

INVITATION FOR BIDS
FOR
SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1
SEQUENTIAL CLOSURE

Mail or Hand Deliver

ORIGINAL BID FORM (MARKED "ORIGINAL") & THREE (3) COMPLETE COPIES

BY 2:00 PM – July 30, 2015

To:

BOARD OF COUNTY COMMISSIONERS
ORANGE COUNTY, FLORIDA
INTERNAL OPERATIONS CENTRE II
PROCUREMENT DIVISION
400 E. SOUTH STREET- 2nd FLOOR
ORLANDO, FLORIDA 32801

Bid Opening:

July 30, 2015 - 2:00 PM

Internal Operations Centre II
Procurement Division Conference Room, Second Floor
Orlando, Florida 32801

Non - Mandatory Pre-Bid Conference – July 9, 2015 2:00PM
Solid Waste Administration Large Conference Room
5901 Young Pine Road, Orlando, FL 32829
Interested bidders are encouraged to attend.

NOTICE TO BIDDERS/OFFERORS

To ensure that your bid/proposal is responsive, you are urged to request clarification or guidance on any issues involving this solicitation before submission of your response. Your point-of-contact for this solicitation is John Schmidt at (407) 836-5647, or email John.Schmidt@ocfl.net.

VOLUME I
PART A
.....

NEW BID BOND REQUIREMENT – See Part C, Instructions to Bidders, Paragraph 19 e.

TABLE OF CONTENTS

PART	DESCRIPTION	PAGE
A	INVITATION FOR BIDS	A
B	NOTICE	B
C	INSTRUCTIONS TO BIDDER	
1.	GENERAL	C-1
2.	PREPARATION AND SUBMISSION OF BIDS	C-1
3.	MINORITY/WOMEN OWNED BUSINESS ENTERPRISE	C-4
4.	BID PREFERENCE FOR SERVICE-DISABLED VETERANS (SDV)	C-9
5.	BID ERRORS	C-10
6.	DEVIATIONS	C-10
7.	SUBSTITUTE MATERIAL AND EQUIPMENT	C-10
8.	REQUESTED INFORMATION/DESCRIPTIVE LITERATURE	C-11
9.	AWARD OF CONTRACT/REJECTION OF BIDS	C-11
10.	POSTING OF RECOMMENDED AWARD	C-12
11.	CONTRACT DOCUMENTS	C-12
12.	MODIFICATION/ALTERATION OF SOLICITATION	C-12
13.	LAWS AND REGULATIONS	C-12
14.	REQUIRED DISCLOSURE	C-13
15.	EXECUTION OF WRITTEN AGREEMENT	C-13
16.	LICENSING REQUIREMENTS	C-13
17.	SECURITY FORFEITURE	C-14
18.	PERFORMANCE BOND AND PAYMENT BOND	C-14
19.	QUALIFICATIONS OF SURETY COMPANIES	C-14
20.	TRENCH SAFETY ACT	C-15
21.	DRUG FREE WORKPLACE	C-15
22.	BID TABULATION AND RECOMMENDED AWARD	C-15
23.	INDEMNIFICATION FOR TORT ACTIONS	C-16
24.	OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.)	C-16
25.	PUBLIC ENTITY CRIME STATEMENT	C-16
26.	SUBCONTRACTOR/SUPPLIER INFORMATION	C-16
27.	SUBCONTRACTOR'S PAST PERFORMANCE	C-17
28.	REFERENCES	C-17
29.	BID & RELATED COSTS	C-17
30.	SOLICITATION CANCELLATIONS	C-18
31.	LICENSES/PERMITS/FEEES	C-18
32.	BID ACCEPTANCE PERIOD	C-18
33.	EQUAL OPPORTUNITY	C-18
34.	ETHICS COMPLIANCE	C-19
35.	TOBACCO FREE CAMPUS	C-19
36.	VERIFICATION OF EMPLOYMENT STATUS	C-19
37.	PROPRIETARY INFORMATION	C-20
38.	MOBILIZATION	C-20
39.	UNBALANCED PRICING	C-20
40.	UNIT PRICES	C-21

PART	DESCRIPTION	PAGE
D	BID FORM	
	OFFICIAL BID FORM	D-1
	NON-COLLUSION AFFIDAVIT	ATTACHMENT A
	REQUIRED DISCLOSURE	ATTACHMENT B
	M/WBE QUESTIONNAIRE	ATTACHMENT C
	COMPLIANCE WITH TRENCH SAFETY ACT	ATTACHMENT D
	REFERENCES	ATTACHMENT E
	PROJECT EXPENDITURE REPORT	ATTACHMENT F
	RELATIONSHIP DISCLOSURE FORM	ATTACHMENT G
	E-VERIFICATION CERTIFICATION	ATTACHMENT H
	BID BOND	EXHIBIT 1
E	CONSTRUCTION CONTRACT	
	CONTRACT FORM	E-1
	PERFORMANCE BOND	E-6
	PAYMENT BOND	E-9
	RELEASE OF LIEN	E-12
	CHANGE ORDER FORM	E-13
	CONSENT OF SURETY/INCREASE OF PENALTY FORM	E-15
	DRUG-FREE WORKPLACE FORM	E-17
F	GENERAL CONDITIONS	
	ARTICLE 1 - CONTRACT	F-1
	ARTICLE 2 - DEFINITIONS	F-1
	ARTICLE 3 - ASSIGNMENT OF AGREEMENT	F-3
	ARTICLE 4 - QUALIFICATIONS OF SUBCONTRACTORS AND SUPPLIERS	F-4
	ARTICLE 5 - STARTING THE WORK	F-4
	ARTICLE 6 - INTERPRETATION AND INTENT OF THE CONSTRUCTION DOCUMENTS	F-4
	ARTICLE 7 - REFERENCE POINTS	F-5
	ARTICLE 8 - BONDS AND INSURANCE AND INDEMNIFICATION	F-6
	ARTICLE 9 - CONTRACTOR'S RESPONSIBILITIES	F-11
	ARTICLE 10 - WORK BY OTHERS	F-17
	ARTICLE 11 - PROJECT MANAGER'S STATUS DURING CONSTRUCTION	F-19
	ARTICLE 12 - CHANGES IN THE WORK	F-19
	ARTICLE 13 - CHANGE OF CONTRACT AMOUNT/CONTRACT TIME	F-20
	ARTICLE 14 - CONDITION OF MATERIALS & PACKAGING	F-27
	ARTICLE 15 - ASBESTOS FREE MATERIALS	F-27
	ARTICLE 16 - WARRANTY/ACCEPTANCE OF DEFECTIVE WORK	F-27
	ARTICLE 17 – DELAYS AND EXTENSION OF TIME	F-30
	ARTICLE 18 - PAYMENT AND COMPLETION	F-31
	ARTICLE 19 - SUSPENSION OF WORK AND TERMINATION	F-38
	ARTICLE 20 - MAINTENANCE AND EXAMINATION OF RECORDS	F-39

ARTICLE 21 – MINORITY/WOMEN OWNED BUSINESS ENTERPRISE REQUIREMENTS AND SMALL BUSINESS PROVISIONS	F-41
ARTICLE 22 - FEDERAL REQUIREMENTS	F-43
ARTICLE 23 – VERBAL ORDERS	F-43
ARTICLE 24 – MISCELLANEOUS	F-44
ARTICLE 25 – CONTRACT CLAIMS	F-45
ARTICLE 26 – VALUE ENGINEERING	F-46
ARTICLE 27 – PATENTS AND ROYALTIES	F-49

**G SUPPLEMENTAL CONDITIONS / SPECIAL PROVISIONS
NOT USED**

VOLUME II

H TECHNICAL PROVISIONS (SPECIFICATIONS)

DIVISION 1 GENERAL REQUIREMENTS

01010	Summary of Work
01025	Measurement and Payment
01027	Schedule of Values
01028	Application for Payments
01030	Special Project Procedures
01035	Health and Safety Requirements
01040	Project Coordination
01060	Surveying
01065	Permits
01092	Abbreviations
01153	Change Order Procedures
01200	Project Meetings
01300	Submittals
01310	Progress Schedules
01320	Construction Photographs
01380	Construction Field Office
01400	Quality Control
01410	Testing and Testing Laboratory Services
01500	Construction Facilities and Temporary Controls
01568	Temporary Erosion and Sedimentation Control
01630	Substitutions and Product Options
01700	Contract Closeout

DIVISION 2 SITE CONSTRUCTION

02200	Site Clearing
02221	Excavation, Trenching, Backfilling and Embankment
02310	Fabric Formed Concrete Revetment System (FFCRS)
02371	Geotextiles
02373	Composite Drainage Net (CDN)
02480	Sodding, Seeding and Mulching
02502	Terrace Underdrain Systems
02668	High Density Polyethylene (HDPE) Geomembrane
02669	Linear Low Density Polyethylene (LLDPE) Geomembrane
02710	Base Course
02761	Pavement Marking
02772	Asphalt Concrete Pavement

SECTION**TITLE****DIVISIONS 3 THROUGH 14 (NOT USED)****DIVISION 15****MECHANICAL**

15052	Landfill Gas (LFG) System Valves
15071	High Density Polyethylene (HDPE) Pipe and Fittings for Letdown Pipes and Culverts
15073	High Density Polyethylene (HDPE) Pipe and Fittings for Gas Management System

DIVISION 16**ELECTRICAL (NOT USED)**

ATTACHMENT A FDEP Permit for Operations and Sequential Closure of Cells 9-12 Class I Landfill

ATTACHMENT B Liner System Construction Quality Assurance Plan for HDPE and LLDPE Geomembrane, and Composite Drainage Net for Cells 9-12 Class I

ATTACHMENT C Excerpts from Geotechnical Report in Support of Permit Application for Operations and Closure of Cells 9-12 Class I Landfill

INDEX OF DRAWINGS / TITLE

COVER SHEET

G-1	SHEET INDEX, LEGEND, LOCATION MAP, AND ABBREVIATIONS
G-2	AERIAL PHOTOGRAPH ORANGE COUNTY SOLID WASTE MANAGEMENT FACILITY
G-3	PROJECT LOCATION AERIAL PHOTOGRAPH
G-4	SURVEY CONTROL POINTS
G-5	EXISTING TOPOGRAPHY AND PROJECT GEOMETRY PLAN
G-6	EXISTING LANDFILL GAS, TEMPORARY DRAINAGE AND LANDFILL CONDITIONS
C-1	PROPOSED PHASE 1 GRADING, LANDFILL GAS SYSTEM AND STORMWATER COLLECTION SYSTEM OVERVIEW
C-2	FINAL GRADING PLAN
C-3	FINAL GRADING PLAN CROSS-SECTIONS
C-4	STORMWATER COLLECTION PLAN
C-5	STORMWATER STRUCTURE SCHEDULE AND TERRACE SWALE SCHEDULE
C-6	LANDFILL GAS SYSTEM PLAN
C-7	EASTERN PERIMETER DITCH RESTORATION
CD-1	CLOSURE FINAL COVER DETAILS
CD-2	CLOSURE FINAL COVER AND STORMWATER DETAILS
CD-3	STORMWATER MANAGEMENT SYSTEM DETAILS
CD-4	STORMWATER MANAGEMENT SYSTEM AND LFG DETAILS
CD-5	LANDFILL GAS MANAGEMENT SYSTEM DETAILS
CD-6	LANDFILL GAS MANAGEMENT SYSTEM DETAILS

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ISSUED: June 18, 2015

**NOTICE
INVITATION FOR BID NO. Y15-788-J2**

**SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1
SEQUENTIAL CLOSURE**

Sealed bid offers (Original Bid Form and three (3) complete copies) for furnishing the above will be accepted up to **2:00 PM, July 30, 2015** in the Procurement Division; Internal Operations Centre II, 400 E. South Street; 2nd Floor, Orlando, FL 32801. Bids will be opened shortly thereafter in the Procurement Division Conference Room, 2nd Floor; Internal Operations Centre II.

Bid Documents are available in the following formats:

1. Complete bid documents may be obtained from the Procurement Division, Internal Operations Centre II, 400 E. South Street, 2nd floor, Orlando, FL 32801. Phone (407) 836-5635 and Fax (407) 836-5899. The documents are available for a cost of **\$50** non-refundable.
2. A printed copy of the basic solicitation documents and a CD containing the construction plans are available for a cost of **\$50** per CD non-refundable.
3. Complete bid documents **including construction plans and specifications** are now available for downloading from the internet at **orangecountyfl.net**.

A Non-Mandatory Pre-Bid Conference will be held on July 9, 2015, 2:00PM, Solid Waste Administration Large Conference Room, 5901 Young Pine Road, Orlando, FL 32829. Interested bidders are encouraged to attend.

SCOPE OF WORK: Scope of work includes a site survey and waste grading, installation of leveling course, geomembrane barrier layer, and protective cover with sod as shown on the plans. The sequential closure construction portion includes installation of landfill gas (LFG) laterals, headers and connection to the existing LFG collection system, installation of secondary stormwater system with terraces and underdrain system, letdown piping, inlet structures and connection to the existing primary system. The project also includes modification of existing condensate pump stations, restoration of a segment of the primary storm water ditch and resurfacing of paved roads.

PROJECT LOCATION: The project site is located at **5901 Young Pine Road, Orlando, FL 32829.**

Johnny M. Richardson, CPPO, CFCM
Manager, Procurement Division

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PART C - INSTRUCTIONS TO BIDDERS

1. GENERAL:

The term County used herein refers to the Board of County Commissioners, Orange County, Florida, or its duly authorized representative. The term Bidder used herein refers to the manufacturer, dealer or business organization submitting a bid to the County in response to this Invitation for Bid.

2. PREPARATION AND SUBMISSION OF BIDS:

- a. Form of Proposal: Each Bidder shall submit the bid in four parts (original Bid Form, marked original, with attachments and three (3) copies of the Bid Form and all attachments) and indicate the base bid price and any alternative(s) that may be included in the proper space(s).

The estimated total base bid is the sum of all pay item totals and the County reserves the right to correct errors in pay item totals arising from incorrect extensions. See "Bid Errors", Item 4.

- b. All bids, proposals or quotations, unless otherwise specified, must be delivered in a sealed envelope, either mailed or hand carried, to the Procurement Division, Orange County Internal Operations Centre II, 400 E. South Street, 2nd Floor, Orlando, Florida 32801, prior to the bid opening time as specified in Part B. Bids received after the date and time specified will be returned unopened. The time/date stamp clock located in the Procurement Division shall serve as the official authority to determine lateness of any bids.

Respondents are cautioned that they are responsible for delivery to the specific location cited above. Therefore, if your bid, proposal or quotation is delivered by an express mail carrier or by any other means, it is your responsibility to ensure delivery to the above address. This office will not be responsible for deliveries made to any place other than the specified address.

The delivery of said bid to the Procurement Division prior to the time and date stated in Part A is solely and strictly the responsibility of the Bidder. The County shall not be responsible for delays in delivery to the Procurement Division caused by the United States Postal Service or courier service, delivery to any other County Office or delays caused by any other occurrence. The bid delivery time will be scrupulously observed. Under no circumstances will bid proposals delivered after the delivery time specified be considered.

The decision to refuse to consider a bid or proposal that was received beyond the date/time established in the solicitation shall not be the basis for a protest pursuant to the Orange County Code (Procurement Ordinance).

Bidders should indicate on the sealed envelope the following:

1. Invitation for Bid Number
 2. Hour and Date of Opening
 3. Name of Bidder
 4. Return Address of the Bidder
- c. Bids will be publicly opened in the Procurement Division Conference Room, 2nd Floor of the Orange County Internal Operations Centre II, 400 E. South Street; Orlando, Florida.
- d. All bid proposals must be manually and duly signed by an authorized corporate officer, principal, or partner (as applicable) with his signature in full. When a firm is a Bidder, the bid proposals shall be signed in the name of the firm by one or more of the partners. When a corporation is a Bidder, the officer signing shall set out the corporate name in full beneath which he shall sign his name, give title of his office and affix the corporate seal. Anyone signing the bid proposal as agent must file with it legal evidence of his authority to do so. Bidders who are nonresident corporations shall furnish to the County a duly certified copy of their permit to transact business in the State of Florida along with the Bid Proposal. Failure to promptly submit this evidence or qualification to do business in the State of Florida may be basis for rejection of the Bid Proposal.
- e. The Bidder is solely responsible for reading and completely understanding the requirements and the specifications of the solicitation.
- f. Bid proposals may be withdrawn by written, telecopied or telegraphic requests dispatched by the Bidder and received by the Manager of the County Procurement Division before the time for receiving bids has expired. Negligence on the part of the Bidder in preparing a bid proposal is not grounds for withdrawal or modification of a bid proposal after such bid proposal has been opened by the County. A Bidder may not withdraw or modify a bid proposal after the appointed bid proposal opening and such bid proposal must be in force for **ninety (90)** days after the bid opening. Bidders may not assign or otherwise transfer their bid proposals.
- g. At the time and place fixed for the opening of bid proposals (see above), every bid proposal properly delivered within the time fixed for receiving bid proposals will be opened and publicly read aloud, irrespective of any irregularities found therein. Bidders and other persons interested may be present, in person or by representative.
- h. A Bid, Payment and Performance Bond are a requirement of the IFB when the bid/contract amount exceeds \$100,000.

Submission of an original Bid Bond (copy not acceptable) completed and signed by all required parties and submitted on the form provided in Exhibit 1 to the Bid Proposal (Part D), or in the alternative, a Certified Check, or a Cashier's Check shall be required to accompany each bid proposal in a stated dollar amount of not less than ten (10%) percent of the sum of the computed total amount of the Bidder's Base Bid proposal. Submittal of a Bid Bond less than 10% of the bid sum shall result in rejection of the bid. **Failure to submit the Bid Bond on the form provided in Exhibit 1 to the Bid Proposal (Part D) shall result in rejection of the bid.**

In order to be acceptable to the County, the Surety company issuing the Bid Bond as called for in this Invitation for Bids, shall meet and comply with the minimum standards described in Part C, Section 19, "Qualifications of Surety Companies". **Failure to submit a Bid Bond from a Surety Company meeting these minimum standards shall result in rejection of the bid.**

Certified checks or cashier's checks shall be drawn on a solvent bank or trust company to the order of the Board of County Commissioners, Orange County, Florida and shall have all necessary documentary revenue stamps attached, if required by law. Personal checks are not acceptable to the County. See Section 19, "Qualifications of Surety Companies" for additional requirement.

- i. A pre-Bid conference will be held at the time and location shown in the Notice, Part B of this Bid package.
- j. No oral interpretation of the meaning of the plans, specifications, or other Contract documents shall be considered binding. Every request for interpretation shall be in writing addressed to **John Schmidt, email John.Schmidt@ocfl.net**. To be given consideration, such requests must be received Ten (10) days prior to bid opening.

Any and all such interpretations and any supplemental instructions will be in the form of a written addendum which, if issued, will be available for downloading from the Internet at orangecountyfl.net. All addenda so issued shall become part of the Contract Documents and receipt shall be acknowledged on the Bid Form, Part D or by completion of the applicable information on the addendum and returning it not later than the date and time for receipt of the bid.

- k. Before submitting bid proposals, Bidders must carefully examine the site of the proposed work and make all necessary investigations to inform themselves thoroughly as to all difficulties involved in the completion of all work required pursuant to the mandates and requirements of this bid package.

No plea of ignorance of conditions or difficulties that may hereafter exist, or of conditions or difficulties that may be encountered in the execution of the work pursuant to this bid package as a result of failure to make the necessary examinations and investigations will be accepted as an excuse for any failure or omission on the part of the successful Bidder (Contractor) to fulfill, in every detail, all of the requirements of the Contract Documents, nor will they be accepted as a basis for any claims whatsoever for extra compensation or for an extension of time.

3. MINORITY/WOMEN OWNED BUSINESS ENTERPRISES:

- a. To provide for the participation of certified minority and women owned businesses (M/WBE's) in the County's procurement of construction services. Bidders submitting bids to the County are urged to comply with M/WBE subcontracting goals established by the County Minority/Women Business Enterprise Ordinance, No. 94-02 and amended by Ordinance No.2009-21. The overall goal for all bids (inclusive of all additive and deductive alternates) is 25% participation for M/WBE subcontractors and suppliers. Upon Contract award the Contractor must meet the M/WBE expenditure required by the Contract.

The Ordinance also addresses minority/women group employment levels setting goals to encourage each Bidder to maintain 18% minority and 6% women employees.

Note: Only 50% of material/supply dollars purchased from M/WBE distributors is applied toward the goals for minority and women business enterprise participation on construction projects. Contractor shall list **the total amount of material/supply dollars** to be purchased from each M/WBE distributor on the Subcontractor/Supplier Page (Attachment C-2). **The County will calculate the actual dollars to be applied toward the goals.**

- b. **NOTICE: Goals for bids under \$100,000**

There are M/WBE goals for all bids including bids for IFB estimated to be less than \$100,000 (inclusive of all additive and deductive alternates).

- c. **M/WBE Bidders competing as primes**

If an M/WBE firm bidding as a prime certifies with his/her bid that it will self-perform 51% percent or more of the project, as evidenced by Attachment C-2, then that firm will not be required to comply with the M/WBE subcontracting goals. **Failure to include the percentage of work and the scope of work to be self-performed, and the dollar amount for the work an M/WBE Bidder competing as a prime intends to self-perform will result in the M/WBE Bidder receiving zero M/WBE participation for the bid.**

However, if the M/WBE Bidder will not be self-performing at least 51% percent of the project, then he/she must comply with the M/WBE

participation goal, and good faith effort documentation required from non-M/WBE Bidders to receive M/WBE compliance consideration.

d. **Subcontracts/Purchase Orders**

The successful Bidder shall provide a copy of all fully executed subcontracts and purchase orders issued to M/WBE's listed on Attachment C-2 to the Business Development Division. Submittal of these subcontracts/purchase orders is a condition precedent to execution of the prime Contract by the County.

The Contractor shall include a Prompt Payment Clause (reference Part F, Article 21, paragraph B) in all subcontracts and purchase orders. The Contractor should include in the subcontracts that they are contingent upon execution of the prime Contract.

The County may, at its discretion, require copies of subcontracts/purchase orders for the non-M/WBE's listed on Attachment C-2. However, if this option is not exercised, the awarded Contractor shall provide a list of all non-M/WBE Subcontractors and suppliers certifying that a prompt payment clause has been included in that Contract or purchase order.

e. **Good Faith Effort Documentation Requirements -**

If the established goals (reference paragraph 3.a above) are not achieved, to maximize consideration for MWBE participation, Bidders should provide with the bid sufficient documentation to substantiate that ALL FIVE of the mandatory efforts listed below were undertaken. Bidders meeting or exceeding the goals need not provide good faith effort documentation. Refer to paragraph f for the sliding scale for enforcement of the good faith effort document.

- i. If a bidder desires to meet the good faith effort documentation requirements he/she must provide written notice to certified M/WBEs that provides the type of work that the Bidder intends to subcontract. The notice shall be by e-mail or fax, no fewer than seven (7) calendar days prior to bid or proposal opening. All e-mails and faxes shall include the legal name of the M/WBE firm. The notice shall advise the M/WBE's:
 - a. that their interest in the contract is being solicited;
 - b. of the specific work the Bidder intends to subcontract
 - c. how to obtain information about and review the contract plans and specifications;
 - d. information on bonding, insurance and other pertinent requirements;
 - e. the deadline for bid or proposal submissions to the Bidder and the bid due date to the County;

- f. 24 hours notice of any addenda.
- ii. Also bidders shall provide an explanation why the M/WBE goals were not achieved, and list the scopes of service not subcontracted on Attachment C-2
- iii. Bidders shall follow up initial submittals of interest by contacting M/WBEs and documenting using a contract log, which shall include the firm's name address, contact information (e-mail, telephone and/or fax numbers), scope of work requested, the date, name of person making the effort, denote if M/WBEs will bid, time quote received and notes denoting if plans and specifications were sent. Each bidder shall use the standardized contact log, Attachment C-5.
- iv. In instances where a non-minority/non-woman contractor is listed for work for which M/WBE availability exists, the Bidder shall submit **ALL** quotations received from M/WBEs **AND** the listed non-M/WBE **within twenty-four (24) hours, if one of the three (3) apparent low Bidders**. The Bidder shall provide an explanation as to why the M/WBE's quotations were not accepted.

Receipt of a lower quotation from a non-M/WBE prior to bid opening will not in itself excuse a Bidder's failure to meet M/WBE participation goals. However, a Bidder's good faith effort obligation does not require a Bidder to accept a quotation from a M/WBE which is an unreasonable price. For the purpose of this subsection, "unreasonable price" means a price above (or below) competitive levels which cannot be attributed to the M/WBE's attempt to cover costs inflated by the present effect of discrimination.

- v. Bidder shall contact the Business Development division staff as a resource to obtain M/WBE participation goal.

If the Bidder fails to meet requirements (i – iv) of the above mentioned good faith effort documentation, then the bidder will be permitted to substitute one of the following with documentation showing that

- (1) The Disney Entrepreneur Center (DEC) was used to host a workshop that informed M/WBE firms how to better prepare for sub-contracting opportunities;
- (2) The Bidder has participated in Orange County Business Development Division's sponsored "How to do Business" workshop;
- (3) The Bidder has sponsored a match-maker event with certified M/WBE firms.

Orange County Business Development Division will determine the usage of this substitution, along with the appropriate time frame for utilizing this credit.

If, after Contract award, Prime Contractors who have not achieved the M/WBE participation goals choose to subcontract work indicated as being self-performed without prior written approval of the Business Development Division (reference Part F, Article 21, paragraph D), the matter will be reported to the Procurement Division with an appropriate responsibility recommendation for consideration in the event the contractor competes for future County contracts.

f. Sliding scale for enforcement of good faith effort requirements

If the established goals are not achieved by the low Bidder and it has been determined that the good faith efforts required for compliance have not been documented by the low Bidder, then the bid shall be rejected as non-responsive, but only if the next lowest responsive bid does not exceed the low bid by more than:

- i. Eight (8) percent on contract awards up to one hundred thousand dollars (\$100,000.00); or
- ii. Seven (7) percent on contract awards from \$100,000.00 to \$500,000.00; or
- iii. Six (6) percent on contract awards from \$500,000.01 to \$750,000.00; or
- iv. Five (5) percent on contract award from \$750,000.01 to \$2,000,000.00; or
- v. Four (4) percent on contract awards from \$2,000,000.01 to \$5,000,000.00; or
- vi. Three (3) percent on contract awards over \$5,000,000.01.

However, if the next low bid is responsive only because of the Bidder having made good faith effort (not because of having met the goals), the Board may approve award of the Contract to the next low Bidder only if the value of its M/WBE participation is equal to or greater than that of the low Bidder.

- g. Letters of Intent shall match **exactly the information provided on** Attachment C-2 to the Bid Forms D, Attachment C-3 and shall be executed by the apparent low Bidder and all M/WBE Subcontractors and/or suppliers listed on Attachment C-2 shall be submitted to the Business Development Division office before 5:00 P.M. on the second business day after bid opening.
- h. Bidders shall not reject an M/WBE as unqualified without sound reasons based on a thorough and documented investigation of that M/WBE's capabilities.

