/08/13	LK	SW6010
Cadmium	< 0.42	0.42	mg/Kg	02/08/13	LK	SW6010
Chromium	25.9	0.42	mg/Kg	02/08/13	LK	SW6010
Mercury	0.20	0.09	mg/Kg	02/08/13	RS	SW-7471
Lead	55.0	0.42	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.7	1.7	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	81		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	39	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/11/13	Y	SW1010
Ignitability	Passed	140	degree F	02/11/13	Y	SW846
pH - Soil	7.84	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 5.8	5.8	mg/Kg	02/11/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/08/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/07/13		SW5035

### TPH by GC (Extractable Products)

Ext. Petroleum HC	ND	12	mg/Kg	02/08/13	JRB	CT ETPH/8015
Identification	ND		mg/Kg	02/08/13	JRB	CT ETPH/8015

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	107		%	02/08/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	410	ug/Kg	02/08/13	AW	SW 8082
PCB-1221	ND	410	ug/Kg	02/08/13	AW	SW 8082
PCB-1232	ND	410	ug/Kg	02/08/13	AW	SW 8082
PCB-1242	ND	410	ug/Kg	02/08/13	AW	SW 8082
PCB-1248	ND	410	ug/Kg	02/08/13	AW	SW 8082
PCB-1254	ND	410	ug/Kg	02/08/13	AW	SW 8082
PCB-1260	ND	410	ug/Kg	02/08/13	AW	SW 8082
PCB-1262	ND	410	ug/Kg	02/08/13	AW	SW 8082
PCB-1268	ND	410	ug/Kg	02/08/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	98		%	02/08/13	AW	30 - 150 %
% TCMX	97		%	02/08/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,1,1-Trichloroethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,1,2,2-Tetrachloroethane	ND	4.2	ug/Kg	02/12/13	H/J	SW8260
1,1,2-Trichloroethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,1-Dichloroethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,1-Dichloroethene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,1-Dichloropropene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,2,3-Trichlorobenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,2,3-Trichloropropane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,2,4-Trichlorobenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,2,4-Trimethylbenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,2-Dibromo-3-chloropropane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,2-Dibromoethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,2-Dichlorobenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,2-Dichloroethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,2-Dichloropropane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,3,5-Trimethylbenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,3-Dichlorobenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,3-Dichloropropane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
1,4-Dichlorobenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
2,2-Dichloropropane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
2-Chlorotoluene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
2-Hexanone	ND	35	ug/Kg	02/12/13	H/J	SW8260
2-Isopropyltoluene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
4-Chlorotoluene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
4-Methyl-2-pentanone	ND	35	ug/Kg	02/12/13	H/J	SW8260
Acetone	ND	140	ug/Kg	02/12/13	H/J	SW8260
Acrylonitrile	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Benzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Bromobenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Bromochloromethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Bromodichloromethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Bromomethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Carbon Disulfide	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Carbon tetrachloride	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Chlorobenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Chloroethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Chloroform	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Chloromethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
cis-1,2-Dichloroethene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
cis-1,3-Dichloropropene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Dibromochloromethane	ND	4.2	ug/Kg	02/12/13	H/J	SW8260
Dibromomethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Dichlorodifluoromethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Ethylbenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Hexachlorobutadiene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Isopropylbenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
m&p-Xylene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Methyl Ethyl Ketone	ND	42	ug/Kg	02/12/13	H/J	SW8260
Methyl t-butyl ether (MTBE)	ND	14	ug/Kg	02/12/13	H/J	SW8260
Methylene chloride	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Naphthalene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
n-Butylbenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
n-Propylbenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
o-Xylene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
p-Isopropyltoluene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
sec-Butylbenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Styrene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
tert-Butylbenzene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Tetrachloroethene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Tetrahydrofuran (THF)	ND	14	ug/Kg	02/12/13	H/J	SW8260
Toluene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Total Xylenes	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
trans-1,2-Dichloroethene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
trans-1,3-Dichloropropene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
trans-1,4-dichloro-2-butene	ND	14	ug/Kg	02/12/13	H/J	SW8260
Trichloroethene	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Trichlorofluoromethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Trichlorotrifluoroethane	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
Vinyl chloride	ND	7.0	ug/Kg	02/12/13	H/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	97		%	02/12/13	H/J	70 - 130 %
% Bromofluorobenzene	90		%	02/12/13	H/J	70 - 130 %
% Dibromofluoromethane	102		%	02/12/13	H/J	70 - 130 %
% Toluene-d8	95		%	02/12/13	H/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	400	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	640	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	280	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	280	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	280	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	280	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	640	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	400	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	280	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	640	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1200	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	400	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	280	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	280	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	640	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	280	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	320	280	ug/Kg	02/08/13	DD	SW 8270
Benzdine	ND	480	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	360	280	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	440	280	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	280	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	400	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	280	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	600	ug/Kg	02/08/13	DD	SW 8270
Chrysene	330	280	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	280	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270



Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	420	280	ug/Kg	02/08/13	DD	SW 8270
Fluorene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	280	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	280	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	400	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	280	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	400	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	400	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	400	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
Pyrene	430	280	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	400	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	80		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	86		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	78		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	78		%	02/08/13	DD	30 - 130 %
% Phenol-d5	79		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	99		%	02/08/13	DD	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

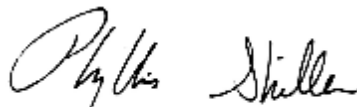
Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

## Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

## Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date Time  
 02/07/13 9:00  
 02/07/13 13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28393

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-1 (6-8)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.36	0.36	mg/Kg	02/08/13	LK	SW6010
Arsenic	< 0.7	0.7	mg/Kg	02/08/13	LK	SW6010
Barium	62.4	0.36	mg/Kg	02/08/13	LK	SW6010
Cadmium	< 0.36	0.36	mg/Kg	02/08/13	LK	SW6010
Chromium	15.8	0.36	mg/Kg	02/08/13	LK	SW6010
Mercury	< 0.08	0.08	mg/Kg	02/08/13	RS	SW-7471
Lead	3.64	0.36	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.4	1.4	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	94		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	26	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/11/13	Y	SW1010
Ignitability	Passed	140	degree F	02/11/13	Y	SW846
pH - Soil	8.48	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 5.3	5.3	mg/Kg	02/11/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/08/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/07/13		SW5035

## TPH by GC (Extractable Products)

Ext. Petroleum HC	ND	10	mg/Kg	02/08/13	JRB	CT ETPH/8015
Identification	ND		mg/Kg	02/08/13	JRB	CT ETPH/8015

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	109		%	02/08/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1221	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1232	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1242	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1248	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1254	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1260	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1262	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1268	ND	350	ug/Kg	02/08/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	90		%	02/08/13	AW	30 - 150 %
% TCMX	86		%	02/08/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,1,1-Trichloroethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,1,2,2-Tetrachloroethane	ND	2.4	ug/Kg	02/12/13	H/J	SW8260
1,1,2-Trichloroethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,1-Dichloroethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,1-Dichloroethene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,1-Dichloropropene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,2,3-Trichlorobenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,2,3-Trichloropropane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,2,4-Trichlorobenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,2,4-Trimethylbenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,2-Dibromo-3-chloropropane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,2-Dibromoethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,2-Dichlorobenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,2-Dichloroethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,2-Dichloropropane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,3,5-Trimethylbenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,3-Dichlorobenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,3-Dichloropropane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
1,4-Dichlorobenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
2,2-Dichloropropane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
2-Chlorotoluene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
2-Hexanone	ND	20	ug/Kg	02/12/13	H/J	SW8260
2-Isopropyltoluene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
4-Chlorotoluene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
4-Methyl-2-pentanone	ND	20	ug/Kg	02/12/13	H/J	SW8260
Acetone	ND	80	ug/Kg	02/12/13	H/J	SW8260
Acrylonitrile	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Benzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Bromobenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Bromochloromethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Bromodichloromethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Bromomethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Carbon Disulfide	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Carbon tetrachloride	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Chlorobenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Chloroethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Chloroform	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Chloromethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
cis-1,2-Dichloroethene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
cis-1,3-Dichloropropene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Dibromochloromethane	ND	2.4	ug/Kg	02/12/13	H/J	SW8260
Dibromomethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Dichlorodifluoromethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Ethylbenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Hexachlorobutadiene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Isopropylbenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
m&p-Xylene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Methyl Ethyl Ketone	ND	24	ug/Kg	02/12/13	H/J	SW8260
Methyl t-butyl ether (MTBE)	ND	8.0	ug/Kg	02/12/13	H/J	SW8260
Methylene chloride	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Naphthalene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
n-Butylbenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
n-Propylbenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
o-Xylene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
p-Isopropyltoluene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
sec-Butylbenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Styrene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
tert-Butylbenzene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Tetrachloroethene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Tetrahydrofuran (THF)	ND	8.0	ug/Kg	02/12/13	H/J	SW8260
Toluene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Total Xylenes	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
trans-1,2-Dichloroethene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
trans-1,3-Dichloropropene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
trans-1,4-dichloro-2-butene	ND	8.0	ug/Kg	02/12/13	H/J	SW8260
Trichloroethene	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Trichlorofluoromethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Trichlorotrifluoroethane	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
Vinyl chloride	ND	4.0	ug/Kg	02/12/13	H/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	99		%	02/12/13	H/J	70 - 130 %
% Bromofluorobenzene	91		%	02/12/13	H/J	70 - 130 %
% Dibromofluoromethane	94		%	02/12/13	H/J	70 - 130 %
% Toluene-d8	97		%	02/12/13	H/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	250	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	250	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	250	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	350	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	250	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	250	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	250	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	250	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	250	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	250	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	560	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	250	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	250	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	250	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	250	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	250	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	250	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	560	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	250	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	350	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	250	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	560	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1000	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	350	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	250	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	250	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	560	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1000	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	250	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1000	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Benzidine	ND	420	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1000	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	250	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	350	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	250	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	250	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	530	ug/Kg	02/08/13	DD	SW 8270
Chrysene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	250	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	250	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	250	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	250	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	250	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Fluorene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	250	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	250	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	250	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	350	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	250	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	350	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	350	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	350	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	250	ug/Kg	02/08/13	DD	SW 8270
Pyrene	ND	250	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	350	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	72		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	73		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	75		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	62		%	02/08/13	DD	30 - 130 %
% Phenol-d5	77		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	106		%	02/08/13	DD	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

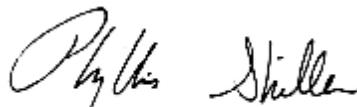
Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.



**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

### Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

### Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date Time  
 02/07/13 9:40  
 02/07/13 13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28394

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-2 (6-8)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.34	0.34	mg/Kg	02/08/13	LK	SW6010
Arsenic	1.9	0.7	mg/Kg	02/08/13	LK	SW6010
Barium	14.8	0.34	mg/Kg	02/08/13	LK	SW6010
Cadmium	< 0.34	0.34	mg/Kg	02/08/13	LK	SW6010
Chromium	8.40	0.34	mg/Kg	02/08/13	LK	SW6010
Mercury	< 0.08	0.08	mg/Kg	02/08/13	RS	SW-7471
Lead	7.12	0.34	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.3	1.3	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	94		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	17	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/11/13	Y	SW1010
Ignitability	Passed	140	degree F	02/11/13	Y	SW846
pH - Soil	8.41	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 4.8	4.8	mg/Kg	02/11/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/08/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/07/13		SW5035

### TPH by GC (Extractable Products)

Ext. Petroleum HC	ND	10	mg/Kg	02/08/13	JRB	CT ETPH/8015
Identification	ND		mg/Kg	02/08/13	JRB	CT ETPH/8015

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	112		%	02/08/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1221	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1232	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1242	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1248	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1254	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1260	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1262	ND	350	ug/Kg	02/08/13	AW	SW 8082
PCB-1268	ND	350	ug/Kg	02/08/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	96		%	02/08/13	AW	30 - 150 %
% TCMX	89		%	02/08/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,1,1-Trichloroethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,1,2,2-Tetrachloroethane	ND	2.6	ug/Kg	02/12/13	H/J	SW8260
1,1,2-Trichloroethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,1-Dichloroethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,1-Dichloroethene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,1-Dichloropropene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,2,3-Trichlorobenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,2,3-Trichloropropane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,2,4-Trichlorobenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,2,4-Trimethylbenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,2-Dibromo-3-chloropropane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,2-Dibromoethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,2-Dichlorobenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,2-Dichloroethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,2-Dichloropropane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,3,5-Trimethylbenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,3-Dichlorobenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,3-Dichloropropane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
1,4-Dichlorobenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
2,2-Dichloropropane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
2-Chlorotoluene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
2-Hexanone	ND	22	ug/Kg	02/12/13	H/J	SW8260
2-Isopropyltoluene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
4-Chlorotoluene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
4-Methyl-2-pentanone	ND	22	ug/Kg	02/12/13	H/J	SW8260
Acetone	ND	86	ug/Kg	02/12/13	H/J	SW8260
Acrylonitrile	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Benzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Bromobenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Bromochloromethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Bromodichloromethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260



Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Bromomethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Carbon Disulfide	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Carbon tetrachloride	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Chlorobenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Chloroethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Chloroform	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Chloromethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
cis-1,2-Dichloroethene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
cis-1,3-Dichloropropene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Dibromochloromethane	ND	2.6	ug/Kg	02/12/13	H/J	SW8260
Dibromomethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Dichlorodifluoromethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Ethylbenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Hexachlorobutadiene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Isopropylbenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
m&p-Xylene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Methyl Ethyl Ketone	ND	26	ug/Kg	02/12/13	H/J	SW8260
Methyl t-butyl ether (MTBE)	ND	8.6	ug/Kg	02/12/13	H/J	SW8260
Methylene chloride	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Naphthalene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
n-Butylbenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
n-Propylbenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
o-Xylene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
p-Isopropyltoluene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
sec-Butylbenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Styrene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
tert-Butylbenzene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Tetrachloroethene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Tetrahydrofuran (THF)	ND	8.6	ug/Kg	02/12/13	H/J	SW8260
Toluene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Total Xylenes	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
trans-1,2-Dichloroethene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
trans-1,3-Dichloropropene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
trans-1,4-dichloro-2-butene	ND	8.6	ug/Kg	02/12/13	H/J	SW8260
Trichloroethene	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Trichlorofluoromethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Trichlorotrifluoroethane	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
Vinyl chloride	ND	4.3	ug/Kg	02/12/13	H/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	98		%	02/12/13	H/J	70 - 130 %
% Bromofluorobenzene	87		%	02/12/13	H/J	70 - 130 %
% Dibromofluoromethane	105		%	02/12/13	H/J	70 - 130 %
% Toluene-d8	94		%	02/12/13	H/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	240	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	240	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	240	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	350	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	240	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	240	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	240	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	240	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	240	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	240	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	550	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	240	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	240	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	240	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	240	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	240	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	240	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	550	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	240	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	350	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	240	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	550	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1000	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	350	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	240	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	240	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	240	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	550	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1000	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	240	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1000	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Benzidine	ND	410	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1000	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	240	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	240	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	350	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	240	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	240	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	520	ug/Kg	02/08/13	DD	SW 8270
Chrysene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	240	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	240	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	240	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	240	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	240	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Fluorene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	240	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	240	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	240	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	350	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	240	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	350	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	350	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	350	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	240	ug/Kg	02/08/13	DD	SW 8270
Pyrene	ND	240	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	350	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	74		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	82		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	72		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	75		%	02/08/13	DD	30 - 130 %
% Phenol-d5	73		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	103		%	02/08/13	DD	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

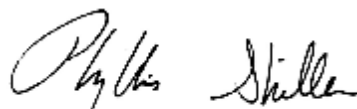
Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

### Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

### Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date                      Time  
 02/06/13                      14:00  
 02/07/13                      13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28395

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-11 (13-15)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.44	0.44	mg/Kg	02/08/13	LK	SW6010
Arsenic	4.9	0.9	mg/Kg	02/08/13	LK	SW6010
Barium	57.1	0.44	mg/Kg	02/08/13	LK	SW6010
Cadmium	0.49	0.44	mg/Kg	02/08/13	LK	SW6010
Chromium	27.6	0.44	mg/Kg	02/08/13	LK	SW6010
Mercury	0.18	0.09	mg/Kg	02/08/13	RS	SW-7471
Lead	28.8	0.44	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.8	1.8	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	74		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	100	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/11/13	Y	SW1010
Ignitability	Passed	140	degree F	02/11/13	Y	SW846
pH - Soil	7.12	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 6.4	6.4	mg/Kg	02/11/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/08/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/06/13		SW5035

### TPH by GC (Extractable Products)

Ext. Petroleum HC	500	13	mg/Kg	02/08/13	JRB	CT ETPH/8015
Identification	**		mg/Kg	02/08/13	JRB	CT ETPH/8015

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	112		%	02/08/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1221	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1232	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1242	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1248	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1254	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1260	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1262	ND	440	ug/Kg	02/08/13	AW	SW 8082
PCB-1268	ND	440	ug/Kg	02/08/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	101		%	02/08/13	AW	30 - 150 %
% TCMX	94		%	02/08/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,1,1-Trichloroethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,1,2,2-Tetrachloroethane	ND	200	ug/Kg	02/13/13	H/J	SW8260
1,1,2-Trichloroethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloroethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloroethene	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,1-Dichloropropene	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,2,3-Trichlorobenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,2,3-Trichloropropane	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,2,4-Trichlorobenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,2,4-Trimethylbenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,2-Dibromo-3-chloropropane	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,2-Dibromoethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichlorobenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichloroethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,2-Dichloropropane	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,3,5-Trimethylbenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,3-Dichlorobenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,3-Dichloropropane	ND	340	ug/Kg	02/13/13	H/J	SW8260
1,4-Dichlorobenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
2,2-Dichloropropane	ND	340	ug/Kg	02/13/13	H/J	SW8260
2-Chlorotoluene	ND	340	ug/Kg	02/13/13	H/J	SW8260
2-Hexanone	ND	1700	ug/Kg	02/13/13	H/J	SW8260
2-Isopropyltoluene	ND	340	ug/Kg	02/13/13	H/J	SW8260
4-Chlorotoluene	ND	340	ug/Kg	02/13/13	H/J	SW8260
4-Methyl-2-pentanone	ND	1700	ug/Kg	02/13/13	H/J	SW8260
Acetone	ND	6700	ug/Kg	02/13/13	H/J	SW8260
Acrylonitrile	ND	340	ug/Kg	02/13/13	H/J	SW8260
Benzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Bromobenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Bromochloromethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
Bromodichloromethane	ND	340	ug/Kg	02/13/13	H/J	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	340	ug/Kg	02/13/13	H/J	SW8260
Bromomethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
Carbon Disulfide	ND	340	ug/Kg	02/13/13	H/J	SW8260
Carbon tetrachloride	ND	340	ug/Kg	02/13/13	H/J	SW8260
Chlorobenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Chloroethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
Chloroform	ND	340	ug/Kg	02/13/13	H/J	SW8260
Chloromethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
cis-1,2-Dichloroethene	ND	340	ug/Kg	02/13/13	H/J	SW8260
cis-1,3-Dichloropropene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Dibromochloromethane	ND	200	ug/Kg	02/13/13	H/J	SW8260
Dibromomethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
Dichlorodifluoromethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
Ethylbenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Hexachlorobutadiene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Isopropylbenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
m&p-Xylene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Methyl Ethyl Ketone	ND	2000	ug/Kg	02/13/13	H/J	SW8260
Methyl t-butyl ether (MTBE)	ND	670	ug/Kg	02/13/13	H/J	SW8260
Methylene chloride	ND	340	ug/Kg	02/13/13	H/J	SW8260
Naphthalene	ND	340	ug/Kg	02/13/13	H/J	SW8260
n-Butylbenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
n-Propylbenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
o-Xylene	ND	340	ug/Kg	02/13/13	H/J	SW8260
p-Isopropyltoluene	ND	340	ug/Kg	02/13/13	H/J	SW8260
sec-Butylbenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Styrene	ND	340	ug/Kg	02/13/13	H/J	SW8260
tert-Butylbenzene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Tetrachloroethene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Tetrahydrofuran (THF)	ND	670	ug/Kg	02/13/13	H/J	SW8260
Toluene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Total Xylenes	ND	340	ug/Kg	02/13/13	H/J	SW8260
trans-1,2-Dichloroethene	ND	340	ug/Kg	02/13/13	H/J	SW8260
trans-1,3-Dichloropropene	ND	340	ug/Kg	02/13/13	H/J	SW8260
trans-1,4-dichloro-2-butene	ND	670	ug/Kg	02/13/13	H/J	SW8260
Trichloroethene	ND	340	ug/Kg	02/13/13	H/J	SW8260
Trichlorofluoromethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
Trichlorotrifluoroethane	ND	340	ug/Kg	02/13/13	H/J	SW8260
Vinyl chloride	ND	340	ug/Kg	02/13/13	H/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	97		%	02/13/13	H/J	70 - 130 %
% Bromofluorobenzene	94		%	02/13/13	H/J	70 - 130 %
% Dibromofluoromethane	97		%	02/13/13	H/J	70 - 130 %
% Toluene-d8	96		%	02/13/13	H/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	440	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	710	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	310	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	310	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	310	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	310	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	310	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	710	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	440	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	310	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	710	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1300	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	440	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	310	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	310	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	710	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1300	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	310	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1300	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Benzidine	ND	530	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	350	310	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	430	310	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1300	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	310	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	440	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	310	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	670	ug/Kg	02/08/13	DD	SW 8270
Chrysene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	310	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	310	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	340	310	ug/Kg	02/08/13	DD	SW 8270
Fluorene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	310	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	310	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	310	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	440	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	310	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	440	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	440	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	440	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	ND	310	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	310	ug/Kg	02/08/13	DD	SW 8270
Pyrene	410	310	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	440	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	77		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	81		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	81		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	76		%	02/08/13	DD	30 - 130 %
% Phenol-d5	79		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	101		%	02/08/13	DD	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

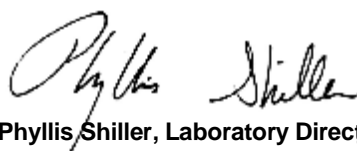
\*\*Petroleum hydrocarbon chromatogram contains a multicomponent hydrocarbon distribution in the range of C9 to C36. The sample was quantitated against a C9-C36 alkane hydrocarbon standard.

Elevated reporting limits for volatiles due to the presence of non-target compounds.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**





Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

## Sample Information

Matrix: SOLID  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

## Custody Information

Collected by:  
 Received by: SW  
 Analyzed by: see "By" below

Date                      Time  
 02/06/13                      15:00  
 02/07/13                      13:27

## Laboratory Data

SDG ID: gbd28385  
 Phoenix ID: BD28396

Project ID: TOE DRAIN DESIGM  
 Client ID: GP-12 (13-15)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.43	0.43	mg/Kg	02/08/13	LK	SW6010
Arsenic	4.3	0.9	mg/Kg	02/08/13	LK	SW6010
Barium	57.6	0.43	mg/Kg	02/08/13	LK	SW6010
Cadmium	< 0.43	0.43	mg/Kg	02/08/13	LK	SW6010
Chromium	22.4	0.43	mg/Kg	02/08/13	LK	SW6010
Mercury	0.27	0.07	mg/Kg	02/08/13	RS	SW-7471
Lead	36.3	0.43	mg/Kg	02/08/13	LK	SW6010
Selenium	< 1.7	1.7	mg/Kg	02/08/13	LK	SW6010
TCLP Metals Digestion	Completed			02/08/13	X/X	SW846 - 3005
Percent Solid	81		%	02/07/13	JL	E160.3
Conductivity - Soil Matrix	140	5	umhos/cm	02/07/13	RWR	SM2510B
Corrosivity	Negative		Pos/Neg	02/07/13	O/EG	SW846
Flash Point	>200	200	degree F	02/11/13	Y	SW1010
Ignitability	Passed	140	degree F	02/11/13	Y	SW846
pH - Soil	7.64	0.10	pH Units	02/07/13 23:45	O/EG	4500-H B/9045
Reactivity Cyanide	< 6.1	6.1	mg/Kg	02/11/13	JL/EG	SW 846-7.3
Reactivity Sulfide	< 20	20	mg/Kg	02/11/13	JL/EG	SW846-7.3
Reactivity	Negative		Pos/Neg	02/11/13	EG	SW 846-7.3
Soil Extraction for PCB	Completed			02/07/13	PB/V	SW3545
Soil Extraction for SVOA	Completed			02/07/13	PJ/V	SW3545
Extraction of CT ETPH	Completed			02/07/13	PJ/V	3545
Mercury Digestion	Completed			02/08/13	X/X	SW7471
TCLP Extraction for Metals	Completed			02/07/13	X	EPA 1311
Total Metals Digest	Completed			02/07/13	AG	SW846 - 3050
Field Extraction	Completed			02/06/13		SW5035

## TPH by GC (Extractable Products)

Ext. Petroleum HC	2000	61	mg/Kg	02/11/13	JRB	CT ETPH/8015
Identification	**		mg/Kg	02/11/13	JRB	CT ETPH/8015

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>QA/QC Surrogates</u></b>						
% n-Pentacosane	Diluted Out		%	02/11/13	JRB	50 - 150 %
<b><u>Polychlorinated Biphenyls</u></b>						
PCB-1016	ND	400	ug/Kg	02/08/13	AW	SW 8082
PCB-1221	ND	400	ug/Kg	02/08/13	AW	SW 8082
PCB-1232	ND	400	ug/Kg	02/08/13	AW	SW 8082
PCB-1242	ND	400	ug/Kg	02/08/13	AW	SW 8082
PCB-1248	ND	400	ug/Kg	02/08/13	AW	SW 8082
PCB-1254	ND	400	ug/Kg	02/08/13	AW	SW 8082
PCB-1260	ND	400	ug/Kg	02/08/13	AW	SW 8082
PCB-1262	ND	400	ug/Kg	02/08/13	AW	SW 8082
PCB-1268	ND	400	ug/Kg	02/08/13	AW	SW 8082
<b><u>QA/QC Surrogates</u></b>						
% DCBP	120		%	02/08/13	AW	30 - 150 %
% TCMX	99		%	02/08/13	AW	30 - 150 %
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,1,1-Trichloroethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,1,2,2-Tetrachloroethane	ND	160	ug/Kg	02/13/13	R/J	SW8260
1,1,2-Trichloroethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,1-Dichloroethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,1-Dichloroethene	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,1-Dichloropropene	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,2,3-Trichlorobenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,2,3-Trichloropropane	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,2,4-Trichlorobenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,2,4-Trimethylbenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,2-Dibromo-3-chloropropane	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,2-Dibromoethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,2-Dichlorobenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,2-Dichloroethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,2-Dichloropropane	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,3,5-Trimethylbenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,3-Dichlorobenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,3-Dichloropropane	ND	260	ug/Kg	02/13/13	R/J	SW8260
1,4-Dichlorobenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
2,2-Dichloropropane	ND	260	ug/Kg	02/13/13	R/J	SW8260
2-Chlorotoluene	ND	260	ug/Kg	02/13/13	R/J	SW8260
2-Hexanone	ND	1300	ug/Kg	02/13/13	R/J	SW8260
2-Isopropyltoluene	ND	260	ug/Kg	02/13/13	R/J	SW8260
4-Chlorotoluene	ND	260	ug/Kg	02/13/13	R/J	SW8260
4-Methyl-2-pentanone	ND	1300	ug/Kg	02/13/13	R/J	SW8260
Acetone	ND	5300	ug/Kg	02/13/13	R/J	SW8260
Acrylonitrile	ND	260	ug/Kg	02/13/13	R/J	SW8260
Benzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Bromobenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Bromochloromethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
Bromodichloromethane	ND	260	ug/Kg	02/13/13	R/J	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Bromoform	ND	260	ug/Kg	02/13/13	R/J	SW8260
Bromomethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
Carbon Disulfide	ND	260	ug/Kg	02/13/13	R/J	SW8260
Carbon tetrachloride	ND	260	ug/Kg	02/13/13	R/J	SW8260
Chlorobenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Chloroethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
Chloroform	ND	260	ug/Kg	02/13/13	R/J	SW8260
Chloromethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
cis-1,2-Dichloroethene	ND	260	ug/Kg	02/13/13	R/J	SW8260
cis-1,3-Dichloropropene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Dibromochloromethane	ND	160	ug/Kg	02/13/13	R/J	SW8260
Dibromomethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
Dichlorodifluoromethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
Ethylbenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Hexachlorobutadiene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Isopropylbenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
m&p-Xylene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Methyl Ethyl Ketone	ND	1600	ug/Kg	02/13/13	R/J	SW8260
Methyl t-butyl ether (MTBE)	ND	530	ug/Kg	02/13/13	R/J	SW8260
Methylene chloride	ND	260	ug/Kg	02/13/13	R/J	SW8260
Naphthalene	ND	260	ug/Kg	02/13/13	R/J	SW8260
n-Butylbenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
n-Propylbenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
o-Xylene	ND	260	ug/Kg	02/13/13	R/J	SW8260
p-Isopropyltoluene	ND	260	ug/Kg	02/13/13	R/J	SW8260
sec-Butylbenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Styrene	ND	260	ug/Kg	02/13/13	R/J	SW8260
tert-Butylbenzene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Tetrachloroethene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Tetrahydrofuran (THF)	ND	530	ug/Kg	02/13/13	R/J	SW8260
Toluene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Total Xylenes	ND	260	ug/Kg	02/13/13	R/J	SW8260
trans-1,2-Dichloroethene	ND	260	ug/Kg	02/13/13	R/J	SW8260
trans-1,3-Dichloropropene	ND	260	ug/Kg	02/13/13	R/J	SW8260
trans-1,4-dichloro-2-butene	ND	530	ug/Kg	02/13/13	R/J	SW8260
Trichloroethene	ND	260	ug/Kg	02/13/13	R/J	SW8260
Trichlorofluoromethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
Trichlorotrifluoroethane	ND	260	ug/Kg	02/13/13	R/J	SW8260
Vinyl chloride	ND	260	ug/Kg	02/13/13	R/J	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	101		%	02/13/13	R/J	70 - 130 %
% Bromofluorobenzene	110		%	02/13/13	R/J	70 - 130 %
% Dibromofluoromethane	102		%	02/13/13	R/J	70 - 130 %
% Toluene-d8	101		%	02/13/13	R/J	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
1,2,4-Trichlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
1,2-Dichlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
1,2-Diphenylhydrazine	ND	410	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,3-Dichlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
1,4-Dichlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,4,5-Trichlorophenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,4,6-Trichlorophenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,4-Dichlorophenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,4-Dimethylphenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrophenol	ND	650	ug/Kg	02/08/13	DD	SW 8270
2,4-Dinitrotoluene	ND	280	ug/Kg	02/08/13	DD	SW 8270
2,6-Dinitrotoluene	ND	280	ug/Kg	02/08/13	DD	SW 8270
2-Chloronaphthalene	ND	280	ug/Kg	02/08/13	DD	SW 8270
2-Chlorophenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
2-Methylnaphthalene	ND	280	ug/Kg	02/08/13	DD	SW 8270
2-Methylphenol (o-cresol)	ND	280	ug/Kg	02/08/13	DD	SW 8270
2-Nitroaniline	ND	650	ug/Kg	02/08/13	DD	SW 8270
2-Nitrophenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
3&4-Methylphenol (m&p-cresol)	ND	410	ug/Kg	02/08/13	DD	SW 8270
3,3'-Dichlorobenzidine	ND	280	ug/Kg	02/08/13	DD	SW 8270
3-Nitroaniline	ND	650	ug/Kg	02/08/13	DD	SW 8270
4,6-Dinitro-2-methylphenol	ND	1200	ug/Kg	02/08/13	DD	SW 8270
4-Bromophenyl phenyl ether	ND	410	ug/Kg	02/08/13	DD	SW 8270
4-Chloro-3-methylphenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
4-Chloroaniline	ND	280	ug/Kg	02/08/13	DD	SW 8270
4-Chlorophenyl phenyl ether	ND	280	ug/Kg	02/08/13	DD	SW 8270
4-Nitroaniline	ND	650	ug/Kg	02/08/13	DD	SW 8270
4-Nitrophenol	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Acenaphthene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Acenaphthylene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Acetophenone	ND	280	ug/Kg	02/08/13	DD	SW 8270
Aniline	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Anthracene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Benz(a)anthracene	300	280	ug/Kg	02/08/13	DD	SW 8270
Benzidine	ND	490	ug/Kg	02/08/13	DD	SW 8270
Benzo(a)pyrene	350	280	ug/Kg	02/08/13	DD	SW 8270
Benzo(b)fluoranthene	420	280	ug/Kg	02/08/13	DD	SW 8270
Benzo(ghi)perylene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Benzo(k)fluoranthene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Benzoic acid	ND	1200	ug/Kg	02/08/13	DD	SW 8270
Benzyl butyl phthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethoxy)methane	ND	280	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroethyl)ether	ND	410	ug/Kg	02/08/13	DD	SW 8270
Bis(2-chloroisopropyl)ether	ND	280	ug/Kg	02/08/13	DD	SW 8270
Bis(2-ethylhexyl)phthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270
Carbazole	ND	610	ug/Kg	02/08/13	DD	SW 8270
Chrysene	330	280	ug/Kg	02/08/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Dibenzofuran	ND	280	ug/Kg	02/08/13	DD	SW 8270
Diethyl phthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270
Dimethylphthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270
Di-n-butylphthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270
Di-n-octylphthalate	ND	280	ug/Kg	02/08/13	DD	SW 8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Fluoranthene	360	280	ug/Kg	02/08/13	DD	SW 8270
Fluorene	320	280	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Hexachlorobutadiene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Hexachlorocyclopentadiene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Hexachloroethane	ND	280	ug/Kg	02/08/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Isophorone	ND	280	ug/Kg	02/08/13	DD	SW 8270
Naphthalene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Nitrobenzene	ND	280	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodimethylamine	ND	410	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodi-n-propylamine	ND	280	ug/Kg	02/08/13	DD	SW 8270
N-Nitrosodiphenylamine	ND	410	ug/Kg	02/08/13	DD	SW 8270
Pentachloronitrobenzene	ND	410	ug/Kg	02/08/13	DD	SW 8270
Pentachlorophenol	ND	410	ug/Kg	02/08/13	DD	SW 8270
Phenanthrene	ND	280	ug/Kg	02/08/13	DD	SW 8270
Phenol	ND	280	ug/Kg	02/08/13	DD	SW 8270
Pyrene	450	280	ug/Kg	02/08/13	DD	SW 8270
Pyridine	ND	410	ug/Kg	02/08/13	DD	SW 8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	73		%	02/08/13	DD	30 - 130 %
% 2-Fluorobiphenyl	74		%	02/08/13	DD	30 - 130 %
% 2-Fluorophenol	76		%	02/08/13	DD	30 - 130 %
% Nitrobenzene-d5	74		%	02/08/13	DD	30 - 130 %
% Phenol-d5	75		%	02/08/13	DD	30 - 130 %
% Terphenyl-d14	98		%	02/08/13	DD	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

Corrosivity is based solely on the pH analysis performed above.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide and Reactive Sulfide. This method is no longer listed in the current version of SW-846.

