TRC

Connecticut Resources Recovery Authority

Hartford Landfill Phase I Lined Ash Area Partial Closure

PROJECT MANUAL

Prepared for

CONNECTICUT RESOURCES RECOVERY AUTHORITY

Hartford, Connecticut

Prepared by

TRC

Windsor, Connecticut

May 1, 2007

PROJECT MANUAL

CONTRACT DOCUMENTS
FOR
HARTFORD LANDFILL - PHASE 1 ASH AREA PARTIAL CLOSURE

MAY 1, 2007

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CONNECTICUT RESOURCES RECOVERY AUTHORITY

NOTICE TO CONTRACTORS – INVITATION TO BID

The Connecticut Resources Recovery Authority ("CRRA") is seeking bids from qualified contractors to furnish all tools, materials, labor, equipment and incidentals thereto for the Closure of a portion of the Phase 1 Ash Area at the Hartford Landfill located at 180 Leibert Road, Hartford, Connecticut 06120 ("Hartford Landfill").

The work will include grading, sub-grade preparation, and the installation of a landfill cap consisting of 40 mil LLDPE geomembrane, soil and/or geosynthetic drainage materials, stormwater management structures, vegetative support materials, erosion control materials, and vegetation over an approximately 7.2 acre area.

Bid package documents may be obtained during normal working hours at the offices of CRRA, 100 Constitution Plaza, 6th Floor, Hartford, Connecticut 06103-1722, beginning **May 3, 2007.** The documents will also be available beginning on the same date on the world wide web at http://www.crra.org under the "Business Opportunities" page.

There will be a mandatory pre-bid conference and tour of the site for all prospective bidders. **The mandatory pre-bid conference and tour will be held at the Hartford Landfill at 10:00 a.m. on May 10, 2007**. Any prospective bidder intending to participate in the tour must contact David Bodendorf at (860) 757-7721 at least 24 hours in advance of the pre-bid conference and site tour.

Sealed bids must be received at the offices of CRRA, 100 Constitution Plaza, 6th Floor, Hartford, Connecticut 06103-1722 no later than 3:00 p.m., Eastern Time, on June 5, 2007. Bids received after the time and date set forth above shall be rejected. All bids shall remain open for ninety (90) days after the bid due date.

Each bid must be accompanied by one of the following forms of bid security: a cashier's check; a certified check; or a bid bond. The bid security must be in the amount of 5% of the bid price.

Bids will be opened publicly at 3:15 p.m. Eastern Time, on June 5, 2007 at the offices of CRRA, 100 Constitution Plaza, 6th Floor, Hartford, Connecticut 06103-1722. CRRA reserves the right to waive any informality or informalities in any bid or the bidding process and to reject any or all of the bids, or any part(s) thereof. Note that all information submitted by a bidder is subject to the Freedom of Information Act.

All questions regarding terms of the bid documents must be received **in writing** no later than 10:00 a.m. on May 17, 2007 at the offices of CRRA, 100 Constitution Plaza, 6th Floor, Hartford, Connecticut 06103-1722, Attn: David Bodendorf, PE, Senior Environmental Engineer (Fax Number - (860) 757-7742; E-Mail – dbodendorf@crra.org).

INSTRUCTIONS TO BIDDERS

HARTFORD LANDFILL

PHASE 1 ASH AREA PARTIAL CLOSURE

CONTENTS

1. DEFINITIONS

As used in this Instructions To Bidders and in other Contract Documents (as defined herein), the following terms shall have the meanings as set forth below:

(a) **Addenda**: Written or graphic documents issued prior to the bid due date that clarify, correct or change any or all of the Contract Documents.

(b) **Contract Documents**:

Hartford Landfill Phase 1 Ash Area Partial Closure Agreement (the "Agreement");

Notice To Contractors – Invitation To Bid;

Instructions To Bidders;

Bid Bond;

Bid Form;

Bid Price Form;

Issues And Questions To Be Addressed;

Questions Concerning Affirmative Action, Small Business Contractors And Occupational Health And Safety;

Affidavit Of Third Party Fees;

Bidder's Background Questionnaire;

Addenda;

Contractor's Bid (including all documentation attached to or accompanying such Bid, all other documentation submitted in connection with such Bid, and all post-bid documentation submitted prior to the Notice Of Award);

Notice Of Award;

Certification Concerning Gifts - Contractor

Notice To Proceed; and

Any written amendments to the Agreement issued pursuant to Section 2.7 and Section 8.6 of the Agreement.

(c) **Laws And Regulations**: Any and all applicable laws, rules, regulations, ordinances, codes, orders and permits of any and all federal, state and local governmental and quasi-governmental bodies, agencies, authorities and courts having jurisdiction.

(d) **Notice Of Award**: Written notification from CRRA to the apparent successful bidder that states that CRRA has accepted such bidder's bid and sets forth the remaining conditions that must be fulfilled by such bidder before CRRA executes the Agreement.

(e) **Project**: The provision by the successful bidder of the Phase 1 Ash Area Partial Closure at the Hartford Landfill in accordance with the Contract Documents.

(f) **Property**: The certain parcel of real property located at 180 Leibert Road in Hartford, Connecticut 06120, upon which property CRRA operates the Hartford Landfill.

(g) **Site**: Those areas of the Property upon which any of the Work is to be performed, furnished and completed by the successful bidder in accordance with the Contract Documents.

Terms used, but not defined, in this Instructions To Bidders shall have the same respective meanings assigned to such terms in the Agreement.

2. COMMUNICATIONS WITH CRRA STAFF AND BOARD MEMBERS

Except as otherwise authorized by this Instructions To Bidders, during the pendency of the Request For Bids ("RFB") submission process, firms contemplating or preparing bids are prohibited from contacting CRRA staff or CRRA Board of Director members in an ex parte manner to discuss the RFB submission process. A firm's RFB submission shall be rejected if any of the foregoing ex parte communications take place.

3. SCOPE OF WORK

The Connecticut Resources Recovery Authority (CRRA) is seeking bids from qualified contractors to furnish all tools, materials, labor, equipment, and incidentals thereto for the performance of Phase 1 Ash Area Partial Closure Work at the Hartford Landfill (the "Work"). The Hartford Landfill is located at 180 Leibert Road in Hartford, Connecticut.

The Work is more particularly described as follows:

(a) Mobilization and demobilization;

(b) Grading of ash residue in preparation for cap sub-base;

(c) Installation of cap sub-base;

(d) Installation of LLDPE membrane;

(e) Installation of cap drainage layer;

(f) Installation of cap drainage structures;

(g) Installation of vegetative support layer;

(h) Installation of temporary and permanent erosion control measures, and;

(i) Making all required notifications and obtaining all local, state, and federal permits and approvals necessary for the completion of the Work.

The above Work is more particularly shown on certain drawings entitled "Hartford Landfill Phase 1 Ash Area Partial Closure" which drawings are set forth in **Exhibit A** of the Agreement. Specific instructions about how the Work is to be performed are included in **Exhibit B** (Technical Specifications) of the Agreement. The time within which the Work must be performed is specified in **Exhibit C** (Project Schedule) of the Agreement.

4. BID PACKAGE DOCUMENTS

This bid package consists of the following documents:

(1) Notice To Contractors – Invitation To Bid
(2) Instructions To Bidders

(3) Bid/Proposal Bond
(4) Bid/Proposal Form
(5) Bid Price Form
(6) Issues And Questions To Be Addressed
(7) Questionnaire Concerning Affirmative Action, Small Business Contractors And Occupational Health And Safety
(8) Affidavit Of Third Party Fees
(9) Bidder's Background Questionnaire
(10) Notice Of Award
(11) Certification Concerning Gifts – Contractor
(12) Notice To Proceed
(13) Hartford Landfill Phase 1 Ash Area Partial Closure Agreement, including:
  (A) Construction Drawings
  (B) Technical Specifications
  (C) Project Schedule
  (D) Construction Performance Bond
  (E) Construction Payment Bond
  (F) Contractor's Wage Certification Form
  (G) Schedule of Prevailing Wages
  (H) Contracting Agency Certification Form

Complete sets of the above documents may be obtained during normal business hours at CRRA's offices 100 Constitution Plaza, 6th Floor, Hartford, Connecticut 06103-1722, beginning May 3, 2007.

All of the documents are also available in PDF format beginning on the same date on the world wide web at:

http://www.crra.org under the "Business Opportunities" page.

All of the forms included in the documents are available for downloading in Microsoft Word format. All bidders must complete the Certification Concerning Bid Forms.

5. MANDATORY PRE-BID CONFERENCE AND SITE TOUR

A mandatory pre-bid conference and tour of the Site for all prospective bidders will be conducted by CRRA staff on May 10, 2007 at 10:00 a.m. Eastern Time. Bids submitted by a bidder who did not attend the mandatory pre-bid conference and site tour shall be rejected. Alternate times for visiting the Site will not be allowed.

Prospective bidders should contact David Bodendorf at (860) 757-7721 at least 24 hours prior to the mandatory pre-bid conference and site tour to make arrangements for participating in the tour and for directions to the Site. Except as otherwise authorized by this Instructions To Bidders, bidders are expressly prohibited from contacting any CRRA personnel regarding this bid solicitation.

6. ADDENDA AND INTERPRETATIONS

CRRA may issue Addenda to this bid package that shall, upon issuance, become part of this package and binding upon all potential or actual bidders for the Work. Such Addenda may be issued in response to requests for interpretation or clarification received from potential bidders. Any request for interpretation or clarification of any documents included in this bid package must be **submitted in writing to David Bodendorf, PE, CRRA, 100 Constitution Plaza, 6th Floor, Hartford, Connecticut 06103-1722 (Fax Number - (860) 757-7742); E-Mail – dbodendorf@crra.org). To be given consideration, any such request must be received by CRRA by 10:00a.m. on May 17, 2007.**

Addenda issued prior to the mandatory pre-bid conference and site tour will be mailed and/or e-mailed to all persons who picked up or requested a printed copy from CRRA of the bid package documents or who otherwise notified CRRA of their interest in the RFB. Such addenda will also be posted on CRRA's web site (http://www.crra.org on the "Business Opportunities" page under the "RFB: Hartford Landfill Phase 1 Ash Area Partial Closure" heading).

Addenda issued after the mandatory pre-bid conference and site tour will be mailed and/or e-mailed to all persons who attended the pre-bid conference and site tour and will be posted on CRRA's web site (http://www.crra.org on the "Business Opportunities" page under the "RFB: Hartford Landfill Phase 1 Ash Area Partial Closure" heading). Such addenda will be mailed/e-mailed and posted on the web site no later than three (3) days before the submittal deadline.

Failure of any bidder to receive any such Addenda shall not relieve such bidder from any conditions stipulated in such Addenda. Only questions answered or issues addressed by formal written Addenda will be binding. **All oral and other written responses, statements, interpretations or clarifications shall be without legal effect and shall not be binding upon CRRA.**

7. BID SUBMITTAL

Sealed bids shall be submitted no later than 3:00 p.m., Eastern Time, June 5, 2007 at the offices of CRRA, 100 Constitution Plaza, 6th Floor, Hartford, Connecticut 06103-1722, Attn: David Bodendorf, Senior Environmental Engineer. Bids received after the time and date set forth above shall be rejected.

Each bidder must submit one (1) original and two (2) copies of its bid. The original bid shall be stamped or otherwise marked as such.

Each bid (the original and two copies) shall be enclosed in a sealed envelope that shall be clearly marked "Bid For Hartford Landfill Phase 1 Ash Area Partial Closure."

No joint bids shall be accepted, but the use of subcontractors is acceptable.

Bids shall remain open and subject to acceptance for ninety (90) days after the bid due date.

Bidders must indicate in their bids that the terms and conditions of the Agreement (Section 14 of this Project Manual), as attached, are non-negotiable and that they are willing and able to execute the Agreement, as attached. (See Section 2 of the Bid Form.) **However, CRRA reserves the right to negotiate with bidder over bidder's price for the Work submitted in its Bid Price Form. Any potential bidder who will be unable to execute the Agreement, as attached, should not submit a bid.**

Submission of a bid will constitute an incontrovertible representation by bidder that:

(a) Bidder has complied with every requirement of the Section of this Instructions To Bidders concerning Examination Of Contract Documents (Section 15) and Site Conditions (Section 16);

(b) Without exception the bid is premised upon performing, furnishing and completing the Services required by the Contract Documents and applying the specific means, methods, techniques, sequences or procedures (if any) that may be shown, indicated or expressly required by the Contract Documents;

(c) Bidder has given CRRA written notice of all conflicts, errors, ambiguities and discrepancies that bidder has discovered in the Contract Documents and the written resolutions thereof by CRRA are acceptable to bidder;

(d) If bidder has failed to promptly notify CRRA of all conflicts, errors, ambiguities and discrepancies that bidder has discovered in the Contract Documents, such failure shall be deemed by both bidder and CRRA to be a waiver to assert these issues and claims in the future; and

(e) The Contract Documents are generally sufficient to indicate and convey understanding by bidder of all terms and conditions for performing, furnishing and completing the Work.

Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a bid must be executed) and delivered to the place where bids are to be submitted at any time prior to the bid due date.

8. BID SECURITY

8.1 Type of Security

Each bid shall be accompanied by one of the following forms of Bid Security:

(a) A cashier's check;

(b) A certified check; or

(c) A bid bond in the form included in Section 3 of the Contract Documents.

The Bid Security shall be made payable to CRRA and shall be in an amount equal to five percent (5%) of the amount of the bid.

Any bid bond submitted as Bid Security shall be in the form provided for such bid bond in the bid package documents and such bid bond shall be executed and issued by a surety company acceptable to CRRA. Any bid that does not contain the above requisite Bid Security or any bid that contains Bid Security that does not comply with the foregoing requirements shall be rejected as non-responsive.

8.2 Disposition of Bid Security

The Bid Security of the successful bidder will be retained until such bidder has executed the Agreement, furnished the required contract security and satisfied all other conditions of the Notice of Award, whereupon such Bid Security will be returned.

If the successful bidder fails to execute and deliver the Agreement, furnish the required contract security, or satisfy all other conditions of the Notice Of Award within ten (10) days after the issuance of such Notice Of Award, CRRA may annul the Notice Of Award and the Bid Security of that bidder shall be forfeited. The Bid Security of other bidders whom CRRA believes to have a reasonable chance of receiving the award may be retained by CRRA until the earlier of the seventh (7^{th}) day after the Effective Date of the Agreement or the ninetieth (90^{th}) day after the bid due date, whereupon the Bid Security furnished by such bidders will be returned. Bid Security with bids that are not competitive will be returned within seven (7) days after the opening of such bids.

9. BID CONTENTS

Bids shall be submitted on forms provided by CRRA as part of this bid package, all of which forms must be completed with the appropriate information required and all blanks on such forms filled in.

A bid must consist of the following and must be in the following order:

(a) Title page;

(b) Cover letter, which includes the Bidder's promise, if any, to set aside a portion of the contract for legitimate minority business enterprises (see Section 11 of this Instructions To Bidders);

(c) Table of Contents;

(d) Bid Security (cashier's check, certified check or bid bond) (see Section 8 of this Instructions To Bidders);

(e) The Bid Form, with Addenda, if any, listed in the appropriate place (Page 4-2), the name and address of the contact for Notices listed in the appropriate place (Page 4-4) and the completed agreement page (Page 4-5);

(f) The completed Bid Price Form (Page 5-1);

(g) Answers to the Issues And Questions To Be Addressed (the answer to each question must begin on a new page) (Page 6-1);

(h) The completed Questions Concerning Affirmative Action, Small Business Contractors And Occupational Health And Safety form (Page 7-1), with the Bidder's most recent EEO-1 data attached if the Bidder wishes such data to be considered in the evaluation of its Bid;

(i) The completed Affidavit Of Third Party Fees form (subscribed and sworn before a Notary Public or Commissioner of the Superior Court) (Page 8-1 through 8-2);

(j) The completed Bidder's Background Questionnaire (Page 9-1);

(k) The completed Certification Concerning Gifts – Contractor's Form (Page 10-1);

Bidders should not include in their bids other portions of the Bid Package Documents (e.g., this Instructions To Bidders or the Agreement).

A bidder may include additional information as an addendum/appendix to its bid if the bidder thinks that it will assist CRRA in evaluating the bidder's bid. A bidder should not include information that is not directly related to the subject matter of this solicitation.

10. BID OPENING

Bids will be opened publicly at 3:05 p.m. Eastern Time, on June 5, 2007 at the offices of CRRA, 100 Constitution Plaza, 6th Floor, Hartford, Connecticut 06103-1722. **CRRA reserves the right to reject any or all of the bids, or any part(s) thereof, and/or to waive any informality or informalities in any bid or the Invitation To Bid process for this Project.**

11. BID EVALUATION

CRRA will base its evaluation of the bids on price, qualifications, demonstrated skill, ability and integrity of each bidder to perform the Work required by the Contract Documents and any other factor or criterion that CRRA, in its sole discretion, deems or may deem relevant or pertinent for such evaluation. The award of the contract for the Work will be made, if at all, to the bidder whose evaluation by CRRA results in CRRA determining that such award to such bidder is in the best interests of CRRA. **However, the selection of a bidder and the award of such contract, while anticipated, are not guaranteed.**

Bids will also be rated on the bidders demonstrated commitment to affirmative action. Sections 46a-68-1 to 46a-68-17 of the *Regulations of Connecticut State Agencies* require CRRA to consider the following factors when awarding a contract that is subject to contract compliance requirements:

(a) The bidder's success in implementing an affirmative action plan (See Question 4 of the Questionnaire Concerning Affirmative Action, Small Business Contractors And Occupational Health And Safety (Section 6 of this Project Manual));

(b) The bidder's success in developing an apprenticeship program complying with Sections 46a-68-1 to 46a-68-17 of the *Regulations of Connecticut State Agencies*, inclusive (See Question 5 of the Questionnaire Concerning Affirmative Action, Small Business Contractors And Occupational Health And Safety (Section 6 of this Project Manual));

(c) The bidder's promise to develop and implement a successful affirmative action plan (See Question 4B of the Questionnaire Concerning Affirmative Action, Small Business Contractors And Occupational Health And Safety (Section 6 of this Project Manual));

(d) The bidder's submission of EEO-1 data indicating that the composition of its work force is at or near parity when compared to the racial and sexual composition of the work force in the relevant labor market area (See Section 9(g) of this Instructions To Bidders); and

(e) The bidder's promise to set aside a portion of the contract for legitimate minority business enterprises (See Section 9(b) of this Instructions To Bidders).

Neither CRRA nor any of its directors, officers, employees or authorized agents shall be liable for any claims or damages resulting from the evaluation, selection, non-selection or rejection of any bid submitted for the Work.

12. CONTRACT AWARD

If the contract is to be awarded, CRRA will issue to the successful bidder a Notice Of Award within ninety (90) days after the bid due date.

13. CONTRACTOR'S CERTIFICATION CONCERNING GIFTS

Pursuant to CGS § 4-252, the apparently successful Bidder must submit a document certifying that it has not given any gifts to certain individuals between the date CRRA started planning the RFO and the date the Agreement is executed. If the apparently successful Bidder does not execute the Certification, it will be disqualified for the Agreement. The dates between which the Bidder may not give gifts and the identities of those to whom it may not give gifts are specified in the attachment to the Notice of Award included in these bid documents.

14. NOTICE TO PROCEED

Following the execution of the Agreement and the satisfaction of all other conditions by the successful Bidder, CRRA will issue to the successful bidder a Notice To Proceed. When the Notice To Proceed is issued by CRRA to the successful Bidder, the successful bidder will proceed with the Work.

15. EXAMINATION OF CONTRACT DOCUMENTS

It is the responsibility of each bidder before submitting a bid to:

(a) Examine thoroughly the Contract Documents and other related data identified in the bid package documents;

(b) Visit the Hartford Landfill to become familiar with and satisfy bidder as to the general, local and site conditions that may affect cost, progress, performance or completion of the Work;

(c) Consider and review any and all Laws And Regulations that may affect cost, progress, performance, furnishing or completion of the Work;

(d) Study and carefully correlate bidder's knowledge and observations with the Contract Documents and such other related data; and

(e) Promptly notify CRRA of all conflicts, errors, ambiguities or discrepancies which bidder has discovered in the Contract Documents.

16. SITE CONDITIONS

All information and data included in this bid package relating to the surface, subsurface and other conditions of the Site are from presently available sources and are being provided only for the information and convenience of the bidders. CRRA does not assume any responsibility for the accuracy or completeness of such information and data. Each bidder is solely responsible for investigating and satisfying itself as to all actual and existing Site conditions, including surface conditions, subsurface conditions and underground facilities. (See Section 2.8 of the Agreement.)

It is understood and agreed that any successful bidder shall not use any information made available to it or obtained in any examination made by it in any manner as a basis or grounds for a claim or demand of any nature against CRRA arising from or by reason of any variance which may exist between information offered or so obtained and the actual materials, conditions, or structures encountered during performance of any of the Work. By submitting a bid for the Work, each bidder expressly waives each and every such claim and demand.

17. BIDDER'S QUALIFICATIONS

CRRA may make any investigation deemed necessary to determine the ability of any bidder to perform the Work required. Each bidder shall furnish CRRA with all such information as may be required for this purpose.

18. PREVAILING WAGE

The Work will be subject to the Prevailing Wage provisions of the *Connecticut General Statutes*. (See Section 8.7 of the Agreement.)

19. AFFIDAVIT OF THIRD PARTY FEES

All bidders must complete and properly execute the Affidavit Of Third Party Fees. If a bidder has neither paid to any third party nor agreed to pay to any third party any fees attributable to this Agreement, the bidder shall write "None" is the first box in the table and properly execute the Affidavit (subscribe and swear before a Notary Public or Commissioner of the Superior Court). For purposes of the Affidavit, a bidder's subcontractors, if any, are not considered third parties.

19. SECURITY FOR FAITHFUL PERFORMANCE

As part of the Agreement to perform the Work, the successful bidder shall provide, within ten (10) days after CRRA issues the Notice Of Award, a construction performance bond and construction payment bond, each of which bonds shall be issued by a surety company acceptable to CRRA and in an amount equal to one hundred percent (100%) of the total Contract Price. Such bonds shall be drawn and submitted on the forms attached to the Agreement. (See **Exhibit D** and **Exhibit E** of the Agreement).

20. CERTIFICATION CONCERNING GIFTS – CONTRACTOR

Section 4-252 of the *Connecticut General Statutes* requires that a Contractor (i.e., the successful bidder/proposer for an Agreement) complete and properly execute this Certification Concerning Gifts at the same time that the Contractor executes the Agreement. If the Contractor fails to make the required certifications, the Contractor shall be disqualified for the Agreement. If a prospective bidder cannot comply with the Certification Concerning Gifts, it should not submit a bid.

21. STATE OF CONNECTICUT TAXES

CRRA is exempt from all State of Connecticut taxes and assessments as is any contractor performing services for CRRA for those services. Accordingly, a bidder shall not charge CRRA any State of Connecticut taxes or assessments at any time in connection with the bidder's performance of the Agreement, nor shall the bidder include any State of Connecticut taxes or assessments in any rates, costs, prices or other charges to CRRA in connection with the bidder's performance of the Agreement. These obligations of the bidder are abso-

lute and apply notwithstanding any payment by the bidder of any State of Connecticut taxes or assessments in connection with its performance of this Agreement. (See Section 3.5 of the Agreement.

22. DISCLOSURE OF INFORMATION

Bidders are hereby advised that any information contained in or submitted with or in connection with their respective bid is subject to disclosure if required by law or otherwise. By submitting a bid, each bidder expressly waives any claim(s) that such bidder or any of its successors and/or assigns has or may have against CRRA or any of its directors, officers, employees or authorized agents as a result of any such disclosure.

23. BID PREPARATION AND OTHER COSTS

Each bidder shall be solely responsible for all costs and expenses associated with the preparation and/or submission of its bid, or incurred in connection with any interviews and negotiations with CRRA, and CRRA shall have no responsibility or liability whatsoever for any such costs and expenses. Neither CRRA nor any of its directors, officers, employees or authorized agents shall be liable for any claims or damages resulting from the solicitation or collection of bids. By submitting a bid, each bidder expressly waives:

(a) Any claim(s) for such costs and expenses; and

(b) Any such claims or damages.

24. SIGNING OF AGREEMENT

If CRRA issues a Notice Of Award to a successful bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other necessary Contract Documents attached.

Within ten (10) days after issuance of a Notice Of Award, the successful bidder shall:

(a) Execute the required number of counterparts of the Agreement;

(b) Deliver to CRRA such executed counterparts and attached Contract Documents along with the required Bonds and any certificates of insurance required by the Contract Documents; and

(c) Satisfy all other conditions of the Notice Of Award.

Once CRRA has received such counterparts, Contract Documents, Bonds and certificates and all requisite approvals to execute the Agreement, and provided the successful bidder has satisfied all such conditions within the foregoing ten (10) day period, CRRA shall deliver one (1) fully signed counterpart of the Agreement to the successful bidder.

At the request of CRRA and if the successful bidder qualifies, the successful bidder shall apply to the State of Connecticut Department of Economic and Community Development, and do all that is necessary to make itself qualify, as a Small Contractor and/or Minority/Women/Disabled Person Business Enterprise in accordance with Section 32-9e of the *Connecticut General Statutes*.

BID/PROPOSAL BOND

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable. The below addresses are to be used for giving required notice.

BIDDER/PROPOSER (Name and Address):	**SURETY** (Name and Address of Principal Place of Business):

OWNER (Name and Address):

Connecticut Resources Recovery Authority
100 Constitution Plaza, 6th Floor
Hartford, CT 06103-1722

BID/PROPOSAL

DUE DATE:	
AMOUNT:	
PROJECT DESCRIPTION (Including Name and Location):	

BOND

BOND NUMBER:	
DATE (Not later than Bid/Proposal Due Date):	
PENAL SUM:	DOLLARS ($)

IN WITNESS WHEREOF, Surety and Bidder/Proposer, intending to be legally bound hereby, subject to the terms printed on Page 2 hereof, do each cause this Bid/Proposal Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER/PROPOSER		**SURETY**	
	(SEAL)		(SEAL)
Bidder's Name and Corporate Seal		Surety's Name and Corporate Seal	
SIGNATURE:		**SIGNATURE:**	
NAME AND TITLE:		**NAME AND TITLE:**	

TERMS AND CONDITIONS TO BID/PROPOSAL BOND

1. Bidder/Proposer and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder/Proposer any difference between the total amount of Bidder's/Proposer's bid/proposal and the total amount of the bid/proposal of the next lowest, responsible and responsive bidder/proposer as determined by Owner for the Work/Service required by the Contract Documents, provided that:
   1.1 If there is no such next lowest, responsible and responsive bidder/proposer, and Owner does not abandon the Project, then Bidder/Proposer and Surety shall pay to Owner the penal sum set forth on the face of this Bond, and
   1.2 In no event shall Bidder's/Proposer's and Surety's obligation hereunder exceed the penal sum set forth on the face of this Bond.
2. Default of Bidder/Proposer shall occur upon the failure of Bidder/Proposer to deliver within the time required by the Bid/Proposal Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement and related documents required by the Bid/Proposal Documents and any performance and payment bonds required by the Bid/Proposal Documents and Contract Documents.
3. This obligation shall be null and void if:
   3.1 Owner accepts Bidder's/Proposer's bid/proposal and bidder/proposer delivers within the time required by the Bid/Proposal Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement and related documents required by the Bid/Proposal Documents and any performance and payments bonds required by the Bid/Proposal Documents and Contract Documents, or
   3.2 All bids/proposals are rejected by Owner, or
   3.3 Owner fails to issue a notice of award to Bidder/ Proposer within the time specified in the Bid/Proposal Documents (or any extension thereof agreed to in writing by Bidder/Proposer and, if applicable, consented to by Surety when required by paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder/Proposer and within 30 calendar days after receipt by Bidder/Proposer and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue notice of award agreed to in writing by Owner and Bidder/Proposer, provided that the total time for issuing notice of award including extensions shall not in the aggregate exceed 120 days from Bid/Proposal Due Date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder/Proposer and Surety and in no case later than one year after Bid/Proposal Due Date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder/Proposer and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable provision of any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

BID/PROPOSAL FORM

PROJECT: Mid-Connecticut

CONTRACT NUMBER: _____ *(To be filled in later by CRRA)*

CONTRACT FOR: CRRA Hartford Landfill Phase 1 Ash Area Partial Closure

BIDS/PROPOSALS SUBMITTED TO: Connecticut Resources Recovery Authority
100 Constitution Plaza, 6th Floor
Hartford, Connecticut 06103-1722

1. DEFINITIONS

Unless otherwise defined herein, all terms that are not defined and used in this Bid/Proposal Form (a "Bid/Proposal") shall have the same respective meanings assigned to such terms in the Contract Documents.

2. TERMS AND CONDITIONS

The undersigned (the "Bidder/Proposer") accepts and agrees to all terms and conditions of the Request For Bids/Proposals/Qualifications, Instructions To Bidders/Proposers, the Agreement and any Addenda to any such documents. This Bid/Proposal shall remain open and subject to acceptance for ninety (90) days after the Bid/Proposal due date.

If CRRA issues a Notice Of Award to Bidder/Proposer, Bidder/Proposer shall within ten (10) days after the date thereof:

(a) Execute the required number of counterparts of the non-negotiable Agreement;

(b) Deliver to CRRA such executed counterparts and all other Contract Documents attached to the Notice Of Award along with any other documents required by the Contract Documents; and

(c) Satisfy all other conditions of the Notice Of Award.

3. BIDDER'S/PROPOSER'S OBLIGATIONS

Bidder/Proposer proposes and agrees, if this Bid/Proposal is accepted by CRRA and CRRA issues a Notice Of Award to Bidder/Proposer, to the following:

(a) To perform, furnish and complete all the Work/Services as specified or indicated in the Contract Documents and Agreement for the applicable prices, rates and/or costs set forth in this Bid/Proposal and in accordance with the terms and conditions of the Contract Documents and Agreement; and

(b) At the request of CRRA and if the successful Bidder/Proposer qualifies, to apply with the State of Connecticut Department of Economic and Community Development, and do all that is necessary to make itself qualify, as a Small Contractor and/or Minority/Women/Disabled Person Business Enterprise in accordance with Section 32-9e of the *Connecticut General Statutes*.

4. BIDDER'S/PROPOSER'S REPRESENTATIONS CONCERNING NON-NEGOTIABILITY OF THE AGREEMENT

In submitting this Bid/Proposal, Bidder/Proposer acknowledges and agrees that the terms and conditions of the Agreement (including all Exhibits thereto), as included in the RFB/P/Q, are non-negotiable, and Bidder/Proposer is willing to and shall, if CRRA accepts its Bid/Proposal for the Work/Services and issues a Notice Of Award to Bidder/Proposer, execute such Agreement. However, CRRA reserves the right to negotiate with Bidder/Proposer over Bidder/Proposer's price and rates for the Work/Services submitted on its Bid/Proposal Price And Payment Rate Schedule Form.

5. BIDDER'S/PROPOSER'S REPRESENTATIONS CONCERNING EXAMINATION OF CONTRACT DOCUMENTS

In submitting this Bid/Proposal, Bidder/Proposer represents that:

(a) Proposer has thoroughly examined and carefully studied the RFB/P/Q package documents and the following Addenda, receipt of which is hereby acknowledged (list Addenda by Addendum number and date):

Addendum Number	Date Issued

(b) Without exception the Bid/Proposal is premised upon performing, furnishing and completing the Work/Services required by the Contract Documents and applying the specific means, methods, techniques, sequences or procedures (if any) that may be shown, indicated or expressly required by the Contract Documents;

(c) Bidder/Proposer is fully informed and is satisfied as to all Laws and Regulations that may affect cost, progress, performance, furnishing and/or completion of the Work/Services;

(d) Bidder/Proposer has studied and carefully correlated Bidder's/Proposer's knowledge and observations with the Contract Documents and such other related data;

(e) Bidder/Proposer has given CRRA written notice of all conflicts, errors, ambiguities and discrepancies that Bidder/Proposer has discovered in the Contract Documents and the written resolutions thereof by CRRA are acceptable to Bidder/Proposer;

(f) If Bidder/Proposer has failed to promptly notify CRRA of all conflicts, errors, ambiguities and discrepancies that Bidder/Proposer has discovered in the Contract Documents, such failure shall be deemed by both Bidder/Proposer and CRRA to be a waiver to assert these issues and claims in the future;

(g) Bidder/Proposer is aware of the general nature of work to be performed by CRRA and others that relates to the Work/Services for which this Bid/Proposal is submitted;

(h) The Contract Documents are generally sufficient to indicate and convey understanding by Bidder/Proposer of all terms and conditions for performing, furnishing and completing the Work/Services for which this Bid/Proposal is submitted.

6. BIDDER'S/PROPOSER'S REPRESENTATIONS CONCERNING INFORMATION MADE AVAILABLE

In submitting this Bid/Proposal, Bidder/Proposer acknowledges and agrees that Bidder/Proposer shall not use any information made available to it or obtained in any examination made by it in connection with this RFB/P/Q in any manner as a basis or grounds for a claim or demand of any nature against CRRA arising from or by reason of any variance which may exist between information offered or so obtained and the actual materials, conditions, or structures encountered during performance of any of the Work/Services.

7. BIDDER'S/PROPOSER'S REPRESENTATIONS CONCERNING STATE OF CONNECTICUT TAXES

In submitting this Bid/Proposal, Bidder/Proposer acknowledges and agrees that CRRA is exempt from all State of Connecticut taxes and assessments, including sales and use taxes. Accordingly, Bidder/Proposer shall not charge CRRA any State of Connecticut taxes or assessments at any time in connection with Bidder's/Proposer's performance of this Agreement, nor shall Bidder/Proposer include any State of Connecticut taxes or assessments in any rates, costs, prices or other charges to CRRA hereunder. Bidder/Proposer represents and warrants that no State of Connecticut taxes or assessments were included in any rates, costs, prices or other charges presented to CRRA in any Bid/Proposal or other submittal to CRRA in connection with this RFB/P/Q.

8. BIDDER'S/PROPOSER'S REPRESENTATIONS CONCERNING DISCLOSURE

OF INFORMATION

In submitting this Bid/Proposal, Bidder/Proposer:

(a) Recognizes and agrees that CRRA is subject to the Freedom of Information provisions of the *Connecticut General Statutes* and, as such, any information contained in or submitted with or in connection with Bidder's/Proposer's Bid/Proposal is subject to disclosure if required by law or otherwise; and

(b) Expressly waives any claim(s) that Bidder/Proposer or any of its successors and/or assigns has or may have against CRRA or any of its directors, officers, employees or authorized agents as a result of any such disclosure.