- i. Bidder's efforts will be evaluated considering the ability of other Bidders to meet the requirements relating to the use of M/WBE subcontractors.
- j. Bidders should make whatever additional efforts are necessary to achieve the goals and it is recommended that these efforts be documented. However, this documentation shall not replace the required documentation if the goals are not met. Bidders are encouraged to contact the Business Development Division for guidance and assistance. Additional efforts by Bidders may include but are not limited to the following:
 - i. Bidders should provide interested M/WBE's with assistance in reviewing the Contract plans and specifications.
 - ii. Bidders should assist interested M/WBE's in obtaining required lines of credit, insurance or bonding.
 - iii. Bidders should solicit only types of work that match the capabilities of the M/WBE's and for which they are certified.
- k. All participating M/WBE's must be certified by Orange County. The Business Development M/WBE Directory is available by e-mail or through the Orange County web site at Orangecountyfl.net. **Only firms having established offices in the Orlando MSA (Orange, Lake, Seminole and Osceola Counties) are eligible for Orange County certification. All firms must be certified prior to bid opening and must be certified in the area(s) for which they will be used.** If a firm claims to be certified, but is not listed in the Directory, Contractor should obtain a copy of their Certificate and/or contact the Business Development Division for verification of certification.
- l. The County has established a credit program whereby Contractors are awarded credits to be applied toward meeting the M/WBE goals on certain County bids. Emphasis will be placed on credits for Non-County Utilization and First-Time M/WBE Utilization. Bidders are encouraged to contact the Business Development Division for information on acquiring and applying the credits.
- m. Effective August 1, 2003, the County implemented a graduation program. Under this program, utilization of M/WBE firms designated as graduates shall count toward meeting M/WBE participation goals only on specified projects. All construction solicitations for which the County has determined the overall contract amount to be awarded to the prime in excess of \$10,000,000 for vertical construction, \$7,000,000 for horizontal construction and \$7,000,000 for all other construction are eligible for graduate M/WBE participation. Vertical construction is any construction of a structure or building which requires a general or building contractor's license. Horizontal construction includes but is not limited to roadwork, site work, drainage or utilities work. Other construction is any construction other than what is defined as vertical or horizontal construction.

The Bidder's total base bid, which is used by the Procurement Division as the basis for determining Contract award value, will be used to determine if graduated M/WBE firms are eligible to participate. If the contract has option provisions, the total base Bid is the total of the Basic Contract Year plus all Option Years. Prime contractors will receive full M/WBE credit for the use of graduated M/WBE's that meet all other requirements.

It is the Bidder's responsibility to insure that graduate M/WBE's are not listed in proposals to meet M/WBE participation requirements on projects in which they are not eligible to participate.

- n. The County is compiling information about the MWBE program in order to gauge the level of program understanding and acceptance. Bidders should complete the M/WBE Survey, Attachment C-4 and return with their Bid Proposal Form. Failure to submit the completed survey may delay award of the Contract.

Intentional failure to attempt compliance and/or intentional failure to comply with the M/WBE subcontract goals pursuant to the Minority/Women Business Enterprise Ordinance, may result in the County invoking penalties under that ordinance and/or a finding by the County that a Bidder is "non-responsible", thus resulting in that bid being rejected and the Bidder facing possible suspension or debarment from future County IFB's.

4. BID PREFERENCE FOR SERVICE-DISABLED VETERANS (SDV)

The Orange County Service-Disabled Veteran Business Program Ordinance sets vendor preferences for service-disabled veteran business enterprises registered with Orange County Business Development division.

As part of this program, Contractors are required to complete the Attachment C-2 listing **ALL** subcontractors (majority, women and minority, and service-disabled veteran) their firm will utilize in fulfillment of the requirements of this solicitation.

Also, in accordance with the County SDV Ordinance, preferences for certified service-disabled veteran business enterprises shall be applied on bid awards (sealed bids). The following bid preference scale shall apply to bids submitted by certified service-disabled veterans business enterprises as long as the bid does not exceed the low bid by more than 8% on bid awards up to \$100,000; 7% on bid awards from \$100,000 to \$500,000; 6% on bid awards from \$500,000.01 to \$750,000.00; 5% on bid award from \$750,000.01 to \$2,000,000; 4% on bid awards from \$2,000,000.01 to \$5,000,000; or 3% on bid awards over \$5,000,000.01.

Certified service-disabled veteran business enterprises may be awarded or recommended for award of contracts when their bids are within the above allowed percentage in comparison to the low responsive and responsible bid(s).

If a certified service-disabled veteran business enterprise, entitled to the vendor preference under this section, and one (1) or more other businesses also entitled to this preference, or another vendor preference provided by the Orange County

Code, submit bids, proposals, or replies for procurement of commodities or contractual services which are otherwise equal with respect to all relevant considerations, including price, quality, and service, then the Procurement Division Manager shall award the procurement or contract to the business having the smallest net worth.

5. BID ERRORS:

Where bid forms have erasures or corrections, each erasure or correction must be initialed in ink by the Bidder. In case of unit price bid items, if an error is committed in the extension of an item, the unit price as shown in the Official Bid Form will govern. Errors between any sum, computed by the Bidder, and the correct sum thereof will be resolved in favor of the correct sum. Any discrepancy between words and numbers will be resolved in favor of the written words.

6. DEVIATIONS:

Bidders are hereby advised that Orange County will only consider bid Proposals that meet the specifications and other requirements imposed upon them by this bid package. In instances where a deviation is stated in the bid form, said bid will be subject to rejection by the County in recognition of the fact that said bid Proposal does not meet the exact requirements imposed upon the Bidder by the Contract Documents.

7. SUBSTITUTE MATERIAL AND EQUIPMENT:

The Contract, if awarded, will be on the basis of material and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or-equal" items. Whenever materials or equipment or patented processes are specified or described in the Contract Documents by naming a trade name, manufacturer, supplier or proprietary item or catalog number, the naming of the item is intended to establish the type, function and quality required and to establish a basis for bidding.

Substitute materials or equipment may be considered after a Contract for the Work is executed if sufficient information is supplied by Contractor to allow Project Manager to evaluate the proposed substitution, unless the naming of the item is followed by words indicating that no substitution is permitted. The procedure for submittal of any such application by Contractor and consideration by Project Manager is set forth in the General Conditions.

In the event that substitute materials or equipment are used and are less costly than the originally specified material or equipment, then the difference in cost of the item shall benefit the County and Contractor in equal proportions. Applications for substitute materials and equipment shall only be evaluated after the Contract is executed. The Base Bid and Alternates shall reflect the costs for the materials and equipment named or specified only.

8. REQUESTED INFORMATION AND DESCRIPTIVE LITERATURE:

Bidders must furnish all requested information in the spaces provided on the bid form or attachments thereto. Additionally, where required pursuant to the provisions of this bid package, Bidders must submit with their bid proposal cuts, sketches, descriptive literature and/or complete specifications relative to the items proposed and offered.

9. AWARD OF CONTRACT/REJECTION OF BIDS:

The Board of County Commissioners will award a Contract to the low, responsive and responsible Bidder, price and other factors considered. The County will award one Contract for this requirement. The Board of County Commissioners, in its sole discretion, reserves the right to reject any and all bids and to waive any informality concerning bid proposals whenever such rejection or waiver is in the best interest of the County. The ability of a Bidder to obtain a performance bond and a payment bond shall not be regarded as the sole test of such Bidder's competency or responsibility. Nothing contained herein shall place a duty upon the County to reject bids or award a Contract based upon anything other than its sole discretion as described herein.

When more than one method of work is prescribed in the solicitation with separate pricing allowed for each method, the County will select the method determined to be in its best interests, price and other factors considered.

Determination of the low Bidder when additive or deductive bid items are involved shall be as follows:

A. ADDITIVE/DEDUCTIVE BID ITEMS:

1. If it is deemed to be in the best interest of the County to accept the additive or deductive items, award will be made to the Bidder that offers the lowest aggregate amount for the base bid, plus or minus (in the order listed on the bid form), those additive or deductive bid items that provide the most features of the work.
2. All bids will be evaluated on the basis of the same additive or deductive bid items.
3. Failure of the Bidder to provide pricing for all unit priced items and/or the Base Bid and ALL requested additive/deductible bid items, or alternate bids shall be cause for rejection of the bid as non-responsive.

B. RECIPROCAL LOCAL PREFERENCE:

In the event the lowest responsive and responsible bid submitted in response to any invitation for bid is by a bidder whose principal place of business is in a county other than Orange County, and such county grants a bid preference for purchases to a bidder whose principal place of business is in such county, then Orange County may award a preference to the (next) lowest responsive

and responsible bidder having a principal place of business within Orange County, Florida. Such preference shall be equal to the preference granted by the county in which the lowest responsive and responsible bidder has its principal place of business **except as provided below.**

Effective July 1, 2015 the reciprocal local preference shall not apply to construction services in which 50 percent or more of the cost will be paid from state-appropriated funds which have been appropriated at the time of the competitive solicitation.

10. POSTING OF RECOMMENDED AWARD AND PROTESTS:

The recommended award will be posted for review by interested parties at the Procurement Division and at <http://apps.ocfl.net/OrangeBids/AwardsRec/default.asp> prior to submission through the appropriate approval process and will remain posted for a period of five full business days.

Failure to file a protest to the Procurement Division Manager by 5:00 PM on the fifth full business day after the posting date shall constitute a waiver of bid/proposal protest proceedings. Additional information relative to protests can be found at: <http://www.orangecountyfl.net/VendorServices/VendorProtestProcedures.aspx>

A lobbying blackout period shall commence upon issuance of the solicitation until the Board selects the successful Bidder. For procurements that do not require Board approval, the blackout period commences upon solicitation issuance and concludes upon Contract award. Additional information relative to lobbying can be found at: <http://www.orangecountyfl.net/OpenGovernment/LobbingAtOrangeCounty.aspx>

The Board of County Commissioners may void any Contract where the County Mayor, one or more County Commissioners, or a County staff person has been lobbied in violation of the blackout period restrictions of Ordinance No. 2002-15.

11. CONTRACT DOCUMENTS:

The Contract Documents shall include the documents stated in the Contract (Titles, Subtitles, Headings, Running Headlines, Table of Contents and Indexes are used merely for convenience purposes).

12. MODIFICATION/ALTERATION OF SOLICITATION AND OR CONTRACT DOCUMENTS

Modification or alteration of the documents contained in this solicitation or the contract resulting from this solicitation shall only be made upon receipt of prior written consent of the County.

13. LAWS AND REGULATIONS:

The Bidder's attention is directed to the fact that all applicable Federal and State laws, municipal and County ordinances, and the rules and regulations of all authorities having jurisdiction over any part of the project shall apply to the solicitation and Contract throughout, and they will be deemed to be included in the solicitation/Contract the same as though herein written.

14. REQUIRED DISCLOSURE:

Bidder shall disclose all material facts with its bid submission pertaining to any felony conviction or any pending felony charges in the last three (3) years anywhere in the United States against (i) Bidder, (ii) any business entity related to or affiliated with Bidder, or (iii) any present or former executive employee, officer, director, stockholder, partner or owner of Bidder or of any such related or affiliated entity. This disclosure shall not apply to any person or entity who is a stockholder, owning less than 20% of the outstanding shares of a Bidder whose stock is publicly owned and traded.

The Bidder shall also disclose any civil conviction or pending civil litigation involving Contract performance during the last three (3) years anywhere in the United States against the Bidder, or against any business controlled by or affiliated with Bidder.

The Board of County Commissioners may reject, at its sole discretion, any Bidder the Commission finds to lack, or whose present or former executive employees, officers, directors, stockholders, partners or owners are found by the Commission to lack honesty, integrity, or moral responsibility. The Commission's finding may be based on the disclosure required herein, the County's own investigation, public records, or any other reliable source of information. The Commission may also reject any Bidder failing to make the disclosure required herein. By submitting a bid, Bidder recognizes and accepts that the Board of County Commissioners may reject any bid at its sole discretion and the Bidder waives any claim it might have for damages or other relief arising from the rejection of its bid or resulting directly or indirectly from the rejection of its bid based on these grounds or from the disclosure of any pertinent information relating to the reasons for rejection of its bid.

15. EXECUTION OF WRITTEN CONTRACT:

The successful Bidder will be required to sign a written Contract which has been made a part of this bid package and identified as the Contract. Said written Contract will evidence in written form the agreement between the parties pursuant to the award having been theretofore made by the County to this Bidder; said signing to be accomplished within ten (10) days after receipt of Notice of Award.

The County will issue an "Official Notice to Proceed" on the project within ninety (90) days after contract award. In the event the Official Notice to Proceed has not been issued by the County within the 90-day period above, the Contractor shall have the option to rescind the Contract or continue with the Contract as originally bid.

16. LICENSING REQUIREMENTS:

The following licensing requirements shall apply when the applicable Florida statute mandates specific licensing for Contractors engaged in the type of work covered by this solicitation.

- a. State of Florida, Department of Professional Regulation, Construction Industries Licensing Board and licensed by other federal, state, regional, county or municipal agencies having jurisdiction over the specified construction work.
- b. Said licenses shall be in the Bidder's name as it appears on the Official Bid Form. Bidder shall supply appropriate license numbers, with expiration dates, as part of their bid. Failure to hold and provide proof of proper licensing, certification and registration may be grounds for rejection of the bid.
- c. Bidder shall provide copies of all applicable licenses with their Bid Proposal.
- d. Subcontractors contracted by the Prime Contractor shall be licensed in their respective fields to obtain construction permits from the County. Said license must be in the name of the subcontractor listed on Attachment C, Subcontractor/Supplier Page, herein.

17. SECURITY FORFEITURE:

When bid security has been required (Part C, Section 2, Paragraph h.): If, within ten (10) days after issuance of Notice of Award of a Contract, the successful Bidder refuses or otherwise neglects to execute the required written Contract and fails to furnish the required Performance Bond and Payment Bond, the amount of the Bidder's bid security (Cashier's Check or Bid Bond) shall be forfeited and the same shall be retained by the County. No plea of mistake in the bid or misunderstanding of the conditions of forfeiture shall be available to the Bidder for the recovery of his bid security or as a defense to any action.

18. PERFORMANCE BONDS AND PAYMENT BONDS:

When the contract amount exceeds \$100,000 a Payment Bond and a Performance Bond issued in a sum equal to one hundred (100%) percent of the total awarded Contract amount by a Surety company considered satisfactory by the County according to the criteria in Section 19 will be required from the successful Bidder for purposes of protecting the County from lawsuits for non-payment of debts as might be incurred during the successful Bidder's performance under such Contract, and insuring the faithful performance of the obligations imposed by the resulting Contract. The Payment Bond and the Performance Bond forms are included in the Contract Documents and said forms must be properly executed by the Surety Company and successful Bidder within ten (10) days after receipt of notification from the County of its award of the Contract. Awarded Bidders shall record bonds in the public records as required by Florida State Statutes, Chapter 255.05.

19. QUALIFICATIONS OF SURETY COMPANIES:

In order to be **ACCEPTABLE** to the County, the Surety company issuing **the Bid Bond, the Performance Bond and the Payment Bond**, as called for in this Invitation for Bids, shall meet and comply with the following minimum standards:

- a. Surety must be admitted to do business in the State of Florida and shall comply with the provisions of Florida Statute 255.05.
- b. Surety must be listed on the U.S. Department of Treasury Fiscal Service, Bureau of Government Financial Operations, Federal Register, Part V, latest revision, entitled: "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies".
- c. All bonds shall be originals and issued or countersigned by a producing agent with satisfactory evidence of the authority of the person or persons executing such bond shall be submitted with the bond. Attorneys-in-fact who sign bonds or other Surety instruments must attach with each bond or Surety instrument a signed, certified and effectively dated copy of their power of attorney. Agents of Surety companies must list their name, address and telephone number on all bonds.
- d. The life of the bonds shall extend twelve (12) months beyond the date of Final Completion and shall contain a waiver of alteration to the terms of the Contract, extensions of time and/or forbearance on the part of the County.
- e. **Surety must have financial standing having a rating from A.M. Best Company (or other equivalent rating company) equal to or better than A- Class VI.**
- f. Should the Bid, Payment and Performance Bonds be issued by co-sureties, each surety listed on the bond shall meet the requirements in paragraphs a. – e. above. In addition, each surety shall submit a power of attorney and all signatures of the co-sureties representatives shall be notarized. The "lead" surety shall be identified for the purposes of underwriting and claims management.

FAILURE TO MEET ANY OF THE REQUIREMENTS CONTAINED ABOVE SHALL RESULT IN REJECTION OF THE BID.

20. TRENCH SAFETY ACT:

Pursuant to Chapter 90-96 (CS/SB 2626), Laws of Florida, "Trench Safety Act", any person submitting a bid/proposal is required to complete the form entitled: COMPLIANCE WITH FLORIDA TRENCH SAFETY ACT (90-96, LAWS OF FLORIDA), if applicable, and return the form with the Official Bid Form, (Part D, Attachment D). This is not a pay item. The purpose of this form is to gather information on the costs associated with trench safety measures and to insure that the bidder has considered these costs and included them in the Base Bid. Failure to complete this form may result in the Bid being declared non-responsive.

21. DRUG-FREE WORKPLACE FORM:

The Drug-Free Workplace Form is attached in Part E and shall be completed and submitted with your bid.

22. BID TABULATION AND RECOMMENDED AWARD:

Bid files may be examined during normal working hours, thirty (30) days after bid opening, or upon recommendation for award, whichever occurs first. Bidders desiring to view these documents are urged to schedule an appointment. For information concerning this bid, please contact the Procurement Division at the address listed above or by calling (407) 836-5635. Please specify the bid number for which you are inquiring. Bid opening results will be available at <http://apps.ocfl.net/orangebids/bidresults/results.asp>. Unsuccessful bidders will not be notified, unless a request is submitted in accordance with this paragraph.

23. INDEMNIFICATION FOR TORT ACTIONS/LIMITATION OF LIABILITY:

The provisions of Florida Statute 768.28 applicable to Orange County, Florida apply in full to this Contract. Any legal actions to recover monetary damages in tort for injury or loss of property, personal injury, or death caused by the negligent or wrongful act or omission of any employee of the County acting within the scope of his/her office or employment are subject to the limitations specified in this statute. No officer, employee or agent of the County acting within the scope of his/her employment or function shall be held personally liable in tort or named as a defendant in any action for any or damage suffered as a result of any act, event, or failure to act.

The County shall not be liable in tort for the acts or omissions of an officer, employee, or agent committed while acting outside the course and scope of his/her employment. This exclusion includes actions committed in bad faith or with malicious purpose, or in a manner exhibiting wanton and willful disregard of human rights, safety, or property.

24. OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.):

In instances where such is applicable due to the nature of the bid matter with which this bid package is concerned, all material, equipment, etc., as proposed and offered by Bidders must meet and conform to all O.S.H.A. requirements; the Bidder's signature upon the bid proposal form (Part D) being by this reference considered a certification of such fact.

25. PUBLIC ENTITY CRIME STATEMENT (FS 287.133):

A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a Contract to provide any goods or services to a public entity, may not submit a bid on a Contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a Contractor, supplier, subcontractor, or any entity in excess of the threshold amount provided in Florida State Statutes Section 287.017 for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.

26. SUBCONTRACTOR/SUPPLIER INFORMATION:

If maximum M/WBE participation is desired bidders must list all proposed subcontractors and suppliers to be used, regardless of racial or gender grouping, to include names, addresses, phone numbers, type of work subcontracted (trade or commodity), dollar amount of work, and the M/WBE designation or Majority (Non-M/WBE) owned company. Attachment C-2 is provided for this information. Contractor shall not change any subcontractors without just cause and approval by the County.

27. SUBCONTRACTOR'S PAST PERFORMANCE:

Bidder is responsible for verifying subcontractor's satisfactory performance on previous Orange County projects. Failure to do so may impact Bidder's responsibility determination.

28. REFERENCES:

Bidder should supply (using the forms enclosed) a list of at least three (3) similar projects successfully completed **by the Bidder, as a Prime Contractor**. "Similar projects" for the purpose of this Invitation for Bid has been defined as a project which construction has been successfully completed within the last ten (10) years, and collectively among all projects submitted, shall include the following:

Landfill construction project where the Bidder acted as the General Contractor (GC) for the Contract and successfully managed a project involving geosynthetic materials and a stormwater management system. The project must include the installation of a minimum 500,000 square feet of geomembrane.

Multi-disciplined construction project where the Bidder acted as the General Contractor (GC) for the Contract and successfully managed a project involving land clearing, earthwork, dewatering, excavation, stormwater management facilities and site improvements with a minimum hard construction cost of \$5,000,000.

EACH SIMILAR PROJECT LISTED SHALL BE LISTED WITH COMPLETE INFORMATION AS SPECIFICALLY PROVIDED ON THE REFERENCE FORM (ATTACHMENT E). THE SPECIFIC INFORMATION ON REFERENCES MUST BE PROVIDED ON THE REFERENCE FORM. DO NOT ATTACH LISTINGS OF REFERENCE INFORMATION. FAILURE TO PROVIDE REFERENCE INFORMATION AS REQUESTED MAY RESULT IN THE REJECTION OF YOUR BID.

The determination of whether a bidder is responsible or not shall be at the sole discretion of the County. Although the County may request submission of a minimum number of similar projects for evaluation, the County's determination of a bidder's responsibility shall not be solely based on the number of similar projects submitted.

The contact person listed as a reference shall be someone who has personal knowledge of the Bidder's performance during the referenced project. Contact persons must have been informed that they are being used as a reference and that the County will be calling or emailing them.

29. BID AND RELATED COSTS:

By submission of a bid, the Bidder agrees that all costs associated with the preparation of his/her bid will be the sole responsibility of the Bidder. The Bidder also agrees that the County bears no responsibility for any costs associated with the preparation of the bid and/or any administrative or judicial proceedings resulting from the solicitation process.

30. SOLICITATION CANCELLATIONS

Orange County reserves the right, and the Manager of the Procurement Division, has the absolute and sole discretion to cancel a solicitation at any time prior to approval of the award by the Board of County Commissioners when such approval is required. The decision to cancel a solicitation cannot be the basis for a protest pursuant to the Orange County Code.

31. LICENSES/PERMITS/FEES:

The Orange County Government Fee Directory, incorporated herein by reference, contains a list of licenses, permits and fees that may apply to this project.

The fee directory link, "Fees" is available at:

<http://www.orangecountyfl.net/portals/0/resource%20library/open%20government/FeeDirectory.pdf>

Bidders shall review all applicable licenses, permits and fees and contact the applicable agency if there are any questions.

32. BID ACCEPTANCE PERIOD

Any bid submitted in response to this Invitation for Bids shall remain in effect for a period of 90 days after bid opening. Upon request of the County, the bidder at its sole option may extend this period.

33. EQUAL OPPORTUNITY

It is hereby declared that equal opportunity and nondiscrimination shall be the County's policy intended to assure equal opportunities to every person, regardless of race, religion, sex, sexual orientation and gender expression/identity, color, age, disability or national origin, in securing or holding employment in a field of work or labor for which the person is qualified, as provided by Section 17-314 of the Orange County Code and the County Administrative Regulations.

Further, the awarded Contractor shall abide by the following provisions:

- (a) The awarded Contractor shall represent that awarded Contractor has adopted and maintains a policy of nondiscrimination as defined by applicable County ordinance throughout the term of this contract.
- (b) The awarded Contractor shall allow reasonable access to all business and employment records for the purpose of ascertaining compliance with the nondiscrimination provision of the contract.
- (c) The provisions of the prime contract shall be incorporated by the awarded Contractor into the contracts of any applicable subcontractors.

34. ETHICS COMPLIANCE

The following forms are included in this solicitation as attachments F and G and shall be completed and submitted as indicated below:

- a. Orange County Specific Project Expenditure Report -The purpose of this form is to document any expenses incurred by a lobbyist for the purposes described in Section 2-351, Orange County Code.

This form shall be completed and submitted with any bid, proposal or other response to an Orange County solicitation. The bidder, proposer or responder to the solicitation shall not be awarded a contract unless this form has been completed and submitted. Any questions concerning this form shall be addressed to the senior contract administrator for this solicitation.

- b. **Relationship Disclosure Form – The purpose of this form is to document any relationships between a bidder, proposer or responder to an Orange County solicitation and the Mayor or any other member of the Orange County Board of County Commissioners.** This form shall be completed and submitted with the applicable bid, proposal or response to an Orange County solicitation.

No contract award will be made unless this form has been completed and submitted. Any questions concerning this form shall be addressed to the senior contract administrator identified in this solicitation. Also, a listing of the most frequently asked questions concerning this form is attached for your information.

35. TOBACCO FREE CAMPUS

All Orange County operations under the Board of County Commissioners shall be tobacco free. This policy shall apply to parking lots, parks, break areas and worksites. It is also applicable to contractors and their personnel during contract performance on county-owned property. Tobacco is defined as tobacco products including, but not limited to, cigars, cigarettes, e-cigarettes, pipes, chewing tobacco and snuff. Failure to abide by this policy may result in civil penalties levied under Chapter 386, Florida Statutes and/or contract enforcement remedies.

36. VERIFICATION OF EMPLOYMENT STATUS

Prior to the employment of any person under this contract, the Contractor shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the Contractor during the contract term, and an express requirement that Contractors include in such subcontracts the requirement that subcontractors performing work or providing services pursuant to the state contract utilize the E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the contract term. For more information on this process, please refer to United States Citizenship and Immigration Service site at:

<http://www.uscis.gov/portal/site/uscis>.

Only those employees determined eligible to work within the United States shall be employed under this contract.

By submission of a bid in response to this solicitation, the Contractor affirms that all employees in the above categories shall undergo e-verification before placement on this contract. The Contractor shall commit to comply with this requirement by completing the E-Verification certification, attached to this solicitation.

37. PROPRIETARY INFORMATION

In accordance with Chapter 119 of the Florida Statutes (Public Records Law), and except as may be provided by other applicable State or Federal Law, all proposers should be aware that Request for Proposals or Invitation for Bids and the responses thereto are in the public domain. **Proposers must identify specifically** any information contained in their response which they consider confidential and/or proprietary and which they believe to be exempt from disclosure, **citing specifically the applicable exempting law.**

IFB NO. Y15-788-J2

ISSUED: June 18, 2015

OFFICIAL BID FORM
FOR
SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1
SEQUENTIAL CLOSURE

Mail or Hand Deliver
ORIGINAL BID FORM AND THREE (3) COMPLETE COPIES
BY 2:00 PM - July 30, 2015

To:
BOARD OF COUNTY COMMISSIONERS
ORANGE COUNTY, FLORIDA
INTERNAL OPERATIONS CENTRE II
PROCUREMENT DIVISION
400 E. SOUTH STREET – 2nd FLOOR
ORLANDO, FLORIDA 32801

Bid Opening:
July 30, 2015, - 2:00 PM

INTERNAL OPERATIONS CENTRE II
PROCUREMENT DIVISION CONFERENCE ROOM, 2nd FLOOR
ORLANDO, FLORIDA

COMPANY NAME

COMPLETE MAILING ADDRESS

CITY, COUNTY, STATE, ZIP CODE

TELEPHONE NUMBER	FAX NUMBER
CONTACT PERSON	E-MAIL ADDRESS

TIN#: _____

NOTE: COMPANY NAME MUST MATCH LEGAL NAME ASSIGNED TO TIN NUMBER. CURRENT W9 MUST BE SUBMITTED WITH BID/PROPOSAL

PART D

**To the Board of County Commissioners
Orange County, Florida**

The Undersigned, hereinafter called "Bidder", having visited the site of the proposed project and familiarized himself with the local conditions, nature and extent of the work, and having examined carefully the Contract Form, General Conditions, Supplementary Conditions, Plans and Specifications and other Contract Documents, with the Bond requirements herein, proposes to furnish all labor, materials, equipment and other items, facilities and services for the proper execution and completion of: **SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1 SEQUENTIAL CLOSURE** in full accordance with the drawings and specifications prepared in accordance with the Contract Documents and, if awarded the Contract, to complete the said work within the time limits specified for the following LUMP SUM BID.

The Bidder agrees to furnish all labor, materials, equipment, and other items, facilities, services, and incidentals for proper execution and completion of the Work as shown on the Drawings and described in the Specifications in accordance with the Contract Documents and other requirements, based on the Bidder's own estimated quantities, costs, site conditions, and local conditions and all other considerations for the following Lump Sum:

**1.0 LUMP SUM "Base Bid, Part A" – Cell 9-12 Class I Landfill
Phase-1 Sequential Closure** \$ _____

2.0 LUMP SUM "Base Bid, Part B"

<u>REF. NO.</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>EXTENDED PRICE</u>
2.1	Solid Waste Grading	80,000	CY	\$ _____	\$ _____
2.2	Primary Liner Repair/Replacement	5,000	SF	\$ _____	\$ _____
2.3	Installation of Additional 40-mil Geomembrane	100,000	SF	\$ _____	\$ _____
2.4	Modification of Condensate Pump Station	7	EA	\$ _____	\$ _____

Subtotal, Base Bid, "Part B" (Items 2.1 through 2.4): \$ _____

TOTAL LUMP SUM BID (Total of Part A, Item 1.0, plus total of Part B, Items 2.1 – 2.4):

(In Words)

\$ _____

Additive Bid Items:

ADDITIVE OPTION NO. 1 (SEE SECTION 01025)

<u>REF. NO.</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>EXTENDED TOTAL</u>
Add-1	Granular Fill from <u>OFF-SITE</u> sources, Haul, Placing, Grading, and Compaction in-place	200,000	CY	\$ _____	\$ _____

ADDITIVE OPTION NO. 2 (SEE SECTION 01025)

<u>REF. NO.</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>EXTENDED TOTAL</u>
Add-2	Granular Fill from <u>ON-SITE</u> sources, Haul, Placing, Grading, and Compaction in-place	200,000	CY	\$ _____	\$ _____

In the event the Contract is awarded to this Bidder, he/she will enter into a formal written agreement with the County in accordance with the accepted bid within ten (10) calendar days after said Contract is submitted to him/her and will furnish to the County a Contract Payment and Performance Bond with good and sufficient sureties, satisfactory to the County, in the amount of 100% of the accepted bid. The Bidder further agrees that in the event of the Bidder's default or breach of any of the agreements of this proposal, the said bid deposit shall be forfeited as liquidated damages.