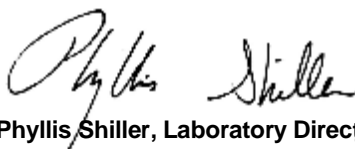
\*\*Petroleum hydrocarbon chromatogram contains a multicomponent hydrocarbon distribution in the range of C9 to C24. The sample was quantitated against a C9-C36 alkane hydrocarbon standard.

Elevated reporting limits for volatiles due to the presence of non-target compounds.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

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**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Bobbi Aloisa, Vice President**



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# QA/QC Report

February 19, 2013

## QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
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QA/QC Batch 220732, QC Sample No: BD28279 (BD28385, BD28386, BD28387, BD28388, BD28389, BD28390, BD28391, BD28392, BD28393)

### ICP Metals - Soil

Arsenic	BRL	1.0	1.06	NC	99.2	88.7	11.2	88.8	87.5	1.5	75 - 125	30
Barium	BRL	18.7	19.7	5.20	106	93.2	12.9	99.3	97.4	1.9	75 - 125	30
Cadmium	BRL	<0.38	<0.38	NC	101	93.1	8.1	92.9	91.1	2.0	75 - 125	30
Chromium	BRL	6.61	7.39	11.1	104	94.0	10.1	95.0	93.8	1.3	75 - 125	30
Lead	BRL	4.04	3.74	7.70	100	89.8	10.7	91.2	90.3	1.0	75 - 125	30
Selenium	BRL	<1.5	<1.5	NC	106	96.0	9.9	78.7	77.9	1.0	75 - 125	30
Silver	BRL	<0.38	<0.38	NC	104	96.2	7.8	96.8	94.4	2.5	75 - 125	30

QA/QC Batch 220853, QC Sample No: BD28279 (BD28385, BD28386, BD28387, BD28388, BD28389, BD28390)

Mercury - Soil	BRL	<0.07	<0.09	NC	105	98.1	6.8	111	110	0.9	70 - 130	30
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Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%.

QA/QC Batch 220733, QC Sample No: BD28394 (BD28394, BD28395, BD28396)

### ICP Metals - Soil

Arsenic	BRL	1.9	1.76	NC	91.5	92.7	1.3	87.5	87.3	0.2	75 - 125	30
Barium	BRL	14.8	15.9	7.20	101	98.0	3.0	98.1	100	1.9	75 - 125	30
Cadmium	BRL	<0.34	<0.37	NC	96.7	94.5	2.3	90.9	90.5	0.4	75 - 125	30
Chromium	BRL	8.40	7.71	8.60	99.4	97.4	2.0	95.6	95.6	0.0	75 - 125	30
Lead	BRL	7.12	4.69	41.2	95.2	95.2	0.0	91.0	90.9	0.1	75 - 125	30
Selenium	BRL	<1.3	<1.5	NC	98.4	99.0	0.6	77.8	77.0	1.0	75 - 125	30
Silver	BRL	<0.34	<0.37	NC	95.1	97.9	2.9	94.2	93.1	1.2	75 - 125	30

QA/QC Batch 220791, QC Sample No: BD28792 (BD28391, BD28392, BD28393, BD28394, BD28395, BD28396)

Mercury - Soil	BRL	<0.08	<0.08	NC	103	102	1.0	98.7	125	23.5	70 - 130	30
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Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%.

r = This parameter is outside laboratory rpd specified recovery limits.



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# QA/QC Report

February 19, 2013

## QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 220790, QC Sample No: BD27750 (BD28385, BD28386, BD28387)												
Reactivity Cyanide	BRL	<5.3	<5.4	NC	104			46.7			85 - 115	30
QA/QC Batch 220860, QC Sample No: BD28388 (BD28388, BD28389, BD28390, BD28391, BD28392, BD28393, BD28394, BD28395, BD28396)												
Reactivity Cyanide	BRL	<6.6	<6.6	NC	104			68.0			85 - 115	30
QA/QC Batch 220881, QC Sample No: BD28392 (BD28389, BD28390, BD28391, BD28392, BD28394, BD28395, BD28396)												
Flash Point		>200	>200	NC	100						85 - 115	30
QA/QC Batch 220768, QC Sample No: BD28394 (BD28385, BD28386, BD28387, BD28388, BD28389, BD28390, BD28391, BD28392, BD28393, BD28394, BD28395, BD28396)												
Conductivity - Soil Matrix	BRL	17	17	NC	100						85 - 115	30
QA/QC Batch 220797, QC Sample No: BD28502 (BD28385, BD28386, BD28387, BD28388)												
Flash Point		>200	>200	NC	100						85 - 115	30

m = This parameter is outside laboratory ms/msd specified recovery limits.



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# QA/QC Report

February 19, 2013

## QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 220983, QC Sample No: BD28159 (BD28385, BD28386)									
<u>Volatiles - Solid</u>									
1,1,1,2-Tetrachloroethane	ND	114			88	102	14.7	70 - 130	30
1,1,1-Trichloroethane	ND	84			94	89	5.5	70 - 130	30
1,1,2,2-Tetrachloroethane	ND	107			111	114	2.7	70 - 130	30
1,1,2-Trichloroethane	ND	92			73	76	4.0	70 - 130	30
1,1-Dichloroethane	ND	83			91	94	3.2	70 - 130	30
1,1-Dichloroethene	ND	84			114	97	16.1	70 - 130	30
1,1-Dichloropropene	ND	85			86	83	3.6	70 - 130	30
1,2,3-Trichlorobenzene	ND	102			<40	41	NC	70 - 130	30 m
1,2,3-Trichloropropane	ND	120			122	119	2.5	70 - 130	30
1,2,4-Trichlorobenzene	ND	89			<40	42	NC	70 - 130	30 m
1,2,4-Trimethylbenzene	ND	108			76	86	12.3	70 - 130	30
1,2-Dibromo-3-chloropropane	ND	137			72	101	33.5	70 - 130	30 l,r
1,2-Dibromoethane	ND	92			59	68	14.2	70 - 130	30 m
1,2-Dichlorobenzene	ND	108			71	74	4.1	70 - 130	30
1,2-Dichloroethane	ND	88			79	81	2.5	70 - 130	30
1,2-Dichloropropane	ND	88			87	86	1.2	70 - 130	30
1,3,5-Trimethylbenzene	ND	108			118	109	7.9	70 - 130	30
1,3-Dichlorobenzene	ND	104			75	76	1.3	70 - 130	30
1,3-Dichloropropane	ND	110			97	98	1.0	70 - 130	30
1,4-Dichlorobenzene	ND	101			69	71	2.9	70 - 130	30 m
2,2-Dichloropropane	ND	72			61	58	5.0	70 - 130	30 m
2-Chlorotoluene	ND	102			90	89	1.1	70 - 130	30
2-Hexanone	ND	106			<40	<40	NC	70 - 130	30 m
2-Isopropyltoluene	ND	110			122	116	5.0	70 - 130	30
4-Chlorotoluene	ND	102			90	89	1.1	70 - 130	30
4-Methyl-2-pentanone	ND	91			<40	<40	NC	70 - 130	30 m
Acetone	ND	90			<40	<40	NC	70 - 130	30 m
Acrylonitrile	ND	87			<40	<40	NC	70 - 130	30 m
Benzene	ND	86			77	81	5.1	70 - 130	30
Bromobenzene	ND	111			89	92	3.3	70 - 130	30
Bromochloromethane	ND	83			73	76	4.0	70 - 130	30
Bromodichloromethane	ND	92			60	80	28.6	70 - 130	30 m
Bromoform	ND	124			53	78	38.2	70 - 130	30 m,r
Bromomethane	ND	90			58	44	27.5	70 - 130	30 m
Carbon Disulfide	ND	79			82	77	6.3	70 - 130	30
Carbon tetrachloride	ND	88			94	92	2.2	70 - 130	30
Chlorobenzene	ND	103			84	83	1.2	70 - 130	30
Chloroethane	ND	87			111	99	11.4	70 - 130	30
Chloroform	ND	84			87	84	3.5	70 - 130	30
Chloromethane	ND	85			87	81	7.1	70 - 130	30
cis-1,2-Dichloroethene	ND	84			77	76	1.3	70 - 130	30



QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	LCS %	LCS D %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
cis-1,3-Dichloropropene	ND	84			<40	50	NC	70 - 130	30
Dibromochloromethane	ND	121			66	95	36.0	70 - 130	30
Dibromomethane	ND	91			74	85	13.8	70 - 130	30
Dichlorodifluoromethane	ND	93			94	89	5.5	70 - 130	30
Ethylbenzene	ND	100			93	89	4.4	70 - 130	30
Hexachlorobutadiene	ND	96			80	83	3.7	70 - 130	30
Isopropylbenzene	ND	112			137	126	8.4	70 - 130	30
m&p-Xylene	ND	99			82	83	1.2	70 - 130	30
Methyl ethyl ketone	ND	86			<40	<40	NC	70 - 130	30
Methyl t-butyl ether (MTBE)	ND	86			76	90	16.9	70 - 130	30
Methylene chloride	ND	80			95	87	8.8	70 - 130	30
Naphthalene	ND	130			<40	<40	NC	70 - 130	30
n-Butylbenzene	ND	101			99	91	8.4	70 - 130	30
n-Propylbenzene	ND	110			119	109	8.8	70 - 130	30
o-Xylene	ND	106			91	88	3.4	70 - 130	30
p-Isopropyltoluene	ND	106			115	104	10.0	70 - 130	30
sec-Butylbenzene	ND	110			132	122	7.9	70 - 130	30
Styrene	ND	104			59	54	8.8	70 - 130	30
tert-Butylbenzene	ND	114			137	129	6.0	70 - 130	30
Tetrachloroethene	ND	100			93	85	9.0	70 - 130	30
Tetrahydrofuran (THF)	ND	86			77	81	5.1	70 - 130	30
Toluene	ND	84			74	76	2.7	70 - 130	30
trans-1,2-Dichloroethene	ND	80			80	80	0.0	70 - 130	30
trans-1,3-Dichloropropene	ND	83			<40	44	NC	70 - 130	30
trans-1,4-dichloro-2-butene	ND	114			94	114	19.2	70 - 130	30
Trichloroethene	ND	93			81	81	0.0	70 - 130	30
Trichlorofluoromethane	ND	89			107	97	9.8	70 - 130	30
Trichlorotrifluoroethane	ND	82			112	102	9.3	70 - 130	30
Vinyl chloride	ND	84			92	87	5.6	70 - 130	30
% 1,2-dichlorobenzene-d4	100	104			101	101	0.0	70 - 130	30
% Bromofluorobenzene	95	98			90	91	1.1	70 - 130	30
% Dibromofluoromethane	94	95			95	92	3.2	70 - 130	30
% Toluene-d8	96	96			97	96	1.0	70 - 130	30

Comment:

Additional 8260 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is 40-160%.

QA/QC Batch 220629, QC Sample No: BD28280 (BD28385, BD28386, BD28387, BD28388, BD28389, BD28390, BD28391, BD28392, BD28393, BD28394, BD28395, BD28396)

TPH by GC (Extractable Products) - Solid

Ext. Petroleum HC	ND	74	70	5.6	78	78	0.0	60 - 120	30
% n-Pentacosane	100	104	101	2.9	108	109	0.9	50 - 150	30

QA/QC Batch 220635, QC Sample No: BD28295 (BD28385, BD28386, BD28387, BD28388, BD28389, BD28390, BD28391, BD28392, BD28393, BD28394, BD28395, BD28396)

Polychlorinated Biphenyls - Solid

PCB-1016	ND	83	87	4.7	74	62	17.6	40 - 140	30
PCB-1221	ND							40 - 140	30
PCB-1232	ND							40 - 140	30
PCB-1242	ND							40 - 140	30
PCB-1248	ND							40 - 140	30
PCB-1254	ND							40 - 140	30
PCB-1260	ND	86	89	3.4	98	89	9.6	40 - 140	30
PCB-1262	ND							40 - 140	30
PCB-1268	ND							40 - 140	30

## QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
% DCBP (Surrogate Rec)	63	71	74	4.1	89	76	15.8	30 - 150	30	
% TCMX (Surrogate Rec)	69	81	84	3.6	64	54	16.9	30 - 150	30	
QA/QC Batch 220727, QC Sample No: BD28387 (BD28385, BD28386, BD28387, BD28388, BD28389, BD28390, BD28391, BD28392, BD28393, BD28394, BD28395, BD28396)										
<b><u>Semivolatiles - Solid</u></b>										
1,2,4,5-Tetrachlorobenzene	ND	94	94	0.0	98	101	3.0	30 - 130	30	
1,2,4-Trichlorobenzene	ND	81	81	0.0	82	85	3.6	30 - 130	30	
1,2-Dichlorobenzene	ND	74	74	0.0	75	77	2.6	30 - 130	30	
1,2-Diphenylhydrazine	ND	73	75	2.7	76	79	3.9	30 - 130	30	
1,3-Dichlorobenzene	ND	73	72	1.4	73	75	2.7	30 - 130	30	
1,4-Dichlorobenzene	ND	72	72	0.0	74	74	0.0	30 - 130	30	
2,4,5-Trichlorophenol	ND	84	85	1.2	88	90	2.2	30 - 130	30	
2,4,6-Trichlorophenol	ND	78	81	3.8	80	82	2.5	30 - 130	30	
2,4-Dichlorophenol	ND	88	91	3.4	92	95	3.2	30 - 130	30	
2,4-Dimethylphenol	ND	61	64	4.8	57	60	5.1	30 - 130	30	
2,4-Dinitrophenol	ND	39	57	37.5	<5	13	NC	30 - 130	30	m,r
2,4-Dinitrotoluene	ND	92	94	2.2	99	100	1.0	30 - 130	30	
2,6-Dinitrotoluene	ND	82	84	2.4	86	90	4.5	30 - 130	30	
2-Chloronaphthalene	ND	78	80	2.5	81	84	3.6	30 - 130	30	
2-Chlorophenol	ND	72	75	4.1	76	78	2.6	30 - 130	30	
2-Methylnaphthalene	ND	85	85	0.0	89	91	2.2	30 - 130	30	
2-Methylphenol (o-cresol)	ND	74	74	0.0	70	73	4.2	30 - 130	30	
2-Nitroaniline	ND	>150	>150	NC	>150	>150	NC	30 - 130	30	l,m
2-Nitrophenol	ND	78	81	3.8	82	85	3.6	30 - 130	30	
3&4-Methylphenol (m&p-cresol)	ND	83	84	1.2	81	85	4.8	30 - 130	30	
3,3'-Dichlorobenzidine	ND	99	83	17.6	88	83	5.8	30 - 130	30	
3-Nitroaniline	ND	85	87	2.3	89	92	3.3	30 - 130	30	
4,6-Dinitro-2-methylphenol	ND	85	95	11.1	90	93	3.3	30 - 130	30	
4-Bromophenyl phenyl ether	ND	93	94	1.1	97	101	4.0	30 - 130	30	
4-Chloro-3-methylphenol	ND	87	88	1.1	90	92	2.2	30 - 130	30	
4-Chloroaniline	ND	94	69	30.7	90	88	2.2	30 - 130	30	r
4-Chlorophenyl phenyl ether	ND	95	97	2.1	101	103	2.0	30 - 130	30	
4-Nitroaniline	ND	79	80	1.3	83	85	2.4	30 - 130	30	
4-Nitrophenol	ND	72	65	10.2	67	70	4.4	30 - 130	30	
Acenaphthene	ND	75	76	1.3	79	81	2.5	30 - 130	30	
Acenaphthylene	ND	80	82	2.5	84	87	3.5	30 - 130	30	
Acetophenone	ND	81	81	0.0	83	85	2.4	30 - 130	30	
Aniline	ND	85	76	11.2	58	58	0.0	30 - 130	30	
Anthracene	ND	87	89	2.3	92	96	4.3	30 - 130	30	
Benz(a)anthracene	ND	75	75	0.0	77	80	3.8	30 - 130	30	
Benzidine	ND	45	27	50.0	7.8	<5	NC	30 - 130	30	l,m,r
Benzo(a)pyrene	ND	77	78	1.3	80	84	4.9	30 - 130	30	
Benzo(b)fluoranthene	ND	87	87	0.0	87	93	6.7	30 - 130	30	
Benzo(ghi)perylene	ND	90	88	2.2	92	100	8.3	30 - 130	30	
Benzo(k)fluoranthene	ND	87	86	1.2	91	93	2.2	30 - 130	30	
Benzyl butyl phthalate	ND	68	67	1.5	70	74	5.6	30 - 130	30	
Bis(2-chloroethoxy)methane	ND	74	76	2.7	76	79	3.9	30 - 130	30	
Bis(2-chloroethyl)ether	ND	64	64	0.0	66	68	3.0	30 - 130	30	
Bis(2-chloroisopropyl)ether	ND	60	61	1.7	62	63	1.6	30 - 130	30	
Bis(2-ethylhexyl)phthalate	ND	70	70	0.0	74	76	2.7	30 - 130	30	
Carbazole	ND	125	127	1.6	130	134	3.0	30 - 130	30	m
Chrysene	ND	74	73	1.4	76	78	2.6	30 - 130	30	

QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
Dibenz(a,h)anthracene	ND	91	92	1.1	96	102	6.1	30 - 130	30
Dibenzofuran	ND	88	89	1.1	92	96	4.3	30 - 130	30
Diethyl phthalate	ND	82	85	3.6	88	90	2.2	30 - 130	30
Dimethylphthalate	ND	81	84	3.6	86	89	3.4	30 - 130	30
Di-n-butylphthalate	ND	81	83	2.4	84	86	2.4	30 - 130	30
Di-n-octylphthalate	ND	65	66	1.5	70	71	1.4	30 - 130	30
Fluoranthene	ND	86	90	4.5	91	94	3.2	30 - 130	30
Fluorene	ND	92	93	1.1	98	100	2.0	30 - 130	30
Hexachlorobenzene	ND	81	85	4.8	86	87	1.2	30 - 130	30
Hexachlorobutadiene	ND	87	85	2.3	88	90	2.2	30 - 130	30
Hexachlorocyclopentadiene	ND	92	89	3.3	94	97	3.1	30 - 130	30
Hexachloroethane	ND	70	71	1.4	71	73	2.8	30 - 130	30
Indeno(1,2,3-cd)pyrene	ND	89	90	1.1	93	100	7.3	30 - 130	30
Isophorone	ND	77	77	0.0	78	81	3.8	30 - 130	30
Naphthalene	ND	83	82	1.2	84	86	2.4	30 - 130	30
Nitrobenzene	ND	71	71	0.0	74	74	0.0	30 - 130	30
N-Nitrosodimethylamine	ND	75	74	1.3	76	74	2.7	30 - 130	30
N-Nitrosodi-n-propylamine	ND	77	76	1.3	79	81	2.5	30 - 130	30
N-Nitrosodiphenylamine	ND	95	97	2.1	100	104	3.9	30 - 130	30
Pentachloronitrobenzene	ND	87	90	3.4	92	96	4.3	30 - 130	30
Pentachlorophenol	ND	66	67	1.5	68	73	7.1	30 - 130	30
Phenanthrene	ND	88	90	2.2	92	96	4.3	30 - 130	30
Phenol	ND	69	79	13.5	77	80	3.8	30 - 130	30
Pyrene	ND	84	86	2.4	89	91	2.2	30 - 130	30
Pyridine	ND	51	48	6.1	46	45	2.2	30 - 130	30
% 2,4,6-Tribromophenol	81	76	78	2.6	74	80	7.8	30 - 130	30
% 2-Fluorobiphenyl	81	80	81	1.2	82	85	3.6	30 - 130	30
% 2-Fluorophenol	78	73	73	0.0	74	74	0.0	30 - 130	30
% Nitrobenzene-d5	76	72	72	0.0	73	75	2.7	30 - 130	30
% Phenol-d5	79	76	77	1.3	77	78	1.3	30 - 130	30
% Terphenyl-d14	92	93	95	2.1	94	96	2.1	30 - 130	30

Comment:

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

QA/QC Batch 221459, QC Sample No: BD28392 (BD28392, BD28393, BD28394)

Volatiles - Solid

1,1,1,2-Tetrachloroethane	ND	104	106	1.9	105	105	0.0	70 - 130	30
1,1,1-Trichloroethane	ND	105	100	4.9	104	105	1.0	70 - 130	30
1,1,2,2-Tetrachloroethane	ND	99	102	3.0	104	98	5.9	70 - 130	30
1,1,2-Trichloroethane	ND	108	106	1.9	104	104	0.0	70 - 130	30
1,1-Dichloroethane	ND	103	100	3.0	98	102	4.0	70 - 130	30
1,1-Dichloroethene	ND	108	95	12.8	97	108	10.7	70 - 130	30
1,1-Dichloropropene	ND	104	98	5.9	100	103	3.0	70 - 130	30
1,2,3-Trichlorobenzene	ND	118	109	7.9	105	113	7.3	70 - 130	30
1,2,3-Trichloropropane	ND	99	102	3.0	100	96	4.1	70 - 130	30
1,2,4-Trichlorobenzene	ND	121	113	6.8	105	110	4.7	70 - 130	30
1,2,4-Trimethylbenzene	ND	108	105	2.8	113	107	5.5	70 - 130	30
1,2-Dibromo-3-chloropropane	ND	102	109	6.6	106	101	4.8	70 - 130	30
1,2-Dibromoethane	ND	104	106	1.9	106	104	1.9	70 - 130	30
1,2-Dichlorobenzene	ND	109	105	3.7	104	109	4.7	70 - 130	30
1,2-Dichloroethane	ND	107	104	2.8	105	106	0.9	70 - 130	30
1,2-Dichloropropane	ND	101	100	1.0	100	102	2.0	70 - 130	30

QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
1,3,5-Trimethylbenzene	ND	104	101	2.9	105	105	0.0	70 - 130	30
1,3-Dichlorobenzene	ND	112	107	4.6	104	107	2.8	70 - 130	30
1,3-Dichloropropane	ND	99	102	3.0	106	101	4.8	70 - 130	30
1,4-Dichlorobenzene	ND	113	107	5.5	103	106	2.9	70 - 130	30
2,2-Dichloropropane	ND	109	106	2.8	104	107	2.8	70 - 130	30
2-Chlorotoluene	ND	107	102	4.8	100	101	1.0	70 - 130	30
2-Hexanone	ND	103	112	8.4	81	74	9.0	70 - 130	30
2-Isopropyltoluene	ND	103	97	6.0	101	106	4.8	70 - 130	30
4-Chlorotoluene	ND	107	102	4.8	102	103	1.0	70 - 130	30
4-Methyl-2-pentanone	ND	107	105	1.9	107	97	9.8	70 - 130	30
Acetone	ND	101	106	4.8	62	60	3.3	70 - 130	30
Acrylonitrile	ND	99	105	5.9	102	99	3.0	70 - 130	30
Benzene	ND	101	97	4.0	100	102	2.0	70 - 130	30
Bromobenzene	ND	105	105	0.0	105	106	0.9	70 - 130	30
Bromochloromethane	ND	102	101	1.0	102	101	1.0	70 - 130	30
Bromodichloromethane	ND	110	108	1.8	102	106	3.8	70 - 130	30
Bromoform	ND	107	115	7.2	101	100	1.0	70 - 130	30
Bromomethane	ND	100	97	3.0	97	103	6.0	70 - 130	30
Carbon Disulfide	ND	98	87	11.9	97	110	12.6	70 - 130	30
Carbon tetrachloride	ND	109	103	5.7	101	108	6.7	70 - 130	30
Chlorobenzene	ND	104	101	2.9	103	104	1.0	70 - 130	30
Chloroethane	ND	107	95	11.9	93	107	14.0	70 - 130	30
Chloroform	ND	104	103	1.0	99	103	4.0	70 - 130	30
Chloromethane	ND	96	87	9.8	92	101	9.3	70 - 130	30
cis-1,2-Dichloroethene	ND	102	103	1.0	103	101	2.0	70 - 130	30
cis-1,3-Dichloropropene	ND	105	103	1.9	104	105	1.0	70 - 130	30
Dibromochloromethane	ND	107	112	4.6	106	105	0.9	70 - 130	30
Dibromomethane	ND	108	105	2.8	102	105	2.9	70 - 130	30
Dichlorodifluoromethane	ND	96	87	9.8	96	100	4.1	70 - 130	30
Ethylbenzene	ND	102	98	4.0	102	104	1.9	70 - 130	30
Hexachlorobutadiene	ND	115	101	13.0	101	113	11.2	70 - 130	30
Isopropylbenzene	ND	102	100	2.0	102	103	1.0	70 - 130	30
m&p-Xylene	ND	103	98	5.0	102	104	1.9	70 - 130	30
Methyl ethyl ketone	ND	95	101	6.1	68	62	9.2	70 - 130	30
Methyl t-butyl ether (MTBE)	ND	104	93	11.2	100	109	8.6	70 - 130	30
Methylene chloride	ND	101	95	6.1	92	98	6.3	70 - 130	30
Naphthalene	ND	106	106	0.0	118	113	4.3	70 - 130	30
n-Butylbenzene	ND	114	107	6.3	103	108	4.7	70 - 130	30
n-Propylbenzene	ND	110	103	6.6	102	104	1.9	70 - 130	30
o-Xylene	ND	111	104	6.5	102	103	1.0	70 - 130	30
p-Isopropyltoluene	ND	110	103	6.6	102	106	3.8	70 - 130	30
sec-Butylbenzene	ND	103	98	5.0	100	104	3.9	70 - 130	30
Styrene	ND	109	101	7.6	100	104	3.9	70 - 130	30
tert-Butylbenzene	ND	104	99	4.9	102	106	3.8	70 - 130	30
Tetrachloroethene	ND	108	105	2.8	104	105	1.0	70 - 130	30
Tetrahydrofuran (THF)	ND	95	99	4.1	104	99	4.9	70 - 130	30
Toluene	ND	104	99	4.9	101	105	3.9	70 - 130	30
trans-1,2-Dichloroethene	ND	106	99	6.8	103	108	4.7	70 - 130	30
trans-1,3-Dichloropropene	ND	107	106	0.9	108	109	0.9	70 - 130	30
trans-1,4-dichloro-2-butene	ND	101	112	10.3	108	99	8.7	70 - 130	30
Trichloroethene	ND	109	102	6.6	101	105	3.9	70 - 130	30
Trichlorofluoromethane	ND	116	102	12.8	96	110	13.6	70 - 130	30
Trichlorotrifluoroethane	ND	108	98	9.7	103	110	6.6	70 - 130	30

m

m

QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
Vinyl chloride	ND	100	91	9.4	90	97	7.5	70 - 130	30
% 1,2-dichlorobenzene-d4	97	100	102	2.0	102	102	0.0	70 - 130	30
% Bromofluorobenzene	92	98	102	4.0	101	100	1.0	70 - 130	30
% Dibromofluoromethane	102	99	102	3.0	103	102	1.0	70 - 130	30
% Toluene-d8	95	101	99	2.0	100	100	0.0	70 - 130	30

Comment:

Additional 8260 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is 40-160%.

QA/QC Batch 221167, QC Sample No: BD29396 (BD28396 (50X) )

Volatiles - Solid

1,1,1,2-Tetrachloroethane	ND	119			95	93	2.1	70 - 130	30	
1,1,1-Trichloroethane	ND	113			98	97	1.0	70 - 130	30	
1,1,2,2-Tetrachloroethane	ND	100			95	91	4.3	70 - 130	30	
1,1,2-Trichloroethane	ND	104			90	89	1.1	70 - 130	30	
1,1-Dichloroethane	ND	103			91	89	2.2	70 - 130	30	
1,1-Dichloroethene	ND	100			92	86	6.7	70 - 130	30	
1,1-Dichloropropene	ND	101			92	84	9.1	70 - 130	30	
1,2,3-Trichlorobenzene	ND	92			62	70	12.1	70 - 130	30	m
1,2,3-Trichloropropane	ND	113			94	83	12.4	70 - 130	30	
1,2,4-Trichlorobenzene	ND	92			62	68	9.2	70 - 130	30	m
1,2,4-Trimethylbenzene	ND	107			90	82	9.3	70 - 130	30	
1,2-Dibromo-3-chloropropane	ND	113			88	92	4.4	70 - 130	30	
1,2-Dibromoethane	ND	104			86	88	2.3	70 - 130	30	
1,2-Dichlorobenzene	ND	103			79	76	3.9	70 - 130	30	
1,2-Dichloroethane	ND	99			86	87	1.2	70 - 130	30	
1,2-Dichloropropane	ND	103			91	88	3.4	70 - 130	30	
1,3,5-Trimethylbenzene	ND	105			92	81	12.7	70 - 130	30	
1,3-Dichlorobenzene	ND	104			80	74	7.8	70 - 130	30	
1,3-Dichloropropane	ND	102			88	86	2.3	70 - 130	30	
1,4-Dichlorobenzene	ND	103			76	73	4.0	70 - 130	30	
2,2-Dichloropropane	ND	130			84	91	8.0	70 - 130	30	
2-Chlorotoluene	ND	101			84	76	10.0	70 - 130	30	
2-Hexanone	ND	113			70	77	9.5	70 - 130	30	
2-Isopropyltoluene	ND	103			94	83	12.4	70 - 130	30	
4-Chlorotoluene	ND	101			84	76	10.0	70 - 130	30	
4-Methyl-2-pentanone	ND	101			84	91	8.0	70 - 130	30	
Acetone	ND	132			52	59	12.6	70 - 130	30	l,m
Acrylonitrile	ND	99			85	92	7.9	70 - 130	30	
Benzene	ND	102			91	87	4.5	70 - 130	30	
Bromobenzene	ND	106			87	80	8.4	70 - 130	30	
Bromochloromethane	ND	105			94	90	4.3	70 - 130	30	
Bromodichloromethane	ND	107			90	87	3.4	70 - 130	30	
Bromoform	ND	119			86	91	5.6	70 - 130	30	
Bromomethane	ND	104			92	87	5.6	70 - 130	30	
Carbon Disulfide	ND	90			86	79	8.5	70 - 130	30	
Carbon tetrachloride	ND	118			93	90	3.3	70 - 130	30	
Chlorobenzene	ND	104			86	81	6.0	70 - 130	30	
Chloroethane	ND	103			96	86	11.0	70 - 130	30	
Chloroform	ND	104			90	91	1.1	70 - 130	30	
Chloromethane	ND	95			89	89	0.0	70 - 130	30	
cis-1,2-Dichloroethene	ND	104			89	87	2.3	70 - 130	30	
cis-1,3-Dichloropropene	ND	110			85	87	2.3	70 - 130	30	
Dibromochloromethane	ND	117			90	90	0.0	70 - 130	30	

QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
Dibromomethane	ND	103			86	88	2.3	70 - 130	30
Dichlorodifluoromethane	ND	87			87	84	3.5	70 - 130	30
Ethylbenzene	ND	102			91	84	8.0	70 - 130	30
Hexachlorobutadiene	ND	89			84	78	7.4	70 - 130	30
Isopropylbenzene	ND	108			97	84	14.4	70 - 130	30
m&p-Xylene	ND	104			89	83	7.0	70 - 130	30
Methyl ethyl ketone	ND	116			71	80	11.9	70 - 130	30
Methyl t-butyl ether (MTBE)	ND	99			93	99	6.3	70 - 130	30
Methylene chloride	ND	96			83	80	3.7	70 - 130	30
Naphthalene	ND	92			63	81	25.0	70 - 130	30
n-Butylbenzene	ND	101			80	75	6.5	70 - 130	30
n-Propylbenzene	ND	108			91	81	11.6	70 - 130	30
o-Xylene	ND	105			89	85	4.6	70 - 130	30
p-Isopropyltoluene	ND	105			89	80	10.7	70 - 130	30
sec-Butylbenzene	ND	104			92	81	12.7	70 - 130	30
Styrene	ND	103			83	78	6.2	70 - 130	30
tert-Butylbenzene	ND	107			97	85	13.2	70 - 130	30
Tetrachloroethene	ND	101			92	83	10.3	70 - 130	30
Tetrahydrofuran (THF)	ND	95			83	93	11.4	70 - 130	30
Toluene	ND	102			89	85	4.6	70 - 130	30
trans-1,2-Dichloroethene	ND	104			90	81	10.5	70 - 130	30
trans-1,3-Dichloropropene	ND	120			81	88	8.3	70 - 130	30
trans-1,4-dichloro-2-butene	ND	134			76	83	8.8	70 - 130	30
Trichloroethene	ND	107			87	82	5.9	70 - 130	30
Trichlorofluoromethane	ND	102			93	89	4.4	70 - 130	30
Trichlorotrifluoroethane	ND	97			93	88	5.5	70 - 130	30
Vinyl chloride	ND	97			89	88	1.1	70 - 130	30
% 1,2-dichlorobenzene-d4	100	98			102	101	1.0	70 - 130	30
% Bromofluorobenzene	98	97			99	100	1.0	70 - 130	30
% Dibromofluoromethane	100	94			101	101	0.0	70 - 130	30
% Toluene-d8	101	100			99	99	0.0	70 - 130	30

Comment:

Additional 8260 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is 40-160%.