9. BIDDER'S/PROPOSER'S REPRESENTATIONS CONCERNING NON-COLLUSION

By submission of this Bid/Proposal, the Bidder/Proposer, together with any affiliates or related persons, the guarantor and any joint ventures, hereby represents that, under risk of termination of the Agreement, if awarded, to the best of its knowledge and belief:

(a) The prices in the Bid/Proposal have been arrived at as the result of an independent business judgment without collusion, consultation, communication, agreement or otherwise for the purpose of restricting competition, as to any matter relating to such prices and any other person or company;

(b) Unless otherwise required by law, the prices that have been quoted in this Bid/Proposal have not, directly or indirectly, been knowingly disclosed by the Bidder/Proposer prior to "opening" to any other person or company;

(c) No attempt has been made or will be made by the Bidder/Proposer to induce any other person, partnership of corporation to submit, or not to submit, a Bid/Proposal for the purpose of restricting competition;

(d) Proposer has not directly or indirectly induced or solicited any other Bidder/Proposer to submit a false or sham Bid/Proposal; and

(e) Proposer has not sought by collusion to obtain for itself any advantage for the Work/Services over any other Bidder/Proposer for the Work/Services or over CRRA.

10. BIDDER'S/PROPOSER'S REPRESENTATIONS CONCERNING RFB FORMS

By submission of this Bid/Proposal, the Bidder/Proposer, together with any affiliates or related business entities or persons, the guarantor and any joint ventures, hereby represents that, under risk of termination of the Agreement, if awarded, all of the forms included in the RFB/P/Q that are submitted to CRRA as part of its Bid/Proposal are identical in form and content to the preprinted forms in the RFB/P/Q except that information requested by the

forms has been inserted in the spaces on the forms provided for the insertion of such requested information.

11. BIDDER'S/PROPOSER'S WAIVER OF DAMAGES

Bidder/Proposer and all its affiliates and subsidiaries understand that by submitting a Bid/Proposal, Bidder/Proposer is acting at its and their own risk and Bidder/Proposer does for itself and all its affiliates, subsidiaries, successors and assigns hereby waive any rights any of them may have to receive any damages for any liability, claim, loss or injury resulting from:

(a) Any action or inaction on the part of CRRA or any of its directors, officers, employees or authorized agents concerning the evaluation, selection, non-selection and/or rejection of any or all Bids/Proposals by CRRA or any of its directors, officers, employees or authorized agents;

(b) Any agreement entered into for the Work/Services (or any part thereof) described in the Contract Documents; and/or

(c) Any award or non-award of a contract for the Work/Services (or any part thereof) pursuant to the Contract Documents.

12. ATTACHMENTS

The following documents are attached hereto and made a part of this Bid/Proposal:

(a) The completed Bid Price And Payment Rate Schedule Form;

(b) Answers to the Issues And Questions To Be Addressed with a written answer provided to each question and each answer beginning on a new page;

(c) Questionnaire Concerning Affirmative Action, Small Business Contractors And Occupational Health and Safety, which has been completely filled out by the Bidder/Proposer;

(d) Affidavit Of Third Party Fees, which has been completely filled out by Bidder/Proposer and signed before a Notary Public or Commissioner of the Superior Court; and

(e) Background Questionnaire, which has been completely filled out by the Bidder/Proposer and signed before a Notary Public or Commissioner of the Superior Court.

13. NOTICES

Communications concerning this Bid/Proposal should be addressed to Bidder/Proposer at the address set forth below.

Bidder/Proposer Name:	
Bidder/Proposer Contact:	
Title:	
Address:	
Telephone Number:	
Fax Number:	
E-Mail Address:	

14. ADDITIONAL REPRESENTATION

Bidder/Proposer hereby represents that the undersigned is duly authorized to submit this Bid/Proposal on behalf of Bidder/Proposer;

AGREED TO AND SUBMITTED ON _____, 200__

Name of Bidder/Proposer (Firm):	
Signature of Bidder/Proposer Representative:	
Name (Typed/Printed):	
Title (Typed/Printed):	

BID PRICE FORM

Bidder will complete the Work as specified in the Contract Documents for the following lump sum and unit price costs (please use itemized table below):

Item No.	Estimated Quantity	Brief Description: Unit or Lump Sum Bid in Both Words and Figures	Total in Figures
		LUMP SUM BID ITEMS	
1	1	Mobilization/Demobilization and Incidental Construction - Mobilize to the site and demobilize after the completion of work all labor, equipment, tools, and other incidentals not covered by other bid items required for the performance of the work for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
2	1	Site Preparation - Remove temporary cover materials placed over the work area and store for reuse or dispose of materials appropriately as described in Section 01010 for the Lump Sum Price of: _____ _____dollars and _____cents ($_____).	$_____
3	1	Subbase Material – 38,600 SY, furnished and installed including placement and compaction as described in Section 02220 and 02225 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
4	1	Geotextile – 40,000 SY, furnished and installed beneath the Geomembrane as described in Section 06644 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
5	1	Geomembrane – 40,000 SY, furnished and installed as described in Section 06643 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____

Item No.	Estimated Quantity	Brief Description: Unit or Lump Sum Bid in Both Words and Figures	Total in Figures
		LUMP SUM BID ITEMS (continued)	
6	1	Geocomposite Drainage Layer – 40,000 SY, furnished and installed as described in Section 06644 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
7	1	Silt Fence with Hay Bales - 1,300 LF, furnished and installed as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
8	1	Jute Netting - 15,000 SF, furnished and installed as described in Section 06642 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
9	1	Turf Reinforcement Mat – 12,500 SY, furnished and installed as described in Section 06642 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
10	1	Flexible Growth Media – 40,000 SY, furnished and applied as described in Section 06642 and 02900 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
11	1	Fiber Filter Tubes – 3,725 LF, furnished and installed as described in Section 06642 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
12	1	Stone Check Dams- 8 total, furnished and installed as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____

Item No.	Estimated Quantity	Brief Description: Unit or Lump Sum Bid in Both Words and Figures	Total in Figures
		LUMP SUM BID ITEMS (continued)	
13	1	Silt Sacks - 3 total, furnished and installed as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
14	1	Half-Pipe Drainage Swale – 920 LF furnished and installed as shown on the Contract Drawings, including the additional cover soil for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
15	1	Drainage Downchute - 280 LF, furnished and installed as described in Section 02721 and as shown on the Contract Drawings (price to include costs for all materials shown beyond that for the cover soil) for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
16	1	Final Cap Working Face Protection - 1,140 LF, furnished and installed as described in Section 01010 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
		UNIT PRICE BID ITEMS	
17	20,000 CY	Ash Relocation and Regrading - Regrade and relocate ash as directed by the Engineer, as described in Section 02220, to achieve final ash grades (cap subgrade) within the Work Area as indicated on the Contract Drawings for the Unit Price per Cubic Yard of: _____ _____dollars and _____cents ($_____)	$_____
18	3 Months	Temporary Facilities - Provide temporary facilities as described in Section 01010 and as shown on the Contract Drawings for the Unit Price per Month of: _____ _____dollars and _____cents ($_____)	$_____
		TOTAL OF BID ITEMS #1 THROUGH #18	$_____

Item No.	Estimated Quantity	Brief Description: Lump Sum Bid in Both Words and Figures	Total in Figures
ALTERNATIVE COVER SOIL BID ITEMS			
19	1	Cover Soil Alternative 1 – 40,000 SY cover material (18") and topsoil (6"), furnished and installed including placement and compaction as described in Section 02220 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
20	1	Cover Soil Alternative 2 – 40,000 SY sand (9"), geotextile, cover material (9"), and topsoil (6"), furnished and installed including placement and compaction as described in Section 02220 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____
21	1	Cover Soil Alternative 3 – 40,000 SY sand (15"), geotextile and topsoil (9"), furnished and installed including placement and compaction as described in Section 02220 and as shown on the Contract Drawings for the Lump Sum Price of: _____ _____dollars and _____cents ($_____)	$_____

Bidder affirms that the above lump sum and unit price costs represent the entire cost to complete the Work in accordance with the Contract Documents, and that no claim will be made on account of any increase in wage scales, material prices, delivery delays, taxes, insurance, cost indexes or any other rates affecting the construction industry or this Project, and that each and every such claim is hereby expressly waived by Bidder.

Name of Bidder (Firm):	
Signature of Bidder Representative:	
Name (Type/Print):	
Title:	
Date:	

ISSUES AND QUESTIONS TO BE ADDRESSED

Instructions: Complete, written answers must be provided to each of these questions and each answer must begin on a new page.

1. List the names of at least three (3) references that can attest to the quality of work performed the bidder. Include the job title, affiliation, address and phone number for each such reference and a brief description of the work performed for the reference.

2. Summarize work of a similar nature to that specified in the Contract Documents which has been performed by the bidder and which will enable CRRA to evaluate the experience and professional capabilities of the bidder.

3. Provide a copy of the bidder's up-to-date certificate of insurance showing all current insurance coverage.

CONNECTICUT RESOURCES RECOVERY AUTHORITY

QUESTIONNAIRE CONCERNING AFFIRMATIVE ACTION, SMALL BUSINESS CONTRACTORS AND OCCUPATIONAL HEALTH AND SAFETY

Because CRRA is a political subdivision of the State of Connecticut, it is required by various statutes and regulations to obtain background information on prospective contractors prior to entering into a contract. The questions below are designed to assist CRRA in procuring this information. Many of the questions are required to be asked by RCSA 46a-68j-31. For the purposes of this form, "Contractor" means Bidder or Proposer, as appropriate.

	Yes	No
1. Is the Contractor an Individual? *If you answered "Yes" to Question 1, skip to Question 2.* *If you answered "No" to Question 1, proceed to Question 1A and then to Question 2.*	☐	☐
1A. How many employees does the Contractor have? ☐		
2. Is the Contractor a Small Contractor based on the criteria in Schedule A? *If you answered "Yes" to Question 2, proceed to Question 2A and then to Question 3.* *If you answered "No" to Question 2, skip to Question 3.*	☐	☐
2A. Is the Contractor registered with the DAS as a Certified Small Business? *If you answered "Yes" to Question 2A, please provide a copy of your Set-Aside Certificate.*	☐	☐
3. Is the Contractor a MWDP Business Enterprise based on the criteria in Schedule B? *If you answered "Yes" to Question 3, proceed to Question 3A and then to Question 4.* *If you answered "No" to Question 3, skip to Question 4.*	☐	☐
3A. Is the Contractor registered with DAS as a MWDP Small Business?	☐	☐
4. Does the Contractor have an Affirmative Action Plan? *If you answered "Yes" to Question 4, proceed to Question 4A and then to Question 5.* *If you answered "No" to Question 4, skip to Question 4B and then to Question 5.*	☐	☐
4A. Has the Affirmative Action Plan been approved by the CHRO?	☐	☐
4B. Will the Contractor develop and implement an Affirmative Action Plan?	☐	☐
5. Does the Contractor have an apprenticeship program complying with RCSA 46a-68-1 through 46a-68-17?	☐	☐
6. Has the Contractor been cited for three or more willful or serious violations of any occupational safety and health act?	☐	☐
7. Has the Contractor received one or more criminal convictions related to the injury or death of any employee in the three-year period preceding the issuance of this Request For Bids/Proposals/Qualifications?	☐	☐
8. Has the Contractor been the recipient of one or more ethical violations from the State of Connecticut Ethics Commission during the three-year period preceding the issuance of this Request For Bids/Proposals/Qualifications?	☐	☐
9. Will subcontractors be involved? *If you answered "Yes" to Question 9, proceed to Question 9A.* *If you answered "No" to Question 9, you are finished with the questionnaire.*	☐	☐
9A. How many subcontractors will be involved? ☐		

LIST OF ACRONYMS

RCSA – Regulations of Connecticut State Agencies
CHRO – State of Connecticut Commission on Human Rights and Opportunities
DAS – State of Connecticut Department of Administrative Services
MWDP – Minority/Women/Disabled Person

FOOTNOTE

[1] If the Contract is a "public works contract" (as defined in Section 46a-68b of the Connecticut General Statutes), the dollar amount exceeds $50,000.00 in any fiscal year, and the Contractor has 50 or more employees, the Contractor, in accordance with the provisions of Section 46a-68c of the Connecticut General Statutes, shall develop and file an affirmative action plan with the Connecticut Commission on Human Rights and Opportunities.

SCHEDULE A
CRITERIA FOR A SMALL CONTRACTOR

Contractor must meet all of the following criteria to qualify as a Small Contractor:

1. Has been doing business and has maintained its principal place of business in the State for a period of at least one year immediately preceding the issuance of the Request For Bids/ Proposals/Qualifications;
2. Has had gross revenues not exceeding ten million dollars in the most recently completed fiscal year;
3. Is headquartered in Connecticut; and,
4. At least 51% of the ownership of the Contractor is held by a person or persons who are active in the daily affairs of the business and have the power to direct the management and policies of the business.

SCHEDULE B
CRITERIA FOR A MINORITY/WOMAN/DISABLED PERSON BUSINESS ENTERPRISE

Contractor must meet all of the following criteria to qualify as a Minority/Woman/Disabled Person Business Enterprise:

1. Satisfies all of the criteria in Schedule A for a Small Contractor;
2. 51% or more of the business and/or its assets must be owned by a person or persons who are minorities as defined in Connecticut General Statutes Section 32-9n (please see below) or is an individual with a disability;
3. The Minority/Woman/Disabled Person must have the power to change policy and management of the business; and,
4. The Minority/Woman/Disabled Person must be active in the day-to-day affairs of the business.

CONNECTICUT GENERAL STATUTES SECTION 32-9n

Sec. 32-9n. Office of Small Business Affairs. (a) There is established within the Department of Economic and Community Development an Office of Small Business Affairs. Such office shall aid and encourage small business enterprises, particularly those owned and operated by minorities and other socially or economically disadvantaged individuals in Connecticut. As used in this section, minority means: (1) Black Americans, including all persons having origins in any of the Black African racial groups not of Hispanic origin; (2) Hispanic Americans, including all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race; (3) all persons having origins in the Iberian Peninsula, including Portugal, regardless of race; (4) women; (5) Asian Pacific Americans and Pacific islanders; or (6) American Indians and persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification.

CONNECTICUT RESOURCES RECOVERY AUTHORITY

AFFIDAVIT OF THIRD PARTY FEES
(Form A2)

All Bidders/Proposers must complete and properly execute this Affidavit of Third Party Fees. The purpose of this Affidavit is to ascertain if the Bidder/Proposer has made or promised any payment to a third party attributable to this Agreement. If no such payment has been made or promised, Bidder/Proposer should write "None" in the first box in the table and execute this Affidavit. For purposes of the Affidavit, Bidder's/Proposer's subcontractors, if any, are not considered third parties.

I, _____, a duly authorized officer and/or representative of _____ (firm name), being duly sworn, hereby depose and say that:

1. I am over eighteen (18) years of age and believe in the obligations of an oath;
2. _____ (firm name) seeks to enter into the "Hartford Landfill Phase 1 Ash Area Partial Closure Agreement" which is the subject of this Request For Bids with the Connecticut Resources Recovery Authority; and
3. All third party fees and agreements to pay third party fees attributable to the "Agreement" are as follows:

Name Of Payee	Dollar Amount Paid Or Value Of Non-Cash Compensation AND Date	Fee Arrangement	Specific Services Performed Or To Be Performed By Payee[1]

(Attach additional copies of this page as necessary.)

NOTE: *For each third party fee arrangement described above (if any), complete the attached Form A2a.*

4. The information set forth herein is true, complete and accurate to the best of my knowledge and belief under penalty of perjury.

Signed: _____

Name (Print): _____

Title: _____

Sworn to before me this _____ day of _____ 200 ___

_____
Notary Public/Commissioner of the Superior Court

[1] Please attach documents evidencing the terms of the fee arrangement and services.

CONNECTICUT RESOURCES RECOVERY AUTHORITY

ADDENDUM TO AFFIDAVIT OF THIRD PARTY FEES (Form A2a)

For each third party fee arrangement disclosed in the attached Affidavit, please explain whether and how each such payment falls within one or more of the following categories of compensation:

(1) Compensation earned for the rendering of legal services when provided by an attorney while engaged in the ongoing practice of law;

(2) Compensation earned for the rendering of investment services, other than legal services, when provided by an investment professional while engaged in the ongoing business of providing investment services;

(3) Compensation for placement agent, due diligence or comparable tangible marketing services when paid to a person who is an investment professional (i) engaged in the ongoing business of representing providers of investment services, or (ii) in connection with the issuance of bonds, notes or other evidence of indebtedness by a public agency;

(4) Compensation earned by a licensed real estate broker or real estate salesperson while engaging in the real estate business on an ongoing basis; or

(5) Payments for client solicitation activities meeting the requirements of Rule 206(4)-3 under the Investment Advisers Act of 1940.

Attach additional pages as necessary.

CONNECTICUT RESOURCES RECOVERY AUTHORITY

BIDDER'S/PROPOSER'S BACKGROUND QUESTIONNAIRE

Please answer the following questions by placing an "X" in the appropriate box.

	Yes	No
1. Has the Bidder/Proposer or any of its principals, owners, officers, partners, directors or stockholders holding more than 50% of the stock of the Bidder/Proposer ever been the subject of a **criminal** investigation? *If you answered "Yes" to Question 1, proceed to Question 1A and, on a separate sheet of paper, state the following: the court in which the investigation is taking or took place; the approximate date the investigation commenced and, if applicable, concluded; the subject matter of the investigation; and the identity of the person or entity involved.* *If you answered "No" to Question 1, proceed to Question 2.*	☐	☐
1A. Has any indictment arisen out of any such investigation? *If you answered "Yes" to Question 1A, proceed to Question 2 and, on a separate sheet of paper, state the following: the name of the person or entity indicted; and the status of any such indictment.* *If you answered "No" to Question 1A, proceed to Question 2.*	☐	☐
2. Has the Bidder/Proposer or any of its principals, owners, officers, partners, directors or stockholders holding more than 50% of the stock of the Bidder/Proposer ever been the subject of a **civil** investigation? *If you answered "Yes" to Question 2, proceed to Question 3 and, on a separate sheet of paper, state the following: the court or other forum in which the investigation took or is taking place; the approximate date the investigation commenced and, if applicable, concluded; the subject matter of the investigation; the identity of the person or entity involved; and the status of the investigation.* *If you answered "No" to Question 2, proceed to Question 3.*	☐	☐
3. Has any entity (e.g., corporation, partnership, etc.) in which a principal, owner, officer, partner, director or stockholder of the Bidder/Proposer has an ownership interest in excess of 50% in such entity ever been the subject of a **criminal** investigation? *If you answered "Yes" to Question 3, proceed to Question 3A and, on a separate sheet of paper, state the following: the court in which the investigation is taking or took place; the approximate date the investigation commenced and, if applicable, concluded; the subject matter of the investigation; and the identity of the person or entity involved.* *If you answered "No" to Question 3, proceed to Question 4.*	☐	☐
3A. Has any indictment arisen out of any such investigation? *If you answered "Yes" to Question 3A, proceed to Question 4 and, on a separate sheet of paper, state the following: the name of the person or entity indicted; and the status of any such indictment.* *If you answered "No" to question 3A, proceed to Question 4.*	☐	☐
4. Has any entity (e.g., corporation, partnership, etc.) in which a principal, owner, officer, partner, director or stockholder of the Bidder/Proposer has an ownership interest in excess of 50% in such entity ever been the subject of a **civil** investigation? *If you answered "Yes" to Question 4, on a separate sheet of paper state the following: the court in which the investigation is taking or took place; the approximate date the investigation commenced and, if applicable, concluded; the subject matter of the investigation; the identity of the person or entity involved; and the status of the investigation.*	☐	☐

	Yes	No
5. Has the Bidder/Proposer or any of its principals, owners, officers, partners, directors or stockholders holding more than 50% of the stock of the Bidder/Proposer ever been debarred from bidding on, or otherwise applying for, any contract with the State of Connecticut or any other governmental authority? *If you answered "Yes" to Question 5, on a separate sheet of paper please explain.*	☐	☐

Signature: _____

Name (print/type): _____

Title: _____

State Of: _____

County Of: _____

_____, being fully sworn, deposes and says that he/she is the _____ (Title) of _____ (Firm Name), the Bidder/Proposer herein, that he/she has provided answers to the foregoing questions on the Bidder's/Proposer's background, and, under the penalty of perjury, certifies that each and every answer is true.

Sworn to before me this _____ day of _____ 200___

_____

Notary Public/Commissioner of the Superior Court

NOTICE OF AWARD

TO:

PROJECT: Mid-Connecticut

CONTRACT NUMBER: _____

CONTRACT FOR: Hartford Landfill Phase 1 Ash Area Partial Closure

The Connecticut Resources Recovery Authority ("CRRA") has considered the Bid submitted by you dated _____ __, 200_ in response to CRRA's Notice To Firms – Invitation To Bid for the above-referenced Work, which Work is more particularly described in the Hartford Landfill Phase 1 Ash Area Partial Closure Agreement (the "Work").

You are hereby notified that your Bid has been accepted for the Work. The amount of the award for the Work is $_____.

Within ten (10) days from the date of this Notice of Award you are required to:

(a) Execute the required number of the attached counterparts of the non-negotiable Agreement;

(b) Execute the Certification Concerning Gifts – Contractor, and deliver such executed Certification to CRRA;

(c) Deliver to CRRA such executed counterparts and all other attached Contract Documents along with the requisite certificates of insurance, performance bond, and payment bond; and

(d) Satisfy all other conditions set forth herein.

As you have agreed, the terms and conditions of the Agreement, as attached, are non-negotiable.

If you fail within ten (10) days from the date of this Notice Of Award to perform and complete any of your obligations set forth in items (a) through (c) above, CRRA will be entitled to consider all your rights arising out of CRRA's acceptance of your Bid as abandoned and terminated. CRRA will also be entitled to such other rights and remedies as may be granted at law or in equity.

You are required to acknowledge your receipt of this Notice Of Award by signing below and returning the same to CRRA.

Dated this _____ day of _____, 200_.

Connecticut Resources Recovery Authority

By: _____
Peter W. Egan
Title: Director of Environmental Affairs & Development

ACCEPTANCE OF NOTICE

Receipt of this NOTICE OF AWARD is hereby acknowledged this _____ day of _____, 200_.

By:

Signature: _____

Name (print/type): _____

Title: _____

CONNECTICUT RESOURCES RECOVERY AUTHORITY

CONTRACTOR'S CERTIFICATION CONCERNING GIFTS

HARTFORD LANDFILL

PHASE 1 ASH AREA PARTIAL CLOSURE

(This CERTIFICATION is to be signed by an authorized officer of the Contractor or the Contractor's managing general partner.)

Section 4-252 of the *Connecticut General Statutes* requires that a Contractor (i.e., the successful bidder/proposer for an Agreement) complete and properly execute this Certification Concerning Gifts at the same time that the Contractor executes the Agreement. If the Contractor fails to make the required certifications, the Contractor shall be disqualified for the Agreement.

I, _____, a duly authorized officer and/or representative of _____ (firm name) (the "Contractor"), being duly sworn, hereby depose and say that:

1. I am over eighteen (18) years of age and believe in the obligations of an oath; and

2. The Contractor has submitted a bid/proposal for the Hartford Landfill Phase 1 Ash Area Partial Closure Agreement (the "Agreement") to the Connecticut Resources Recovery Authority ("CRRA"), has been selected by CRRA as the successful bidder/proposer for the Agreement and is prepared to enter into the Agreement with CRRA; and

3. No gifts were made between August 1, 2006 and the date of execution of the Agreement, by

   (a) The Contractor,

   (b) Any principals and key personnel of the Contractor who participated substantially in preparing the Contractor's bid/proposal for or the negotiation of the Agreement, or

   (c) Any agent of the Contractor or principals and key personnel who participated substantially in preparing the Contractor's bid/proposal for or the negotiation of the Agreement

   to

   (1) Any public official or employee of CRRA who participated substantially in the preparation of the bid/proposal solicitation for or the negotiation or award of the Agreement (such CRRA employees are listed in Table 2 below), or

   (2) Any public official or state employee of any state agency who has supervisory or appointing authority over CRRA (such public officials and state employees are listed in Table 3 below); and

4. No such principals and key personnel of the Contractor or agent of the Contractor or principals and key personnel knows of any action by Contractor to circumvent the prohibition on gifts by providing for any other principals and key personnel, official, employee or agent of the Contractor to provide a gift to any such public official or state employee; and

5. The Contractor made the bid/proposal for the Agreement without fraud or collusion with any person;

6. The information set forth herein is true, to the best of my knowledge and belief, subject to the penalties of false statement.

TABLE 2: CRRA Substantial Participants in the Preparation of the Request for Bids/Proposals for the Agreement

David M. Bodendorf, P.E., Senior Environmental Engineer

TABLE 3: Public Officials and State Employees of State Agencies Who Have Supervisory or Appointing Authority over CRRA

Governor M. Jodi Rell
Senator Donald E. Williams, Jr., President Pro Tempore of the Senate
Senator Louis C. DeLuca, Minority Leader of the Senate
Representative James A. Amann, Speaker of the House of Representatives
Representative Lawrence F. Cafero, Jr., Minority Leader of the House of Representatives

Signature: _____

Name (type/print): _____

Title: _____

State Of: _____

County Of: _____

_____, being fully sworn, deposes and says that

he/she is the _____ (Title) of

_____ (Firm Name), the Contractor herein, that he/she has read the foregoing statement concerning gifts, and, under the penalty of perjury, certifies that each and every part of said statement is true to his/her best knowledge and belief.

Sworn to before me this _____ day of _____ 200__

_____

Notary Public/Commissioner of the Superior Court

For the purposes of this Certification Concerning Gifts, the following terms are defined as follows:

"Gift" means anything of value, which is directly and personally received, unless consideration of equal or greater value is given in return. "Gift" shall **not** include:

(1) A political contribution otherwise reported as required by law or a donation or payment as described in subdivision (9) or (10) of subsection (b) of section 9-333b of the *Connecticut General Statutes*;

(2) Services provided by persons volunteering their time, if provided to aid or promote the success or defeat of any political party, any candidate or candidates for public office or the position of convention delegate or town committee member or any referendum question;

(3) A commercially reasonable loan made on terms not more favorable than loans made in the ordinary course of business;

(4) A gift received from (A) an individual's spouse, fiance or fiancee, (B) the parent, brother or sister of such spouse or such individual, or (C) the child of such individual or the spouse of such child;

(5) Goods or services (A) which are provided to the state (i) for use on state property, or (ii) to support an event or the participation by a public official or state employee at an event, and (B) which facilitate state action or functions. As used in this Affidavit Concerning Gifts, "state property" means (i) property owned by the state, or (ii) property leased to an agency in the Executive or Judicial Department of the state;

(6) A certificate, plaque or other ceremonial award costing less than one hundred dollars;

(7) A rebate, discount or promotional item available to the general public;

(8) Printed or recorded informational material germane to state action or functions;

(9) Food or beverage or both, costing less than fifty dollars in the aggregate per recipient in a calendar year, and consumed on an occasion or occasions at which the person paying, directly or indirectly, for the food or beverage, or his representative, is in attendance;

(10) Food or beverage or both, costing less than fifty dollars per person and consumed at a publicly noticed legislative reception to which all members of the General Assembly are invited and which is hosted not more than once in any calendar year by a lobbyist or business organization. For the purposes of such limit, (A) a reception hosted by a lobbyist who is an individual shall be deemed to have also been hosted by the business organization which he owns or is employed by, and (B) a reception hosted by a business organization shall be deemed to have also been hosted by all owners and employees of the business organization who are lobbyists. In making the calculation for the purposes of such fifty-dollar limit, the donor shall divide the amount spent on food and beverage by the number of persons whom the donor reasonably expects to attend the reception;

(11) Food or beverage or both, costing less than fifty dollars per person and consumed at a publicly noticed reception to which all members of the General Assembly from a region of the state are invited and which is hosted not more than once in any calendar year by a lobbyist or business organization. For the purposes of such limit, (A) a reception hosted by a lobbyist who is an individual shall be deemed to have also been hosted by the business organization which he owns or is employed by, and (B) a reception hosted by a business organization shall be deemed to have also been hosted by all owners and employees of the business organization who are lobbyists. In making the calculation for the purposes of such fifty-dollar limit, the donor shall divide the amount spent on food and beverage by the number of persons whom the donor reasonably expects to attend the reception. As used in this subdivision, "region of the state" means the established geographic service area of the organization hosting the reception;

(12) Gifts costing less than one hundred dollars in the aggregate or food or beverage provided at a hospitality suite at a meeting or conference of an interstate legislative association, by a person who is not a registrant or is not doing business with the state of Connecticut;

(13) Admission to a charitable or civic event, including food and beverage provided at such event, but excluding lodging or travel expenses, at which a public official or state employee participates in his official capacity, provided such admission is provided by the primary sponsoring entity;

(14) Anything of value provided by an employer of (A) a public official, (B) a state employee, or (C) a spouse of a public official or state employee, to such official, employee or spouse, provided such benefits are customarily and ordinarily provided to others in similar circumstances; or

(15) Anything having a value of not more than ten dollars, provided the aggregate value of all things provided by a donor to a recipient under this subdivision in any calendar year shall not exceed fifty dollars.

"Participated substantially" means participation that is direct, extensive and substantive, and not peripheral, clerical or ministerial.

"Principals and key personnel" means officers, directors, shareholders, members, partners and managerial employees.

NOTICE TO PROCEED

TO:

PROJECT: Hartford Landfill Phase 1 Ash Area Partial Closure

CONTRACT NUMBER: _____

CONTRACT FOR: Hartford Landfill Phase 1 Ash Area Partial Closure

You are hereby notified to commence the Work in accordance with the Agreement, dated _____, 200_, and that the Contract Time under the Agreement will commence to run on _____, 200_. By this date, you are to start performing the Work required by the Contract Documents. Pursuant to the Agreement, the date for completing all of the Work and having such Work ready for CRRA's acceptance is as follows:

Completion Date: _____, 200_

You are required to acknowledge your receipt of this Notice To Proceed by signing below and returning such receipted Notice To Proceed to CRRA.

Dated this _____ day of _____, 200_.

Connecticut Resources Recovery Authority

By: _____
Peter W. Egan
Title: Director of Environmental Affairs & Development

ACCEPTANCE OF NOTICE

Receipt of this NOTICE TO PROCEED is hereby acknowledged this _____ day of _____, 200_.

By:

Signature: _____

Name (print/type): _____

Title: _____

HARTFORD LANDFILL

PHASE 1 ASH AREA PARTIAL CLOSURE AGREEMENT

THIS HARTFORD LANDFILL PHASE 1 ASH AREA PARTIAL CLOSURE AGREEMENT ("Agreement") is made as of this _____ day of _____, 200_ by and between the **CONNECTICUT RESOURCES RECOVERY AUTHORITY**, a body politic and corporate, constituting a public instrumentality and political subdivision of the State of Connecticut, having its principal offices at 100 Constitution Plaza, 6th Floor, Hartford, Connecticut 06103 (hereinafter "CRRA" or "Owner") and _____, a _____, having its principal offices at _____, _____, _____ (hereinafter "Contractor").

CONTENTS

PRELIMINARY STATEMENT

CRRA leases a certain parcel of real property located at 180 Leibert Road in Hartford, Connecticut (the "Property"), upon which property CRRA operates the Hartford Landfill (the "Hartford Land-

fill"). CRRA now desires to enter into this Agreement with Contractor in order for Contractor to construct a landfill cap over a portion of the Phase 1 Ash Area of the Hartford Landfill within the boundaries of the Property, and other related work, in accordance with the Contract Documents (the "Project").

NOW, THEREFORE, in consideration of the mutual covenants, promises, and representations contained herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows.

1. DEFINITIONS, CONSTRUCTION AND INTERPRETATION

1.1 Definitions

As used in this Agreement and in other Contract Documents (as defined herein) the following terms shall have the meanings as set forth below:

(a) **"Addenda"** means written or graphic documents issued prior to the bid due date, which clarify, correct or change any or all of the Contract Documents.

(b) **"Acceptance Date"** means the date on which CRRA determines that the Work (as defined herein) has been completed by Contractor in accordance with the Contract Documents.

(c) **"Contract Documents"** means this Agreement (including all exhibits attached hereto), Notice To Contractors -Invitation To Bid, Instructions To Bidders, Addenda, Contractor's bid (including all documentation accompanying such bid, all other documentation submitted in connection with such bid, and all post-bid documentation submitted prior to the Notice Of Award), Notice Of Award, the Notice To Proceed (as defined herein), the Bonds (as defined herein), the Plans (as defined herein), any written amendments to any of the Contract Documents and any change order issued pursuant to Section 2.7 hereof.

(d) **"Contract Time"** means the number of days or the date, as set forth in **Exhibit C** of this Agreement, to perform and complete the Work and have such Work ready for CRRA's acceptance.

(e) **"Effective Date"** means the date set forth above in this Agreement.

(f) **"Engineer"** means CRRA or its Consultant, or any successive engineering firm thereto selected by CRRA to act as its representative in various matters concerning the Project.

(g) **"Laws And Regulations"** means any and all applicable current or future laws, rules, regulations, ordinances, codes, orders and permits of any and all federal, state and local governmental and quasi-governmental bodies, agencies, authorities and courts having jurisdiction.

(h) **"Notice Of Award"** means written notification from CRRA to the apparent successful bidder which states that CRRA has accepted such bidder's bid and sets forth the remaining conditions that must be fulfilled by such bidder before CRRA executes the Agreement.

(i) **"Owner"** means CRRA.

(j) **"Owner's Designee"** or **"Owner's Representative"** means Engineer.

(k) **"Site"** means those areas of the Property upon which the Work is to be performed, furnished and completed by Contractor in accordance with the Contract Documents.

1.2 Construction And Interpretation

For purposes of this Agreement:

(a) Capitalized terms used herein shall have the meanings set forth herein;

(b) Whenever nouns or pronouns are used in this Agreement, the singular shall mean the plural, the plural shall mean the singular, and any gender shall mean all genders or any other gender, as the context may require;

(c) Words that have well-known technical or trade meanings are used herein in accordance with such recognized meanings unless otherwise specifically provided;

(d) All accounting terms not otherwise defined herein have the meanings assigned to them in accordance with "generally accepted accounting principles," and the term "generally accepted accounting principles" with respect to any computation required or permitted hereunder shall mean such accounting principles that are generally accepted as of the Effective Date of this Agreement;

(e) The words "herein", "hereof" and "hereunder" and words of similar import refer to this Agreement as a whole and not to any particular Article, Section or Subsection;

(f) Reference to any particular party shall include that party's employees and the authorized agents of that party;

(g) All references to agreements are references to the agreements as the provisions thereof that may be amended, modified or waived from time to time; and,

(h) The captions contained in this Agreement have been inserted for convenience only and shall not affect or be effective to interpret, change or restrict the terms of provisions of this Agreement.