Failure of the Bidder to provide pricing for all unit priced items and/or the Base Bid and ALL requested additive/deductive bid items, or alternate bids shall be cause for rejection of the bid as non-responsive.

The Bidder hereby agrees that there is attached:

- | | | | |
|-----|---|-----|-------------|
| 1. | Non-Collusion Affidavit, Attachment A | Yes | ___ |
| 2. | Required Disclosure, Attachment B | Yes | ___ |
| 3. | M/WBE Forms | | |
| | Employment Data, Attachment C-1 | Yes | ___ |
| | Subcontractor/Supplier Page, Attachment C-2 | Yes | ___ |
| | M/WBE Survey, Attachment C-4 | Yes | ___ |
| | Good Faith Effort, Attachment C-5 | Yes | ___ No ___ |
| 4. | Trench Safety Act Form, Attachment D | Yes | ___ N/A ___ |
| 5. | Drug-Free workplace Form | Yes | ___ |
| 6. | Bid Bond on Form in Exhibit 1 or Cashier's Check
(10% of Base Bid) | Yes | ___ N/A ___ |
| 7. | Original Bid Form (marked "Original") & 3
complete copies with all attachments | Yes | ___ |
| 8. | References, Attachment E | Yes | ___ |
| 9. | Licenses | Yes | ___ N/A ___ |
| 10. | Current W9 | Yes | ___ |
| 11. | Project Expenditure Report, Attachment F | Yes | ___ |
| 12. | Relationship Disclosure Form, Attachment G | Yes | ___ |
| 13. | Verification of Employment Status, Attachment H | Yes | ___ |

ACKNOWLEDGEMENT OF ADDENDA

The Bidder shall acknowledge receipt of any addenda issued to the solicitation by completing the blocks below or by completion of the applicable information on the addendum and returning it not later than the date and time for receipt of the bid. Failure to acknowledge an addendum that has a material impact on the solicitation may negatively impact the responsiveness of your bid. Material impacts include but are not limited to changes to specifications, delivery time, performance period, quantities, bonds, letters of credit, insurance, qualifications, etc.

Addendum No. _____ Dated _____ Addendum No. _____ Dated _____

Addendum No. _____ Dated _____ Addendum No. _____ Dated _____

If awarded this construction Contract, the Bidder agrees to complete the work covered by this Contract as follows:

1. Work shall start at the project site within fourteen (14) days of the effective date of the Notice to Proceed.
2. Substantially complete in **300** consecutive calendar days from date of Official Notice to Proceed.
3. Final completion in **360** consecutive calendar days from date of Official Notice to Proceed.
4. Should the Successful Bidder fail to complete work as specified, the liquidated damage clause will apply (Part E, Contract).

The Bidder hereby agrees that the County reserves the right to waive informalities in any bid and to reject any or all bids, or to accept any bid that in its judgment will be for the best interest of the County.

FLORIDA CONSTRUCTION INDUSTRIES LICENSING BOARD CERTIFICATION:

(NAME OF HOLDER) (CERTIFICATE NO.)

(SIGNATURE OF BIDDER) (CERTIFICATE EXPIRATION DATE)

(NAME TYPED)

IDENTIFICATION OF BUSINESS ORGANIZATION

Complete and submit the following information:

Type of Organization

{ } Sole Proprietorship { } Partnership

{ } Joint Venture { } Corporation

State of Incorporation: _____

Principal Place of Business (Florida Statute Chapter 607):
_____ City/County/State

THE PRINCIPAL PLACE OF BUSINESS SHALL BE THE ADDRESS OF THE BIDDER'S PRINCIPAL OFFICE AS IDENTIFIED BY THE FLORIDA DIVISION OF CORPORATIONS

AUTHORIZED SIGNATORIES/NEGOTIATORS

The bidder or proposer represents that the following principals are authorized to sign and/or negotiate Contracts and related documents to which the bidder or proposer will be duly bound. Principal is defined as an employee, officer or other technical or professional in a position capable of substantially influencing the development or outcome of an activity required to perform the covered transaction.

Name	Title	Telephone Number	E-Mail Address
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

IN WITNESS WHEREOF, THE BIDDER HAS HEREUNTO SET HIS SIGNATURE AND AFFIXED HIS SEAL THIS DAY OF _____, A.D. 20__.

BY _____ (SEAL)

TITLE: _____

PRINT NAME AND TITLE _____

FEDERAL I.D.# _____

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NON-COLLUSION AFFIDAVIT

The undersigned being first duly sworn as provided by law, deposes and says:

1. This Affidavit is made with the knowledge and intent that it is to be filed with the Board of County Commissioners, Orange County, Florida and that it will be relied upon by said County, in any consideration which may give to and any action which it may take with respect to this Proposal.

2. The undersigned is authorized to make this Affidavit on behalf of,

(Name of Corporation, Partnership, Individual, etc.)

A _____, formed under the laws of _____ of which he is

(Sole Owner, Partner, President, etc.)

3. Neither the undersigned nor any other person, firm or corporation named in above Paragraph 2, nor anyone else to the knowledge of the undersigned, have themselves solicited or employed anyone else to solicit favorable action for this Proposal by the County, also that no head of any department or employee therein, or any officer of Orange County, Florida is directly interested therein.

4. This Proposal is genuine and not collusive or a sham; the person, firm or corporation named above in Paragraph 2 has not colluded, conspired, connived or agreed directly or indirectly with any bidder or person, firm or corporation, to put in a sham Proposal, or that such other person, firm or corporation, shall refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference with any person, firm or corporation, to fix the prices of said proposal or proposals of any other bidder; and all statements contained in the proposal or proposals described above are true; and further, neither the undersigned, nor the person, firm or corporation named above in Paragraph 3, has directly or indirectly submitted said proposal or the contents thereof, or divulged information or data relative thereto, to any association or to any member or agent thereof.

(AFFIANT)

TAKEN, SWORN AND SUBSCRIBED TO BEFORE ME this ____ day of _____, 20__.

Notary Public (SEAL)

(Print, Type or Stamp Commissioned Name of Notary Public)

Personally Known _____ or Produced Identification _____ Type of Identification: _____

REQUIRED DISCLOSURE

The following Disclosure is of all material facts pertaining to any felony or civil conviction or any pending felony or civil charges in the last three (3) years in this State or any other State of the United States against 1) Bidder, 2) any business entity related to or affiliated with bidder, or 3) any present or former executive employee, officer, director, stockholder, partner or owner of bidder or of any such related or affiliated entity. This Disclosure shall not apply to any person or entity which is only a stockholder, which person or entity owns twenty percent (20) or less of the outstanding shares of a bidder whose stock is publicly owned and traded.

BIDDER

IFB/RFP Number & Title: _____

EMPLOYMENT DATA, SCHEDULE OF MINORITIES AND WOMEN (Rev. 1/99)

Please provide the following data pertaining to your workforce. If you have an Orange County workforce, it should be shown. If you do not have an Orange County workforce, total permanent workforce should be shown. If this is a Joint Venture, employment data shall be furnished for each firm composing the joint venture. It is mandatory that you provide workforce data. Failure to provide this form with your bid/proposals may be cause for rejection of your bid/proposal.

JOB CATEGORIES	MAJORITY		MINORITY MALES				MINORITY FEMALES				TOTAL
	White Male	White Female	Black	Hispanic	American Indian	Asian American	Black	Hispanic	American Indian	Asian American	
Officials, Mgrs. Supervisors											
Professionals											
Technicians											
Sales Workers											
Office and Clerical											
Craftsman (Skilled)											
Operatives (Semi-Skilled)											
Laborers (Unskilled)											
Service Workers											
Apprentices											
Interns/Co-Ops											
Wages to Work Employees											
TOTAL											
Changes Since Last Report											

The above reflects (Check One): _____ Orange County Workforce _____ Total Permanent Workforce (Outside Orange County)
 For Construction Projects Only: Do you intend to hire new employees for the project? ___ Yes ___ No If yes, how many approximately? _____

Name of Firm _____ Period of Report _____ No. of Years in Business in Orange County _____

Form Completed by _____
 Name/Title (Printed or Typed) _____ Signature _____

Form Approved by _____
 Name/Title (Printed or Typed) _____ Signature _____

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PRIME CONTRACTOR/SUBCONTRACTOR/SUPPLIER INFORMATION

If maximum M/WBE participation is desired, bidders must list **all** proposed Subcontractors **and suppliers** to be used. Provide company names; contacts, addresses, phone numbers; work to be performed with the Contractor's own workforce, including estimated dollar amount allocated for that work (work that is consistently and historically performed in-house); total amount to be paid to this sub/supplier (do not discount supply dollars); and M/WBE designation or if non-M/WBE (Majority). See Instructions to Bidders, Part C, for complete M/WBE requirements. Provide **all** information requested. Use additional sheets if necessary. Failure to provide all of the information requested may negatively impact the M/WBE evaluation.

1. What is the estimated percent of work that the Prime Contractor will self-perform? _____%
List these areas below with approximate dollar amounts to be allocated for the work.

2. Is all work (whether to be subbed or self-performed) listed below? Yes ____ No ____
Are all material suppliers listed? Yes ____ No ____
If no, please explain. _____

3. Is your firm certified through Orange County as an M/WBE? Yes ____ No ____
(See Part C for specific requirements for certified M/WBE firms)

4. Is your firm registered through Orange County as a Service Disabled-Veteran (SDV)? Yes ____ No ____

5. Did you include any M/WBE credits- First Time Utilization (FTU) or Non-County Utilization (NC) with this bid? (If so, insert copy of credit Yes ____ No ____
(If so, insert copy of credit and specify credit type below)

O.C. CERTIFIED

<u>COMPANY NAME, CONTACT ADDRESS, PHONE NUMBER</u>	<u>WORK TO BE PERFORMED (TRADE) OR COMMODITY TO BE SUPPLIED</u>	<u>DOLLAR AMOUNT</u>	<u>M/WBE or Non-M/WBE; or SDV; or TYPE OF M/WBE CREDIT-FTU or NC</u>
1 _____ _____ _____	<u>Sub / Supplier / In-house (Circle One)</u> _____ _____	_____ _____	_____ _____
2 _____ _____ _____	<u>Sub / Supplier / In-house (Circle One)</u> _____ _____	_____ _____	_____ _____
3 _____ _____ _____	<u>Sub / Supplier / In-house (Circle One)</u> _____ _____	_____ _____	_____ _____

Signature of Bidder

Title

PRIME CONTRACTOR/SUBCONTRACTOR/SUPPLIER INFORMATION

<u>COMPANY NAME, CONTACT ADDRESS, PHONE NUMBER</u>	<u>WORK TO BE PERFORMED (TRADE) OR COMMODITY TO BE SUPPLIED</u>	<u>DOLLAR AMOUNT</u>	<u>O.C. CERTIFIED M/WBE or Non-MWBE; or SDV; or TYPE OF M/WBE CREDIT-FTU or NC</u>
4 _____ _____ _____	<u>Sub/Supplier/In-house (Circle One)</u> _____ _____	_____	_____
5 _____ _____ _____	<u>Sub/Supplier/In-house (Circle One)</u> _____ _____	_____	_____
6 _____ _____ _____	<u>Sub/Supplier/In-house (Circle One)</u> _____ _____	_____	_____
7 _____ _____ _____	<u>Sub/Supplier/In-house (Circle One)</u> _____ _____	_____	_____
8 _____ _____ _____	<u>Sub/Supplier/In-house (Circle One)</u> _____ _____	_____	_____
9 _____ _____ _____	<u>Sub/Supplier/In-house (Circle One)</u> _____ _____	_____	_____
10 _____ _____ _____	<u>Sub/Supplier/In-house (Circle One)</u> _____ _____	_____	_____
11 _____ _____ _____	<u>Sub/Supplier/In-house (Circle One)</u> _____ _____	_____	_____

Signature of Bidder

Title

INSTRUCTIONS Contractor shall place the following on their letterhead, executed by their authorized agent. Letter is to be submitted **before 5:00 PM on the second business day (i.e., if bid opens on Thursday, due on Monday before 5:00 PM)** after bid opening to: Orange County Business Development Division; 400 E. South Street; 2nd Floor, Orlando, FL 32801; Fax Number (407) 836-5477. A Letter of Intent is to be executed with all M/WBE Subcontractors and suppliers listed by the Contractor on the Subcontractor/Supplier page submitted with this bid. Any M/WBE's not listed on Subcontractor/Supplier page for this bid will not be accepted. Failure to submit this form within the required time frame may result in the bid being found non-responsive.

**LETTER OF INTENT
(VERIFICATION M/WBE UTILIZATION)**

IFB # _____ **PROJECT TITLE** _____

I, _____, (Prime Contractor) have entered into an agreement with the following Minority/Women-owned Business Enterprise to do the work shown on Attachment C-2 of the Bid Form and shown below. I understand that prior to execution of the prime Contract by Orange County, a subcontract and/or purchase order will be executed with this firm and a copy of the agreement will be sent to the Orange County Business Development Division.

SUBCONTRACTOR/SUPPLIER

SPECIFIC SCOPES OF WORK/COMMODITY

SUBCONTRACT/PURCHASE ORDER PRICE

I understand that I shall not be allowed to substitute or change Subcontractors, without the express prior approval of Orange County's Project Manager and the Business Development Division. Such approval shall in no way relieve my obligations pursuant to Orange County's M/WBE requirements and goals contained in the Orange County Minority/Women Business Enterprise Ordinance, Orange County Code, Chapter 17, Article III, Division 4.

Under penalty of perjury, I declare that I have read the foregoing and the facts stated in it are true. False statements may result in criminal prosecution for a felony of the third degree as provided for in Section 92.525(3), Florida Statutes.

Authorized Agent of Prime Contractor

Authorized Agent, Subcontractor/Supplier

Printed Name & Title

Printed Name & Title

Date: _____

Date: _____

Phone Number

Fax Number

INSTRUCTIONS Contractor shall place the following on their letterhead, executed by their authorized agent. Letter is to be submitted **before 5:00 PM on the second business day (i.e., if bid opens on Thursday , due on Monday before 5:00 PM)** after bid opening to: Orange County Business Development Division; 400 E. South Street; 2nd Floor, Orlando, FL 32801; Fax Number (407) 836-5477. A Letter of Intent is to be executed with all **SDV** Subcontractors and suppliers listed by the Contractor on the Subcontractor/Supplier page submitted with this bid. Any **SDV's** not listed on Subcontractor/Supplier page for this bid will not be accepted. Failure to submit this form within the required time frame may result in the bid being found non-responsive.

**LETTER OF INTENT
(VERIFICATION OF SERVICE-DISABLED VETERAN UTILIZATION)**

IFB # _____ PROJECT TITLE _____

I, _____,(Prime Contractor) have entered into an agreement with the following Service-Disabled Veteran Business to do the work shown on Attachment C-2 of the Bid Form and shown below (contingent upon award of the prime contract to our company). I understand that prior to execution of the prime Contract by Orange County, a subcontract and/or purchase order will be executed with this firm and a copy of the agreement will be sent to the Orange County Business Development Division.

SDV SUBCONTRACTOR/SUPPLIER

SPECIFIC SCOPES OF WORK/COMMODITY

SUBCONTRACT/PURCHASE ORDER PRICE

I understand that I shall not be allowed to substitute or change Subcontractors, without the express prior approval of Orange County's Project Manager and the Business Development Division. Such approval shall in no way relieve my obligations pursuant to Orange County's Service-Disable Veteran Business Program requirements contained in the Orange County Ordinance, Orange County Code, Chapter 17, Article III, Division 5.

Under penalty of perjury, I declare that I have read the foregoing and the facts stated in it are true. False statements may result in criminal prosecution for a felony of the third degree as provided for in Section 92.525(3), Florida Statutes.

Authorized Agent of Prime Contractor

Authorized Agent, Subcontractor/Supplier

Printed Name & Title

Printed Name & Title

Date: _____

Date: _____

Phone Number

Fax Number

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M/WBE Survey

Company _____ Contact Name: _____

Contact's Phone Number: _____ IFB #: _____

Please answer the following questions regarding Orange County's M/WBE Program:

1. If you failed to meet the County's M/WBE goal for this solicitation, please check reasons below:

- No M/WBE contractors/suppliers available
- Self-performing more than 75% of the work
- Self-performing 100% of the work
- Prices from M/WBE contractors/suppliers too high
- Other (please explain)

2. If checked "self performing work" in question #1, explain in detail why you propose to self perform the work and list any subcontractors you intend to use. Also, provide a detailed listing of the suppliers, items to be purchased and costs thereof:

3. When you submitted your bid without the desired M/WBE participation, were you concerned that this deficiency would cause rejection of your bid?
 Yes No

If no, why not?

4. What steps do you recommend the County take to ensure that the M/WBE goal is achieved on projects of this nature?

5. Do you support the County's M/WBE program?
 Yes No

If no, why not?

6. Do you believe you can remain competitive if you fully complied with the County's M/WBE program?
 Yes No

If no, why not?

7. Do you have any type of working relationship with M/WBE subcontractors?
Yes No

If yes, is it (check all that apply):

- Routine business only
 Only during bid solicitation
 Other (please explain)

8. Do you desire to establish a working relationship with M/WBE subcontractors?
 Yes No

9. Are you aware that you could call the Business Development Division for information or additional assistance with M/WBE participation in bid solicitations?
 Yes No

10. Please provide any additional comments:

Please note that failure to provide this information with your Bid Proposal may delay the award of the contract. Therefore, a timely response is requested. You may be contacted by staff from the Business Development Division in the near future.

GOOD FAITH EFFORT M/WBE CONTRACT LOG (See Part C, SECTION 3, Paragraph E-iii)
 (Required only if Good Faith Effort Documentation is being provided as part of this Bid)

IFB No/ Project Name

Firm's Name/Address	Contact Info: E-mail, Phone and /or fax	Scope of Work (Work to be performed/Trade/or Commodity Supplied)	Date	Name of Person Contacting Firms	Firm to Bid (Y or N)	Date & Time Quote Received	Notes

Under penalty of perjury, I declare that I have read the foregoing and the facts stated in it are true. False statements may result in criminal prosecution for a felony of the third degree as provided for in Section 92.525 (3), Florida Statutes. I,

_____, (Signature off Authorized Agent),
 _____ / _____ / _____ (Printed Name, Title, and Date)

COMPLIANCE WITH FLORIDA TRENCH SAFETY ACT (90-96, LAWS OF FLORIDA)

Bidder hereby acknowledges that all costs for complying with the Florida Trench Safety Act are included in the various items of the Total Estimated Base Bid or Lump Sum Bid. For informational purposes only, the Bidder is required to further identify these costs in the summary below.

TRENCH SAFETY MEASURE (DESCRIPTION)	UNIT OF MEASURE (LF, SY)	UNIT (QUANTITY)	UNIT COST	EXTENDED COST
A) _____	_____	_____	\$ _____	\$ _____
B) _____	_____	_____	\$ _____	\$ _____
C) _____	_____	_____	\$ _____	\$ _____
D) _____	_____	_____	\$ _____	\$ _____
			TOTAL	\$ _____

SIGNED: _____

TITLE: _____

THIS IS NOT A PAY ITEM: The purpose of this form is to gather information on the costs associated with trench safety measures and to insure that the Bidder has considered these costs and included them in the Total Estimated Base Bid or Lump Sum Bid. Contractor will not receive additional payment if actual quantities differ from those estimated or if the Contractor uses a safety measure different than those listed.

(Failure to complete this form may result in the Bid being declared non-responsive.)

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REFERENCES:

Bidder should supply (using the forms enclosed) a list of at least three (3) similar projects successfully completed **by the Bidder, as a Prime Contractor**. "Similar projects" for the purpose of this Invitation for Bid has been defined as a project which construction has been successfully completed within the last ten (10) years, and collectively among all projects submitted, shall include the following:

- A landfill construction project where the Bidder acted as the General Contractor (GC) for the Contract and successfully managed a project involving geosynthetic materials and a stormwater management system. The project must include the installation of a minimum 500,000 square feet of geomembrane.
- A multi-disciplined construction project where the Bidder acted as the General Contractor (GC) for the Contract and successfully managed a project involving land clearing, earthwork, dewatering, excavation, stormwater management facilities and site improvements with a minimum hard construction cost of \$5,000,000.

The determination of whether a bidder is responsible or not shall be at the sole discretion of the County. Although the County may request submission of a minimum number of similar projects for evaluation, the County's determination of a bidder's responsibility shall not be solely based on the number of similar projects submitted.

The contact person listed as a reference shall be someone who has personal knowledge of the Bidder's performance during the referenced project. Contact persons must have been informed that they are being used as a reference and that the County will be calling or emailing them.

1. Project Name _____
Owner _____
Contact _____
Address _____

Telephone Number/Email Address _____
Contract Number and Amount # _____ \$ _____
Change Orders \$ _____
Final Contract \$ _____
Completed on Schedule? Yes ___ No ___ Date: _____
Project Description _____

2. Project Name _____
Owner _____
Contact _____
Address _____

Telephone Number/Email Address _____

Contract Number and Amount # _____ \$ _____

Change Orders \$ _____

Final Contract \$ _____

Completed on Schedule? Yes ___ No ___ Date: _____

Project Description _____

3. Project Name _____
Owner _____
Contact _____
Address _____

Telephone Number/Email Address _____

Contract Number and Amount # _____ \$ _____

Change Orders \$ _____

Final Contract \$ _____

Completed on Schedule? Yes ___ No ___ Date: _____

Project Description _____

4. Project Name _____
Owner _____
Contact _____
Address _____

Telephone Number/Email Address _____
Contract Number and Amount # _____ \$ _____
Change Orders \$ _____
Final Contract \$ _____
Completed on Schedule? Yes ___ No ___ Date: _____
Project Description _____

5. Project Name _____
Owner _____
Contact _____
Address _____

Telephone Number/Email Address _____
Contract Number and Amount # _____ \$ _____
Change Orders \$ _____
Final Contract \$ _____
Completed on Schedule? Yes ___ No ___ Date: _____
Project Description _____

6. Project Name _____
Owner _____
Contact _____
Address _____

Telephone Number/Email Address _____
Contract Number and Amount # _____ \$ _____
Change Orders \$ _____
Final Contract \$ _____
Completed on Schedule? Yes _____ No _____ Date: _____
Project Description _____

7. Project Name _____
Owner _____
Contact _____
Address _____

Telephone Number/Email Address _____
Contract Number and Amount # _____ \$ _____
Change Orders \$ _____
Final Contract \$ _____
Completed on Schedule? Yes _____ No _____ Date: _____
Project Description _____

For Staff Use Only:

Initially submitted on _____

Updated On _____

Specific Project Expenditure Report (Revised November 5, 2010)

For use as of March 1, 2011

SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1 SEQUENTIAL CLOSURE

Case or Bid No. **Y15-788 -J2**

ORANGE COUNTY SPECIFIC PROJECT EXPENDITURE REPORT

This lobbying expenditure form shall be completed in full and filed with all application submittals. This form shall remain cumulative and shall be filed with the department processing your application. Forms signed by a principal's authorized agent shall include an executed Agent Authorization Form.

This is the initial Form: _____

This is a Subsequent Form: _____

Part I

Please complete all of the following:

Name and Address of Principal (legal name of entity or owner per Orange County tax rolls): _____

Name and Address of Principal's Authorized Agent, if applicable: _____

List the name and address of all lobbyists, consultants, contractors, subcontractors, individuals or business entities who will assist with obtaining approval for this project. (Additional forms may be used as necessary.)

1. Name and address of individual or business entity: _____
Are they registered Lobbyist? Yes ___ or No ___
2. Name and address of individual or business entity: _____
Are they registered Lobbyist? Yes ___ or No ___
3. Name and address of individual or business entity: _____
Are they registered Lobbyist? Yes ___ or No ___
4. Name and address of individual or business entity: _____
Are they registered Lobbyist? Yes ___ or No ___
5. Name and address of individual or business entity: _____
Are they registered Lobbyist? Yes ___ or No ___
6. Name and address of individual or business entity: _____
Are they registered Lobbyist? Yes ___ or No ___
7. Name and address of individual or business entity: _____
Are they registered Lobbyist? Yes ___ or No ___
8. Name and address of individual or business entity: _____
Are they registered Lobbyist? Yes ___ or No ___

For Staff Use Only:

Initially submitted on _____

Updated On _____

Specific Project Expenditure Report (Revised November 5, 2010)

For use as of March 1, 2011

SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1 SEQUENTIAL CLOSURE

Case or Bid No. Y15-788 -J2

Company Name: _____

Part II

Expenditures:

For this report, an "expenditure" means money or anything of value given by the principal and/or his/her lobbyist for the purpose of lobbying, as defined in section 2-351, Orange County Code. This may include public relations expenditures including, but not limited to, petitions, fliers, purchase of media time, cost of print and distribution of publications. However, the term "expenditure" **does not** include:

- Contributions or expenditures reported pursuant to chapter 106, Florida Statutes;
- Federal election law, campaign-related personal services provided without compensation by individuals volunteering their time;
- Any other contribution or expenditure made by or to a political party;
- Any other contribution or expenditure made by an organization that is exempt from taxation under 26 U.S.C. s. 527 or s. 501(c)(4), in accordance with s.112.3215, Florida Statutes; and/or
- Professional fees paid to registered lobbyists associated with the project or item.

The following is a complete list of all lobbying expenditures and activities (including those of lobbyists, contractors, consultants, etc.) incurred by the principal or his/her authorized agent and expended in connection with the above-referenced project or issue. **You need not include de minimus costs (under \$50) for producing or reproducing graphics, aerial photographs, photocopies, surveys, studies or other documents related to this project.**

Date of Expenditure	Name of Party Incurring Expenditure	Description of Activity	Amount Paid
TOTAL EXPENDED THIS REPORT			\$

For Staff Use Only:

Initially submitted on _____

Updated On _____

Specific Project Expenditure Report (Revised November 5, 2010)

For use as of March 1, 2011

SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1 SEQUENTIAL CLOSURE

Case or Bid No. **Y15-788 -J2**

Company Name: _____

**Part III
ORIGINAL SIGNATURE AND NOTARIZATION REQUIRED**

I hereby certify that information provided in this specific project expenditure report is true and correct based on my knowledge and belief. I acknowledge and agree to comply with the requirement of section 2-354, of the Orange County code, to amend this specific project expenditure report for any additional expenditure(s) incurred relating to this project prior to the scheduled Board of County Commissioner meeting. I further acknowledge and agree that failure to comply with these requirements to file the specific expenditure report and all associated amendments may result in the delay of approval by the Board of County Commissioners for my project or item, any associated costs for which I shall be held responsible. In accordance with s. 837.06, Florida Statutes, I understand and acknowledge that whoever knowingly makes a false statement in writing with the intent to mislead a public servant in the performance of his or her official duty shall be guilty of a misdemeanor in the second degree, punishable as provided in s. 775.082 or s. 775.083, Florida Statutes.

Date: _____

Signature of Principal or Principal's Authorized Agent

(check appropriate box)

PRINT NAME AND TITLE: _____

STATE OF _____ :

COUNTY OF _____ :

I certify that the foregoing instrument was acknowledged before me this ____ day of _____, 20__ by _____ He/she is personally known to me or has produced _____ as identification and did/did not take an oath.