QA/QC Batch 221076, QC Sample No: BD29453 (BD28388, BD28389 (50X) , BD28390 (50X) , BD28395 (50X) )

Volatiles - Solid

1,1,1,2-Tetrachloroethane	ND	107			87	99	12.9	70 - 130	30
1,1,1-Trichloroethane	ND	105			95	96	1.0	70 - 130	30
1,1,2,2-Tetrachloroethane	ND	93			91	104	13.3	70 - 130	30
1,1,2-Trichloroethane	ND	106			90	95	5.4	70 - 130	30
1,1-Dichloroethane	ND	102			91	95	4.3	70 - 130	30
1,1-Dichloroethene	ND	103			96	90	6.5	70 - 130	30
1,1-Dichloropropene	ND	99			91	89	2.2	70 - 130	30
1,2,3-Trichlorobenzene	ND	104			56	66	16.4	70 - 130	30
1,2,3-Trichloropropane	ND	104			86	95	9.9	70 - 130	30
1,2,4-Trichlorobenzene	ND	96			62	71	13.5	70 - 130	30
1,2,4-Trimethylbenzene	ND	101			81	90	10.5	70 - 130	30
1,2-Dibromo-3-chloropropane	ND	109			85	96	12.2	70 - 130	30
1,2-Dibromoethane	ND	105			89	96	7.6	70 - 130	30
1,2-Dichlorobenzene	ND	105			78	87	10.9	70 - 130	30
1,2-Dichloroethane	ND	106			94	96	2.1	70 - 130	30
1,2-Dichloropropane	ND	103			92	94	2.2	70 - 130	30
1,3,5-Trimethylbenzene	ND	100			81	91	11.6	70 - 130	30

QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	LCS %	LCS D %	LCS RPD	MS %	MS D %	MS RPD	% Rec Limits	% RPD Limits
1,3-Dichlorobenzene	ND	101			79	87	9.6	70 - 130	30
1,3-Dichloropropane	ND	100			88	98	10.8	70 - 130	30
1,4-Dichlorobenzene	ND	100			78	86	9.8	70 - 130	30
2,2-Dichloropropane	ND	103			91	92	1.1	70 - 130	30
2-Chlorotoluene	ND	102			81	89	9.4	70 - 130	30
2-Hexanone	ND	97			48	56	15.4	70 - 130	30 m
2-Isopropyltoluene	ND	101			78	86	9.8	70 - 130	30
4-Chlorotoluene	ND	97			82	90	9.3	70 - 130	30
4-Methyl-2-pentanone	ND	100			85	89	4.6	70 - 130	30
Acetone	ND	92			<40	<40	NC	70 - 130	30 m
Acrylonitrile	ND	96			84	96	13.3	70 - 130	30
Benzene	ND	100			91	92	1.1	70 - 130	30
Bromobenzene	ND	103			86	95	9.9	70 - 130	30
Bromochloromethane	ND	101			90	94	4.3	70 - 130	30
Bromodichloromethane	ND	110			93	96	3.2	70 - 130	30
Bromoform	ND	110			80	95	17.1	70 - 130	30
Bromomethane	ND	100			94	90	4.3	70 - 130	30
Carbon Disulfide	ND	95			95	87	8.8	70 - 130	30
Carbon tetrachloride	ND	108			94	93	1.1	70 - 130	30
Chlorobenzene	ND	103			86	92	6.7	70 - 130	30
Chloroethane	ND	104			98	90	8.5	70 - 130	30
Chloroform	ND	104			93	96	3.2	70 - 130	30
Chloromethane	ND	94			88	87	1.1	70 - 130	30
cis-1,2-Dichloroethene	ND	105			94	95	1.1	70 - 130	30
cis-1,3-Dichloropropene	ND	103			88	93	5.5	70 - 130	30
Dibromochloromethane	ND	108			86	100	15.1	70 - 130	30
Dibromomethane	ND	108			91	94	3.2	70 - 130	30
Dichlorodifluoromethane	ND	85			87	83	4.7	70 - 130	30
Ethylbenzene	ND	98			87	91	4.5	70 - 130	30
Hexachlorobutadiene	ND	102			52	54	3.8	70 - 130	30 m
Isopropylbenzene	ND	102			85	93	9.0	70 - 130	30
m&p-Xylene	ND	99			86	89	3.4	70 - 130	30
Methyl ethyl ketone	ND	84			45	51	12.5	70 - 130	30 m
Methyl t-butyl ether (MTBE)	ND	106			98	93	5.2	70 - 130	30
Methylene chloride	ND	98			90	88	2.2	70 - 130	30
Naphthalene	ND	108			68	78	13.7	70 - 130	30 m
n-Butylbenzene	ND	98			73	78	6.6	70 - 130	30
n-Propylbenzene	ND	103			83	89	7.0	70 - 130	30
o-Xylene	ND	106			85	91	6.8	70 - 130	30
p-Isopropyltoluene	ND	102			77	83	7.5	70 - 130	30
sec-Butylbenzene	ND	100			77	83	7.5	70 - 130	30
Styrene	ND	103			84	90	6.9	70 - 130	30
tert-Butylbenzene	ND	103			82	90	9.3	70 - 130	30
Tetrachloroethene	ND	100			93	97	4.2	70 - 130	30
Tetrahydrofuran (THF)	ND	96			89	97	8.6	70 - 130	30
Toluene	ND	104			91	90	1.1	70 - 130	30
trans-1,2-Dichloroethene	ND	106			96	92	4.3	70 - 130	30
trans-1,3-Dichloropropene	ND	104			90	94	4.3	70 - 130	30
trans-1,4-dichloro-2-butene	ND	95			77	95	20.9	70 - 130	30
Trichloroethene	ND	111			90	87	3.4	70 - 130	30
Trichlorofluoromethane	ND	111			100	91	9.4	70 - 130	30
Trichlorotrifluoroethane	ND	99			98	91	7.4	70 - 130	30
Vinyl chloride	ND	98			93	87	6.7	70 - 130	30

QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
% 1,2-dichlorobenzene-d4	97	102			104	100	3.9	70 - 130	30
% Bromofluorobenzene	92	99			98	100	2.0	70 - 130	30
% Dibromofluoromethane	101	100			100	101	1.0	70 - 130	30
% Toluene-d8	94	101			100	98	2.0	70 - 130	30

Comment:

Additional 8260 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is 40-160%.

QA/QC Batch 221205, QC Sample No: BD30155 (BD28387, BD28391)

Volatiles - Solid

1,1,1,2-Tetrachloroethane	ND	108	115	6.3	98	94	4.2	70 - 130	30
1,1,1-Trichloroethane	ND	105	108	2.8	98	89	9.6	70 - 130	30
1,1,2,2-Tetrachloroethane	ND	96	97	1.0	91	85	6.8	70 - 130	30
1,1,2-Trichloroethane	ND	104	101	2.9	90	87	3.4	70 - 130	30
1,1-Dichloroethane	ND	101	98	3.0	89	85	4.6	70 - 130	30
1,1-Dichloroethene	ND	93	96	3.2	92	82	11.5	70 - 130	30
1,1-Dichloropropene	ND	93	97	4.2	94	85	10.1	70 - 130	30
1,2,3-Trichlorobenzene	ND	106	95	10.9	73	72	1.4	70 - 130	30
1,2,3-Trichloropropane	ND	96	106	9.9	93	81	13.8	70 - 130	30
1,2,4-Trichlorobenzene	ND	104	97	7.0	77	71	8.1	70 - 130	30
1,2,4-Trimethylbenzene	ND	99	103	4.0	87	75	14.8	70 - 130	30
1,2-Dibromo-3-chloropropane	ND	112	112	0.0	108	98	9.7	70 - 130	30
1,2-Dibromoethane	ND	105	101	3.9	92	93	1.1	70 - 130	30
1,2-Dichlorobenzene	ND	100	101	1.0	87	79	9.6	70 - 130	30
1,2-Dichloroethane	ND	98	95	3.1	88	86	2.3	70 - 130	30
1,2-Dichloropropane	ND	97	98	1.0	90	85	5.7	70 - 130	30
1,3,5-Trimethylbenzene	ND	94	100	6.2	88	76	14.6	70 - 130	30
1,3-Dichlorobenzene	ND	100	103	3.0	89	78	13.2	70 - 130	30
1,3-Dichloropropane	ND	98	98	0.0	89	85	4.6	70 - 130	30
1,4-Dichlorobenzene	ND	100	102	2.0	87	78	10.9	70 - 130	30
2,2-Dichloropropane	ND	133	141	5.8	104	105	1.0	70 - 130	30
2-Chlorotoluene	ND	93	98	5.2	89	79	11.9	70 - 130	30
2-Hexanone	ND	145	140	3.5	67	68	1.5	70 - 130	30
2-Isopropyltoluene	ND	93	98	5.2	88	75	16.0	70 - 130	30
4-Chlorotoluene	ND	93	98	5.2	89	79	11.9	70 - 130	30
4-Methyl-2-pentanone	ND	105	99	5.9	83	85	2.4	70 - 130	30
Acetone	ND	>150	>150	NC	47	47	0.0	70 - 130	30
Acrylonitrile	ND	100	94	6.2	80	83	3.7	70 - 130	30
Benzene	ND	95	97	2.1	91	84	8.0	70 - 130	30
Bromobenzene	ND	97	101	4.0	93	82	12.6	70 - 130	30
Bromochloromethane	ND	100	100	0.0	91	87	4.5	70 - 130	30
Bromodichloromethane	ND	102	103	1.0	90	87	3.4	70 - 130	30
Bromoform	ND	116	116	0.0	95	97	2.1	70 - 130	30
Bromomethane	ND	103	103	0.0	95	83	13.5	70 - 130	30
Carbon Disulfide	ND	87	90	3.4	91	80	12.9	70 - 130	30
Carbon tetrachloride	ND	106	115	8.1	96	91	5.3	70 - 130	30
Chlorobenzene	ND	98	101	3.0	91	83	9.2	70 - 130	30
Chloroethane	ND	95	101	6.1	93	83	11.4	70 - 130	30
Chloroform	ND	99	99	0.0	88	85	3.5	70 - 130	30
Chloromethane	ND	93	94	1.1	89	84	5.8	70 - 130	30
cis-1,2-Dichloroethene	ND	102	99	3.0	88	85	3.5	70 - 130	30
cis-1,3-Dichloropropene	ND	111	110	0.9	94	93	1.1	70 - 130	30
Dibromochloromethane	ND	109	111	1.8	95	91	4.3	70 - 130	30
Dibromomethane	ND	103	100	3.0	89	87	2.3	70 - 130	30



QA/QC Data

SDG I.D.: gbd28385

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
Dichlorodifluoromethane	ND	93	94	1.1	96	91	5.3	70 - 130	30
Ethylbenzene	ND	95	98	3.1	91	83	9.2	70 - 130	30
Hexachlorobutadiene	ND	94	90	4.3	74	63	16.1	70 - 130	30 m
Isopropylbenzene	ND	94	101	7.2	91	77	16.7	70 - 130	30
m&p-Xylene	ND	96	99	3.1	90	81	10.5	70 - 130	30
Methyl ethyl ketone	ND	>150	141	NC	68	74	8.5	70 - 130	30 l,m
Methyl t-butyl ether (MTBE)	ND	107	97	9.8	93	99	6.3	70 - 130	30
Methylene chloride	ND	92	93	1.1	84	77	8.7	70 - 130	30
Naphthalene	ND	115	91	23.3	71	82	14.4	70 - 130	30
n-Butylbenzene	ND	96	99	3.1	82	68	18.7	70 - 130	30 m
n-Propylbenzene	ND	96	103	7.0	90	76	16.9	70 - 130	30
o-Xylene	ND	99	102	3.0	91	82	10.4	70 - 130	30
p-Isopropyltoluene	ND	97	101	4.0	83	68	19.9	70 - 130	30 m
sec-Butylbenzene	ND	93	98	5.2	87	73	17.5	70 - 130	30
Styrene	ND	96	99	3.1	89	81	9.4	70 - 130	30
tert-Butylbenzene	ND	95	100	5.1	90	76	16.9	70 - 130	30
Tetrachloroethene	ND	95	99	4.1	95	82	14.7	70 - 130	30
Tetrahydrofuran (THF)	ND	97	91	6.4	79	85	7.3	70 - 130	30
Toluene	ND	96	98	2.1	90	84	6.9	70 - 130	30
trans-1,2-Dichloroethene	ND	95	100	5.1	92	80	14.0	70 - 130	30
trans-1,3-Dichloropropene	ND	125	122	2.4	100	104	3.9	70 - 130	30
trans-1,4-dichloro-2-butene	ND	140	141	0.7	97	103	6.0	70 - 130	30 l
Trichloroethene	ND	97	101	4.0	90	81	10.5	70 - 130	30
Trichlorofluoromethane	ND	99	100	1.0	93	85	9.0	70 - 130	30
Trichlorotrifluoroethane	ND	93	94	1.1	90	84	6.9	70 - 130	30
Vinyl chloride	ND	93	94	1.1	91	84	8.0	70 - 130	30
% 1,2-dichlorobenzene-d4	101	101	100	1.0	100	101	1.0	70 - 130	30
% Bromofluorobenzene	99	103	99	4.0	100	101	1.0	70 - 130	30
% Dibromofluoromethane	99	99	96	3.1	98	101	3.0	70 - 130	30
% Toluene-d8	101	101	100	1.0	99	99	0.0	70 - 130	30

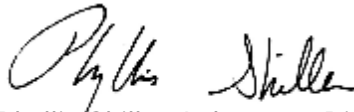
Comment:

Additional 8260 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is 40-160%.

l = This parameter is outside laboratory lcs/lcsd specified recovery limits.  
 m = This parameter is outside laboratory ms/msd specified recovery limits.  
 r = This parameter is outside laboratory rpd specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference

  
 Phyllis Shiller, Laboratory Director  
 February 19, 2013

# Sample Criteria Exceedences Report

Requested Criteria: GAM, GWP, RC, SWP

gbd28385 - GEI

State: CT

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
BD28389	\$8260MAR	Chloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	54	54	ug/Kg
BD28389	\$8260MAR	Vinyl chloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	40	40	ug/Kg
BD28389	\$8260MAR	Bromomethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	200	200	ug/Kg
BD28389	\$8260MAR	1,1-Dichloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	140	140	ug/Kg
BD28389	\$8260MAR	Methylene chloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	100	100	ug/Kg
BD28389	\$8260MAR	Acrylonitrile	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	10	10	ug/Kg
BD28389	\$8260MAR	Chloroform	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	120	120	ug/Kg
BD28389	\$8260MAR	Carbon tetrachloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	100	100	ug/Kg
BD28389	\$8260MAR	Benzene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	20	20	ug/Kg
BD28389	\$8260MAR	1,2-Dichloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	20	20	ug/Kg
BD28389	\$8260MAR	Trichloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	100	100	ug/Kg
BD28389	\$8260MAR	1,2-Dichloropropane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	100	100	ug/Kg
BD28389	\$8260MAR	Bromodichloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	11	11	ug/Kg
BD28389	\$8260MAR	1,1,2-Trichloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	100	100	ug/Kg
BD28389	\$8260MAR	1,2-Dibromoethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	10	10	ug/Kg
BD28389	\$8260MAR	1,2-Dibromoethane	CT / VOLATILE ORGANIC COMPOUND / RES DEC (mg/k	ND	290	7	7	ug/Kg
BD28389	\$8260MAR	Tetrachloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	100	100	ug/Kg
BD28389	\$8260MAR	Dibromochloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	170	10	10	ug/Kg
BD28389	\$8260MAR	1,1,1,2-Tetrachloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	20	20	ug/Kg
BD28389	\$8260MAR	Bromoform	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	290	80	80	ug/Kg
BD28389	\$8260MAR	1,1,1,2-Tetrachloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	170	10	10	ug/Kg
BD28389	\$8270-SMR	Phenanthrene	CT / SEMIVOLATILE ORGANIC COMP / GA/GAA PMC (m	5600	300	4000	4000	ug/Kg
BD28389	\$ETPH_SMR	Ext. Petroleum HC	CT / PESTICIDES, PCB's, TPH, a / GA/GAA PMC (mg/kg)	8400	120	500	500	mg/Kg
BD28389	\$ETPH_SMR	Ext. Petroleum HC	CT / PESTICIDES, PCB's, TPH, a / RES DEC (mg/kg)	8400	120	500	500	mg/Kg
BD28390	\$8260MAR	Chloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	54	54	ug/Kg
BD28390	\$8260MAR	Vinyl chloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	40	40	ug/Kg
BD28390	\$8260MAR	Bromomethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	200	200	ug/Kg
BD28390	\$8260MAR	1,1-Dichloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	140	140	ug/Kg
BD28390	\$8260MAR	Methylene chloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg
BD28390	\$8260MAR	Acrylonitrile	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	10	10	ug/Kg
BD28390	\$8260MAR	Chloroform	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	120	120	ug/Kg
BD28390	\$8260MAR	Carbon tetrachloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg
BD28390	\$8260MAR	Benzene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	20	20	ug/Kg
BD28390	\$8260MAR	1,2-Dichloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	20	20	ug/Kg
BD28390	\$8260MAR	Trichloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg
BD28390	\$8260MAR	1,2-Dichloropropane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg
BD28390	\$8260MAR	Bromodichloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	11	11	ug/Kg
BD28390	\$8260MAR	1,1,2-Trichloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg
BD28390	\$8260MAR	1,2-Dibromoethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	10	10	ug/Kg
BD28390	\$8260MAR	1,2-Dibromoethane	CT / VOLATILE ORGANIC COMPOUND / RES DEC (mg/k	ND	260	7	7	ug/Kg
BD28390	\$8260MAR	Tetrachloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg

# Sample Criteria Exceedences Report

Requested Criteria: GAM, GWP, RC, SWP

**gbd28385 - GEI**

State: CT

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
BD28390	\$8260MAR	Dibromochloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	160	10	10	ug/Kg
BD28390	\$8260MAR	1,1,1,2-Tetrachloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	20	20	ug/Kg
BD28390	\$8260MAR	Bromoform	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	80	80	ug/Kg
BD28390	\$8260MAR	1,1,2,2-Tetrachloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	160	10	10	ug/Kg
BD28390	\$ETPH_SMR	Ext. Petroleum HC	CT / PESTICIDES, PCB's, TPH, a / GA/GAA PMC (mg/kg)	1300	12	500	500	mg/Kg
BD28390	\$ETPH_SMR	Ext. Petroleum HC	CT / PESTICIDES, PCB's, TPH, a / RES DEC (mg/kg)	1300	12	500	500	mg/Kg
BD28395	\$8260MAR	Chloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	54	54	ug/Kg
BD28395	\$8260MAR	Vinyl chloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	40	40	ug/Kg
BD28395	\$8260MAR	Vinyl chloride	CT / VOLATILE ORGANIC COMPOUND / RES DEC (mg/k	ND	340	320	320	ug/Kg
BD28395	\$8260MAR	Bromomethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	200	200	ug/Kg
BD28395	\$8260MAR	1,1-Dichloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	140	140	ug/Kg
BD28395	\$8260MAR	Methylene chloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	100	100	ug/Kg
BD28395	\$8260MAR	Acrylonitrile	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	10	10	ug/Kg
BD28395	\$8260MAR	Chloroform	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	120	120	ug/Kg
BD28395	\$8260MAR	Carbon tetrachloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	100	100	ug/Kg
BD28395	\$8260MAR	Benzene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	20	20	ug/Kg
BD28395	\$8260MAR	1,2-Dichloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	20	20	ug/Kg
BD28395	\$8260MAR	Trichloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	100	100	ug/Kg
BD28395	\$8260MAR	1,2-Dichloropropane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	100	100	ug/Kg
BD28395	\$8260MAR	Bromodichloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	11	11	ug/Kg
BD28395	\$8260MAR	1,1,2-Trichloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	100	100	ug/Kg
BD28395	\$8260MAR	1,2-Dibromoethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	10	10	ug/Kg
BD28395	\$8260MAR	1,2-Dibromoethane	CT / VOLATILE ORGANIC COMPOUND / RES DEC (mg/k	ND	340	7	7	ug/Kg
BD28395	\$8260MAR	Tetrachloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	100	100	ug/Kg
BD28395	\$8260MAR	Dibromochloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	200	10	10	ug/Kg
BD28395	\$8260MAR	1,1,1,2-Tetrachloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	20	20	ug/Kg
BD28395	\$8260MAR	Bromoform	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	340	80	80	ug/Kg
BD28395	\$8260MAR	1,1,2,2-Tetrachloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	200	10	10	ug/Kg
BD28396	\$8260MAR	Chloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	54	54	ug/Kg
BD28396	\$8260MAR	Vinyl chloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	40	40	ug/Kg
BD28396	\$8260MAR	Bromomethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	200	200	ug/Kg
BD28396	\$8260MAR	1,1-Dichloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	140	140	ug/Kg
BD28396	\$8260MAR	Methylene chloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg
BD28396	\$8260MAR	Acrylonitrile	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	10	10	ug/Kg
BD28396	\$8260MAR	Chloroform	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	120	120	ug/Kg
BD28396	\$8260MAR	Carbon tetrachloride	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg
BD28396	\$8260MAR	Benzene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	20	20	ug/Kg
BD28396	\$8260MAR	1,2-Dichloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	20	20	ug/Kg
BD28396	\$8260MAR	Trichloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg
BD28396	\$8260MAR	1,2-Dichloropropane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg

## Sample Criteria Exceedences Report

### gbd28385 - GEI

Requested Criteria: GAM, GWP, RC, SWP

State: CT

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
BD28396	\$8260MAR	Bromodichloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	11	11	ug/Kg
BD28396	\$8260MAR	1,1,2-Trichloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg
BD28396	\$8260MAR	1,2-Dibromoethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	10	10	ug/Kg
BD28396	\$8260MAR	1,2-Dibromoethane	CT / VOLATILE ORGANIC COMPOUND / RES DEC (mg/k	ND	260	7	7	ug/Kg
BD28396	\$8260MAR	Tetrachloroethene	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	100	100	ug/Kg
BD28396	\$8260MAR	Dibromochloromethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	160	10	10	ug/Kg
BD28396	\$8260MAR	1,1,1,2-Tetrachloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	20	20	ug/Kg
BD28396	\$8260MAR	Bromoform	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	260	80	80	ug/Kg
BD28396	\$8260MAR	1,1,2,2-Tetrachloroethane	CT / VOLATILE ORGANIC COMPOUND / GA/GAA PMC (	ND	160	10	10	ug/Kg
BD28396	\$ETPH_SMR	Ext. Petroleum HC	CT / PESTICIDES, PCB's, TPH, a / GA/GAA PMC (mg/kg)	2000	61	500	500	mg/Kg
BD28396	\$ETPH_SMR	Ext. Petroleum HC	CT / PESTICIDES, PCB's, TPH, a / RES DEC (mg/kg)	2000	61	500	500	mg/Kg

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

# Reasonable Confidence Protocol Laboratory Analysis QA/QC Certification Form

**Laboratory Name:** Phoenix Environmental Labs, Inc. **Client:** GEI

**Project Location:** TOE DRAIN DESIGM **Project Number:**

**Laboratory Sample ID(s):** BD28385, BD28386, BD28387, BD28388, BD28389, BD28390, BD28391, BD28392, BD28393, BD28394, BD28395, BD28396

**Sampling Date(s):** 2/6/2013, 2/7/2013

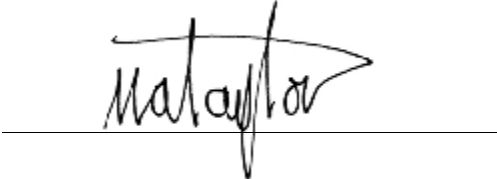
**RCP Methods Used:**

1311/1312     6010     7000     7196     7470/7471     8081     EPH     TO15  
 8082     8151     8260     8270     ETPH     9010/9012     VPH

1.	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1a.	Were the method specified preservation and holding time requirements met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1b.	EPH and VPH methods only: Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
2.	Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3.	Were samples received at an appropriate temperature (< 6 Degrees C)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
4.	Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? See Sections: SVOA Narration, VOA Narration.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5a.	Were reporting limits specified or referenced on the chain-of-custody?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5b.	Were these reporting limits met?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
6.	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
7.	Are project-specific matrix spikes and laboratory duplicates included in the data set?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA

**Note:** For all questions to which the response was "No" (with the exception of question #5a, #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence".

**I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.**

Authorized Signature: 
 Date: Tuesday, February 19, 2013  
 Printed Name: Maryam Taylor  
 Position: Project Manager



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# RCP Certification Report

February 19, 2013

SDG I.D.: gbd28385

The client requested a shorter list of elements than the 6010 RCP list.

Not all constituents met requested criteria due to the presence of target and non target compounds causing a necessary dilution.

## ETPH Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Au-fid1 02/12/13-1 (BD28389, BD28396)

Initial Calibration (FID1 - ETPH\_1) - The initial calibration curve was within method criteria and had a %RSD less than 30%.

The daily continuing calibration standard was within method criteria of +/- 30 %D.

As per section 7.2.3, a discrimination check standard was run and contained the following outliers: None

**Printed Name** Jeff Bucko  
**Position:** Chemist  
**Date:** 2/12/2013

**Instrument:** Au-x12 02/08/13-2 (BD28385, BD28386, BD28387, BD28388, BD28391, BD28392, BD28393, BD28394, BD28395)

Initial Calibration (FID1 - ETPH\_1) - The initial calibration curve was within method criteria and had a %RSD less than 30%.

The daily continuing calibration standard was within method criteria of +/- 30 %D.

As per section 7.2.3, a discrimination check standard was run and contained the following outliers:C36

**Printed Name** Jeff Bucko  
**Position:** Chemist  
**Date:** 2/8/2013

**Instrument:** Au-x12 02/08/13-3 (BD28390)

Initial Calibration (FID1 - ETPH\_1) - The initial calibration curve was within method criteria and had a %RSD less than 30%.

The daily continuing calibration standard was within method criteria of +/- 30 %D.

As per section 7.2.3, a discrimination check standard was run and contained the following outliers: none

**Printed Name** Jeff Bucko  
**Position:** Chemist  
**Date:** 2/8/2013



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# RCP Certification Report

February 19, 2013

SDG I.D.: gbd28385

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## QC (Batch Specific)

----- Sample No: BD28280, QA/QC Batch: 220629 -----

All LCS recoveries were within 60 - 120 with the following exceptions: None.

All LCSD recoveries were within 60 - 120 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

## Mercury Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Merlin 02/08/13-1 (BD28391, BD28392, BD28393, BD28394, BD28395, BD28396)

The method preparation blank contains all of the acids and reagents as the samples; the instrument blanks do not.

The initial calibration met all criteria including a standard run at or below the reporting level.

All calibration verification standards (ICV, CCV) met criteria.

All calibration blank verification standards (ICB, CCB) met criteria.

The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.

**Printed Name** Rick Schweitzer

**Position:** Chemist

**Date:** 2/8/2013

**Instrument:** Merlin 02/11/13-1 (BD28385, BD28386, BD28387, BD28388, BD28389, BD28390)

The method preparation blank contains all of the acids and reagents as the samples; the instrument blanks do not.

The initial calibration met all criteria including a standard run at or below the reporting level.

All calibration verification standards (ICV, CCV) met criteria.

All calibration blank verification standards (ICB, CCB) met criteria.

The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.

**Printed Name** Rick Schweitzer

**Position:** Chemist

**Date:** 2/11/2013



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# RCP Certification Report

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SDG I.D.: gbd28385

## QC (Batch Specific)

----- Sample No: BD28279, QA/QC Batch: 220853 -----

All LCS recoveries were within 70 - 130 with the following exceptions: None.

All LCSD recoveries were within 70 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

----- Sample No: BD28792, QA/QC Batch: 220791 -----

All LCS recoveries were within 70 - 130 with the following exceptions: None.

All LCSD recoveries were within 70 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

## ICP Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Arcos 02/07/13-1 (BD28385, BD28386, BD28387, BD28388, BD28389, BD28390, BD28391, BD28392, BD28393, BD28394, BD28395, BD28396)

The initial calibration met criteria.

The continuing calibration standards met criteria for all the elements reported. The linear range is defined daily by the calibration range.

The continuing calibration blanks were less than the reporting level for the elements reported.

The ICSA and ICSAB were analyzed at the beginning and end of the run and were within criteria.

**Printed Name** Laura Kinnin

**Position:** Chemist

**Date:** 2/7/2013

**Instrument:** Arcos 02/08/13-1 (BD28385, BD28386, BD28387, BD28388, BD28389, BD28390, BD28391, BD28392, BD28393, BD28394, BD28395, BD28396)

The initial calibration met criteria.

The continuing calibration standards met criteria for all the elements reported. The linear range is defined daily by the calibration range.

The continuing calibration blanks were less than the reporting level for the elements reported.

The ICSA and ICSAB were analyzed at the beginning and end of the run and were within criteria.

**Printed Name** Laura Kinnin

**Position:** Chemist

**Date:** 2/8/2013





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# RCP Certification Report

February 19, 2013

SDG I.D.: gbd28385

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## QC (Site Specific)

----- Sample No: BD28394, QA/QC Batch: 220733 -----

All LCS recoveries were within 75 - 125 with the following exceptions: None.

All LCSD recoveries were within 75 - 125 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

All MS recoveries were within 75 - 125 with the following exceptions: None.

All MSD recoveries were within 75 - 125 with the following exceptions: None.

All MS/MSD RPDs were less than 30% with the following exceptions: None.

A matrix effect is suspected when a MS/MSD recovery is outside of criteria. No further action is required if LCS/LCSD compounds are within criteria.

## QC (Batch Specific)

----- Sample No: BD28279, QA/QC Batch: 220732 -----

All LCS recoveries were within 75 - 125 with the following exceptions: None.

All LCSD recoveries were within 75 - 125 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

## PCB Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Au-ecd24 02/10/13-1 (BD28385, BD28386)

8082 Narration:

The initial calibration RSD for the compound list was less than 15% except for the following compounds: none

The continuing calibration standards were within acceptance criteria except for the following compounds: none

**Printed Name** Adam Werner

**Position:** Chemist

**Date:** 2/10/2013

**Instrument:** Au-ecd6 02/08/13-1 (BD28392, BD28393, BD28394, BD28395, BD28396)

8082 Narration:

The initial calibration RSD for the compound list was less than 15% except for the following compounds: none

The continuing calibration standards were within acceptance criteria except for the following compounds: none



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# RCP Certification Report

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SDG I.D.: gbd28385

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**Printed Name** Adam Werner  
**Position:** Chemist  
**Date:** 2/8/2013

**Instrument:** Au-ecd8 02/08/13-1 (BD28387, BD28388, BD28389, BD28390, BD28391)

8082 Narration:

The initial calibration RSD for the compound list was less than 15% except for the following compounds: none

The continuing calibration standards were within acceptance criteria except for the following compounds: none

**Printed Name** Adam Werner  
**Position:** Chemist  
**Date:** 2/8/2013

## QC (Batch Specific)

----- Sample No: BD28295, QA/QC Batch: 220635 -----

All LCS recoveries were within 40 - 140 with the following exceptions: None.

All LCSD recoveries were within 40 - 140 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

## SVOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

**QC Batch 220727 (Samples: BD28385, BD28386, BD28387, BD28388, BD28389, BD28390, BD28391, BD28392, BD28393, BD28394, BD28395, BD28396): -----**

**One or more analytes is below the criteria. A low bias for these analytes is likely. (2,4-Dinitrophenol, Benzidine)**

**The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (2,4-Dinitrophenol, 4-Chloroaniline, Benzidine)**

**The MS and/or the MSD recovery is above the upper range for one or more analytes that were not reported in the sample(s), therefore no significant bias is suspected. (Carbazole)**

**The QC recovery for one or more analytes is above the upper range but were not reported in the sample(s), therefore no significant bias is suspected. (2-Nitroaniline)**

**Instrument:** Chem06 02/07/13-2 (BD28385, BD28386, BD28387, BD28388, BD28389, BD28390, BD28391, BD28392, BD28393, BD28394, BD28395, BD28396)

The DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.



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# RCP Certification Report

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SDG I.D.: gbd28385

## Initial Calibration (Chem06/SV\_0125)

Greater than 90% of the target compounds met calibration criteria with a RSD <20% or >0.99 correlation coefficient. The following compounds had RSDs >20% and <0.99 correlation coefficient: Benzaldehyde, Atrazine

The following compounds failed to meet the minimum required response factor: 2-nitrophenol, Hexachlorobenzene

## Continuing Calibration:

Greater than 80% of target compounds met continuing calibration criteria with a %D <20. The following compounds had >20% difference from the initial calibration: Benzaldehyde, Benzyl Alcohol, Hexachlorocyclopentadiene, 1,2,4,5-Tetrachlorobenzene, Atrazine, 3,3'-dichlorobenzidine

**Printed Name** Damien Drobinski  
**Position:** Chemist  
**Date:** 2/7/2013

## QC (Site Specific)

----- Sample No: BD28387, QA/QC Batch: 220727 -----

All LCS recoveries were within 30 - 130 with the following exceptions: 2-Nitroaniline(>150%)

All LCSD recoveries were within 30 - 130 with the following exceptions: 2-Nitroaniline(>150%), Benzidine(27%)

All LCS/LCSD RPDs were less than 30% with the following exceptions: 2,4-Dinitrophenol(37.5%), 4-Chloroaniline(30.7%), Benzidine(50.0%)

All MS recoveries were within 30 - 130 with the following exceptions: 2,4-Dinitrophenol(<5%), 2-Nitroaniline(>150%), Benzidine(7.8%)

All MSD recoveries were within 30 - 130 with the following exceptions: 2,4-Dinitrophenol(13%), 2-Nitroaniline(>150%), Benzidine(<5%), Carbazole(134%)

All MS/MSD RPDs were less than 30% with the following exceptions: None.

A matrix effect is suspected when a MS/MSD recovery is outside of criteria. No further action is required if LCS/LCSD compounds are within criteria.

## VOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

**QC Batch 221205 (Samples: BD28387, BD28391): -----**

**The LCS and/or the LCSD recovery is above the upper range for one or more analytes that were not reported in the sample(s), therefore no significant bias is suspected. (2,2-Dichloropropane, trans-1,4-dichloro-2-butene)**

**QC Batch 221459 (Samples: BD28392, BD28393, BD28394): -----**

**The LCS/LCSD recovery is acceptable. One or more analytes in the site specific matrix spike recovery is below the lower range, therefore a slight low bias is possible. (Acetone, Methyl ethyl ketone)**

**Instrument:** Chem03 02/07/13-2 (BD28385, BD28386)

Initial Calibration Verification (RCPE\_0207):



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# RCP Certification Report

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SDG I.D.: gbd28385

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>90% of target compounds met method criteria.

The following compounds had %RSDs >20%: Acetone, 2,2-dichloropropane, Carbon Tetrachloride, Cis-1,3-dichloropropene, Trans-1,3-dichloropropene, Dibromochloromethane, 1,1,1,2-tetrachloroethane, Bromoform, Trans-1,4-dichloro-2-butene, 1,2-dibromo-3-chloropropane, Naphthalene

Continuing Calibration Verification:

>80% of target compounds met method criteria. Internal standards were within the 50%-200% deviation from the initial calibration.

The following compounds had % Deviations >20%: Chloromethane, Acetone, 2,2-Dichloropropane, Methyl Ethyl Ketone, Carbon Tetrachloride, trans-1,3-Dichloropropene, 1,2-Dibromo-3-Chloropropane

**Printed Name** Johanna Harrington  
**Position:** Chemist  
**Date:** 2/7/2013

**Instrument:** Chem03 02/12/13-3 (BD28396)

Initial Calibration Verification (RCPS\_0211):

>90% of target compounds met method criteria.

The following compounds had %RSDs >20%: Acetone, 2,2-dichloropropane, Cis-1,3-dichloropropene, Trans-1,3-dichloropropene, Bromoform, Trans-1,4-dichloro-2-butene, Naphthalene

Continuing Calibration Verification:

>80% of target compounds met method criteria. Internal standards were within the 50%-200% deviation from the initial calibration.