2. SCOPE OF WORK

2.1 Contractor's Responsibilities

Contractor shall be responsible for:

(a) Mobilization to the site and establishing temporary facilities, preparing the site for construction of the cap by placing sediment and erosion controls and removing temporary cover over the work area, regrading ash to proposed final contours as required, placing and compacting subgrade, construction of the landfill cap system including the geotextile, geomembrane, and geocomposite drainage layer, placing and compacting cover soil, placing topsoil and establishing vegetation, and construction of half-pipe drainage swales and downchute all as shown on the construction drawings.

(b) Performing all other work required for the Project, all of which is in accordance with and as required by the Contract Documents, including but not limited to, the drawings set forth in **Exhibit A** attached hereto and made a part hereof (the "Plans" or "Contract Drawings") and the Technical Specifications set forth in **Exhibit B** attached hereto and made a part hereof (the "Technical Specifications");

(c) Furnishing all labor, materials, supplies, tools, equipment and other facilities and necessary appurtenances or property for or incidental to the Project and the performance and completion of the Work (as hereinafter defined);

(d) Restoring any part of the Property, the improvements thereon, including but not limited to any access roads, or the Work (as hereinafter defined) that require restoration pursuant to the terms and conditions in Section 4.4 hereof; and

(e) Making all required notifications and obtaining all local, state, and federal permits and approvals necessary for the completion of the Work.

Items (a) through (e) above are hereinafter collectively referred to as the "Work."

2.2 Performance and Completion of Work

All Work shall be performed and completed by Contractor in a good workmanlike manner consistent and in accordance with:

(a) Any and all instructions, guidance and directions provided by CRRA or Engineer to Contractor;

(b) The Contract Documents;

(c) Sound construction practices;

(d) The highest industry standards applicable to Contractor and its performance of the Work hereunder;

(e) The schedule for the Work set forth in **Exhibit C** attached hereto and made a part hereof; and

(f) All Laws And Regulations.

Items (a) through (f) above are hereinafter collectively referred to as the "Standards."

Contractor shall obtain any locally required building or other permits required for the Work, and Contractor shall also assist and fully cooperate with CRRA in obtaining any other applicable permits necessary to begin and complete the Work.

2.3 CRRA's Responsibilities

CRRA and/or its Engineer shall be responsible for administering this Agreement, accepting the Work that is performed and completed by Contractor in accordance with the Contract Documents, and receiving and paying invoices for such Work.

2.4 Direction of Work

CRRA and/or its Engineer may, where necessary or desired, provide Contractor with instructions, guidance and directions in connection with Contractor's performance of the Work hereunder. CRRA reserves the right to determine whether Contractor will, upon completion of any phase of the Work, proceed to any or all remaining phases of the Work. If CRRA determines that Contractor shall not proceed with the remaining Work, CRRA shall terminate this Agreement in accordance with Section 4.3 hereof.

2.5 CRRA's Inspection Rights

Contractor's performance of the Work hereunder, as well as Contractor's work products resulting from such performance, are subject to inspection by CRRA. Inspections may be conducted at any time by CRRA. In the event of an inspection, Contractor shall provide to CRRA any documents or other materials that may be necessary in order for CRRA to conduct the inspection. If, after any such inspection, CRRA is unsatisfied with Contractor's performance of the Work hereunder or any of the work products resulting therefrom, Contractor shall, at the direction of CRRA, render such performance or work products satisfactory to CRRA at no additional cost or expense to CRRA and without any extension of or addition to any Contract Time for the remaining Work. For purpose of this Section 2.5, CRRA shall mean CRRA and/or its authorized agents, including but not limited to Engineer.

2.6 Access

CRRA hereby grants to Contractor, during the Hartford Landfill's normal hours of operation, access to only those areas of the Property necessary for Contractor to perform the Work hereunder, provided that:

(a) Contractor shall not interfere with any other operations or activities being conducted on the Property by either CRRA or any other person or entity;

(b) Contractor directly coordinates with CRRA on such access and Contractor's storage of any equipment or materials on the Property; and

(c) Contractor is in compliance with all of the terms and conditions of this Agreement.

CRRA reserves the right to revoke the access granted to Contractor herein if Contractor fails to comply with any of the foregoing conditions of access.

2.7 Change in Scope of Work

In the event that CRRA determines during the term of this Agreement that any revisions, modifications or changes are necessary to the scope of Work as set forth in Section 2.1 hereof, then pursuant to CRRA's request, Contractor shall promptly commence and perform the work required for such revisions, modifications or changes, which work shall be performed in accordance with the Standards unless otherwise specifically agreed to in writing by CRRA and Contractor. If any adjustment(s) to the Contract Price and/or the Contract Time is required as a result of such revisions, modifications or changes, CRRA and Contractor shall mutually agree in writing on the amount of such adjustment(s) provided that the schedule of values (including the unit prices set forth therein) approved by CRRA for the Project, to the extent applicable, shall be used to determine the appropriate increase or decrease in the quantity or cost of the materials or Work necessitated by such revisions, modifications or changes. Contractor shall promptly commence and perform any work required by such revisions, modifications or changes even if CRRA and Contractor cannot agree on the amount of such adjustment(s).

2.8 Site and Subsurface Conditions

All information and data shown or indicated in the Contract Documents with respect to underground facilities, surface conditions, subsurface conditions or other conditions at or contiguous to the Site are furnished for information only and CRRA does not assume any responsibility for the accuracy or completeness of such information and data. Contractor acknowledges and agrees that CRRA does not assume any responsibility for such information and data and that Contractor is solely responsible for investigating and satisfying itself as to all actual and existing Site conditions, including but not limited to surface conditions, subsurface conditions and underground facilities. Contractor has carefully studied all such information and data and Contractor has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (including but not limited to surface conditions, subsurface conditions and underground facilities) at or contiguous to the Site and all other conditions or factors which may affect cost, progress, performance, furnishing or completion of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction or performance of the Work to be employed by Con-

tractor and safety precautions and programs incident thereto. Contractor does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for Contractor to conclusively determine, and Contractor has so determined, that the Work can be performed, furnished and completed in accordance with the Contract Time, the Contract Price and the other terms and conditions of the Contract Documents. In the event that the information or data shown or indicated in the Contract Documents with respect to underground facilities or surface, subsurface or other conditions at or contiguous to the Site differs from conditions encountered by Contractor during performance of the Work, there shall be no increase in the Contract Price and/or no extension of the Contract Time as a result of such differing conditions, unless CRRA, in its sole and absolute discretion, agrees in writing to such increase and/or extension.

2.9 Methane Gases

Contractor acknowledges the presence of methane gases at the Hartford Landfill and that, during the term of this Request For Bids, methane gases will be collected from such Hartford Landfill. Contractor covenants and agrees that it and its employees, agents, subcontractors and materialmen shall take all necessary precautions with respect to the presence of methane gases at all times at such Hartford Landfill, including, but not limited to, prohibiting the presence of any open flames, sparks, smoking or any other activity which might ignite any of the methane gases present at the Hartford Landfill.

2.10 Proprietary Information

Contractor shall not use, publish, distribute, sell or divulge any information obtained from CRRA by virtue of this Agreement for Contractor's own purposes or for the benefit of any person, firm, corporation or other entity (other than CRRA) without the prior written consent of CRRA. Any report or other work product prepared by Contractor in connection with the performance of the Work hereunder shall be owned solely and exclusively by CRRA and cannot be used by Contractor for any purpose beyond the scope of this Agreement without the prior written consent of CRRA.

2.11 Books and Records

Contractor shall maintain proper books and records containing complete and correct information on all Work performed by Contractor pursuant to this Agreement in accordance with generally accepted accounting principles and practices. CRRA has the right to inspect and review all such books and records during Contractor's business hours.

2.12 Status of Contractor

CRRA and Contractor acknowledge and agree that Contractor is acting as an independent contractor in performing any Work for CRRA hereunder and that Contractor shall perform such Work in its own manner and method subject to the terms of this Agreement. Nothing in this Agreement shall be construed or interpreted as creating a partnership, a joint venture, an agency, a master-servant relationship, an employer-employee relationship or any other rela-

tionship between CRRA and Contractor other than that of an owner and an independent contractor. Contractor is expressly forbidden from transacting any business in the name of or on account of CRRA, and Contractor has no power or authority to assume or create any obligation or responsibility for or on behalf of CRRA in any manner whatsoever.

2.13 Subcontractors

Contractor shall consult with CRRA before hiring any subcontractors to perform any Work hereunder. Contractor shall require all of its subcontractors to abide by the terms and conditions of this Agreement. Moreover, Contractor's subcontracts with such subcontractors shall specifically provide that, in the event of a default by Contractor thereunder or under this Agreement, CRRA may directly enforce such subcontracts and make payments thereunder. Contractor shall provide CRRA with all contracts, amendments, books, records, accounts, correspondence and other materials necessary to enforce such subcontracts. Also Contractor's subcontracts with its subcontractors shall specifically include CRRA as a third party beneficiary and shall provide that such subcontractors shall not be excused from any of their obligations under such subcontracts by reason of any claims, setoffs, or other rights whatsoever that they may have with or against Contractor other than through such subcontracts.

2.14 Contractor's Employees

All persons employed by Contractor shall be subject and responsible solely to the direction of Contractor and shall not be deemed to be employees of CRRA.

2.15 Mechanic's Liens

Contractor shall claim no interest in the Property or any equipment, fixtures or improvements located or to be located thereon, including but not limited to the Hartford Landfill or any part thereof. Contractor shall not file any mechanic's liens or other liens or security interests against CRRA or any of its properties, including but not limited to the Property. Contractor shall defend, indemnify and hold harmless CRRA against all costs associated with the filing of such liens or interests by Contractor or any of its subcontractors or materialmen. Before any subcontractor or materialman of Contractor commences any Work hereunder, Contractor shall deliver to CRRA an original waiver of mechanic's liens properly executed by such subcontractor or materialman. If any mechanic's lien is filed against CRRA or any of its properties in connection with the Work hereunder, Contractor shall cause the same to be canceled and discharged of record within fifteen (15) days after the filing of such lien and, if Contractor fails to do so, CRRA may, at its option but without any obligation to do so, make any payment necessary to obtain such cancellation or discharge and the cost thereof, at CRRA's election, shall be either deducted from any payment due to Contractor hereunder or reimbursed to CRRA promptly upon demand by CRRA to Contractor.

3. COMPENSATION AND PAYMENT

3.1 Compensation

The total amount of compensation to be paid to Contractor by CRRA for the Work hereunder shall not exceed _____ ($_____) Dollars (the "Contract Price"), which Contract Price shall be payable as set forth in Section 3.2 below. Contractor acknowledges and agrees that the Contract Price constitutes the full compensation to Contractor for the Work to be performed by Contractor hereunder and includes all expenses and costs to be incurred by Contractor in performing such Work.

3.2 Payment Procedure

After Contractor completes the Work, Contractor shall submit to CRRA a written request for payment for all the Work completed by Contractor. The written request for payment shall be submitted on AIA Forms G702 and G703 and in accordance with the General Requirements, and such request shall include the name of the Project, the contract number, and all of the other information and documentation required by the General Requirements. If CRRA determines in its sole and absolute discretion that the Work for which Contractor is requesting payment has been properly performed and completed in conformance with the Standards, Contractor is not in default hereunder and CRRA does not dispute the amount of the payment requested, then CRRA shall pay Contractor the amount requested (the "Authorized Sum") within thirty (30) days after CRRA's receipt of such written request. If, however, CRRA determines that any of the Work for which Contractor has requested payment is not in conformance with the Standards, then CRRA may in its sole and absolute discretion withhold all or a portion of the Authorized Sum, and Contractor shall, if requested by CRRA, immediately take, at Contractor's sole cost and expense, all action necessary to render such Work in conformance with the Standards. CRRA shall have no obligation under this Agreement to pay for any Work that CRRA determines has not been performed and/or completed in conformance with the Standards. CRRA shall have no obligation to pay Contractor any amounts due Contractor under this Agreement if Contractor is in default hereunder.

3.3 Accounting Obligations

Contractor shall maintain books and accounts of the costs incurred by Contractor in performing the Work pursuant to this Agreement by contract number and in accordance with generally accepted accounting principles and practices. CRRA, during normal business hours, for the duration of this Agreement, shall have access to such books and accounts to the extent required to verify such costs incurred.

3.4 Withholding Taxes And Other Payments

No FICA (social security) payroll tax, state or federal income tax, federal unemployment tax or insurance payments, state disability tax or insurance payments or state unemployment tax or insurance payments shall be paid or deposited by CRRA with respect to Contractor, nor be withheld from payment to Contractor by CRRA. No workers' compensation insurance has

been or will be obtained by CRRA on account of the Work to be performed hereunder by Contractor, or any of Contractor's employees or subcontractors. Contractor shall be responsible for paying or providing for all of the taxes, insurance and other payments described or similar to those described in this Section 3.4 and Contractor hereby agrees to indemnify CRRA and hold CRRA harmless against any and all such taxes, insurance or payments, or similar costs which CRRA may be required to pay in the event that Contractor's status hereunder is determined to be other than that of an independent contractor.

3.5 State of Connecticut Taxes

Contractor agrees that, pursuant to *Connecticut General Statutes* § 22a-270 (as the same may be amended or superceded from time to time) CRRA is exempt from all State of Connecticut taxes and assessments. Without limiting the generality of the preceding sentence, Contractor also agrees that, pursuant to *Connecticut General Statutes* § 12-412(92) (as the same may be amended or superceded from time to time), "[t]he sales and use of any services or tangible personal property to be incorporated into or used or otherwise consumed in the operation of any project of [CRRA] . . .whether such purchases are made directly by [CRRA] or are reimbursed by [CRRA] to the lessee or operator of such project" is not subject to Connecticut Sales and Use Taxes. Accordingly, Contractor shall not charge CRRA any State of Connecticut taxes or assessments at any time in connection with Contractor's performance of this Agreement, nor shall Contractor include any State of Connecticut taxes or assessments in any rates, costs, prices or other charges to CRRA hereunder. The obligations of Contractor contained in the preceding sentence are absolute and shall apply notwithstanding any payment by Contractor of any State of Connecticut taxes or assessments in connection with its performance of this Agreement. Contractor represents and warrants that no State of Connecticut taxes or assessments were included in any rates, costs, prices or other charges presented to CRRA in any RFB or other submittal or proposal to CRRA in connection with this Agreement.

4. TERM OF AGREEMENT

4.1 Term

The term of this Agreement shall commence upon the Effective Date and shall terminate, unless otherwise terminated or extended in accordance with the terms and provisions hereof, on the first anniversary of the Acceptance Date.

4.2 Time is of the Essence

CRRA and Contractor hereby acknowledge and agree that time is of the essence with respect to Contractor's performance of the Work hereunder. Accordingly, upon CRRA's issuance to Contractor of a notice to proceed with the Work (the "Notice To Proceed"), which Notice To Proceed shall be issued after the parties hereto receive all of the local, state and federal permits required for the Work hereunder, Contractor shall immediately commence performance of the Work and continue to perform the same during the term of this Agreement in accor-

dance with the schedule set forth in attached **Exhibit C** in order to complete all of the Work and have such Work ready for CRRA's acceptance by the ninetieth (90^{th}) day following the issuance of such Notice To Proceed (the "Completion Date"). CRRA and Contractor recognize the difficulties involved in proving actual damages and losses suffered by CRRA if the Work is not completed and ready for CRRA's acceptance by the Completion Date. Accordingly, instead of requiring any such proof, CRRA and Contractor agree that as liquidated damages for any such delay in completion or readiness for acceptance (but not as a penalty) Contractor shall pay CRRA five hundred and 00/100 ($500.00) dollars for each calendar day beyond the Completion Date that Contractor fails to complete all of the Work or have the same ready for CRRA's acceptance until all such Work is completed by Contractor and readied by Contractor for acceptance by CRRA.

4.3 Termination

CRRA may terminate this Agreement at any time by providing Contractor with ten (10) days' prior written notice of such termination. Upon receipt of such written notice from CRRA, Contractor shall immediately cease performance of all Work, unless otherwise directed in writing by CRRA. Prior to any termination of this Agreement, Contractor shall remove all of its personnel and equipment from the Property, restore any part of the Property, any of the improvements located or to be located thereon, including but not limited to any access roads, or any of the Work that requires restoration pursuant to the terms and conditions of Section 4.4 hereof. Upon termination of this Agreement pursuant to this Section 4.3,

(a) CRRA shall pay Contractor for all Work performed and completed by Contractor prior to the termination date, provided:

  (i) Such Work has been performed and completed by Contractor in conformance with the Standards;

  (ii) Payment for such Work has not been previously made or is not disputed by CRRA;

  (iii) Contractor is not in default hereunder; and,

  (iv) Contractor has performed and completed all its obligations under this Section 4.3 and Section 4.4 hereof to CRRA's satisfaction, and

(b) CRRA shall have no further liability hereunder.

Except for the payment that may be required pursuant to the preceding sentence, CRRA shall not be liable to Contractor in any other manner whatsoever in the event CRRA exercises its right to terminate this Agreement.

4.4 Restoration

Unless otherwise directed in writing by CRRA, Contractor shall:

(a) Restore any part of the Property or any of the improvements located or to be located thereon, other than those areas of the Property or such improvements improved by Contractor pursuant to this Agreement, disturbed or damaged by Contractor or any of its directors, officers, employees, agents, subcontractors or materialmen to the same condition existing immediately prior to such disturbance or damage; and

(b) Restore or repair any completed Work so disturbed or damaged to the condition required by the Contract Documents for acceptance of such Work by CRRA.

5. INDEMNIFICATION

5.1 Contractor's Indemnity

Contractor shall at all times defend, indemnify and hold harmless CRRA and its board of directors, officers, agents and employees from and against any and all claims, damages, losses, judgments, liability, workers' compensation payments and expenses (including but not limited to attorneys' fees) arising out of injuries to the person (including death), damage to property or any other damages alleged to have been sustained by: (a) CRRA or any of its directors, officers, agents, employees or other contractors, or (b) Contractor or any of its directors, officers, agents, employees, subcontractors or materialmen, or (c) any other person, to the extent any such injuries, damage or damages are caused or alleged to have been caused in whole or in part by the acts, omissions or negligence of Contractor or any of its directors, officers, agents, employees, subcontractors or materialmen. Contractor further undertakes to reimburse CRRA for damage to property of CRRA caused by Contractor or any of its directors, officers, agents, employees, subcontractors or materialmen, or by faulty, defective or unsuitable material or equipment used by it or any of them. The existence of insurance shall in no way limit the scope of this indemnification. Contractor's obligations under this Section 5.1 shall survive the termination or expiration of this Agreement.

5.2 Workmanship and Materials Warranty; Other Warranties and Guarantees

For a period of one (1) year following the Acceptance Date (the "Warranty Period"), Contractor warrants the workmanship, equipment, and materials furnished under this Agreement for the Project against defects. If during or at the end of the Warranty Period, CRRA determines that any of such workmanship, equipment or materials is or has become defective, Contractor shall, at its own cost and expense, promptly repair or replace such defective workmanship, equipment or materials in order to render the same to the same condition as warranted above. Any repairs to or replacements of such workmanship, equipment or materials required under this Section 5.2 must be approved by CRRA before Contractor may commence performance of such repairs or replacements, and all such repairs or replacements shall be performed by Contractor in accordance with all applicable Standards. In connection therewith Contractor shall obtain all warranties and guarantees for all material and equipment furnished hereunder by Contractor that are assignable to CRRA. Contractor shall assign such

warranties and guarantees to CRRA upon the Acceptance Date. Contractor's obligations under this Section 5.2 shall survive the termination or expiration of this Agreement.

6. INSURANCE

6.1 Required Insurance

Contractor shall procure and maintain, at its own cost and expense, throughout the term of this Agreement and any extension thereof, the following insurance, including any required endorsements thereto and amendments thereof:

(a) Commercial General Liability insurance alone or in combination with Commercial Umbrella insurance with a limit of not less than five million dollars ($5,000,000.00) each occurrence covering liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury, and liability assumed under an insurance contract (including the tort liability of another assumed in a business contract).

(b) Business Automobile Liability insurance alone or in combination with Commercial Umbrella insurance covering any auto (including owned, hired, and non-owned autos), with a limit of not less than one million dollars ($1,000,000.00) each accident.

(c) Workers' Compensation with statutory limits and Employers' Liability limits of five hundred thousand dollars ($500,000.00) each accident for bodily injury by accident or five hundred thousand dollars ($500,000.00) for each employee for bodily injury by disease.

(d) Pollution Legal Liability with a limit of not less than one million dollars ($1,000,000).

6.2 Certificates

Within five (5) days after CRRA issues the Notice Of Award, Contractor shall submit to CRRA a certificate or certificates for each required insurance referenced in Section 6.1 above certifying that such insurance is in full force and effect and setting forth the information required by Section 6.3 below. Additionally, Contractor shall furnish to CRRA within thirty (30) days before the expiration date of the coverage of each required insurance set forth in Section 6.1 above, a certificate or certificates containing the information required by Section 6.3 below and certifying that such insurance has been renewed and remains in full force and effect.

6.3 Specific Requirements

All policies for each insurance required hereunder shall:

(a) Name CRRA as an additional insured (this requirement shall not apply to workers' compensation insurance/employers' liability insurance);

(b) Include a standard severability of interest clause;

(c) Provide for not less than thirty (30) days' prior written notice to CRRA by registered or certified mail of any cancellation, restrictive amendment, non-renewal or change in coverage;

(d) Contain a waiver of subrogation holding CRRA free and harmless from all subrogation rights of the insurer; and

(e) Provide that such required insurance hereunder is the primary insurance and that any other similar insurance that CRRA may have shall be deemed in excess of such primary insurance.

6.4 Issuing Companies

All policies for each insurance required hereunder shall be issued by insurance companies that are either licensed by the State of Connecticut and have a Best's Key Rating Guide of A-VII or better, or otherwise deemed acceptable by CRRA in its sole discretion.

6.5 Contractor's Subcontractors

Contractor shall either have its subcontractors covered under the insurance required hereunder, or require such subcontractors to procure and maintain the insurance that Contractor is required to procure and maintain under this Agreement.

6.6 No Limitation on Liability

No provision of this Article 6 shall be construed or deemed to limit Contractor's obligations under this Agreement to pay damages or other costs and expenses.

6.7 Other Conditions

CRRA shall not, because of accepting, rejecting, approving, or receiving any certificate of insurance required hereunder, incur any liability for:

(a) The existence, non-existence, form or legal sufficiency of the insurance described on such certificate,

(b) The solvency of any insurer, or

(c) The payment of losses.

7. BONDS

7.1 Bonds

Within ten (10) days after CRRA issues the Notice Of Award, Contractor shall furnish CRRA with construction performance and payment bonds (the "Bonds") each in the full amount of the Contract Price. The Bonds shall be in and drawn on the forms set forth in **Exhibit D** and **Exhibit E** attached hereto and made a part hereof, and such Bonds shall be issued and executed by a surety company or surety companies acceptable to CRRA. If the surety on any of the Bonds furnished by Contractor is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the above requirements, Contractor shall immediately substitute another bond and surety, subject to the requirements set forth in this Section 7.1.

8. MISCELLANEOUS

8.1 Non-Discrimination

Contractor agrees to the following:

(a) Contractor agrees and warrants that in the performance of the Work for CRRA Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, including civil union status, national origin, ancestry, sex, sexual orientation, mental retardation or physical disability, including, but not limited to, blindness, unless it is shown by Contractor that such disability prevents performance of the Work involved, in any manner prohibited by the laws of the United States or of the State of Connecticut. Contractor further agrees to take affirmative action to insure that applicants with job related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, including civil union status, national origin, ancestry, sex, sexual orientation, mental retardation, or physical disability, including, but not limited to, blindness, unless it is shown by Contractor that such disability prevents performance of the Work involved;

(b) Contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of Contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Connecticut Commission on Human Rights and Opportunities (The "Commission");

(c) Contractor agrees to provide each labor union or representative of workers with which Contractor has a collective bargaining agreement or other contract or understanding and each vendor with which Contractor has a contract or understanding, a notice to be provided by the Commission, advising the labor union, workers' representative and vendor of Contractor's commitments under Sections

4a-60 and 4a-60a of the *Connecticut General Statutes* and to post copies of the notice in conspicuous places available to employees and applicants for employment;

(d) Contractor agrees to comply with each applicable provision of Sections 4a-60, 4a-60a, 46a-68e, and 46a-68f, inclusive, of the *Connecticut General Statutes* and with each regulation or relevant order issued by the Commission pursuant to Sections 46a-56, 46a-68e, and 46a-68f of the *Connecticut General Statutes*; and

(e) Contractor agrees to provide the Commission with such information requested by the Commission, and permit access to pertinent books, records and accounts concerning the employment practices and procedures of Contractor as related to the applicable provisions of Sections 4a-60, 4a-60a and 46a-56 of the *Connecticut General Statutes*. If this Agreement is a public works contract, Contractor agrees and warrants that it will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials in such public works project.

8.2 Entire Agreement

This Agreement constitutes the entire agreement and understanding between the parties hereto and concerning the subject matter hereof, and supersedes any previous agreements, written or oral, between the parties hereto and concerning the subject matter hereof.

8.3 Governing Law

This Agreement shall be governed by, and construed, interpreted and enforced in accordance with the laws of the State of Connecticut as such laws are applied to contracts between Connecticut residents entered into and to be performed entirely in Connecticut.

8.4 Assignment

This Agreement may not be assigned in whole or in part by either party without the prior written consent of the other party or such assignment shall be void.

8.5 No Waiver

Failure to enforce any provision of this Agreement or to require at any time performance of any provision hereof shall not be construed to be a waiver of such provision, or to affect the validity of this Agreement or the right of any party to enforce each and every provision in accordance with the terms hereof. No waiver of any provision of this Agreement shall affect the right of CRRA or Contractor thereafter to enforce such provision or to exercise any right or remedy available to it in the event of any other default involving such provision or any other provision. Making payment or performing pursuant to this Agreement during the existence of a dispute shall not be deemed to be and shall not constitute a waiver of any claims or defenses of the party so paying or performing.

8.6 Modification

This Agreement may not be amended, modified or supplemented except by a writing signed by the parties hereto that specifically refers to this Agreement. Any oral representations or letters by the parties or accommodations shall not create a pattern or practice or course of dealing contrary to the written terms of this Agreement unless this Agreement is formally amended, modified or supplemented.

8.7 Prevailing Wages

Contractor hereby represents that the Contractor's Wage Certification Form, as executed by Contractor and attached hereto as **Exhibit F** and made a part hereof, has been submitted by Contractor to the State of Connecticut's Department of Labor for Contractor's performance of the Work. Contractor shall pay wages on an hourly basis to any mechanic, laborer or workman employed upon the Work herein and the amount of payment or contribution paid or payable on behalf of each such employee to an employee welfare fund, as defined in *Connecticut General Statutes* § 31-53(h), at rates equal to the rates customary or prevailing for the same work in the same trade or occupation in the town in which the Work is being conducted, which rates are more specifically set forth in **Exhibit G** attached hereto and made a part hereof. If Contractor is not obligated by agreement to make payment or contribution on behalf of such employees to any such employee welfare fund, Contractor shall pay to each employee as part of his or her wages the amount of payment or contribution for his or her classification on each payday. Contractor shall keep, maintain and preserve records relating to the wages and hours worked by each employee and a schedule of the occupation or work classification at which each mechanic, laborer, or workman under this Agreement is employed during each work day and week in such manner and form as the labor commissioner establishes to assure the proper payments due to such employees or employee welfare funds under *Connecticut General Statutes* §§ 31-53 and 31-54. Pursuant to *Connecticut General Statutes*§ 31-53(f), Contractor shall complete and submit to CRRA on a weekly basis during the term of this Agreement and any extension thereof the payroll certification forms set forth in **Exhibit H** attached thereto and made a part hereof. Contractor hereby represents and covenants that it is not now, and has not been for at least three (3) years previous to the date of this Agreement, listed by the labor commissioner as a person who has violated laws and regulations relating to prevailing wages.

8.8 Notices

All notices, requests, demands and other communications hereunder shall be in writing and shall be deemed to have been duly given if mailed via certified first class mail return receipt requested postage prepaid or overnight express mail service to the pertinent address below.

(a) If to CRRA:

Connecticut Resources Recovery Authority
100 Constitution Plaza, 6th Floor
Hartford, Connecticut 06103

Attention: Peter Egan

With a copy to:

Connecticut Resources Recovery Authority
100 Constitution Plaza, 6th Floor
Hartford, Connecticut 06103
Attention: President

(b) If to Contractor:

_____
_____
_____
Attention: _____

8.9 Benefit and Burden

This Agreement shall inure to the benefit of and be binding upon the heirs, personal representatives, successors and assigns of the parties hereto.

8.10 Severability

CRRA and Contractor hereby understand and agree that if any part, term or provision of this Agreement is held by any court to be invalid, illegal or in conflict with any applicable law, the validity of the remaining portions of this Agreement shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if this Agreement did not contain the particular part, term or provision held to be invalid, illegal or in conflict with any applicable law.

8.11 Counterparts

This Agreement may be executed in any number of counterparts by the parties hereto. Each such counterpart so executed shall be deemed to be an original and all such executed counterparts shall constitute but one and the same instrument.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals as of the day and year first written above.

CONNECTICUT RESOURCES RECOVERY AUTHORITY

By: _____

Thomas D. Kirk
Its President
Duly Authorized

CONTRACTOR

By: _____

Its
Duly Authorized

EXHIBIT A

CONSTRUCTION DRAWINGS

The following Construction Drawings are hereby incorporated by reference and made a part of this Agreement as if such plan had been attached in its entirety to this Agreement:

- Connecticut Resources Recovery Authority Hartford Landfill – Phase 1 Ash Area Partial Closure

EXHIBIT B

TECHNICAL SPECIFICATIONS

The following Technical Specifications are hereby incorporated by reference and made a part of this Agreement as if such plan had been attached in its entirety to this Agreement:

- Connecticut Resources Recovery Authority Hartford Landfill – Phase 1 Ash Area Partial Closure

SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A.. Contract Documents and general provisions of the Contract, including General and Supplementary Conditions and other Technical Specifications, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A.. The Project is entitled, "Hartford Landfill - Phase I Ash Area Partial Closure." A portion of the currently active landfill, as shown on the Contract Drawings, will be capped and landscaped. The work involves mobilization and establishing temporary facilities, preparation of the site, establishing sediment and erosion controls, preparing the ash grades, constructing the surface cap and drainage layers, placing cover material and topsoil, constructing drainage structures, and landscaping.

B. The Contractor shall include in his bid, all items required in order to carry out the intent of the Work as described, shown, and implied in the Contract Documents.

C. It shall be the Contractor's responsibility upon discovery to immediately notify CRRA in writing, of errors, omissions, discrepancies, and instances of non-compliance with applicable codes and regulations within the documents. Any additional costs arising from the Contractor's failure to provide such notification shall be borne by the Contractor.

D. The Contractor shall include in his bid all items required in order to carry out the intent of the Work as described, shown, and implied in the Contract Documents.

1.3 WORK SEQUENCE

A. Prior to mobilization, the Contractor shall provide CRRA with all the required testing and analytical data for materials and soils to be brought onsite for the construction of the landfill cap.

B. The Contractor shall mobilize all equipment, labor, tools, materials, and incidentals to the site. Temporary facilities shall include a construction trailer, sanitary facilities, and materials, equipment, and soil storage area as shown on the Contract Drawings. The Contractor shall demobilize following the completion of work and shall restore all storage areas to their condition prior to commencing work.

C. The Contractor shall prepare the site for construction by installing sediment and erosion controls as shown on the Contract Drawings and by removing temporary cover materials in place within the Work Area. Liner used to cover the working face may either be reused, if in good condition and approved by the Engineer, to construct the protective

barrier for the limits of the final cap at the working face or disposed of appropriately. Concrete blocks securing the liner may also be reused to construct the protective barrier or moved to an onsite location as indicated by CRRA.

D. The Contractor shall complete the final grading of the ash within the Work Area. Prior to initiating construction of the landfill cap, CRRA will perform a survey to determine the areas of cut and fill to achieve the final ash surface grade prior to commencing construction of the landfill cap. The Contractor will be responsible for regrading the surface, and possibly relocation of ash in areas where large amounts of fill may be required, to achieve the final grade. All grades prior to placement of sub base shall be no greater than 33%, nor less than 4%. Contractor shall remove all visible pieces of metal prior to placement of sub base.

E. The Contractor shall furnish, place, and compact 6 inches of subbase soil in accordance with the provisions of the Contract Documents. The Contractor shall furnish and install the nonwoven geotextile, geomembrane, and geocomposite drainage layer in accordance with the provisions of the Contract Documents. The Contractor shall provide a final as-built survey of the limits of the liner showing topography and spot elevations, prepared and sealed by a Connecticut licensed surveyor. Copies of all field notes shall accompany the as-built survey.

G. The Contractor shall furnish, place, and compact final cover material and topsoil as specified in the alternative selected for construction by CRRA. Three separate alternatives are described in the Contract Documents and the Contractor shall provide a price for the construction of each alternative described. CRRA will make the final determination as to which cover material and topsoil option will be employed.

H. The Contractor shall construct surface water drainage control structures, half-pipe diversion swale and downchute swale, in accordance with the provisions of the Contract Documents. The Contractor shall provide a final as-built survey of the surface drainage control structures showing topography and spot elevations, prepared and sealed by a Connecticut licensed surveyor. Copies of all field notes shall accompany the as-built survey.

I. The Contractor shall place surface erosion control materials, turf reinforcement mat and jute matting, and fiber filter tubes, in accordance with the provisions of the Contract Documents. Vegetation shall be established by applying the flexible growth media mixed with the specified grass seed mixture to the entire Work Area. The Contractor shall ensure that vegetation is established by maintaining sediment and erosion controls and water as necessary until the work is accepted by CRRA. The Contractor shall provide a final as-built survey of the final surface gradess showing topography and spot elevations, prepared and sealed by a Connecticut licensed surveyor. Copies of all field notes shall accompany the as-built survey.

1.4 MISCELLANEOUS PROVISIONS

A. Examination of the Site:
   1. It is not the intent of the Contract Documents to show all existing conditions. All contractors are required to attend the Pre-Bid Conference prior to submitting their Bid Proposal. This is the only opportunity to visit and examine the site with CRRA.
   2. Contractors should investigate and satisfy themselves as to the conditions affecting the work, including but not restricted to those bearing upon transportation, handling, and storage of materials, availability of labor, water, electric power, uncertainties of weather, roads or similar physical conditions of the ground, and facilities needed preliminary to and during the prosecution of the Work. Any failure by the Contractor to acquaint himself with the available information shall not relieve him from the responsibility for estimating properly the difficulty and cost of successfully performing the Work.