Witness my hand and official seal in the county and state stated above on the ____ day of _____, in the year _____.

Signature of Notary Public

(Notary Seal)

Notary Public for the State of _____

My Commission Expires: _____

Staff signature and date of receipt of form _____

Staff reviews as to form and does not attest to the accuracy or veracity of the information provided herein.

FREQUENTLY ASKED QUESTIONS (FAQ) ABOUT THE SPECIFIC PROJECT EXPENDITURE REPORT

Updated 3-1-11

WHAT IS A SPECIFIC PROJECT EXPENDITURE REPORT (SPR)?

A Specific Project Expenditure Report (SPR) is a report required under Section 2-354(b) of the Orange County Lobbying Ordinance, codified at Article X of Chapter 2 of the Orange County Code, reflecting all lobbying expenditures incurred by a principal and his/her authorized agent(s) and the principal's lobbyist(s), contractor(s), subcontractor(s), and consultant(s), if applicable, for certain projects or issues that will ultimately be decided by the Board of County Commissioners (BCC).

Matters specifically exempt from the SPR requirement are ministerial items, resolutions, agreements in settlement of litigation matters in which the County is a party, ordinances initiated by County staff, and some procurement items, as more fully described in 2.20 of the Administrative Regulations.

Professional fees paid by the principal to his/her lobbyist for the purpose of lobbying need not be disclosed on this form. (See Section 2-354(b), Orange County Code.)

WHO NEEDS TO FILE THE SPR?

The principal or his/her authorized agent needs to complete and sign the SPR and warrant that the information provided on the SPR is true and correct.

A principal that is a governmental entity does not need to file an SPR.

HOW ARE THE KEY RELEVANT TERMS DEFINED?

Expenditure means "a payment, distribution, loan, advance, reimbursement, deposit, or anything of value made by a lobbyist or principal for the purpose of lobbying. This may include public relations expenditures (including but not limited to petitions, flyers, purchase of media time, cost of print and distribution of publications) but does not include contributions or expenditures reported pursuant to Chapter 106, Florida Statutes, or federal election law, campaign-related personal services provided without compensation by individuals volunteering their time, any other contribution or expenditure made by or to a political party, or any other contribution or expenditure made by an organization that is exempt from taxation under 26 U.S.C. s. 527 or s. 501(c)(4)." (See Section 112.3215, Florida Statutes.) Professional fees paid by the principal to his/her lobbyist for the purpose of lobbying are not deemed to be "expenditures." (See Section 2-354, Orange County Code.)

Lobbying means seeking "to encourage the approval, disapproval, adoption, repeal, rescission, passage, defeat or modification of any ordinance, resolution, agreement, development permit, other type of permit, franchise, vendor, consultant, contractor, recommendation, decision or other foreseeable action of the [BCC]," and "include[s] all communications, regardless of whether initiated by the lobbyist or by the person being lobbied, and regardless of whether oral, written or electronic." (See Section 2-351, Orange County Code.) Furthermore, *lobbying* means communicating "directly with the County Mayor, with any other member of the [BCC], or with any member of a procurement committee." (See Section 2-351, Orange County Code.) *Lobbying* also means communicating "indirectly with the County Mayor or any other member of the [BCC]" by communicating with any staff member of the Mayor or any member of the BCC, the county administrator, any deputy or assistant county administrator, the county attorney, any county department director, or any county division manager. (See Section 2-351, Orange County Code.) *Lobbying* does not include the act of appearing before a Sunshine Committee, such as the Development Review Committee or the Roadway Agreement Committee other than the BCC.

Principal means “the person, partnership, joint venture, trust, association, corporation, governmental entity or other entity which has contracted for, employed, retained, or otherwise engaged the services of a lobbyist.” *Principal* may also include a person, partnership, joint venture, trust, association, corporation, limited liability corporation, or other entity where it or its employees do not qualify as a lobbyist under the definition set forth in Section 2-351 of the Orange County Code but do perform lobbying activities on behalf of a business in which it has a personal interest.

DOES THE SPR NEED TO BE UPDATED IF INFORMATION CHANGES?

Yes. It remains a continuing obligation of the principal or his/her authorized agent to update the SPR whenever any of the information provided on the initial form changes.

WHERE DO THE SPR AND ANY UPDATES NEED TO BE FILED?

The SPR needs to be filed with the County Department or County Division processing the application or matter. If and when an additional expenditure is incurred subsequent to the initial filing of the SPR, an amended SPR needs to be filed with the County Department or County Division where the original application, including the initial SPR, was filed.

WHEN DO THE SPR AND ANY UPDATES NEED TO BE FILED?

In most cases, the initial SPR needs to be filed with the other application forms. The SPR and any update must be filed with the appropriate County Department or County Division not less than seven (7) days prior to the BCC hearing date so that they may be incorporated into the BCC agenda packet. (See Section 2-354(b), Orange County Code.) When the matter is a discussion agenda item or is the subject of a public hearing, and any additional expenditure occurs less than 7 days prior to BCC meeting date or updated information is not included in the BCC agenda packet, the principal or his/her authorized agent is obligated to verbally present the updated information to the BCC when the agenda item is heard or the public hearing is held. When the matter is a consent agenda item and an update has not been made at least 7 days prior to the BCC meeting or the update is not included in the BCC agenda packet, the item will be pulled from the consent agenda to be considered at a future meeting.

WHO WILL BE MADE AWARE OF THE INFORMATION DISCLOSED ON THE SPR AND ANY UPDATES?

The information disclosed on the SPR and any updates will be a public record as defined by Chapter 119, Florida Statutes, and therefore may be inspected by any interested person. Also, the information will be made available to the Mayor and the BCC members. This information will accompany the other information for the principal’s project or item.

CONCLUSION:

We hope you find this FAQ useful to your understanding of the SPR. Please be informed that in the event of a conflict or inconsistency between this FAQ and the requirements of the applicable ordinance governing specific project expenditure reports, the ordinance controls.

Also, please be informed that the County Attorney’s Office is not permitted to render legal advice to a principal, his/her authorized agent, or any other outside party. Accordingly, if after reading this FAQ the principal, his/her authorized agent or an outside party has any questions, he/she is encouraged to contact his/her own legal counsel.

For Staff Use Only:

OC CE FORM 2P

Date Submitted _____

FOR PROCUREMENT-RELATED ITEMS (November 5, 2010) Date Updated _____

For use after March 1, 2011

Bid Number **Y15-788 -J2**

RELATIONSHIP DISCLOSURE FORM

FOR USE WITH PROCUREMENT ITEMS, EXCEPT THOSE WHERE THE COUNTY IS THE PRINCIPAL OR PRIMARY APPLICANT

For procurement items that will come before the Board of County Commissioners for final approval, this form shall be completed by the bidder, offerer, quoter or respondent and shall be submitted to the Procurement Division by the bidder, offerer, quoter or respondent.

In the event any information provided on this form should change, the applicant must file an amended form on or before the date the item is considered by the appropriate board or body.

Part I

INFORMATION ON APPLICANT (BIDDER, OFFEROR, QUOTER, PROPOSER, OR RESPONDENT):

Legal Name of Applicant: _____

Business Address (Street/P.O. Box, City and Zip Code):

Business Phone () _____

Facsimile () _____

INFORMATION ON APPLICANT'S AUTHORIZED AGENT, IF APPLICABLE:

(Agent Authorization Form also required to be attached)

Name of Applicant's Authorized Agent:

Business Address (Street/P.O. Box, City and Zip Code):

Business Phone () _____

Facsimile () _____

For Staff Use Only:

OC CE FORM 2P

Date Submitted _____

FOR PROCUREMENT-RELATED ITEMS (November 5, 2010) Date Updated _____

For use after March 1, 2011

Bid Number **Y15-788 -J2**

Company Name: _____

Part II

IS THE APPLICANT A RELATIVE OF THE MAYOR OR ANY MEMBER OF THE BCC?

___ YES ___ NO

IS THE MAYOR OR ANY MEMBER OF THE BCC THE APPLICANT'S EMPLOYEE?

___ YES ___ NO

IS THE APPLICANT OR ANY PERSON WITH A DIRECT BENEFICIAL INTEREST IN THE OUTCOME OF THIS MATTER A BUSINESS ASSOCIATE OF THE MAYOR OR ANY MEMBER OF THE BCC?

___ YES ___ NO

If you responded "YES" to any of the above questions, please state with whom and explain the relationship:

(Use additional sheets of paper if necessary)

For Staff Use Only:

OC CE FORM 2P

Date Submitted _____

FOR PROCUREMENT-RELATED ITEMS (November 5, 2010) Date Updated _____

For use after March 1, 2011

Bid Number **Y15-788 -J2**

Company Name: _____

Part III

ORIGINAL SIGNATURE AND NOTARIZATION REQUIRED

I hereby certify that information provided in this relationship disclosure form is true and correct based on my knowledge and belief. If any of this information changes, I further acknowledge and agree to amend this relationship disclosure form prior to any meeting at which the above-referenced project is scheduled to be heard. In accordance with s. 837.06, Florida Statutes, I understand and acknowledge that whoever knowingly makes a false statement in writing with the intent to mislead a public servant in the performance of his or her official duty shall be guilty of a misdemeanor in the second degree, punishable as provided in s. 775.082 or s. 775.083, Florida Statutes.

Signature of Applicant

Date: _____

Print Name and Title of Person completing this form: _____

STATE OF _____ :
COUNTY OF _____ :

I certify that the foregoing instrument was acknowledged before me this ____ day of _____, 20__ by _____. He/she is personally known to me or has produced _____ as identification and did/did not take an oath.

Witness my hand and official seal in the county and state stated above on the ____ day of _____, in the year _____.

(Notary Seal) _____
Signature of Notary Public
Notary Public for the State of _____
My Commission Expires: _____

Staff signature and date of receipt of form

Staff reviews as to form and does not attest to the accuracy or veracity of the information provided herein.

**AGENT AUTHORIZATION FORM
FOR PROCUREMENTS IN ORANGE COUNTY, FLORIDA**



I/WE, (PRINT BIDDER, OFFEROR, QUOTER OR RESPONDENT NAME)

_____, DO HEREBY AUTHORIZE TO ACT AS MY/OUR AGENT
(PRINT AGENT'S NAME), _____, TO EXECUTE ANY PETITIONS OR
OTHER DOCUMENTS NECESSARY TO AFFECT THE **CONTRACT APPROVAL PROCESS** MORE SPECIFICALLY
DESCRIBED AS FOLLOWS, **IFB NO. Y15- 788-J2, SOLID WASTE MANAGEMENT CELL 9-12 CLASS I
LANDFILL PHASE-1 SEQUENTIAL CLOSURE**, AND TO APPEAR ON MY/OUR BEHALF BEFORE ANY
ADMINISTRATIVE OR LEGISLATIVE BODY IN THE COUNTY CONSIDERING THIS **CONTRACT** AND TO ACT IN ALL
RESPECTS AS OUR AGENT IN MATTERS PERTAINING TO THIS CONTRACT.

Date: _____
Signature of Bidder, Offeror, Quoter or Respondent

STATE OF _____ :
COUNTY OF _____ :

I certify that the foregoing instrument was acknowledged before me this ____ day of _____, 20__ by _____. He/she is personally known to me or has produced _____ as identification and did/did not take an oath.

Witness my hand and official seal in the county and state stated above on the ____ day of _____, in the year _____.

(Notary Seal) _____
Signature of Notary Public
Notary Public for the State of _____

My Commission Expires: _____

FREQUENTLY ASKED QUESTIONS (FAQ)
ABOUT THE
RELATIONSHIP DISCLOSURE FORM
Updated 6-28-11

WHAT IS THE RELATIONSHIP DISCLOSURE FORM?

The Relationship Disclosure Form (form OC CE 2D and form OC CE 2P) is a form created pursuant to the County's Local Code of Ethics, codified at Article XIII of Chapter 2 of the Orange County Code, to ensure that all development-related items and procurement items presented to or filed with the County include information as to the relationship, if any, between the applicant and the County Mayor or any member of the Board of County Commissioners (BCC). The form will be a part of the backup information for the applicant's item.

WHY ARE THERE TWO RELATIONSHIP DISCLOSURE FORMS?

Form OC CE 2D is used only for development-related items, and form OC CE 2P is used only for procurement-related items. The applicant needs to complete and file the form that is applicable to his/her case.

WHO NEEDS TO FILE THE RELATIONSHIP DISCLOSURE FORM?

Form OC CE 2D should be completed and filed by the owner of record, contract purchaser, or authorized agent. Form OC CE 2P should be completed and filed by the bidder, offeror, quoter, or respondent, and, if applicable, their authorized agent. In all cases, the person completing the form must sign the form and warrant that the information provided on the form is true and correct.

WHAT INFORMATION NEEDS TO BE DISCLOSED ON THE RELATIONSHIP DISCLOSURE FORM?

The relationship disclosure form needs to disclose pertinent background information about the applicant and the relationship, if any, between, on the one hand, the applicant and, if applicable, any person involved with the item, and on the other hand, the Mayor or any member of the BCC.

In particular, the applicant needs to disclose whether any of the following relationships exist: (1) the applicant is a business associate of the Mayor or any member of the BCC; (2) any person involved with the approval of the item has a beneficial interest in the outcome of the matter *and* is a business associate of the Mayor or any member of the BCC; (3) the applicant is a relative of the Mayor or any member of the BCC; or (4) the Mayor or any member of the BCC is an employee of the applicant. (See Section 2-454, Orange County Code.)

HOW ARE THE KEY RELEVANT TERMS DEFINED?

Applicant means, for purposes of a development-related project, the owner, and, if applicable, the contract purchaser or owner's authorized agent. *Applicant* means, for purposes of a procurement item, the bidder, offeror, quoter, respondent, and, if applicable, the authorized agent of the bidder, offeror, quoter, or respondent.

Business associate means any person or entity engaged in or carrying on a business enterprise with a public officer, public employee, or candidate as a partner, joint venture, corporate shareholder where the shares of such corporation are not listed on any national or regional stock exchange, or co-owner of property. In addition, the term includes any person or entity engaged in or carrying on a business enterprise, or otherwise engaging in common investment, with a public officer, public employee, or candidate as a partner, member, shareholder, owner, co-owner, joint venture partner, or other investor, whether directly or indirectly, whether through a Business Entity or through interlocking Parent Entities, Subsidiary Entities, or other business or investment scheme, structure, or venture of any nature. (See Section 112.312(4), Florida Statutes, and Section 2-452(b), Orange County Code.)

Employee means any person who receives remuneration from an employer for the performance of any work or service while engaged in any employment under any appointment or contract for hire or apprenticeship, express or implied, oral or written, whether lawfully or unlawfully employed, and includes, but is not limited to, aliens and minors. (See Section 440.02(15), Florida Statutes.)

Relative means an individual who is related to a public officer or employee as father, mother, son, daughter, brother, sister, uncle, aunt, first cousin, nephew, niece, husband, wife, father-in-law, mother-in-law, son-in-law, daughter-in-law, brother-in-law, sister-in-law, stepfather, stepmother, stepson, stepdaughter, stepbrother, stepsister, half brother, half sister, grandparent, great grandparent, grandchild, great grandchild, step grandparent, step great grandparent, step grandchild, step great grandchild, person who is engaged to be married to the public officer or employee or who otherwise holds himself or herself out as or is generally known as the person whom the public officer or employee intends to marry or with whom the public officer or employee intends to form a household, or any other natural person having the same legal residence as the public officer or employee. (See Section 112.312(21), Florida Statutes.)

DOES THE RELATIONSHIP DISCLOSURE FORM NEED TO BE UPDATED IF INFORMATION CHANGES?

Yes. It remains a continuing obligation of the applicant to update this form whenever any of the information provided on the initial form changes.

WHERE DO THE RELATIONSHIP DISCLOSURE FORM AND ANY SUBSEQUENT UPDATES NEED TO BE FILED?

For a development-related item, the Relationship Disclosure Form and any update need to be filed with the County Department or County Division where the applicant filed the application. For a procurement item, the Relationship Disclosure Form and any update need to be filed with the Procurement Division.

WHEN DO THE RELATIONSHIP DISCLOSURE FORM AND ANY UPDATES NEED TO BE FILED?

In most cases, the initial form needs to be filed when the applicant files the initial development-related project application or initial procurement-related forms. However, with respect to a procurement item, a response to a bid will not be deemed unresponsive if this form is not included in the initial packet submitted to the Procurement Division.

If changes are made after the initial filing, the final, cumulative Relationship Disclosure Form needs to be filed with the appropriate County Department or County Division processing the application not less than seven (7) days prior to the scheduled BCC agenda date so that it may be incorporated into the BCC agenda packet. When the matter is a discussion agenda item or is the subject of a public hearing, and an update has not been made at least 7 days prior to BCC meeting date or is not included in the BCC agenda packet, the applicant is obligated to verbally present such update to the BCC when the agenda item is heard or the public hearing is held. When the matter is a consent agenda item and an update has not been made at least 7 days prior to the BCC meeting or the update is not included in the BCC agenda packet, the item will be pulled from the consent agenda to be considered at a future meeting.

WHO WILL REVIEW THE INFORMATION DISCLOSED ON THE RELATIONSHIP DISCLOSURE FORM AND ANY UPDATES?

The information disclosed on this form and any updates will be a public record as defined by Chapter 119, Florida Statutes, and may therefore be inspected by any interested person. Also, the information will be made available to the Mayor and the BCC members. This form and any updates will accompany the information for the applicant's project or item.

However, for development-related items, if an applicant discloses the existence of one or more of the relationships described above and the matter would normally receive final consideration by the Concurrency Review Committee or the Development Review Committee, the matter will be directed to the BCC for final consideration and action following committee review.

CONCLUSION:

We hope you find this FAQ useful to your understanding of the Relationship Disclosure Form. Please be informed that if the event of a conflict or inconsistency between this FAQ and the requirements of the applicable ordinance or law governing relationship disclosures, the ordinance or law controls.

Also, please be informed that the County Attorney's Office is not permitted to render legal advice to an applicant or any other outside party. Accordingly, if the applicant or an outside party has any questions after reading this FAQ, he/she is encouraged to contact his/her own legal counsel.

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E VERIFICATION CERTIFICATION

IFB NO. Y15-788-J2

NAME OF CONTRACTOR: _____ (referred to herein as “Contractor”)

ADDRESS OF CONTRACTOR:

The undersigned does hereby certify that the above named contractor:

- 1. Is registered and is using the E-Verify system; or
- 2. Does not have any employees and does not intend to hire any new employees during the period of time that the contractor will be providing services under the contract and consequently is unable to register to use the E-Verify system; or
- 3. Employs individuals that were hired prior to the commencement of providing labor on the contract and does not intend to hire any new employees during the period of time that the contractor will be providing labor under the contract, and consequently is unable to use the E-Verify system.

The undersigned acknowledges the use of the E-Verify system for newly hired employees is an ongoing obligation for so long as the contractor provides labor under the contract and that the workforce eligibility of all newly hired employees will be properly verified using the E-Verify system.

In accordance with Section 837.06, Florida Statutes, Contractor acknowledges that whoever knowingly makes a false statement in writing with the intent to mislead a public servant in the performance of his or her official duties shall be guilty of a misdemeanor in the second degree, punishable as provided in Section 775.082 or Section 775.083, Florida Statutes.

AUTHORIZED SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

BID BOND

BOND NUMBER _____

STATE OF FLORIDA)
SS
COUNTY OF ORANGE)

KNOW ALL MEN BY THESE PRESENTS, that we, _____, as Principal, and _____, as Surety, are held firmly bound unto Orange County, Florida, in the penal sum of: \$ _____ Dollars **(Ten percent {10%} of base bid if no amount entered)**
(Total Sum Written in Words)

lawful money of the United States, for the payment of which sum well and truly to be made, we bound ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the attached Bid, dated the _____ day of _____, **20**__, for a Contract entitled: **SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1 SEQUENTIAL CLOSURE, IFB Y15-788-J2.**

NOW THEREFORE, if the Principal shall withdraw said Bid prior to the date of opening the same, or shall within ten (10) days after the prescribed forms are presented to him for signature, enter in a written Contract with Orange County, Florida, in accordance with the Bid as accepted, and give a Performance Bond and a Payment Bond with good and sufficient Surety or sureties as may be required, for the faithful performance and proper fulfillment of such Contract and for prompt payment of all persons furnishing labor or materials in connection therewith, or in the event of the failure to enter into such Contract and give such Bonds within the time specified, if the Principal shall pay the County the difference between the amount specified in said Bid and the amount for which the County may procure the required work and/or supplies, provided the latter amount to be in excess of the former, then the above obligations shall be void and of no effect; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above written parties have executed this instrument under their several seals this the _____ day of _____, **20**__, the name and corporate seal of each corporate party being affixed and these presents duly signed by its undersigned, pursuant to authority of its governing body.

CONTRACTOR-PRINCIPAL:

SURETY:

NAME OF BUSINESS ENTITY

NAME OF SURETY

SIGNATURE
(SEAL)

SIGNATURE: SURETY AGENT
(SEAL)

TYPE NAME AND TITLE

TYPE NAME AND TITLE

BUSINESS ADDRESS

BUSINESS ADDRESS

TELEPHONE

TELEPHONE

NAIC NUMBER: _____

Licensed Florida Insurance Agent? Yes _____ No _____

License Number: _____

STATE OF _____)

COUNTY OF _____) SS

CITY OF _____)

Before me, a Notary Public duly commissioned, qualified and acting personally, appeared:

to me well known, who being by me first duly sworn upon oath says that he is Attorney-in-Fact for

as Surety, and that he has been authorized by said Surety to execute the foregoing Bid Bond on behalf of the Principal (Contractor) named therein in favor of the owner.

Subscribed and sworn to before me this the _____ day of _____, 20__.

Notary Public

(Print, Type or Stamp Commissioned Name of Notary Public)

Personally Known _____ or Produced Identification _____

Type of Identification: _____

In accordance with Part C, Section 19 and Part F Article 8 of the Invitation for Bids, if applicable, list the Lead Surety.

LEAD SURETY

AGENT FOR SURETY

Signature

BY: _____

AGENCY ADDRESS: _____

SURETY ADDRESS: _____

PHONE _____

**BOARD OF COUNTY COMMISSIONERS
ORANGE COUNTY, FLORIDA
LUMP SUM CONSTRUCTION CONTRACT**

CONTRACT:

Made between the Board of County Commissioners, Orange County, Florida (hereinafter called County), represented by the Manager of the Procurement Division executing this Contract, and:

>

Federal Identification Number: >

A Corporation formed under the laws of the State of Florida, hereinafter called Contractor.

The Contractor shall perform all the Work required by the Contract Documents for the proper execution and completion of **SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1 SEQUENTIAL CLOSURE** in full accordance with the drawings and as elaborated in the specifications of **Invitation for Bids No. Y15-788-J2** which is made a part of this Contract as completely as if set forth herein.

I

AMOUNT OF CONTRACT:

The County shall pay the Contractor in current funds, and in accordance with the progress payment schedule as stated herein, for the performance of the Work, subject to additions and deductions by Change Order as provided in the Contract Documents, the Contract Amount of >(\$>) at the lump sum set forth in the Invitation for Bid Official Bid Form, Part D.

II

ASBESTOS FREE MATERIALS:

Project is to be constructed with asbestos free materials. A written, notarized statement on company letterhead is to be submitted with the final payment request. Final payment shall be withheld until such statement is submitted. Contractor shall agree that if materials containing asbestos are subsequently discovered at any future time to have been included in the construction done by the Contractor or any of its Subcontractors or agents and were not specified in the design or required by the Contract document, Contractor shall be liable for all costs related to the abatement of such asbestos and damages or claims against the County.

III
ADMINISTRATIVE DATA:

Progress Payments: Based upon Applications for Payment submitted to the Project Manager by the Contractor and Certificates for Payment issued by the Project Manager the County shall make progress payments on account of the Contract Amount to the Contractor as provided in the Contract Documents as follows:

Not later than 30 days following approval of an application for Payment, ninety percent (90%) of the portion of the Contract Amount properly allocable to labor, materials and equipment incorporated in the Work and ninety percent (90%) of the portion of the Contract Amount properly allocable to materials and equipment suitably stored at the site or at some other location agreed upon in writing, for the period covered by the application for payment, less the aggregate of previous payments made by the Owner.

When the completion of the Work ascertained as payable exceeds fifty percent (50%) of the total contract amount the retainage percentage withheld shall be reduced to 5%. Upon Final completion of the entire Work, a sum sufficient to increase the total payments to one hundred percent (100%) of the Contract Amount, less such amounts as the Owner shall determine for all incomplete work and unsettled claims as provided in the Contract Documents.

Should the Contractor fail to substantially complete all Work under this Contract and make the project available for beneficial use on or before the date stipulated for Substantial Completion (or such later date as may result from extension of time granted by County), he shall pay and/or the County may retain from the compensation otherwise to be paid to the Contractor, as liquidated damages, the sum of **\$1,000.00** for each consecutive calendar day that terms of the Contract remain unfulfilled beyond date allowed by the Contract, which sum is agreed upon as a reasonable and proper measure of damages which County will sustain per diem by failure of Contractor to complete work within time as stipulated; it being recognized by County and Contractor that the injury to County which could result from a failure of Contractor to complete on schedule is uncertain and cannot be computed exactly. In no way shall costs for liquidated damages be construed as a penalty on the Contractor. For each consecutive calendar day that the work remains incomplete after the date established for Final Completion, the County will retain from the compensation otherwise to be paid to the Contractor the sum of **\$1,000.00**. This amount is the mutually agreed upon minimum measure of damages the County will sustain by failure of the Contractor to complete all remedial work, correct deficient work, clean up the project and other miscellaneous tasks as required to complete all Work specified and this amount of liquidated damages is in addition to the liquidated damages prescribed above for failure to timely achieve Substantial Completion.

IV
CONTRACT DOCUMENTS:

This Contract entered into this date by the Board of County Commissioners hereinafter called the County, represented by the Manager of the Procurement Division executing this Contract and the individual, partnership or corporation named above, hereinafter called the Contractor. Witnesseth that the parties hereto do mutually agree as follows:

The Contractor shall furnish all labor, equipment and materials and perform the Work described for the amount stated above in strict accordance with the General Conditions, Supplementary Conditions/Special Provisions, Plans and Specifications and other Contract Documents, all of which are made a part hereof and designated as follows:

- a. Orange County Invitation for Bids/Project Manual, **IFB No. Y15-788-J2 dated June 18, 2015**, (which contains the Invitation for Bids, Notice, Instruction to Bidders, Bid Form and Attachments, this Contract, General Conditions, Supplementary Conditions / Special Provisions, and Specifications);
- b. Drawings bearing the title "**Construction Plans, SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1 SEQUENTIAL CLOSURE**".
- c. Addendum No.> dated >;
- d. >'s Bid Proposal dated **July 30, 2015**;
- e. Payment/Performance Bond;
- f. Certificates of Insurance;

V
PRIORITY OF DOCUMENTS:

The order of precedence of items and documents is as follows:

Construction Contract
Permits
Supplemental Conditions/Special Provisions
General Conditions
Specifications/Technical Provisions
Drawings/Plans
Road Design, Structures, and Traffic Operations Standards (If applicable)
Florida Department of Transportation Standard Specifications for Road and Bridge Construction (If applicable)
Bid Proposal
Instructions to Bidders

VI
TIME OF COMMENCEMENT AND FINAL COMPLETION:

- a. Work to commence within fourteen (14) days of Official Notice to Proceed date and shall be completed, unless amended by written Change Order or Amendment executed by both parties to this Contract.
- b. Substantial Completion of the Work shall be achieved not later than **300** consecutive calendar days from date of Official Notice to Proceed.
- c. Final Completion of the Work shall be achieved not later than **360** consecutive calendar days from date of Official Notice to Proceed.

VII
COMPLIANCE WITH M/WBE CONTRACT REQUIREMENTS:

By entering into this Contract, the Contractor affirmatively commits to comply with the MWBE subcontracting requirements submitted with his/her bid. The failure of the Contractor to comply with this commitment during the Contract's performance period may be considered a breach of Contract.