The following compounds had % Deviations >20%: Tetrahydrofuran (THF)

**Printed Name** Johanna Harrington  
**Position:** Chemist  
**Date:** 2/12/2013

**Instrument:** Chem03 02/13/13-1 (BD28387, BD28391)

Initial Calibration Verification (RCPE\_0207):

>90% of target compounds met method criteria.

The following compounds had %RSDs >20%: Acetone, Carbon Tetrachloride, Trans-1,3-dichloropropene, Dibromochloromethane, 1,1,1,2-tetrachloroethane, Bromoform, Trans-1,4-dichloro-2-butene, 1,2-dibromo-3-chloropropane, Naphthalene

Continuing Calibration Verification:

>80% of target compounds met method criteria. Internal standards were within the 50%-200% deviation from the initial calibration.

The following compounds had % Deviations >20%: 2,2-Dichloropropane, Tetrahydrofuran (THF), trans-1,3-Dichloropropene, trans-1,4-Dichloro-2-butene

**Printed Name** Johanna Harrington  
**Position:** Chemist  
**Date:** 2/13/2013

**Instrument:** Chem18 02/12/13-1 (BD28392, BD28393, BD28394)

Initial Calibration Verification (CHEM18/RCPS\_0207):

>90% of target compounds met criteria.



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# RCP Certification Report

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SDG I.D.: gbd28385

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The following compounds had %RSDs >20%: Acrolein and Acetone.

Continuing Calibration Verification:

>80% of target compounds met criteria. Internal standards were within the 50%-200% deviation from the initial calibration.

The following compounds had % Deviations >20%: Dichlorodifluoromethane, Acrolein, Acetone, Tetrahydrofuran (THF), Methyl Ethyl Ketone, 2-Hexanone

**Printed Name** Johanna Harrington  
**Position:** Chemist  
**Date:** 2/12/2013

**Instrument:** Chem18 02/12/13-2 (BD28388, BD28389, BD28390, BD28395)

Initial Calibration Verification (CHEM18/RCPS\_0207):

>90% of target compounds met criteria.

The following compounds had %RSDs >20%: Acrolein and Acetone.

Continuing Calibration Verification:

>80% of target compounds met criteria. Internal standards were within the 50%-200% deviation from the initial calibration.

The following compounds had % Deviations >20%: Acrolein, Acetone, Tetrahydrofuran (THF), Methyl Ethyl Ketone, 2-Hexanone

**Printed Name** Johanna Harrington  
**Position:** Chemist  
**Date:** 2/12/2013



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# RCP Certification Report

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SDG I.D.: gbd28385

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## QC (Site Specific)

----- Sample No: BD28392, QA/QC Batch: 221459 -----

All LCS recoveries were within 70 - 130 with the following exceptions: None.

All LCSD recoveries were within 70 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

All MS recoveries were within 70 - 130 with the following exceptions: Acetone(62%), Methyl ethyl ketone(68%)

All MSD recoveries were within 70 - 130 with the following exceptions: Acetone(60%), Methyl ethyl ketone(62%)

All MS/MSD RPDs were less than 30% with the following exceptions: None.

A matrix effect is suspected when a MS/MSD recovery is outside of criteria. No further action is required if LCS/LCSD compounds are within criteria.

## QC (Batch Specific)

----- Sample No: BD28159, QA/QC Batch: 220983 -----

All LCS recoveries were within 70 - 130 with the following exceptions: 1,2-Dibromo-3-chloropropane(137%)

----- Sample No: BD29396, QA/QC Batch: 221167 -----

All LCS recoveries were within 70 - 130 with the following exceptions: Acetone(132%), trans-1,4-dichloro-2-butene(134%)

----- Sample No: BD29453, QA/QC Batch: 221076 -----

All LCS recoveries were within 70 - 130 with the following exceptions: None.

----- Sample No: BD30155, QA/QC Batch: 221205 -----

All LCS recoveries were within 70 - 130 with the following exceptions: 2,2-Dichloropropane(133%), 2-Hexanone(145%), Acetone(>150%), Methyl ethyl ketone(>150%), trans-1,4-dichloro-2-butene(140%)

All LCSD recoveries were within 70 - 130 with the following exceptions: 2,2-Dichloropropane(141%), 2-Hexanone(140%), Acetone(>150%), Methyl ethyl ketone(141%), trans-1,4-dichloro-2-butene(141%)

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

## Temperature Narration

The samples were received at 2C with cooling initiated.  
(Note acceptance criteria is above freezing up to 6°C)



**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



# RCP Certification Report

February 19, 2013

SDG I.D.: gbd28385



### CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, Manchester, CT 06040  
 Email: info@phoenixlabs.com Fax (860) 645-0823  
**Client Services (860) 645-8726**

Cooler: Yes  No   
 Coolant: IPK  ICE  N

Temp 2 °C Pg of

**Data Delivery:**

Fax #: \_\_\_\_\_  
 Email: \_\_\_\_\_

Customer: GEI Consultants Inc  
 Address: 455 Windy Brook Drive  
Glastonbury CT 06033

Project: Toe Drain Design  
 Report to: Barry Giroux  
 Invoice to: \_\_\_\_\_

Project P.O.: \_\_\_\_\_  
 Phone #: 860-368-5300  
 Fax #: 860-368-5307

**Client Sample - Information - Identification**

Sampler's Signature: Ronald May Jr Date: 2-7-13

Analysis Request

**Matrix Code:**

DW=Drinking Water GW=Ground Water SW=Surface Water WW=Waste Water  
 SE=Sediment SL=Sludge S=Soil/Solid W=Wipe O=Other

VOC's 8260	SVOC's 8270	PCB's 8270	ETPH 8082	Total	TCLP	RCRA-8 metals	P.H	Flashpoint	Reactivity	Conductivity	Soil VOA Vials	GL Soil container (Methanol)   H <sub>2</sub> O	GL Soil container ( ) oz	40 ml VOA Vial	GL Amber 1000ml   As is   HCl	PL As is   1250ml   500ml   1000ml	PL H <sub>2</sub> SO <sub>4</sub>   1250ml   500ml	PL HNO <sub>3</sub> 250ml	PL NaOH 250ml	Backha Bottle		
←	←	←	←	←	←	←	←	←	←	←	1	2	2	1	2	2	1	2	2	1	2	2
←	←	←	←	←	←	←	←	←	←	←	1	2	2	1	2	2	1	2	2	1	2	2
←	←	←	←	←	←	←	←	←	←	←	1	2	2	1	2	2	1	2	2	1	2	2
←	←	←	←	←	←	←	←	←	←	←	1	2	2	1	2	2	1	2	2	1	2	2
←	←	←	←	←	←	←	←	←	←	←	1	2	2	1	2	2	1	2	2	1	2	2
←	←	←	←	←	←	←	←	←	←	←	1	2	2	1	2	2	1	2	2	1	2	2
←	←	←	←	←	←	←	←	←	←	←	1	2	2	1	2	2	1	2	2	1	2	2
←	←	←	←	←	←	←	←	←	←	←	1	2	2	1	2	2	1	2	2	1	2	2
←	←	←	←	←	←	←	←	←	←	←	1	2	2	1	2	2	1	2	2	1	2	2

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled
28385	GP-10 (5-6)	S	2-6	8:25
28386	GP-9 (7-8)	S	2-6	9:00
28387	GP-8 (9-10)	S	2-6	9:30
28388	GP-7 (9-10)	S	2-6	10:00
28389	GP-6 (9-10)	S	2-6	10:30
28390	GP-5 (9-10)	S	2-6	11:55
28391	GP-4 (9-10)	S	2-6	11:25
28392	GP-3 (6-8)	S	2-7	8:30
28393	GP-1 (6-8)	S	2-7	9:00
28394	GP-2 (6-8)	S	2-7	9:40
28395	GP-11 (13-15)	S	2-6	14:00
28396	GP-12 (13-15)	S	2-6	15:00

Relinquished by: Ronald May Jr Accepted by: Theresa R  
 Date: 2/7/13 Time: 13:27

**RI**  
 Direct Exposure (Residential)  
 GW  
 Other

**CT**  
 RCP Cert  
 GW Protection  
 SW Protection  
 GA Mobility  
 GB Mobility  
 Residential DEC  
 I/C DEC  
 Other

**MA**  
 MCP Certification  
 GW-1  
 GW-2  
 GW-3  
 S-1  
 S-2  
 S-3  
 MWRA eSMART  
 Other

**Data Format**  
 Excel  
 PDF  
 GIS/Key  
 EQUIS  
 Other

**Data Package**  
 Tier II Checklist  
 Full Data Package\*  
 Phoenix Std Report  
 Other

Comments, Special Requirements or Regulations:  
Note: Prepare extract for TCLP  
RCRA-8. Hold extract

**Turnaround:**  
 1 Day\*  
 2 Days\*  
 3 Days\*  
 Standard  
 Other  
 \* SURCHARGE APPLIES

State where samples were collected: CT

\* SURCHARGE APPLIES





Tuesday, February 26, 2013

Attn: Mr Barry Giroux  
GEI Consultants  
455 Winding Brook Drive  
Suite 201  
Glastonbury, CT 06033

Project ID: TOE DRAIN DESIGN  
Sample ID#s: BD39025 - BD39026

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style.

Phyllis Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #MA-CT-007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
VT Lab Registration #VT11301



**Environmental Laboratories, Inc.**

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 26, 2013

FOR: Attn: Mr Barry Giroux  
GEI Consultants  
455 Winding Brook Drive  
Suite 201  
Glastonbury, CT 06033

### Sample Information

Matrix: SOIL  
Location Code: GEI  
Rush Request: 48 Hour  
P.O.#:

### Custody Information

Collected by:  
Received by: SW  
Analyzed by: see "By" below

### Date      Time

02/22/13      10:00  
02/22/13      14:29

## Laboratory Data

SDG ID: GBD39025  
Phoenix ID: BD39025

Project ID: TOE DRAIN DESIGN  
Client ID: GP-11A (2-4 FT)

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Percent Solid	88		%	02/23/13	JL	E160.3
Soil Extraction SVOA BN	Completed			02/22/13	BJ/V	SW3545
Extraction of CT ETPH	Completed			02/22/13	JJ/V	3545

### TPH by GC (Extractable Products)

Ext. Petroleum HC	22	11	mg/Kg	02/24/13	JRB	CT ETPH/8015
Identification	**		mg/Kg	02/24/13	JRB	CT ETPH/8015

### QA/QC Surrogates

% n-Pentacosane	98		%	02/24/13	JRB	50 - 150 %
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### Polynuclear Aromatic HC

2-Methylnaphthalene	ND	260	ug/Kg	02/23/13	DD	SW 8270
Acenaphthene	ND	260	ug/Kg	02/23/13	DD	SW 8270
Acenaphthylene	ND	260	ug/Kg	02/23/13	DD	SW 8270
Anthracene	ND	260	ug/Kg	02/23/13	DD	SW 8270
Benz(a)anthracene	410	260	ug/Kg	02/23/13	DD	SW 8270
Benzo(a)pyrene	510	260	ug/Kg	02/23/13	DD	SW 8270
Benzo(b)fluoranthene	580	260	ug/Kg	02/23/13	DD	SW 8270
Benzo(ghi)perylene	270	260	ug/Kg	02/23/13	DD	SW 8270
Benzo(k)fluoranthene	270	260	ug/Kg	02/23/13	DD	SW 8270
Chrysene	500	260	ug/Kg	02/23/13	DD	SW 8270
Dibenz(a,h)anthracene	ND	260	ug/Kg	02/23/13	DD	SW 8270
Fluoranthene	440	260	ug/Kg	02/23/13	DD	SW 8270
Fluorene	ND	260	ug/Kg	02/23/13	DD	SW 8270
Indeno(1,2,3-cd)pyrene	ND	260	ug/Kg	02/23/13	DD	SW 8270
Naphthalene	ND	260	ug/Kg	02/23/13	DD	SW 8270
Phenanthrene	ND	260	ug/Kg	02/23/13	DD	SW 8270
Pyrene	510	260	ug/Kg	02/23/13	DD	SW 8270

### QA/QC Surrogates

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
% 2-Fluorobiphenyl	87		%	02/23/13	DD	30 - 130 %
% Nitrobenzene-d5	76		%	02/23/13	DD	30 - 130 %
% Terphenyl-d14	80		%	02/23/13	DD	30 - 130 %

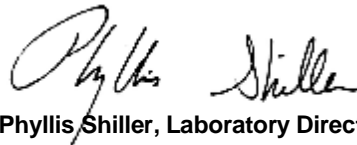
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

\*\*Petroleum hydrocarbon chromatogram contains a multicomponent hydrocarbon distribution in the range of C14 to C36. The sample was quantitated against a C9-C36 alkane hydrocarbon standard.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.  
This report must not be reproduced except in full as defined by the attached chain of custody.



**Phyllis Shiller, Laboratory Director**

**February 26, 2013**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

February 26, 2013

FOR: Attn: Mr Barry Giroux
GEI Consultants
455 Winding Brook Drive
Suite 201
Glastonbury, CT 06033

Sample Information

Matrix: SOIL
Location Code: GEI
Rush Request: 48 Hour
P.O.#:

Custody Information

Collected by:
Received by: SW
Analyzed by: see "By" below

Date Time

02/22/13 11:00
02/22/13 14:29

Laboratory Data

SDG ID: GBD39025
Phoenix ID: BD39026

Project ID: TOE DRAIN DESIGN
Client ID: GP-12A (2-4 FT)

Table with 7 columns: Parameter, Result, RL/PQL, Units, Date/Time, By, Reference. Rows include Percent Solid, Soil Extraction SVOA BN, and Extraction of CT ETPH.

TPH by GC (Extractable Products)

Table with 7 columns: Parameter, Result, RL/PQL, Units, Date/Time, By, Reference. Rows include Ext. Petroleum HC and Identification.

QA/QC Surrogates

Table with 7 columns: Parameter, Result, RL/PQL, Units, Date/Time, By, Reference. Row includes % n-Pentacosane.

Polynuclear Aromatic HC

Table with 7 columns: Parameter, Result, RL/PQL, Units, Date/Time, By, Reference. Lists various polynuclear aromatic hydrocarbons like 2-Methylnaphthalene, Acenaphthene, etc.

QA/QC Surrogates

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
% 2-Fluorobiphenyl	87		%	02/23/13	DD	30 - 130 %
% Nitrobenzene-d5	77		%	02/23/13	DD	30 - 130 %
% Terphenyl-d14	78		%	02/23/13	DD	30 - 130 %

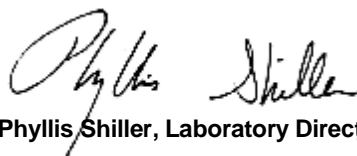
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.



**Phyllis Shiller, Laboratory Director**

**February 26, 2013**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

February 26, 2013

QA/QC Data

SDG I.D.: GBD39025

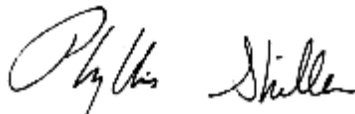
Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 221790, QC Sample No: BD38572 (BD39025, BD39026)									
<u>TPH by GC (Extractable Products) - Soil</u>									
Ext. Petroleum HC	ND	72	66	8.7				60 - 120	30
% n-Pentacosane	73	75	68	9.8				50 - 150	30
QA/QC Batch 221786, QC Sample No: BD38734 (BD39025, BD39026)									
<u>Polynuclear Aromatic HC - Soil</u>									
2-Methylnaphthalene	ND	59	60	1.7	79	83	4.9	30 - 130	30
Acenaphthene	ND	57	57	0.0	81	83	2.4	30 - 130	30
Acenaphthylene	ND	64	64	0.0	90	93	3.3	30 - 130	30
Anthracene	ND	61	60	1.7	86	90	4.5	30 - 130	30
Benz(a)anthracene	ND	65	63	3.1	90	91	1.1	30 - 130	30
Benzo(a)pyrene	ND	57	56	1.8	82	83	1.2	30 - 130	30
Benzo(b)fluoranthene	ND	63	61	3.2	93	92	1.1	30 - 130	30
Benzo(ghi)perylene	ND	72	70	2.8	104	104	0.0	30 - 130	30
Benzo(k)fluoranthene	ND	63	60	4.9	81	89	9.4	30 - 130	30
Chrysene	ND	64	63	1.6	89	94	5.5	30 - 130	30
Dibenz(a,h)anthracene	ND	66	64	3.1	94	95	1.1	30 - 130	30
Fluoranthene	ND	64	63	1.6	86	91	5.6	30 - 130	30
Fluorene	ND	60	60	0.0	84	88	4.7	30 - 130	30
Indeno(1,2,3-cd)pyrene	ND	69	67	2.9	101	100	1.0	30 - 130	30
Naphthalene	ND	57	58	1.7	74	77	4.0	30 - 130	30
Phenanthrene	ND	63	61	3.2	87	91	4.5	30 - 130	30
Pyrene	ND	63	63	0.0	85	89	4.6	30 - 130	30
% 2-Fluorobiphenyl	72	61	60	1.7	84	85	1.2	30 - 130	30
% Nitrobenzene-d5	68	53	52	1.9	71	72	1.4	30 - 130	30
% Terphenyl-d14	72	66	65	1.5	89	91	2.2	30 - 130	30

Comment:

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference

  
 Phyllis Shiller, Laboratory Director  
 February 26, 2013

# Sample Criteria Exceedences Report

GBD39025 - GEI

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
--------	-------	-----------------	----------	--------	----	----------	----------------	-------------------

\*\*\* No Data to Display \*\*\*

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

## Reasonable Confidence Protocol Laboratory Analysis QA/QC Certification Form

**Laboratory Name:** Phoenix Environmental Labs, Inc. **Client:** GEI

**Project Location:** TOE DRAIN DESIGN **Project Number:**

**Laboratory Sample ID(s):** BD39025, BD39026

**Sampling Date(s):** 2/22/2013

**RCP Methods Used:**

1311/1312     6010     7000     7196     7470/7471     8081     EPH     TO15  
 8082     8151     8260     8270     ETPH     9010/9012     VPH

1.	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1a.	Were the method specified preservation and holding time requirements met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1b.	EPH and VPH methods only: Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
2.	Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3.	Were samples received at an appropriate temperature (< 6 Degrees C)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
4.	Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5a.	Were reporting limits specified or referenced on the chain-of-custody?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5b.	Were these reporting limits met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
6.	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
7.	Are project-specific matrix spikes and laboratory duplicates included in the data set?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA

**Note:** For all questions to which the response was "No" (with the exception of question #5a, #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence".

**I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.**

Authorized  
Signature: \_\_\_\_\_

*R. Makol*

Date: Tuesday, February 26, 2013

Printed Name: Rashmi Makol

Position: Project Manager

Nov 2007





**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



# RCP Certification Report

February 26, 2013

SDG I.D.: GBD39025

The client requested a short list for 8270 RCP Semivolatile.

## ETPH Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Au-fid84 02/24/13-1 (BD39025, BD39026)

Initial Calibration (FID84 - ETPH\_13) - The initial calibration curve was within method criteria and had a %RSD less than 30%.

The daily continuing calibration standard was within method criteria of +/- 30 %D.

As per section 7.2.3, a discrimination check standard was run and contained the following outliers: none

**Printed Name** Jeff Bucko  
**Position:** Chemist  
**Date:** 2/24/2013

## QC (Batch Specific)

----- Sample No: BD38572, QA/QC Batch: 221790 -----

All LCS recoveries were within 60 - 120 with the following exceptions: None.

All LCSD recoveries were within 60 - 120 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

## PAH Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Chem12 02/22/13-1 (BD39025, BD39026)

The DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.

Initial Calibration (Chem12/BN\_0207)  
Greater than 90% of the target compounds met calibration criteria: None

The following compounds failed to meet the minimum required response factor: None

Continuing Calibration:  
Greater than 80% of target compounds met continuing calibration criteria with a %D <20. The following compounds had >20% difference from the initial calibration: None.



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# RCP Certification Report

February 26, 2013

SDG I.D.: GBD39025

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**Printed Name** Damien Drobinski  
**Position:** Chemist  
**Date:** 2/22/2013

## QC (Batch Specific)

----- Sample No: BD38734, QA/QC Batch: 221786 -----

All LCS recoveries were within 30 - 130 with the following exceptions: None.

All LCSD recoveries were within 30 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

## Temperature Narration

The samples in this delivery group were received at 1°C.  
(Note acceptance criteria is above freezing up to 6°C)





Tuesday, February 19, 2013

Attn: Mr. Barry Giroux  
GEI Consultants  
455 Winding Brook Drive  
Suite 201  
Glastonbury, CT 06033

Project ID: TOE DRAIN DESIGN  
Sample ID#s: BD29937 - BD29938

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Phyllis Shiller".

Phyllis Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #MA-CT-007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
VT Lab Registration #VT11301



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

February 19, 2013

FOR: Attn: Mr. Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

### Sample Information

Matrix: GROUND WATER  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

### Custody Information

Collected by: RM  
 Received by: LB  
 Analyzed by: see "By" below

Date: 02/12/13  
 Time: 13:15  
 02/12/13 16:39

## Laboratory Data

SDG ID: GBD29937  
 Phoenix ID: BD29937

Project ID: TOE DRAIN DESIGN  
 Client ID: GP-11-MW

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Silver	< 0.001	0.001	mg/L	02/13/13	EK	SW6010
Arsenic	0.006	0.004	mg/L	02/13/13	LK	SW6010
Barium	0.189	0.002	mg/L	02/13/13	EK	SW6010
Cadmium	< 0.001	0.001	mg/L	02/13/13	EK	SW6010
Chromium	< 0.001	0.001	mg/L	02/13/13	EK	SW6010
Mercury	< 0.0002	0.0002	mg/L	02/13/13	RS	SW7470
Lead	< 0.002	0.002	mg/L	02/13/13	EK	SW6010
Selenium	< 0.010	0.010	mg/L	02/13/13	EK	SW6010
Extraction of CT ETPH	Completed			02/12/13	I/d	3510/3520
Mercury Digestion	Completed			02/13/13	X/X	SW7470
Semi-Volatile Extraction	Completed			02/12/13	I/X	SW3520
Total Metals Digestion	Completed			02/12/13	AG	

### TPH by GC (Extractable Products)

Ext. Petroleum HC	0.28	0.070	mg/L	02/13/13	JRB	CTETPH/8015D
Identification	**		mg/L	02/13/13	JRB	CTETPH/8015D

### QA/QC Surrogates

% n-Pentacosane	86		%	02/13/13	JRB	50 - 150 %
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### Volatiles

1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,1,1-Trichloroethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	02/13/13	R/P	SW8260
1,1,2-Trichloroethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,1-Dichloroethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,1-Dichloroethene	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,1-Dichloropropene	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,2,3-Trichlorobenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,2,3-Trichloropropane	ND	1.0	ug/L	02/13/13	R/P	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
1,2,4-Trichlorobenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,2,4-Trimethylbenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,2-Dibromo-3-chloropropane	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,2-Dibromoethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,2-Dichlorobenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,2-Dichloroethane	ND	0.6	ug/L	02/13/13	R/P	SW8260
1,2-Dichloropropane	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,3,5-Trimethylbenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,3-Dichlorobenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,3-Dichloropropane	ND	1.0	ug/L	02/13/13	R/P	SW8260
1,4-Dichlorobenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
2,2-Dichloropropane	ND	1.0	ug/L	02/13/13	R/P	SW8260
2-Chlorotoluene	ND	1.0	ug/L	02/13/13	R/P	SW8260
2-Hexanone	ND	5	ug/L	02/13/13	R/P	SW8260
2-Isopropyltoluene	ND	1	ug/L	02/13/13	R/P	SW8260
4-Chlorotoluene	ND	1.0	ug/L	02/13/13	R/P	SW8260
4-Methyl-2-pentanone	ND	5	ug/L	02/13/13	R/P	SW8260
Acetone	ND	25	ug/L	02/13/13	R/P	SW8260
Acrylonitrile	ND	5	ug/L	02/13/13	R/P	SW8260
Benzene	ND	0.7	ug/L	02/13/13	R/P	SW8260
Bromobenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
Bromochloromethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
Bromodichloromethane	ND	0.5	ug/L	02/13/13	R/P	SW8260
Bromoform	ND	1.0	ug/L	02/13/13	R/P	SW8260
Bromomethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
Carbon Disulfide	ND	5	ug/L	02/13/13	R/P	SW8260
Carbon tetrachloride	ND	1.0	ug/L	02/13/13	R/P	SW8260
Chlorobenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
Chloroethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
Chloroform	ND	1.0	ug/L	02/13/13	R/P	SW8260
Chloromethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
cis-1,2-Dichloroethene	ND	1.0	ug/L	02/13/13	R/P	SW8260
cis-1,3-Dichloropropene	ND	0.5	ug/L	02/13/13	R/P	SW8260
Dibromochloromethane	ND	0.5	ug/L	02/13/13	R/P	SW8260
Dibromomethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
Dichlorodifluoromethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
Ethylbenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
Hexachlorobutadiene	ND	0.4	ug/L	02/13/13	R/P	SW8260
Isopropylbenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
m&p-Xylene	ND	1.0	ug/L	02/13/13	R/P	SW8260
Methyl ethyl ketone	ND	5	ug/L	02/13/13	R/P	SW8260
Methyl t-butyl ether (MTBE)	ND	1.0	ug/L	02/13/13	R/P	SW8260
Methylene chloride	ND	1.0	ug/L	02/13/13	R/P	SW8260
Naphthalene	ND	1.0	ug/L	02/13/13	R/P	SW8260
n-Butylbenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
n-Propylbenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
o-Xylene	ND	1.0	ug/L	02/13/13	R/P	SW8260
p-Isopropyltoluene	ND	1.0	ug/L	02/13/13	R/P	SW8260
sec-Butylbenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
Styrene	ND	1.0	ug/L	02/13/13	R/P	SW8260

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
tert-Butylbenzene	ND	1.0	ug/L	02/13/13	R/P	SW8260
Tetrachloroethene	ND	1.0	ug/L	02/13/13	R/P	SW8260
Tetrahydrofuran (THF)	ND	2.5	ug/L	02/13/13	R/P	SW8260
Toluene	ND	1.0	ug/L	02/13/13	R/P	SW8260
Total Xylenes	ND	2.0	ug/L	02/13/13	R/P	SW8260
trans-1,2-Dichloroethene	ND	1.0	ug/L	02/13/13	R/P	SW8260
trans-1,3-Dichloropropene	ND	0.5	ug/L	02/13/13	R/P	SW8260
trans-1,4-dichloro-2-butene	ND	5	ug/L	02/13/13	R/P	SW8260
Trichloroethene	ND	1.0	ug/L	02/13/13	R/P	SW8260
Trichlorofluoromethane	ND	1.0	ug/L	02/13/13	R/P	SW8260
Trichlorotrifluoroethane	ND	1	ug/L	02/13/13	R/P	SW8260
Vinyl chloride	ND	1.0	ug/L	02/13/13	R/P	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	101		%	02/13/13	R/P	70 - 130 %
% Bromofluorobenzene	99		%	02/13/13	R/P	70 - 130 %
% Dibromofluoromethane	116		%	02/13/13	R/P	70 - 130 %
% Toluene-d8	100		%	02/13/13	R/P	70 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4-Trichlorobenzene	ND	5.0	ug/L	02/15/13	DD	SW8270
1,2-Dichlorobenzene	ND	5.0	ug/L	02/15/13	DD	SW8270
1,2-Diphenylhydrazine	ND	5.0	ug/L	02/15/13	DD	SW8270
1,3-Dichlorobenzene	ND	5.0	ug/L	02/15/13	DD	SW8270
1,4-Dichlorobenzene	ND	5.0	ug/L	02/15/13	DD	SW8270
2,4,5-Trichlorophenol	ND	10	ug/L	02/15/13	DD	SW8270
2,4,6-Trichlorophenol	ND	10	ug/L	02/15/13	DD	SW8270
2,4-Dichlorophenol	ND	10	ug/L	02/15/13	DD	SW8270
2,4-Dimethylphenol	ND	10	ug/L	02/15/13	DD	SW8270
2,4-Dinitrophenol	ND	50	ug/L	02/15/13	DD	SW8270
2,4-Dinitrotoluene	ND	5.0	ug/L	02/15/13	DD	SW8270
2,6-Dinitrotoluene	ND	5.0	ug/L	02/15/13	DD	SW8270
2-Chloronaphthalene	ND	5.0	ug/L	02/15/13	DD	SW8270
2-Chlorophenol	ND	10	ug/L	02/15/13	DD	SW8270
2-Methylnaphthalene	ND	5.0	ug/L	02/15/13	DD	SW8270
2-Methylphenol (o-cresol)	ND	10	ug/L	02/15/13	DD	SW8270
2-Nitroaniline	ND	50	ug/L	02/15/13	DD	SW8270
2-Nitrophenol	ND	10	ug/L	02/15/13	DD	SW8270
3&4-Methylphenol (m&p-cresol)	ND	10	ug/L	02/15/13	DD	SW8270
3,3'-Dichlorobenzidine	ND	50	ug/L	02/15/13	DD	SW8270
3-Nitroaniline	ND	50	ug/L	02/15/13	DD	SW8270
4,6-Dinitro-2-methylphenol	ND	50	ug/L	02/15/13	DD	SW8270
4-Bromophenyl phenyl ether	ND	5.0	ug/L	02/15/13	DD	SW8270
4-Chloro-3-methylphenol	ND	20	ug/L	02/15/13	DD	SW8270
4-Chloroaniline	ND	20	ug/L	02/15/13	DD	SW8270
4-Chlorophenyl phenyl ether	ND	5.0	ug/L	02/15/13	DD	SW8270
4-Nitroaniline	ND	20	ug/L	02/15/13	DD	SW8270
4-Nitrophenol	ND	50	ug/L	02/15/13	DD	SW8270
Acetophenone	ND	5.0	ug/L	02/15/13	DD	SW8270
Aniline	ND	10	ug/L	02/15/13	DD	SW8270
Anthracene	ND	5.0	ug/L	02/15/13	DD	SW8270

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Benzidine	ND	50	ug/L	02/15/13	DD	SW8270
Benzoic acid	ND	50	ug/L	02/15/13	DD	SW8270
Benzyl butyl phthalate	ND	5.0	ug/L	02/15/13	DD	SW8270
Bis(2-chloroethoxy)methane	ND	5.0	ug/L	02/15/13	DD	SW8270
Bis(2-chloroethyl)ether	ND	5.0	ug/L	02/15/13	DD	SW8270
Bis(2-chloroisopropyl)ether	ND	5.0	ug/L	02/15/13	DD	SW8270
Carbazole	ND	5.0	ug/L	02/15/13	DD	SW8270
Dibenzofuran	ND	5.0	ug/L	02/15/13	DD	SW8270
Diethyl phthalate	ND	5.0	ug/L	02/15/13	DD	SW8270
Dimethylphthalate	ND	5.0	ug/L	02/15/13	DD	SW8270
Di-n-butylphthalate	ND	5.0	ug/L	02/15/13	DD	SW8270
Di-n-octylphthalate	ND	5.0	ug/L	02/15/13	DD	SW8270
Fluoranthene	ND	5.0	ug/L	02/15/13	DD	SW8270
Fluorene	ND	5.0	ug/L	02/15/13	DD	SW8270
Hexachlorobutadiene	ND	5.0	ug/L	02/15/13	DD	SW8270
Hexachlorocyclopentadiene	ND	5.0	ug/L	02/15/13	DD	SW8270
Isophorone	ND	5.0	ug/L	02/15/13	DD	SW8270
Naphthalene	ND	5.0	ug/L	02/15/13	DD	SW8270
Nitrobenzene	ND	5.0	ug/L	02/15/13	DD	SW8270
N-Nitrosodimethylamine	ND	5.0	ug/L	02/15/13	DD	SW8270
N-Nitrosodi-n-propylamine	ND	5.0	ug/L	02/15/13	DD	SW8270
N-Nitrosodiphenylamine	ND	5.0	ug/L	02/15/13	DD	SW8270
Phenol	ND	10	ug/L	02/15/13	DD	SW8270
Pyrene	ND	5.0	ug/L	02/15/13	DD	SW8270
<b><u>QA/QC Surrogates</u></b>						
% 2,4,6-Tribromophenol	131		%	02/15/13	DD	15 - 130 %
% 2-Fluorobiphenyl	94		%	02/15/13	DD	30 - 130 %
% 2-Fluorophenol	86		%	02/15/13	DD	15 - 130 %
% Nitrobenzene-d5	126		%	02/15/13	DD	30 - 130 %
% Phenol-d5	34		%	02/15/13	DD	15 - 130 %
% Terphenyl-d14	75		%	02/15/13	DD	30 - 130 %
<b><u>Semivolatiles</u></b>						
1,2,4,5-Tetrachlorobenzene	ND	1.6	ug/L	02/14/13	DD	SW8270 (SIM)
Acenaphthene	0.2	0.050	ug/L	02/14/13	DD	SW8270 (SIM)
Acenaphthylene	ND	0.050	ug/L	02/14/13	DD	SW8270 (SIM)
Benz(a)anthracene	0.08	0.040	ug/L	02/14/13	DD	SW8270 (SIM)
Benzo(a)pyrene	ND	0.050	ug/L	02/14/13	DD	SW8270 (SIM)
Benzo(b)fluoranthene	0.13	0.050	ug/L	02/14/13	DD	SW8270 (SIM)
Benzo(ghi)perylene	ND	3.0	ug/L	02/14/13	DD	SW8270 (SIM)
Benzo(k)fluoranthene	ND	0.050	ug/L	02/14/13	DD	SW8270 (SIM)
Bis(2-ethylhexyl)phthalate	ND	1.6	ug/L	02/14/13	DD	SW8270 (SIM)
Chrysene	0.1	0.050	ug/L	02/14/13	DD	SW8270 (SIM)
Dibenz(a,h)anthracene	0.02	0.010	ug/L	02/14/13	DD	SW8270 (SIM)
Hexachlorobenzene	ND	0.060	ug/L	02/14/13	DD	SW8270 (SIM)
Hexachloroethane	ND	2.4	ug/L	02/14/13	DD	SW8270 (SIM)
Indeno(1,2,3-cd)pyrene	0.05	0.050	ug/L	02/14/13	DD	SW8270 (SIM)
Pentachloronitrobenzene	ND	0.10	ug/L	02/14/13	DD	SW8270 (SIM)
Pentachlorophenol	ND	0.80	ug/L	02/14/13	DD	SW8270 (SIM)
Phenanthrene	0.07	0.050	ug/L	02/14/13	DD	SW8270 (SIM)



Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Pyridine	ND	0.50	ug/L	02/14/13	DD	SW8270 (SIM)
<b>QA/QC Surrogates</b>						
% 2,4,6-Tribromophenol	131		%	02/14/13	DD	15 - 130 % <sup>3</sup>
% 2-Fluorobiphenyl	94		%	02/14/13	DD	30 - 130 %
% 2-Fluorophenol	86		%	02/14/13	DD	15 - 130 %
% Nitrobenzene-d5	126		%	02/14/13	DD	30 - 130 %
% Phenol-d5	34		%	02/14/13	DD	15 - 130 %
% Terphenyl-d14	75		%	02/14/13	DD	30 - 130 %

3 = This parameter exceeds laboratory specified limits.  
 B = Present in blank, no bias suspected.