B. Decontamination of Vehicles
   1. The Contractor shall be responsible for decontaminating vehicles used on ash surfaces. Vehicles used in the relocation and regrading of ash prior to the construction of the final cap may be washed in the vehicle wash facility onsite. Exposure to ash surfaces will be limited during cap construction, however, the Contractor must take measures to limit the transport of ash from the disposal area and the Contractor will be required to decontaminate vehicles leaving the ash area. Dry decontamination methods will be allowed if sufficient.

1.5 CONTRACTOR USE OF PREMISES

A. General: The Contractor shall have full access to the Work Area. Access to areas immediately surrounding the Work Area shall be limited to allow for CRRA's continued operations of the facility. The Contractor shall not be allowed to interfere with facility operations unless prior approval is received from CRRA and the facility operator, MDC.

B. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.
   1. The Contractor shall confine his operations, including storage or materials, supplies, equipment, and incidentals to the areas specified in the Contract Documents.
   2. Existing access roads, drives, walks, and parking areas are to be kept free and clear at all times. All deliveries for the project are to enter the Hartford Landfill property between 7 AM and 3 PM, Monday through Friday. All Contractors are to check all roadways for accessibility and clearances for deliveries of all large material and equipment. Only designated areas shall be used for parking and storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
   3. The Contractor shall be responsible for keeping the work area clean and shall pick up rubbish and debris generated by the Contractor and promptly remove from the site.

4. Contractor's daily access to the site shall be as indicated on the Contract Documents. Parking for the Contractor's employees shall be limited to an area designated by CRRA and the Contractor may be required to provide identification stickers for all vehicles.
5. Special precautions shall be taken to protect all drainage systems near the Work Area. Prevent any and all sediment, debris, or other materials from getting into these systems. Should any sediment, debris, or other materials get into these systems or if any damage occurs to them, the Contractor shall immediately contact CRRA. The Contractor shall be fully responsible for all costs associated with additional cleaning and repairs caused by neglecting to protect the drainage systems.
6. No signs, other than those approved by CRRA, shall be visible on the premises.

PART 2 – PRODUCTS

None

PART 3 - EXECUTION

None

END OF SECTION

SECTION 02112

EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 DESCRIPTION

A. The work described herein and as shown in the details on the Contract Drawings shall consist of furnishing all labor, material and equipment and performing all operations required for furnishing and installing the erosion and sediment controls during construction activities. Silt fence shall be required where indicated on the Project Drawings. Also maintain the erosion and sediment controls through the construction period until the site has been stabilized, as determined by the ENGINEER. The CONTRACTOR shall be responsible for maintaining compliance with all applicable erosion and sediment control regulations.

B. The work shall conform to the Soil Erosion and Sediment Control Plan as defined below. Site soil erosion and sediment controls must be in place before proceeding with any site demolition activity.

1.2 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 185	(1997) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
ASTM C 33	(1997) Concrete Aggregates
ASTM D 3787	(1989) Bursting Strength of Knitted Goods – Constant-Rate-or-Transverse (CRT) Ball Burst Test
ASTM D 4355	(1992) Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
ASTM D 4533	(1991; R 1996) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(1991; R 1996) Grab Breaking Load and Elongation of Geotextiles

ASTM D 5141 (1996) Determining Filtering Efficiency and Flow rate of a Geotextile for Silt Fence Application Using Site-Specific Soil

CT Public Act No. 83-388 An Act Concerning Soil Erosion and Sediment Control

CT Council on Soil and Water Conservation (2002) Connecticut Guidelines for Soil Erosion and Sediment Control

1.3 SUBMITTALS

No later than fifteen (15) days prior to initiating any site work, the CONTRACTOR shall submit each of the statements listed below for review and comment by the ENGINEER. The ENGINEER shall review the statements for compliance with the project specifications, industry standards, and good engineering practice. The ENGINEER shall provide comments on the statements within seven (7) days of receipt. The CONTRACTOR shall, to the satisfaction of the ENGINEER, address any comments or concerns that the OWNER or ENGINEER has on the draft statements and submit six (6) copies of final statements to the ENGINEER. Statements shall be submitted as complete organized reports (including tables of contents), bound in durable, 3-ring, water resistant binders. The CONTRACTOR shall not be allowed to commence with any site work until the final statements have been submitted to the ENGINEER, and the ENGINEER has acknowledged that the CONTRACTOR has addressed all the applicable comments and concerns on the draft report.

A. Soil Erosion and Sediment Control Plan
   1. The ENGINEER shall prepare a plan that describes materials and methods to be used. Provide plans, sketches, details and sequence. Prepare the Plan in accordance with this Section the Connecticut Council on Soil and Water Conservation's "Connecticut Guidelines for Soil Erosion and Sediment Control", dated 2002. the CONTRACTOR shall be responsible for the following plan.

B. Stormwater Discharge Permit for Construction Activity
   1. In accordance with CTDEP Bureau of Water Management's provisions, a Stormwater Discharge Permit for Construction Activity will be obtained by the OWNER. The OWNER will provide copies of application and approval certificate to the CONTRACTOR.

PART 2 PRODUCTS

2.1 SILT FENCE FABRIC

A. Fabric used in silt fence construction shall be non-rotting, ultraviolet light resistant woven polyester geotextile with sufficient strength for the purpose intended. The grab tensile strength shall exceed 150 pounds and puncture strength shall exceed 50 pounds.

2.2 STRAWBALES

A. Bales used in sedimentation control system shall be made of straw with forty pounds minimum weight and one hundred and twenty pounds maximum.

2.3 WOOD STAKES

A. Wood stakes used in sedimentation control system shall be a minimum 1 inch by 2 inch nominal size by a minimum 3 feet long.

2.4 SILT SACKS/FILTER FABRIC CATCH BASIN TRAPS

A. Filter fabric catch basin traps shall utilize filter fabric of the type described in 02112-2.1 and shall be constructed as shown on the Contract Drawings. Proprietary silt sacks may also be used with approval from the ENGINEER.

2.5 FIBER FILTRATION TUBES

A. The Fiber Filtration Tubes (FFT) shall consist of an engineered composite of wood fibers, man-made fibers and performance-enhancing polymers encased within cylindrical tubes composed of a heavy-duty, knitted, high density polyethylene mesh. The photodegradable mesh shall be oriented in diamond or hexagonal patterns and shall move freely at all knitted yarn intersections. The FFT shall allow water to flow freely through its matrix, provide three-dimensional filtration of soil particles and facilitate the release of flocculants to coagulate and aggregate suspended soil particles.

2.6 JUTE NETTING

A. Jute netting shall be a jute netting woven from undyed and unbleached plain, single jute yarn, loosely twisted with approximately uniform diameter yarn in both length and width directions. The finished cloth physical requirements are as follows:

Width – Nominal 48 inches
Length – Convenient lengths; 50 yard minimum
Weight – 1.05 pounds – 1.70 pounds per linear yard of 48 inch wide material
Mass – 0.5 to 0.769 kg/m of 1200 mm wide material
Openings – Approximately ½" to 1" in width and length

1. The use of either staples or stakes shall be as recommended by the manufacturer of the erosion control netting.
2. Staples used to fasten the erosion control netting to the soil surface shall be steel, U-shaped and shall be approximately 6 inches long and 1 inch wide. Machine made staples shall be of No. 11 gauge or heavier steel wire. Hand made staples shall be made from 13 inch lengths of No. 9 gauge or heavier steel wire.
3. Stakes used to fasten the erosion control netting to the soil surface shall be of a type, shape and length as recommended by the manufacturer unless designated otherwise by the plans.

B. Product and Manufacturer
   1. Terra-Tubes by Profile Products, LLC
   2. or Equal

PART 3 EXECUTION

3.1 CONSTRUCTION METHODS

Construction of erosion and sediment control practices shall be sequenced to coordinate with the construction schedule. Perimeter erosion and sediment controls shall be in place and be completely functional prior to start of any land disturbing activities. All erosion and sediment controls shall be constructed and installed in accordance with the Contract Drawings and Soil Erosion and Sediment Control Plan approved by the Owner's Representative.

A. Silt Fence
   1. Furnish and install silt fence where indicted on the Project Drawings and as required by the Soil Erosion and Sediment Control Plan. The silt fence shall remain in place during the duration of the project and shall be removed with the approval of the Engineer.

B. Catch Basin Protection
   1. For catch basins in paved roadways, provide a filter fabric sediment trap as shown on the Drawings.

C. Furnish and install Fiber Filtration Tubes (FFT) where indicated on the Contract Drawings.
   1. Install FFTs in accordance with manufacture's recommendations. The FFTs shall be installed after final grading and remain until turf is firmly established.

D. Jute Netting
   1. Jute netting strips shall be rolled out flat, parallel to the direction of flow, in flumes and ditches, perpendicular to the direction of flow on backslopes. When two or more strips are required to cover an area, they shall overlap 3 inches (minimum); and staples placed with half of each staple located in each of the adjoining blankets. Ends of strips shall overlap a minimum of 6 inches with the upgrade section on top. The upslope end (anchor slot) of each strip shall be buried in 6 inch vertical slots, and soil tamped firmly against it.

E. Maintenance
   1. The erosion and sediment control measures shall remain in place for the duration of the construction period and until turf has been established pursuant to Section 02900. The Contractor shall inspect all erosion and sediment control measures after each rainfall event and replace or repair as necessary for measures to remain functional and as directed by the ENGINEER.

3.2 BEST MANAGEMENT PRACTICES

A. Erosion and Sediment Control Devices

1. Soil erosion and sediment controls are measures that are used to reduce the amount of soil particles that are carried off of a land area and deposited in a receiving water. This section provides a general description of the most appropriate measures planned for this project. All applicable soil erosion and sediment control measures shall be implemented in accordance with the guidelines contained herein prior to commencement of construction activities. Measures shall be maintained during and after the demolition activity until final stabilization is accomplished, after which time all temporary soil erosion and sediment control measures will be removed.

   a. Temporary Stabilization
   Temporary stabilization consists of terracing, mulching, or reseeding vegetation in all disturbed, unvegetated areas that are exposed during prolonged periods of inactivity. Due to the relatively short nature of the proposed project activities, it is not likely that temporary stabilization will be required. However, temporary stabilization measures shall be implemented if construction halts for more than 14 days, where construction will not resume within 21 days, and where the area is not subject to traffic.

   b. Permanent Stabilization
   Permanent stabilization for the footprint of the landfill cap consists of turf establishment as described in Section 02935.

   c. Temporary Erosion Control Practices
   Prior to initiating construction, all temporary erosion and sediment control practices shall be in place. This section discusses all temporary erosion and sediment control practices that are necessary for the construction practices.

      1. Construction Access
      Any material which is transported outside the contract boundaries and is deposited on public roadways shall be removed immediately. Material may be removed by shoveling, wet mopping, wet sweeping, or wet power brooming and shall be transported to the appropriate stockpile within the contract boundaries. Road washing shall be allowed only after the sediment is removed in the above manner and approved by the ENGINEER. Dry sweeping or dry power brooming shall not be allowed.

      2. Silt Fence and Straw Bales
      Silt Fence and straw bales will be used to intercept and retain small amounts of sediment carried by sheet flow from the disturbed areas during construction activities in order to prevent sediment runoff from the project site. Silt fence and straw bales shall be placed within or around the work zones as shown on the Contract Drawings. Silt fence and straw bales are to be used in areas with slope except in drainageways. Silt fence and straw bales shall be placed perpendicular to the flow of runoff and parallel to the contours. The devices shall be placed down slope of disturbed areas where erosion would occur in the form of sheet or rill erosion. Construct silt fence and straw bale applications as shown on the Contract Drawings.

END OF SECTION

SECTION 02220

EXCAVATION, BACKFILL AND ASH REGRADING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, tools, equipment tests and incidentals required to perform all excavating, backfilling, compaction, and disposing of earth materials as shown, specified, and required for the purpose of constructing the landfill cap, structures, pipelines, drainage structures, embankments, roads, grading, and other facilities required to complete the Work in every respect.
2. All of the necessary excavation, backfilling and compaction of ash and soil material to achieve the landfill cap subgrades contours as shown on the Contract Drawings.
3. All temporary means needed to maintain the site in a continuously dewatered condition.
4. All necessary testing of materials as required in the Contract Documents.
5. All necessary preparation of subgrade for the landfill cap, pavements, roadways, soil and fill material, geosynthetics and geomembranes is included.
6. All necessary preparation required to repair displaced and eroded soil materials on subgrade, drainage layer, barrier protection layer, general fill layers, and vegetative layer prior to final acceptance is included.
7. All temporary means needed to prevent discharge of sediment to water courses due to dewatering systems or erosion during construction are included. Such means shall be included in a Stormwater Pollution Control Plan to be prepared by the ENGINEER prior to mobilization.
8. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition.
9. All necessary earthwork required to load and transport off-site soil material; unload, place, compact and grade the subgrade material, embankment fill, structural fill, barrier protection material, drainage material, and topsoil is included.
10. All necessary earthwork required to cut, fill and grade existing grade to within 1-inch of specified subgrade.
11. All necessary earthwork required to excavate, load and temporarily stockpile existing on-site soil material; unload, place, compact and grade the subgrade material, embankment fill, structural fill, barrier protection material, and topsoil is included.

B. Related Sections:

1. Section 02225, Subbase Material
2. Section 02227, Cover Soil Material
3. Section 02228, Topsoil
4. Section 02230, Crushed Stone and Gravel
5. Section 02900, Turf Establishment, Landscaping

C. General:

1. The CONTRACTOR shall be required to excavate ash and temporary soil cover from the site as directed by the ENGINEER and use the same as compacted backfill to achieve the landfill cap subgrade contours shown on the Contract Drawings.
2. CONTRACTOR is required to use approved clean material from off-site sources as shown on the Drawings to achieve final landfill configuration.
3. Fill materials and their respective applications include, but are not limited to the following:

Fill Material		Application
1)	Subbase	Subbase Layer
2)	Cover Soil	Layer overlying Geomembrane
3)	Topsoil	Vegetative Layer
4)	Relocated Ash & Temporary Cover	Cap Subgrade

4. Prior to mobilization to the site to construct the landfill cap, CRRA will perform a survey of the Work Area to determine areas that will require cut or fill to achieve the final ash surface grade. The Contractor will be responsible for regrading the surface of the Work Area to achieve this final grade. It may be necessary for the Contractor to move large amounts of fill to achieve the final grades. Payment will be made on a unit price basis. Contractor will determine means and methods to achieve final grades. All grades prior to placement of subbase shall be no greater than 33%, nor less than 4%. CONTRACTOR shall remove all visible pieces of metal within the ash layer prior to placement of subbase.
5. CONTRACTOR shall provide a final as-built survey of lines and grades showing topography and spot elevations prepared and sealed by a Connecticut licensed surveyor for top of liner and finished grades. Copies of all field notes shall accompany the as-built surveys and shall be submitted prior to the request for payment.
6. CONTRACTOR'S test field data must indicate compliance with the Contract Documents in order to be accepted. The data must be presented to and accepted by the ENGINEER prior to placement of the next lift. CONTRACTOR must assist the ENGINEER in doing periodic conformance testing while the work is in progress. The field data must be certified and sealed by a Connecticut licensed Professional Engineer.

D. CONTRACTOR shall provide ENGINEER with access to the borrow pit or material source upon request for the purposes of observing material source operations and obtaining samples.

E. CONTRACTOR shall maintain open access to roads at all times during landfill cap construction. CONTRACTOR shall not block the existing roads at any time. If access needs to be temporarily blocked during construction, the CONTRACTOR shall provide written notice to the OWNER at least one week prior to needing to block this access.

1.2 QUALITY ASSURANCE

A. Tests:
   1. The services of a qualified testing laboratory shall be engaged by the CONTRACTOR to make tests and determine acceptability of the fill or material as listed below. The laboratory shall be acceptable to the ENGINEER.
   2. Required Tests:
      a. Topsoil, cover material, and subbase samples from Off-Site: Gradation, ASTM D 422, Priority Pollutant Semivolatile Organic Compounds (SVOCs), EPA Method 8270, Priority Pollutant Volatile Organic Compounds (VOCs), EPA Method 8260, Priority Pollutant Metals, EPA Method 6010 (HG Method), PCB's/Pesticides, EPA Method 8081, Herbicides, EPA Method 8151. All environmental test results shall be in conformance with the criteria for Residential Direct Exposure Criteria (RDEC) and Class GB Groundwater Pollutant Mobility Criteria (GBPMC) of the CTDEP's Remediation Standard Regulations (RSRs), 22a-133k-l to k-3 of the Regulations of Connecticut State Agencies.
      b. Compacted in place cover material and subbase samples: Compaction, Modified Proctor ASTM D 1557, ASTM D 1556, ASTM D 2922 and ASTM D3017.

B. Permits and Regulations:
   1. CONTRACTOR shall obtain all necessary permits for work.
   2. CONTRACTOR shall perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction and any other permits required for this project.
   3. CONTRACTOR shall obtain and comply with the CTDEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities.

C. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.
   1. ASTM D 422, Particle-Size Analysis of Soils
   2. ASTM D 1556, Density of Soil in Place by the Sand-Cone Method.
   3. ASTM D 1557, Moisture-Density Relations of Soils, using 10.0 lb (4.5 kg) Rammer and 18-in. (457 mm) Drop
   4. ASTM D 2922, Density of Soil in Place by Nuclear Methods.
   5. ASTM D 3017, Water Content of Soil and Rock in Place by Nuclear Methods
   6. Priority Pollutant Semivolatile Compounds by EPA Method 8270
   7. Priority Pollutant Volatile Organic Compounds by EPA Method 8260
   8. Priority Pollutant Metals by EPA Method 6010 (HG Method)
   9. Pesticides, EPA Method 8081
   10. Herbicides, EPA Method 8151
   11. PCB, EPA Method 8082

   Note: Items 6 through 11 as noted above will be referred to as "environmental testing" throughout these Specifications.

1.3 SUBMITTALS

A. Test Reports:
   1. Submit six (6) copies of the following reports directly to ENGINEER from the testing service, with copy to the CONTRACTOR:
      a. All tests for cover material, subbase, and topsoil.
      b. Compliance testing during construction.
      c. Field density tests.
      d. Optimum moisture - maximum density curve for each soil.
   2. Testing shall conform to the following as a minimum.
      a. Tests on material
         1) Cover material and subbase: Particle size tests and environmental tests from off-site shall be performed at a frequency of 1 per 5,000 cubic yards if from a natural borrow source or 1 per source, whichever is more stringent. Material that is not from a natural borrow source shall be tested at a frequency of 1 per 1,000 cubic yards.
      b. Field density tests:
         1) Subbase and cover material: CONTRACTOR shall conduct one (1) test every 10,000 square feet per 12 inch lift. A Troxler Nuclear Moisture-Density gauge shall be used for all field density tests. Test locations shall be tied into a site grid system 50 foot square. Test reports shall note the grid location point and lift for each test. CONTRACTOR shall establish and maintain grid points for each lift of material placed.
      c. Moisture-density curve for each cover material and subbase source used for backfill.
      d. CONTRACTOR will conduct one ASTM D1557 for every 10,000 cubic yards of cover material and subbase, and one ASTM D422 for every 5,000 cubic yards of cover material and subbase.
      e. Strength tests as specified in Sections 02220 and 02225 for determining internal & interface characteristics.

B. Submit six (6) samples of all gravel, backfill and base materials required.

C. ENGINEER shall prepare a Stormwater Pollution Control Plan in accordance with the CTDEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities. This plan shall address temporary means needed to prevent discharge of sediment to water courses because of dewatering systems or erosion and off-site removal and disposal of all water that has contacted exposed solid waste material as a result of construction activities.

1.4 JOB CONDITIONS

A. Existing Structures: Shown on the Drawings are certain surface and underground structures adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of the CONTRACTOR. CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures. They shall be supported and protected

from injury by the CONTRACTOR. If they are damaged, broken or injured, they shall be restored immediately by the CONTRACTOR at his expense.

B. Existing Utilities: Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
   1. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the ENGINEER immediately for directions as to procedure. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
   2. Do not interrupt existing utilities serving facilities occupied and used by OWNER or others, except when permitted in writing by ENGINEER and then only after acceptable temporary utility services have been provided.

C. Use of Explosives:
   1. The use of explosives will not be permitted.

D. Protection of Persons and Property: Barricade open excavations occurring as part of this Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
   1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

E. Dust Control: CONTRACTOR shall conduct all of his operations and maintain the area of his activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust. Calcium chloride shall be used to control serious or prolonged dust problems, subject to approval of ENGINEER.

PART 2 – PRODUCTS

2.0 ACCEPTABLE MANUFACTURERS

A. Not Applicable.

2.1 SOIL MATERIALS

A. Cover Material:
   1. Cover material shall be used where shown and specified, including, but not limited to subgrade preparation of access roads.
   2. Cover material in accordance with Section 02227.
   3. All cover material must adhere to the range of cohesion/internal friction angle properties (i.e. 0 psf, 37°) specified below:

Cohesion, psf	Internal Friction Angle Φ
0	37
10	36
20	34
35	32
45	30

4. Provide approved soil materials for cover material, free of contaminated soil, clay, rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.

B. Topsoil:
1. Topsoil shall be placed where shown or specified or directed by ENGINEER.
2. Provide approved soil materials for Topsoil, free of contaminated soil, clay, rock or gravel larger than 1 inch in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.
3. All Topsoil materials must adhere to the range of cohesion/internal friction angle properties (i.e. 0 psf, 37°) specified below:

Cohesion, psf	Internal Friction Angle Φ
0	37
10	36
20	34
35	32
45	30

4. See Section 02900 "Landscaping" for full specifications.

C. Subbase Material:
1. Subbase shall be provided to cover the waste areas achieving final grades. Subbase shall be placed where shown or specified on the Drawings, or as directed by ENGINEER.
2. See Section 02225 "Subbase Material", for detailed specifications related to Subbase.

PART 3 - EXECUTION

3.1 INSPECTION

A. ENGINEER will examine the areas and conditions under which excavating, filling, and grading are to be performed and notify the CONTRACTOR of conditions he may find that are detrimental to the proper and timely completion of the Work. Do not proceed

with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

B. CONTRACTOR shall provide the ENGINEER with clean, unused, scalable 5 gallon pails with handles and lids to obtain samples. CONTRACTOR shall assist ENGINEER while taking samples.

3.2 SITE PREPARATION

A. Temporary cover will be removed from the work area. Liner and concrete blocks may be reused, if approved by the engineer, for construction of the cap/working face protection barrier. CONTRACTOR will grade ash surface to achieve final grades prior to construction of the landfill cap. The CONTRACTOR will excavate excess ash and temporary cover soil to achieve the subgrade contours on the Contract Drawings. The CONTRACTOR will also excavate ash and temporary cover soil from outside the cap area and transport the material to areas requiring fill to achieve the cap subgrade contours shown on the Contract Drawings. The ash used as backfill shall be compacted in loose lifts not exceeding 8 inches thickness with four passes of a vibratory roller.

3.3 EXCAVATION

A. CONTRACTOR shall perform all excavation required to complete the Work as directed by the engineer. Excavations shall include ash only and shall not require drilling and blasting to remove.

B. Material Storage: Stockpile satisfactory excavated materials in approved areas, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
1. Locate and retain soil materials at locations indicated on Contract Drawings.
2. Dispose of excess soil material and waste materials as specified hereinafter.
3. CONTRACTOR shall ensure temporary erosion & sediment control measures are taken in accordance with the Stormwater Management Plan.

3.4 UNAUTHORIZED EXCAVATION

A. All excavation outside the lines and grades shown, and which is not approved by the ENGINEER, together with the removal and disposal of the associated material shall be at the CONTRACTOR'S expense. The unauthorized excavation shall be filled and compacted with select backfill by the CONTRACTOR at his expense.

B. Any damage, disturbance, or settlement that occurs as a result of the CONTRACTOR'S stockpiling of material or equipment on site shall be the responsibility of the CONTRACTOR to repair and/or supply additional materials to compensate for settlement caused by the CONTRACTOR'S actions.

3.5 GRADING

A. General: Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth subgrade surfaces within specified tolerances,

compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Compaction:
   1. After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

3.6 FIELD QUALITY CONTROL

A. Quality Control Testing During Construction:
   1. CONTRACTOR shall establish and maintain a 50 foot grid for control of field density testing.
   2. Compaction testing shall be performed by contractor on a 50 foot grid in the presence of the ENGINEER.
   3. Compaction testing shall be performed according to ASTM D 2922, Density of Soil in Place by Nuclear Methods.
   4. Compaction testing shall be presented and accepted by the ENGINEER prior to placement of the next lift. Fill Compaction test results on the 50 foot grid interval to be signed and stamped by a professional engineer licensed in the State of Connecticut prior to submission to the ENGINEER.
   5. Field compaction testing shall be included in each of the bid items. Field compaction testing for additional compacted backfill and structural fill shall be included in the respective bid items.

PART 4 - ASH REGRADING MEASUREMENT AND PAYMENT

A. Method of Measurement
   1. The CONTRACTOR will retain the services of a licensed Connecticut Land Surveyor to survey the pre-construction grades and the grades of the top of the finished cap subgrade. At a minimum, the survey shall consist of cross-sections spaced every 50 feet and oriented east-west perpendicular to the west slope. Spot elevations shall be taken every 25 feet and at grade changes for every section. The survey limits shall coincide with the cap limits plus 50 feet.
   2. Measurement for payment shall only be within the limits of grading shown for the subgrade for the cap area shown on the Contract Drawings. The volume of excavation and filling shall be calculated using the average end area method based upon the pre-construction and finished cap subgrade sections.

B. Basis for Payment
   1. The CONTRACTOR will be paid at the contract unit price for "ash relocation and regrading" on a cubic yard basis for the combined volume of excavation and fill as defined in the method of measurement above. The price shall include all labor, equipment, materials and tools incidental to the relocation and regrading of ash and temporary cover soil to achiever the landfill cap subgrade shown on the Contract Drawings.

END OF SECTION

SECTION 02225

SUBBASE MATERIAL

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:

1. The work to be performed under this Section shall include materials, all labor, tools, equipment, and testing for furnishing, placing, grading, and compacting Subgrade as shown on the Drawings or as otherwise directed by the ENGINEER.
2. All necessary testing of materials as required in the Contract Documents.
3. CONTRACTOR field test data shall indicate compliance with the Contract Documents in order to be accepted. The field data shall be certified by the ENGINEER.
4. CONTRACTOR shall provide the ENGINEER with access to the borrow pits or material sources upon request for the purposes of observing material source operations and obtaining samples. The CONTRACTOR shall be responsible for supplying all required samples for testing.
5. All soil layer thicknesses referenced in this Section represent the installed compacted thickness.
6. Items listed in Section 02220, Part 1 - General, 1.1 Description also apply.

B. Related Sections:

Section 02220, Excavation, Backfill and Ash Regrading
Section 02228, Topsoil
Section 06643, Geomembranes.
Section 06645, Geosynthetics.

1.2 QUALITY ASSURANCE

A. Tests:

1. The services of a qualified testing laboratory shall be engaged by the CONTRACTOR to make tests and determine acceptability of the fill or material as listed below. The laboratory shall be acceptable to the ENGINEER.
2. Required Tests:
   a. Subbase material Samples from Off-Site: Gradation, ASTM D 422, Priority Pollutant Semivolatile Compounds, EPA Method 8270, Priority Pollutant Volatile Organic Compounds, EPA Method 8240, Priority Pollutant Metals, EPA Method 6010 (HG Method), Pesticides, EPA Method 8081, PCBs/EPA Method 8082, Herbicides, EPA Method 8150. All test results shall be in conformance with the criteria for Industrial Direct Exposure Criteria (IDEC) and Class GB Groundwater Pollutant Mobility Criteria (GBPMC) of the CTDEP's Remediation Standard

Regulations (RSRs), 22a-133k-l to k-3 of the Regulations of Connecticut State Agencies.

c. Compacted Subbase material: Compaction, ASTM D 1557, ASTM D 1556, ASTM D 2922 and ASTM D3017.

B. Permits and Regulations:
1. CONTRACTOR shall obtain all necessary permits.

C. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.
1. ASTM D 422, Particle-Size Analysis of Soils.
2. ASTM D 4318, Liquid Limit, Plastic Limit and Plasticity Index of Soils.
3. ASTM D 1557, Moisture-Density Relations of Soils, using 10.0 lb (4.5 kg) Rammer and 18-in. (457 mm) Drop.
4. ASTM D 2922, Density of Soil in Place by Nuclear Methods.
5. ASTM D 3017, Water Content of Soil and Rock in Place by Nuclear Methods.
6. Priority Pollutant Semivolatile Compounds by EPA Method 8270.
7. Priority Pollutant Volatile Organic Compounds by EPA Method 8240.
8. Priority Pollutant Metals by EPA Method 6010 (HG Method).
9. Pesticides, EPA Method 8081.
10. Herbicides, EPA Method 8150.
11. PCBs/EPA Method 8082.

Note: Items 6 through 11 as noted above will be referred to as "environmental testing" throughout these Specifications.

1.3 SUBMITTALS

A. Test Reports:
1. Submit six (6) copies of the following reports directly to ENGINEER from the testing service, with copy to the CONTRACTOR:
   a. All tests for subbase material.
   b. Compliance testing during construction.
   c. Structures subgrade.
   d. Field density tests.
   e. Optimum moisture - maximum density curve for each soil.
2. Testing shall conform to the following as a minimum.
   a. Tests on material
      1) Subbase material: Environmental tests and particle size tests for Subbase material from off-site shall be performed at a frequency of 1 per 3,000 cubic yards if from a natural borrow source or 1 per source, whichever is more stringent. Material that is not from a natural borrow source shall be tested at a frequency of 1 per 1,000 cubic yards.
   b. Field density tests:
      1) Subbase material: CONTRACTOR shall conduct one (1) test every 10,000 square feet per 6 inch lift. A Troxler Nuclear Moisture-Density gauge shall be used for all field density tests. Test locations shall be tied into a site grid system 50 foot square. Test reports shall note the grid location point and lift

for each test. CONTRACTOR shall establish and maintain grid points for each lift of material placed.

c. Moisture-density curve for each Subbase material used in construction.
d. CONTRACTOR will conduct one ASTM D1557 for every 3,000 cubic yards of Subbase material, and one ASTM D422 for every 1,000 cubic yards of Subbase material.

B. Submit six (6) samples of all Subbase materials required.

C. ENGINEER shall prepare prior to mobilization, a Stormwater Pollution Control Plan prepared in accordance with the CTDEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities. This plan shall address temporary means needed to prevent discharge of sediment to water courses because of dewatering systems or erosion and off-site removal and disposal of all water that has contacted exposed solid waste material as a result of construction activities.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Not Applicable.

2.2 SUBBASE

A. SUBBASE

1. Subbase shall be provided to cover the waste areas and for supporting the overlying geomembrane. Subbase shall be placed where shown or specified on the Drawings, or as otherwise directed by ENGINEER.
2. Subbase shall be low plasticity inorganic soil borrow with adequate shear strength properties. The material shall be an earthen soil which is free of vegetation, ice or frozen material, wood, glass, metal, or other deleterious material. The maximum particle size shall be 1/4-inch and free of sharp edges.
3. The Subbase shall meet or exceed the following requirements:
   a. Internal Shear Strength:
      All Subbase material must adhere to the range of cohesion/internal friction angle properties (i.e. 0 psf, 37°) specified below:

Cohesion, psf	Internal Friction Angle Φ
0	37
10	36
20	34
35	32
45	30

The tests shall be performed for a minimum of three normal tresses that simulate field loading conditions. The following normal loads shall be used:
   i. Condition No. 1 - 100psf, 300psf, 500psf.
b. U.S. Standard Sieve analysis parameters:
   i. 100% passing 1/4-inch square sieve.
   ii. Less than or equal to 30% passing #200 sieve.
c. Plasticity index (PI) < 5.
d. The CONTRACTOR shall submit to the ENGINEER engineering calculations prepared by a licensed Connecticut Professional Engineer, shop drawings, proposed quality assurance and quality control measures, product information, laboratory test results and all other necessary and applicable data to the ENGINEER.
e. The Subbase shall be tested in accordance with ASTM D5321, based on soil type and geosynthetics used and shall exhibit an interface friction angle >27°. Refer to Section 06643 and 06645 for testing requirements.

4. Provide approved soil materials for Subbase, free of contaminated soil, clay, rock or gravel larger than 0.25 inches in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter. Soil material acceptable for use as Subbase shall be classified as SW, SP or SM according to the Unified Soil Classification System.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The ENGINEER or his representative will examine the areas and conditions under which excavating, filling, and grading are to be performed and notify the CONTRACTOR of conditions CONTRACTOR may encounter that are detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

B. CONTRACTOR shall provide the ENGINEER or his representative with clean, unused, scalable 5-gallon pails with handles and lids to obtain samples. CONTRACTOR shall provide personnel to the ENGINEER or his representative to collect samples.

C. Prior to procurement of material and starting construction, the ENGINEER shall have submitted and received approvals for the materials based on the testing required in this Section.

D. Subbase material shall be pushed up side slopes, never down slope or sideways. It is imperative that the CONTRACTOR makes every reasonable effort to minimize the potential for Subbase to adversely affect the overlying proposed geomembrane via penetration. Therefore, a crew of 3 workers shall work near the earthmoving equipment and remove all rocks, stones, roots or other debris in excess of 1/4-inch in any dimension that could cause damage to the proposed overlying geomembrane. Equipment operators shall not be permitted to make sharp turns or quick stops.

E. Subbase shall be placed on all areas as shown on the Drawings or as directed by the ENGINEER and as described in these Specifications. The thickness of each lift prior to compaction of the Subbase shall be no greater than eight (8) inches. Total compacted thickness of the Subbase shall be as shown on the Drawings. Compaction of the Subbase shall be accomplished by suitable compaction equipment, subject to approval by the ENGINEER.

F. The Subbase shall be placed and compacted as necessary to achieve the required shear strength (internal friction angle). The Subbase shall be compacted to 95 percent of Modified Proctor. The moisture content of the material shall be maintained within 3 percent of optimum moisture. Contractor shall not work wet cover material that cannot support equipment.

G. The existing on-site material or material delivered to the site shall be visually inspected by the ENGINEER during construction to check that it is consistently the same as the materials previously existent or delivered to the site. If changes in the material occur, the ENGINEER shall verify the material is from an approved source and the ENGINEER may require additional testing in accordance with Paragraph 1.3, Part A (2) of this Section. If the material is not from an approved source or if the material is determined to not be acceptable by the ENGINEER, the CONTRACTOR shall be notified that the material is not approved. The ENGINEER shall reject any work performed by the CONTRACTOR using the new material until the appropriate testing is conducted and the material is approved by the ENGINEER.