The County may take action up to and including termination for default if this condition is not remedied within the time period specified by the Manager, Procurement Division.

VIII
MISCELLANEOUS PROVISIONS:

- a. Terms used in this Contract that are defined in the General Conditions shall have the meanings designated in those conditions.
- b. No price adjustments shall be made on this contract to the bid price of any products or materials including but not limited to gasoline, diesel or other fuels, and bituminous materials, including asphalt due to fluctuations in market prices, changes in suppliers or any other reason.
- c. County and Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto, his partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.
- d. The laws of the State of Florida shall govern this Contract. Any and all legal action necessary to enforce the provisions of this Contract will be held in Orange County, Florida. Venue for any litigation involving this Contract shall be the Ninth Circuit Court in and for Orange County, Florida.

**BOARD OF COUNTY COMMISSIONERS
ORANGE COUNTY, FLORIDA**

BY _____
**Johnny M. Richardson, CPPO, CFCM
Manager, Procurement Division**

BY _____
Signature

DATE _____
(For County use only)

Type or Print Name

**Corporate
Seal**

PERFORMANCE BOND

BOND NUMBER _____

KNOW ALL MEN BY THESE PRESENTS that

Name of Contractor _____

Address _____

Phone Number _____

Corporation, Partnership or Individual _____

hereinafter referred to as the Contractor, as Principal, and

Name of Surety _____

Address _____

Phone Number _____

hereinafter called SURETY, as SURETY, are held and firmly bound unto Orange County, 400 East South Street, Orlando, FL 32801, (407)836-5635 a Political Subdivision of the State of Florida as Obligee, hereinafter referred to as Owner, in the full and just sum of \$ _____, lawful money of the United States of America, to the payment of which sum, well and truly to be made, the Contractor and SURETY bind themselves, their representatives, and each of their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Contractor has entered into **Contract No. Y15-788** with the "County", also referred to herein as the OWNER, for the project entitled: **SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1 SEQUENTIAL CLOSURE, 5901 Young Pine Road, Orlando, FL 32829**, with conditions and provisions as are further described in the aforementioned Contract, which Contract is by reference made a part hereof for the purpose of explaining this bond.

General description of the Work: Work includes a site survey and waste grading, installation of leveling course, geomembrane barrier layer, and protective cover with sod as shown on the plans. The sequential closure construction portion includes installation of landfill gas (LFG) laterals, headers and connection to the existing LFG collection system, installation of secondary stormwater system with terraces and underdrain system, letdown piping, inlet structures and connection to the existing primary system. The project also includes modification of existing condensate pump stations, restoration of a segment of the primary storm water ditch and resurfacing of paved roads.

NOW, THEREFORE, the condition of this obligation is such that if Contractor shall fully, promptly and faithfully perform said Contract and all obligations thereunder, including all obligations imposed by the Contract documents (which includes the Notice to Bidders, Instruction to Bidders, Proposal and Bid Form, General and Supplementary Conditions, Detail Specifications, Form(s) of Contract Bond(s), Plans and Specifications and such amendments thereof as may be made as provided for therein), then this obligation shall be void; otherwise it shall remain in full force and effect.

1. The undersigned shall indemnify and save harmless said Owner against and from all costs, expenses and damages, including litigation costs and attorney's fees arising out of, or in connection with the neglect, default or want of care or skill, including patent infringement on the part of said Contractor, his agents, servants or employees in the execution or performance of said Contract.

The applicable provisions of Section 255.05 and 713.01 Florida Statutes apply to this bond.

2. Whenever Contractor shall be, and declared by Owner to be in default under the Contract, the Owner having performed Owner's obligations thereunder, the SURETY may promptly remedy the default or shall promptly:
 - A. Complete the Contract in accordance with its terms and conditions; or
 - B. Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by SURETY of the lowest responsible bidder, or, if the Owner elects, upon determination by the Owner and the SURETY jointly of the lowest responsible bidder, arrange for a Contract between such bidder and the Owner. SURETY shall make available as the work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this Paragraph) sufficient funds to pay the costs of completion, including other costs and damages for which the SURETY may be liable hereunder, the amount set forth in the first paragraph hereof.
3. Any changes in or under the Contract Documents and compliance or noncompliance with any formalities connected with the Contract or the changes shall not affect SURETY'S obligation under this bond. Any increase in the total Contract amount as authorized by the Owner shall accordingly increase the SURETY'S obligation by the same dollar amount of said increase. The Principal shall be responsible for notification to SURETY of all such changes.
4. The undersigned expressly acknowledges its obligations and liabilities for liquidated damages suffered by the Owner under the provisions of the Contract Documents.
5. The undersigned, covenant and agree that no change, extension of time, exercise of options for Contract renewals, changes to Contract amounts, alterations or additions to the terms of the Contract or the work to be performed thereunder, or the specifications accompanying the same shall in any way affect their obligation on this bond, and the SURETY does hereby expressly waive notice of any such change, extension of time, change to Contract amount, alteration, or addition. Moreover, no alterations or additions to this bond form shall be binding unless specifically agreed to in writing by the parties.
6. The Contractor shall save the Owner harmless from any and all damages, expenses and costs which may arise by virtue of any defects in said work or materials within a period of one (1) year from the date of Final Completion of the Project.

Signed and sealed this the _____ day of _____, 20__.

CONTRACTOR, AS PRINCIPAL

WITNESS:

_____ BY: _____
 Firm Name
 Signature

 Type Name and Title

SURETY

AGENT FOR SURETY

NAIC Number: _____

Signature

BY: _____ AGENCY ADDRESS: _____

SURETY ADDRESS: _____

PHONE _____

Licensed Florida Insurance Agent? Yes _____ No _____

License Number: _____

STATE OF _____)

COUNTY OF _____) SS

CITY OF _____)

Before me, a Notary Public duly commissioned, qualified and acting personally, appeared:

to me well known, who being by me first duly sworn upon oath says that he is Attorney-in-Fact for

as Surety, and that he has been authorized by said Surety to execute the foregoing Performance Bond on behalf of the Principal (Contractor) named therein in favor of the owner.

Subscribed and sworn to before me this the _____ day of _____, 20__.

Notary Public

(Print, Type or Stamp Commissioned Name of Notary Public)

Personally Known _____ or Produced Identification _____

Identification: _____ Type of _____

In accordance with Part C, Section 19 and Part F Article 8 of the Contract, if applicable, list the Lead Surety.

LEAD SURETY

AGENT FOR SURETY

Signature

BY: _____

AGENCY ADDRESS: _____

SURETY ADDRESS: _____

PHONE _____

P A Y M E N T B O N D

BOND NUMBER _____

KNOW ALL MEN BY THESE PRESENTS that

Name of Contractor _____

Address _____

Phone Number _____

Corporation, Partnership or Individual _____

Thereinafter called Contractor, as Principal, and

Name and Address of Surety _____

hereinafter called SURETY, as SURETY, are held and firmly bound unto Orange County, 400 East South Street, Orlando, FL 32801, (407) 836-5635 a Political Subdivision of the State of Florida as Obligee, in the full and just sum of \$_____, lawful money of the United States of America, to the payment of which sum, well and truly to be made, the Contractor and SURETY bind themselves, their representatives, and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Contractor has entered into **Contract No. Y15-788** with the "County", also referred to herein as the OWNER, for the project entitled: **SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1 SEQUENTIAL CLOSURE, 5901 Young Pine Road, Orlando, FL 32829**, with conditions and provisions as are further described in the aforementioned Contract, which Contract is by reference made a part hereof for the purpose of explaining this bond.

General description of the Work: Work includes a site survey and waste grading, installation of leveling course, geomembrane barrier layer, and protective cover with sod as shown on the plans. The sequential closure construction portion includes installation of landfill gas (LFG) laterals, headers and connection to the existing LFG collection system, installation of secondary stormwater system with terraces and underdrain system, letdown piping, inlet structures and connection to the existing primary system. The project also includes modification of existing condensate pump stations, restoration of a segment of the primary storm water ditch and resurfacing of paved roads.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS such that if Contractor shall promptly make payments to all claimants for any and all labor and material used or reasonably required for use or furnished in connection with the performance of said Contract, and shall perform all other covenants and obligations of this bond, then this obligation shall be void; otherwise it shall remain in full force and effect.

1. The undersigned shall promptly make payment to all persons supplying services, labor, material or supplies used directly or indirectly by said Contractor, or any subcontractor(s) or sub-subcontractor(s), in the prosecution of the work provided for in said Contract.
2. Subject to the Owner's priority, claimants covered by Section 713.01 of the Florida Statutes shall have a direct right of action against the Principal and SURETY under this obligation, after written notice of the performance of labor or delivery of materials or supplies, and non-payment therefore. Any claimant who seeks to recover against the Principal or SURETY under this obligation must also satisfy the notice requirement and time limitations of Section 255.05 of the Florida Statutes, as amended.
3. The undersigned, covenant and agree that no change, extension of time, exercise of options for Contract renewals, change to Contract amounts, alterations or additions to terms of the Contract or the work to be performed thereunder, or the specifications accompanying the same shall in any way affect their obligation on this bond and the SURETY does hereby expressly waive notice of any such change, extension of time, exercise of options for Contract renewal, changes to Contract amount, alternations or additions. Moreover, no alterations or additions to this bond form shall be binding unless specifically agreed to in writing by the parties.

The applicable provisions of Sections 255.05 and Florida Statutes apply to this bond.

4. Any changes in or under the Contract Documents and compliance or noncompliance with any formalities connected with the Contract or the changes shall not affect SURETY'S obligation under this bond. Any increase in the total Contract amount as authorized by the Owner shall accordingly increase the SURETY'S obligation by the same dollar amount of said increase. The Principal shall be responsible for notification to SURETY of all such changes.

Signed and sealed this the _____ day of _____, 20_____

CONTRACTOR, AS PRINCIPAL:

WITNESS:

Firm Name

Signature

BY: _____
Signature

Type Name and Title

SURETY: _____

AGENT FOR SURETY: _____

NAIC Number: _____

BY: _____
Signature

BY: _____

AGENCY ADDRESS: _____

SURETY ADDRESS _____

PHONE NO. _____

Licensed Florida Insurance Agent? Yes _____ No _____

License Number: _____

STATE OF _____)

COUNTY OF _____) SS

CITY OF _____)

Before me, a Notary Public duly commissioned, qualified and acting personally, appeared:

to me well known, who being by me first duly sworn upon oath says that he is Attorney-in-Fact for

as Surety, and that he has been authorized by said Surety to execute the foregoing Payment Bond on behalf of the Principal (Contractor) named therein favor of the owner.

Subscribed and sworn to before me this the _____ day of _____, 20_____.

Notary Public

(Print, Type or Stamp Commissioned Name of Notary Public)

Personally Known _____ or Produced Identification (Type) _____

In accordance with Part C, Section 19 and Part F Article 8 of the Contract, if applicable, list the Lead Surety.

_____	_____
LEAD SURETY	AGENT FOR SURETY
_____	_____
	Signature
BY: _____	AGENCY ADDRESS: _____
SURETY ADDRESS: _____	_____
_____	PHONE _____

(THIS FORM MUST BE UTILIZED IN ALL FINAL PAY APPLICATIONS)

FINAL RELEASE OF LIEN

KNOW ALL MEN BY THESE PRESENTS, that for and in consideration of the sum of monies, set out in the accompanying Estimate Statement No. _____, final, which quantity, the receipt of which is hereby acknowledged, is accepted as full and complete compensation for all work done, materials furnished and damages or claims arising under Orange County Contract No. Y15-788, entitled:

SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1
SEQUENTIAL CLOSURE

By:

Contractor

(SEAL)

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before this _____ day of

_____ 20_____, by _____.

Personally Known _____ OR Produced Identification _____

Type of identification Produced _____

**CHANGE ORDER REQUEST
PURCHASE ORDER / DELIVERY ORDER / CONTRACT**

*Vendor Code: _____ *Vendor Name: _____ *Date: _____

*Change Order Request No.: _____ *Document No.: _____ Contract No. _____

*Department: _____ *Contact/Phone No.: _____

ACCOUNTING LINE CHANGE ONLY:

Accounting Line From: _____ Amount: _____

Accounting Line To: _____ Amount: _____

COMMODITY LINE NUMBER ADD:

Comm. Line No.: _____ Commodity Code: _____ Quantity: _____ Unit of Measure: _____

Unit Cost: _____ Description: _____ MA Line No. _____

Accounting Line: _____ Amount: _____

COMMODITY LINE NUMBER INCREASE / DECREASE / DELETE:

Comm. Line No. _____ Increase Qty By: _____ Decrease Qty By: _____ Increase Unit Cost By: _____

Decrease Unit Cost By: _____ Accounting Line: _____

Delete: _____ (check only if you want to delete this line number).

CANCELLATION:

_____ Please cancel Purchase Order / Delivery Order

Original sent to vendor: _____ Yes _____ No

***JUSTIFICATION (Required for all transactions):** _____

Enter Retainage for line number(s) _____ in the amount of _____ %

*Original PO/DO/Contract Award/Encumbrance <u>circle one</u>	Contract Amount	Encumbered/De-Encumbered Amount
	\$ _____	\$ _____
*Net Dollars for Previous Change Orders (Addition/Subtraction) <u>circle one</u>	\$ _____	\$ _____
*Net Dollars for This Change Order (Addition/Subtraction) <u>circle one</u>	\$ _____	\$ _____
*Total Dollars	\$ _____	\$ _____

By signing this agreement, the Contractor hereby releases the County, its agents, and employees from any and all liabilities under this contract for further equitable adjustments and/or claims associated with this change order.

*Vendor/Contractor Authorization: _____ Date: _____

*Departmental Approval: _____ Date: _____

*Purchasing & Contracts Approval: _____ Date: _____

For Purchasing Use Only Track Change Order: Yes No Change Award Amount to: \$ _____

Add the following text to the PO/DO: _____

CHANGE ORDER REQUEST CONTINUATION SHEET Document No.: _____
PURCHASE ORDER / DELIVERY ORDER / CONTRACT

ACCOUNTING LINE CHANGE ONLY:

Accounting Line From: _____ Amount: _____
Accounting Line To: _____ Amount: _____
Accounting Line Add: _____ Amount: _____
Accounting Line From: _____ Amount: _____
Accounting Line To: _____ Amount: _____
Accounting Line Add: _____ Amount: _____

COMMODITY LINE NUMBER ADD:

Comm. Line No.: _____ Commodity Code: _____ Quantity: _____ Unit of Measure: _____
Unit Cost: _____ Description: _____ MA Line No. _____
Accounting Line: _____ Amount: _____
Comm. Line No.: _____ Commodity Code: _____ Quantity: _____ Unit of Measure: _____
Unit Cost: _____ Description: _____ MA Line No. _____
Accounting Line: _____ Amount: _____
Comm. Line No.: _____ Commodity Code: _____ Quantity: _____ Unit of Measure: _____
Unit Cost: _____ Description: _____ MA Line No. _____
Accounting Line: _____ Amount: _____

COMMODITY LINE NUMBER INCREASE / DECREASE / DELETE:

Comm. Line No. ____ Increase Qty By: _____ Decrease Qty By: _____ Increase Unit Cost By: _____
Decrease Unit Cost By: _____ Accounting Line: _____
Delete: ____ (check only if you want to delete this line number).
Comm. Line No. ____ Increase Qty By: _____ Decrease Qty By: _____ Increase Unit Cost By: _____
Decrease Unit Cost By: _____ Accounting Line: _____
Delete: ____ (check only if you want to delete this line number).
Comm. Line No. ____ Increase Qty By: _____ Decrease Qty By: _____ Increase Unit Cost By: _____
Decrease Unit Cost By: _____ Accounting Line: _____
Delete: ____ (check only if you want to delete this line number).

*Departmental Approval: _____	Date: _____
Purchasing & Contracts Approval: _____	Date: _____

CONSENT OF SURETY AND INCREASE OF PENALTY

BOND NUMBER _____

1.CONTRACT#	2.MODIFICATION#	3.DATED
4.The Surety consents to the foregoing Contract notification and agrees that its bond or bonds shall apply and extend to the Contract as modified or amended. The principal and Surety further agree that on or after the execution of this consent, the penalty of the performance bond or bonds is increased by _____ dollars (\$ _____) and the penalty of the payment bond or bonds is increased by _____ dollars (\$ _____). However, the increase of the liability of each co-Surety resulting from this consent shall not exceed the sums shown below.		
5.NAME OF SURETY	6.INCREASE IN LIABILITYLIMIT UNDER PERFORMANCE BOND	7.INCREASE IN LIABILITYLIMIT UNDER PAYMENT BOND
a. SURETY ADDRESS	b. SIGNATURE c. TYPED NAME AND TITLE d. DATE THIS CONSENT EXECUTED	

SURETY _____

FLORIDA RESIDENT AGENT FOR SURETY _____

Signature

BY: _____ AGENCY

ADDRESS: _____

SURETY ADDRESS: _____

PHONE _____

Signature

Type Name and Title

Business Address

License Number

Telephone Number (Include Area Code)

STATE OF _____)

COUNTY OF _____) SS

CITY OF _____)

Before me, a Notary Public duly commissioned, qualified and acting personally, appeared:

to me well known, who being by me first duly sworn upon oath says that he is Attorney-in-Fact for

as Surety, and that he has been authorized by said Surety to execute the foregoing Performance Bond on behalf of the Principal (Contractor) named therein in favor of the owner.

Subscribed and sworn to before me this the _____ day of _____, 20__.

Notary Public

(Print, Type or Stamp Commissioned Name of Notary Public)

Personally Known _____ or Produced Identification _____

DRUG-FREE WORKPLACE FORM

The undersigned vendor, in accordance with Florida Statute 287.087 hereby certifies that _____ does:

Name of Business

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Informs employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, employee assistance programs and the penalties that may be imposed upon employees for drug abuse violations.
3. Gives each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in Paragraph 1.
4. In the statement specified in Paragraph 1, notifies the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of Chapter 893 or of any controlled substance law of the United States or any State, for a violation occurring in the workplace no later than five (5) days such conviction.
5. Imposes a sanction on, or requires the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.
6. Makes a good faith effort to continue to maintain a drug-free workplace through implementation of Paragraphs 1 thru 5.

As the person authorized to sign this statement, I certify that this firm complies fully with the above requirements.

Bidder's Signature

Date

PART F

GENERAL CONDITIONS

ARTICLE 1 - THE CONTRACT

The Contract Documents are identified in the Contract, Part E. Titles, Subtitles, Headings, Running Headlines, Table of Contents, and Indexes are printed in the Contract Documents merely for convenience.

ARTICLE 2 - DEFINITIONS

The words and expressions (or pronouns used in their stead) defined in this Article shall, wherever they appear in the Contract Documents, be construed as follows unless a different meaning is clear from the context.

"Addenda" shall mean any additional Contract provisions issued in writing by the County prior to receipt of Bid.

"Bid Proposal" shall mean the offer or proposal of the Bidder submitted on the Official Bid Form and Attachments setting forth the prices for the Work to be performed.

"Bidder" shall mean any person, firm or corporation submitting a Bid for the Work.

"Board of County Commissioners" shall mean the Board of County Commissioners, Orange County, Florida, or their duly authorized representative(s).

"Change Order" shall mean a written order to the Contractor, signed by the County, authorizing an addition, deletion or revision in the Work, or an adjustment in the Contract Amount or the Contract Time issued after execution of the Contract.

"Contract" shall mean the written agreement between the County and the Contractor covering the Work to be performed; the Contract will be attached to and made a part of the Contract Documents.

"Contractor" shall mean successful bidder (and vice versa), whether a corporation, firm, individual or any combination thereof, and its (or their) successors, personal representatives, executors, administrators and assigns.

"Contract Amount" shall mean the total monies payable to the Contractor under the Contract Documents. The term "Contract Price" where used in the Contract Documents refers to the Contract Amount.

"Contract Float" shall mean the number of days that an activity or a sequence of activities does not necessarily have to start or end on the scheduled dates to maintain the schedule, or as a minimum, the number of days that an activity may be delayed from its early start date without delaying completion of the Work beyond the Contract Time for Substantial Completion or Final Acceptance.

"Contract Time" will mean the number of calendar days stated in the Agreement for the completion of the Work.

"County" shall mean the Board of County Commissioners, Orange County, Florida, or their duly authorized representative(s), for whom the Work is being performed.

"Day " shall mean one calendar day when used in the Contract Documents.

"Defective Work" shall mean (a) Work that is unsatisfactory, deficient or damaged, does not conform to the Contract Documents, or does not meet the requirements of any inspection, test or approval, or (b) Work associated with punch list items that the Contractor fails to complete within a reasonable time after issuance of the punch list by the Project Manager.

"Drawings" shall mean only those drawings specifically referred to as such in these documents or in any Addenda. Drawings issued after the execution of the Contract to explain further, to illustrate, or to show changes in the Work will be known as "Supplementary Drawings" and shall be binding upon the Contractor with the same force as the Drawings.

"Final Acceptance" shall mean acceptance of the Work by the County upon the expiration of the correction period required by the Contract Documents.

"Final Completion" shall mean acceptance of the Work by the County as evidenced by its signature upon Final Certificate of Completion and approval thereof by the Board of County Commissioners. The Final Certificate of Completion shall be signed only after the County has assured itself by tests, inspection or otherwise that all of the provisions of the Contract have been carried out to its satisfaction.

"Notice" shall mean written Notice. Notice shall be served upon the Contractor either personally or by leaving the said Notice at his residence or with his Agency in charge of the Work, or addressed to the Contractor at the residence or place of business given in the Bid and deposited in a postpaid wrapper in any post box regularly maintained by the United States Post Office.

"Notice of Award" shall mean the written notice of award of the Contract given by the County to the apparent successful Bidder.

"Notice to Proceed" shall mean the written notice given by the County to Contractor fixing the date the Contract Times will commence to run.

"Professional" shall mean the professional independent Architectural/Engineering firm designated to assist the County in the work by a prior agreement entered into by the County and the said firm. The terms "Engineer" and "Architect", where used in the Contract Documents, refer to the Professional.

"Project" shall mean the entire improvement of which this Contract forms a part.

"Project Manager" shall be the duly authorized representative of the County during the construction period.

“Record Schedule” shall mean the time table of predicted tasks, milestones, task durations, deadlines and the start and end dates of the Work indicated in a Progress Schedule accepted by the County and provided to the County prior to the first progress payment. County acceptance of a revised and/or updated Progress Schedule will result in a revised Record Schedule, if so noted in the County’s written acceptance, that will be used to evaluate progress and delays occurring after the acceptance of the revised Record Schedule.

"Shop Drawings" shall mean all drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, a manufacturer, supplier or distributor and which illustrate the equipment, material and/or some portion of the Work.

"Site" shall mean the area upon or in which the Contractor's operations are carried on and such other areas adjacent thereto as may be designated as such by the Project Manager.

"Specifications" shall mean parts of the Contract Documents identified as "Specifications" and organized into Divisions. The specifications include general requirements and technical descriptions of materials, equipment, construction systems, standards and workmanship. The term "Technical Provisions" where used in the Contract Documents refers to the Specifications.

"Subcontractor" shall mean any person, firm or corporation other than employees of the Contractor who or which contracts with the Contractor to furnish, or actually furnishes labor, materials and/or equipment for the Work.

"Substantial Completion" shall mean the completion of the Work by the Contractor to the point where the County may make beneficial use of the Work.

"Surety" shall mean any corporation that executes, as Surety, the Contractor's Bid Bond, Payment Bond and Performance Bonds securing the performance of this Contract.

"Work" shall mean any and all obligations, duties and responsibilities necessary to the successful completion of the construction assigned to or undertaken by the Contractor under the Contract Documents, including the furnishing of all labor, materials, equipment, and other incidentals.

ARTICLE 3 -ASSIGNMENT OF CONTRACT

The Contractor may not make any assignment of the contractual agreement between the parties, in whole or in part, without prior written authorization as may be given by the County, at its sole discretion.

No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without written consent of the party sought to be bound; and specifically but without limitation, monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the

contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

ARTICLE 4 - QUALIFICATIONS OF SUBCONTRACTORS AND SUPPLIERS

The Project Manager will notify the Contractor in writing if the Project Manager, after due investigation, has reasonable objection to any Subcontractor or Supplier on the Subcontractor or Supplier Page, Bid Form Attachment C-2. If the Project Manager has reasonable objection to any Subcontractor or Supplier, the Contractor shall submit another acceptable one to the County. No increase in Contract Amount or Contract Time will be allowed under this article, unless Contractor can prove substantial increase due to the change, in which case Contractor may request an equitable adjustment to the Contract Amount or Contract Time. If Contractor requests an equitable adjustment as a result of a requested change, Contractor shall make available to the County all documents necessary, as requested by the County, to substantiate such adjustment.

The failure of the Project Manager to make objections to any Subcontractor or Supplier on the list shall not constitute a waiver of any right of the County to reject defective Work, material or equipment; or work, material or equipment not in conformance with the requirements of the Contract Documents. Should the Contractor desire to add, change or delete a Subcontractor or Supplier previously listed, the Contractor shall submit written justification for said change to the Project Manager for approval prior to the new Subcontractor or Supplier performing any Work on the Project.

ARTICLE 5 - STARTING THE WORK

The Contractor will start the Work within **fourteen (14)** calendar days of the official "Notice to Proceed" date. The Contract Time shall commence on the effective date of the "Notice to Proceed."

Preconstruction Conference: Within 20 days after the effective date of the Contract, but before Contractor starts the Work at the site, a conference attended by Contractor, Project Manager, Professional and others as appropriate will be held to discuss such topics as may include, but not limited to; schedules, procedures for handling Shop Drawings and other submittals and for processing Applications for Payment, maintenance of traffic, initiation of coordination with affected utilities, agreement upon the Notice to Proceed date, and to establish a working understanding among the parties as to the Work.

ARTICLE 6 - INTERPRETATION AND INTENT OF THE CONTRACT DOCUMENTS

It is the intent of the Specifications and Drawings to describe the complete Work to be constructed in accordance with the Contract Documents. However, the County makes no representation or warranty of any nature whatsoever to the Contractor concerning such documents. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If the Contractor finds a conflict, error or discrepancy in the Contract Documents, he will call it to the Project Manager's attention in writing before proceeding with the Work affected thereby. Any work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials or equipment described in words which so applied have a well known technical or trade meaning shall be deemed to refer to such recognized standards. In case of conflict, the more stringent requirements shall take precedence and govern.

Written clarifications or interpretations (which shall be consistent with or reasonably inferable from the Contract Documents) will be issued in response to a Contractor Request for Interpretation (RFI) or as the Project Manager or Professional may otherwise determine necessary. If the Contractor believes a written clarification or interpretation justifies an increase in Contract Amount or Contract Time, the Contractor shall make a claim for such increase in accordance with Article 13 of the General Conditions. If the Contractor is authorized by the County to proceed with the Work involved before full agreement is reached on (a) whether any increases are due at all, or (b) the extent of any such increases (if any are determined to be due), the Contractor shall furnish daily to the Project Manager, or Professional, actual cost records.

ARTICLE 7 - REFERENCE POINTS

Availability of Lands: The County will furnish, as indicated in the Contract Documents and not later than the date when needed by the Contractor, the lands upon which the Work is to be done, rights-of-way for access thereto and such other lands which are designated for the use of the Contractor. Easements for permanent structures or permanent changes in existing facilities will be obtained by the County unless otherwise specified in the Contract Documents. If the Contractor believes that any delay in the County's furnishing these lands or easements entitles him to an extension of the Contract Time, he may make a claim therefore as provided in Article 13. The Contractor will provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment. The Project Manager will, upon request, furnish to the Contractor copies of all available boundary surveys and subsurface test.

Unforeseen Subsurface Conditions: The Contractor will promptly notify the Project Manager in writing of any subsurface or latent physical conditions at the site which may differ materially from those indicated in the Contract Documents. The Project Manager will promptly investigate those conditions and advise the Contractor in writing if further surveys or subsurface tests are necessary. Promptly thereafter, if needed, the Project Manager will obtain the necessary additional surveys and tests and furnish copies to the Contractor. If the Project Manager finds that the results of such surveys or tests indicate subsurface or latent physical conditions differing significantly from those indicated in the Contract Documents, a Change Order shall be issued incorporating the necessary revisions, in accordance with Article 12.