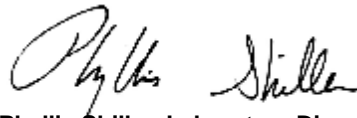
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

\*\*Petroleum hydrocarbon chromatogram contains a multicomponent hydrocarbon distribution in the range of C9 to C24. The sample was quantitated against a C9-C36 alkane hydrocarbon standard.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.  
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**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Phyllis Shiller, Laboratory Director**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 February 19, 2013

FOR: Attn: Mr. Barry Giroux  
 GEI Consultants  
 455 Winding Brook Drive  
 Suite 201  
 Glastonbury, CT 06033

Sample Information

Matrix: WATER  
 Location Code: GEI  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by: RM  
 Received by: LB  
 Analyzed by: see "By" below

Date

02/12/13  
 02/12/13

Time

0:00  
 16:39

Laboratory Data

SDG ID: GBD29937  
 Phoenix ID: BD29938

Project ID: TOE DRAIN DESIGN  
 Client ID: TRIP BLANK

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
<b><u>Volatiles</u></b>						
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,1,1-Trichloroethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,1,2,2-Tetrachloroethane	ND	0.50	ug/L	02/13/13	R/T	SW8260
1,1,2-Trichloroethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,1-Dichloroethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,1-Dichloroethene	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,1-Dichloropropene	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,2,3-Trichlorobenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,2,3-Trichloropropane	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,2,4-Trichlorobenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,2,4-Trimethylbenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,2-Dibromo-3-chloropropane	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,2-Dibromoethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,2-Dichlorobenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,2-Dichloroethane	ND	0.60	ug/L	02/13/13	R/T	SW8260
1,2-Dichloropropane	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,3,5-Trimethylbenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,3-Dichlorobenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,3-Dichloropropane	ND	1.0	ug/L	02/13/13	R/T	SW8260
1,4-Dichlorobenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
2,2-Dichloropropane	ND	1.0	ug/L	02/13/13	R/T	SW8260
2-Chlorotoluene	ND	1.0	ug/L	02/13/13	R/T	SW8260
2-Hexanone	ND	5.0	ug/L	02/13/13	R/T	SW8260
2-Isopropyltoluene	ND	1.0	ug/L	02/13/13	R/T	SW8260
4-Chlorotoluene	ND	1.0	ug/L	02/13/13	R/T	SW8260
4-Methyl-2-pentanone	ND	5.0	ug/L	02/13/13	R/T	SW8260
Acetone	ND	25	ug/L	02/13/13	R/T	SW8260

Client ID: TRIP BLANK

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Acrylonitrile	ND	5.0	ug/L	02/13/13	R/T	SW8260
Benzene	ND	0.70	ug/L	02/13/13	R/T	SW8260
Bromobenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
Bromochloromethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
Bromodichloromethane	ND	0.50	ug/L	02/13/13	R/T	SW8260
Bromoform	ND	1.0	ug/L	02/13/13	R/T	SW8260
Bromomethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
Carbon Disulfide	ND	5.0	ug/L	02/13/13	R/T	SW8260
Carbon tetrachloride	ND	1.0	ug/L	02/13/13	R/T	SW8260
Chlorobenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
Chloroethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
Chloroform	ND	1.0	ug/L	02/13/13	R/T	SW8260
Chloromethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
cis-1,2-Dichloroethene	ND	1.0	ug/L	02/13/13	R/T	SW8260
cis-1,3-Dichloropropene	ND	0.50	ug/L	02/13/13	R/T	SW8260
Dibromochloromethane	ND	0.50	ug/L	02/13/13	R/T	SW8260
Dibromomethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
Dichlorodifluoromethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
Ethylbenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
Hexachlorobutadiene	ND	0.40	ug/L	02/13/13	R/T	SW8260
Isopropylbenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
m&p-Xylene	ND	1.0	ug/L	02/13/13	R/T	SW8260
Methyl ethyl ketone	ND	5.0	ug/L	02/13/13	R/T	SW8260
Methyl t-butyl ether (MTBE)	ND	1.0	ug/L	02/13/13	R/T	SW8260
Methylene chloride	ND	1.0	ug/L	02/13/13	R/T	SW8260
Naphthalene	ND	1.0	ug/L	02/13/13	R/T	SW8260
n-Butylbenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
n-Propylbenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
o-Xylene	ND	1.0	ug/L	02/13/13	R/T	SW8260
p-Isopropyltoluene	ND	1.0	ug/L	02/13/13	R/T	SW8260
sec-Butylbenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
Styrene	ND	1.0	ug/L	02/13/13	R/T	SW8260
tert-Butylbenzene	ND	1.0	ug/L	02/13/13	R/T	SW8260
Tetrachloroethene	ND	1.0	ug/L	02/13/13	R/T	SW8260
Tetrahydrofuran (THF)	ND	2.5	ug/L	02/13/13	R/T	SW8260
Toluene	ND	1.0	ug/L	02/13/13	R/T	SW8260
Total Xylenes	ND	1.0	ug/L	02/13/13	R/T	SW8260
trans-1,2-Dichloroethene	ND	1.0	ug/L	02/13/13	R/T	SW8260
trans-1,3-Dichloropropene	ND	0.50	ug/L	02/13/13	R/T	SW8260
trans-1,4-dichloro-2-butene	ND	5.0	ug/L	02/13/13	R/T	SW8260
Trichloroethene	ND	1.0	ug/L	02/13/13	R/T	SW8260
Trichlorofluoromethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
Trichlorotrifluoroethane	ND	1.0	ug/L	02/13/13	R/T	SW8260
Vinyl chloride	ND	1.0	ug/L	02/13/13	R/T	SW8260
<b><u>QA/QC Surrogates</u></b>						
% 1,2-dichlorobenzene-d4	101		%	02/13/13	R/T	70 - 130 %
% Bromofluorobenzene	96		%	02/13/13	R/T	70 - 130 %
% Dibromofluoromethane	115		%	02/13/13	R/T	70 - 130 %
% Toluene-d8	99		%	02/13/13	R/T	70 - 130 %

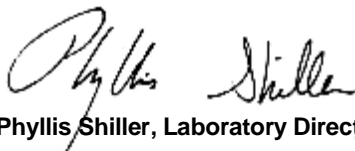
Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
-----------	--------	------------	-------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

TRIP BLANK INCLUDED

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.  
This report must not be reproduced except in full as defined by the attached chain of custody.



**Phyllis Shiller, Laboratory Director**

**February 19, 2013**

**Reviewed and Released by: Phyllis Shiller, Laboratory Director**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# QA/QC Report

February 19, 2013

## QA/QC Data

SDG I.D.: GBD29937

Parameter	Blank	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 221043, QC Sample No: BD29258 (BD29937)												
Mercury - Water	BRL	<0.0002	<0.0002	NC	88.8	86.8	2.3	87.6	88.8	1.4	70 - 130	20
Comment:												
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%.												
QA/QC Batch 221020, QC Sample No: BD29872 (BD29937)												
<u>ICP Metals - Aqueous</u>												
Arsenic	BRL	0.004	<0.004	NC	95.5	100	4.6	97.2	99.3	2.1	75 - 125	20
Barium	BRL	<0.002	<0.002	NC	97.0	100	3.0	99.9	101	1.1	75 - 125	20
Cadmium	BRL	<0.001	<0.001	NC	97.3	102	4.7	97.8	99.4	1.6	75 - 125	20
Chromium	BRL	<0.001	<0.001	NC	94.5	99.0	4.7	95.4	97.7	2.4	75 - 125	20
Lead	BRL	<0.002	<0.002	NC	96.1	101	5.0	96.9	98.7	1.8	75 - 125	20
Selenium	BRL	<0.010	<0.010	NC	91.7	96.7	5.3	93.2	94.9	1.8	75 - 125	20
Silver	BRL	<0.001	<0.001	NC	91.4	95.0	3.9	92.2	93.8	1.7	75 - 125	20



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# QA/QC Report

February 19, 2013

## QA/QC Data

SDG I.D.: GBD29937

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 220914, QC Sample No: BD28967 (BD29937)									
<u>TPH by GC (Extractable Products) - Ground Water</u>									
Ext. Petroleum HC	ND	70	83	17.0				60 - 120	20
% n-Pentacosane	74	75	88	16.0				50 - 150	20
QA/QC Batch 221199, QC Sample No: BD29409 (BD29937, BD29938)									
<u>Volatiles - Ground Water</u>									
1,1,1,2-Tetrachloroethane	ND	97	110	12.6	104	99	4.9	70 - 130	30
1,1,1-Trichloroethane	ND	101	115	13.0	101	93	8.2	70 - 130	30
1,1,2,2-Tetrachloroethane	ND	92	103	11.3	107	99	7.8	70 - 130	30
1,1,2-Trichloroethane	ND	98	110	11.5	110	101	8.5	70 - 130	30
1,1-Dichloroethane	ND	103	118	13.6	98	91	7.4	70 - 130	30
1,1-Dichloroethene	ND	93	107	14.0	101	91	10.4	70 - 130	30
1,1-Dichloropropene	ND	89	101	12.6	105	94	11.1	70 - 130	30
1,2,3-Trichlorobenzene	ND	97	106	8.9	101	96	5.1	70 - 130	30
1,2,3-Trichloropropane	ND	96	108	11.8	105	103	1.9	70 - 130	30
1,2,4-Trichlorobenzene	ND	93	104	11.2	97	94	3.1	70 - 130	30
1,2,4-Trimethylbenzene	ND	95	106	10.9	97	91	6.4	70 - 130	30
1,2-Dibromo-3-chloropropane	ND	96	104	8.0	104	99	4.9	70 - 130	30
1,2-Dibromoethane	ND	95	106	10.9	111	102	8.5	70 - 130	30
1,2-Dichlorobenzene	ND	95	105	10.0	100	94	6.2	70 - 130	30
1,2-Dichloroethane	ND	94	106	12.0	109	100	8.6	70 - 130	30
1,2-Dichloropropane	ND	94	106	12.0	106	97	8.9	70 - 130	30
1,3,5-Trimethylbenzene	ND	92	103	11.3	97	91	6.4	70 - 130	30
1,3-Dichlorobenzene	ND	96	107	10.8	99	91	8.4	70 - 130	30
1,3-Dichloropropane	ND	96	107	10.8	107	98	8.8	70 - 130	30
1,4-Dichlorobenzene	ND	95	106	10.9	98	92	6.3	70 - 130	30
2,2-Dichloropropane	ND	94	102	8.2	77	69	11.0	70 - 130	30
2-Chlorotoluene	ND	95	107	11.9	99	91	8.4	70 - 130	30
2-Hexanone	ND	97	108	10.7	109	103	5.7	70 - 130	30
2-Isopropyltoluene	ND	93	104	11.2	100	92	8.3	70 - 130	30
4-Chlorotoluene	ND	93	104	11.2	99	92	7.3	70 - 130	30
4-Methyl-2-pentanone	ND	99	109	9.6	116	106	9.0	70 - 130	30
Acetone	ND	95	108	12.8	100	105	4.9	70 - 130	30
Acrylonitrile	ND	103	113	9.3	103	98	5.0	70 - 130	30
Benzene	ND	88	100	12.8	104	92	12.2	70 - 130	30
Bromobenzene	ND	94	106	12.0	100	93	7.3	70 - 130	30
Bromochloromethane	ND	106	119	11.6	100	95	5.1	70 - 130	30
Bromodichloromethane	ND	99	113	13.2	111	102	8.5	70 - 130	30
Bromoform	ND	105	118	11.7	114	107	6.3	70 - 130	30
Bromomethane	ND	104	128	20.7	80	91	12.9	70 - 130	30
Carbon Disulfide	ND	86	96	11.0	96	88	8.7	70 - 130	30
Carbon tetrachloride	ND	94	109	14.8	117	105	10.8	70 - 130	30
Chlorobenzene	ND	93	106	13.1	101	93	8.2	70 - 130	30

QA/QC Data

SDG I.D.: GBD29937

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
Chloroethane	ND	99	113	13.2	99	91	8.4	70 - 130	30
Chloroform	ND	103	118	13.6	97	91	6.4	70 - 130	30
Chloromethane	ND	91	105	14.3	95	88	7.7	70 - 130	30
cis-1,2-Dichloroethene	ND	104	123	16.7	97	92	5.3	70 - 130	30
cis-1,3-Dichloropropene	ND	94	105	11.1	104	95	9.0	70 - 130	30
Dibromochloromethane	ND	100	114	13.1	111	104	6.5	70 - 130	30
Dibromomethane	ND	97	108	10.7	108	100	7.7	70 - 130	30
Dichlorodifluoromethane	ND	77	87	12.2	101	93	8.2	70 - 130	30
Ethylbenzene	ND	91	104	13.3	99	93	6.3	70 - 130	30
Hexachlorobutadiene	ND	87	97	10.9	94	88	6.6	70 - 130	30
Isopropylbenzene	ND	93	104	11.2	98	90	8.5	70 - 130	30
m&p-Xylene	ND	94	105	11.1	101	92	9.3	70 - 130	30
Methyl ethyl ketone	ND	101	108	6.7	107	105	1.9	70 - 130	30
Methyl t-butyl ether (MTBE)	ND	89	100	11.6	113	104	8.3	70 - 130	30
Methylene chloride	ND	98	112	13.3	95	89	6.5	70 - 130	30
Naphthalene	ND	96	106	9.9	103	100	3.0	70 - 130	30
n-Butylbenzene	ND	93	103	10.2	98	91	7.4	70 - 130	30
n-Propylbenzene	ND	94	107	12.9	97	89	8.6	70 - 130	30
o-Xylene	ND	100	111	10.4	102	93	9.2	70 - 130	30
p-Isopropyltoluene	ND	94	105	11.1	98	91	7.4	70 - 130	30
sec-Butylbenzene	ND	90	100	10.5	99	91	8.4	70 - 130	30
Styrene	ND	97	110	12.6	104	96	8.0	70 - 130	30
tert-Butylbenzene	ND	94	105	11.1	100	92	8.3	70 - 130	30
Tetrachloroethene	ND	91	100	9.4	99	92	7.3	70 - 130	30
Tetrahydrofuran (THF)	ND	104	120	14.3	110	102	7.5	70 - 130	30
Toluene	ND	92	105	13.2	102	94	8.2	70 - 130	30
trans-1,2-Dichloroethene	ND	100	113	12.2	96	89	7.6	70 - 130	30
trans-1,3-Dichloropropene	ND	94	106	12.0	106	98	7.8	70 - 130	30
trans-1,4-dichloro-2-butene	ND	99	107	7.8	105	99	5.9	70 - 130	30
Trichloroethene	ND	95	108	12.8	102	93	9.2	70 - 130	30
Trichlorofluoromethane	ND	96	108	11.8	103	93	10.2	70 - 130	30
Trichlorotrifluoroethane	ND	90	101	11.5	101	93	8.2	70 - 130	30
Vinyl chloride	ND	91	105	14.3	101	92	9.3	70 - 130	30
% 1,2-dichlorobenzene-d4	102	101	100	1.0	101	100	1.0	70 - 130	30
% Bromofluorobenzene	98	100	101	1.0	101	101	0.0	70 - 130	30
% Dibromofluoromethane	110	110	111	0.9	96	100	4.1	70 - 130	30
% Toluene-d8	99	100	99	1.0	101	100	1.0	70 - 130	30

Comment:

Additional 8260 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is 40-160%.

QA/QC Batch 221007, QC Sample No: BD29551 (BD29937)

Semivolatiles - Ground Water

1,2,4,5-Tetrachlorobenzene	ND	75	74	1.3				30 - 130	20
1,2,4-Trichlorobenzene	ND	75	75	0.0				30 - 130	20
1,2-Dichlorobenzene	ND	82	82	0.0				30 - 130	20
1,2-Diphenylhydrazine	ND	81	85	4.8				30 - 130	20
1,3-Dichlorobenzene	ND	79	77	2.6				30 - 130	20
1,4-Dichlorobenzene	ND	81	80	1.2				30 - 130	20
2,4,5-Trichlorophenol	ND	83	83	0.0				30 - 130	20
2,4,6-Trichlorophenol	ND	87	87	0.0				30 - 130	20
2,4-Dichlorophenol	ND	84	85	1.2				30 - 130	20
2,4-Dimethylphenol	ND	54	53	1.9				30 - 130	20
2,4-Dinitrophenol	ND	66	73	10.1				30 - 130	20

QA/QC Data

SDG I.D.: GBD29937

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
2,4-Dinitrotoluene	ND	89	93	4.4				30 - 130	20
2,6-Dinitrotoluene	ND	91	93	2.2				30 - 130	20
2-Chloronaphthalene	ND	87	89	2.3				30 - 130	20
2-Chlorophenol	ND	81	83	2.4				30 - 130	20
2-Methylnaphthalene	ND	82	83	1.2				30 - 130	20
2-Methylphenol (o-cresol)	ND	78	81	3.8				30 - 130	20
2-Nitroaniline	ND	>150	>150	NC				30 - 130	20
2-Nitrophenol	ND	77	78	1.3				30 - 130	20
3&4-Methylphenol (m&p-cresol)	ND	82	84	2.4				30 - 130	20
3,3'-Dichlorobenzidine	ND	N/A	N/A	NC				30 - 130	20
3-Nitroaniline	ND	103	109	5.7				30 - 130	20
4,6-Dinitro-2-methylphenol	ND	89	95	6.5				30 - 130	20
4-Bromophenyl phenyl ether	ND	84	86	2.4				30 - 130	20
4-Chloro-3-methylphenol	ND	85	86	1.2				30 - 130	20
4-Chloroaniline	ND	41	44	7.1				30 - 130	20
4-Chlorophenyl phenyl ether	ND	78	80	2.5				30 - 130	20
4-Nitroaniline	ND	103	109	5.7				30 - 130	20
4-Nitrophenol	ND	84	90	6.9				30 - 130	20
Acenaphthene	ND	96	98	2.1				30 - 130	20
Acenaphthylene	ND	89	92	3.3				30 - 130	20
Acetophenone	ND	90	92	2.2				30 - 130	20
Aniline	ND	N/A	N/A	NC				30 - 130	20
Anthracene	ND	101	106	4.8				30 - 130	20
Benz(a)anthracene	ND	102	105	2.9				30 - 130	20
Benzidine	ND	N/A	N/A	NC				10 - 130	20
Benzo(a)pyrene	ND	89	94	5.5				30 - 130	20
Benzo(b)fluoranthene	ND	98	100	2.0				30 - 130	20
Benzo(ghi)perylene	ND	112	117	4.4				30 - 130	20
Benzo(k)fluoranthene	ND	103	105	1.9				30 - 130	20
Benzoic acid	ND	N/A	N/A	NC				30 - 130	20
Benzyl butyl phthalate	ND	96	95	1.0				30 - 130	20
Bis(2-chloroethoxy)methane	ND	84	87	3.5				30 - 130	20
Bis(2-chloroethyl)ether	ND	80	75	6.5				30 - 130	20
Bis(2-chloroisopropyl)ether	ND	85	86	1.2				30 - 130	20
Bis(2-ethylhexyl)phthalate	3.2	118	92	24.8				30 - 130	20
Carbazole	ND	135	>150	NC				30 - 130	20
Chrysene	ND	109	115	5.4				30 - 130	20
Dibenz(a,h)anthracene	ND	103	107	3.8				30 - 130	20
Dibenzofuran	ND	83	86	3.6				30 - 130	20
Diethyl phthalate	ND	91	94	3.2				30 - 130	20
Dimethylphthalate	ND	87	89	2.3				30 - 130	20
Di-n-butylphthalate	ND	98	100	2.0				30 - 130	20
Di-n-octylphthalate	ND	98	98	0.0				30 - 130	20
Fluoranthene	ND	81	86	6.0				30 - 130	20
Fluorene	ND	99	101	2.0				30 - 130	20
Hexachlorobenzene	ND	89	97	8.6				30 - 130	20
Hexachlorobutadiene	ND	74	72	2.7				30 - 130	20
Hexachlorocyclopentadiene	ND	53	54	1.9				30 - 130	20
Hexachloroethane	ND	82	80	2.5				30 - 130	20
Indeno(1,2,3-cd)pyrene	ND	104	108	3.8				30 - 130	20
Isophorone	ND	84	86	2.4				30 - 130	20
Naphthalene	ND	84	85	1.2				30 - 130	20
Nitrobenzene	ND	81	82	1.2				30 - 130	20



QA/QC Data

SDG I.D.: GBD29937

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
N-Nitrosodimethylamine	ND	68	71	4.3				30 - 130	20
N-Nitrosodi-n-propylamine	ND	82	83	1.2				30 - 130	20
N-Nitrosodiphenylamine	ND	110	120	8.7				30 - 130	20
Pentachloronitrobenzene	ND	83	85	2.4				30 - 130	20
Pentachlorophenol	ND	85	85	0.0				30 - 130	20
Phenanthrene	ND	103	107	3.8				30 - 130	20
Phenol	ND	70	72	2.8				30 - 130	20
Pyrene	ND	99	105	5.9				30 - 130	20
Pyridine	ND	27	33	20.0				30 - 130	20
% 2,4,6-Tribromophenol	112	91	88	3.4				15 - 130	20
% 2-Fluorobiphenyl	87	83	83	0.0				30 - 130	20
% 2-Fluorophenol	84	69	70	1.4				15 - 130	20
% Nitrobenzene-d5	103	79	79	0.0				30 - 130	20
% Phenol-d5	84	70	71	1.4				15 - 130	20
% Terphenyl-d14	102	79	84	6.1				30 - 130	20

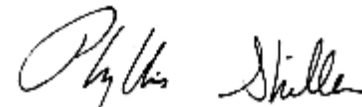
Comment:

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

- l = This parameter is outside laboratory lcs/lcsd specified recovery limits.
- m = This parameter is outside laboratory ms/msd specified recovery limits.
- r = This parameter is outside laboratory rpd specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference



Phyllis Shiller, Laboratory Director  
February 19, 2013

# Sample Criteria Exceedences Report

Requested Criteria: GAM, GWP, RC, SWP

**GBD29937 - GEI**

State: CT

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
BD29937	\$8260GWR	Acrylonitrile	CT / VOLATILE ORGANIC COMPOUND / GWPC (µg/L)	ND	5	0.5	0.5	ug/L
BD29937	\$8260GWR	1,2-Dibromoethane	CT / VOLATILE ORGANIC COMPOUND / GWPC (µg/L)	ND	1.0	0.05	0.05	ug/L
BD29937	\$8270-SIMFSR	Aniline	CT / SEMIVOLATILE ORGANIC COMP / GWPC (µg/L)	ND	10	6	6	ug/L
BD29937	\$8270-SIMFSR	3,3'-Dichlorobenzidine	CT / SEMIVOLATILE ORGANIC COMP / GWPC (µg/L)	ND	50	10	10	ug/L
BD29937	\$8270-SIMR	Benz(a)anthracene	CT / SEMIVOLATILE ORGANIC COMP / GWPC (µg/L)	0.08	0.040	0.06	0.06	ug/L
BD29937	\$8270-SIMR	Benzo(b)fluoranthene	CT / SEMIVOLATILE ORGANIC COMP / GWPC (µg/L)	0.13	0.050	0.08	0.08	ug/L
BD29937	\$8270-SIMR	Dibenz(a,h)anthracene	CT / SEMIVOLATILE ORGANIC COMP / SWPC (µg/L)	0.02	0.010	0.01	0.01	ug/L
BD29937	AS-WM	Arsenic	CT / INORGANIC SUBSTANCES / SWPC (µg/L)	0.006	0.004	0.004	0.004	mg/L
BD29938	\$8260GWR	Acrylonitrile	CT / VOLATILE ORGANIC COMPOUND / GWPC (µg/L)	ND	5.0	0.5	0.5	ug/L
BD29938	\$8260GWR	1,2-Dibromoethane	CT / VOLATILE ORGANIC COMPOUND / GWPC (µg/L)	ND	1.0	0.05	0.05	ug/L

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

## Reasonable Confidence Protocol Laboratory Analysis QA/QC Certification Form

**Laboratory Name:** Phoenix Environmental Labs, Inc. **Client:** GEI

**Project Location:** TOE DRAIN DESIGN **Project Number:**

**Laboratory Sample ID(s):** BD29937, BD29938

**Sampling Date(s):** 2/12/2013

**RCP Methods Used:**

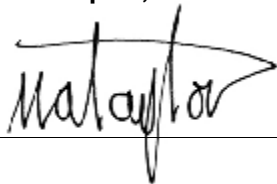
1311/1312     6010     7000     7196     7470/7471     8081     EPH     TO15  
 8082     8151     8260     8270     ETPH     9010/9012     VPH

1.	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1a.	Were the method specified preservation and holding time requirements met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1b.	EPH and VPH methods only: Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
2.	Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3.	Were samples received at an appropriate temperature (< 6 Degrees C)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
4.	Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? See Section: SVOA Narration.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5a.	Were reporting limits specified or referenced on the chain-of-custody?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5b.	Were these reporting limits met?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
6.	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
7.	Are project-specific matrix spikes and laboratory duplicates included in the data set?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA

**Note:** For all questions to which the response was "No" (with the exception of question #5a, #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence".

**I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.**

Authorized  
Signature: \_\_\_\_\_



Date: Tuesday, February 19, 2013  
Printed Name: Maryam Taylor  
Position: Project Manager

Nov 2007



**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



# RCP Certification Report

February 19, 2013

SDG I.D.: GBD29937

The client requested a shorter list of elements than the 6010 RCP list.

Volatile 8260 analysis:

The reporting level for Acrylonitrile is above the GWP criteria.

1,2-Dibromoethane does not meet GWP criteria, this compound is analyzed by GC/ECD to achieve this criteria.

8270 Semi-volatile Organics:

In order to achieve the requested reporting levels for the target compounds, the sample was extracted and analyzed via 8270 selective ion monitoring (SIM) as well as 8270 full scan.

Aniline and 3,3- Dichlorobenzidine reporting levels do not meet GWP criteria.

## ETPH Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Au-fid1 02/13/13-1 (BD29937)

Initial Calibration (FID1 - ETPH\_1) - The initial calibration curve was within method criteria and had a %RSD less than 30%.

The daily continuing calibration standard was within method criteria of +/- 30 %D.

As per section 7.2.3, a discrimination check standard was run and contained the following outliers:C36

**Printed Name** Jeff Bucko

**Position:** Chemist

**Date:** 2/13/2013

## QC (Batch Specific)

----- Sample No: BD28967, QA/QC Batch: 220914 -----

All LCS recoveries were within 60 - 120 with the following exceptions: None.

All LCSD recoveries were within 60 - 120 with the following exceptions: None.

All LCS/LCSD RPDs were less than 20% with the following exceptions: None.

## Mercury Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Merlin 02/13/13-1 (BD29937)

The method preparation blank contains all of the acids and reagents as the samples; the instrument blanks do not.

The initial calibration met all criteria including a standard run at or below the reporting level.

All calibration verification standards (ICV, CCV) met criteria.

All calibration blank verification standards (ICB, CCB) met criteria.



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# RCP Certification Report

February 19, 2013

SDG I.D.: GBD29937

---

The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.

**Printed Name** Rick Schweitzer  
**Position:** Chemist  
**Date:** 2/13/2013

## QC (Batch Specific)

----- Sample No: BD29258, QA/QC Batch: 221043 -----

All LCS recoveries were within 70 - 130 with the following exceptions: None.

All LCSD recoveries were within 70 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 20% with the following exceptions: None.

## ICP Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Arcos 02/13/13-1 (BD29937)

The initial calibration met criteria.

The continuing calibration standards met criteria for all the elements reported. The linear range is defined daily by the calibration range.

The continuing calibration blanks were less than the reporting level for the elements reported.

The ICSA and ICSAB were analyzed at the beginning and end of the run and were within criteria.

**Printed Name** Laura Kinnin  
**Position:** Chemist  
**Date:** 2/13/2013

**Instrument:** Arcos 02/14/13-1 (BD29937)

The initial calibration met criteria.

The continuing calibration standards met criteria for all the elements reported. The linear range is defined daily by the calibration range.

The continuing calibration blanks were less than the reporting level for the elements reported.

The ICSA and ICSAB were analyzed at the beginning and end of the run and were within criteria.

**Printed Name** Laura Kinnin  
**Position:** Chemist  
**Date:** 2/14/2013

**Instrument:** Blue 02/13/13-1 (BD29937)

The initial calibration met criteria.

The continuing calibration standards met criteria for all the elements reported. The linear range is defined daily by the calibration range.

The continuing calibration blanks were less than the reporting level for the elements reported.

The ICSA and ICSAB were analyzed at the beginning and end of the run and were within criteria.



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# RCP Certification Report

February 19, 2013

SDG I.D.: GBD29937

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**Printed Name** Laura Kinnin  
**Position:** Chemist  
**Date:** 2/13/2013

## QC (Batch Specific)

----- Sample No: BD29872, QA/QC Batch: 221020 -----

All LCS recoveries were within 75 - 125 with the following exceptions: None.

All LCSD recoveries were within 75 - 125 with the following exceptions: None.

All LCS/LCSD RPDs were less than 20% with the following exceptions: None.

## SVOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

**QC Batch 221007 (Samples: BD29937): -----**

**A trace amount of an analyte was found in blank but were not reported in the sample(s), therefore no bias is suspected. (Bis(2-ethylhexyl)phthalate)**

**The LCS and/or the LCSD recovery is above the upper range for one or more analytes that were not reported in the sample(s), therefore no significant bias is suspected. (2-Nitroaniline, Carbazole)**

**The LCS and/or the LCSD recovery is below the lower range, but within the method criteria. All of the other QC is acceptable, therefore no significant bias is suspected. (Pyridine)**

**The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (Bis(2-ethylhexyl)phthalate)**

**Instrument:** Chem07 02/15/13-1 (BD29937)

The DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.

Initial Calibration (Chem07/SV\_0204):

Greater than 90% of the target compounds met calibration criteria with a RSD <20% or >0.99 correlation coefficient. The following compounds had RSDs >20% and <0.99 correlation coefficient: 4-chloroaniline, 3-nitroaniline

The following compounds failed to meet the minimum required response factor: 2-nitrophenol, Hexachlorobenzene

Continuing Calibration:

Greater than 80% of target compounds met continuing calibration criteria with a %D <20. The following compounds had >20% difference from the initial calibration: Benzyl Alcohol, Bis(2-chloroisopropyl)ether, 2,4-Dinitrophenol, 4,6-Dinitro-2-methylphenol, 3,3'-dichlorobenzidine

**Printed Name** Damien Drobinski  
**Position:** Chemist  
**Date:** 2/15/2013



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# RCP Certification Report

February 19, 2013

SDG I.D.: GBD29937

## SVOASIM Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Chem04 02/14/13-1 (BD29937)

The DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.

In the event that lower detection levels were requested, the samples may have been analyzed by selective ion monitoring (SIM) mode.

If PAH/base neutral were requested, Phoenix utilized a method that contained a shortened list, so some of the compounds in the narrative may be non-applicable.

Initial Calibration (Chem04/SIM\_0116):

Greater than 90% of the target compounds met calibration criteria with a RSD <20% or >0.99 correlation coefficient. The following compounds had RSDs >20% and <0.99 correlation coefficient: None

The following compounds failed to meet the minimum required response factor: None

Continuing Calibration:

Greater than 80% of target compounds met continuing calibration criteria with a %D <20. The following compounds had >20% difference from the initial calibration: None.

**Printed Name** Damien Drobinski  
**Position:** Chemist  
**Date:** 2/14/2013

## QC (Batch Specific)

----- Sample No: BD29551, QA/QC Batch: 221007 -----

All LCS recoveries were within 30 - 130 with the following exceptions: 2-Nitroaniline(>150%), Carbazole(135%), Pyridine(27%)

All LCSD recoveries were within 30 - 130 with the following exceptions: 2-Nitroaniline(>150%), Carbazole(>150%)

All LCS/LCSD RPDs were less than 20% with the following exceptions: Bis(2-ethylhexyl)phthalate(24.8%)

## VOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

**Instrument:** Chem17 02/12/13-2 (BD29937, BD29938)

Initial Calibration (RCPS\_0212):

All SPCCs, CCCs and >80% of target compounds met criteria except that the following compounds had %RSDs >20%: Acetone



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# RCP Certification Report

February 19, 2013

SDG I.D.: GBD29937

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**Continuing Calibration Verification:**

The following compounds had % Deviations >30%: Tetrahydrofuran (THF)

**Printed Name** Tina Covensky  
**Position:** Chemist  
**Date:** 2/12/2013

**QC (Batch Specific)**

----- Sample No: BD29409, QA/QC Batch: 221199 -----

All LCS recoveries were within 70 - 130 with the following exceptions: None.

All LCSD recoveries were within 70 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

**Temperature Narration**

The samples were received at 1C with cooling initiated.  
(Note acceptance criteria is above freezing up to 6°C)





# Attachment 4

---

## CCTV Inspection

# FIELD OBSERVATION REPORT

**Project :** Pump Station CCTV Inspections  
**Client :** Town of East Hartford, Connecticut  
**Contractor:** NEPCCO

**Date:** Mon., July 16, 2012  
**Report No.** 3  
**Page:** 1 of 6  
**GEI Proj. No.** 12447-0

---

**Time of Arrival:** 7:00 a.m.      **Departure:** 1:30 p.m.      **Weather:** 90s°F, Sunny

**Persons Contacted, Company**  
Joe Assard, NEPCCO

**GEI Representatives**  
Michael Flynn (author)

**Purpose of Site Visit:** CCTV Inspection of Pitkin Street Outfall and Collector Drains.

## Observations

1. NEPCCO accessed Valve Chamber 4 to perform the CCTV Runs 1 and 2.

NEPCCO's laborer performed a confined space entry to set up the camera. NEPCCO video recorded each run. I observed the live feed during each run. Locations and my general observations for each run are summarized below and in the attached plans. The plans are separated based on pipes related to Pitkin Street Outfall and pipes related to the Collector Drain.

- a. Run 1: Valve Chamber (VC) 4 to Manhole (MH) 10
  - i. Total Run Length: Approximately 50 feet
  - ii. Pipe Size and Type: 30-inch-diameter Reinforced Concrete Pipe (RCP)
  - iii. In general, the pipe appeared to be in good condition relative to its age. I did not observe any cracks or joint displacements.
  