H. The thickness of the in-place Subbase will be checked after the completion of the work on a grid pattern not to exceed 50-foot by 50-foot by digging, by hand, with a plastic shovel in the presence of and as directed by the ENGINEER. The size of the test hole shall not be less than one-foot in diameter. Measurements shall be made perpendicular to the slope. The CONTRACTOR shall be responsible for digging holes in the Subbase to allow for the measurements to be taken by the ENGINEER. After measurements have been made, the CONTRACTOR shall backfill the holes with Subbase, and hand tamp. During digging and backfill of test holes, the CONTRACTOR shall use plastic shovels and exercise care not to damage any materials. Any such damage shall be repaired at the expense of the CONTRACTOR.

I. The CONTRACTOR shall be responsible to repair damage to the Subbase between testing and acceptance.

J. All soil samples are to be obtained under the direction of the ENGINEER.

K. Final acceptance of Subbase is dependent on:
   a. Satisfying the minimum requirement of compacted thickness (6 inches) of the Subbase layer measured perpendicular to the slope.
   b. Subbase meeting all the physical/analytical properties listed in Section 02225.
   c. Final inspection conducted by the ENGINEER ensuring that the final state of the Subbase and Subbase surface will not puncture, wrinkle, or damage the proposed overlying geomembrane in any manner. If the compacted Subbase does not meet the

ENGINEER'S requirements to ensure the integrity of the proposed overlying geomembrane, then the CONTRACTOR will perform all work necessary to mitigate to acceptable Subbase conditions, at no additional cost to the OWNER.

L. Any damage, disturbance, or settlement that occurs as a result of the CONTRACTOR'S stockpiling of material or equipment on site shall be the responsibility of the CONTRACTOR to repair and/or supply additional materials to compensate for settlement caused by the CONTRACTOR'S actions.

3.2 SOURCE QUALIFICATION TESTING

A. Prior to acceptance of the borrow or stockpile site, the CONTRACTOR shall provide the following soil analyses to the ENGINEER:

1. Results of interface friction test performed for the interface between the proposed Subbase and proposed geotextile material in accordance with ASTM Standard Test Method D 5321 (latest revision) performed under saturated conditions, with a 24-hour saturation period prior to the test, Determining the Coefficient of Soil/Geosynthetic Friction by the Direct Shear Method. The test shall be performed for a minimum of three normal stresses applied to bracket the normal stress . of 300 psf at the interface being tested. The CONTRACTOR shall take particular note that this test shall be repeated for every proposed geotextile and Subbase combination used in the construction.
2. Results of compaction tests conducted in accordance with ASTM D 1557 (latest revision), Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
3. Results of Atterberg limits, plastic and liquid limit, and plasticity index conducted in accordance with ASTM D 4318 (latest revision), Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
4. Results of the particle-size analysis conducted in accordance with ASTM D 421/422 (latest revision). Standard Practice for Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants/Test Method for Particle Size Analysis of Soils.
5. Results of chemical analyses conducted in accordance with the requirements of Section 02225.

B. Unless otherwise stated, both imported and existing Subbase materials shall be tested prior to construction for the following at the indicated intervals in the table below. The following test frequencies shall be consistent with paragraph 1.3, Part A, (2) of this section.

ITEM	FREQUENCY
Interface friction test (ASTM D5321)	Initial test (one time)
Soil Compaction test (ASTM D1557)	Initial test (one time)
Atterberg, liquid, plastic limits (ASTM D4318)	Initial test (one time)
Particle size analysis (ASTM D421/422)	See paragraph 1 .3, Part A, (2) of this Section.

Environmental Testing (1)	See paragraph 1 .3, Part A, (2) of this Section.
US Standard Sieve Analysis 1/4-inch sieve #200 sieve	Initial test (one time)

Notes: (1) Environmental Testing only applies to the testing of off-site material proposed for use as Subbase. Environmental Testing is representative of the tests and associated test methods detailed in paragraph 1.2 Quality Assurance, of this section.

3.3 SUBBASE

A. Subbase Material:
   1. Quality Control Testing:
      a. The ENGINEER shall perform quality control testing during construction. This testing is in addition to all other tests required to be conducted by the CONTRACTOR.
      b. The ENGINEER shall collect representative samples from each material source of Subbase for testing at a frequency determined by the ENGINEER.
      c. The Subbase shall exhibit an interface friction angle in accordance with the values as specified in paragraph 2.2 A.3.e of this specification. Materials tested by the ENGINEER exhibiting results not meeting the interface friction angle requirements will be rejected, or the CONTRACTOR may be required to furnish additional test data, at his expense, to demonstrate acceptability of the material.

END OF SECTION

SECTION 02227

COVER SOIL MATERIAL

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:

1. The work to be performed under this Section shall include materials, all labor, tools, equipment, and testing for furnishing, placing, grading, and compacting Cover Soil as shown on the Drawings or as otherwise directed by the ENGINEER.
2. All necessary testing of materials as required in the Contract Documents.
3. CONTRACTOR field test data shall indicate compliance with the Contract Documents in order to be accepted. The field data shall be certified by the ENGINEER.
4. CONTRACTOR shall provide the ENGINEER with access to the borrow pits or material sources upon request for the purposes of observing material source operations and obtaining samples. The CONTRACTOR shall be responsible for supplying all required samples for testing.
5. All soil layer thicknesses referenced in this Section represent the installed compacted thickness.
6. Items listed in Section 02220, Part 1 - General, 1.1 Description also apply.
7. Three Cover Soil alternatives are proposed, as shown on the Contract Drawings, and the Contractor shall provide bid for the construction of each alternative. CRRA will decide following the receipt of bids which cover soil alternative will be employed. Cover Soil Alternative 1 requires placing 18 inches of suitable material and 6 inches of topsoil. Cover Soil Alternative 2 requires placing 9 inches of sand, 9 inches of suitable material, and 6 inches of topsoil. Cover Soil Alternative 3 requires placing 15inches of sand and 9 inches of topsoil. For Alternatives 2 and 3, a suitable geotextile shall separate sand from overlying material. Section 06645 provides geotextile details. Requirements for suitable material and sand for each alternative are specified within this section. Section 02228 provides the requirements for topsoil.

B. Related Sections:

Section 02220, Excavation and Backfill and Ash Regrading
Section 02225, Subbase
Section 02228, Topsoil
Section 06643, Geomembranes
Section 06645, Geosynthetics

1.2 QUALITY ASSURANCE

A. Tests:
   1. The services of a qualified testing laboratory shall be engaged by the CONTRACTOR to make tests and determine acceptability of all fill or material as listed below. The laboratory shall be acceptable to the ENGINEER.
   2. Required Tests:
      a. Cover Soil material Samples from Off-Site: Gradation, ASTM D 422, Priority Pollutant Semivolatile Compounds, EPA Method 8270, Priority Pollutant Volatile Organic Compounds, EPA Method 8240, Priority Pollutant Metals, EPA Method 6010 (HG Method), Pesticides, EPA Method 8081, PCB, EPA Method 8082, Herbicides, EPA Method 8150. All test results shall be in conformance with the criteria for Residential Direct Exposure Criteria (RDEC) and Class GB Groundwater Pollutant Mobility Criteria (GBPMC) of the CTDEP's Remediation Standard Regulations (RSRs), 22a-133k-l to k-3 of the Regulations of Connecticut State Agencies.
      b. Compacted Cover Soil material: Compaction, ASTM D 1557, ASTM D 1556, ASTM D 2922 and ASTM D3017.

B. Permits and Regulations:
   1. CONTRACTOR shall obtain all necessary permits for work.
   2. CONTRACTOR shall perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

C. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.
   1. ASTM D 422, Particle-Size Analysis of Soils.
   2. ASTM D4318, Liquid Limit, Plastic Limit and Plasticity Index for Soils.
   3. ASTM D 1556, Density of Soil in Place by the Sand-Cone Method.
   4. ASTM D 1557, Moisture-Density Relations of Soils, using 10.0 lb (4.5 kg) Rammer and 18-in. (457 mm) Drop.
   5. ASTM D 2922, Density of Soil in Place by Nuclear Methods.
   6. ASTM D 3017, Water Content of Soil and Rock in Place by Nuclear Methods.
   7. Priority Pollutant Semivolatile Compounds by EPA Method 8270.
   8. Priority Pollutant Volatile Organic Compounds by EPA Method 8240.
   9. Priority Pollutant Metals by EPA Method 6010 (HG Method).
   10. Pesticides, EPA Method 8080.
   11. Herbicides, EPA Method 8150.
   12. PCBs, EPA Method 8082.

   Note: Items 6 through 11 as noted above will be referred to as "environmental testing" throughout these Specifications.

1.3 SUBMITTALS

A. Test Reports:
   1. Submit six (6) copies of the following reports directly to ENGINEER from the testing service, with copy to the CONTRACTOR:

a. All tests for cover soil material.
b. Compliance testing during construction.
c. Field density tests.
d. Optimum moisture - maximum density curve for each soil.

2. Testing shall conform to the following as a minimum.
   a. Tests on material
      1) Cover Soil material: Environmental tests and particle size tests for Cover Soil material from off-site shall be performed at a frequency of 1 per 5,000 cubic yards if from a natural borrow source or 1 per source, whichever is more stringent. Material that is not from a natural borrow source shall be tested at a frequency of 1 per 1,000 cubic yards.
   b. Field density tests:
      1) Cover Soil material: CONTRACTOR shall conduct one (1) test every 10,000 square feet per 6 inch lift. A Troxler Nuclear Moisture-Density gauge shall be used for all field density tests. Test locations shall be tied into a site grid system 50 foot square. Test reports shall note the grid location point and lift for each test. CONTRACTOR shall establish and maintain grid points for each lift of material placed.
   c. Moisture-density curve for each cover soil material used in construction.
   d. CONTRACTOR will conduct one ASTM D1557 for every 5,000 cubic yards of each cover soil material, and one ASTM D422 for every 3,000 cubic yards of each cover soil material.

B. Submit six (6) samples of all Cover Soil materials required.

C. ENGINEER shall prepare prior to mobilization, a Stormwater Pollution Control Plan prepared in accordance with the CTDEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities. This plan shall address temporary means needed to prevent discharge of sediment to water courses because of dewatering systems or erosion and off-site removal and disposal of all water that has contacted exposed solid waste material as a result of construction activities.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Not Applicable.

2.2 COVER SOIL

A. Cover Soil

1. Each Cover Soil material shall be provided to cover the geomembrane and drainage layer. Cover Soil shall be placed where shown or specified on the Drawings, or as otherwise directed by ENGINEER.
2. Cover Soil shall be low plasticity inorganic soil borrow with adequate shear strength properties. The material shall be an earthen soil which is free of vegetation, ice or

frozen material, wood, glass, metal, or other deleterious material. The maximum particle size shall be ¼ inch for all soil placed within 6 inches of the geomembrane and shall be free of sharp edges. The maximum particle size shall be 3 inches and free of sharp edges for all other cover soil.

3. The Cover Soil material shall meet the following requirements:
   a. Cover Soil Alternative 1
      1) Permeability: The coefficient of hydraulic conductivity, k, shall not be more permeable than 2.0×10^{-4} cm/s.
      2) Internal Shear Strength: All Cover Soil material must adhere to the range of cohesion/internal friction angle properties specified below:

Cohesion (psf)	Internal Friction Angle (Φ)
0	37
10	36
20	34
35	32
45	30

The tests shall be performed for a minimum of three normal stresses that simulate field loading conditions. The following normal loads shall be used, 100 psf, 300 psf, 500 psf.

      3) U.S Standard Sieve analysis parameters:
         i. 100% passing ¼ inch or 3-inch square sieve (see A2 above)
         ii. Less than or equal to 20% passing No. 200 sieve
      4) Plasticity index (PI) <15
      5) The Contractor shall submit to the Engineer engineering calculations prepared by a licensed Connecticut Professional Engineer, shop drawings, proposed quality assurance and quality control measures, product information, laboratory test results and all other necessary and applicable data to the Engineer.
      6) The Cover Soil material shall be tested in accordance with ASTM D 5321, based on soil type and geosynthetics used and shall exhibit an interface friction angle of >27°.
   b. Cover Soil Alternative 2
      1) Permeability: The coefficient of hydraulic conductivity, k, for sand shall be more permeable than 1.0×10^{-3} cm/s and the hydraulic conductivity of suitable overlying material shall be less permeable than 2.0×10^{-4} cm/s..
      2) Internal Shear Strength: All Cover Soil material must adhere to the range of cohesion/internal friction angle properties specified below:

Cohesion (psf)	Internal Friction Angle (Φ)
0	37
10	36
20	34
35	32
45	30

The tests shall be performed for a minimum of three normal stresses that simulate field loading conditions. The following normal loads shall be used, 100 psf, 300 psf, 500 psf.

3) U.S Standard Sieve analysis parameters:
   i. 100% passing ¼ inch or 3-inch square sieve (see A2 above)
   ii. Less than or equal to 5% passing No. 200 sieve for sand and less than or equal to 20% passing No. 200 sieve for suitable overlying material
4) Plasticity index (PI) <15 for all Cover Materials
5) The Contractor shall submit to the Engineer engineering calculations prepared by a licensed Connecticut Professional Engineer, shop drawings, proposed quality assurance and quality control measures, product information, laboratory test results and all other necessary and applicable data to the Engineer.
6) The Cover Soil material shall be tested in accordance with ASTM D 5321, based on soil type and geosynthetics used and shall exhibit an interface friction angle of >27°.

c. Cover Soil Alternative 3
   1) Permeability: The coefficient of hydraulic conductivity, k, for sand shall be more permeable than 1.0×10^{-3} cm/s.
   2) Internal Shear Strength: All Cover Soil material must adhere to the range of cohesion/internal friction angle properties specified below:

Cohesion (psf)	Internal Friction Angle (Φ)
0	37
10	36
20	34
35	32
45	30

The tests shall be performed for a minimum of three normal stresses that simulate field loading conditions. The following normal loads shall be used, 100 psf, 300 psf, 500 psf.

3) U.S Standard Sieve analysis parameters:
   i. 100% passing ¼ inch or 3-inch square sieve (see A2 above)
   ii. Less than or equal to 5% passing No. 200 sieve
4) Plasticity index (PI) <15
5) The Contractor shall submit to the Engineer engineering calculations prepared by a licensed Connecticut Professional Engineer, shop drawings, proposed quality assurance and quality control measures, product information, laboratory test results and all other necessary and applicable data to the Engineer.
6) The Cover Soil material shall be tested in accordance with ASTM D 5321, based on soil type and geosynthetics used and shall exhibit an interface friction angle of >27°.

5. Provide approved soil materials for cover soil, free of contaminated soil, clay, rock or gravel larger than ¼ inch or 3 inches (see A2 above) in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The ENGINEER or his representative will examine the areas and conditions under which excavating, filling, and grading are to be performed and notify the CONTRACTOR of conditions CONTRACTOR may encounter that are detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

B. CONTRACTOR shall provide the ENGINEER or his representative with clean, unused, scalable 5-gallon pails with handles and lids to obtain samples. CONTRACTOR shall provide personnel to the ENGINEER or his representative to collect samples.

C. Prior to procurement of material and starting construction, the ENGINEER shall have submitted and received approvals for the materials based on the testing required in this Section.

D. Cover Soil material shall be pushed using low pressure equipment and a minimum of 12 inches of material shall be kept beneath the tracks at all times. It is imperative that the CONTRACTOR makes every reasonable effort to minimize the potential for Cover Soil to adversely affect the underlying geomembrane and drainage layer via penetration. Therefore, low pressure equipment shall be used to place cover materials. Equipment operators shall not be permitted to make sharp turns or quick stops.

E. Cover material shall be placed on all areas as shown on the Drawings or as directed by the ENGINEER and as described in these Specifications. The thickness of each lift prior to compaction of the cover material shall be no greater than twelve (12) inches. Total compacted thickness of the cover material shall be as shown on the Drawings. Compaction of the Cover Soil material shall be accomplished by suitable compaction equipment, subject to approval by the ENGINEER.

F. The cover material shall be placed and compacted as necessary to achieve the required permeabilities and shear strength. The cover material shall be compacted to 90 percent of Modified Proctor. The moisture content of the material shall be maintained within 3 percent of optimum moisture. Contractor shall not work wet cover material that cannot support equipment.

G. If changes in the material occur, the ENGINEER shall verify the material is from an approved source and the ENGINEER may require additional testing in accordance with Paragraph 1.3, Part A (2) of this Section. If the material is not from an approved source or if the material is determined to not be acceptable by the ENGINEER, the CONTRACTOR shall be notified that the material is not approved. The ENGINEER shall reject any work performed by the CONTRACTOR using the new material until the appropriate testing is conducted and the material is approved by the ENGINEER.

H. The thickness of the in-place cover material will be checked after the completion of the work on a grid pattern not to exceed 50-foot by 50-foot by digging, by hand, with a plastic shovel in the presence of and as directed by the ENGINEER. The size of the test hole shall not be less than one-foot in diameter. Measurements shall be made perpendicular to the slope. The CONTRACTOR shall be responsible for digging holes in the cover material to allow for the measurements to be taken by the ENGINEER. After measurements have been made, the CONTRACTOR shall backfill the holes with cover material, and hand tamp. During digging and backfill of test holes, the CONTRACTOR shall use plastic shovels and exercise care not to damage any materials. Any such damage shall be repaired at the expense of the CONTRACTOR.

I. The CONTRACTOR shall be responsible to repair damage to the cover material between testing and acceptance.

J. All soil samples are to be obtained under the direction of the ENGINEER.

K. Final acceptance of cover material is dependent on:
   a. Satisfying the minimum requirement of thickness from the selected alternative as shown on the Contract Drawings measured perpendicular to the slope.
   b. Cover material meeting all the physical/analytical properties listed in Section 02227.

L. Any damage, disturbance, or settlement that occurs as a result of the CONTRACTOR'S stockpiling of material or equipment on site shall be the responsibility of the CONTRACTOR to repair and/or supply additional materials to compensate for settlement caused by the CONTRACTOR'S actions.

3.2 SOURCE QUALIFICATION TESTING

A. Prior to acceptance of the borrow or stockpile site, the CONTRACTOR shall provide the following soil analyses to the ENGINEER:
   1. Results of interface friction test performed for the interface between the proposed Cover Soil and proposed geosynthetic in accordance with ASTM Standard Test Method D 5321 (latest revision) performed under saturated conditions, with a 24-hour saturation period prior to the test, Determining the Coefficient of Soil/Geosynthetic Friction by the Direct Shear Method. The test shall be performed for a minimum of three normal stresses applied to bracket the normal stress . of 300 psf at the interface being tested. The CONTRACTOR shall take particular note that this test shall be repeated for every proposed geosynthetic and Cover Soil combination used in the construction.
   2. Results of compaction tests conducted in accordance with ASTM D 1557 (latest revision), Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort.
   3. Results of Atterberg limits, plastic and liquid limit, and plasticity index conducted in accordance with ASTM D 4318 (latest revision), Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

4. Results of the particle-size analysis conducted in accordance with ASTM D 421/422 (latest revision). Standard Practice for Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants/Test Method for Particle Size Analysis of Soils.
5. Results of hydraulic conductivity testing conducted in accordance with ASTM D 5084 (latest revision), Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
6. Results of chemical analyses conducted in accordance with the requirements of Section 02227.

B. Unless otherwise stated, both imported and existing Cover Soil materials shall be tested prior to construction for the following at the indicated intervals in the table below. The following test frequencies shall be consistent with paragraph 1.3, Part A, (2) of this section.

ITEM	FREQUENCY
Interface friction test (ASTM D5321)	Initial test (one time)
Soil Compaction test (ASTM D1557)	Initial test (one time)
Atterberg, liquid, plastic limits (ASTM D4318)	Initial test (one time)
Particle size analysis (ASTM D42 1/422)	See paragraph 1 .3, Part A, (2) of this Section.
Environmental Testing (1)	See paragraph 1 .3, Part A, (2) of this Section.
Hydraulic conductivity (ASTM D5084)	Initial test (one time)
US Standard Sieve Analysis 1/4-inch sieve #200 sieve	Initial test (one time)

Notes: (1) Environmental Testing only applies to the testing of off-site material proposed for use as Subgrade. Environmental Testing is representative of the tests and associated test methods detailed in paragraph 1.2 Quality Assurance, of this section.

3.3 COVER SOIL

A. Cover Soil
1. Quality Control Testing:
   a. The ENGINEER shall perform quality control testing during construction. This testing is in addition to all other tests required to be conducted by the CONTRACTOR.
   b. The ENGINEER shall collect representative samples from each material source of Cover Soil for testing at a frequency determined by the ENGINEER.
   c. The Cover Soil shall exhibit an interface friction angle in accordance with the values as specified in Section 2.2(A) of this specification. Materials tested by the ENGINEER exhibiting results not meeting the interface friction angle requirements will be rejected, or the CONTRACTOR may be required to furnish additional test data, at his expense, to demonstrate acceptability of the material.

END OF SECTION

SECTION 02228

TOPSOIL MATERIAL

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
1. CONTRACTOR shall furnish and place topsoil as shown on the Contract Drawings.

B. Related Sections:
1. Section 02220, Excavation and Backfill and Ash Regrading.
2. Section 02900, Turf Establishment and Landscaping.

C. General:
1. CONTRACTOR is required to use approved material from off-site sources.

D. CONTRACTOR shall provide ENGINEER with access to the material source upon request for the purposes of observing material source operations and obtaining samples.

1.2 QUALITY ASSURANCE

A. Tests:
1. The services of a qualified testing laboratory shall be engaged by the CONTRACTOR to make tests and determine acceptability of the material as listed below. The laboratory shall be acceptable to the ENGINEER.
2. Required Tests:
   a. Topsoil from Off-Site: Gradation, ASTM D 422, Priority Pollutant Semivolatile Organic Compounds (SVOCs), EPA Method 8270, Priority Pollutant Volatile Organic Compounds (VOCs), EPA Method 8260, Priority Pollutant Metals, EPA Method 6010 (HG Method), Pesticides, EPA Method 8081, PCBs, EPA Method 8082, Herbicides, EPA Method 8151, Soil pH, EPA Method 9045D. All environmental test results shall be in conformance with the criteria for Residential Direct Exposure Criteria (RDEC) and Class GB Groundwater Pollutant Mobility Criteria (GBPMC) of the CTDEP's Remediation Standard Regulations (RSRs), 22a-133k-l to k-3 of the Regulations of Connecticut State Agencies.

1.3 SUBMITTALS

A. Test Reports:
1. Submit six (6) copies of the following reports directly to ENGINEER from the testing service, with copy to the CONTRACTOR:
   a. All tests for Topsoil as specified above.

b. Written statement giving the location of the properties from which the Topsoil is to be obtained, the names and addresses of the suppliers, and, if applicable, crops grown on the properties during the past 2 years.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Topsoil:
1. Topsoil shall be placed where shown or specified or directed by ENGINEER.
2. Provide approved soil materials for Topsoil, free of contaminated soil, clay, rock or gravel larger than 1 inch in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.
3. All Topsoil materials must adhere to the range of cohesion/internal friction angle properties (i.e. 0 psf, 37°) specified below:

Cohesion, psf	Internal Friction Angle Φ
0	37
10	36
20	34
35	32
45	30

4. See Section 02900 "Turf Establishment and Landscaping" for full specifications and additional topsoil properties and testing requirements.

PART 3 - EXECUTION

3.1 PLACING

A. ENGINEER will examine the areas and conditions under which Topsoil placing is to be performed and notify the CONTRACTOR of conditions he may find that are detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner. Placing of Topsoil shall conform to the requirements of Section 02220.

END OF SECTION

SECTION 02230

GRAVEL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall furnish and place gravel of the types specified at locations shown on the Drawings including, weeps into drainage swales, diversion swale and perimeter or as otherwise directed by the ENGINEER.

B. Related Sections:
   1. Section 02220, Excavation and Backfill and Ash Regrading.
   2. Section 02271, Riprap.

1.2 SUBMITTALS

A. CONTRACTOR shall advise the ENGINEER of the source location and provide a representative sample.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Rounded gravel for weeps (pea stone): The materials shall be well-graded clean, screened rock obtained from an approved source and conforming to the specifications of ASTM C-33. Maximum size shall be 1-inch, 85 percent shall pass a 3/4-inch sieve and a maximum 5 percent shall pass a #10 sieve.
   1. CONTRACTOR shall submit sample meeting the above requirements to an approved commercial testing laboratory for sieve analysis. The laboratory analysis results shall be approved by the ENGINEER before any material is ordered.
   2. After the materials are delivered to the job site, the ENGINEER will take two samples from each shipment of material. The CONTRACTOR shall have a sieve analysis performed on these samples by a commercial testing laboratory. If the results of the samples taken in the field do not conform to those previously approved, the material will be rejected and shall be modified or removed from the job site.
   3. CONTRACTOR shall furnish and place gravel as shown and specified or as directed by the ENGINEER.

PART 3 - EXECUTION

3.1 PLACING

A. Gravel shall be spread in layers of uniform thickness not exceeding 12 inches and shall be thoroughly compacted with suitable power driven tampers or other power driven

equipment. The placing of gravel shall conform to applicable requirements of Section 02220 except as noted above.

END OF SECTION

SECTION 02271

RIPRAP

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, tools, equipment, testing, and incidentals required to furnish and place riprap at the base of the drainage downchute or as otherwise specified by the ENGINEER.

B. Related Work Sections:
   1. Section 02220, Excavation and Backfill and Ash Regrading.
   2. Section 03600, Grout.

PART 2 - PRODUCTS

A. Riprap shall consist of hard, durable, angular field or quarry stone. All stones shall be between 6 inches and 10 inches with 75% greater than 8 inches. The stones shall be free of dirt, debris, or deleterious material. Stones salvaged from excavation and meeting the above requirements maybe used for riprap if approved by the ENGINEER.

PART 3 - EXECUTION

3.1 PLACING

A. Minimum total thickness of the riprap layer shall be as shown on the Drawings.

B. The stones shall be placed so that the weight of the stone is carried by the underlying material and not by the adjacent stones. On slopes, the largest of stones shall be at the bottom. Riprap shall be of proper size to form a compact solid blanket to protect the slopes.

C. Riprap shall be placed so as to conform as closely as practicable in size and character to existing riprap, if any.

D. Riprap may be placed with equipment, however, care shall be taken in placing to obtain a good gradation of materials so that the riprap will be firm and solid. Surfaces shall be leveled to the required alignment and slopes by hand placing the stone so as to fill large voids and to make the surface even.

END OF SECTION

SECTION 02721

CORRUGATED METAL PIPE (CMP)

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope: CONTRACTOR shall provide all labor, materials, tools, equipment and incidentals required to furnish, install, and test the half-pipe diversion swales as shown on the Drawings and specified herein.

B. Included hereunder are all pipe, couplings, bolts, nuts, factory- applied painting, and appurtenances required for installation and testing.

C. General:
1. Pipe shall be furnished in nominal lengths and the diversion swales constructed with a minimum number of couplings. Corrugations on the pipe shall be annular and the pipe should be delivered ready to use. Whole pipe sections cut in half in the field shall have newly exposed surfaces coated to prevent corrosion.
2. Pipe shall be free of fractures and surface roughness.
3. All joint surfaces shall be smooth and free of spalls, cracks, or fractures and all imperfections that would affect the watertightness and performance of the joint.

D. Related Sections:
1. Section 02220, Excavation and Backfill and Ash Regrading.

1.2 QUALITY ASSURANCE

A. Manufacturer Qualifications: CMP shall be the standard product in regular production by the manufacturer whose product has proven reliable in similar service.

B. Design Criteria:
1. Diversion Swales: As shown on the Drawings.

C. Reference Standards: Comply with applicable provisions and recommendations of the following:
1. Standards of the American Society for Testing and Materials, ASTM.
2. Standards of the American Iron and Steel Institute, AISI.
3. Standards of the American Association of State Highway and Transportation Officials, AASHTO.

1.3 SUBMITTALS

A. Shop Drawings: Shop Drawing submittals shall consist of six (6) copies and shall include the following:
1. Manufacturer's instructions and recommendations for installation of the couplings.

1.4 PRODUCT DELIVERY. STORAGE, AND HANDLING

A. Delivery, storage, and handling of materials shall be in accordance with the manufacturer's instructions. CONTRACTOR shall inspect shipments for damage and content well in advance of the date scheduled for incorporation in the Work.

1.5 JOB CONDITIONS

A. Job conditions are as discussed in Section 02220, "Excavation and Backfill".

PART 2 - PRODUCTS

2.1 MATERIALS

A. Corrugated Metal Half Pipe:
   1. Half pipe shall be minimum 16 gage corrugated (annular) galvanized coated steel pipe fabricated from steel sheet conforming to ASTM A 929 and AASHTO No. M-218. Connect half-pipe sections as shown on the Contract Drawings.
   2. Coatings: All pipe and couplings shall be hot dip galvanized in accordance with ASTM A 123.
   3. Size and Extent: Refer to Drawings.
   4. Anchors: Half-pipe will be anchored in the diversion swale as indicated on the Contract Drawing.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR shall inspect CMP piping to ensure that it is free of defects in material and workmanship. The compatibility of the CMP pipe, couplings, and coatings shall be verified.

3.2 PREPARATION

A. Line and Grade:
   1. Pipe shall be laid according to lines and grades shown on the Drawings or approved by ENGINEER by sloping pipe uniformly between elevations given.
   2. CONTRACTOR shall be responsible for maintaining lines and grades.

B. Diversion Swale:
   1. Construct as shown on the Contract Drawings
   2. Set anchors in bedding and lay pipe such that the anchors and barrel receives bearing pressure from the trench bottom.
   3. Blocking under the CMP will not be permitted unless specifically approved by ENGINEER.

C. Pipe:
   1. Completely remove and clean all foreign material from pipe interior.
   2. Clean pipe joints thoroughly.

3.3 INSTALLATION

A. Laying CMP:
   1. Pipe shall be installed only in the presence of ENGINEER.
   2. Lower pipe into the swale with suitable power equipment.

END OF SECTION

SECTION 02900

LANDSCAPING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, tools, materials, testing, equipment and incidentals as shown, specified and required to furnish and perform landscaping work.
   2. The extent of the landscaping Work shall be performed as shown and as specified in schedules.
   3. The landscaping Work required includes the following:
      a. Importing topsoil from off-site sources if existing cover soils are unacceptable.
      b. Maintenance Work as specified until completion of the Contract.
      c. Soil amendments.
      d. Fertilizers.
      e. Grass materials.
      f. Miscellaneous landscape materials,
      g. Guarantees.

B. Coordination:
   1. Review installation procedures under other Sections and coordinate the installation of items that must be installed with the landscaping.
   2. Notify other contractors in advance of the installation of the landscaping to provide the other contractors with sufficient time for the installation of items included in their contracts that must be installed before landscaping.

C. Related Sections:
   1. Section 02220, Excavation and Backfill.
   2. Section 06642, Erosion Control Geosynthetics.

1.2 QUALITY ASSURANCE

A. Landscape Subcontractor Qualifications:
   1. Subcontract the landscape Work to a single firm specializing in landscape Work.
   2. The landscape subcontractor shall have a minimum of five years of experience of performing substantially similar work.

B. Source Quality Control:
   1. General:
      a. Ship landscape materials with certificates of inspection as required by governmental authorities.
      b. Comply with governing regulations applicable to landscape materials.

c. ENGINEER will request inspection of delivery slips for materials to verify specified quantities of bulk deliveries of soil amendments and fertilizers.

2. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Analytical Chemists, wherever applicable or as further specified.
3. Off-Site Topsoil: Obtain topsoil from local sources or from areas having similar soil characteristics to that found at the site of the Work. Obtain topsoil only from naturally well-drained sites where topsoil occurs in depth of not less than 4- inches; do not obtain from bogs or marshes.
4. Topsoil stockpiled for reuse: Existing cover soils will be inspected by ENGINEER prior to particle size testing to determine suitability for reuse. At the time of inspection ENGINEER will require representative soil samples to be tested for physical properties, pH value, organic matter, and available phosphoric acid and potassium if proposed for use as topsoil. Contractor shall supply twenty pound samples and perform tests at no additional expense to OWNER.
5. All Topsoil shall meet the testing requirements of Paragraph 1.3B.

C. Reference Standards: Comply with the applicable provisions and recommendations of the following, except as otherwise shown or specified.
1. ASTM C 602, Agricultural Liming Materials.
2. ASTM D 422, Method for Particle Size Analysis of Soils.
3. ASTM D 2487, Classification of Soils for Engineering.
4. Association of Official Analytical Chemists, Official Methods of Analysis.
5. American Joint Committee on Horticultural Nomenclature, Standardized Plant Names.
6. Official Seed Analysts of North America, Standards of Quality.
7. FSO-F-241D, Fertilizer, Mixed, Commercial.
8. FSO-F-166E, Peat Moss; Peat, Humus; and Peat, Reed-sedge.

1.3 SUBMITTALS

A. Shop Drawings: The CONTRACTOR shall submit six (6) copies of the following for approval:
1. Planting schedule showing scheduled dates for Turf Work in each area of site.
2. Before delivery of off-site topsoil, written statement giving the location of the properties from which the topsoil is to be obtained, the names and addresses of the suppliers, the depth to be stripped and the crops grown during the past 2 years.
3. Manufacturer's specifications and installation instructions for all materials required.
4. Leachate/Stormwater Management Plan in accordance with Section 02220, Part 1.3 Paragraph C.

B. Test Reports: Submit for approval the following:
1. Before delivery of off-site topsoil and/or re-use of existing topsoil, a soil analysis made by an approved soil testing laboratory stating porosity, the percentages of silt, clay, sand and organic matter, the pH and the mineral and plant nutrient content of the topsoil. Supply topsoil with 5 percent organic matter. Test results for topsoil should also be provided for

particle size testing (ASTM D 422), Testing shall be at a frequency of 1 per 5,000 cubic yards.

2. Environmental testing of off-site topsoil shall be conducted at a frequency of one per 5,000 cubic yards or 1 per source, whichever is more stringent for material from a natural borrow source, and 1 test per 1,000 cubic yards if from another source. Testing shall include Priority Pollutant Semivolatile Organic Compounds (SVOCs), EPA Method 8270, Priority Pollutant Volatile Organic Compounds (VOCs), EPA Method 8260, Priority Pollutant Metals, EPA Method 6010 (HG Method), PCB's/Pesticides, EPA Method 8081, Herbicides, EPA Method 8151. All test results shall be in conformance with the criteria for Residential Direct Exposure Criteria (RDEC) and Class GB Groundwater Pollutant Mobility Criteria (GBPMC) of the CTDEP's Remediation Standard Regulations (RSRs), 22a-133k- 1 to k-3 of the Regulations of Connecticut State Agencies.
3. Before delivery of peat humus an analysis made by an approved laboratory stating the mechanical and chemical analysis of the peat humus proposed for use.