Reference Points: The Contractor shall be responsible for all field survey work coincidental with completion of this Work as specified herein. All survey work shall be done under the supervision of a Registered Professional Surveyor and Mapper. The County shall furnish, one time, a set of permanent reference markers along the line of work to form the basis for the above Contractor's survey.

All **Section Corners** and **Quarter Section** corners falling within the limits of this Work shall be perpetuated by a Florida Registered Surveyor and Mapper.

- A. All such corners falling within or on the boundaries of this project shall have reference ties made, certified to and submitted to the County Surveyor, Orange County, Florida, prior to the commencing of construction.

- B. Upon completion of construction and prior to Final Completion, certified corner records shall be submitted to the Department of Natural Resources in compliance with Florida Statutes, Chapter 177.507 and a copy of said certified corner record shall also be submitted to the Orange County Surveyor. Said corner records shall reflect the corner as perpetuated and which shall meet these minimum standards.
1. If the corner falls in asphalt or concrete construction, the corner shall be a 2 1/4" metal disc marked according to standard government practices and set in concrete no less than 18" in depth and shall be encased in an adjustable 5 1/4" diameter or larger valve box raised to the finished surface of construction.
 2. If the corner falls at any other location, it shall be a 4" x 4" concrete monument no less than 23" long with a 2 1/4" metal disc marked according to standard government practices. The top of said monument shall be set flush with the ground ($\pm 0.5'$ depending on conditions).
- C. Any U.S.C. and G.S. monument within limits of construction are to be protected. If monuments are in danger of damage, the Contractor shall contact the Project Manager and the Orange County Surveyor prior to the commencing of construction.
- D. Payment for all necessary survey work shall be included in the bid as part of other items of work.

ARTICLE 8 – BONDS, INSURANCE AND INDEMNIFICATION

Payment and Performance Bonds: The CONTRACTOR shall execute and deliver to the County the Payment and Performance Bonds (see Part C, 2-h) included herein as security for the faithful performance and completion of the Work and payment for all materials and labor furnished or supplied in connection with all Work included in the Contract Documents. These Bonds shall be in amounts at least equal to the Contract Amount, shall name the County as obligee and shall be in such form and by sureties of financial standing having a rating from A.M. Best Company (or other equivalent rating company) equal to or better than A- VI and must be included on the approved list of sureties issued by the United States Department of Treasury. Prior to execution of the Contract Documents the County may require the Contractor to furnish such other Bonds, in such form and with such sureties as it may require. If such Bonds are required by written instructions given prior to opening of Bids, the premium shall be paid by the Contractor. If the Contract Amount is increased by Change Order, it shall be the Contractor's responsibility to insure that the Payment and Performance Bonds be amended accordingly and a copy of the amendment is forwarded to the County.

If the Surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any State where any part of the Work is located or it ceases to meet the requirements imposed by the Contract Documents, the Contractor shall within five (5) days thereafter substitute another Bond with another Surety both of which shall be acceptable to the County.

Insurance Requirements:

Contractor agrees to maintain on a primary basis and at its sole expense, at all times throughout the duration of this Contract the following types of insurance coverage with limits and on forms (including endorsements) as described herein. These requirements, as well as the County's review or acceptance of insurance maintained by Contractor is not intended to and shall not in any manner limit or qualify the liabilities assumed by Contractor under this Contract. Contractor is required to maintain any coverage required by federal and state workers' compensation or financial responsibility laws including but not limited to Chapter 324 and 440, Florida Statutes, as may be amended from time to time. Insurance carriers providing coverage shall be authorized and/or eligible to do business in the State of Florida and shall possess a current A.M. Best's Financial Strength Rating of A- Class VIII.

The Contractor shall require and ensure that each of its subcontractors maintain insurance until the completion of their work under any contract associated with this Contract. Failure of the Contractor to maintain insurance coverage for itself or for any other persons or entities for whom it is responsible or to ensure that its subcontractors maintain coverage shall not relieve the Contractor of any contractual responsibility, obligation or liability.

If the CONTRACTOR intends to bid on this Contract as a Joint Venture then all insurance coverage required herein shall include the Joint Venture as "named insured". If the Joint Venture has no employees then this requirement is waived for workers' compensation. The Joint Venture shall also purchase discontinued completed operations coverage for any claims made after the dissolution of the Joint Venture. This coverage shall be for a period of two years following final completion of the project or continuing service contract.

The minimum types and amounts of insurance inclusive of any amount provided by an umbrella or excess policy, shall be as follows:

- Workers' Compensation – The Contractor shall maintain coverage for its employees with statutory workers' compensation limits, and no less than the limits indicated in the Schedule of Limits (see below) for Employers' Liability. Said coverage shall include a waiver of subrogation in favor of the County. The County will not accept elective exemptions. Any contractor using an employee leasing company shall complete the Leased Employee Affidavit (Exhibit A).

Required Endorsements:

- Waiver of Subrogation- WC 00 03 13 or its equivalent (Exhibit G)
- Commercial General Liability – The Contractor shall maintain coverage issued on an ISO form CG 00 01 or its equivalent, with a limit of liability of not less than the limits indicated in the Schedule of Limits (see below). Contractor further agrees coverage shall not contain any endorsement(s) excluding or limiting Product/Completed Operations, Independent Contractors, Contractual Liability, or Separation of Insureds. The General Aggregate limit shall either apply separately to this Contract or shall be at least twice the required occurrence limit.

All projects with a Contract Amount greater than \$20,000,000 shall be written on a Designated Premises or Projects basis (Exhibit B). Commercial umbrella and excess coverage shall include liability coverage for damage to the Contractor's completed work equivalent to that provided under ISO Form CG 00 01 04 13.

Required Endorsements:

- Additional Insured- CG 20 10 04 13 and CG 20 37 04 13 or its equivalent (Exhibits E and F)
- Waiver of Subrogation- CG 24 04 05 09 or its equivalent

Note: If blanket endorsements are being submitted please include the entire endorsement. The policy number to which the endorsement applies shall be indicated directly on the endorsement.

- Business Automobile Liability - The Contractor shall maintain coverage for all owned; non-owned and hired vehicles issued on ISO form CA 00 01 or its equivalent, with limits of not less than the limits indicated in the Schedule of Limits (see below). In the event the Contractor does not own automobiles the Contractor shall maintain coverage for hired and non-owned auto liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

Required Endorsements:

- MCS-90- for operations governed under Sections 29 & 30 of the Motor Carrier Act of 1980

Schedule of Limits:

Contract Amount	Workers' Comp/ Employers' Liability	General Liability	Automobile Liability
Up to \$10 million	Statutory/\$500,000	\$1,000,000	\$1,000,000
\$10 - \$20 million	Statutory/\$1,000,000	\$5,000,000	\$5,000,000
Over \$20 million	To Be Determined by the County		

- Pollution Legal Liability - The Contractor agrees to maintain Contractor's Pollution Legal Liability with a limit of not less than one million (\$1,000,000) per occurrence on a per-project basis.
- Builders' Risk - If this Contract includes: (1) construction of a new above-ground structure or structures, (2) any addition, improvement, alteration, or repair to an existing structure or structures, or (3) the installation of machinery or equipment into an existing structure or structures, the Contractor shall maintain builders' risk insurance providing coverage to equally protect the interests of the County, the Professional, the Contractor and subcontractors of any tier. Coverage shall be written on a completed value form (Exhibit C) in an amount at least equal to 100% of the estimated completed value of the project plus any subsequent modifications of that sum.

The coverage shall be written on an “all-risk” basis and shall, at a minimum cover the perils insured under the ISO CP 10 30 Special Causes of Loss Form (Exhibit D) and shall include property in transit and property stored on or off premises, which shall become part of the project. The Contractor agrees not to maintain a wind or flood sub-limit less than 25% of the estimated completed value of the project. The Contractor agrees any flat deductible(s) shall not exceed \$25,000, and any wind percentage deductible (when applicable) shall not exceed five-percent (5%). The coverage shall not be subject to automatic termination of coverage in the event the project/building is occupied in whole or in part, or put to its intended use, or partially accepted by the County. If such restriction exists the Contractor shall request that the carrier endorse the policy to amend the automatic termination clause to only terminate coverage if the policy expires, is cancelled, the County’s interest in the project ceases, or the project is accepted and insured by the County.

- Professional Liability- If the construction method is “design-build” the Contractor agrees to maintain Professional Liability on a per-project basis. The Contractor agrees to provide coverage with limits and deductibles as prescribed below.

<u>Project Cost</u>	<u>Minimum Limit</u>	<u>Maximum Deductible</u>
\$0-1,000,000	50% of project cost subject to a minimum of \$100,000/occurrence	10% of project cost or \$25,000, whichever is smaller
\$1,000,000-5,000,000	\$1,000,000	\$100,000
over \$5,000,000	Determined by the County	

When a self-insured retention or deductible exceeds \$100,000 the County reserves the right to request a copy of the Contractor’s most recent annual report or audited financial statement. For policies written on a “Claims-Made” basis the Contractor agrees to maintain a retroactive date prior to or equal to the effective date of this contract. In the event the policy is canceled, non-renewed, switched to occurrence form, or any other event which triggers the right to purchase a Supplemental Extended Reporting Period (SERP) during the life of this contract the Contractor agrees to purchase the SERP with a minimum reporting period of not less than two years. Purchase of the SERP shall not relieve the Contractor of the obligation to provide replacement coverage.

The Contractor shall be responsible for all risk of loss whether insured or not until final acceptance of the project by the County. The Contractor agrees to be fully and solely responsible for any costs or expenses resulting from a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the application of said deductible, co-insurance penalty, self-insured retention, or coverage exclusion or limitation. The County has the right to request that the Contractor procure and maintain a surety bond for any deductible amounts that exceed any amount stated herein in such amount and on such form that are acceptable to the County.

The County reserves the right, but not the responsibility to periodically review any and all policies of insurance and to reasonably adjust the limits and/or types of coverage required herein, from time to time throughout the term of this Contract. In such event, the County shall provide the Contractor written notice of such adjustments and the Contractor shall comply within thirty (30) days of receipt thereof. Any request for an exception to these insurance requirements must be submitted in writing to the County for approval.

The Contractor agrees to specifically include the County as an Additional Insured on the Commercial General Liability policy with a CG 20 37 – Additional Insured - Owners, Lessees or Contractors-Completed Operations (Exhibit E) or CG 20 10 – Additional Insured-Owners, Lessees or Contractors-Scheduled Person or Organization Endorsement, or their equivalent (Exhibit F). The Contractor shall also specifically include the County as an Additional Insured on any Commercial Umbrella or Excess policies unless the County is automatically defined under the policy as an Additional Protected Person. Additionally, the Contractor agrees to specifically include the County as an Additional Insured under the Contractor’s Pollution Liability coverage (when applicable). The name of the organization identified in each Additional Insured endorsement’s schedule shall read Orange County Board of County Commissioners.

The Contractor agrees by entering into this written Contract to provide a Waiver of Subrogation in favor of the County, Contractor, Professional, and sub-contractors of any tier for each required policy providing coverage during the life of this Contract. When required by the insurer, or should a policy condition not permit an endorsement, the Contractor agrees to notify the insurer and request that the policy(ies) be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or an equivalent endorsement. This Waiver of Subrogation requirement shall not apply to any policy, which includes a condition that specifically prohibits such an endorsement or voids coverage should the Contractor enter into such an agreement on a pre-loss basis.

Before execution of this Contract by the County and the start of any Work and for the duration of this Contract, the Contractor shall provide the COUNTY with current certificates of insurance evidencing all required coverage. The certificates shall clearly indicate that the Contractor has obtained insurance of the type, amount and classification as required for strict compliance with this insurance section. No material change or cancellation of the insurance shall be effective without thirty (30) days prior written notice to the COUNTY. Certificates shall specifically reference the project title and contract number. The certificate holder shall read:

Orange County Board of County Commissioners
c/o Procurement Division
400 E. South Street
Orlando, Florida 32801

Prior to commencement of any Work performed by subcontractors (if any), the Contractor shall obtain certificates of insurance evidencing coverage from each of its subcontractors and shall furnish within five days, copies of said certificates upon request by the County. In addition to the certificate(s) of insurance the Contractor shall also provide a blanket or specific additional insured endorsement and all waivers of subrogation or transfer of rights of recovery endorsements for each policy.

Failure of the County to demand such certificate or other evidence of full compliance with these insurance requirements or failure of the County to identify a deficiency from evidence provided will not be construed as a waiver of the Contractor's obligation to maintain such insurance.

Indemnification:

Subject to the limitations in the third paragraph under this heading, the Contractor will defend, indemnify and hold harmless the County, its agents and employees from and against all liabilities, claims, damages, losses, costs and expenses (including attorney's fees) arising out of or resulting from the performance of the Work, provided that any such liability, claim, damage, loss, cost or expense:

- is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting there from and,
- is caused in whole or in part by any act or omission of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in whole or in part by a party indemnified hereunder.

The Contractor hereby acknowledges receipt of One Hundred Dollars (\$100) and other good and valuable consideration from the County as consideration for the indemnification provisions in this Contract.

In any and all claims against the County, its agents or employees; employees of the Contractor and subcontractor; all persons directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under the previous paragraph shall not be limited in any way as to the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

The indemnification obligations of the Contractor under this section shall not extend to the liability of the Professional and its agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or the giving or the failure to give requested interpretations by the Professional and their agents or employees, provided such giving or failure to give is the primary cause of injury or damage.

The Contractor will defend, indemnify and hold harmless the County and anyone directly or indirectly employed by it from and against all claims, damages, losses and expenses (including attorney's fees) arising out of any infringement of patent rights or copyrights held by others during or after completion of the Work, and shall defend all such claims in connection with any alleged infringement of such rights.

Provided however, if this Contract is deemed by a court of competent jurisdiction to be a construction contract under Section 725.06, Florida Statutes, any obligation of the Contractor to defend, indemnify or hold harmless the County, its officers and employees shall be limited to an obligation to indemnify and hold harmless to the extent caused by the negligence, recklessness or intentionally wrongful conduct of the Contractor and persons employed or utilized by the Contractor in the performance of the Contract.

The indemnification provisions contained herein shall survive the termination of this Contract.

ARTICLE 9 - CONTRACTOR'S RESPONSIBILITIES

Supervision and Superintendence - The Contractor will supervise and direct the work efficiently and with his best skill and attention. He will be solely responsible for the means, methods, techniques, sequences and procedure of construction, unless otherwise specified. The Contractor will be responsible to see that the finished Work complies accurately with the Contract Documents. The Contractor will keep on the site at all times during its progress a competent, resident superintendent who shall not be replaced without written notice to the Project Manager. The superintendent will be the Contractor's representative at the site and shall have authority to act on behalf of the Contractor. All communications given to the superintendent shall be as binding as if given to the Contractor.

The Project Manager may require in writing that the Contractor remove from the Work any of Contractor's personnel that the Project Manager determines to be incompetent, careless or otherwise objectionable.

No claims for an increase in Contract Amount or Contract Time based on the Project Manager's use of this provision will be valid. Contractor shall indemnify and hold the County harmless from and against any claim by Contractor's personnel on account of the use of this provision.

Labor, Materials and Equipment - The Contractor will provide competent, suitable, qualified personnel to lay out the Work and perform construction as required by the Contract Documents. He will at all times maintain good discipline and order at the site. The Contractor will furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities and incidentals necessary for the execution, testing, initial operation and completion of the Work.

All materials and equipment will be new except as otherwise provided in the Contract Documents. If required by the Project Manager, the Contractor will furnish satisfactory evidence as to the kind and quality of materials and equipment furnished.

All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator or processors except as otherwise provided in the Contract Documents.

Substitute Material or Equipment - If it is indicated in the Specifications that the Contractor may furnish or use a substitute that is equal to any material or equipment specified, and if the Contractor wishes to furnish or use a proposed substitute, he will within thirty (30) days after the award of the Contract make written application to the Project Manager for acceptance of such a substitute, certifying in writing that the proposed substitute will perform adequately the duties imposed by the general design, be similar and of equal substance to that specified and be suited to the same use and capable of performing in an efficient and economic manner as that specified. The application will include sufficient information to allow the Project Manager to evaluate the substitutions.

The application will state the extent, if any, to which the review, acceptance, furnishing and installation of the proposed substitute will prejudice Contractor's completion of the Work within the Contract Time(s). If the cost of the review of the substitution is greater than that of the originally specified item, the Contractor will reimburse the County for all costs. County may require Contractor to furnish at Contractor's expense a special performance guarantee or other Surety with respect to any substitute. The benefit of lower cost items shall be shared between the County and Contractor as specified in the Instructions to Bidders. No substitute shall be ordered or installed without the written acceptance of the Project Manager who shall be the sole judge of acceptability.

Concerning Subcontractors - The Contractor will not employ any Subcontractor, other person or organization of the types referred to in Article 4 (whether initially or as a substitute) against whom the County or the Project Manager may have reasonable objections, nor will the Contractor be required to employ any Subcontractor against whom he has reasonable objection.

The Contractor will not make any substitution for any Subcontractor who has been accepted by the Project Manager, unless the County and the Project Manager determine that there is good cause for doing so.

The Contractor will be fully responsible for all acts and omissions of his Subcontractors and of persons directly or indirectly employed by them and of persons for whose acts any of them may be liable to the same extent that they are employed by him. Nothing contained in the Contract Documents shall create, nor be interpreted to create, privity or any other contractual relationship whatsoever between the County and any Subcontractor or any person except the Contractor, or any obligation on the part of the County to pay or to see to the payment of any monies due any Subcontractor, except as may otherwise be required by law. The County may furnish to any Subcontractor, to the extent practicable, evidence of amounts paid to the Contractor on account of specific Work done. The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor in dividing the Work among Subcontractors or delineating the Work to be performed by any specific trade.

The Contractor agrees to bind specifically every Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the County.

All Work performed for the Contractor by Subcontractors shall be pursuant to an appropriate agreement between the Contractor and the Subcontractor which shall contain provisions that waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by insurance held by the County as trustee. The Contractor will pay each Subcontractor a share of any insurance monies received by the Contractor under this insurance.

Patent Fees And Royalties - The Contractor will pay all license fees and royalties and assume all costs incident to the use of any invention, design, process or device which is the subject of patent rights or copyrights held by others.

Permits - The Contractor will secure and pay for all construction permits and licenses and will pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of his Bid except those as may be identified in the Specifications. The Contractor will also pay all public utility charges except as provided for in the Contract Documents.

Laws and Regulations - The Contractor will give all notices and comply with all laws, ordinances, rules and regulations applicable to the work. If the Contractor observes that the Specifications or Drawings are at variance therewith, he will give the Project Manager prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Change Order. If the Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations and without such notice to the Project Manager, he will bear all costs arising therefrom; however, it shall not be his primary responsibility to make certain that the Drawings and Specifications are in accordance with such laws, ordinances, rules and regulations.

Use Of Premises - The Contractor will confine his equipment, the storage of materials and equipment, and the operations of his workers to the areas permitted by law, ordinances, permits or the requirements of the Contract Documents and shall not unreasonably encumber the premises with materials or equipment.

The Contractor shall confine the operation of workmen and equipment, and the storage of materials and equipment to the County's property or to other non-County property or in public right-of-way areas indicated on the Contract Drawings as including work to be done pursuant to the Contract documents. In the event the Contractor desires to have access to the project site, or perform work or operations pertaining to the Contract on, over or from non-County property adjacent to the project site, the Contractor shall obtain written authorization to do so from the respective adjacent property owner(s) prior to using such property. Such written authorization shall include a provision whereby the property owner agrees to hold the County harmless, and to defend the County, in the event of any liability,

loss, injury, or claim incurred as a result of the Contractors work or operations involving the use of the adjacent non-County property.

The County shall be provided with a notarized, certified copy of such written authorization(s) before the Contractor commences work or operations or use of such property in connection with work or operations pursuant to this Contract.

Record Drawings - The Contractor will keep one record copy of all Specifications, Drawings, Addenda, Change Orders and Shop Drawings at the site in good order, and annotated and/or marked on a current basis to indicate the progress of the work done and to show all changes made during the construction process or conditions varying from the Bid Documents. These shall be available to the Project Manager for inspection throughout construction and shall be delivered to the Project Manager upon completion of the Work, but prior to final payment.

Safety And Protection - The Contractor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. He will take all necessary precautions for the safety of and will provide the necessary protection to prevent damage, injury or loss to:

- A. All employees on the Project and other persons who may be affected thereby:
- B. All the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site; and

- C. Other property at the site or adjacent thereto including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

The Contractor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body or public or private utility service organization having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. He will erect and maintain, as required by the conditions and the progress of the Work, all necessary safeguards for safety and protection and, in addition, he will comply with all applicable recommendations of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc., and the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) and subsequent revisions and addenda as published by the U.S. Department of Transportation, Federal Highway Administration and adopted by the Florida Department of Transportation. He will notify owners of adjacent utilities when prosecution of the Work may affect them.

All damage, injury or loss to any property or all damage, disruption, discontinuance or other loss to any utility system or roadways referred to in Paragraph B. and C. caused directly or indirectly, in whole or in part by the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, will be remedied by the Contractor, except damage or loss attributable to the fault of the Drawings or the Specifications or to the acts or omissions of the County, and not attributable, directly or indirectly, in whole or in part, to the fault of negligence of the Contractor. The Contractor must also comply with the guidelines set forth in the Orange County Safety & Health Manual. The manual can be accessed online at the address below:

<http://www.orangecountyfl.net/VendorServices/OrangeCountySafetyandHealthManual.asp>

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The Contractor will designate a responsible member of his organization whose duty shall be the prevention of accidents at the site. **This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the Project Manager.**

Emergencies - In emergencies affecting the safety of persons, the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Project Manager, is obligated to act at his discretion to prevent threatened damage, injury or loss. He will give the Project Manager prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be issued covering the changes and deviations involved. If the Contractor believes that additional Work done by him in an emergency which arose from causes beyond his control entitles him to an increase in the Contract Amount or an extension of the Contract Time, he may make a claim therefore as provided in Article 13.

Shop Drawing and Samples - After checking and verifying all field measurements, the Contractor will submit to the Project Manager for review, in accordance with the accepted schedule of Shop Drawing submission, five copies (or at the Project Manager's option, one reproducible copy) of all Shop Drawings, which shall have been checked by and stamped with the approval of the Contractor and identified as the Project Manager may require. The data shown on the Shop Drawings will be complete with respect to dimensions, design criteria, materials of construction and the like to enable the project manager to review the information as required.

The Contractor will also submit to the Project Manager for review with such promptness as to cause no delay in the Work, all samples required by the Contract Documents. All samples shall be checked by and stamped with the approval of the Contractor, identified clearly as to material, manufacturer, any pertinent numbers and the use for which intended.

At the time of each submission, the Contractor will in writing call to the Project Manager's attention to any deviations that the Shop Drawing or sample may have from the requirements of the Contract documents.

The Project Manager will review with reasonable promptness and take appropriate action with regard to Shop Drawings and samples, but its review shall be only for general conformance with the design concept of the Project and for compliance with the information given in the Contract Documents. The acceptance of a separate item as such will not indicate approval of the assembly in which the item functions.

The Contractor will make any corrections required by the Project Manager and will return the required number of corrected copies of Shop Drawings and re-submit new samples until accepted.

The Contractor's stamp of approval on any Shop Drawing or sample shall constitute a representation to the Project Manager that the Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers and similar data or he assumes full responsibility for doing so, and that he has reviewed or coordinated each Shop Drawing or sample with the requirements of the Work and Contract Documents.

No Work requiring a Shop Drawing or sample submission shall be commenced until the submission has been accepted by the Project Manager. A copy of each accepted Shop Drawing and each accepted sample shall be kept in good order by the Contractor at the site and shall be available to the Project Manager.

The Project Manager's acceptance of Shop Drawings or samples shall not relieve the Contractor from his responsibility for any deviations from the requirements of the Contract Documents, unless the Contractor has in writing called the Project Manager's attention to such deviation at the time of submission and the County and the Project Manager have given written acceptance to the specific deviation; nor shall any acceptance by the Project Manager relieve the Contractor from responsibility for errors or omissions in the Shop Drawing.

Each Shop Drawing or sample submittal or substitution request by the Contractor shall contain a reference identifying the applicable, specific Section of the Specifications to which it pertains. Submittals failing to comply with this provision shall be rejected and returned to the Contractor without review.

Each Shop Drawing or sample submittal or substitution request shall include the following stamped certification by the Contractor:

"The General Contractor has reviewed the Shop Drawing, sample or substitution submitted herewith and has determined and hereby certifies that in all respects this submittal is in full compliance and conformance with the Contract specifications, drawings and all other Contract requirements pertaining thereto".

Failure of the Contractor to include the above stated specification reference number or certification of compliance shall result in the rejection of the submittal. The Contractor will also submit within five (5) days of Contract Award to the Project Manager for acceptance all samples required by the Contract Documents. All samples will have been checked by and stamped with the approval of the Contractor, identified clearly as to material, manufacturer, any pertinent numbers and the use for which intended.

In the event that the Contractor, or anyone working for or on behalf of the Contractor on this project, should commence or do any work requiring submission of a Shop Drawing or sample, or involving a substitution or an "or-equal" request without having such submittal accepted by the County in writing, then the Contractor is advised that any and all such work will be done at its risk and is subject to rejection and/or removal at the Contractor's expense and at no additional cost to the County if applicable Shop Drawing, sample, substitution, "or-equal" or other submittal is not accepted.

Further, the Contractor will not receive "progress" or "final" payment for any and all work commenced or done which requires, but has not received acceptance of Shop Drawings, samples, substitution requests, or "or-equal" requests or any other required submittal, nor will the Contractor receive "progress" or "final" payment for any and all work that has been determined by the Professional or the County's Project Manager not to be in compliance or conformance with the established Contract requirements, Contract change orders, written directives, written clarifications provided to the Contractor, or accepted Shop Drawings, accepted samples, accepted substitutions, or accepted "or-equals".

Cleaning Up - The Contractor will keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work; at the completion of the Work he will remove all waste materials, rubbish and debris from and about the premises as well as all tools, construction equipment and machinery, and surplus materials, and will leave the site clean and ready for occupancy by the County. The Contractor will restore to their original condition those portions of the Site not designated for alteration by the Contract Documents. If at any time during construction of this project, the Contractor fails to clean up on a daily basis, the County may do so. All costs associated with the County's cleanup activities on behalf of the Contractor shall be deducted from amounts due to the Contractor.

ARTICLE 10 – WORK BY OTHERS AND UTILITY COORDINATION

Work by Others – The County may perform additional work related to the project by itself, or it may let other direct contracts which shall contain general conditions similar to these. The Contractor will afford the other contractors who are parties to such direct contracts (or the County, if it is performing the additional work itself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of work, and shall properly connect and coordinate his Work with theirs.

Should the contract entail relocation of facilities not a part of this Contract, the Contractor will coordinate and cooperate with the applicable entity responsible for this portion of the work.

If any part of the Contractor's Work depends (for proper execution of results) upon work of any such other Contractor (or the County), the Contractor will inspect and promptly report to the Project Manager in writing any defects, deficiencies or delays in such work that render it unsuitable for such proper execution and results.

The Contractor's failure to report shall constitute an acceptance of the other work, except as to defects, deficiencies and delays which may appear in the other work after the execution of the work.

The Contractor will do all cutting, fitting and patching of his Work that may be required to make its several parts come together properly, and fit it to receive or be received by such other work. The Contractor will not endanger any work of others by cutting, excavating or otherwise altering such other work and will only cut or alter such other work with the written consent of the Project Manager.

If the performance of additional work by other Contractors or the County is not noted in the contract documents prior to the execution of the Contract, written notice thereof shall be given to the Contractor prior to starting any such additional work. If the Contractor believes that the performance of such additional work by the County or others involves him in additional expense or entitles him to an extension of the Contract Time, he may make a claim therefore as provided in Article 13.