- b. Run 2: VC4 to MH9b
  - i. Total Run Length: Approximately 312 feet
  - ii. Pipe Size and Type: 36-inch-diameter RCP
  - iii. At 24 feet, I observed several rocks were sitting at the bottom of the pipe. NEPCCO manually removed the rocks to enable the camera to continue in the pipe.
  - iv. At 130 feet, I observed a manhole. The manhole cover was visible from above ground. It is located in the parking area of the southbound side of East River Drive. NEPCCO accessed the manhole to realign the camera to continue the run.
  - v. At 312 feet, I observed a manhole. The manhole cover was not visible from above ground. Based on the distance and direction of pipes entering the manhole, it is likely beneath the ground surface in the brush near the walkway (see attached Collector Drain Plan). The camera could not continue into the next 36-inch diameter pipe towards MH9b because inverts were at different

# FIELD OBSERVATION REPORT

**Project :** Pump Station CCTV Inspections  
**Client :** Town of East Hartford, Connecticut  
**Contractor:** NEPCCO

**Date:** Mon., July 16, 2012  
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**Page:** 2 of 6  
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elevations. Additionally, I observed soil deposits approximately 50% filling the pipe towards MH9b.

- vi. The run was terminated at this manhole. In general, the pipe appeared to be in good condition relative to its age. I did not observe any cracks or joint displacements.

- 2. NEPCCO accessed MH10 to perform CCTV Runs 3 and 4. MH 10 observations were noted in the June 29 Field Observation Report. A sketch of MH10 is attached.

NEPCCO's laborer performed a confined space entry to set up the camera. NEPCCO video recorded each run. I observed the live feed during each run. Locations and my general observations for each run are summarized below and in the attached plans. The plans are separated based on pipes related to Pitkin Street Outfall and pipes related to the Collector Drain. Additional runs from this manhole are detailed in the June 29 Field Observation Report.

a. Run 3: VC3 to Outfall

- i. Total Run Length: Approximately 215 feet
- ii. Pipe Size and Type: 36-inch-diameter RCP
- iii. At 18 feet, I observed the pipe leading to the pump station.
- iv. At 90 feet I observed the gate valve at the levee centerline.
- v. In general, the pipe appeared to be in good condition relative to its age. I did not observe any cracks or joint displacements.

b. Run 4: VC3 to Pitkin Street Pump Station

- i. Total Run Length: Approximately 30 feet
- ii. Pipe Size and Type: 36-inch-diameter RCP
- iii. In general, the pipe appeared to be in good condition relative to its age. I did not observe any cracks or joint displacements.

Additionally, NEPCCO used the camera to video approximately 10 feet of the pipe between MH10 and MH11. The pipe was over 75% filled with debris and soil, including what appeared to be a clean gravel. NEPCCO's laborer indicated he could see a break in the pipe approximately 10 feet in. This break is potentially causing the subsidence in the parking area above.

- 3. NEPCCO accessed the manhole (MH FB) northwest of the pump station, located in the riprap near

# FIELD OBSERVATION REPORT

**Project :** Pump Station CCTV Inspections  
**Client :** Town of East Hartford, Connecticut  
**Contractor:** NEPCCO

**Date:** Mon., July 16, 2012  
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**No.**

---

the steps for the Founders Bridge. Two 8-inch-diameter vitrified clay pipes (VCP) were tied into the manhole. These pipes appear to differ from the record drawings for the levee system, however they appear to correspond with the 1963 Founders Bridge drawing (Sheet 7 – East Approaches to Founders Bridge). One pipe, directed south along the embankment toe, appears to be the toe drain. The other pipe, directed east, appears to tie into VC4 on the drawings, however an inlet was not observed from that direction at VC4. Both pipes were filled greater than 50% with deposits and were unable to be inspected.

4. NEPCCO accessed MH9b (the manhole cover is open-grate). NEPCCO's laborer performed a confined space entry to observe the condition of the pipes.

The 36-inch-diameter RCP directed to the buried manhole was filled over 30% with debris and soil and was unable to be recorded. NEPCCO used the camera to video approximately 10 feet of the pipe. With the exception of the debris, the pipe observed appeared to be in good condition relative to its age. I did not observe any cracks or joint displacements.

The 30-inch-diameter RCP directed for MH8 was filled over 30% with debris and soil and was unable to be recorded. NEPCCO used the camera to video approximately 10 feet of the pipe. With the exception of the debris, the pipe observed appeared to be in good condition relative to its age. I did not observe any cracks or joint displacements.

The 8-inch-diameter VCP that appears to run to MH9 was filled over 90% with debris and soil.

The corrugated metal pipe and 15-inch-diameter were not inspected. They appear to be related to drainage of the Founders Bridge and parking lot.

5. NEPCCO accessed MH8. NEPCCO's laborer performed a confined space entry to observe the condition of the pipes.

The 30-inch-diameter RCP directed for MH9 was filled over 30% with debris and soil and was unable to be recorded. NEPCCO used the camera to video approximately 10 feet of the pipe. With the exception of the debris, the pipe observed appeared to be in good condition relative to its age. I did not observe any cracks or joint displacements.

NEPCCO observed the 8-inch-diameter VCP lateral drain connecting to the toe drain. NEPCCO indicated the pipe was in good condition relative to its age.

NEPCCO observed a buried manhole 4 feet east of MH8. The manhole appeared to be grouted at the top. Pipes tied into the manhole appeared to be related to drainage of the parking lot.

NEPCCO performed a CCTV run north of MH8. The pipe was filled approximately 10-25% with debris and soil. I observed a buried manhole 12 feet north of MH8. The manhole appeared to be grouted at the top. Pipes tied into the manhole appeared to be related to drainage.

# FIELD OBSERVATION REPORT

**Project :** Pump Station CCTV Inspections  
**Client :** Town of East Hartford, Connecticut  
**Contractor:** NEPCCO

**Date:** Mon., July 16, 2012  
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## Pictures of Today's Activities:

### Valve Chamber 4 (VC4)



Founders Bridge Manhole location

### Founders Bridge Manhole (MH FB)



Founders Bridge Manhole location

# FIELD OBSERVATION REPORT

**Project :** Pump Station CCTV Inspections  
**Client :** Town of East Hartford, Connecticut  
**Contractor:** NEPCCO

**Date:** Mon., July 16, 2012  
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## MH9b



MH9b location. Walkway ramp north of Founders



MH9b location. Parking lot looking northeast



MH9b looking towards buried manhole.



MH9b looking towards MH8.

# FIELD OBSERVATION REPORT

**Project :** Pump Station CCTV Inspections  
**Client :** Town of East Hartford, Connecticut  
**Contractor:** NEPCCO

**Date:** Mon., July 16, 2012  
**Report No.** 3  
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**No.**

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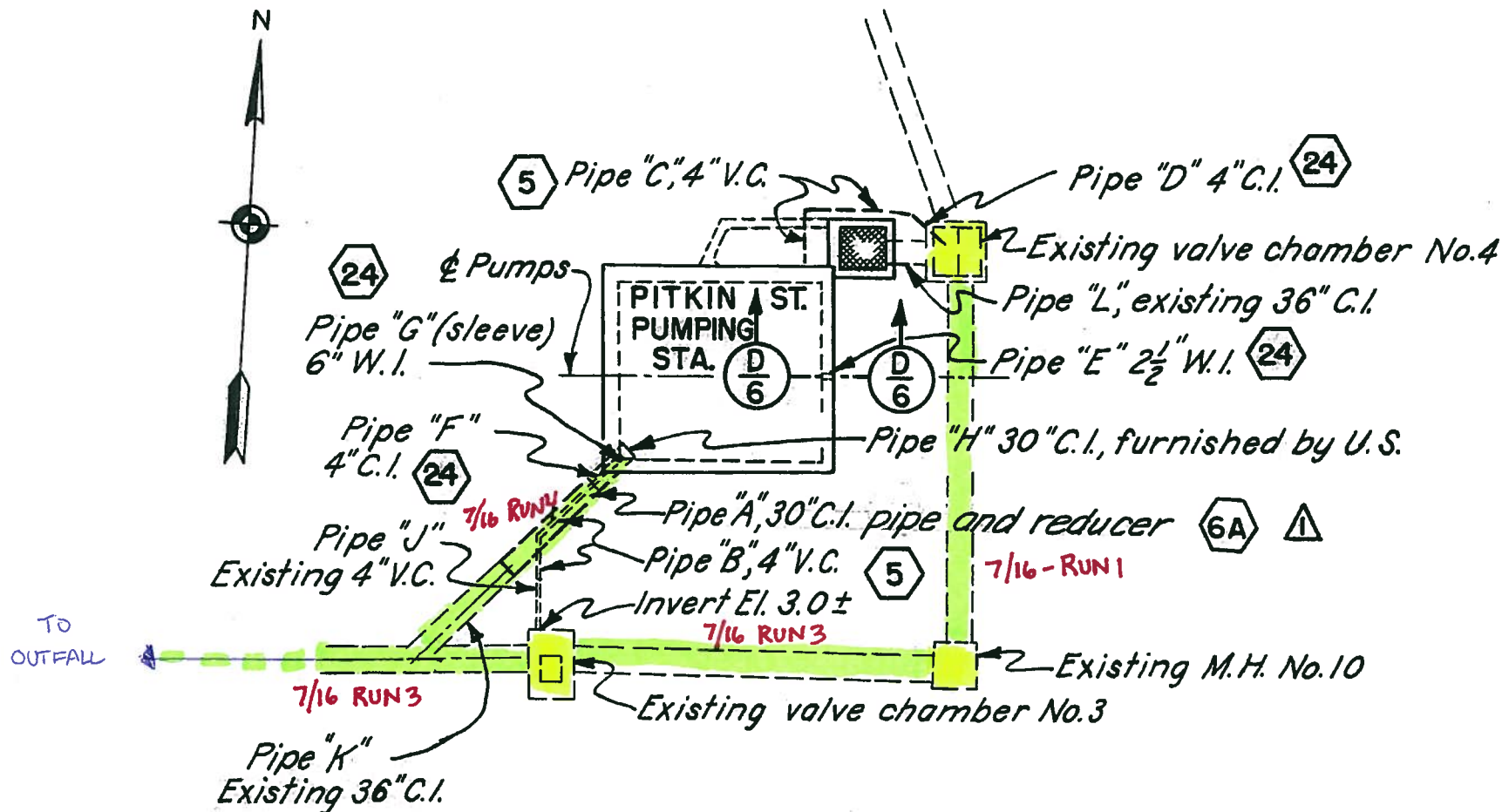


MH9b – 8-inch-diameter VCP to MH9.

**Attachments:** Fig. 1 Pitkin Street Outfall Inspection Summary  
Fig. 2 Collector Drain Inspection Summary  
Fig. 3 MH10 Sketch

END OF REPORT





Observations: In general, pipes appeared to be in good condition relative to their age.

### PLAN - PIPE LOCATIONS



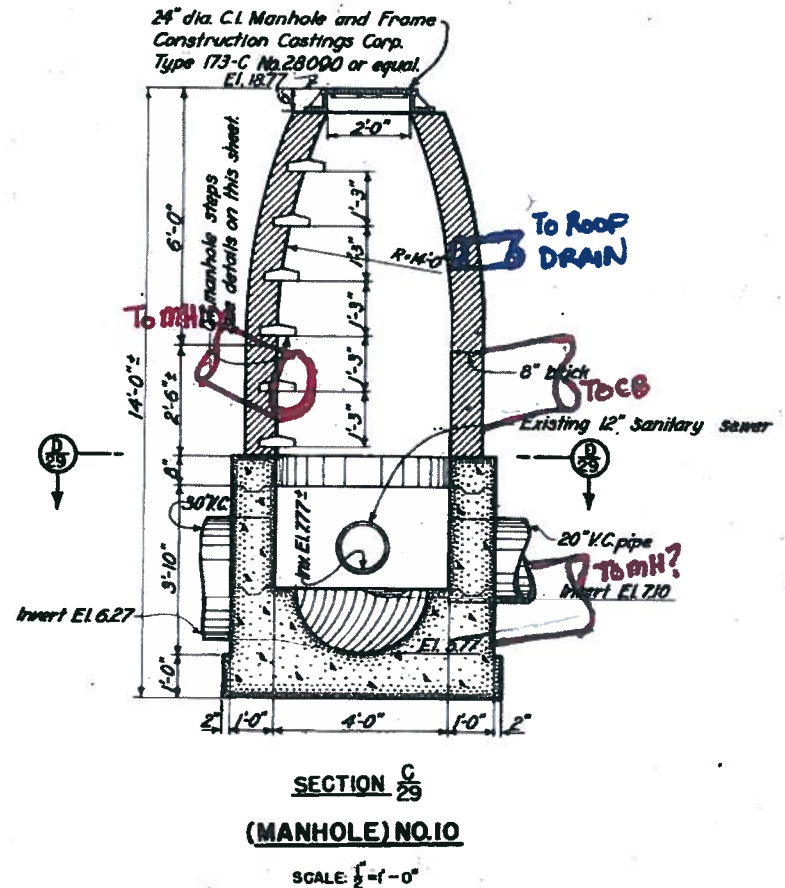
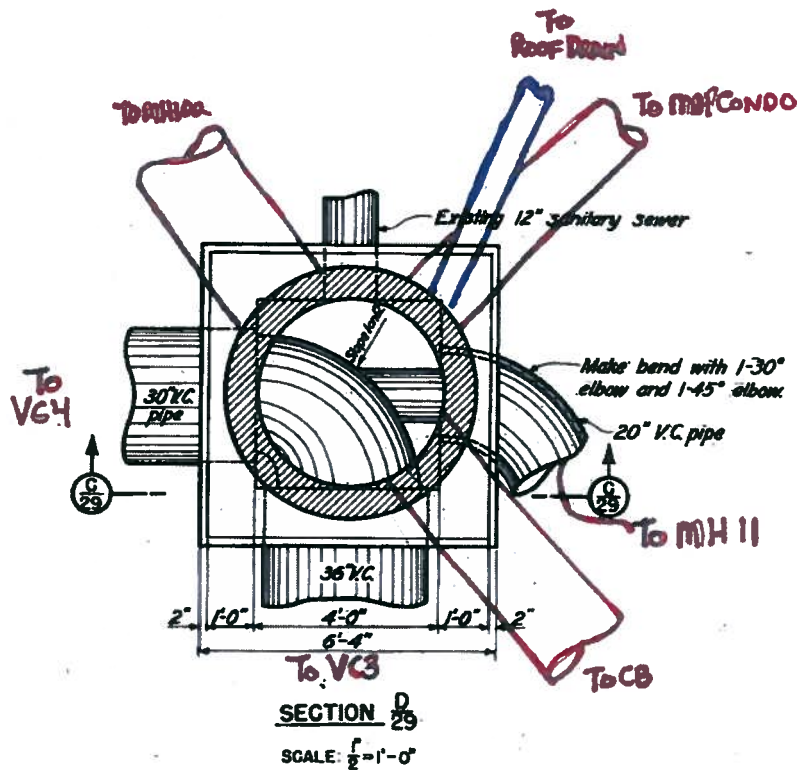
Notes:  
 1. Source: Record Drawings, Sheet No. 6, Miscellaneous Details, Pitkin Street Pumping Station, Connecticut River Flood Control. East Hartford, Connecticut, 1941.

East Hartford Flood Control System  
 East Hartford Pump Station Outfall Inspections  
 East Hartford, Connecticut

Town of East Hartford  
 East Hartford, Connecticut



PITKIN STREET OUTFALL  
 INSPECTIONS



Notes:

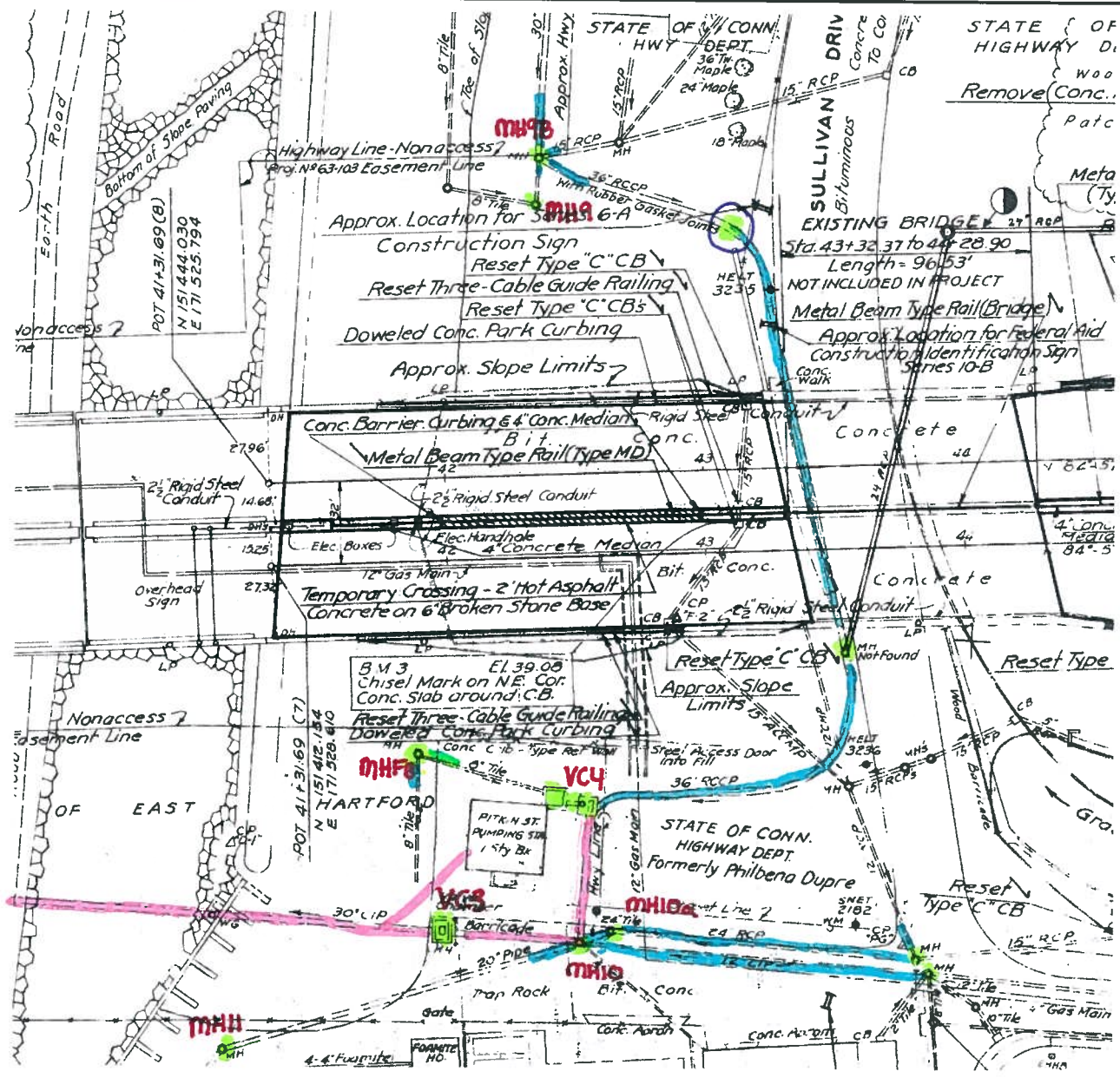
1. Source: Record Drawings, Sheet No. 29, Drainage Structures No. 1, East Hartford Dike, Connecticut River Flood Control. East Hartford, Connecticut, 1939.

<p>East Hartford Flood Control System East Hartford Pump Station Outfall Inspections East Hartford, Connecticut</p>
<p>Town of East Hartford East Hartford, Connecticut</p>

**GEI** Consultants

Project 124470

<p>MANHOLE 10</p>
<p>Page 636 of 685 No. 20-16 Phase 1 Toe Drain Repair Fig. 1</p>



- MANHOLE/  
VALVE CHAMBER
- INSPECTED COLLECTOR  
DRAIN OR PIPE
- SEE OUTFALL  
INSPECTION RESULTS

Notes:  
 1. Source: Record Drawings, Sheet No. 29, Drainage Structures No. 1, East Hartford Dike, Connecticut River Flood Control. East Hartford, Connecticut, 1939.

East Hartford Flood Control System  
 East Hartford Pump Station Outfall Inspections  
 East Hartford, Connecticut

Town of East Hartford  
 East Hartford, Connecticut

**GEI** Consultants

Project 124470 Bid No. 20-18 Phase 1 Toe Drain Repair

MANHOLE 10

Page 637 of 685  
 July 2012  
 Fig. 3

**SECTIONS OF THIS REPORT NOT APPLICABLE TO  
SEGMENT 3 OF THE TOE DRAIN SYSTEM HAVE BEEN  
REMOVED. SPECIFIC RUNS AS NOTED ON PAGE 1 OF  
THE PROJECT SUMMARY SHEET.**

**CCTV Inspections  
Pitkin and Cherry Street Pump Stations  
East Hartford, CT  
June/July 2012**

**FOR:**

**GEI Consulting Engineers  
400 Unicorn Park Drive, 4th Floor  
Woburn, MA 01801**

Sewer System Maintenance  
Rehabilitation Programs  
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**New England Pipe  
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**Division HEITKAMP, Inc.**

99 CALLENDER ROAD  
P.O. BOX 730  
WATERTOWN CT 06795-0730





NEPCCO Division Heitkamp, Inc.  
 99 Callender Road  
 Watertown, CT 06795  
 Phone: 860.274.5469



## Project Summary

### EAST HARTFORD CT GEI 12-03-3028

Main ID	Date	Address	Start MH	Finish MH	Pipe	Asset length	Surveyed Length
VCNO.2/OFNO.1	6/26/2012	CHERRY ST PUMPING STATION	VALVE CHAMBER NO.2	OUTFALL NO.1	CAS	180.3	180.3
VCNO.1/VCNO.2	6/26/2012	CHERRY ST PUMPING STATION	VALVE CHAMBER NO.2	VALVE CHAMER NO.1	VCP	43.8	43.8
CSPS/VCNO.2	6/26/2012	CHERRY ST PUMPING STATION	VALVE CHAMBER NO.2	CHERRY ST PUMPING STATION	CAS	37.6	37.6
EHG-001	6/29/2012	PITKIN STREET PUMP STA	MH 10	PS MH 1	VCP	77.0	77.0
EHG-002	6/29/2012	PITKIN STREET PUMP STA	MH 10	MH 10A	VCP	13.0	13.0
EHG-003	6/29/2012	PITKIN STREET PUMP STA	MH 10A	PS MH 2	RCP	121.0	121.0
EHG-004	6/29/2012	PITKIN STREET PUMP STA	MH 10	VC 3	RCP	52.0	52.0
EHG-005	6/29/2012	PITKIN STREET PUMP STA	VC 3	OUTFLOW	RCP	109.0	109.0
VC4/10	7/16/2012	EAST RIVER DR P.S.#2	VC4	10	RCP	50.5	50.5



**Not included in this report - work performed outside of Toe Drain Design Scope. See 2012 Outfall Inspection Memorandums**

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 Watertown, CT 06795  
 Phone: 860.274.5469



Main ID	Date	Address	Start MH	Finish MH	Pipe	Asset length	Surveyed Length
9B/VC4	7/16/2012	EAST RIVER DR P.S.#2	9B	VC4	RCP	417.0	318.2
VC3/OUTFALL	7/16/2012	EAST RIVER DR P.S.#2	VC3	OUTFALL	RCP	215.6	215.6
PS2/VC3	7/16/2012	EAST RIVER DR P.S.#2	VC3	PS2	RCP	30.0	19.4
11/10	7/16/2012	EAST RIVER P.S.#2	10	11	VCP	100.0	10.0
13/VC4	7/16/2012	EAST RIVER DR P.S.#2	13	VC4	VCP	70.0	10.0
8/9B	7/16/2012	EAST RIVER ST	9B	8	RCP	286.0	10.0

Number of inspections: 15

**Subtotal**                    **1,802.8 ft**    **1,267.4 ft**  
**Total**                         **1,802.8 ft**    **1,267.4 ft**

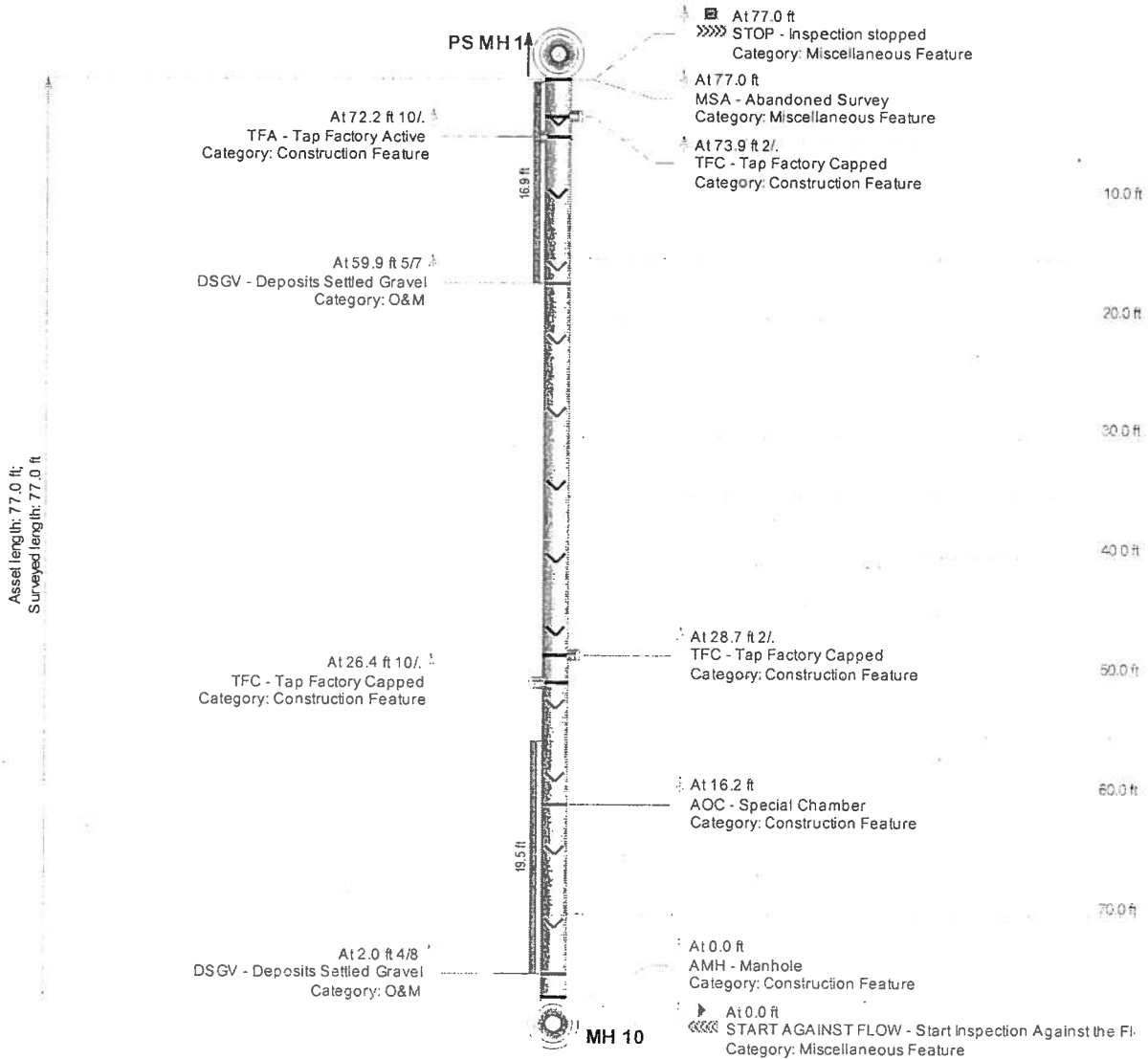






## Main Inspection with Pipe-Run Graph

Project Name: <b>EAST HARTFORD CT GEI 12-03-3028</b>		Mainline ID: <b>EHG-001</b>		City: <b>E.HARTFORD 12-03-3028</b>		Address: <b>PITKIN STREET PUMP STA</b>	
Start date/time: <b>6/29/2012</b>	Pipe width: <b>12</b>	Pipe height: <b>12</b>	Pipe type: <b>VCP</b>	Surface condition: <b>G</b>			
Direction: <b>UPSTREAM</b>		Surveyed footage: <b>77.0</b>		Weather: <b>3</b>		MEDIA_LABEL <b>439-01; 00000-00702</b>	



NEPCCO Division Heitkamp, Inc.  
 99 Callender Road  
 Watertown, CT 06795  
 Phone: 860.274.5469



## PACP Sewer Report

Operator: Mark Ross      SUR\_CERT\_NO: U-704-1473      SYSTEM\_OWNER:      Survey Customer: GEI CONSULTANTS, INC.      DRAINAGE\_AREA:      SHEET\_NUMBER: 1

Work order no.: 12-03-3028      Mainline ID: EHG-001      Start date/time: 2012/06/29 09:00      Address: PITKIN STREET PUMP STA      City: E.HARTFORD 12-03-3028

FURTHER\_LOCATION\_DETAILS:      Upstream node: PS MH 1      Depth:      GRADE\_TO\_INVE:      RIM\_TO\_GRADE:

Downstream node: MH 10      Depth:      GRADE\_TO\_INVERT:      RIM\_TO\_GRADE:      Use of Sewer: SW      Direction: U      Flow Control: N      Pipe height: 12

Pipe width:      Pipe shape: C      Pipe type: VCP      Ln. Method:      Joint distance: 2.0      Asset length: 77.0      Surveyed footage: 77.0      Year laid:      YEAR\_REHABILITAT:      MEDIA\_LABEL: 439-01; 00000-00702

Reason: A      Sewer Category:      Pre-Cleaning: N      DATE\_CLEANED:      Weather: 3      Surface: G      Comments:

Grade	Amount of Structural Defects	Structural			O&M		Overall Pipe				
		Structural Segment Grade	Structural Pipe Rating	Quick Structural Pipe Rating Index	Amount of O&M Defects	O&M Segment Grade	O&M Pipe Rating	Overall Pipe Rating	Overall Pipe Rating Index		
1	0	0			0	0					
2	0	0			7	14					
3	0	0	0	0000	0	0	14	2700	2	14	2
4	0	0			0	0					
5	0	0			0	0					



Operator: Mark Ross      SYSTEM\_OWNER      Start date/time: 2012/06/29      Upstream node: PS MH 1      Mainline ID: EHG-001      SHEET\_NUMBER: 2

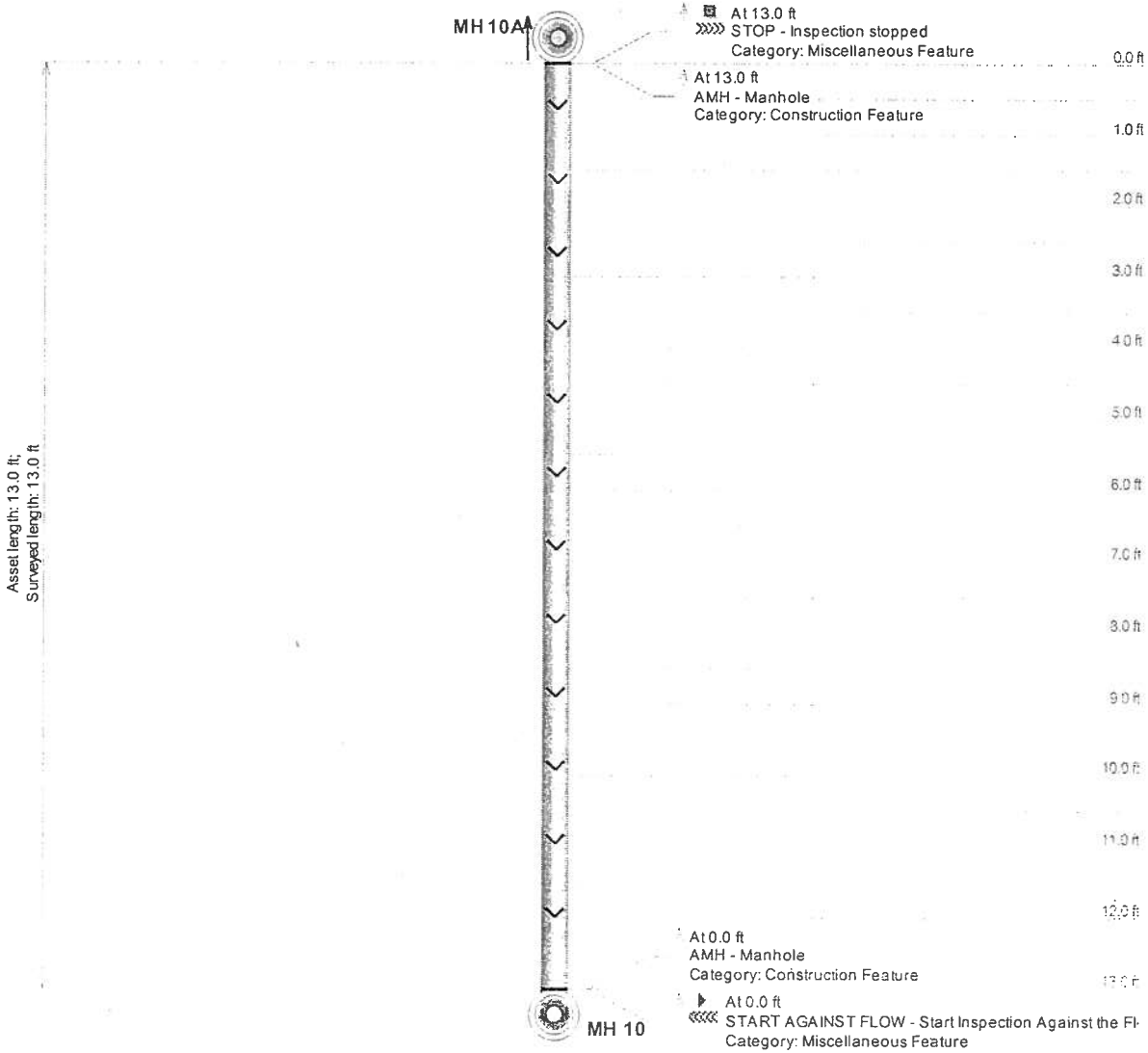
Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
						1st	2nd			At/From	to				
0.0	22	AMH											CF		MH 10
2.0	57	DSGV	S1					10		4	8		O&M	2	
16.2	141	AOC											CF		MANMADE T
21.5	57	DSGV	F1					10		4	8		O&M	2	
26.4	191	TFC				4				10			CF		
28.7	206	TFC				4				2			CF		
59.9	282	DSGV	S2					5		5	7		O&M	2	
72.2	318	TFA				4				10			CF		
73.9	333	TFC				4				2			CF		
76.8	282	DSGV	F2					5		5	7		O&M	2	
77.0	382	MSA													DUE TO DEBRIS OVER 50%