C. Certificates: Submit for approval the following:
   1. Certificates of inspection as may be required by governmental authorities to accompany shipments, and manufacturer's or vendors certified analysis for soil amendments and fertilizer materials. For standard products submit other data substantiating that materials comply with specified requirements.
   2. Certificates from seed vendors certified statement for each seed mixture required, stating botanical and common name, percentage by weight and percentages of purity, germination, and weed seed for each species.

D. Operation and Maintenance Data: Submit for approval the following:
   1. Typewritten instructions recommending procedures to be established by OWNER for the maintenance of landscape Work for one full year. Submit prior to expiration of required maintenance period(s). Include moisture requirements of each type of planting and insect prevention measures including types of spray and application instructions, and special winter protection measures required for each planting.

E. Guarantee: Submit for approval a written guarantee, in the terms specified under "Guarantee" provision of these Specifications, signed by CONTRACTOR.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials:
   1. Deliver packaged materials in original, unopened containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery.
   2. Furnish seed in sealed, standard containers.
   3. Notify ENGINEER of delivery schedule in advance so materials may be inspected upon arrival at job site.
   4. Remove unacceptable material immediately from project site.

B. Storage of Materials:
   1. Store and cover materials to prevent deterioration. Remove packaged materials which have become wet or show deterioration or water marks from the site. Replace at no further cost to OWNER.
   2. Seed that is wet or moldy or that has been otherwise damaged in transit or storage is not acceptable. Replace at no further cost to OWNER.

1.5 JOB CONDITIONS

A. Environmental Requirements:
   1. Proceed with and complete the Work as rapidly as portions of the Site become available, working within the seasonal limitations for each kind of landscape Work required.
   2. Do not spread seed when wind velocity exceeds 5 miles per hour.
   3. Do not plant when drought, or excessive moisture, or other unsatisfactory conditions prevail.

B. Scheduling:
   1. Plant or install materials only during normal planting seasons for each type of landscape Work required. Correlate planting with specified maintenance periods to provide maintenance until occupancy by OWNER.

C. Wetlands
   1. Heavy equipment working in wetlands shall be avoided and if required shall be placed on mats to minimize soil/vegetation disturbance. Disturbed areas in wetlands shall be restored to preconstruction contours upon completion of the work.
   2. Temporary fills shall be disposed of at an upland site and suitably contained to prevent erosion and/or transport to a waterway or wetland. Temporary fill areas shall be restored to their original elevations. No temporary fill shall be placed in waters and/or wetlands.
   3. The CONTRACTOR shall make every reasonable effort to carry out the construction or operation of the Work in a manner so as to maintain as much as is practicable, and to minimize any adverse impacts on, existing fish, and wildlife, and natural environmental values and to discourage the establishment or spread of plant species identified as non-native invasive species by any federal or state agency.

1.6 ALTERNATIVES

A. Substitutions are not allowed.

1.7 GUARANTEE

A. Guarantee turf through the specified maintenance period, until Final Acceptance of the Work.

B. Immediately remove and replace turf found to be dead or in unhealthy condition during guarantee period and through the specified maintenance period. Make replacements during growth season following end of guarantee period. Furnish and plant replacements which comply with requirements shown and specified. ENGINEER will make another

inspection at end of extended guarantee period, if any, to determine acceptance or rejection. Only one replacement will be required at end of guarantee period, except for losses or replacements due to failure to comply with specified requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil:

1. Existing cover soils shall be analyzed in accordance with Part 1.2 B Paragraph 4 of the Section to determine the suitability for reuse as topsoil. Soils approved by the ENGINEER for use as topsoil shall be stockpiled by the CONTRACTOR for reuse in landscape Work. If quantity of stockpiled topsoil is insufficient, the CONTRACTOR shall provide additional topsoil as required to complete landscape Work.
2. Provide off-site topsoil as required, which is fertile, friable, natural loam, surface soil, capable of sustaining vigorous plant growth, free of any admixture of subsoil, clods of hard earth, plants or roots, sticks or other extraneous material harmful to plant growth. Supply topsoil with the following analysis:
   a. 1 -inch Mesh: 100 percent passing.
      #4 Sieve: 90 to 100 percent passing.
      #200 Sieve: 0 - 1 0 percent passing.
   b. Clay content of material passing #200 sieve not greater than 60 percent, as determined by hydrometer tests.
   c. pH 5.0 to pH 6.5. If approved by ENGINEER, natural topsoil not having the pH value specified may be amended by CONTRACTOR at his own expense.
   d. Organic content not less than 5 percent, as determined by ignition loss.
   e. Free of pests and pest larvae.

B. Soil Amendments:

1. Lime: Natural limestone containing not less than 85 percent of total carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.
2. Peat Humus: Provide peat humus which is a natural product of with sphagnum moss, reed, or sedge peat, taken from a fresh water site. Supply shredded material, fee from lumps, roots, stones and other extraneous foreign matter, capable of passing through a 1/2-inch screen, which can easily be incorporated with the topsoil. Supply material which has been conditioned in storage piles after excavation for at least 6 months, including one freezing and thawing period. Supply peat humus with the following analysis:
   a. Not less than 90 percent organic matter by weight on an oven dry basis.
   b. pH range 5 to 7.5.
   c. Moisture content 35 percent at time of incorporation into soil.
   d. Water absorbing ability 150 percent to 350 percent by weight.
3. Sand: Washed of fine to medium texture.
4. Ferrous Sulfate: Commercial grade and unadulterated.

C. Commercial Fertilizers:

1. Complete fertilizer of neutral character, with a minimum of 75 percent nitrogen derived from natural organic sources or ureaform; 40-50 percent of the nitrogen shall be water soluble. Available phosphoric acid derived form superphosphate, bone, or tankage. Potash derived from muriate of potash, containing 60 percent potash. Uniform in composition, freeflowing and suitable for application with approved equipment. Provide fertilizer with the following percentages of available plant nutrients.
   a. For lawns, provide fertilizer with not less than 4 percent phosphoric acid and not less than 2 percent potassium, and the percentage of nitrogen required to provide not less than 1.5 pounds of actual nitrogen per 1000 square feet of lawn area. Provide nitrogen in a form that will be available to the lawn during the initial period of growth.
2. Bonemeal: Commercial, raw, finely ground; 4 percent nitrogen and 20 percent phosphoric acid.
3. Superphosphate: Soluble mixture of treated minerals; 20 percent available phosphoric acid.
4. Hydroseeding Fertilizer:
   a. Commercial designation of 18-24-6. Provide a complete fertilizer of neutral character with a minimum of 75 percent nitrogen derived from natural organic sources.
   b. Minimum 40-50 percent of nitrogen shall be water soluble.
   c. Uniform in composition, free-flowing and suitable for application with approved equipment.
   d. Product and Manufacturer: Provide one of the following:
      1) Scotts Starter Fertilizer by the Scotts Company.
      2) Or equal.

D. Grass Materials:

1. Grass Seed Mixture: Provide fresh, clean, new-crop seed complying with the, tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified. Birdsfoot trefoil shall be inoculated before planting.
2. The "Schedule of Grass Seed Requirements" is as follows:

GRASS SEED MIX SEEDING SCHEDULE			
BOTANICAL NAME	COMMON NAME	MIXTURE PERCENT BY WEIGHT	MINIMUM PERCENT PURITY/ GERMINATION
Agrastis tenuis	Colonial Bentgrass	5%	95/90%
Festuca rubra	Chewings Fescue	35%	97/80%
Festuca longifolia	Hard Fescue	30%	96/85%
Lotus corniculatus	Birdsfoot Trefoil	10%	96/90%
Lolium perenne	Perennial Ryegrass	20%	98/90%

The seeding rate for the mixture shall be 175 pounds per acre. The acceptable planting periods are from April 1 through June 15 and September 1 through October 15.

E. Miscellaneous Landscape Materials:
1. Hydromulch:
a. On areas and slopes within the Limit of Cap as shown on Contract Drawings, provide a hydraulically applied flexible growth medium (FGM) at the rate of 3,500 pounds per acre.
b. Provide the following:
1) Product and manufacturer:
a) Flexterra FGM by Profile Products, LLC
b) or equal.
2. Water: Potable.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR and his installer shall examine the subgrade, verify the elevations, observe the conditions under which Work is to be performed, and notify ENGINEER of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the ENGINEER.

3.2 PREPARATION

A. Soil Preparation:
1. Loosen subgrade of turfbed areas as required to prepare seedbed. Remove debris over 1-1/2 inches in any dimension and sticks, roots, rubbish and other extraneous matter. Limit preparation to areas which will be planted promptly after preparation.
2. Spread topsoil to minimum depth of 6-inches after natural settlement and light rolling to 85 percent Modified Proctor density.
a. Do not spread topsoil while in frozen condition or when moisture content is so great that excessive compaction will occur nor when so dry that dust will form in the air or that clods will not break readily.
3. Apply ground limestone, by machine, over all areas to receive turf, as required, to bring the soil to a neutral pH. Work lightly into the top 3 inches of topsoil at least five days before applying the commercial fertilizers.
4. Apply commercial fertilizers in the following quantities:
a. For grass apply only at a rate sufficient to supply 1.5 pounds of nitrogen per 1000 square feet. For 5-10-5 use 30 pounds per 1000 square feet.
5. Apply commercial fertilizers within 10 days of seeding.
6. Apply commercial fertilizers in 2 operations. First application shall be 3/4 of total amount.
7. Thoroughly and evenly incorporate commercial fertilizers with the soil to depth of 3 inches by discing, or other approved method.
a. In areas inaccessible to power equipment, use hand tools.
8. Apply superphosphate for grass areas at the rate of 20 pounds per 1000 square feet and incorporate into the top 3 inches of topsoil.
9. Grade turfbed areas to smooth, even surface with loose, uniformly fine texture-Remove all stones and extraneous foreign material in excess of 3/4 inch in diameter. Roll and rake

and remove ridges and fill depressions, as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.

10. Apply a second dressing of fertilizer. Use 1/4 of the total amount.
11. Moisten prepared turfbed areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting. Do not create a muddy soil condition.
12. Restore turfbed areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

B. Adequate sedimentation and erosion control management measures, practices and devices, such as phased construction, vegetated filter strips, geotextile silt fences, or other devices shall be installed and properly maintained to reduce erosion and retain sediment on-site during and after construction in accordance with the CONTRACTOR'S Leachate Control Plan and Stormwater Pollution Control Plan. These devices shall be capable of preventing erosion, of collecting sediment, suspended and floating materials, and of filtering fine sediment. These devices shall be removed upon completion of work and the disturbed areas shall be stabilized. The sediment collected by these devices shall be removed and placed at an upland location, in a manner that will prevent its later erosion into a waterway or wetland. If the ENGINEER determines that the on-site placement of the collected sediment may adversely affect the integrity of the site, the collected sediment will be removed and disposed of at no additional cost to the OWNER. All exposed soil and other fills shall be permanently stabilized at the earliest practicable date. See Section 02112 "Sedimentation and Erosion Controls".

3.3 INSTALLATION

A. Hydroseeding

1. Strictly comply with manufacturer's installation instructions and recommendations. For optimum pumping and application performance use approved mechanically agitated, hydraulic seeding/mulching machines with a fan-type nozzle (50-degree tip). Apply FGM from opposing directions and to achieve best soil coverage.
2 Erosion Control and Revegetation:
   a. For maximum performance, apply FGM in a two-step process:
   b. Step One: Mix and apply seed and soil amendments with small amount of FGM for visual metering.
   c. Step Two: Mix and apply FGM at a rate of 50 lb per 125 gallons (23 kg/475 liters) of water over freshly seeded surfaces. Confirm loading rates with equipment manufacturer. Do not leave seeded surfaces unprotected, especially if precipitation is imminent.
   d. Depending upon site conditions FGM may be applied in a one-step process where all components may be mixed together in single tank loads. Consult with manufacturer for further details.
3 Mixing:
   A mechanically agitated hydraulic-application machine is recommended:
   a. Fill tank to middle of agitator shaft or tank about 1/3 full of water. Turn on pump to wet or purge lines. Begin agitating. Keep adding water slowly while adding the FGM at a steady rate.

b. Consult application and loading charts to determine number of bags to be added. Mix at a rate of 50 lbs. of FGM per 125 gallons (23kg/475 liters). Contact equipment manufacturer to confirm optimum FGM mixing rates.
c. All FGM should be loaded when the tank is approximately 3/4 full.
d. Fertilizer should be added once the tank is nearly full.
e. Before applying, mix the slurry for at least 10 minutes after adding the last amount of FGM. This is very important to fully activate the bonding additives and to attain proper viscosity.
f. Turn off recirculation valve to minimize potential for air entrainment within the slurry.

4. Application:
   a. Use a fan-type nozzle (50-degree tip) whenever possible for best soil surface coverage. Apply FGM from opposing directions to soil surface, reducing the "shadow effect" and assuring a minimum of 95% of soil surface coverage. Slope interruption devices or water diversion techniques are recommended when slope lengths exceed 100 ft (30m).
   b. Install materials at an application rate of 3500 pounds per acre.
   c. Increase application rates on highly erosive soils or chiseled, disked, furrowed or tracked slopes. Contact Manufacturer for additional details.
   d. Material should not be applied in channels, swales or other areas where concentrated flows are anticipated, unless installed in conjunction with a temporary erosion control blanket or non-degradable turf reinforcement mat.
   e. After application, thoroughly flush the tank, pumps and hoses to remove all FGM material. Wash all material from the exterior of the machine and remove any slurry spills. FGM will be more difficult to remove once it dries.
5. Prevent foot or vehicular traffic, or the movement of equipment over the seeded areas. Reseed areas damaged as a result of such activity.
6. Prevent the seeded areas from drying out. After seedlings appear in about 2-3 weeks reseed all bare spots larger than 18-inches in diameter. Areas to be reseeded shall be hand raked to scarify the surface and seed shall be applied by cyclone spreader. Lightly rake the seed into the soil.

B. Reconditioning Existing Turf:
1. Recondition existing turf areas damaged by CONTRACTOR'S operations including storage of materials and equipment and movement of vehicles. Also recondition existing turf areas where minor regrading is required.
2. Provide fertilizer, seed or sod, soil amendments, and erosion control matting as specified for new turf and as required to provide a satisfactorily reconditioned turf. Provide new topsoil as required to fill low spots and meet new finish grades.
3. Cultivate bare and compacted areas thoroughly to provide a satisfactory planting bed.
4. Remove diseased and unsatisfactory turf areas; do not bury into soil. Remove topsoil containing foreign materials resulting from CONTRACTOR'S operations including, but not limited to oil drippings, stone, gravel and other loose building materials.
5. In areas approved by ENGINEER, where substantial turf remains (but is thin), mow, rake, aerate if compacted, fill low spots, remove humps and cultivate soil, fertilize, and seed. Remove weeds before seeding or if extensive, apply selective chemical weed killers as required. Apply a seedbed mulch, if required, to maintain moist conditions.

6. Water newly planted areas and keep moist until new turf is established.

3.4 MAINTENANCE

A. Begin maintenance immediately after planting.

B. Maintain turf for not less than the period stated below, and longer as required to establish an acceptable stand, as determined by ENGINEER.
   1. Grass seed lawns, not less than 60 days.
   2. If seeded in fall and not given a full 60 days maintenance, or if not considered acceptable at that time, continue maintenance the following spring until acceptable lawn is established.

3.5 CLEANUP AND PROTECTION

A. During landscape Work, store materials and equipment where directed. Keep pavements clean and work area in an orderly condition.

B. Protect landscape Work and materials form damage due to landscape operations, operations by other contractors and trades and trespassers. Maintain production during installation and maintenance periods. Treat, repair or replace damaged landscape Work as directed.

C. Take all precautions to insure that hydroseed slurry, is only placed on the areas designated. Completely clean any overspray, on areas not designated to receive slurry, to the satisfaction of ENGINEER.

D. Remove all rubbish, equipment and rejected materials from the site.

E. Protection includes all temporary fences, barriers and signs and other Work incidental to proper maintenance.

3.6 INSPECTION AND ACCEPTANCE

A. When the landscape Work is completed, including maintenance, the ENGINEER will make an inspection to determine acceptability.

B. Where inspected landscape Work does not comply with the requirements, replace rejected Work and continue specified maintenance until reinspected by ENGINEER and found to be acceptable. Remove rejected plants and materials promptly from the project site.

C. Any damage, disturbance, or settlement that occurs as a result of the CONTRACTOR'S stockpiling of material or equipment on site shall be the responsibility of the CONTRACTOR to repair and/or supply additional materials to compensate for settlement caused by the CONTRACTOR'S actions.

D. The thickness of the in-place Topsoil will be checked by the CONTRACTOR after the completion of the work on a grid pattern not to exceed 50-foot by 50-foot by digging, by

hand, with a plastic shovel in the presence of and as directed by the ENGINEER. The size of the test hole shall not be less than one-foot in diameter. Measurements shall be made perpendicular to the slope. The CONTRACTOR shall be responsible for digging holes in the Topsoil to allow for the measurements to be taken by the ENGINEER. After measurements have been made, the CONTRACTOR shall backfill the holes with Topsoil, and hand tamp. During digging and backfill of test holes, the CONTRACTOR shall use plastic shovels and exercise care not to damage any materials. Any such damage shall be repaired at the expense of the CONTRACTOR.

END OF SECTION

SECTION 03600

GROUT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, tools, materials, equipment, testing, and incidentals as shown, specified and required to furnish and install grout at the base of the drainage downchute.

B. Related Sections:
   1. Section 02271, Riprap

1.2 QUALITY ASSURANCE

A. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
   1. ASTM C 150, Portland Cement.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials: Grout materials from manufacturers shall be delivered in unopened containers and shall bear intact manufacturer's labels.

B. Storage of Materials: Grout materials shall be stored in a dry shelter and shall be protected from moisture.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Rip-Rap and Gabion Grout:
   1. Use a design mix for Class "A" grout with a 28-day compressive strength of 4,000 psi, a maximum water-cement ratio by weight of .45, air content of 9 percent, and a minimum cement content of 658 pounds per cubic yard.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR shall examine the substrate and conditions under which grout is to be placed, and notify ENGINEER in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.

3.2 INSTALLATION

A. General:

1. Place grout as shown and in accordance with manufacturer's instructions. If manufacturer's instructions conflict with the Specifications do not proceed until ENGINEER provides clarification.
2. Drypacking will not be permitted.
3. Placing grout shall conform to temperature and weather limitations as specified by the Manufacturer.

END OF SECTION

SECTION 06643

GEOMEMBRANES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
1. CONTRACTOR shall furnish all labor, materials, tools, testing, equipment and incidentals required to supply, install and test textured linear low density (LLDPE) polyethylene flexible geomembrane as shown on the Drawings and specified herein. Only one type of LLDPE geomembrane shall be used for the entire project, and will at a minimum be utilized within the entire limit of waste
2. The textured LLDPE geomembrane shall be textured on both sides.
3. Subgrade preparation is included under Section 02220 and Section 02225.
4. Refer to Section 06647 for additional requirements relating to cold weather construction and installation.

B. Related Sections:
1. Section 06645, Geosynthetics.
2. Section 06646, Geocomposite Drainage Layer
3. Section 06647, Cold Weather Installation - Geomembrane.

C. CONTRACTOR shall supply field enclosures, field tensiometers, arbor presses and all other equipment and appurtenances for completing and testing the work.

1.2 DEFINITIONS

A. Roll: One roll shall be a length of liner material delivered to the site, packaged or rolled in some manner as to prevent kinks, creases, pinholes or cold bends in the material.

1.3 QUALITY ASSURANCE

A. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:
1. Standards of American Society for Testing and Materials (ASTM).

B. Single Source:
1. All liner material shall be obtained from a single material supplier and all liner sheets shall be manufactured by a single liner manufacturer.

C. Liner Manufacturer's Qualifications and Experience:
1. Liner manufacturer shall be a specialist in the manufacture of textured PE liners and shall demonstrate:
   a. At least five years experience in the manufacture of textured PE liners.
   b. At least 10 million square feet of textured PE liner.

c. At least 10 completed projects.

2. Liner Manufacturers:
   a. GSE, Inc.
   b. Or equal.

D. Liner Installer's Qualifications and Experience:

1. Liner installer shall be a specialist in the installation of textured PE liners and shall have installed at least 10 million square feet of PE liner during the last five years. The installer is responsible for field handling, placing, seaming, loading (against wind) and other aspects of geomembranes and geosynthetics.
   a. Installer's field crew shall include at least one "master seamer", whose experience conforms to Article 3.4 of this Section.
   b. Submit resume of master seamers.
   c. Submit resume of field superintendent.

E. Liner Installer's Field Services and Reports:

1. Retain services of liner installer's factory trained representatives with demonstrated ability and experience in the field seaming, field testing and all other pertinent aspects of PE liner installation to perform the services listed below:
   a. Inspect the drainage layer material and supervise any corrective work required. Prepare an inspection report.
      1) Identify ASTM methods and values that result from repairs.
      2) Describe corrective work.
   b. Supervise the unloading handling, and storage of all liner sheets.
   c. Supervise the handling, unrolling and placement of all liner sheets.
   d. Perform all field seaming and testing of liner.
   e. Perform all repairs to damaged liner sections.
   f. Supervise the placement of top drainage layer/liner cover material.
   g. Conduct startup seam testing.
   h. Conduct field destructive and non-destructive seam tests.
   i. Prepare detailed test reports and submit copies of these reports to ENGINEER daily.
   j. Prepare a written report at the completion of the work which includes the following:
      1) Complete identification of flexible membrane liner, including but not limited to, resin type, physical properties and other pertinent data.
         a. Identify ASTM methods and values.
      2) Complete description of field seaming system used including material, method, temperatures, seam overlap width and cure or aging time.
      3) Complete description of field sampling and testing including test equipment used, location of field tests, copy of test results, conditioning procedure prior to destructive seam testing, method of recording loading and determining average load for destructive test methods and type of failure in tests (i.e. within the seam, within the sheet material, clamp edge, seam edge). Copies of all non-destructive test results for seam and repair areas and discussions on repair methods used for failed seams.

4) "As-built" drawings showing actual layout of liner sheets, destructive sample locations, patch/repair locations, pipe penetration details and anchor trench details.
5) An affidavit of compliance from the liner manufacturer, per Article 3.11.A.5.

F. Quality Control During Manufacturing:

1. Prior to the installation of any geomembrane material, the CONTRACTOR shall submit for approval to the ENGINEER information obtained from the manufacturer.
   a. origin (Resin Supplier's name, resin production plant), identification (brand name, number) and production date of the PE resin;
   b. copy of quality control certificates issued by the PE Resin Supplier; and
   c. reports on the test conducted by the PE Resin Supplier and/or liner Manufacturer to verify the quality of the PE resin used to manufacture the geomembrane rolls tests shall include, specific gravity (ASTM D792 Method A or ASTM D1505), melt index (ASTM D1238 Condition E) density (ASTM D1505) and percent carbon.
2. Random sampling shall be performed by the Liner Manufacturer, at no additional cost to the OWNER, throughout the liner production run to assure proper quality control. The minimum frequency of such sampling shall be as follows:
   a. Two (2) samples taken from each day's production, and
   b. One (1) sample per two (2) rolls, and
   c. All non-consecutive rolls delivered to the project.
   d. Other sampling as proposed by the CONTRACTOR and approved by the ENGINEER.
3. The samples shall be tested for the following properties:
   a. Uniformity: Visual inspection to assure the material is free of holes, blisters, undispersed raw material, or foreign matter.
   b. Thickness: Measurement along the sample to assure that the sheet is within the specified tolerances of thickness (ASTM D 1593).
   c. Carbon Black: The proper amount, grade and degree of dispersion are imperative to assure proper U.V. radiation protection (ASTM D 1248).
   d. Tensile Properties: One (1) dimensional tensile testing which measures tensile strength at yield and at break and elongation at yield and at break shall be made (ASTM D 638).
4. All pre-assembled panel seems shall be tested at the factory in accordance with the destructive and nondestructive testing specified in Paragraph 3.8 and 3.9 of this Section.
5. The CONTRACTOR shall provide the OWNER and ENGINEER with certified copies of the manufacturer's test results.
6. The OWNER and ENGINEER, at their discretion, may employ and pay for an independent testing laboratory to perform additional testing of the liner materials. This testing may also include all properties specified in Paragraph 2.2E and need not be limited to the testing performed by the Manufacturer. The CONTRACTOR shall, at no additional cost, provide field destructive samples to the OWNER or ENGINEER as required.
7. The CONTRACTOR shall be solely responsible to the OWNER for the quality of the material provided. Should any of the tests performed on the material yield

unsatisfactory results, the CONTRACTOR will be responsible for replacing the material with satisfactory material without delaying the total project time and without any cost to the OWNER.

G. Testing Laboratory:

1. The services of a qualified testing laboratory shall be engaged by the CONTRACTOR to make tests and determine the acceptability of the liner materials. CONTRACTOR shall be responsible for coordinating and scheduling all testing with the laboratory so as not to delay completion of the Work.

H. Friction Angle Tests:

Prior to placement of the textured PE geomembranes, CONTRACTOR shall provide ENGINEER with laboratory test results as described below. These tests are intended to verify the side slope stability of the landfill.

1. Textured PE liner, geosynthetics and cover soils; PE liners, geosynthetics and cover soils shall be fabricated, and soils shall be chosen, to achieve a minimum peak friction angle of:
   a. Textured PE and Drainage Geocomposite; 27 degrees with a normal stress of 150 psf between the textured PE liner and the proposed drainage geocomposite,
   b. Textured PE and Geotextile Fabric: 27 degrees with a normal stress of 150 psf between the textured PE liner and the proposed geotextile fabric.
   c. Drainage net composite and Cover Soil Material; 27 degrees with a normal stress of 150 psf between the drainage net composite and Cover Soil Material.
   d. 27 degrees with a normal stress of 150 psf between the all soil interfaces including, but not limited to Subbase material and Ash Fill, and between Cover Soil Material and Topsoil.
2. During construction and before completion, CONTRACTOR shall repeat the above tests with the materials used on-site, if the ENGINEER determines that the materials have changed, or if the test materials used in the preparation of the Shop Drawings are not identical to those used in construction.
3. The friction angle testing outlined above shall be conducted using ASTM D5321 and ASTM 3080 modified to be in general accordance with the following requirements is intended to indicate the performance of the various components by attempting to model the field conditions:
   a. The shear box shall be a minimum of 12 inches square in plan dimensions.
   b. Each half of the shear box shall be a minimum of three inches in depth.
   c. Proposed soils shall be compacted to approximately 90 percent Modified Proctor Density, with a moisture content, determined through the laboratory testing and topsoil shall be compacted to approximate 80 percent Modified Proctor density.
   d. The geosynthetics shall be placed in the same sequence as shown on the Drawings. The interface geosynthetics in questions shall be connected to the respective upper or lower shear box frame.
   e. The test shall be performed for a minimum of three normal stresses applied to the geosynthetic to bracket the normal stresses defined above, as required to define the failure plane friction angle. The peak and residual shear stresses shall be recorded and plotted against the normal compressive stresses used. A best fit straight line shall be constructed for each test series.

f. All samples shall be normally consolidated under the applied load.
g. The direction of shear for each interface tested shall be in the direction of manufacture (machine direction) for each geosynthetic sample.
h. Apply the shear force using a constant rate of displacement not to exceed .01 in./min.
i. All tests shall be continued until a constant shearing force is recorded,
j. All tests shall be conducted with the soil and geosynthetics in a wet condition, by saturating and maintaining the specimen in water for 24 hours prior to and during testing.

The actual test methods and equipment shall be proposed by the CONTRACTOR and approved by the ENGINEER.

In addition to the prequalification testing, a minimum of three tests shall be performed by the CONTRACTOR during the course of the work to confirm that the frictional characteristics of the products continues to meet the requirements of this specification. Testing shall be performed in accordance with paragraph 1.3.H of this section.

1.4 SUBMITTALS

A. Shop Drawings:
1. Submit shop drawings for approval as soon as possible after award of Contract.
2. Shop drawings shall include:
   a. Drawings showing layout of liner sheets, anchor trench details and pipe penetration details. Layout diagram indicating the location of pre-assembled panels. Shop drawings need not identify each sheet and panel by number, per Article 3.2 of this Section; however, quality assurance record shall do so.
   b. Complete description of field seaming procedures.
   c. Work plan for liner installation including manpower and equipment requirements.
   d. Detailed description of field testing methods to be performed.
   e. Name of liner installer and written description of at least three (3) recent liner installation projects completed by liner installer
   g. Provide a list of at least three (3) references for liner installer
   h. Resume(s) of master seamers for liner installer
   i. Resume(s) of field superintendent for liner installer
   j. Liner installers QA/QC plan and cold weather installation procedures.
   k. Provide friction angle test results.

B. Affidavit of Compliance:
1. Provide 6 copies of an affidavit, certifying that all liner materials furnished for this project (reference project title and number) comply with all requirements specified in the Contract Documents.
2. No liner material shall be shipped until the affidavits are submitted to the ENGINEER.

C. Test Reports: Provide 6 copies of all factory and field quality control test reports.

D. Pre-weld seaming records, vacuum and pressure test records, and daily as-built information and sketches shall be submitted to the ENGINEER daily for review. Destructive seam testing, results shall be submitted to the ENGINEER as soon as available.

1.5 WARRANTY

A. The Bidder shall submit 3 copies of the liner manufacturer's offer of warranty with his bid. Pipe penetration seals and field seams, shall be included in the warranty. The warranty shall guarantee materials for a minimum period of 20 years and labor for a minimum period of 5 years.

B. CONTRACTOR shall provide the OWNER with a sample warranty in accordance with offer of warranty submitted with his bid.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery including unloading, storage and handling shall be performed in accordance with the liner manufacturer's recommendations and shall be done in such a manner as to prevent damage to the liner.

B. CONTRACTOR shall provide all labor and equipment required to assist ENGINEER in inspection and sampling of liner materials upon delivery to the site, or as requested by the ENGINEER.

PART 2 - PRODUCTS

2.1 PE RESIN

A. 1. The PE geomembrane shall be manufactured of virgin, first-quality resin and shall be compounded and manufactured specifically for the intended purpose. No regrinded or reprocessed materials shall be used in the manufacturing of the geomembrane. The resin manufacturer shall certify each batch for the specified properties.

2. The Polyethylene (Compounded) resin shall conform to the following properties:

Property	Test Method	Requirements
Specific Gravity	(ASTM* D 792 or ASTM D 1505)	>.915
Melt Index	(ASTM D 1238 Condition E)	<1.0/10min
Carbon Black Content	(ASTM D 1503)	2-3%

B. The resin used for extrusion bonded seams shall be identical in all respects to the PE resin used to manufacture the liner sheets. The installer shall provide certifications for welding rod and/or resin used to manufacture the rod prior to installation.

2.2 PE SHEET MANUFACTURING

A. The PE liner materials shall be formulated from the appropriate polymers and compounding ingredients to form an PE sheet material that meets all requirements for use as a liner for a municipal waste landfill. The sheet material shall be capable of being bonded to itself by thermal bonding in accordance with the sheet manufacturer's recommendations and instructions.

B. Liner sheets which have repair patches upon delivery to the site shall not be accepted.

C. Sheets shall be at least ten feet (10') in width. Individual liner sheets may be pre-assembled at the factory into larger panels to minimize field seams. Liner sheet and pre-assembled panel sizes shall consider access to site and materials handling constraints.

D. Each roll shall be identified by a number and date of manufacture. The number shall identify roll number and batch or lot number as a minimum.

E. The completed sheet, upon thorough quality control testing specified herein, must demonstrate the following properties:

1. General Sheet Properties:

Property	Test Method	Minimum Value	Units
1. Specific Gravity	ASTM D 1505 Method A	0.92	g/cm^3
2. Melt Flow Rate	ASTM D1238	<1.0	g/l0 Min
3. Coefficient of Linear Thermal Expansion, nominal	ASTM D 696	$1.2x10^{-4}$	C^{-1}
4. Water Absorption	ASTM D 570	.10 max.	%wt. change
5. Modulus of Elasticity, Min.	ASTM D 638	80,000	psi
6. Carbon Black Content	ASTM D 1603	2 Min. 3 Max.	% %
7. Dimensional Stability maximum change percent)	ASTM D 1204 212°F 1 hr.	±2	each dir. %change max.
8. Resistance to Soil Burial	ASTM D 3083		% change max. in original value

a. Tensile Strength Yield and Break		±10	
b. Elongation at Yield and Break		±10	
9. Environmental Stress	ASTM D 1693	1,500	Min. hours

2. Sheet Properties for Specific Sheet Applications:

Property	Test Method	Units	Minimum Values[2]
1. Textured			Yes
a. One side			No
b. Two sides			Yes
2. Thickness, (min. average)	ASTMD1593	mils	38
3. Tear Resistance, min. (MD & CMD)[1]	ASTMD1004 DieC	lbs	22
4. Tensile Strength, min. a. Break (MD & CMD)[1]	ASTM D 638*	lbs/inch width	60
5. Elongation, min. a. Break (MD&CMD)[1]	ASTM D 638*	%	250

Notes:

A. Primary Liner

(1) MD = Machine Direction
CMD = Cross Machine Direction

(2) The minimum values presented are for use as a guide only and represent the absolute minimum properties for the sheet. The critical property will be the minimum friction angle specified and may result is a thicker geomembrane necessary to comply with these specifications.

*Speed 2 ipm, Test Specimen

Property	Test Method	Value	Units
Field Seam Requirements			
1. Bonded Seam Strength	ASTM D 4437	FTB[1] and 76[2] minimum	Breaking factor Ibs/inch mm.
2. Peel Adhesion lb/inch min.	ASTM D 4437	FTB[1] and 60[2]	

(1) FTB - Film Tear Bond, and shall have a maximum of 10% peel in seam or portion of seam tested.

(2) Required minimum failure value for seam.
(3) Both halves of split wedge seams will be tested.

2.3 PIPE PENETRATION MATERIALS

A. Extrusion Joining Resin: Resin used for extrusion joining sheets and sheet to pipe shall be PE produced from the same as the sheet resin. Physical properties shall be the same as those of the resin used in the manufacture of the PE liner. The resin shall be supplied in black.

B. Extrusion weld on pipe shall be non-destructively tested and repaired in accordance with the procedures outlined in paragraph 3.8 of this section or as approved by ENGINEER.