Utility Coordination – Section 337.401 (1), Florida Statutes and other applicable law allows utility owners to install and maintain along, above, under, across or on any road or right-of-way any electric transmission or distribution facilities, telephone, telegraph, pole lines, poles, railway structures, ditches, sewers, water, heat, gas mains, pipelines, fences, gasoline tanks and pumps, waterlines, gas lines, wire lines, utility service connections, water and gas meter boxes, valve boxes, light standards, cable lines, cable ways, signals, signal boxes, and all other utility installations, improvements and utility appurtenances to be installed and maintained in the right-of-way.

The Contractor understands and agrees that the lands upon which the Work is to be performed consists of prior existing right-of-way, as well as, recently acquired right-of-way. The Contractor acknowledges and agrees that utility installations and appurtenances are located within the limits of the planned construction Work. The utility installations and appurtenances may be in conflict with the Contractor's Work or require relocation or adjustments. All utility conflict resolutions, relocations, or adjustments are to be moved by the utility owners at their expense, unless otherwise provided in the Contract documents.

The Contractor, by submission of a bid, agrees that prior to bid he has studied, performed field inspections, and evaluated all potential utility conflicts, the locations of permanent and temporary utility appurtenances in their present and relocated positions as may be shown on the plans. The Contractor acknowledges and agrees that the Contractor's bid has considered all potential utility conflicts, the locations of permanent and temporary utility appurtenances in their present and relocated positions including those shown on the plans, not shown on the plans, and those identified during the

Contractor's pre-bid study or that should have been identified during the Contractor's field inspections, and evaluation of the limits of the planned construction Work.

The design Professional may show surface or subsurface utility conflicts, relocations, or adjustments in the drawings and plans. The surface and subsurface utility information shown in the drawings and plans was obtained and used by the design Professional to establish design criteria for the design plans. The accuracy as to location and the identification of all surface or subsurface utility information is not warranted or guaranteed and is not to be construed as part of the construction plans governing the construction Work. The Contractor shall solely make his own determinations as to surface and subsurface conditions.

The Contractor shall be solely responsible for utility coordination including all utility conflict resolutions, relocations, and adjustments. The concept of "utility coordination" means that the Contractor shall, at a minimum:

- A. Investigate both subsurface and aboveground conditions to identify potential conflicts far enough in advance of his planned construction operations to allow the Contractor to coordinate with utility owners and responsible parties any necessary conflict resolutions, relocations, or adjustments such that they can occur without delay to the Contractor's operations and Progress Schedule.
- B. Conduct regularly scheduled Utility Coordination Meetings with all affected utilities, and shall maintain detailed minutes of the discussions.
- C. Contact all utility owners in advance of any needed conflict resolutions, relocations, or adjustments.
- D. Contact the Project Manager as to all Contractor scheduled utility conflict resolutions, relocations, or adjustments.
- E. Schedule all work to be performed by the utility owners related to utility conflict resolutions, relocations, or adjustments.
- F. Schedule all work to be performed by the utility owners so as not to delay or disrupt in any way the Contractor's own performance of the Contractor's Performance Schedule.
- G. Assure the proper connection of the Contractor's Work with the work of the utility owners.
- H. Assure that the schedule, contacts, and proper connections between the Contractor's Work and the utility owner's work harmonize the work of both in a common action to achieve resolution of utility conflicts, relocations, and adjustments.
- I. Contractor shall, at no cost to the County, adjust the project schedule to allow the work to proceed in such a manner that delays to the progress of the work are minimized.

As discussed more fully in Article 17, delays to the Contractor's Progress Schedule resulting from the resolution of utility conflicts, relocations, and adjustments to utilities will not be considered as the basis for granting a change in Contract Amount or Contract Time.

ARTICLE 11 - PROJECT OWNER STATUS DURING CONSTRUCTION

The Contractor shall provide the following information to all subcontractors and suppliers:

County's Representatives - The Project Owner shall be the Board of County Commissioners. The Board shall be represented by the Project Manager listed below during the construction period:

Manager, Solid Waste Division, or designee, Jim Flynt
Address: 5901 Young Pine Road, Orlando, FL 32829
Phone: 407-836-6600

ARTICLE 12 - CHANGES IN THE WORK

Without invalidating the Contract, the County may, at any time or from time to time, order additions, deletions or revisions in the Work authorized by written Change Orders or directive. Upon receipt of a Change Order, the Contractor will proceed with the work involved. All such work shall be executed under the applicable conditions of the Contract documents. If any Change Order causes an increase or decrease in the Contract Amount or any extension or shortening of the Contract Time, an equitable adjustment will be made as provided in Article 13.

Additional Work performed by the Contractor without authorization of a Change Order will not entitle him to an increase in the Contract Amount or any extension of the Contract Time, except in the case of an emergency as provided in Article 9.

It is the Contractor's responsibility to notify his Surety of any changes affecting the general scope of the Work or change of the Contract Amount and the amount of the applicable bonds shall be adjusted accordingly, and an amended bond document furnished to the County.

In the event the County directs the Contractor to make a change in the Work, and if the County and the Contractor do not arrive at a mutually acceptable increase or decrease in the Contract Amount, the Contractor shall not use any such lack of mutual acceptance as a basis or cause to stop or otherwise delay the progress or the execution and completion of any of the work ordered, directed or required pursuant to the Contract Documents.

If the Contractor believes an event or situation has occurred which justifies a change in the Contract Amount or Contract Time, he shall deliver a written notice to the Project Manager. Each such written notice shall be delivered promptly, and in any event no later than 15 days after the Contractor first discovered the occurrence. The Contractor shall be deemed to have waived the right to collect any and all costs incurred more than 15 days prior to the date of delivery of the written notice, and shall be deemed to have waived the right to seek an extension of the Contract Time with respect to any delay in the Progress Schedule which accrued more than 15 days prior to the date of delivery of the written notice.

Any such notice shall include sufficient detail to explain the basis of entitlement to a claim for an adjustment to the Contract Amount or Contract Time. When requested by the Project Manager, the Contractor shall furnish any additional information and details as may be required to determine the facts or allegations involved, which shall be provided within fifteen (15) days of the request unless a longer time period is allowed by the Project Manager.

The Contractor shall prepare proposals detailing proposed adjustments to Contract Amount and/or Contract Time in accordance with Article 13 and submit them to the Project Manager within 15 days of the County's issuance of a proposed Change Order or the Contractor's submitting a written notice of a change or claim for an adjustment to the Contract Amount or Contract Time. Contractor's proposals shall be irrevocable for a period of at least sixty (60) days after receipt by the County. Any delay in the submittal of a complete, adequate and acceptable proposal will not justify an increase in Contract Amount or Contract Time. Contractor agrees that it shall give the County access to any and all of Contractor's and Subcontractors' books, records and other materials relating to proposed Change Orders and other claims for adjustment to Contract Amount or Contract Time.

ARTICLE 13 - CHANGE OF CONTRACT AMOUNT AND CONTRACT TIME

Contract Amount - The Contract Amount constitutes the total compensation payable to the Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by the Contractor shall be at his expense without change in the Contract Amount. The Contract Amount may only be changed by written Change Order issued by the County. Any claim for an increase in the Contract Amount shall be in writing and delivered to the Project Manager within fifteen (15) days of the occurrence of the event giving rise to the claim.

All claims for adjustment in the Contract Amount shall be determined by the Project Manager. However, no claim for an adjustment to the Contract Amount will be considered for unforeseeable causes that were beyond the fault or negligence of the Contractor or his Subcontractors or supplier such as acts of God, floods, riots, etc. This restriction does not restrict submission of claims for additional Contract Time due to events of this nature. Any change in the Contract Amount shall be incorporated in a Change Order.

Proposals or Claims Substantiating Adjustments; Limitations:

- A. Contractor proposals or claims shall cover all aspects of the Work involved and shall be fully documented and itemized as to all costs, quantities and charges for overhead and profit. Amounts for Subcontractors or Suppliers at any tier shall be similarly supported. When determining Subcontractors' costs, the methods to be Used shall be those used for the Contractor's costs, except that the term "Subcontractor" shall replace the term "Contractor," context permitting.
- B. Where the change in Contract Amount arises from changes in the time required to perform any Work, or where a change in Contract Time is sought, the Contractor's itemized estimates shall detail all productivity and production data, and include an analysis of the Record Schedule demonstrating the schedule status just before and after the occurrence of events on which the request is

based (thereby showing the extent of delay resulting from the event involved) and any measures taken or planned to mitigate the impacts.

- C. Neither the Contract Time nor Contract Amount shall be changed due to a delay in Contractor's early completion date until all the corresponding Contract Float available in the Record Schedule at the start of the delay is used and performance of the specified Work extends necessarily beyond that Contract Time. The Contractor shall not recover from the County (a) acceleration costs incurred to overcome delays which warrant extensions in Contract Time but exclude changes in Contract Amount, (b) escalation costs for any part of the Work having Contract Float or not delayed beyond the late dates in the Record Schedule, or (c) delay costs not expressly allowed in General Conditions Article 13 as supplemented.
- D. Changes in Contract Amount for extensions in Contract Time shall exclude costs that are unaffected or do not relate to the extension in Contract Time, such as: (a) operating costs of construction equipment assigned to the Work on a continuing basis, (b) operating costs and owned/rental costs of construction equipment (crane used for specific lifts, concrete pump used for specific pours, etc.), and (c) fully paid site facilities, tools, etc.

The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Amount shall be determined in one of the following ways:

- A. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved. If the quantities originally contemplated are so changed in a proposed Change Order, that application of the Unit Prices to the quantities proposed will cause substantial inequity to the County or the Contractor, the applicable unit price(s) shall be equitably adjusted by mutual agreement.
- B. By mutual acceptance of a lump sum.
- C. By cost and mutually acceptable fixed amount for overhead and profit.
- D. If the value of work covered by a Change Order cannot be established or mutually agreed to utilizing any of the above three methods, the value shall be determined by the County on the basis of an estimate of the out-of-pocket cost and percentages that are acceptable to the County for overhead and profit. The out-of-pocket cost shall only include those direct costs which are needed to perform the work such as labor (including payroll taxes, fringe benefits, labor burden and workers' insurance), materials, equipment, and other incidental out-of-pocket construction costs directly involved in the work, including but not limited to small tools, expendables and material costs but shall not include project management or project supervisory costs unless the Change Order includes an increase in the Contract time.

Methods for Determining Adjustments in Contract Amount:

- A. If the County directs the Contractor to proceed with the Work involved pursuant to actual out-of-pocket costs plus contractual allowances for overhead and profit and states a Not-to-exceed price, Contractor claims for costs, overhead or profit beyond the Not-to-exceed price shall be invalid, unless, prior to incurring those costs, overhead or profit Contractor provides written notice and County increases the Not-to-exceed price in writing..
- B. If payment for the Work involved is to be determined by a court of law, it is agreed by the Contractor that the actual out-of-pocket cost and overhead and profit method contained in the General and Supplemental Conditions shall represent an appropriate method for determining the cost and overhead and profit for the Work involved.
- C. In computing Cost of the Work involved in a Change Order or claim, costs shall be allowable only to the extent costs (a) are consistent with those prevailing in the Orlando Metropolitan Statistical Area (which includes Orange, Seminole, Lake and Osceola Counties) and with applicable criteria set forth in 48 CFR Part 31 (federal contract cost principles and procedures), (b) include only the appropriate items for labor, material or equipment, construction equipment and special cost items specified in General Conditions Articles 13.

In such case, the Contractor will submit in the form prescribed by the County an itemized cost breakdown together with supporting data.

The amount of credit to be allowed by the Contractor to the County for any such change which results in a net decrease in cost, will be the amount of the actual net decrease as determined by the County. When both additions and credits are involved in any one change, the combined overhead and profit shall be figured on the basis of the net increase, if any.

To be eligible for consideration, the Contractor's written claim for a change in the Contract price, including claim(s) from sub-contractors, shall include an itemized cost breakdown with supporting data as described below:

- A. For labor: Provide written documentation from the Contractor and Subcontractors or others as appropriate in the form of a detailed breakdown by each labor classification involved indicating the number of hours of Work involved and the hourly payroll rate applicable to each to substantiate the basis and amount of the direct labor cost. The direct labor cost may be increased to provide an allowance for indirect payroll costs (labor burden), such as payroll taxes, fringe benefits, and workers insurance after all premium discounts, rebates and other appropriate reductions have been taken.

Allowable labor costs shall be limited to craft labor (including foremen) in the direct employ of the Contractor (or Subcontractor) assigned to the site and engaged in furnishing and incorporating materials or equipment in the Work involved in the Change Order or Claim.

When determining actual payroll costs, daily time sheets certified by the Contractor and verified by the Project Manager along with certified payroll records shall be the valid records.

- B. For material, supplies, equipment, furnishings, etc., to be installed or included in the Work: Provide written documentation from the Contractor and Subcontractors, suppliers, etc., to substantiate the basis and amount of the various cost items involved. Material costs shall reflect the Contractor's reasonably anticipated net actual cost after consideration of trade discounts and volume rebates.
- C. For construction equipment: Provide written documentation in the form of a detailed breakdown by each construction equipment category indicating, the applicable unit rates (i.e., \$'s per hour, \$'s per day etc.) and the number of hours, days, etc. to substantiate the basis and amount of the construction equipment out-of-pocket costs.
- D. Special cost items (any out-of-pocket cost items not considered to be material, labor or construction equipment as set forth above including but not limited to small tools and expendables): Provide written documentation in the form of a detailed breakdown or itemization of the costs, fees, charges, hours, hourly rates, etc., to clarify, document and substantiate the basis and amount of the out-of-pocket cost. Special cost items due to the Work or a delay involved in a Change Order or Claim may include a proportion of the following indirect costs, to the extent those indirect costs increase or decrease on account of (a) the Cost of the Work involved for labor, Subcontractor or Supplier furnished materials or equipment, or (b) an extension in Contract Time as follows (provided that no cost shall be paid for holidays or weather days during the delay):
 - 1. Payroll costs for the Contractor's full-time superintendent and payroll costs for other personnel in the employ of the Contractor resident (engaged in activities) at the site if those costs arise solely from an extension in Contract Time;
 - 2. Costs of small tools and expendables (less market value if not consumed) of items individually valued at less than \$1,000.00 that are not owned by the workers, if the Contractor provides an itemized list of items required for the performance of the Work involved; however, no such costs shall be allowed over 4% of the direct labor costs, unless the Contractor furnishes detailed data sufficient to allow verification that a higher percentage is appropriate for the Work involved;
 - 3. Costs of office and temporary facilities at the site, including utilities, fuel and sanitary facilities, telephone and internet service at the site, materials, supplies, equipment, other minor expenses (e.g. expressage and petty cash), if those costs arise solely from an extension in Contract Time;
 - 4. Costs of consultants not in the direct employ of the Contractor, if those costs are or were authorized by the County before proceeding with the Work involved;

5. Taxes on the Work involved, and for which the Contractor is liable; and royalty payments and charges and fees for permits, if any of them relate solely to the Work involved;
6. Physical losses, damages and expenses to the Work, not compensated by property insurance, or otherwise to be sustained by the Contractor in the prosecution of the Work (except losses and damages within the deductible amounts of property insurance, if any), but only if the losses, damages and expenses result from the fault or negligence of the County, or
7. Bond premiums and insurance premiums not included as part of the indirect labor cost, if they relate solely to the Work involved.

E. Construction Equipment Costs:

1. For equipment owned by Contractor (or Subcontractor) or rented or leased from lessors associated with or owned by them, allowable costs shall be limited to equipment required for the Work involved in a Change Order or claim with individual replacement values exceeding \$1,000.00. Transportation, loading/unloading, installation, dismantling and removal costs shall be allowed only if prior written consent is obtained from the Project Manager, and if the equipment is, or was, transported to the site solely for the Work involved. Shipping costs will be allowed only if the equipment is not available in the Orlando Metropolitan Statistical Area.

Contractor shall be entitled to ownership and operation costs of the equipment based on the Contractor's normal accounting practices, but in no event shall equipment ownership or operation costs exceed the applicable hourly rates listed in the "Cost Reference Guide," published by Prism Business Media. For multiple shifts, the equipment rate shall not exceed the shift Work adjustments recommended in the referenced Cost Guide.

Equipment costs shall be computed using the same accounting and estimating rules and prices, whether related to added or deleted Work, and shall cease when the equipment is no longer needed for the Work involved.

2. For equipment rented or leased from lessors not associated with or owned by the Contractor (or Subcontractor), the Contractor shall be entitled to rental or lease rates, but in no event shall the rates or hourly operating costs exceed applicable rates in the Rental Rate "Blue Book" published by Prism Business Media. The equipment rate for second or third shifts shall not exceed fifty percent (50%) of the base rate. Hourly rates for equipment previously in use at the site for at least a month shall be based on the monthly rate divided by 176 hours. Equipment previously in use for only one week or not previously in use at the site shall not be invoiced to the County at rates higher than the following schedule correlating equipment usage to payment category:

Less than 8 hours	Hourly Rate
1 day but less than 7 days	Daily Rate
1 week but less than 30 days	Weekly Rate
30 days or more (when in use)	Monthly Rate

3. Rented (or owned) equipment idled by actions of the County *for* reasons under the sole control of the County shall be paid as rented equipment (or as one-half of owned equipment), provided the idle period exceeds what is normal for such equipment and occurs during normal working hours.

When determining actual construction equipment costs, daily logs of the equipment, operators and actual usage, verified by the Project Manager, shall be the valid records.

With respect to the allowances for overhead and profit the following schedule shall be used in determining the total cost of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract price:

- A. For the Contractor, for Work (i.e., the cost of labor, materials and construction equipment as described above) performed by the Contractor's own forces; 15% of the cost.
- B. For the Contractor, for the Work performed by the Contractor's Subcontractor; 7 ½% of the amount due the Subcontractor.
- C. For each Subcontractor involved, for Work performed by that Subcontractor's own forces 7 ½% of the cost.
- D. For each Subcontractor, for Work performed by the Subcontractor's Sub-Subcontractor's 5% of the amount due the Sub-Subcontractor.
- E. Cost to which overhead and profit is to be applied shall be determined in accordance with provisions of this Article 13.
- F. The Cost of the Work involved in a Change Order or claim shall not include any of the following costs (considered administrative costs or contingencies covered by the overhead and profit):
 1. Payroll costs and other compensation of (a) executives, general and administrative managers, estimators, claim consultants, attorneys, accountants, labor relation coordinators, contract and subcontract administrators, purchasers, expeditors and other administrative staff, whether employed at the site or in the Contractor's (or Subcontractor's) principal or branch offices; and (b) project managers, construction managers, engineers, architects, schedulers, detailers, safety personnel, clerks and other administrative staff employed in his principal or branch offices;
 2. Costs in the preparation of Change Orders or claims (whether or not ultimately authorized by the County);

3. Costs of engineers, architects, accountants, consultants, attorneys and others, in the direct employ of the Contractor or otherwise, utilized for services related to a controversy or claim about the acceptability of the Work;
4. Any part of the Contractor's capital expenses, including interest on capital for the Work involved, lost interest on unpaid retainage, and charges for delinquent payments;
5. Any other expenses of the Contractor's principal and branch offices, including storage and yard facilities; and any costs not specifically and expressly allowed in General Conditions Article 13 as supplemented.

If deemed necessary, the overhead and profit allowance schedule shown above may be adjusted by the Project Manger.

Cash Allowances - It is understood that the Contractor has included in the Contract Amount any allowances so named in the Contract Documents and shall cause the Work so covered to be done by such Suppliers or Subcontractors and for such sums within the limit of the allowances as the County may accept. Prior to final payment, the Contract Amount shall be adjusted as required and an appropriate Change Order issued. The Contractor agrees that the original Contract amount includes such sums as he deems proper for cost and profit on account of cash allowances. No demand for additional cost or profit in connection therewith will be allowed.

Change of Contract Time - The Contract Time may only be changed by written Change Order. Any claim for an extension in the Contract Time shall be in writing and include an analysis of the Progress Schedule as further described in the Specifications, and shall be delivered to the Project Manager within fifteen (15) days of the occurrence of the event giving rise to the claim.

All claims for adjustment in the Contract Time shall be determined by the Project Manager. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

The Contract Time may be extended for an amount equal to time lost due to unforeseeable causes beyond the control of the Contractor (and his Subcontractors and Suppliers) if he makes a claim therefore. Such delays shall include, but not be restricted to, acts or neglect by any separate Contractor employed by the County; fires; floods; labor disputes; epidemics or acts of God.

All time limits stated in the Contract Documents are of the essence to the Contract. The stated time limits are agreed to be adequate to complete the work, including the procurement, manufacture and delivery of all material and equipment required, and account for any and all potential impact, delays, disruptions and costs that may be expected.

ARTICLE 14 - CONDITION OF MATERIALS AND PACKAGING:

In instances where the Specifications, (Part H) make this subject applicable (and unless otherwise indicated), all goods and items offered for sale and/or shipped by the Contractor pursuant to the requirements imposed upon said Contractor by this bid package,

will be new and in first class condition; all related containers being new and suitable for storage and shipment; all prices including the cost of standard commercial packaging. Contractors will be solely responsible for making any and all claims against carriers as concerns missing or damaged items.

ARTICLE 15 - ASBESTOS FREE MATERIALS:

Project is to be constructed with asbestos free materials. A written, notarized statement on company letterhead is to be submitted with the final payment request. Final payment shall be withheld until such statement is submitted.

Contractor shall agree that if materials containing asbestos are subsequently discovered at any future time to have been included in the construction done by the Contractor or any of its Subcontractors or agents and were not specified in the design or required by the Contract document, Contractor shall be liable for all costs related to the abatement of such asbestos and damages or claims against the County.

ARTICLE 16 – WARRANTY AND GUARANTEE, ACCEPTANCE OF DEFECTIVE WORK

Warranty and Guarantee - The Contractor warrants and guarantees to the County that all materials and equipment will be new unless otherwise specified and that all Work will be of good quality, free from faults or defects and in accordance with the requirements of the Contract Documents including any required inspections, tests or approvals. All unsatisfactory Work, all faulty Work, and all Work not conforming to the requirements of the Contract Documents or such inspections, tests or approvals shall be considered defective. Prompt notice of all defects shall be given to the Contractor. All defective Work, whether or not in place, may be rejected, corrected or accepted as provided in this Article. All warranty and guarantee coverage periods shall commence from the Final Completion date of the project as determined by the Project Manager. The coverage commencement date of warranties and guarantees shall, in accordance with the provisions stated above, be entered on each warranty or guarantee document.

However, in the event the coverage commencement date entered on the warranty or guarantee document is not in accordance with the provisions stated above, the coverage commencement date shall nonetheless be the date determined by applying the provisions stated above.

Tests and Inspections - If the Contract Documents, laws, ordinances, rules, regulations or order of any public authority having jurisdiction require any Work to specifically be inspected, tested or approved by someone other than the Contractor, the Contractor will give the Project Manager timely notice of readiness therefore. The Contractor will furnish the Project Manager with the required certificates of inspection, testing or approval. All such tests will be in accordance with the methods prescribed by the American Society for Testing Materials or such other applicable organizations as may be required by law or the Contract Documents.

If any such Work required to be inspected, tested or approved is covered without written approval of the Project Manager, it must, if requested by the Project Manager, be uncovered for observation at the Contractor's expense. The cost of all such inspections,

tests and approvals shall be borne by the Contractor unless otherwise provided. Neither observations by the Contractor nor inspections, tests or approvals by persons other than the Contractor shall relieve the Contractor from his obligations to perform the Work in accordance with the requirements of the Contract Documents.

Access To The Work - The Project Manager and his representative and other representatives of the County and the Professional will at all times have access to the Work. The Contractor will provide proper facilities for such access and observation of the Work and also for any inspection or testing thereof by others.

Uncovering Work - If any Work is covered contrary to the request of the Project Manager it must, if requested by the Project Manager be uncovered for observation and replaced at the Contractor's expense. If any Work has been covered which the Project Manager has not specifically requested to observe prior to its being covered, or if the Project Manager considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor, at the Project Manager's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Project Manager may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, the Contractor will bear all the expense of such uncovering, exposure, observation, inspection and testing, and of satisfactory reconstruction. If, however, such Work is not found to be defective, the Contractor will be allowed an increase in the Contract amount or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and re-construction, if he makes a claim therefore as provided in Article 13.

Notice to Cure - If the County determines the Work is defective or deficient; if the Contractor fails to supply sufficient skilled workers or suitable materials or equipment; if the Contractor fails to make prompt payments to Subcontractors for labor, materials or equipment; if the work is not progressing in a safe, orderly or well coordinated manner; or if the general progress and/or quality of the work is not adequate to ensure continuation or completion of the work in accordance with the Contract completion time requirements, then the Procurement Division Manager shall issue a notice to cure, giving the Contractor a specific period of time

(1) in which to submit to the Project Manager a written Plan of Action including a schedule setting forth a plan by which the deficiencies will be corrected, and (2) a specific period of time in which to correct the deficiencies. If the Contractor does not submit a Plan of Action to indicate how and when the deficiencies indicated in the notice to cure will be cured within the specified time frame that is acceptable to the Project Manager, and if those deficiencies are not corrected within that time frame, then the County shall take further action, up to and including Contract termination. The Contractor shall not be entitled to any delay claims as a result of the County's issuance of the notice to cure.

Correction or Removal of Defective Work - If required by the Project Manager prior to approval of final payment, the Contractor will, promptly, without cost to the County and as specified by the Project Manager, either correct any defective Work whether or not fabricated, installed or completed or, if the Work has been rejected by the Project Manager, remove it from the Site and replace it with non-defective Work.

If the Contractor does not correct such defective Work or remove and replace such rejected work within a reasonable time, or as specified in a written notice from the Project Manager, the County may have the deficiency corrected or the rejected work removed and replaced. All direct and indirect costs of such correction or removal and replacement shall be paid by the

Contractor. The Contractor will also bear the expense of making good all work of others destroyed or damaged by this correction, removal or replacement of his defective Work.

One (1) Year Correction Period - The Contractor shall be responsible for the timely correction of any deficiencies in the work for a period of one (1) year after final acceptance or such longer period of time as may be prescribed by law or by any other terms required by the Contract. The Contractor will promptly without cost to the County and in accordance with the Project Manager's written instructions either correct such defective Work or, if it has been rejected by the Project Manager, remove it from the site and replace it with non-defective Work. If the Contractor does not promptly comply with the terms of such instructions, the Project Manager may have the defective Work corrected or the rejected Work removed and replaced. All direct and indirect costs of such removal and replacement will be paid by the Contractor.

Acceptance Of Defective Work - If, instead of requiring correction or removal and replacement of defective Work, the Project Manager prefers to accept it, then he may do so. In such case, if acceptance occurs prior to approval of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents including an appropriate reduction in the Contract amount. If the acceptance occurs after approval of final payment, the appropriate amount shall be paid by the Contractor to the County.

Neglected Work By Contractor - If the Contractor should neglect to prosecute the Work in accordance with the Contract Documents, including any requirements of the progress schedule, the County may, after reasonable written notice to the Contractor and without prejudice to any other remedy it may have, make good such deficiency and the cost thereof shall be charged against the Contractor. A Change Order shall be issued incorporating the necessary revision in the Contract Documents including an appropriate reduction in the Contract Amount. If the payments then or therefore due the Contractor are not sufficient to cover such amount, the Contractor will pay the difference to the County.

Notice is hereby given that the County will retain and pay for an independent materials testing laboratory to perform certain tests as follows:

- a. Initial concrete test cylinder making and testing (concrete mix design will be by Contractor).
- b. Initial earthwork compaction.
- c. Initial in-place testing of sub-grade, sub-base and base for roadways including thickness and compaction (soil cement design will be by Contractor). The County reserves the right to perform any other tests it deems necessary to ensure that any all construction is adequate for the purposes intended and meets all applicable criteria.

- d. Subsequent tests required after the initial tests to verify compliance with the Contract Documents in areas failing the initial tests shall be paid for by the Contractor by back charge to subsequent applications for payment.

The Contractor will perform and pay for all material testing and other testing specified in the Contract Documents and as stated in paragraphs a. through e. above. The purpose of performing these tests is to verify compliance with the specifications as set forth in the Contract Documents.

ARTICLE 17 – DELAYS AND EXTENSION OF TIME

County Obligation – The County owes no duty, obligation, damages, change in Contract Amount, or liability to Contractor as a result of any delay, interference, suspension or other event which may impact Contractor’s progress schedule of its contract.