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## Main Inspection with Pipe-Run Graph

Project Name: EAST HARTFORD CT GEI 12-03-3028	Mainline ID: EHG-002	City: E.HARTFORD 12-03-3028 TK 439	Address: PITKIN STREET PUMP STA
Start date/time: 6/29/2012	Pipe width: 	Pipe height: 24	Pipe type: VCP
Direction: UPSTREAM	Surveyed footage: 13.0	Weather: 3	Surface condition: G
		MEDIA_LABEL 439-01; 00702-00838	



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 Watertown, CT 06795  
 Phone: 860.274.5469



## PACP Sewer Report

Operator: Mark Ross      SUR\_CERT\_NO: U-704-1473      SYSTEM\_OWNER:      Survey Customer: GEI CONSULTANTS, INC.      DRAINAGE\_AREA:      SHEET\_NUMBER: 1

Work order no.: 12-03-3028      Mainline ID: EHG-002      Start date/time: 2012/06/29 09:13      Address: PITKIN STREET PUMP STA      City: E.HARTFORD 12-03-3028 TK 439

FURTHER\_LOCATION\_DETAILS      Upstream node: MH 10A      Depth:      GRADE\_TO\_INVE:      RIM\_TO\_GRADE:

Downstream node: MH 10      Depth:      GRADE\_TO\_INVERT:      RIM\_TO\_GRADE:      Use of Sewer: SW      Direction: U      Flow Control: N      Pipe height: 24

Pipe width:      Pipe shape: C      Pipe type: VCP      Ln. Method:      Joint distance: 2.0      Asset length: 13.0      Surveyed footage: 13.0      Year laid:      YEAR\_REHABILITAT:      MEDIA\_LABEL: 439-01; 00702-00838

Reason: A      Sewer Category:      Pre-Cleaning: N      DATE\_CLEAVED:      Weather: 3      Surface: G      Comments:

Grade	Amount of Structural Defects	Structural			O&M			Overall Pipe			
		Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating	Structural Pipe Rating Index	Amount of O&M Defects	O&M Segment Grade	O&M Pipe Rating	O&M Quick Rating	O&M Pipe Rating Index	Overall Pipe Rating
1	0	0			0	0					
2	0	0			0	0					
3	0	0	0	0000	0	0	0	0000	0	0	0
4	0	0			0	0					
5	0	0			0	0					



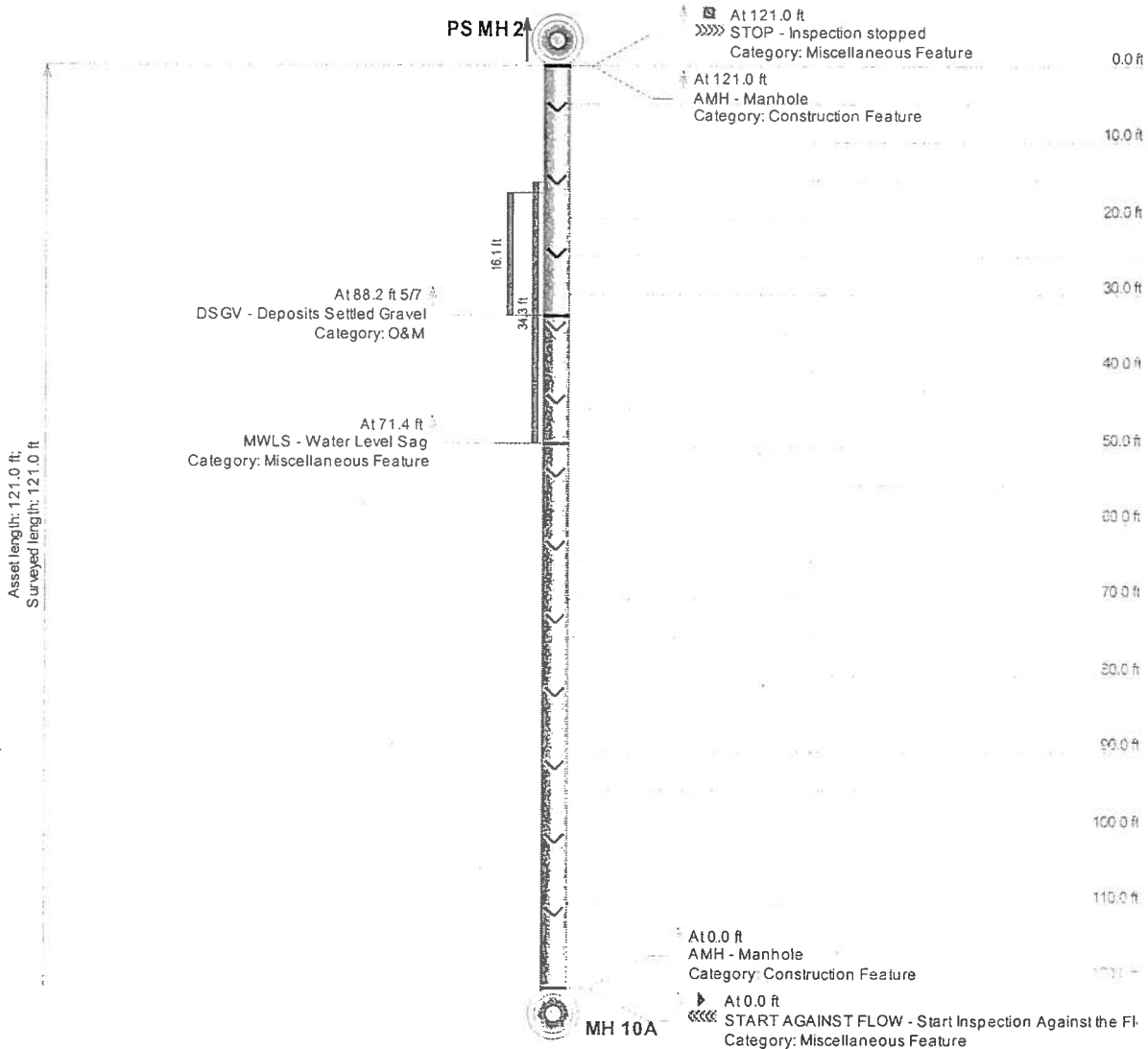
Operator: Mark Ross      SYSTEM\_OWNER: SYSTEM\_OWNER      Start date/time: 2012/06/29      Upstream node: MH 10A      Mainline ID: EHG-002      SHEET\_NUMBER: 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
						1st	2nd			At/From	to				
0.0	9	AMH											CF		MH 10
13.0	79	AMH											CF		MH 10A



## Main Inspection with Pipe-Run Graph

Project Name: EAST HARTFORD CT GEI 12-03-3028		Mainline ID: EHG-003		City: E.HARTFORD 12-03-3028 TK 439		Address: PITKIN STREET PUMP STA	
Start date/time: 6/29/2012		Pipe width: 24		Pipe height: 24		Pipe type: RCP	
Direction: UPSTREAM		Surveyed footage: 121.0		Weather: 1		Surface condition: G	
				Weather: 1		MEDIA_LABEL 439-01; 00838-01845	



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 Phone: 860.274.5469



## PACP Sewer Report

Operator: Mark Ross      SUR\_CERT\_NO: U-704-1473      SYSTEM\_OWNER:      Survey Customer: GEI CONSULTANTS, INC.      DRAINAGE\_AREA:      SHEET\_NUMBER: 1

Work order no.: 12-03-3028      Mainline ID: EHG-003      Start date/time: 2012/06/29 09:18      Address: PITKIN STREET PUMP STA      City: E.HARTFORD 12-03-3028 TK 439

FURTHER\_LOCATION\_DETAILS      Upstream node: PS MH 2      Depth:      GRADE\_TO\_INVE:      RIM\_TO\_GRADE:

Downstream node: MH 10A      Depth:      GRADE\_TO\_INVERT:      RIM\_TO\_GRADE:      Use of Sewer: SW      Direction: U      Flow Control: N      Pipe height: 24

Pipe width:      Pipe shape: C      Pipe type: RCP      Ln. Method:      Joint distance: 4.0      Asset length: 121.0      Surveyed footage: 121.0      Year laid:      YEAR\_REHABILITAT:      MEDIA\_LABEL: 439-01; 00838-01845

Reason: A      Sewer Category:      Pre-Cleaning: N      DATE\_CLEANED:      Weather: 1      Surface: G      Comments:

Grade	Amount of Structural Defects	Structural			O&M		Overall Pipe					
		Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating	Structural Pipe Rating Index	Amount of O&M Defects	O&M Segment Grade	O&M Pipe Rating	O&M Quick Rating	O&M Pipe Rating Index	Overall Pipe Rating	Overall Pipe Rating Index
1	0	0				0	0					
2	0	0				3	6					
3	0	0	0	0000	0	0	0	6	2300	2	20	2
4	0	0				0	0					
5	0	0				0	0					

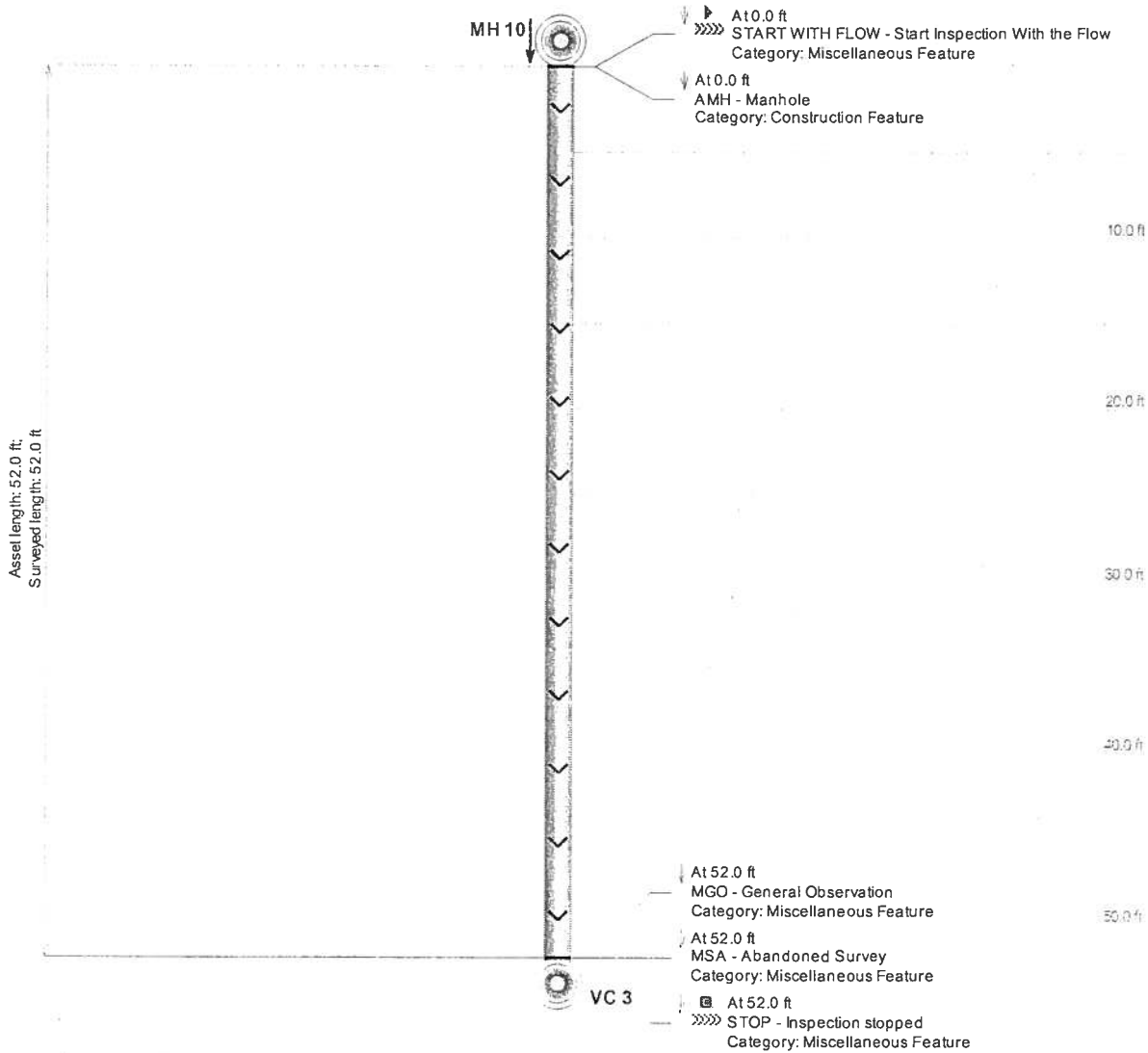






# Main Inspection with Pipe-Run Graph

Project Name: EAST HARTFORD CT GEI 12-03-3028		Mainline ID: EHG-004		City: E.HARTFORD 12-03-3028 TK 439		Address: PITKIN STREET PUMP STA	
Start date/time: 6/29/2012	Pipe width:	Pipe height: 30	Pipe type: RCP	Surface condition: G			
Direction: Downstream		Surveyed footage: 52.0		Weather: 1		MEDIA_LABEL 439-01; 01845-02149	



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 Phone: 860.274.5469



## PACP Sewer Report

Operator: Mark Ross	SUR_CERT_NO U-704-1473	SYSTEM_OWNER	Survey Customer GEI CONSULTANTS, INC.	DRAINAGE_AREA	SHEET_NUMBER 1
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Work order no.: 12-03-3028	Mainline ID: EHG-004	Start date/time: 2012/06/29 09:53	Address: PITKIN STREET PUMP STA	City: E.HARTFORD 12-03-3028 TK 439
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FURTHER_LOCATION_DETAILS	Upstream node: MH 10	Depth:	GRADE_TO_INVE	RIM_TO_GRADE
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Downstream node: VC 3	Depth:	GRADE_TO_INVERT	RIM_TO_GRADE	Use of Sewer SW	Direction: D	Flow Control N	Pipe height: 30
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Pipe width:	Pipe shape: C	Pipe type: RCP	Ln. Method	Joint distance:	Asset length: 52.0	Surveyed footage: 52.0	Year laid:	YEAR_REHABILITAT	MEDIA_LABEL 439-01; 01845-02149
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Reason: A	Sewer Category	Pre-Cleaning N	DATE_CLEANED	Weather: 1	Surface G	Comments
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Grade	Amount of Structural Defects	Structural			O&M			Overall Pipe		
		Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating	O&M Segment Grade	O&M Pipe Rating	O&M Quick Rating	Overall Pipe Rating	Overall Pipe Rating Index	
1	0	0			0	0				
2	0	0			0	0				
3	0	0	0	0000	0	0	0	0000	0	0
4	0	0			0	0				
5	0	0			0	0				



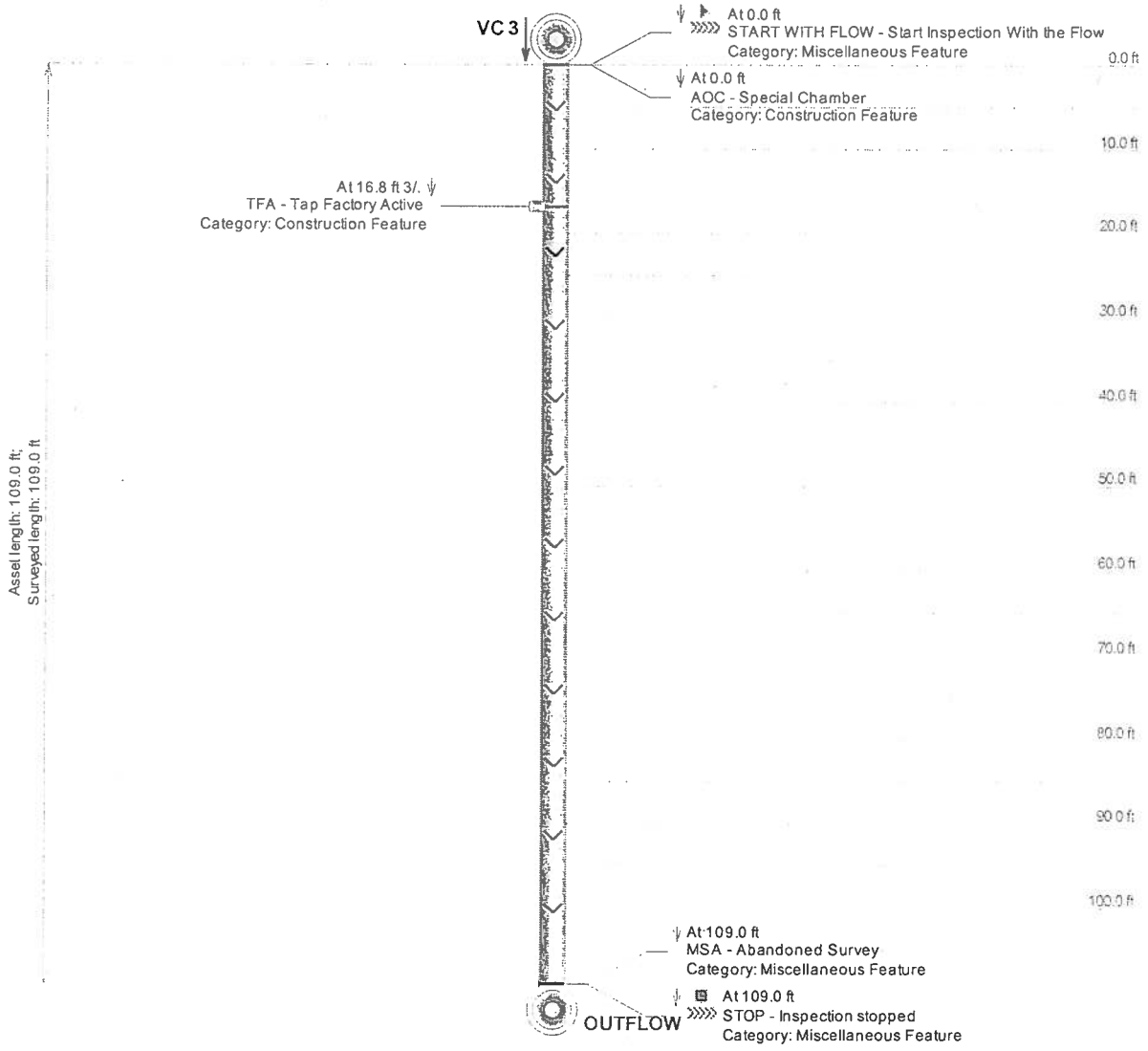
Operator: Mark Ross      SYSTEM\_OWNER      Start date/time: 2012/06/29      Upstream node: MH 10      Mainline ID: EHG-004      SHEET\_NUMBER: 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value		Joint	Circumferential Location	Image Ref.	Family	Rating	Remarks
						Inches (mm)	%						
						1st	2nd	At/From to					
0.0	7	AMH									CF		MH 10
52.0	113	MGO											VC 3 GATEVALVE
52.0	144	MSA											VC 3



# Main Inspection with Pipe-Run Graph

Project Name: EAST HARTFORD CT GEI 12-03-3028	Mainline ID: EHG-005	City: E, HARTFORD 12-03-3028 TK 439	Address: PITKIN STREET PUMP STA
Start date/time: 6/29/2012	Pipe width: 	Pipe height: 30	Pipe type: RCP
Direction: Down stream	Surveyed footage: 109.0	Weather: 1	Surface condition: D
			MEDIA_LABEL 439-01; 02149-0262



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## PACP Sewer Report

Operator: Mark Ross	SUR_CERT_NO U-704-1473	SYSTEM_OWNER	Survey Customer GEI CONSULTANTS, INC.	DRAINAGE_AREA	SHEET_NUMBER 1
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Work order no.: 12-03-3028	Mainline ID: EHG-005	Start date/time: 2012/06/29 09:58	Address: PITKIN STREET PUMP STA	City: E, HARTFORD 12-03-3028 TK 439
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FURTHER_LOCATION_DETAILS	Upstream node: VC 3	Depth:	GRADE_TO_INVE	RIM_TO_GRADE
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Downstream node: OUTFLOW	Depth:	GRADE_TO_INVERT	RIM_TO_GRADE	Use of Sewer SW	Direction: D	Flow Control N	Pipe height: 30
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Pipe width:	Pipe shape: C	Pipe type: RCP	Ln. Method	Joint distance:	Asset length: 109.0	Surveyed footage: 109.0	Year laid:	YEAR_REHABILITAT	MEDIA_LABEL 439-01; 02149-02627
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Reason: A	Sewer Category	Pre-Cleaning N	DATE_CLEANED	Weather: 1	Surface D	Comments
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Grade	Amount of Structural Defects	Structural			O&M			Overall Pipe		
		Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating	Amount of O&M Defects	O&M Segment Grade	O&M Pipe Rating	O&M Quick Rating	Overall Pipe Rating	Overall Pipe Rating Index
1	0	0			0	0				
2	0	0			0	0				
3	0	0	0	0000	0	0	0	0000	0	0
4	0	0			0	0				
5	0	0			0	0				



Operator: Mark Ross      SYSTEM\_OWNER      Start date/time: 2012/06/29      Upstream node: VC 3      Mainline ID: EHG-005      SHEET\_NUMBER: 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
						1st	2nd			At/From	to				
0.0	9	AOC											CF		VC 3 GATEVALVE
16.8	64	TFA				30				3			CF		
109.0	269	MSA													DUE TO FLOW

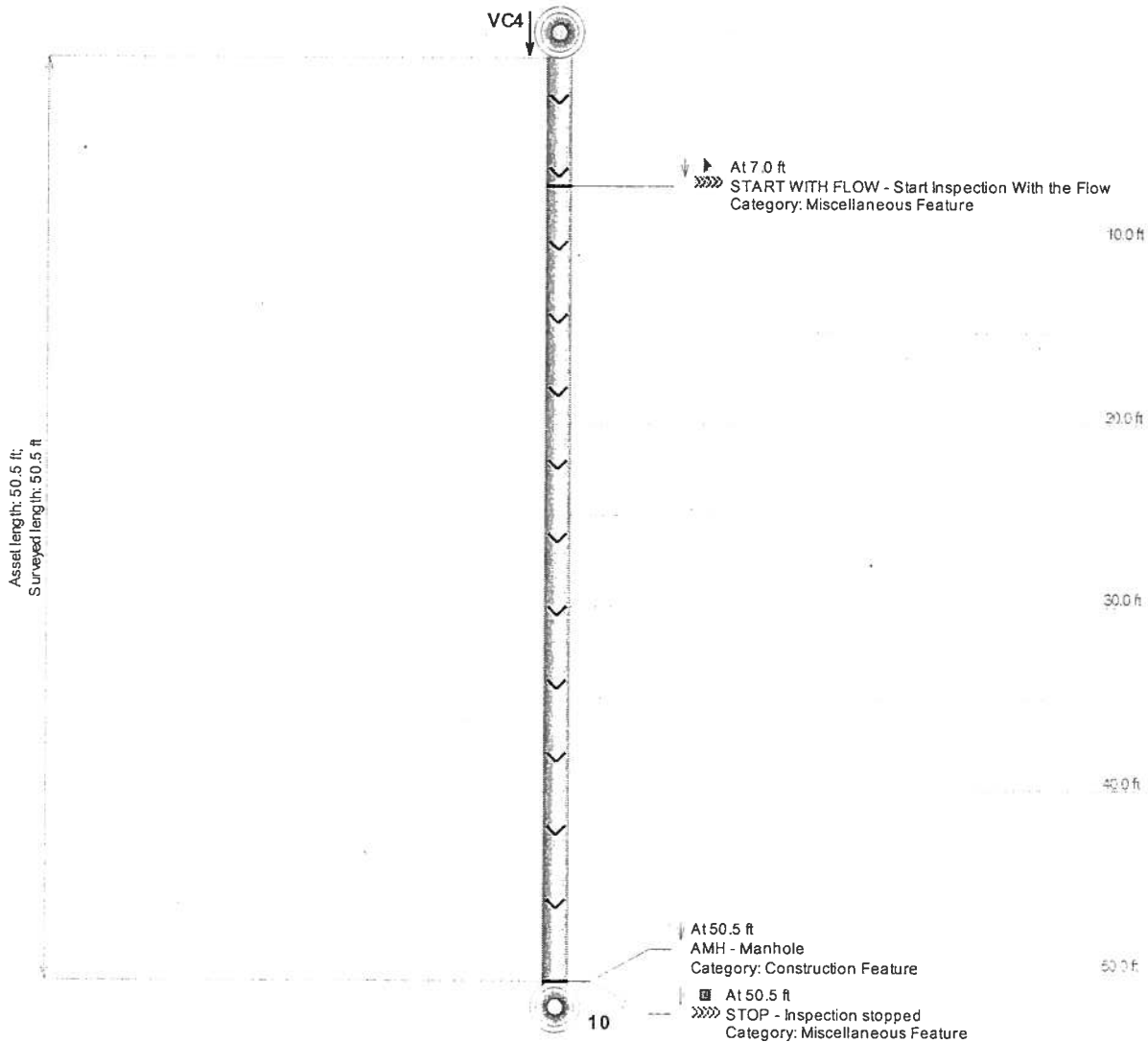






## Main Inspection with Pipe-Run Graph

Project Name: EAST HARTFORD CT GEI 12-03-3028	Mainline ID: VC4/10	City: EAST HARTFORD CT	Address: EAST RIVER DR P.S.#2
Start date/time: 7/16/2012	Pipe width: 	Pipe height: 30	Pipe type: RCP
Direction: Downstream	Surveyed footage: 50.5	Weather: 	MEDIA_LABEL 50-2 0:00:00-0:02:2



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 Phone: 860.274.5469



## PACP Sewer Report

Operator: JOSEPH ASSARD      SUR\_CERT\_NO: U-704-1474      SYSTEM\_OWNER:      Survey Customer: GEI CONSULTANTS, INC.      DRAINAGE\_AREA:      SHEET\_NUMBER: 1

Work order no.:      Mainline ID: VC4/10      Start date/time: 2012/07/16 08:49      Address: EAST RIVER DR P.S.#2      City: EAST HARTFORD CT

FURTHER\_LOCATION\_DETAILS      Upstream node: VC4      Depth:      GRADE\_TO\_INVE:      RIM\_TO\_GRADE:

Downstream node: 10      Depth:      GRADE\_TO\_INVERT:      RIM\_TO\_GRADE:      Use of Sewer:      Direction: D      Flow Control:      Pipe height: 30

Pipe width:      Pipe shape: C      Pipe type: RCP      Ln. Method:      Joint distance:      Asset length: 50.5      Surveyed footage: 50.5      Year laid:      YEAR\_REHABILITAT:      MEDIA\_LABEL: 450-2 0:00:00-0:02:26

Reason:      Sewer Category:      Pre-Cleaning: N      DATE\_CLEANED: 2012/07/16      Weather:      Surface:      Comments:

Grade	Amount of Structural Defects	Structural			O&M			Overall Pipe		
		Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating	Amount of O&M Defects	O&M Segment Grade	O&M Pipe Rating	O&M Quick Rating	Overall Pipe Rating	Overall Pipe Rating Index
1	0	0			0	0				
2	0	0			0	0				
3	0	0	0	0000	0	0	0	0000	0	0
4	0	0			0	0				
5	0	0			0	0				

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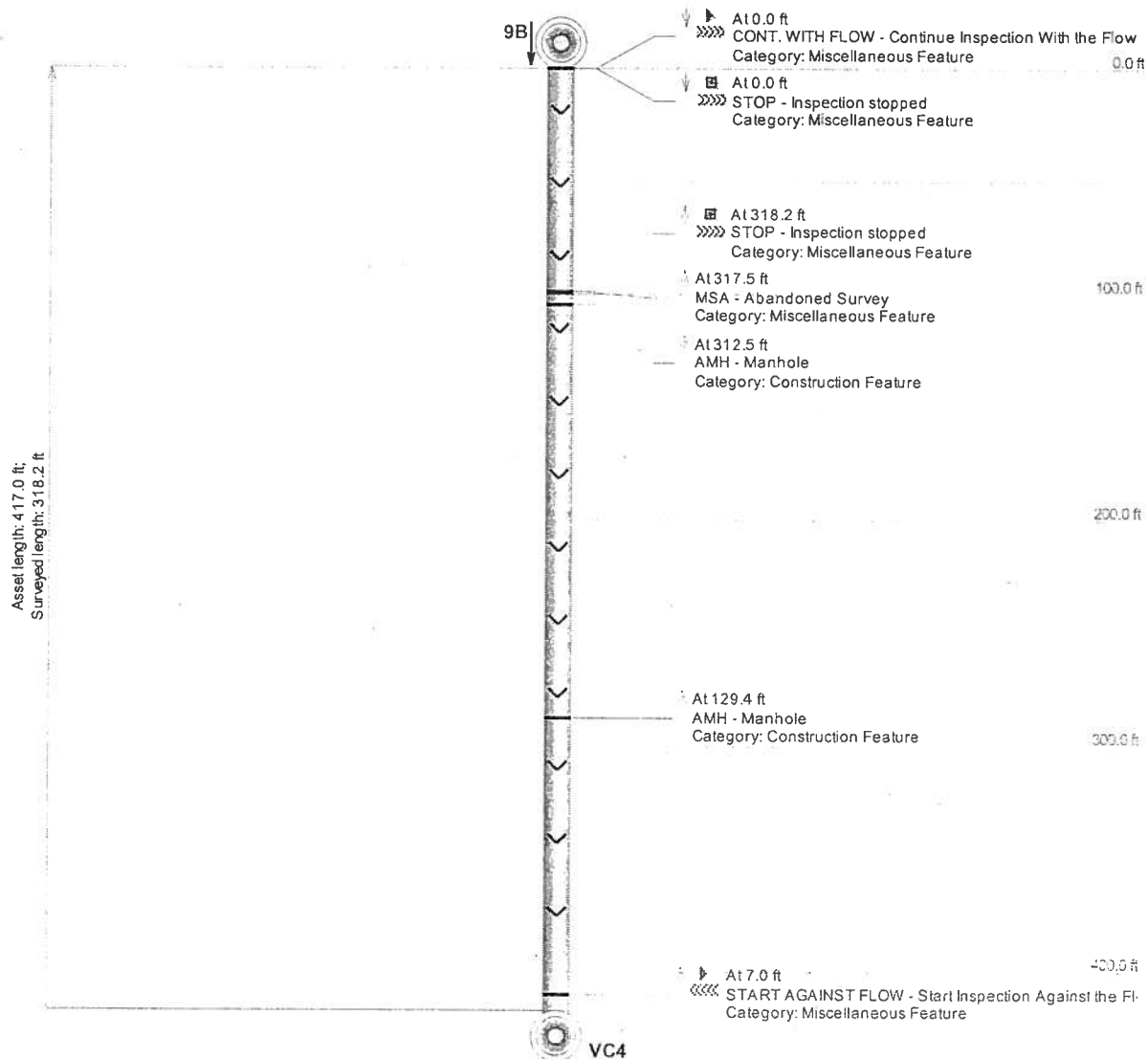
Operator: JOSEPH ASSARD      SYSTEM\_OWNER  
 Start date/time: 2012/07/16      Upstream node: VC4  
 Mainline ID: VC4/10      SHEET\_NUMBER: 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value		Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
						Inches (mm)	%		At/From	to				
50.5	140	AMH										CF		MH10



## Main Inspection with Pipe-Run Graph

Project Name: EAST HARTFORD CT GEI 12-03-3028	Mainline ID: 9B/VC4	City: EAST HARTFORD CT	Address: EAST RIVER DR P.S.#2
Start date/time: 7/16/2012	Pipe width: 	Pipe height: 36	Pipe type: RCP
Direction: Downstream	Surveyed footage: 318.2	Weather: 	MEDIA_LABEL 50-2 0:02:26-0:19:1



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 Watertown, CT 06795  
 Phone: 860.274.5469



## PACP Sewer Report

Operator: JOSEPH ASSARD      SUR\_CERT\_NO: U-704-1474      SYSTEM\_OWNER:      Survey Customer: GEI CONSULTANTS, INC.      DRAINAGE\_AREA:      SHEET\_NUMBER: 1

Work order no.:      Mainline ID: 9B/VC4      Start date/time: 2012/07/16 08:57      Address: EAST RIVER DR P.S.#2      City: EAST HARTFORD CT

FURTHER\_LOCATION\_DETAILS:      Upstream node: 9B      Depth:      GRADE\_TO\_INVE:      RIM\_TO\_GRADE:

Downstream node: VC4      Depth:      GRADE\_TO\_INVERT:      RIM\_TO\_GRADE:      Use of Sewer:      Direction: D      Flow Control:      Pipe height: 36

Pipe width:      Pipe shape: C      Pipe type: RCP      Ln. Method:      Joint distance:      Asset length: 417.0      Surveyed footage: 318.2      Year laid:      YEAR\_REHABILITAT:      MEDIA\_LABEL: 450-2  
0:02:26-0:19:17

Reason:      Sewer Category:      Pre-Cleaning: N      DATE\_CLEANED: 2012/07/16      Weather:      Surface:      Comments:

Grade	Amount of Structural Defects	Structural Segment Grade	Structural			O&M		ORM			Overall Pipe	
			Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	O&M Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0				0	0					
2	0	0				0	0					
3	0	0	0	0000	0	0	0	0000	0	0	0	0
4	0	0				0	0					
5	0	0				0	0					

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 Phone: 860.274.5469



## PACP Sewer Report

Operator: JOSEPH ASSARD      SUR\_CERT\_NO: U-704-1474      SYSTEM\_OWNER:      Survey Customer: GEI CONSULTANTS, INC.      DRAINAGE\_AREA:      SHEET\_NUMBER: 1

Work order no.:      Mainline ID: VC4/10      Start date/time: 2012/07/16 08:49      Address: EAST RIVER DR P.S.#2      City: EAST HARTFORD CT

FURTHER\_LOCATION\_DETAILS      Upstream node: VC4      Depth:      GRADE\_TO\_INVE:      RIM\_TO\_GRADE:

Downstream node: 10      Depth:      GRADE\_TO\_INVERT:      RIM\_TO\_GRADE:      Use of Sewer:      Direction: D      Flow Control:      Pipe height: 30

Pipe width:      Pipe shape: C      Pipe type: RCP      Ln. Method:      Joint distance:      Asset length: 50.5      Surveyed footage: 50.5      Year laid:      YEAR\_REHABILITAT:      MEDIA\_LABEL: 450-2  
 0:00:00-0:02:26

Reason:      Sewer Category:      Pre-Cleaning: N      DATE\_CLEANED: 2012/07/16      Weather:      Surface:      Comments:

Grade	Amount of Structural Defects	Structural			O&M			Overall Pipe		
		Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating	Amount of O&M Defects	O&M Segment Grade	O&M Pipe Rating	O&M Quick Rating	Overall Pipe Rating	Overall Pipe Rating Index
1	0	0			0	0				
2	0	0			0	0				
3	0	0	0	0000	0	0	0	0000	0	0
4	0	0			0	0				
5	0	0			0	0				



Operator: JOSEPH ASSARD      SYSTEM\_OWNER      Start date/time: 2012/07/16      Upstream node: VC4      Mainline ID: VC4/10      SHEET\_NUMBER: 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value		%	Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
						Inches (mm)				At/From	to				
50.5	140	AMH											CF		MH10

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 Watertown, CT 06795  
 Phone: 860.274.5469



## PACP Sewer Report

Operator: JOSEPH ASSARD      SUR\_CERT\_NO: U-704-1474      SYSTEM\_OWNER:      Survey Customer: GEI CONSULTANTS, INC.      DRAINAGE\_AREA:      SHEET\_NUMBER: 1

Work order no.:      Mainline ID: 9B/VC4      Start date/time: 2012/07/16 08:57      Address: EAST RIVER DR P.S.#2      City: EAST HARTFORD CT

FURTHER\_LOCATION\_DETAILS:      Upstream node: 9B      Depth:      GRADE\_TO\_INVE:      RIM\_TO\_GRADE:

Downstream node: VC4      Depth:      GRADE\_TO\_INVERT:      RIM\_TO\_GRADE:      Use of Sewer:      Direction: D      Flow Control:      Pipe height: 36

Pipe width:      Pipe shape: C      Pipe type: RCP      Ln. Method:      Joint distance:      Asset length: 417.0      Surveyed footage: 318.2      Year laid:      YEAR\_REHABILITAT:      MEDIA\_LABEL: 450-2  
0:02:26-0:19:17

Reason:      Sewer Category:      Pre-Cleaning: N      DATE\_CLEANED: 2012/07/16      Weather:      Surface:      Comments:

Grade	Amount of Structural Defects	Structural Segment Grade	Structural			O&M		ORM			Overall Pipe	
			Pipe Rating	Quick Rating	Pipe Rating Index	Defects	Segment Grade	O&M Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Pipe Rating Index
1	0	0				0	0					
2	0	0				0	0					
3	0	0	0	0000	0	0	0	0000	0	0	0	0
4	0	0				0	0					
5	0	0				0	0					





Operator: JOSEPH ASSARD      SYSTEM\_OWNER      Start date/time: 2012/07/16      Upstream node: 9B      Mainline ID: 9B/VC4      SHEET\_NUMBER: 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
						1st	2nd			At/From	to				
129.4	477	AMH											CF		EXTRA MH
312.5	964	AMH											CF		EXTRA MH
317.5	1128	MSA													DIRT



Operator: JOSEPH ASSARD      SYSTEM\_OWNER      Start date/time: 2012/07/16      Upstream node: 9B      Mainline ID: 9B/VC4      SHEET\_NUMBER: 2

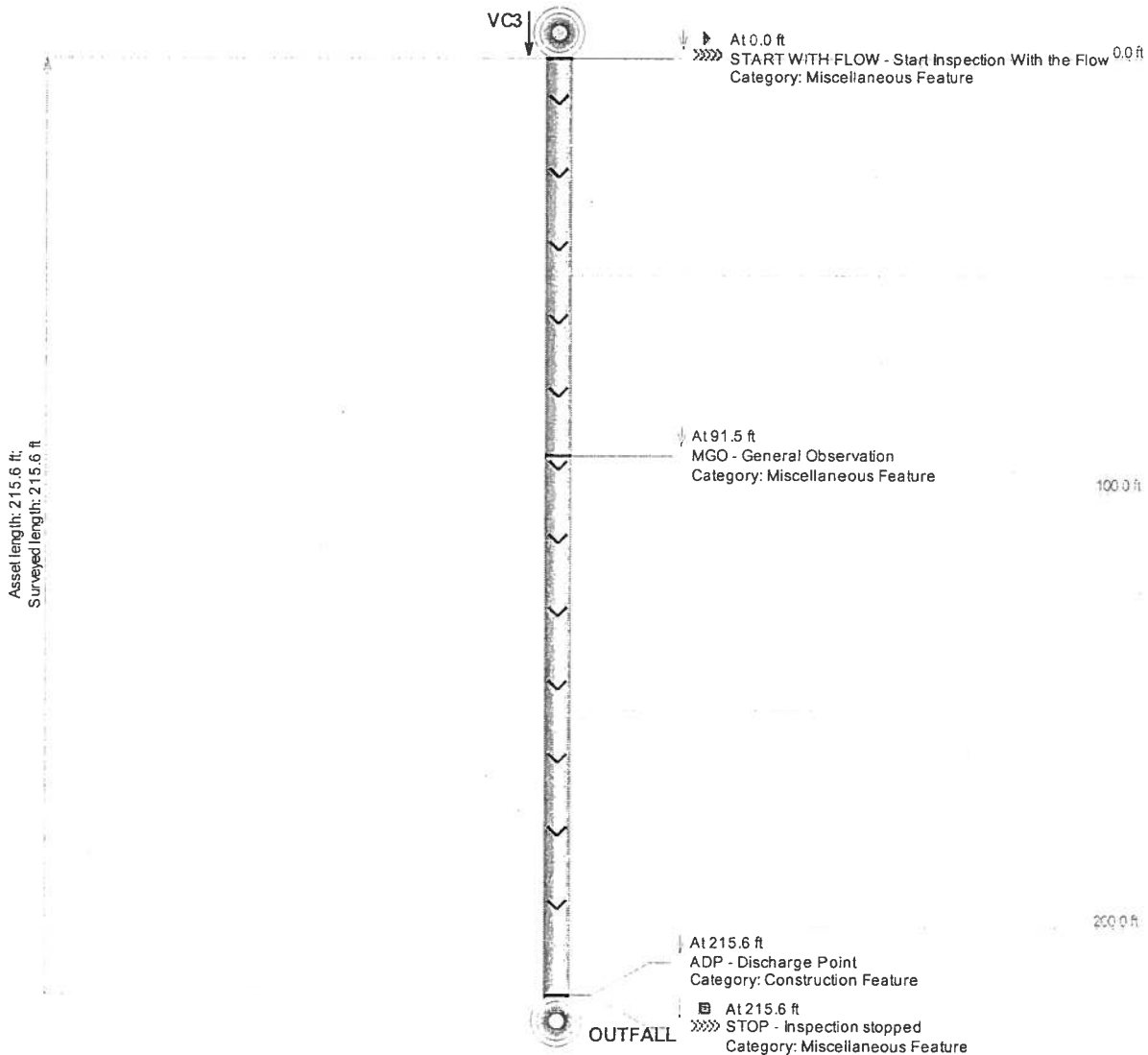
Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
						1st	2nd			At/From	to				
129.4	477	AMH											CF		EXTRA MH
312.5	964	AMH											CF		EXTRA MH
317.5	1128	MSA													DIRT

NEPCCO Division Heitkamp, Inc.  
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 Phone: 860.274.5469



## Main Inspection with Pipe-Run Graph

Project Name: EAST HARTFORD CT GEI 12-03-3028	Mainline ID: VC3/OUTFALL	City: EAST HARTFORD CT	Address: EAST RIVER DR P.S. #2
Start date/time: 7/16/2012	Pipe width: 36	Pipe height: RCP	Surface condition:
Direction: Downstream	Surveyed footage: 215.6	Weather: 50-1	MEDIA_LABEL 0:19:17-0:28:3



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 39 Callender Road  
 Watertown, CT 06795  
 Phone: 860.274.5469



## PACP Sewer Report

Operator: JOSEPH ASSARD      SUR\_CERT\_NO: U-704-1474      SYSTEM\_OWNER:      Survey Customer: GEI CONSULTANTS, INC.      DRAINAGE\_AREA:      SHEET\_NUMBER: 1

Work order no.:      Mainline ID: VC3/OUTFALL      Start date/time: 2012/07/16 10:15      Address: EAST RIVER DR P.S.#2      City: EAST HARTFORD CT

FURTHER\_LOCATION\_DETAILS:      Upstream node: VC3      Depth:      GRADE\_TO\_INVE:      RIM\_TO\_GRADE:

Downstream node: OUTFALL      Depth:      GRADE\_TO\_INVERT:      RIM\_TO\_GRADE:      Use of Sewer:      Direction: D      Flow Control:      Pipe height: 36

Pipe width:      Pipe shape: C      Pipe type: RCP      Ln. Method:      Joint distance:      Asset length: 215.6      Surveyed footage: 215.6      Year laid:      YEAR\_REHABILITAT:      MEDIA\_LABEL: 450-10:19:17-0:28:34

Reason:      Sewer Category:      Pre-Cleaning: N      DATE\_CLEANED: 2012/07/16      Weather:      Surface:      Comments:

Grade	Amount of Structural Defects	Structural			O&M			Overall Pipe			
		Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating	Structural Pipe Rating Index	Amount of O&M Defects	O&M Segment Grade	O&M Pipe Rating	O&M Quick Rating	O&M Pipe Rating Index	Overall Pipe Rating
1	0	0			0	0					
2	0	0			0	0					
3	0	0	0	0000	0	0	0	0000	0	0	0
4	0	0			0	0					
5	0	0			0	0					

VEPCCO Division Heitkamp, Inc.  
 39 Callender Road  
 Watertown, CT 06795  
 Phone: 860.274.5469



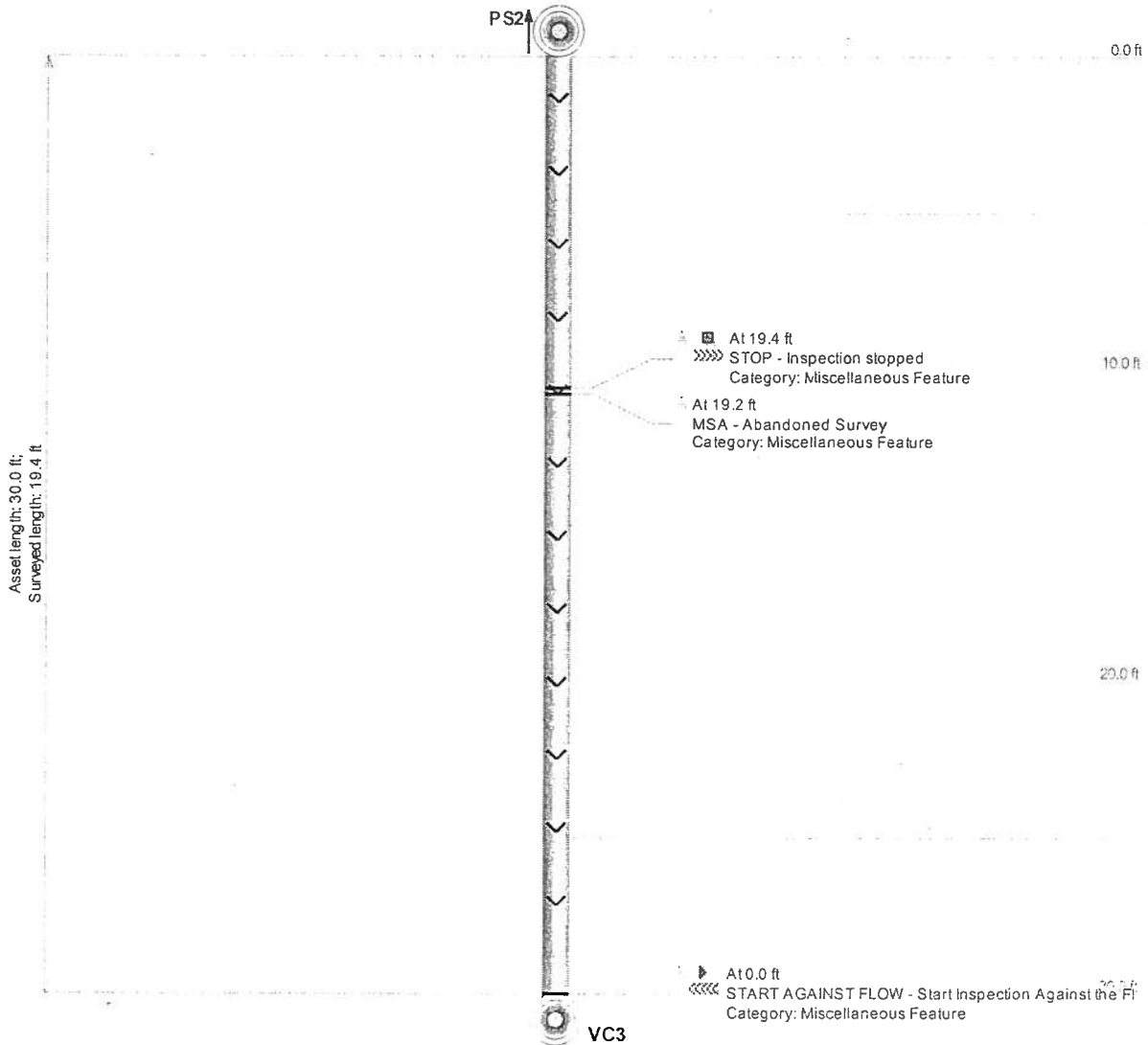
Operator: JOSEPH ASSARD      SYSTEM\_OWNER      Start date/time: 2012/07/16      Upstream node: VC3      Mainline ID: VC3/OUTFALL      SHEET\_NUMBER: 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks	
						1st	2nd			At/From	to					
91.5	267	MGO														VALVE
215.6	531	ADP											CF			OUTFALL



## Main Inspection with Pipe-Run Graph

Project Name: EAST HARTFORD CT GEI 12-03-3028	Mainline ID: PS2/VC3	City: EAST HARTFORD CT	Address: EAST RIVER DR P.S. #2
Start date/time: 7/16/2012	Pipe width: 	Pipe height: 36	Pipe type: RCP
Direction: UPSTREAM	Surveyed footage: 19.4	Weather: 	MEDIA_LABEL: 50-2 0:28:34-0:30:2



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## PACP Sewer Report

Operator: JOSEPH ASSARD      SUR\_CERT\_NO: U-704-1474      SYSTEM\_OWNER:      Survey Customer: GEI CONSULTANTS, INC.      DRAINAGE\_AREA:      SHEET\_NUMBER: 1

Work order no.:      Mainline ID: PS2/VC3      Start date/time: 2012/07/16 10:36      Address: EAST RIVER DR P.S.#2      City: EAST HARTFORD CT

FURTHER\_LOCATION\_DETAILS      Upstream node: PS2      Depth:      GRADE\_TO\_INVE:      RIM\_TO\_GRADE:

Downstream node: VC3      Depth:      GRADE\_TO\_INVERT:      RIM\_TO\_GRADE:      Use of Sewer:      Direction: U      Flow Control:      Pipe height: 36

Pipe width:      Pipe shape: C      Pipe type: RCP      Ln. Method:      Joint distance:      Asset length: 30.0      Surveyed footage: 19.4      Year laid:      YEAR\_REHABILITAT:      MEDIA\_LABEL: 450-2 0:28:34-0:30:25

Reason:      Sewer Category:      Pre-Cleaning: N      DATE\_CLEANED: 2012/07/16      Weather:      Surface:      Comments:

Grade	Amount of Structural Defects	Structural			Amount of O&M Defects	O&M Segment Grade	O&M			Overall Pipe	
		Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating			Structural Pipe Rating Index	O&M Pipe Rating	O&M Quick Rating	O&M Pipe Rating Index	Overall Pipe Rating
1	0	0			0	0					
2	0	0			0	0					
3	0	0	0	0000	0	0	0	0000	0	0	0
4	0	0			0	0					
5	0	0			0	0					



Operator: JOSEPH ASSARD      SYSTEM\_OWNER      Start date/time: 2012/07/16      Upstream node: PS2      Mainline ID: PS2/VC3      SHEET NUMBER 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm)		%	Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
						1st	2nd			At/From	to				
19.2	105	MSA													COULD NT GET TO PUMP OUTLETS

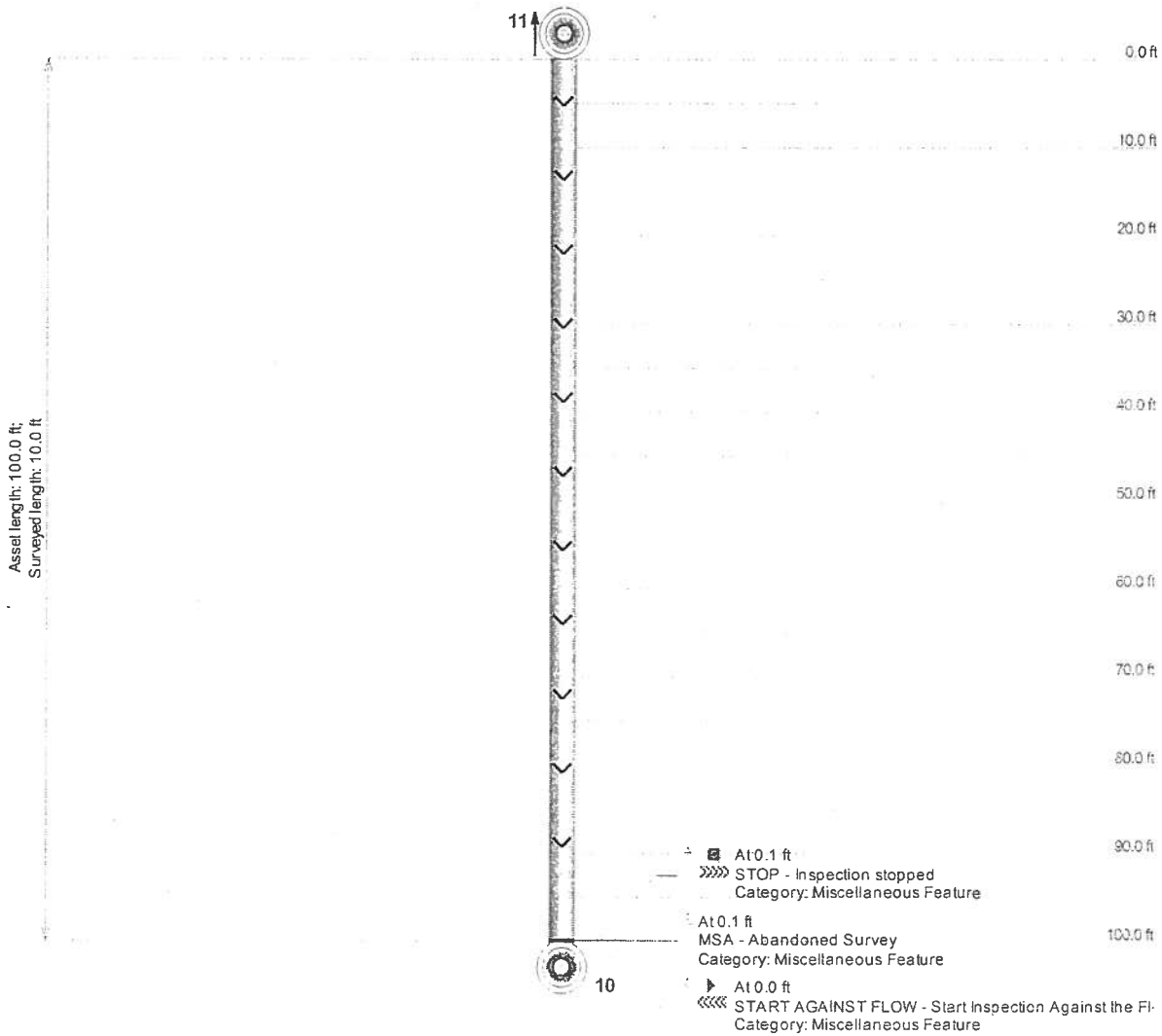


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## Main Inspection with Pipe-Run Graph

Project Name: EAST HARTFORD CT GEI 12-03-3028	Mainline ID: 11/10	City: EAST HARTFOED CT	Address: EAST RIVER P.S. #2
Start date/time: 7/16/2012	Pipe width: 	Pipe height: 20	Pipe type: VCP
Direction: UPSTREAM	Surveyed footage: 10.0	Weather: 	MEDIA_LABEL: 50-2 0:30:25-0:33:1



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## PACP Sewer Report

Operator: JOSEPH ASSARD      SUR\_CERT\_NO: U-704-1474      SYSTEM\_OWNER:      Survey Customer: GEI CONSULTANTS, INC.      DRAINAGE\_AREA:      SHEET\_NUMBER: 1

Work order no.:      Mainline ID: 11/10      Start date/time: 2012/07/16 11:00      Address: EAST RIVER P.S.#2      City: EAST HARTFOED CT

FURTHER\_LOCATION\_DETAILS:      Upstream node: 11      Depth:      GRADE\_TO\_INVE:      RIM\_TO\_GRADE:

Downstream node: 10      Depth:      GRADE\_TO\_INVERT:      RIM\_TO\_GRADE:      Use of Sewer:      Direction: U      Flow Control:      Pipe height: 20

Pipe width:      Pipe shape: C      Pipe type: VCP      Ln. Method:      Joint distance:      Asset length: 100.0      Surveyed footage: 10.0      Year laid:      YEAR\_REHABILITAT:      MEDIA\_LABEL: 450-2 0:30:25-0:33:19

Reason:      Sewer Category:      Pre-Cleaning: N      DATE\_CLEANED: 2012/07/16      Weather:      Surface:      Comments:

Grade	Amount of Structural Defects	Structural Segment Grade	Structural			O&M		Overall Pipe				
			Pipe Rating	Structural Quick Rating	Pipe Rating Index	Amount of O&M Defects	O&M Segment Grade	O&M Pipe Rating	O&M Quick Rating	O&M Pipe Rating Index	Overall Pipe Rating	Overall Pipe Rating Index
1	0	0				0	0					
2	0	0				0	0					
3	0	0	0	0000	0	0	0	0000	0	0	0	0
4	0	0				0	0					
5	0	0				0	0					



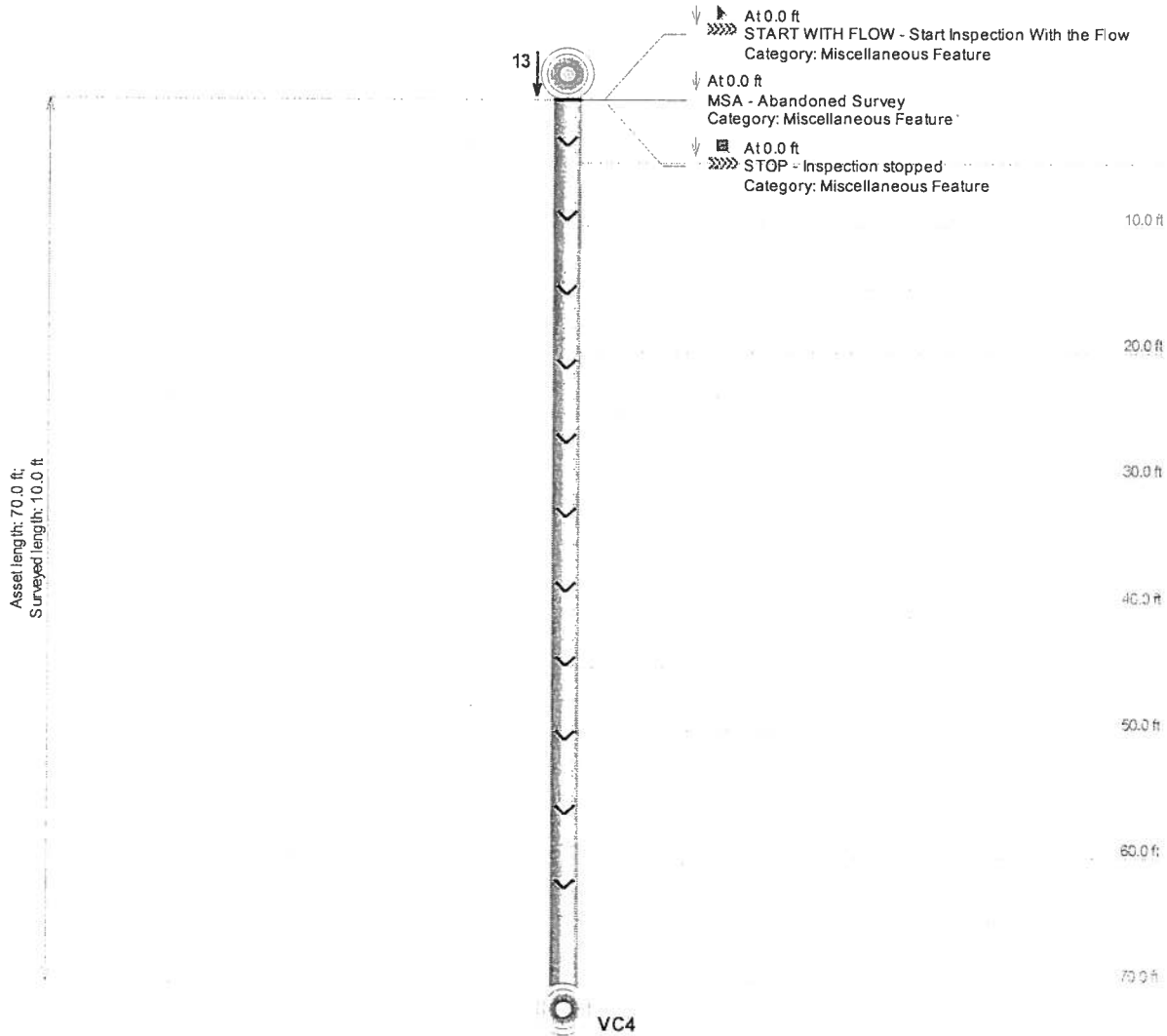
Operator: JOSEPH ASSARD      SYSTEM\_OWNER      Start date/time: 2012/07/16      Upstream node: 11      Mainline ID: 11/10      SHEET\_NUMBER: 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value		Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks	
						Inches (mm)	%		At/From	to					
0.1	173	MSA													DIRT



## Main Inspection with Pipe-Run Graph

Project Name: EAST HARTFORD CT GEI 12-03-3028	Mainline ID: 13/VC4	City: EAST HARTFORD CT	Address: EAST RIVER DR P.S. #2
Start date/time: 7/16/2012	Pipe width: 	Pipe height: 8	Pipe type: VCP
Direction: Downstream	Surveyed footage: 10.0	Weather: 	MEDIA_LABEL: .50-2 0:33:19-0:35:0



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## PACP Sewer Report

Operator: JOSEPH ASSARD    SUR\_CERT\_NO: U-704-1474    SYSTEM\_OWNER:    Survey Customer: GEI CONSULTANTS, INC.    DRAINAGE\_AREA:    SHEET\_NUMBER: 1

Work order no.:    Mainline ID: 13/VC4    Start date/time: 2012/07/16 11:21    Address: EAST RIVER DR P.S.#2    City: EAST HARTFORD CT

FURTHER\_LOCATION\_DETAILS:    Upstream node: 13    Depth:    GRADE\_TO\_INVE:    RIM\_TO\_GRADE:

Downstream node: VC4    Depth:    GRADE\_TO\_INVERT:    RIM\_TO\_GRADE:    Use of Sewer:    Direction: D    Flow Control:    Pipe height: 8

Pipe width:    Pipe shape: C    Pipe type: VCP    Ln. Method:    Joint distance:    Asset length: 70.0    Surveyed footage: 10.0    Year laid:    YEAR\_REHABILITAT:    MEDIA\_LABEL: 450-2 0:33:19-0:35:01

Reason:    Sewer Category:    Pre-Cleaning: N    DATE\_CLEANED: 2012/07/16    Weather:    Surface:    Comments:

Grade	Amount of Structural Defects	Structural Segment Grade	Structural			ORM			Overall Pipe		
			Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Quick Rating	Pipe Rating Index	Pipe Rating	Quick Rating	Pipe Rating Index
1	0	0	0	0000	0	0	0	0	0000	0	0
2	0	0				0	0				
3	0	0				0	0				
4	0	0				0	0				
5	0	0				0	0				



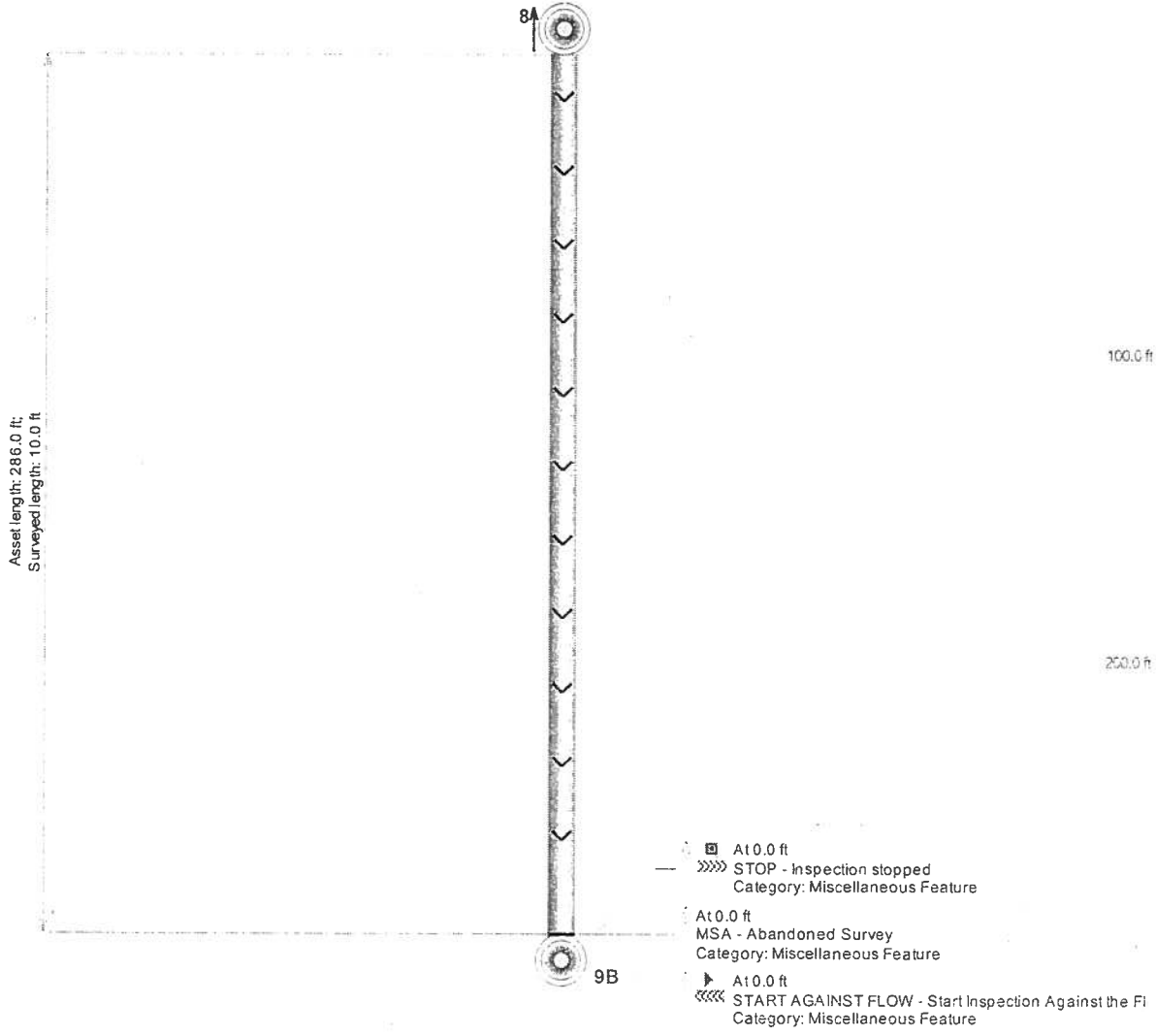
Operator: JOSEPH ASSARD      SYSTEM\_OWNER      Start date/time: 2012/07/16      Upstream node: 13      Mainline ID: 13/VC4      SHEET\_NUMBER: 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value		Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks	
						Inches (mm)	%		At/From	to					
0.0	153	MSA													DIRT



## Main Inspection with Pipe-Run Graph

Project Name: EAST HARTFORD CT GEI 12-03-3028	Mainline ID: 8/9B	City: EAST HARTFORD CT	Address: EAST RIVER ST
Start date/time: 7/16/2012	Pipe width: 	Pipe height: 36	Pipe type: RCP
Surface condition: 	Direction: UPSTREAM	Surveyed footage: 10.0	Weather: 
MEDIA_LABEL		50-2 0:35:38-0:37:3	



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## PACP Sewer Report

Operator: JOSEPH ASSARD      SUR\_CERT\_NO: U-704-1474      SYSTEM\_OWNER:      Survey Customer: GEI CONSULTANTS, INC.      DRAINAGE\_AREA:      SHEET\_NUMBER: 1

Work order no.:      Mainline ID: 8/9B      Start date/time: 2012/07/16 11:59      Address: EAST RIVER ST      City: EAST HARTFORD CT

FURTHER\_LOCATION\_DETAILS      Upstream node: 8      Depth:      GRADE\_TO\_INVE:      RIM\_TO\_GRADE:

Downstream node: 9B      Depth:      GRADE\_TO\_INVERT:      RIM\_TO\_GRADE:      Use of Sewer:      Direction: U      Flow Control:      Pipe height: 36

Pipe width:      Pipe shape: C      Pipe type: RCP      Ln. Method:      Joint distance:      Asset length: 286.0      Surveyed footage: 10.0      Year laid:      YEAR\_REHABILITAT:      MEDIA\_LABEL: 450-2 0:35:38-0:37:36

Reason:      Sewer Category:      Pre Cleaning: N      DATE CLEANED: 2012/07/16      Weather: Surface      Comments:

Grade	Amount of Structural Defects	Structural Segment Grade	Structural Pipe Rating	Structural Pipe Rating	Structural Pipe Rating Index	Amount of O&M Defects	O&M Segment Grade	O&M Pipe Rating	O&M Quick Rating	O&M Pipe Rating Index	Overall Pipe Rating	Overall Pipe Rating Index
1	0	0				0	0					
2	0	0				0	0					
3	0	0	0	0000	0	0	0	0	0000	0	0	0
4	0	0				0	0					
5	0	0				0	0					





Operator: JOSEPH ASSARD      SYSTEM\_OWNER      Start date/time: 2012/07/16      Upstream node: 8      Mainline ID: 8/9B      SHEET\_NUMBER 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value		Joint	Circumferential Location	Image Ref.	Family	Rating	Remarks
						Inches (mm)	%						
						1st	2nd	At/From to					
0.0	117	MSA											DIRT



# Attachment 5

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**DVD – CCTV Recordings**