C. Factory fabricated boots will be considered as an alternative by ENGINEER providing:
1. The boot assembly has sufficient length of pipe and PE sheeting to facilitate field installation
2. The manufacturer certifies the materials used conform to the applicable portions of these specifications.
3. The manufacturer provides non-destructive test results on the prepared boot assembly.
4. Any boots that appear to be damaged shall be replaced or repaired as required by the ENGINEER.

PART 3 - EXECUTION

3.1 PREPARATION FOR GEOMEMBRANE INSTALLATION

A. Prepare base material to receive the geomembrane in accordance with geomembrane manufacturer's recommendations. Refer to Section 02220 "Excavation and Backfill", and Section 02225 "Subbase" for additional requirements relating to preparation of subbase material and overlying Cover Soil material layer. As a minimum, this certification shall include date, job name, material used, base composition, roll or panel number, and signature of manufacturer's representative.

B. The geomembrane Manufacturer shall certify in writing that the surface on which the geomembrane will be installed is acceptable. This certificate of acceptance shall be given to the ENGINEER prior to commencement of geomembrane installation.

3.2 GEOMEMBRANE PLACEMENT

A. Panel Identification: A panel is the unit area of geomembrane which is to be seamed in the field. A panel is a roll or a portion of roll cut in the field. Each panel shall be given an "identification code" (number or letter-number) consistent with the layout plan. This identification code shall be agreed upon by the ENGINEER and CONTRACTOR. This identification code shall be as simple and logical as possible. The CONTRACTOR shall

establish a table or chart showing correspondence between roll numbers and identification codes. The identification code shall be used for all quality assurance records.

B. Panel Placement:
   1. The CONTRACTOR shall verify that panels are installed at the location indicated on the Drawings.
   2. Panels placed prior to field seaming shall begin at the low point and proceed upward and outward with "shingle" overlaps to facilitate drainage in the event of precipitation.
   3. CONTRACTOR shall record on a drawing the identification code, roll number, location, and date of installation of each panel.

C. Weather Conditions:
   1. Geomembrane placement shall not proceed at an ambient temperature above 40°C (104°F) unless otherwise specified or approved by the ENGINEER. For temperatures below 5°C (41°F) refer to Section 06647 Cold Weather Installation - Flexible Membrane Liner. Geomembrane placement shall not be conducted during any precipitation, in the presence of excessive moisture (e.g., fog, dew, or frost), in an area of ponded water, or in the presence of excessive winds, as determined by the ENGINEER.
   2. CONTRACTOR shall verify that the above conditions are fulfilled. Additionally, the CONTRACTOR shall verify that the supporting soil has not been damaged by weather conditions.

D. Method of Placement:
   1. Use no equipment that could damage the geomembrane by handling, trafficking, leakage of hydrocarbons, or other means;
   2. Prohibit all personnel on the geomembrane from smoking, wearing damaging shoes, or engaging in other activities which could damage the geomembrane;
   3. Use methods to unroll the panels that do not cause scratches, folds or crimps in the geomembrane and do not damage the subgrade;
   4. Use methods to place the panels that minimize wrinkles (especially differential wrinkles between adjacent panels);
   5. Place adequate loading (e.g., sand bags), not likely to damage the geomembrane, to prevent uplift by wind; and
   6. Minimize direct contact with the geomembrane (i.e., the geomembrane in traffic areas is protected by geotextiles, extra geomembrane, or other suitable materials).

E. Damage: The ENGINEER shall inspect each panel, after placement and prior to seaming, for damage. The ENGINEER shall advise the CONTRACTOR which panels, or portions of panels, shall be rejected, repaired, or accepted. Damaged panels of portions or damaged panels which have been rejected shall be marked and removed from the work area. The damaged materials shall become the property of the CONTRACTOR.
   1. Alternatives for disposition of damaged liner with approval of ENGINEER:
      a. Remove from site at expense of CONTRACTOR.
      b. Use as slip sheets.
      c. Use as protective pads beneath vehicles.

d. Use as spill protection.
e. Use as chafe strips along berms.

3.3 ANCHOR TRENCH

A. Excavate anchor trenches to the lines and width shown on the Drawings, prior to geomembrane placement, and as follows:
1. Top of each slope.
2. At end of rolls on slopes.
3. At other points as recommended by manufacturer.

B. Round trench edge to avoid sharp bends in the geomembrane. No loose soil shall be allowed to underlie the geomembrane in the anchor trench.

C. Backfill the anchor trench in accordance with Section 02220, Excavation and Backfill.

3.4 FIELD AND SHOP FABRICATED SEAMING

A. Seam Layout: CONTRACTOR shall provide the ENGINEER with a drawing of the facility to be lined showing shop fabricated seams and field seams in a manner which differentiates the seam types. Field seams should be oriented parallel to the line of maximum slope (e.g., oriented along, not across, the slope). In corners and odd-shaped geometric locations, the number of field seams should be minimized. No horizontal seam shall be constructed on the slope. The seam at the toe of the slope shall be no less than five (5) feet from the toe of the slope.

B. Requirements of Personnel: All personnel performing seaming operations shall be qualified by experience or by successfully passing seaming tests. At least two seamers shall have experience seaming a minimum of 2,000,000 square feet of PE geomembrane using the same type of seaming apparatus in use at the site. The most experienced seamer, the "master seamer", shall provide direct supervision, as required, over less experienced seamers. No field seaming shall take place without the master seamer being present.

3.5 OVERLAPPING AND TEMPORARY BONDING

A. Overlap panels by a minimum of three (3) inches for extrusion welding and 125 mm (5 inches) for fusion welding, or as approved by ENGINEER.

B. Assure that the procedure used to temporarily bond adjacent panels together does not damage the geomembrane; in particular, the temperature of hot air at the nozzle of any spot welding apparatus is controlled such that the geomembrane is not damaged.

C. No solvent or adhesive shall be used unless the product is approved in writing by the ENGINEER.

3.6 SEAM PREPARATION

A. Prior to seaming, confirm that the seam area is clean and free of moisture, dust, dirt, debris of any kind, and foreign material; and clean seam area as necessary to permit seaming.

B. Where seam overlap bonding is required, the process shall be according to the Manufacturer's instructions and in a way that does not damage the geomembrane.

C. Seams shall be aligned with the fewest possible number of wrinkles and "fishmouths".
   1. Where more than five "fishmouth" per 500 linear feet of seam occur, replace the seam and:
      a. retrain the operator, or
      b. repair seaming equipment.

3.7 SEAMING EQUIPMENT AND PRODUCTS

A. General:
   1. Approved processes for field seaming are extrusion welding and fusion welding.
   2. Use only apparatus which have been specifically approved by make and model.

B. Extrusion Process:
   1. Welding apparatus shall be equipped with gauges giving the temperature in the apparatus and at the nozzle. CONTRACTOR shall provide documentation regarding the PE extrudate to the ENGINEER and shall record and certify that the extrudate temperatures, ambient temperatures, and geomembrane surface temperatures as specified at appropriate intervals.
   2. CONTRACTOR shall comply with the following:
      a. spare operable seaming apparatus is available on-site;
      b. equipment used for seaming is not likely to damage the geomembrane;
      c. the extruder is purged prior to beginning a seam until all heat degraded extrudate has been removed from the barrel;
      d. the electric generator is placed on a smooth base such that no damage occurs to the geomembrane;
      e. splash protection is provided beneath equipment;
      f. fuel cans are stored off the geomembrane;
      g. a smooth insulating plate or fabric is placed beneath the welding apparatus after usage;
      h. the geomembrane is protected from damage in heavily trafficked areas; and
      i. Any comers of panels or areas where two or more seams meet shall be capped with a minimum 1 foot diameter patch.

C. Fusion Process:
   1. Fusion-welding apparatus must be automated vehicular-mounted devices which produce a double seam with an enclosed space. The seaming apparatus shall be equipped with gauges giving the applicable temperatures and pressures. The

CONTRACTOR shall log ambient, seaming apparatus, and geomembrane surface temperatures as well as seaming apparatus pressures.

2. CONTRACTOR shall comply with the following:
   a. spare operable seaming apparatus is available on-site;
   b. equipment used for seaming is not likely to damage the geomembrane;
   c. for cross seams, the edge of the cross seams is ground to a smooth incline (top and bottom) prior to welding;
   d. the electric generator is placed on a smooth base such that no damage occurs to the geomembrane;
   e. a smooth insulating plate or fabric is placed beneath the hot welding apparatus after usage; and
   f. the geomembrane is protected from damage in heavily trafficked areas.

D. Weather Conditions for Seaming:
1. Field seaming is prohibited during precipitation, in presence of moisture, or when winds are in excess of 20 miles per hour.
2. Unless authorized in writing by the ENGINEER, no seaming shall be attempted below 5°C (41 °F) nor above 40°C (104°F).
   a. Refer to Section 616.
3. Between 5°C (41°F) and 10°C (50°F), seaming is possible if the geomembrane is preheated by either sun or hot air device, and if there is not excessive cooling resulting from wind (as determined by the ENGINEER).
4. Above 10°C (50°F), no preheating is required.
5. In all cases, the geomembrane shall be dry and protected from wind damage.

E. Test Seams:
1. Test seams shall be made on fragment pieces of geomembrane liner to verify that seaming conditions are adequate. Make test seams:
   a. Each day prior to commencing field seaming, a test weld 3 feet long shall be run from each welding machine under the same conditions as exist for the liner welding.
   b. During field seaming, one 1-inch seam test sample shall be prepared and field peeled for every 500 feet of field seam.
   c. Each seamer shall make at least one (1) test seam each day and one test seam at least once every four hours, or at any time equipment is shut down and cooled.
2. Test seam sample shall be at least three (3) feet long by one (1) foot wide with the seam centered lengthwise. Cut five (5) adjoining specimens one (1) inch wide each from each end of the test seam sample. Test specimens in peel and shear by tensiometer, and the specimens shall not fail in the seam. If test seam fails, repeat the entire seam test operation. If the additional test seam fails, the seaming apparatus or seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two (2) consecutive, successful, full test seams are achieved.
3. ENGINEER shall observe all test seam procedures. The remainder of the successful test seam sample shall be assigned a number and marked accordingly by the CONTRACTOR, who shall also log the date, hour, ambient temperature, number of seaming unit, welding temperatures, equipment speed, name of seamer, and pass or fail description. The sample itself shall be labeled and submitted to the ENGINEER.

4. All test seam apparatuses shall be as close to the operations as possible to permit continuous observation of construction activities by the ENGINEER.

F. General Seaming Procedure:
1. Extend seaming to the outside edge of panels to be placed in the anchor trench.
2. As required, a firm substrate shall be provided by using a flat board, a conveyor belt, or similar hard surface directly under the seam overlap to achieve proper support.
3. Fishmouths or wrinkles at the seam overlaps shall be cut along the ridge of the wrinkle in order to achieve a flat overlap. The cut fishmouths or wrinkles shall be seamed and patched with an oval or round patch of the same geomembrane extending a minimum of six (6) inches beyond the fishmouth or wrinkle in all directions.
4. All seams shall be marked by the seamer with the seamer name, date, equipment number, and starting time. The liner installer shall mark each seam with a number to identity the seam. This number will be used by the installer to record all QA/QC data associated with the seam.
5. All tee seams or intersections where 3 or more panels are joined shall be capped with a patch 6 inches beyond the intersection in all directions.
6. CONTRACTOR shall take samples from the start and stop of each seam welded. Samples shall be one inch wide and shall be tested in peel and shear. Any seam failed shall be reconstructed.
7. Areas of seams which show evidence of overheating or degradation of liner properties due to seaming shall be patched or replaced by the CONTRACTOR at no expense to the OWNER.

3.8 NON-DESTRUCTIVE SEAM TESTING

A. General:
1. CONTRACTOR shall test all field seams non-destructively using a vacuum test unit or air pressure to verify seam continuity.
2. CONTRACTOR shall cap-strip with same geomembrane all locations where seams cannot be non-destructivity tested.
3. CONTRACTOR shall correct all inadequate seams or portions thereof in accordance with approved method.
4. CONTRACTOR shall provide copies of the non-destructive test results to the ENGINEER.

B. Vacuum Box Testing:
1. Inspect all field seams for unbonded areas by applying a vacuum to a soaped section of seam.
2. Apply the vacuum by a vacuum box equipped with a vacuum gage, a clear glass view panel in the top, and a soft rubber gasket on the periphery of the open bottom. The vacuum box shall be similar to the Series A 100 Straight Seam Tester as supplied by the American Parts and Service Company, 2201 West Commonwealth Avenue, P.O. Box 702, Alhambra, California 91802.
3. Thoroughly soap a section of the seam, place the inspection box over the soaped seam section and seal the gasket sealed to the liner.
4. Apply a vacuum of between eight (8) and ten (10) inches of mercury (Hg) to the box for not less than thirty (30) seconds by use of a gasoline or electric driven power-

vacuum pump apparatus. Mark areas that bubble (unbonded areas) for repair by the CONTRACTOR.

5. Box shall have a minimum overlap of three (3) inches when advancing to the next test.

C. Air Pressure Testing: Test all double fusion seams with an air pressure test by sealing both ends and applying air to a pressure between twenty-five (25) and thirty (30) psi. Seam failure will be determined if loss of pressure exceed two (2) psi or does not stabilize. Two gauges shall be used to measure continuity of the air channel, one at each end of the seam. Both gauges shall be observed and recorded. Pressure differential between the two gauges shall be no more than 1 psi. The seam tester shall record on the report forms and on the liner the tester name, the start and end times, start and end pressures at each gauge, and the result of the test.

3.9 DESTRUCTIVE SEAM TESTING

A. Location and Frequency of Samples:

1. ENGINEER shall determine locations where seam samples shall be cut out for laboratory testing. Samples shall be taken at a minimum frequency of one test location per 500 feet of seam length and a maximum frequency shall be agreed upon by the ENGINEER and CONTRACTOR.
2. Additional test locations shall be determined during seaming at the ENGINEER'S discretion. Selection of such locations may be prompted by suspicion of excess crystallinity, contamination, offset welds, or any other potential cause of imperfect welding. The CONTRACTOR shall not be informed in advance of the additional locations where the seam samples will be taken.
3. Cut samples as the seaming progresses in order to have laboratory test results before completion of geomembrane installation. Assign a number to each sample, mark it accordingly, record sample location on layout drawing, and record reason for taking the sample at this location.
4. ENGINEER shall witness all field tests and mark all samples and portions with their number. CONTRACTOR shall log the date and time, ambient temperature, number of seaming unit, name of seamer, welding apparatus temperatures and pressures, and pass or fail description, and attach a copy to each sample portion.
5. Samples shall be eighteen (18) inches wide by forty-seven (47) inches long with the seam centered lengthwise. Cut one 1-inch wide strip from each end of the sample and test in the field, by tensiometer, at a separation rate of 2 inches per minute for peel and shear. The remaining sample shall be cut into three (3) parts and distributed as follows:
   a. One portion to the testing laboratory, 18 inches x 15 inches;
   b. One portion to the ENGINEER for archive storage, 18 inches x 15 inches; and
   c. One portion to the installer, 18 inches x 15 inches.

B. Laboratory Testing:

1. CONTRACTOR will forward test samples to an independent laboratory selected by the ENGINEER. Testing shall include "Seam Strength" (ASTM D4437) and "Peel Adhesion" (ASTM D4437). The minimum acceptable values shall be as specified in Section 2.2. Copies of all laboratory test results shall be submitted by the laboratory

to the ENGINEER as soon as they become available. Contractor shall account for a minimum turnaround time for tests to be 3 business days.

C. Procedures for Destructive Test Failure:
   1. The following procedures shall apply whenever a sample fails the field destructive test:
      a. Reconstruct the seam between the failed location and any passed test location, at ten (10) feet, minimum, from the location of the failed test.
      b. Take a sample for an additional field test:
         1) If this additional sample passes the test, reconstruct seam between that location and the original failed location.
         2) If this sample fails, then the process is repeated.
      c. In any case, all acceptable seams must be bounded by two passed test locations (e.g., the above procedure shall be followed in both directions from the original failed location), and
      d. One (1) test must be taken within the reconstructed area.
   2. With samples that fail a laboratory destructive test, follow the above procedures, considering laboratory tests exclusively. Since the final seam must be bounded by two (2) passed test locations, it may then be necessary to take one or more new samples for laboratory testing in addition to the one required in the reconstructed seam area.
   3. CONTRACTOR may perform additional testing for his purposes, subject to the following restrictions at a minimum:
      a. OWNER will not pay for tests.
      b. Test results will be nonbinding for all purposes upon the OWNER, ENGINEER and laboratory.
      c. PE installation shall proceed in the absence of results of CONTRACTOR'S additional testing; untimely results from CONTRACTOR'S additional testing shall not be cause for delay claim.
      d. CONTRACTOR may only test the installer's sample, obtained and distributed per Article 3.9.A.4.C.

3.10 DEFECTS AND REPAIRS

A. Sweep and wash the geomembrane surface prior to inspection. Inspect all seams and non-seam areas of the geomembrane for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. Non-destructively test each suspect location, both in seam and non-seam areas, using the methods specified herein. Mark and repair each location which fails the non-destructive testing.

B. Repair procedures should be agreed upon between ENGINEER and CONTRACTOR. Unless otherwise agreed, the procedures shall be as follows:
   1. Defective seams shall be repaired by reconstruction as described below.
   2. Tears or pinholes shall be repaired by seaming or patching.
   3. Blisters, larger holes, undispersed raw materials, and contamination by foreign matter shall be repaired by patches.

4. Surfaces of PE geomembrane which are to be patched shall be abraded no more than one (1) hour prior to the repair.
5. All seams used in repairing procedures must be approved extrusion welded seams and shall be subjected to the same non-destructive test procedures as outlined for all other seams.
6. Each patch shall be numbered and logged. Patches shall be round or oval in shape, and made of the same geomembrane, and extend a minimum of six (6) inches beyond the edge of defects in each direction.
7. Patches shall be applied using approved methods only.
8. Where excessive extrudate surface occurs, the affected seam length shall be cap-stripped.
9. Any cold rudded areas shall be patched.

C. Seam reconstruction for the extrusion welding process shall be achieved by grinding the existing seam and rewelding a new seam or patching as determined by ENGINEER. Seam reconstruction for the fusion process shall be achieved by cutting out the existing seam and welding in a replacement strip.

D. Each repair shall be non-destructively tested using the methods specified herein, as appropriate. Repairs which pass the non-destructive test shall be taken as an indication of an adequate repair. Failed tests indicate that the repair shall be redone and retested until a passing test results. The ENGINEER shall observe all non-destructive testing of repairs and the CONTRACTOR shall record the number of each patch, date, name of patcher, and test outcome. The CONTRACTOR will identify each patch and repair on the as-built drawing.

3.11 GEOMEMBRANE ACCEPTANCE

A. At the conclusion of placement of the PE geomembrane, prepare and submit six (6) copies of a written report of the work which includes the following:
1. Complete identification of PE geomembrane liner, including, but not limited to, resin type, physical properties and other pertinent data.
2. Complete description of failed seaming system used including material, method, temperatures, seam overlap width and cure or aging time.
3. Complete description of field sampling and testing including test equipment used, location of field tests, copy of all field laboratory test results, conditioning procedure prior to destructive seam testing, method of recording loading and determining average load for destructive test methods, and type of failure in tests (i.e., within the seam, within the sheet material, clamp edge, seam edge).
4. "As-built" drawings showing actual layout of liner sheets, pipe penetration details, patches, repairs, destructive samples and anchor trench details. "As-built" drawings shall also provide invert and spot elevations for each sump, pipe penetration and at 100-foot intervals along each anchor trench.
5. An affidavit of compliance from the liner manufacturer, containing the following wording:

"I (name and title), as the duly authorized representative of (Company name), hereby certify that the installation of the textured LLDPE geomembrane has been completed in accordance with the terms and conditions of the Contract Documents.

6. Completed warranty for the installed items in accordance with paragraph 1.4 of this section.

By: _____
(signature)

(Corporate Seal) Witness: _____
(signature)

Date: _____

END OF SECTION

SECTION 06645

GEOSYNTHETICS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: CONTRACTOR shall provide all labor, materials, tools, equipment, testing, and services necessary for the placement of geotextile as liner protection cushion, and a geocomposite drainage layer within the cap system, and weed control fabric in the enclosed flare area as shown on the Drawings and specified, or as otherwise directed by the ENGINEER.

B. Related Sections:
   1. Section 06643, Geomembranes.

1.2 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
   1. Geosynthetic manufacturer shall be a specialist in the manufacture of the particular geosynthetic.

B. Submittals:
   1. Shop Drawings:
      a. CONTRACTOR shall submit six (6) copies of manufacturer's data, specifications, installation instructions and dimensions.
      b. CONTRACTOR shall submit six (6) copies of an affidavit certifying that each geosynthetic furnished complies with all requirements specified herein.
      c. No geosynthetic shall be shipped until the affidavit is submitted to ENGINEER.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Each roll of geosynthetic delivered to the site shall be labeled by the manufacturer identifying the manufacturer's name, product identification, lot number, roll number and roll dimensions.

B. All geosynthetics shall be protected from ultraviolet light exposure, precipitation or other inundation, mud, dirt, dust, puncture, cutting or any other damaging or deleterious conditions. Geosynthetic rolls shall be shipped and stored in relatively opaque and watertight wrappings.

C. CONTRACTOR shall provide all labor and equipment required to assist ENGINEER in inspection of materials upon delivery to the site.

PART 2 - PRODUCTS

2.1 GEOTEXTILE

A. Geotextile shall be a needle punched, nonwoven fabric composed of filaments which are formed into a stable network such that the filaments retain their relative position. Filter fabric shall be inert to biological degradation and naturally encountered chemicals, alkalis, and acids. The geotextile shall conform, as a minimum, to the following:

Fabric Property	Unit	Typical Test Method	Value[1]
Unit Weight (mass per unit area)	oz/yd^2	ASTM D 5261	12
Thickness	mils	ASTM D 5199	110
Grab Tensile Strength	lb	ASTM D 4632	320
Grab Tensile/Elongation	%	ASTM D 4632	50
Puncture Strength	lb	ASTM D 4833	190
Trapezoid Tear Strength (MD)	lb	ASTM D 4533	125
Apparent Opening Size	mm	ASTM D 4751	0.150
Falling Head Permeability, "k"	cm/sec	ASTM D 4491	0.29
UV Resistance (500 hrs)	%	ASTM D 4355	70

NOTES:

1. Values listed represent minimum values each roll delivered to the site shall meet when tested in accordance with the specified ASTM test method.

B. Geotextile filter fabric shall be:
   1. NW12 produced by GSE Lining Technology, Inc.
   2. Or equal.

2.2 GEOCOMPOSITE

A. The Geonet Drainage Layer (GDL) shall be:
   1. Tenflow 770-2 manufactured by Tenax Corporation
   2. Or equal.
      a. For any natural drainage material alternative, design and performance demonstration must be submitted for engineer's approval. Any alternative GDL material for engineer approval must be submitted together with transmissivity testing with1,000 hours at the specified boundary conditions, and demonstrate performance equivalency to all the property requirements and testing methods as indicated in Tables 1& 2, as well as Part B below.

B. The manufacturer of the GDL shall submit documents for the engineer's review that the GDL to be supplied to the project site has proven installation. As a minimum, the manufacturer shall certify that:
   1. The proposed GDL has been installed at least 10 million square feet. The proposed GDL has been installed at least 10 projects that are in operations for a minimum two years.

C. The polymer used to manufacture the Geonet core of the GDL shall be polyethylene. Manufacturer shall certify that no regrind material is used in the geonet manufacturing process.

D. The drainage core of the GDL shall be manufactured by extruding polyethylene to form a triaxial void maintaining structure. The geonet shall meet the property requirements listed in Table 1.

E. The geotextile of the GDL shall be UV resistant, continuous filament, needle punched, nonwoven polypropylene geotextile. The geotextile shall meet the property requirements listed in Table 2.

TABLE 1: REQUIRED GEOCOMPOSITE DRAINAGE LAYER PROPERTIES

PROPERTY	TEST METHOD	UNITS	VALUE
Geonet Structure	Triaxial		
Thickness (min.)	ASTM D 5199	mil	340 ± 10%
Tensile Strength (min.)	ASTM D 4595	lb/ ft	425 ± 10%
Density (min.)	ASTM D 1505	g/cm^3	0.94
Melt Flow Index (max.)	ASTM D 1238	g/10 min	1.0
Carbon Black Content (min.)	ASTM D 4218	%	2
Creep Reduction Factor[1]	GRI- GC8	-	1.1
Geocomposite Ply Adhesion (min.)	ASTM D7005	lb/inch	0.5
Transmissivity[2] –Machine Direction (min.) @1000psf load	ASTM D 4716 GRI –GC8	(m^2/sec)	7.0E-03 @ gradient 0.1 4.0E-03 @ gradient 0.33

Notes:

1. The creep reduction factor is determined from 10,000 hour test duration, extrapolated to 30 years and using a compressive load of 1,000 psf.

2. For both MQC and CQA, transmissivity tests shall be conducted at the frequency of 200,000 square feet per test. The normal compressive load shall be 1,000 psf at hydraulic gradients of 0.1 and 0.33. Testing boundary conditions from the top to bottom are: upper steel load plate/Ottawa sand/Geocomposite/Geomembrane/ lower load plate (the flat side of the geocomposite facing the soil boundary), with a minimum seating period of 100 hours.

TABLE 2: REQUIRED GEOTEXTILE PROPERTIES

PROPERTY	TEST METHOD	UNITS	VALUE
Serviceability Class	Class 2		
UV Resistance @500 Hours (MIN)	ASTM G 154 or D 4355	%	70
Grab Tensile Strength (MARV)	ASTM D4632	lbs	160
Grab Elongation (MARV)	ASTM D4632	%	50
Trapezoid Tear (MARV)	ASTM D4533	lbs	60
Puncture Strength (MARV)	ASTM D4833	lbs	90
AOS (MaxARV)	ASTM D4751	US Sieve (mm)	70 (0.21)
Permittivity (MARV)	ASTM D4491 Falling head	sec^{-1}	1.1

TABLE 3: REQUIRED MANUFACTURER'S QUALITY CONTROL TEST DATA

PROPERTY	TEST METHOD	UNITS	FREQUENCY
Resin Tests			
DENSITY	ASTM D1505	g/cm^3	Per Lot
MELT FLOW INDEX	ASTM D1238	g/10 min	Per Lot
Geonet Tests			
THICKNESS	ASTM D5199	mm	50,000 ft^2
CARBON BLACK CONTENT	ASTM D4218	%	50,000 ft^2
TENSILE STRENGTH-MD	ASTM D4595	lbs/ft	50,000 ft^2
Geotextile Tests			
WEIGHT	ASTM D3776	Oz/sy	100,000 ft^2
AOS	ASTM D4751	US Sieve (mm)	500,000 ft^2
PERMITTVITY	ASTM D4491 Falling head	sec^{-1}	500,000 ft^2
GRAB TENSILE STRENGTH	ASTM D4632	lbs	100,000 ft^2
TRAPEZOID TEAR	ASTM D4533	lbs	100,000 ft^2
PUNCTURE STRENGTH	ASTM D4833	lbs	100,000 ft^2
Geocomposite Tests			
PLY ADHESION	ASTM D7005	lbs/in	100,000 ft^2
TRANSMISSIVITY-MD	ASTM D4716	m^2/sec	200,000 ft^2

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

A. All geosynthetics shall be weighted with sandbags or the equivalent when required. Such sandbags shall be installed during placement and shall remain until replaced with cover material or geomembrane.

B. If white or light colored geotextile is used, precautions shall be taken against "snowblindness" of personnel.

C. CONTRACTOR shall take any necessary precautions to prevent damage to underlying layers during placement of each geosynthetic.

D. During placement of geosynthetics, care shall be taken not to entrap in the geosynthetics stone, excessive dust, or moisture that could damage the geomembrane, generate clogging, or hamper subsequent seaming.

E. Geosynthetics shall not be exposed to precipitation prior to being installed, and shall not be exposed to direct sunlight for more than 15 days. Any materials not complying with this requirement shall be removed and replaced at no cost to the OWNER.

F. CONTRACTOR shall not operate equipment on geosynthetics without the specified depth of cover.

G. Excavation of fill material over geosynthetics shall be completed by hand with plastic shovels.

3.2 GEOTEXTILE

A. Geotextile fabrics shall be deployed in the direction of the slope unless otherwise directed by ENGINEER.

B. Geotextile fabrics shall be overlapped 3 inches and sewn as detailed on Contract Drawings unless otherwise approved by ENGINEER. Overlaps shall be oriented in the direction of filling.

C. Any bum mark, material defect or tear in the fabric shall be repaired as follows:
   1. A fabric patch shall be sewn into place using a double sewn lock stitch (1/4 inch to 3/4 inch apart and no closer than 1 inch from any edge).
   2. On slopes with a grade less than 8%, the CONTRACTOR may use a fabric patch heat welded in place with a minimum of 24 inches overlap in all directions.
   3. Should any damaged area exceed 10 percent of the width of the roll, the roll shall be cut, overlapped and sewn to form a new seam.

3.3 GEOCOMPOSITE

A. Handling and Placement of GDL

1. After the substratum/geomembrane has been installed/ constructed, tested and approved by the Engineer, the surface shall be cleaned and free of excess dirt and debris.
2. The Contractor and the Installer shall handle all geocomposite in such a manner as to ensure it is not damaged in any way. Precautions shall also been taken to prevent damage to underlying layers during placement of the geocomposite.
3. The geocomposite roll should be installed in the direction of the slope, following the labeled instructions as provided by the manufacturer with respect to the top/bottom sides.
4. If the project contains long, steep slopes, special care shall be taken so that only full-length rolls are used at the top of the slope.
5. In the presence of wind, all geocomposite shall be weighted with sandbags or the equivalent. Such sandbags shall be installed during placement and shall remain until replaced with cover material.
6. If necessary, the geocomposite shall be positioned by hand after being unrolled to minimize wrinkles.
7. The geocomposite shall be properly anchored to resist sliding. Anchor trench compacting equipment shall not come into direct contact with the geocomposite.
8. If there are any obstructions (such as outlet pipes or monitoring wells) while deploying the geocomposite, the geocomposite shall be cut to fit around the obstruction. Care shall be taken as to make sure there is no gap between the obstruction and the geocomposite. The geocomposite shall be cut in a way that the lower geotextile and geonet core is in contact with the obstruction and the upper geotextile has an excess overhang. There must be enough of the upper geotextile to be able to tuck the upper geotextile back under the geocomposite to protect the exposed geonet core, and prevent soil particles from migrating into the geonet core flow channels.

B. Seams and Overlaps

1. Each component of the geocomposite (geotextile(s) and geonet) shall be secured or seamed to the like component at overlaps.
2. Adjacent edges of geonet along the length of the geocomposite, shall be overlapped 2-3 inches, as shown on the Contract Drawings. These overlaps shall be joined by tying the geonet cores together with white or yellow cable ties or plastic fasteners. These ties shall be spaced at a maximum of every 5 feet along the roll length, or a maximum of 2 feet if the geocomposite is installed vertically.
3. Adjoining geocomposite rolls (end to end) along the roll width shall be shingled down in the direction of the slope, with the geonet portion of the top geocomposite overlapping the geonet portion of the bottom geocomposite a minimum of 12 inches across the roll width as shown on the Contract Drawings. Geonet shall be tied every 12 inches across the roll width and every 6 inches in the anchor trench or as specified by the Engineer.
4. The bottom layer of geotextile (if any) shall be overlapped.
5. The top layers of geotextile shall be sewn together, or at the discretion of the Engineer may be heat bonded or wedge welded. Geotextiles shall be overlapped a

minimum of 4 inches prior to seaming or heat bonding, geotextile sewing seams to be used are Prayer, "J", or Butterfly, as shown on the Contract Drawings. The seam shall be a two-thread, double-lock stitch, or a double row of single-thread, chain stitch. If heat bonding is to be used, care must be taken to avoid burn through of the geotextile. It is important that the geotextiles be joined continuously along to the roll as to prevent any fugitive particle migration into the geonet core flow channels.

C. Repair

1. Any small holes or tears in the top geotextile shall be patched with an 8" x 8" geotextile piece. The patching geotextile shall be the same as the original one. Apply the spray adhesive *(3M Super 77 adhesive is the recommended)* to one side of the 8" x 8"textile patch. Center and apply the 8" x 8" textile patch over the blemish, hole, tear or thin spot in the geotextile. Firmly press 8" x 8" textile patch over the repair area. If the damaged area of the geotextile is greater than this standard patch size, a bigger size patch is recommended using a multitude of 8" x 8" patches. If the geotextile is damaged beyond 50 percent of the width of the roll, a continuous piece of fabric the same width as the geocomposite may be cap-stripped directly to the adjacent seams by sewing a portion of the new geotextile in place.
2. Any large rips, tears or damage areas on the deployed geocomposite core shall be removed and patched by placing a patch extending 12" beyond the edges of the damaged areas. The patch shall be secured to the original geonet tying every 6 inches with approved tying devices. If the hole or tear width across the roll is more than 50% percent the width of the roll, the damaged area shall be cut out.

3.4 PLACEMENT OF COVER SOIL MATERIALS

A. Placement of the cover soil is recommended to proceed immediately following placement and inspection of the geocomposite.

B. When applying Cover Soil Material, no equipment generally speaking shall drive directly across geocomposite. If a vehicle has to be driven on top of the geocomposite, the vehicle shall be driven in a fashion not to damage the geotextile, geonet or geocomposite. Acceleration or deceleration shall be in a smooth and gentle manner. Operator shall not make any sudden turns or stops when driving on the geonet or geocomposite. If any tear or local damage occurs to the geotextile, geonet or geocomposite, patching technique as described in the above section shall be used.

C. The specified fill material shall be placed and spread utilizing vehicles with a low ground pressure (LGP). The cover soil shall be placed on the geocomposite from the bottom of the slope proceeding upwards and in a manner, which prevents instability of the cover soil or damage to the geocomposite. Unless otherwise specified by the Engineer, all equipment for spreading fill material overlying the geocomposite shall comply with the following:

Maximum Equipment Ground Pressure (psi)	Minimum Separation Thickness (inches)
< 5	12
5 - 10	18
>10	24

D. Compaction of the initial lift placed over the geocomposite must be performed in a manner that does not damage the geocomposite.

END OF SECTION

SECTION 06647

COLD WEATHER INSTALLATION - GEOMEMBRANE

PART I - GENERAL

1.1 DESCRIPTION

A. Scope:
1. The Work covered by this section consists of cold weather installation requirements and supplements Section 06643. The CONTRACTOR may be required to work through cold weather months. If cold weather conditions prevail, the CONTRACTOR shall adjust the storage, handling, and installation procedures and conduct all necessary Work to ensure the integrity of the installed bottom and top liners. All of the provisions of Section 06643 will be strictly adhered to, except as modified herein.
2. All necessary Work required for snow and ice removal is included herein.
3. No direct or separate payment will be made for cold weather storage and installation of liners, snow or ice removal and for providing all other labor, materials, tools, equipment and services necessary to meet the requirements specified in this Section.
4. CONTRACTOR shall supply an outdoor thermometer for each welding enclosure.

B. Related Sections:
1. Section 02220, Excavation and Backfill.
2. Section 06643, Geomembrane.

1.2 SUBMITTALS

A. The CONTRACTOR may be required to work through cold weather months. Therefore, six (6) copies of the proposed methods of cold weather installation construction shall be submitted in sufficient detail for the OWNER and ENGINEER to evaluate the proposed cold weather methods and techniques, such as preheating materials, the use of portable, heated enclosure shacks for field seaming, and other special equipment.

B. The CONTRACTOR shall pre-submit acceptable evidence (to be approved by the OWNER and ENGINEER) that his performance standards will be maintained at lower temperatures.

C. Submittals for Cold Weather Installation:
1. Seaming shall be suspended when temperatures are below 41°F or above 104°F. At his option, the CONTRACTOR shall submit a cold weather installation plan for the review and approval of the ENGINEER.
2. The CONTRACTOR shall submit to the ENGINEER the following additional cold weather construction items and information for approval, not later than 5 days after the notice to proceed from the OWNER:
   a. Field seaming and fabrication details during cold weather when temperatures are below 41°F.

b. Work plan for liner installation during cold weather including manpower and equipment requirements.
c. Shop Drawings and installation diagrams for liner panel sections layout and penetration details.

3. The ENGINEER will return all submittals to the CONTRACTOR within 10 working days of receipt.
4. The CONTRACTOR shall also specify any additional proposed method of testing the field seams. This testing is to be performed by the Liner Installer who will be required to provide a written report in accordance with Section 06643.
5. The CONTRACTOR shall present a schedule of cold weather operations to the ENGINEER and obtain the ENGINEER'S approval in writing of the same. This schedule shall be submitted sufficiently in advance of the proposed work as to afford a reasonable amount of time for the ENGINEER to review and approve the schedule.
6. The CONTRACTOR shall submit shop drawings for the welding enclosures.
7. The CONTRACTOR shall not install liner at ambient temperatures less than 41°F without an approved cold weather installation plan.

PART 2 - PRODUCTS

(Refer to Section 06643)

PART 3 - EXECUTION

3.1 COLD WEATHER STORAGE OF LLDPE GEOMEMBRANE MATERIALS

A. CONTRACTOR shall store and protect materials in accordance with manufacturer's recommendations and requirements of the Specifications. Additionally, all liner materials shall be stored inside heated areas, if the site temperature is, or is expected to drop, below 41 °F at any time during the storage period. The CONTRACTOR shall make his own provisions for heated storage.

3.2 LINER SUBBASE

A. Liner shall not be placed over water, ice, snow or frozen precipitation of any kind. Liner shall not be placed over frozen subbase which in the opinion of the ENGINEER may be detrimental to the integrity of the liner installation. Unacceptable subbase shall be reworked and replaced as necessary by the CONTRACTOR to provide adequate liner support.

3.3 COLD WEATHER INSTALLATION REQUIREMENTS FOR LLDPE FLEXIBLE MEMBRANE LINER

A. The CONTRACTOR shall be required to implement the previously approved cold weather installation methods when the air temperature reaches 41°F or below. As a minimum the cold weather construction methods to be implemented shall include:
1. Providing additional labor, seaming crews, materials and equipment as required to pursue the work.

2. Adjustment of field seaming pre-heat to control heat loss prior to field welding to accommodate temperature, wind and humidity conditions.
3. Adjustment of the rate of field welding to accommodate temperature, wind and humidity conditions.
4. Exercising extra care in preparing panel edges prior to seaming to insure that edges to be seamed are dry, clean and free of all dirt, snow, ice, slush or water.

B. When the outside ambient temperature drops below 41°F, the CONTRACTOR shall conduct field seaming in heated, portable shelters to minimize liner heat loss and to maintain dry, clean panel edges during seaming.

C. In addition to the quality assurance sampling and testing specified in Section 06643, the CONTRACTOR shall provide and operate a portable pull test machine at the site during field seaming operations. The CONTRACTOR shall sample the liner seam and conduct pull tests during the seaming to insure that acceptable weld seams are being fabricated and to gauge the effectiveness of the cold weather construction methods. Field tested seams must achieve 100 percent of the strength of the base liner material. CONTRACTOR shall sample and perform pull tests a minimum of 4 times per shift and as ordered by the ENGINEER. CONTRACTOR shall adjust the seaming and construction methods to achieve acceptable field seams.

D. CONTRACTOR shall place Geosynthetics and Cover Soil Materials over liner as soon as field seams have cured, been tested and accepted.

E. No Geosynthetics and Cover Soil Materials shall be placed over ice, snow or frozen precipitation. CONTRACTOR will be responsible for ensuring that surfaces are clean and dry prior to placement.

END OF SECTION

SECTION 06642

EROSION CONTROL GEOSYNTHETICS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: Contractor shall provide all labor, materials, tools, equipment, and incidentals necessary for the placement of erosion control geosynthetics and Turf Reinforcement Mats (TRM) on slopes and drainage swales as shown and specified on the Drawings, or as otherwise directed by the ENGINEER.

B. Related Sections:
   1. Section 02900, Landscaping.

1.2 QUALITY CONTROL

A. Manufacturer Qualifications: Erosion control geosynthetic manufacturer shall be a specialist in the manufacture of the particular geosynthetic.

1.3 SUBMITTALS

A. Shop Drawings:
   1. Submit six (6) copies of manufacturer data, specifications, dimensions and installation instructions for erosive soils and high runoff velocities.
   2. Submit six (6) copies of an affidavit certifying that each geosynthetic furnished complies with all requirements specified herein.
   3. No geosynthetic shall be shipped until the affidavit is submitted to ENGINEER.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCTS

A. Turf Reinforcement Mat (TRM)
   1. TRM shall be non-biodegradable turf reinforcing erosion control material mesh matrix with stabilizer (as necessary to protect from ultraviolet radiation), supplied in rolls. Permanent Erosion control geosynthetic shall be:
      a. Enkamat 7010 produced by Colband Geosynthetics, Inc..
      b. Or equal.

B. The TRM shall be made from 100% synthetic material and contain no biodegradable or photodegradable components or materials.

C. The TRM shall be a three-dimensional matrix and maintain the three dimensional stability without laminated or stitched layers. The TRM shall have a sufficient Area Holding Capacity and a minimum 90% open space available for soil and root interaction. The TRM

shall not loose its structural integrity and shall not unravel or separate when TRM is cut in the field.

D. The TRM shall exhibit no buoyancy factor (i.e., the specific gravity of the fibers used should be greater than 1.0) so as to allow the TRM to maintain intimate contact with the soil (particularly between fasteners) under low flow conditions.

E. The TRM shall meet the requirements of Table 1.

TABLE 1 – PERMANENT TURF REINFORCEMENT MAT

Property	Test Method	Units	Value
Mass/Unit Area	ASTM D 5261	oz/yd^2	8.0
Thickness	ASTM D 5199	inches	0.4
Tensile Strength (MD)	ASTM D 5035 mod	lb/ft	160.0
Area Holding Capacity	Calculated	in^3/yd^2	450
Porosity	Calculated	%	>95
UV Stability	ASTM D 1682 mod	%	80
Velocity 30 min. Vegetated 50 hr. Vegetated	Flume Testing[1]	ft/sec	 19.0 14.0
Shear 30 min. Vegetated 50 hr. Vegetated	Flume Testing[1]	lb/ft^2	 8.0 6.0

1 – Acceptable facilities include Utah State University, Colorado State University

F. Anchoring Devices

1. The TRM shall be secured in place using heavy-duty metal staples. The metal staples shall be U-shaped, a minimum of 6 inch long (each leg), one and one half (1-1/2) inches wide, and shall be fabricated from 9 gauge diameter metal wire. If difficulties arise installing the staples, then 10 inch pins fabricated from 9 gauge with one and one half (1-1/2) inch diameter washer or 7 inch gutter spike with one and one half (1-1/2) inch diameter washer shall be used. In some cases where loose soil conditions exists and anchors of stated length do not properly secure the TRM to the ground, then longer staple should be used such as a 8-12 inch long staples or pins.

PART 3 - EXECUTION

3.1 PREPARATION

A. The TRM product will be installed explicitly according to the manufacturer recommendations. The installation site shall be prepared by filling the area to the design grade.

B. The surface to receive the TRM shall be prepared to relatively smooth conditions free of obstructions, depressions, debris and soft or low density pockets of material. The material shall be capable of supporting a vegetative cover.

C. Erosion features such as rills, gullies, etc. must be graded out of the surface before TRM deployment. Smooth roll drum compaction may be required before deploying TRM to make sure the TRM makes immediate contact with the soil.

D. Cut trenches for initial anchor trenches, termination trench and longitudinal anchor trenches (6 inches wide and 9 inches in depth).

E. Contractor shall place all cover materials in such a manner to ensure: the erosion control geosynthetics are not damaged; minimal slippage of the erosion control geosynthetics or underlying layers; and no excess tensile stresses are introduced into the erosion control geosynthetic.

F. Contractor shall consult with manufacturer regarding recommendation as to the sequence for seeding and placement of the erosion control geosynthetic. Following seeding and placement of the erosion control geosynthetic, Contractor may be directed by the ENGINEER to mulch the surface in accordance with directions for mulching in Section 02900 Landscaping.

3.2 INSTALLATION - SLOPES

A. Install Erosion control geosynthetics as per Manufacturer's installation procedure, or as described below.

B. Grade subgrade to be stable and firm, but not crusted.

C. Apply erosion control geosynthetic with the length of roll laid perpendicular to the slope.

D. Install an anchor slot at the up slope and down slope ends of the geosynthetic placement. Bury at least 12 inches of the end of the geosynthetic horizontally in the anchor slots. Secure the geosynthetic in the anchor slot by stakes at intervals of 3 feet or less prior to burying. Tamp the soil against the geosynthetic in the slot.

E. Overlap successive lengths of the erosion control geosynthetic at least 3 feet, with the up slope length on top. Stake the overlap by placing 3 staples spaced across the end of each of the overlapping lengths and by placing 3 staples across the width of the center of overlap area.

F. Construct check slots by placing a fold at least 6 inches vertically into the soil. Staple the geosynthetic at each check slot edge, overlap and in the center of the geosynthetic. Coordinate check slots with adjacent rolls such that check slots are not staggered. Check slots shall be placed at a frequency of every 25 feet.

G. Place 1 row of staples, spaced 10 inches on center on each side of check slot and place staples on all longitudinal overlaps at a maximum spacing of 3 feet.

H. Maintain the geosynthetic until all Work has been completed and accepted. Contractor shall repair areas where damaged by any cause until vegetation final acceptance.

I. Place additional staples to maintain contact of geosynthetic with ground surface as required by manufacturer.

END OF SECTION

EXHIBIT C

PROJECT SCHEDULE

Completion Date: A total of ninety (90) days are allowed to complete the Work and have such Work ready for acceptance by CRRA. Contractor shall commence performance of the Work upon CRRA's issuance to Contractor of the Notice To Proceed pursuant to Section 4.2 of the Agreement.

EXHIBIT D

PERFORMANCE BOND

PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable. The below addresses are to be used for giving required notice.

CONTRACTOR (Name and Address):	**SURETY** (Name and Principal Place of Business):

OWNER (Name and Address):

Connecticut Resources Recovery Authority
100 Constitution Plaza, 6th Floor
Hartford, CT 06103-1722

AGREEMENT

DATE:	
AMOUNT:	
PROJECT DESCRIPTION (Including Name and Location):	Phase 1 Ash Area Partial Closure Agreement Hartford Landfill 180 Leibert Road Hartford, Connecticut 06120

BOND

BOND NUMBER:	
DATE: (Not earlier than Agreement Date)	
AMOUNT:	DOLLARS ($)

IN WITNESS WHEREOF, Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on Pages 2 and 3 hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL		**SURETY**	
	(SEAL)		(SEAL)
Contractor's Name and Corporate Seal		Surety s Name and Corporate Seal	
SIGNATURE:		**SIGNATURE:**	
NAME AND TITLE:		**NAME AND TITLE:**	

TERMS AND CONDITIONS TO PERFORMANCE BOND

1. The Contractor and the Surety jointly and severally bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the foregoing Agreement, the terms of which are incorporated herein by reference. Any singular reference to the Contractor, the Surety, the Owner or any other party herein shall be considered plural where applicable.

2. If the Contractor performs the Agreement, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.1.

3. If there is no Owner Default (as hereinafter defined), the Surety's obligation under this Bond shall arise after:

   3.1 The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below, that the Owner is considering declaring a Contractor Default (as hereinafter defined) and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen (15) days after the receipt of such notice to discuss methods of performing the Agreement. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Agreement, but such an agreement shall not waive the Owner's right, if any, to subsequently declare a Contractor Default; and

   3.2 The Owner has declared a Contractor Default (as hereinafter defined) and formally terminated the Contractor's right to complete the Agreement. Such Contractor Default shall not be declared earlier than twenty (20) days after the Contractor and the Surety have received notice as provided in Subparagraph 3.1.

   3.3 The Owner has agreed to pay the Balance of the Agreement Price to the Surety in accordance with the terms of the Agreement or to a contractor selected to perform the Agreement in accordance with the terms of the agreement with the Owner.

4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

   4.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Agreement; or

   4.2 Undertake to perform and complete the Agreement itself, through its agents or through independent contractors; or

   4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Agreement, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with a performance bond executed by a qualified surety equivalent to the bond issued on the Agreement, and pay to the Owner the amount of damages described in Paragraph 6; or

   4.4 Waive its right to perform and complete, arrange for completion or obtain a new contractor and with reasonable promptness under the circumstances:

      4.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or

      4.4.2 Deny liability in whole or in part and notify the Owner citing reasons therefor.

5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen (15) days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4 and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

6. After the Owner has terminated the Contractor's right to complete the Agreement, and if the Surety elects to act under Subparagraph 4.1, 4.2 or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Agreement, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Agreement. To the limit of the amount of this Bond, the Surety is obligated without duplication for:

   6.1 The responsibilities of the Contractor for correction of defective work and completion of the Agreement;

   6.2 Additional legal and delay costs resulting from the Contractor's Default and resulting from the actions or failure to act of the Surety under Paragraph 4; and

   6.3 Liquidated damages, or if no liquidated damages are specified in the Agreement, actual damages caused by delayed performance or non-performance of the Contractor.

7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Agreement. No right of action shall accrue on this Bond to any person or entity other than the Owner or its successors and assigns.

8. The Surety hereby waives notice of any change, including changes of time, to the Agreement or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two (2) years after Contractor Default or within two (2) years after the Contractor ceased working or within two (2) years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions

of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page of this Bond.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Agreement was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions confirming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

    12.1 Balance of the Agreement Price: The total amount payable by the Owner to the Contractor under the Agreement after all proper adjustments have been made, including allowance to the Contactor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Agreement.

    12.2 Agreement: The agreement between the Owner and the Contractor identified on the signature page, including all Agreement Documents and changes thereto.

    12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with any of the terms of the Agreement.

    12.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Agreement or to perform and complete or comply with the other terms hereof.

EXHIBIT E

PAYMENT BOND

PAYMENT BOND

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable. The below addresses are to be used for giving required notice.

CONTRACTOR (Name and Address):	**SURETY** (Name and Principal Place of Business):

OWNER (Name and Address):

Connecticut Resources Recovery Authority
100 Constitution Plaza, 6th Floor
Hartford, CT 06103-1722

AGREEMENT

DATE:	
AMOUNT:	
PROJECT DESCRIPTION (Including Name and Location):	Phase 1 Ash Area Partial Closure Agreement Hartford Landfill 180 Leibert Road Hartford, Connecticut 06120

BOND

BOND NUMBER:	
DATE: (Not earlier than Agreement Date)	
AMOUNT:	DOLLARS ($)

IN WITNESS WHEREOF, Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on Pages 2 and 3 hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL		**SURETY**	
(SEAL)		(SEAL)	
Contractor's Name and Corporate Seal		Surety s Name and Corporate Seal	
SIGNATURE:		**SIGNATURE:**	
NAME AND TITLE:		**NAME AND TITLE:**	

TERMS AND CONDITIONS TO PAYMENT BOND

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Agreement, which is incorporated herein by reference.

2. With respect to the Owner, this obligation shall be null and void if the Contractor:

   2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and

   2.2 Defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity whose claim, demand, lien or suit is for the payment for labor, materials or equipment furnished for use in the performance of the Agreement, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.

4. The Surety shall have no obligation to Claimants under this Bond until:

   4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

   4.2 Claimants who do not have a direct contract with the Contractor:

      4.2.1 Have furnished written notice to the Contractor and sent a copy, or notice thereof to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and

      4.2.2 Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and

      4.2.3 Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.

5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.

6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:

   6.1 Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

   6.2 Pay or arrange for payment of any undisputed amounts.

7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

8. Amounts owed by the Owner to the Contractor under the Agreement shall be used for the performance of the Agreement and to satisfy claims, if any, under any Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Agreement are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

9. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Agreement. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. The Surety hereby waives notice of any change, including changes of time, to the Agreement or to related subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Subparagraph 4.1 or Clause 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Agreement, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

    15.1 Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Agreement. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Agreement, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished,

    15.2 Agreement: The agreement between the Owner and the Contractor identified on the signature page, including all Agreement Documents and changes thereto.

    15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Agreement or to perform and complete or comply with the other terms thereof.

EXHIBIT F

CONTRACTOR'S WAGE CERTIFICATION FORM

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM

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

EXHIBIT G

SCHEDULE OF PREVAILING WAGES

STATUTE 31-55a

Project Hartford Landfill, Phase 1 Ash Area Partial Closure

Minimum Rates and Classifications
for Heavy Construction

Connecticut Department of Labor
Wage and Workplace Standards Division

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 to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number **Project Town** **Hartford**
FAP **State**
Project Hartford Landfill, Phase 1 Ash Area Partial Closure

CLASSIFICATION	Hourly Rate	Benefits
01) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters. **See Laborers Group 7**		
1) Boilermaker	$31.65	8.72 + 32%
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	$30.25	16.60
2) Carpenters, Piledrivermen	$26.15	14.86
2a) Diver Tenders	$26.15	14.86
3) Divers	$34.61	14.86

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4) Painters: Brush, Roller, Blasting (Sand, Water, etc.), Spray	$35.20	12.55
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)	$32.00	17.38
6) Ironworkers: (Ornamental, Reinforcing, Structural, and Precast Concrete Erection	$30.05	20.18 + 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)	$31.77	18.26
----LABORERS----		
8) Group 1: Laborer (Unskilled)	$23.00	13.40
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen.	$23.25	13.40
10) Group 3: Pipelayers	$23.35	13.40
11) Group 4: Jackhammer/Pavement breaker (handheld), mason tenders/catch basin builders, asphalt rakers, air track operators, block pavers and curb setters.	$23.50	13.40
12) Group 5: Toxic waste workers (non-mechanical systems).	$25.00	13.40

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13) Group 6: Blasters	$24.75	13.40
Group 7: Asbestos Removal, non-mechanical systems (does not include leaded joint pipe).	$24.00	13.40
Group 8: Traffic control signalmen.	$15.00	13.40
----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	$27.25	13.40 + a
13b) Brakemen, Trackmen	$26.45	13.40 + a
14) Concrete Workers, Form Movers, and Strippers	$26.45	13.40 + a
15) Form Erectors	$26.73	13.40 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		
16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	$26.45	13.40 + a

Project Hartford Landfill, Phase 1 Ash Area Partial Closure

17) Laborers Topside, Cage Tenders, Bellman	$26.35	13.40 + a
18) Miners	$27.25	13.40 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	$32.53	13.40 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	$30.87	13.40 + a
21) Mucking Machine Operator	$33.20	13.40 + a
----TRUCK DRIVERS----(*see note below)		
Two axle trucks	$25.43	11.5225
Three axle trucks; two axle ready mix	$25.53	11.5225
Three axle ready mix	$25.58	11.5225

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Four axle trucks, heavy duty trailer (up to 40 tons)	$25.63	11.5225
Four axle ready-mix	$25.53	11.5225
Heavy duty trailer (40 tons and over)	$25.88	11.5225
Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	$25.68	11.5225
----POWER EQUIPMENT OPERATORS----		
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.	$32.05	16.05 + a
Group 2: Cranes (100 ton rate capacity and over); Backhoe over 2 cubic yards; Piledriver ($3.00 premium when operator controls hammer)	$31.73	16.05 + a
Group 3: Backhoe; 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 backhoe.	$30.99	16.05 + a
Group 4: Trenching machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper)	$30.60	16.05 + a
Group 5: Specialty Railroad Equipment; 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" Mandrell)	$30.01	16.05 + a

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Group 5 continued: Side; Combination Hoe and Loader; Directional Driller	$30.01	16.05 + a
Group 6: Front end loader (3 up to 7 cubic yards), Grader; Bulldozer.	$29.70	16.05 + a
Group 7: Asphalt roller, concrete saws and cutters (ride on type), Vermeer Concrete Cutter, Scraper; Snooper; Skidder; Milling Maching (24" and Under Mandrel).	$29.36	16.05 + a
Group 8: Mechanic, grease truck operator, hydroblaster, barrier mover, power stone spreader; welder; work boat under 26 ft.; transfer machine.	$28.96	16.05 + a
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).	$28.53	16.05 + a
Group 10: Vibratory hammer, Ice machine, Diesel and Air Hammer, etc..	$27.96	16.05 + a
Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), robot demolition equipment.	$26.49	16.05 + a
Group 12: Wellpoint operator.	$26.43	16.05 + a
Group 13: Compressor Batter Operator.	$25.85	16.05 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	$24.71	16.05 + a

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Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator.	$24.30	16.05 + a
Group 16: Maintenance Engineer.	$23.65	16.05 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator	$25.98	16.05 + a
Group 18: Power safety boat; vaccum truck; zim mixer; sweeper	$25.54	16.05 + a

**NOTE: SEE BELOW

----LINE CONSTRUCTION----(Railroad Construction and Maintenance)

20) Lineman, Cable Splicer, Dynamite Man	$35.65	10.70 + 6.25%
21) Heavy Equipment Operator	$22.09	10.70 + 6.25%
22) Equipment Operator, Tractor Trailer Driver, Material Men	$30.30	10.70 + 6.25%
23) Driver Groundmen	$26.74	10.70 + 6.25%

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----LINE CONSTRUCTION----

24) Driver Groundmen	$25.99	10.70 + 6.25%
25) Groundmen	$19.06	10.70 + 6.25%
26) Heavy Equipment Operators	$31.19	10.70 + 6.25%
27) Linemen, Cable Splicers, Dynamite Men	$34.65	10.70 + 6.25%
28) Material Men, Tractor Trailer Drivers, Equipment Operators	$29.45	10.70 + 6.25%

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Project Hartford Landfill, Phase 1 Ash Area Partial Closure

Welders: Rate for craft to which welding is incidental.

Note: Hazardous waste removal work receives additional $1.50 per hour for power equipment operators and $1.00 per hour for truck drivers.

****Note: Hazardous waste premium $1.50 per hour over classified rate***

Crane with 150 ft. boom (including jib) - $ .75 extra
Crane with 200 ft. boom (including jib) - $1.20 extra
Crane with 250 ft. boom (including jib) - $2.50 extra
Crane with 300 ft. boom (including jib) - $3.50 extra
Crane with 400 ft. boom (including jib) - $4.00 extra
Crane with 500 ft. boom (including jib) - $5.00 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 site ratio shall not be less than one full-time journeyperson instructing and supervising the work of each apprentice in a specific trade.

~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work ~~

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.

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.

As of: 4/23/2007
Project 9382

Project Hartford Landfill, Phase 1 Ash Area Partial Closure

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.

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.

As of: 4/23/2007
Project 9382

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: 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.

EXHIBIT H

NOTICE TO ALL CONTRACTING AGENCIES - CONTRACTING AGENCY CERTIFICATION FORM

CONNECTICUT DEPARTMENT OF LABOR FOOTNOTES

PAYROLL CERTIFICATION FORMS

INFORMATION BULLETIN - OCCUPATIONAL CLASSIFICATIONS

NOTICE TO ALL MASON CONTRACTORS

SEC. 31-53b. CONSTRUCTION SAFETY AND HEALTH COURSE

INFORMATIONAL BULLETIN - THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

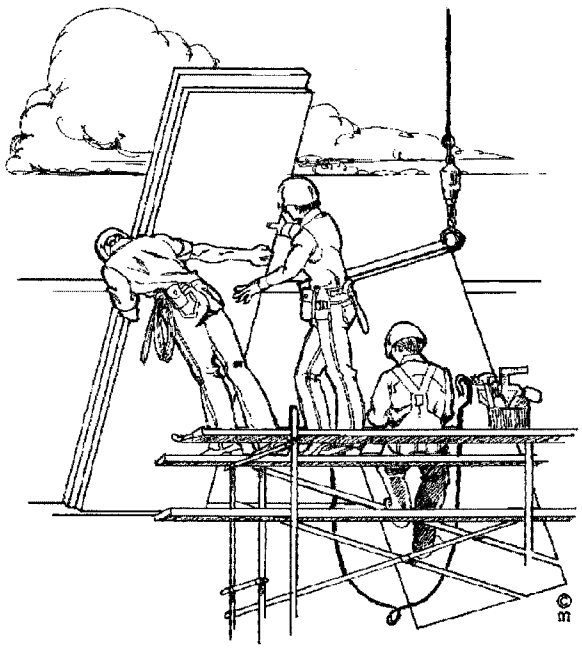
~NOTICE~

TO ALL CONTRACTING AGENCIES

Please be advised that Connecticut General Statutes Section 31-53, requires the contracting agency to certify to the Department of Labor, the total dollar amount of work to be done in connection with such public works project, regardless of whether such project consists of one or more contracts.

Please find the attached "Contracting Agency Certification Form" to be completed and returned to the Department of Labor, Wage and Workplace Standards Division, Public Contract Compliance Unit.

✎ Inquiries can be directed to (860)263-6543.



CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION
CONTRACT COMPLIANCE UNIT

CONTRACTING AGENCY CERTIFICATION FORM

I, _____, acting in my official capacity as _____,
authorized representative title

for _____, located at _____,
contracting agency address

do hereby certify that the total dollar amount of work to be done in connection with

_____, located at _____,
project name and number address

shall be $_____, which includes all work, regardless of whether such project

consists of one or more contracts.

CONTRACTOR INFORMATION

Name:_____

Address:_____
Authorized Representative:_____
Approximate Starting Date: _____

Approximate Completion Date:_____

_____ _____
Signature Date

Return To: Connecticut Department of Labor
Wage & Workplace Standards Division
Contract Compliance Unit
200 Folly Brook Blvd.
Wethersfield, CT 06109

Date Issued: _____

CONNECTICUT DEPARTMENT OF LABOR
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, Plasters, Stone Masons (BUILDING CONSTRUCTION)

a. Paid Holiday: If an employee works on Christmas Eve until noon he shall be paid for 8 hours

b. Fringe contributions for cement masons (performing flatwork only) will receive one and one-half times fringe contributions for hours worked over eight hours per day.

Bricklayers, Cement Masons, Cement Finishers, Plasters, Stone Masons (HEAVY AND HIGHWAY CONSTRUCTION)

a. Paid Holiday: If an employee works on Christmas Eve until noon he shall be paid for 8 hours

Carpenters, Diver Tenders, Dockbuilders, Piledrivers (HEAVY AND HIGHWAY CONSTRUCTION)

a. Paid Holidays: Memorial Day, Independence Day, Labor Day, provided the employee works 3 days during the week of the holiday and the working day before and after the holiday, if scheduled.

Electricians

Fairfield County: West of the Five Mile River in Norwalk

a. $2.00 per hour not to exceed $14.00 per day.

Elevator Constructors: Mechanics

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor 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.

Ironworkers

a. Paid Holidays: Last four working hours on Christmas Eve and New Year's eve are paid holidays, provided the employee has been on the employer's payroll for the five consecutive days prior to Christmas Eve and New Year's Eve.

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 4th and Labor Day, provided the employee is employed 15 days prior to the holiday; and Christmas Day, provided the employee has worked in a shop on or after December 11th.

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 such contractor 20 working days prior to any such holiday.

Truck Drivers

(HEAVY & 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 days service and works the last scheduled day before and the first scheduled day after the holiday.

In accordance with Connecticut General Statutes, 31-53
Certified Payrolls with a statement of compliance
shall be submitted monthly to the contracting agency.

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

WEEKLY PAYROLL

Connecticut Department of Labor
Wage and Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

CONTRACTOR NAME AND ADDRESS:	SUBCONTRACTOR NAME & ADDRESS	WORKER'S COMPENSATION INSURANCE CARRIER POLICY # EFFECTIVE DATE: EXPIRATION DATE:
PAYROLL NUMBER / Week-Ending Date / PROJECT NAME & ADDRESS		

PERSON/WORKER AND ADDRESS	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION TRADE LICENSES TYPE & NUMBER	DAY AND DATE S	M	T	W	TH	F	S HOURS WORKED EACH DAY	S-TIME O-TIME	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 FICA	FEDERAL WITH-HOLDING	STATE WITH-HOLDING	OTHER	GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
													1. $							
												$	2. $							
												Base Rate	3. $							
													4. $							
												$	5. $							
												Cash Fringe	6. $							
													1. $							
												$	2. $							
												Base Rate	3. $							
													4. $							
												$	5. $							
												Cash Fringe	6. $							
													1. $							
												$	2. $							
												Base Rate	3. $							
													4. $							
												$	5. $							
												Cash Fringe	6. $							
													1. $							
												$	2. $							
												Base Rate	3. $							
													4. $							
												$	5. $							
												Cash Fringe	6. $							

9/1/2005 *IF REQUIRED
WWS-CP1 *SEE REVERSE SIDE

***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 _____
2) Pension or retirement _____
3) Life Insurance _____
4) Disability _____
5) Vacation, holiday _____
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:

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 employee 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 employee 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 employee of the Employer 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.

Submitted on

_____

(Date) (Signature) (Title)

*****THIS IS A PUBLIC DOCUMENT*****
*****DO NOT INCLUDE SOCIAL SECURITY NUMBERS*****

Weekly Payroll Certification For
Public Works Projects (Continued)

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

WEEKLY PAYROLL

Week-Ending Date:
Contractor or Subcontractor Business Name:

PERSON/WORKER AND ADDRESS	APPR RATE %	MALE/ FEMALE AND RACE*	WORK CLASSIFICATION / TRADE LICENSES TYPE & NUMBER	DAY AND DATE / HOURS WORKED EACH DAY: S	M	T	W	TH	F	S	S-TIME / O-TIME	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: FICA	FEDERAL WITH-HOLDING	STATE WITH-HOLDING	OTHER	GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY
												$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							
												$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							
												$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							
												$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							
												$ Base Rate $ Cash Fringe	1. $ 2. $ 3. $ 4. $ 5. $ 6. $							

*IF REQUIRED

NOTICE: THIS PAGE MUST BE ACCOMPANIED BY A COVER PAGE (FORM # WWS-CP1)

Revised: March 22, 2007

Informational Bulletin

Occupational Classifications

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 Insulator:

- Handle, install, apply, fabricate, distribute, prepare, alter, repair, or dismantle heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

Carpenter:

- Assembly and installation of modular furniture/furniture systems.
  [**New**] a. Free-standing furniture is not covered. This includes: 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.
- Applies fire stopping materials on fire resistive joint systems only.
- Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings.
- Installation of curtain/window walls only where attached to wood or metal studs.

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: (Revised)

- 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.

Continued

Electrician:

- Installation or maintenance of telecommunication, LAN wiring or computer equipment. Low voltage wiring.

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:

- Installs light metal sash, head sills, and 2-story aluminum storefronts.
  Installation of aluminum window walls and curtain walls is the "joint" work of the Glaziers and Ironworkers classification which requires either a blended rate or equal composite workforce.

Ironworkers:

- Handling, sorting, and installation of reinforcing steel (rebar).
- Installation of aluminum window walls and curtain walls is the "joint" work of the Glaziers and Ironworkers classification which requires either a blended rate or equal composite workforce. Insulated metal and insulated composite panels are still installed by the Ironworker.
- Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation.

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.

Lead Paint Removal:

- Painter 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 Rate-
  1) Removal of lead paint from any surface *NOT* to be repainted.
  2) Where removal is on a *TOTAL* Demolition project only.

Roofers:

- Preparation of surface, tear-off and/or removal of any type of roofing, and/or clean-up of any areas where a roof is to be relaid.

Continued

Sheet Metal Worker:

- 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, facia, 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

Truck Drivers:

- Truck Drivers delivering asphalt are covered under prevailing wage while on the site and directly involved in the paving operation.
- 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 the Contract Compliance Unit, Wage and Workplace Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd, Wethersfield, CT 06109 at (860)263-6543.

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.

Sec. 31-53b. Construction safety and health course. Proof of completion required for employees on public building projects. Enforcement. Regulations. (a) Each contract entered into on or after July 1, 2007, for the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public building project by the state or any of its agents, or by an political subdivision of the state or any of its agents, where the total cost of all work to be performed by all contractors and subcontractors in connection with the contract is at least one hundred thousand dollars, shall contain a provision requiring that, not later than thirty days after the date such contract is awarded, each contractor furnish proof to the Labor Commissioner that all employees performing manual labor on or in such public building, pursuant to such contract, have 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, in the case of telecommunications employees, have completed at least ten hours of training in accordance with 29 CFR 1910.268.

(b) Any employee required to complete a construction safety and health course required under subsection (a) of this section who has not completed the course shall be subject to removal from the worksite if the employee does not provide documentation of having completed such course by the fifteenth day after the date the employee is found to be in noncompliance. The Labor Commissioner or said commissioner's designee shall enforce this section.

(c) Not later than January 1, 2007, 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 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) For the purposes of this section, "public building" means a structure, paid for in whole or in part with state funds, within a roof and within exterior walls or fire walls, designed for the housing, shelter, enclosure and support or employment of people, animals or property of any kind, including, but not limited to, sewage treatment plants and water treatment plants, "Public building" does not include site work, roads or bridges, rail lines, parking lots or underground water, sewer or drainage systems including pump houses or other utility systems.

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;

(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 ULTMATELY ARISE CONCERNIG THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.