Extension of Time Sole Remedy – Should Contractor’s performance, in whole or in part, be interfered with, delayed, re-sequenced, disrupted, or be suspended in the commencement, prosecution or completion, for reasons beyond Contractor’s control, and without any fault or negligence on its part contributing thereto, Contractor’s sole remedy shall be an extension of Contract Time in which to complete the Contract.

Contract Time Extension – The County may grant an extension of Contract Time when a controlling item of work on the critical path of Contractor’s progress schedule is delayed by factors not reasonably anticipated or foreseeable at the time of bid. Such time extension may be allowed only for delays occurring during the time for performance set forth in the progress schedule. Extensions of Contract Time will not be granted for delays due, in whole or in part, to the fault or negligence of Contractor or any entity or person for whom Contractor is responsible.

Utility Conflicts, Relocation, and Adjustment Delays – The Contractor is solely responsible for the coordination and resolution of all utility conflicts, relocations, and adjustments. Delays resulting from the resolution of utility conflicts, relocations, and adjustments to utilities will not be considered as the basis for granting a change in Contract Amount or Contract Time.

Limitation on Damages – In the event the provision regarding an extension of time as being the sole remedy, see above, is not legally enforceable and Contractor is not limited to the sole remedy of an extension of time, Contractor shall not under any circumstances be allowed to recover any of the following items of damage against the County: (1) profit; (2) loss of profit; (3) work inefficiencies; (4) loss of productivity; (5) overtime premiums; (6) escalation; (7) home office overhead, including but not limited to costs of any kind for home office personnel; (8) indirect damages; and (9) consequential damages, including but not limited to loss of bonding capacity, loss of bidding opportunities, and insolvency.

ARTICLE 18 - PAYMENT AND COMPLETION

Schedule of Values – The Contractor shall submit a schedule of values of the Work including quantities and unit prices totaling the Contract Amount no later than twenty (20) days after receipt of the Notice to Proceed and prior to commencing Work on the project. The schedule of values shall be in a form satisfactory to the County.

The schedule of values shall subdivide the Work into sufficient detail to serve as the basis for progress payments during construction. Upon acceptance of the schedule of values by the Project Manager, it may be incorporated into the form of application for payment prescribed by the County.

The Contractor shall not imbalance its schedule of values nor artificially inflate any element thereof. The violation of this provision by the Contractor shall constitute a material breach of this contract.

Progress Schedule – The Contractor’s Progress Schedule shall utilize the Critical Path Method (“CPM”). The Contractor’s Progress Schedule shall be prepared using Primavera P-6 or other software approved by the County; the software shall be specifically intended for the preparation of construction schedules incorporating a critical path. The software used by the Contractor must be approved in advance by the County. The Contractor shall submit a Progress Schedule CPM (both in hard printed copy with network diagrams and electronic disc files) no later than twenty (20) days after receipt of the Notice to Proceed, and prior to commencing Work on the project. The Progress Schedule CPM shall clearly identify all controlling items of Work and activities defined as the critical path, which if delayed or prolonged, will delay the time of completion of the Contract. The critical path shall include a minimum 10% float time as part of the Contract Time for unforeseen conditions. Contractor shall provide additional float time above the required minimum 10% based on his experience, understanding of the scope, and inspection of the site.

Progress Payment Update Schedules CPM – The Contractor shall submit an Update Schedule CPM to the Project Manager concurrent with each Application for Progress Payment. The Update Schedule CPM shall focus on the period from the last Update Schedule CPM to the current Update Schedule CPM submitted with the Application for Progress Payment. Activities that have either started or finished shall be reported as they actually occurred and designated as complete, if actually completed. For activities in progress that are forecasted to complete longer than planned, the remaining durations shall be revised, not the original durations. All out of sequence activities are to be reviewed and their relationships either verified or changed.

The Contractor’s failure to submit a Progress Payment Schedule CPM and Progress Payment Narrative Report as described herein with an Application for Progress Payment shall be sufficient reason for rejection of the Progress Payment request. If the Project Manager rejects the Progress Payment Update Schedule CPM or the Progress Payment Narrative Report, the entire Progress Payment request shall be rejected and must be resubmitted with the corrected Progress Payment Update Schedule CPM and Progress Payment Narrative Report.

Progress Payment Narrative Report – Each Update Schedule CPM shall be accompanied by a written Narrative Report. The Narrative Report shall describe the physical progress during the report period, plans for continuing the Work during the forthcoming report period, actions planned to correct any delays, and a detailed explanation of potential delays or problems and their estimated impact on performance, milestone completion dates, the forecasted completion date, and the forecasted substantial completion date. In addition, alternatives for possible schedule recovery to mitigate any potential delays shall be discussed.

The Contractor's Progress Payment Narrative Report shall include a detailed list of all outstanding Contract Claims with a detailed description of each Contract Claim. The Narrative Report shall follow the outline set forth below:

Contractor's Narrative Report Outline:

- (1) Contractor's dated transmittal letter.
- (2) Work completed during the report period.
- (3) Description of the current critical path.
- (4) Description of problem areas.
- (5) Current and anticipated delays:
 - a. Cause of the delay
 - b. Corrective action and schedule adjustments to correct the delay.
- (6) Impact of the delay on other activities, milestones, and completion dates. Changes in construction sequences.
- (7) Pending items and status thereof:
 - a. Permits.
 - b. Change orders.
 - c. Time extensions.
- (8) A list of all outstanding Contract Claims and a detailed description of each Contract Claim.
- (9) Contract completion date status:
 - a. Ahead of schedule and number of days.
 - b. Behind schedule and number of days.

Schedule and Report Format – The Contractor shall submit the Progress Schedule CPM, Progress Payment Update Schedules CPM, and the Progress Payment Narrative Report to the Project Manager on both: (1) electronic disc files; and, (2) printed copies of the network diagrams and narrative reports.

Project Manager Review – The Project Manager shall review the Contractor's Progress Schedule CPM, Progress Payment Update Schedules CPM, and Progress Payment Narrative Reports. The Project Manager may accept or reject Update Schedule CPMs or Narrative Reports. Rejected Update Schedule CPMs and Narrative Reports shall be corrected and re-submitted to the Project Manager.

Final Schedule Update – The Contractor within fifteen (15) days after substantial completion shall submit a final update of the schedule with actual start and actual finish dates for all activities and controlling items of Work identified as the critical path. The Final Schedule Update shall be accompanied by a certification signed by the Contractor stating, "To the best of my knowledge, the enclosed final update of the project schedule reflects the actual start and completion dates of the activities and controlling items of Work on the critical path."

Application For Progress Payment – Applications for payments shall be processed in accordance with Florida Statute 218.735, Part VII, "Local Government Prompt Payment Act".

The Project Manager shall provide written notice to the Contractor identifying the name, address, phone number and email address of the agent or employee the Contractor is required to submit payment requests or invoices to. This notice will be provided no later than ten (10) days after issuance of the Notice to Proceed.

Not more often than once a month, on a date established at the Project Pre-Construction Conference, the Contractor may submit to the Project Manager for review the County's standard application for payment form filled out and signed by the Contractor covering the Work completed as of the date of the Application and supported by such data as the Project Manager may reasonably require. Also, if payment is requested on the basis of materials and equipment not incorporated in the work but delivered and suitably stored at the site or at another location agreed to in writing, the application for payment shall also be accompanied by such supporting data, satisfactory to the Project Manager, as will establish the County's title to the material and equipment and protect its interest therein, including applicable insurance, partial Consent of Surety, and detailed inventory listing of stored material. Each such request shall include the submittal by the Contractor of (1) a detailed, itemized inventory listing the material stored at the site for which payment is requested, (2) documentation to indicate and substantiate the cost or value attributed to the items included in the stored material inventory list, and (3) the County's "Responsibility And Liability For Materials And Equipment Not Included In The Work" form executed by the Contractor. Failure to provide proper supporting documentation may subject the Progress Payment application to rejection. All progress payments will be subject to the retainage percentage specified in the Contract Documents that will be issued in the final payment after acceptance by the County of the Work.

Based upon Applications for Payment submitted to the Project Manager by the Contractor and Certificates for Payment issued by the Project Manager the County shall make progress payments on account of the Contract Amount to the Contractor as provided in the Contract Documents as follows:

In the timeframes outlined in FS 218.735, Section 2, ninety percent (90%) of the portion of the Contract Amount properly allocable to labor, materials and equipment incorporated in the Work and ninety percent (90%) of the portion of the Contract Amount properly allocable to materials and equipment suitably stored at the site or at some other location agreed upon in writing, for the period covered by the application for payment, less the aggregate of previous payments made by the Owner. When the completion of the Work ascertained as payable exceeds fifty percent (50%) of the total contract amount the retainage percentage withheld shall be reduced to 5%.

Upon Final completion of the entire Work, a sum sufficient to increase the total payments to one hundred percent (100%) of the Contract Amount, less such amounts as the Owner shall determine for all incomplete work and unsettled claims as provided in the Contract Documents.

The Contractor may, at the discretion of the County's Project Manager, be required to have applications for Progress Payments accompanied by legally effective partial releases or waivers of liens executed by all Subcontractors which performed services and suppliers of material or equipment for the Contractor for services or supplies which were included in the previous Application for Progress Payment, or, in the alternative, Consent of Surety to Partial Payment. The Contractor shall include the following certification on each Application for Progress Payments and the Application for Final Payment:

"The undersigned Contractor certifies that the work covered by this application for payment has been done, or completed in accordance with the Contract documents, that all amounts have been paid by Contractor for work, supplies, material or equipment for which previous Certificates for Payment were issued and that the current payment shown herein is now due".

Contractor's Warranty Of Title - The Contractor warrants and guarantees that title to all work, materials and equipment covered by an application for payment, whether incorporated in the Project or not, will have passed to the County prior to the making of the application for payment, free and clear of all liens, claims, security interests and encumbrances; and that no work, materials or equipment covered by an application for payment will have been acquired by the Contractor or by any other person performing the work at the site or furnishing materials and equipment for the Project subject to an agreement under which an interest therein or encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

Approval of Payments - The Project Manager will, within twenty (20) business days after receipt of each application for payment, either indicate his approval of payment or return the Application to the Contractor indicating in writing the reason for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and re-submit the Application. The County will pay the Contractor the amount approved within the time frame set forth in the Local Government Prompt Payment Act.

In the event the Contractor and the Project Manager do not achieve mutual agreement on the basis or amount of the payment, and should the Contractor be unwilling to make the necessary corrections or modifications, and re-submit the Application, then the County, to avoid delay in paying the Contractor the amount the County has determined the Contractor is entitled to receive, shall approve and process the Application by making such adjustments thereto as the County deems appropriate so that the Contractor receives, without delay, payment of the amount the County has determined to have been earned and owing to the Contractor.

In the event a dispute arises involving payments or invoices that have been rejected by the Project Manager and resubmitted by the Contractor and that cannot be resolved in accordance with F.S. 218.735 (3) the Orange County Payment/Invoice Disputes Resolution Process Procedures shall be used to resolve the dispute. The procedures can be obtained by contacting the Procurement Division at (407)-836-5635.

The Project Manager's approval of any payment requested in an application for payment shall constitute a representation by him to the County, based on the Project Manager's on-site observations of the Work in progress and on his review of the application for payment and the supporting data, that the Work has progressed to the point indicated; that, to the best of his knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning Project upon Substantial Completion, to the results of any subsequent tests called for in his approval); and that the Contractor is entitled to payment of the amount approved. However, by approving any such payment, the Project Manager shall not thereby be deemed to have represented that he made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, that he has reviewed the means, methods, techniques, sequences and procedures of construction nor that he has made

any examination to ascertain how or for what purpose the Contractor has used the moneys paid or to be paid to him on account of the Contract Amount.

The Project Manager's approval of final payment shall constitute an additional representation by him to the County that the conditions precedent to the Contractor's belief being entitled to final payment as set forth in this Article have been fulfilled.

The Project Manager may refuse to approve the whole or any part of any payment if in his opinion he is unable to make such representations to the County. He may then refuse to approve any such payment because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously approved, to such extent as may be necessary in his opinion to protect the County from loss because:

- A. The Work is defective;
- B. Claims have been filed or there is reasonable evidence indicating the probable filing thereof;
- C. The Contract Amount has been reduced because of Change Order(s);
- D. The County has been required to correct defective Work or complete the Work in accordance with Article 16; or
- E. Of unsatisfactory prosecution of the Work, including failure to clean up as required by Article 9.

Substantial Completion - Prior to final payment, the Contractor shall certify in writing to the Project Manager that the entire Work is Substantially Complete and request that the Project Manager issue a certificate of Substantial Completion. Within a reasonable time thereafter, the Project Manager and Contractor will make an inspection of the Work to determine the status of completion. If the Project Manager does not consider the Work Substantially Complete, the Contractor will be notified in writing giving the reasons therefore. If the Project Manager considers the Work Substantially complete, a tentative certificate of Substantial Completion will be issued. This Certificate shall fix the date of Substantial Completion and the responsibilities between the County and the Contractor for maintenance, heat and utilities.

There shall be attached to the Certificate a single punch list of items to be completed or corrected by the Contractor. The punch list must specify a date, not to exceed five (5) days after the punch list has been developed and reviewed, in which the delivery of the punch list to the Contractor must be made. Items not included on the punch list cannot be used as a basis to withhold final payment for retainage. In addition, the final contract completion date shall be at least thirty (30) days after the delivery of the punch list to the Contractor. Punch lists not provided to the Contractor by the date agreed upon for delivery will cause the contract time for completion to be extended by the number of days the local government exceeded the delivery date. Damages may only be assessed against the Contractor in the event the Contractor fails to complete the project within the contract period as was extended by the guidelines set forth in this provision.

The final undisputed retainage payment must be made within twenty (20) business days after receipt of a proper payment request. This would be less any amount withheld in accordance with the contract provisions for incomplete or uncorrected work unless otherwise provided for by written notice to the Contractor specifying the failure of the Contractor to meet contract requirements in the development of the punch list.

The County shall have the right to exclude the Contractor from the Work after achievement of Substantial Completion, but the County will allow the Contractor reasonable access to complete items on the punch list.

Partial Utilization - Prior to Substantial Completion, the Project Manager may request the Contractor to permit the use of a specified part of the Work which it believes it may use without significant interference with construction of other parts of the Work. If the Contractor agrees, he will certify to the Project Manager that said part of the Work is Substantially Complete and request the Project Manager issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time thereafter, the Project Manager and Contractor will make an inspection of that part of the Work to determine its status of completion.

If the County and the Project Manager consider that part of the Work to be Substantially Complete, the Project Manager will deliver to the Contractor a certificate to that effect, fixing the date of Substantial Completion as to that part of the Work, attaching thereto a punch list of items to be completed or corrected before final payment and fixing the responsibility between the County and Contractor for maintenance, heat and utilities as to that part of the Work.

The County shall have the right to exclude the Contractor from any part of the Work which is so certified to be Substantially Complete but the County will allow the Contractor reasonable access to complete or correct items on the punch list.

Final Inspection - Upon written notice from the Contractor that the Work is complete, including the "punch" listed deficiencies, the Project Manager will make a final inspection with the Contractor and will notify the Contractor in writing of any particulars in which this inspection reveals that the Work is defective. The Contractor shall immediately make such corrections as are necessary to remedy such defects and to complete all the required work.

Final Inspection For Payment - After the Contractor has completed any such corrections to the satisfaction of the Project Manager and delivered all maintenance and operating instructions, schedules, guarantees, bonds, Certificates of Inspection and other documents as required by the Contract Documents, he may make application for final payment following the procedure for progress payments. The final application for payment shall be accompanied by legally effective final releases or waivers of liens from the Contractor and all Subcontractors which performed services for the Contractor and all suppliers of material and/or equipment to the Contractor and the consent of Surety to final payment. The Final Release of Lien, Form E-12, must be utilized in all Final Pay Applications.

Approval Of Final Payment - If, on the basis of its observations and review of the Work during construction, its final inspection and its review of the final application for payment (all as required by the Contract Documents), the Project Manager is satisfied that the Work

has been completed and the Contractor has fulfilled all of his obligations under the Contract Documents, it will, within twenty (20) business days after receipt of the final application for payment, indicate in writing its approval of payment. Otherwise, it will return the Application to the Contractor, indicating in writing its reason for refusing to approve final payment, in which case the Contractor will make the necessary corrections and re-submit the Application.

The County will, in accordance with the Local Government Prompt Payment Act, pay the Contractor the amount approved by the County and issue a Certificate of Final Completion.

If after Substantial Completion of the Work, Final Completion is materially delayed through no fault of the Contractor, and the Project Manager so confirms, the County shall, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than the retainage stipulated in the Contract, the written consent of the Surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Project Manager prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

Contractor's Continuing Obligation - The Contractor's obligation to perform the Work and complete the Work in accordance with the Contract Documents shall be absolute. Neither approval of any progress or final payment by the County, the issuance of Certificate of Completion, any payment by the County to the Contractor under the Contract Documents, any use or occupancy of the Work or any part thereof by the County, any act of acceptance by the County, any failure to do so, nor any correction of defective Work by the County shall constitute an acceptance of Work not in accordance with the Contract Documents.

Waiver Of Claims - The making and acceptance of final payment shall constitute:

- A. A waiver of all claims by the County against the Contractor other than those arising from unsettled liens, from defective Work appearing after final payment or from failure to comply with the requirements of the Contract Documents, or from the terms of any special guarantees specified therein, and,
- B. A waiver of all claims by the Contractor against the County other than those previously made in writing and still unsettled.

Progress Schedule Updates – Contractor shall submit a progressed version of the Progress Schedule with each Application for Payment, showing actual progress up to the date of the application. If the update calculations result in dates for completion of the Work, or a part thereof, beyond the Contract Time or Milestone, Contractor shall revise the schedule to show how the Work can be completed within the remaining time, or requests an extension of Contract Time if Contractor believes he is entitled to additional time under Article 13.

The Contractor shall be required to have applications for Progress Payments accompanied by legally effective partial releases or waivers of liens executed by all Subcontractors which performed services and suppliers of material or equipment for the Contractor for services or supplies which were included in the previous Application for Progress Payment and Consent of Surety to Partial Payment. (This is not optional.)

ARTICLE 19 - SUSPENSION OF WORK AND TERMINATION

County May Suspend Work - The County may at any time and without cause suspend the Work or any portion thereof by notice in writing to the Contractor. The Project Manager shall fix the date on which Work shall be resumed and the Contractor will resume the Work on the date so fixed.

For unreasonable delays, the Contractor will be allowed an increase in the Contract Amount, an extension of the Contract Time or both, if directly attributable to any suspension and if he makes a claim therefore provided in Article 13. However, no profits will be allowed on claims for suspended work. Also, during any period of suspension, the Contractor shall take all available measures to mitigate costs such as taking on new work, reassigning resources to other Contracts, etc.

County May Terminate for Cause - If the Contractor is adjudged bankrupt or insolvent; if he makes a general assignment for the benefit of his creditors without County approval; if a trustee or receiver is appointed for the Contractor or for any of his property; if he files a petition to take advantage of any debtor's act or to reorganize under the bankruptcy or similar laws; if he fails to prosecute and complete the Work in accordance with the established Project schedule or within the Contract Time allowed; if he repeatedly fails to supply sufficient skilled workers or suitable materials or equipment; if he repeatedly fails to make prompt payment to Subcontractors for labor, materials or equipment; if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction; if he disregards the authority of the Project Manager; or if he otherwise substantially violates any provisions of the Contract Documents, then the County may, without prejudice to any other right or remedy and after giving the Contractor and his Surety if applicable seven (7) days written notice, terminate the services of the Contractor and take possession of the Work and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor and assign the completion of the Work to the Surety, or finish the Work by whatever method it may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the Work is finished.

If the unpaid balance of the Contract Amount exceeds the direct and indirect cost of completing the Work, including compensation for additional professional services, such excess shall be paid to the Contractor. If such cost exceeds the unpaid balance, the Contractor shall pay the difference to the County within fifteen (15) days after notification.

If the contractor fails to provide such payment to the County, the County at its sole discretion may deduct the balance owed from payments due the Contractor on any other contracts between the Contractor and the County. Such cost incurred by the County will be determined by the County and incorporated in a Change Order.

If the County elects to assign the completion of the Work to the Surety, and the Surety tenders a replacement contractor, then Surety shall provide performance, payment and other surety bonds as may be required in accordance with the Contract Documents.

Where the Contractor's services have been so terminated by the County, said termination shall not affect any rights of the County against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies by the County due the Contractor will not release the Contractor from liability.

Upon Termination for Cause, the Contractor shall not be entitled to payment for any anticipated supplemental costs, administrative expenses and/or profit for uncompleted Work.

If the Contractor's failure to perform the contract arises from causes beyond the control and without the fault or negligence of the Contractor the contract shall not be terminated for default. Examples of such causes include (1) acts of God or the public enemy, (2) acts of a government in its sovereign capacity, (3) fires, (4) floods, (5) epidemics, (6) strikes and (7) unusually severe weather.

If after notice of termination of the services of the Contractor for cause, it is determined that the Contractor was not in default, the termination shall be deemed to have been for the convenience of the County. In such event the Contractor may recover from the County payment for Work completed and reasonable termination costs as provided in the following paragraph.

Termination for Convenience: Upon seven (7) days written notice to the Contractor and the Surety, or sooner if reasonable under the circumstances, the County may, without cause and without prejudice to any other right or remedy, elect to terminate any part of the Work, or the Contract in whole or in part, as the County may deem appropriate. In any termination for convenience, the Contractor shall be paid for Work completed by the Contractor, Subcontractors and Suppliers at the time of termination provided the Work has been inspected and accepted by the County. However, the payment to the Contractor will exclude any and all anticipated supplemental costs, administrative expenses and profit for uncompleted Work. Upon termination for convenience, the County shall have full power and authority to take possession of the Work, assume any sub-agreements with Subcontractors and suppliers that the County selects, and prosecute the Work to completion by Contract or as the County may deem expedient. A termination for convenience may apply to individual delivery orders, purchase orders or to the contract in its entirety.

Authority to Terminate: The authority to terminate this Contract including all notices thereto is the sole responsibility of the Manager, Procurement Division.

ARTICLE 20 - MAINTENANCE AND EXAMINATION OF RECORDS

The Contractor shall keep adequate records and supporting documents applicable to this Contract. Said records and documentation shall be retained by the Contractor for a minimum of five (5) years after the date of final payment on this contract. If any litigation, claim or audit is commenced prior to the expiration of the five (5) year period, the records shall be maintained until all litigation, claims or audit findings involving the records have been resolved.

If applicable, time records and cost data shall be maintained in accordance with generally accepted accounting principles. This includes full disclosure of all transactions associated with the contract.

Contractor's "records and supporting documents" as referred to in this Contract shall include any and all information, materials and data of every kind and character, including without limitation, records, books, papers, documents, subscriptions, recordings, agreements, purchase orders, invoices, leases, contracts, commitments, arrangements, notes, daily diaries, superintendent reports, drawings, receipts, vouchers

and memoranda, and any and all other agreements, sources of information and matters that may in the County's judgment have any bearing on or pertain to any matters, rights, duties or obligations under or covered by any Contract document. Such records and documents shall included (hard copy, as well as computer readable data, written policies and procedures; time sheets; payroll registers; cancelled checks; subcontract files (including proposals of successful and unsuccessful bidders, bid recaps, etc.); original estimates; estimating worksheets; correspondence; change order files (including pricing data used to price change proposals and documentation covering negotiated settlements); back-charge logs and supporting documentation; general ledger entries detailing cash and trade discounts earned, insurance rebates and dividends; and any other contractor records which may have a bearing on matters of interest to the County in connection with the Contractor's dealings with the County (all foregoing hereinafter referred to as "records and supporting documents") to the extent necessary to adequately permit evaluation and verification of:

- a) Contractor compliance with contract requirements; or
- b) Compliance with provisions for pricing change orders; or
- c) Compliance with provisions for pricing invoices; or
- d) Compliance with provisions regarding pricing of claims submitted by the Contractor or his payees; or
- e) Compliance with the County's business ethics; or
- f) Compliance with applicable state statutes and County Ordinances and regulations.

Records and documents subject to audit shall also include those records and documents necessary to evaluate and verify direct and indirect costs, (including overhead allocations) as they may apply to costs associated with this Contract. In those situations where Contractor's records have been generated from computerized data (whether mainframe, mini-computer, or PC based computer systems), Contractor agrees to provide the County's representatives with extracts of data files in computer readable format on data disks or suitable alternative computer exchange formats.

The County and its authorized agents shall have the right to audit, inspect and copy records and documentation as often as the County deems necessary throughout the term of this contract and for a period of five (5) years after final payment. Such activity shall be conducted during normal business hours. The County, or any of its duly authorized representatives, shall have access within forty-eight (48) hours to such books, records, documents, and other evidence for inspection, audit and copying.

The County, during the period of time defined by the preceding paragraph, shall have the right to obtain a copy of and otherwise inspect any audit made at the direction of the Contractor as concerns the aforesaid records and documentation. Records and documents shall be made accessible at the Contractor's local place of business. If the records are unavailable locally, it shall be the Contractor's responsibility to insure that all required records are provided at the Contractor's expense including payment of travel and maintenance costs incurred by the County's authorized representatives or designees in accessing records maintained out of the county. The direct costs of copying records, excluding any overhead cost, shall be at the County's expense.

Contractor shall require all payees (examples of payees include subcontractors, insurance agents, material suppliers, etc.) to comply with the provisions of this article by

including the requirements hereof in a written contract agreement between contractor and payee. Such requirements include a flow-down right of audit provisions in contracts with payees, which shall also apply to Subcontractors and Sub-subcontractors, material suppliers, etc. Contractor shall cooperate fully and shall cause all aforementioned parties and all of Contractor's subcontractors (including those entering into lump sum subcontracts and lump sum major material purchase orders) to cooperate fully in furnishing or in making available to the County from time to time whenever requested in an expeditious manner any and all such records, documents, information, materials and data.

The County's authorized representatives or designees shall have reasonable access to the Contractor's facilities, shall be allowed to interview all current or former employees to discuss matters pertinent to the performance of this Contract and shall have adequate and appropriate work space, in order to conduct audits in compliance with this article.

Even after a change order proposal has been approved, Contractor agrees that if the County later determines the cost and pricing data submitted was inaccurate, incomplete, not current or not in compliance with the terms of the contract regarding pricing of change orders, then an appropriate contract price reduction will be made. Such post-approval contract price adjustment will apply to all levels of contractors and/or subcontractors and to all types of change order proposals specifically including lump sum change orders, unit price change orders, and cost-plus change orders.

If an audit inspection or examination by the County, or its designee, in accordance with this article discloses overpricing or overcharges (of any nature) by the Contractor to the County in excess of one-half of one percent (.5%) of the total contract billings, the reasonable actual cost of the County's audit shall be reimbursed to the County by the Contractor. Any adjustments and /or payments that must be made as a result of any such audit or inspection of the contractor's invoices and /or records and supporting documents shall be made within a reasonable amount of time (not to exceed 90 days) from presentation of the County's findings to the Contractor.

ARTICLE 21 - MINORITY/WOMEN OWNED BUSINESS ENTERPRISE REQUIREMENTS AND SMALL BUSINESS PROVISIONS

The Contractor will comply with all requirements of Orange County's Minority/Women Owned Business Enterprise Ordinance No. 94-01, as amended by Ordinance No. 2009-21. In summary, the ordinances establish a goal of 25% of the County's annual monetary value of contracts be awarded to minority/women owned business enterprises meeting Contract specifications.

The goals for work force employment levels are 18% minority and 6% women. Other provisions of the Ordinance as it pertains to construction projects may be found in Part C of this document.

To facilitate monitoring for compliance with the Ordinance, the Contractor shall:

- A. Provide to the County's Business Development Division all subcontracts and/or purchase orders, fully executed by both parties, with each Subcontractor and supplier listed on Attachment C-2 in the Prime Contractor's bid (M/WBE's and

non-M/WBE's). **The prime Contract will not be executed by the County until these documents are on file in the Business Development Division.** Prime Contractor should include in the subcontract / purchase order a statement that makes the legality of the document contingent upon execution of the prime Contract by the County.

- B. The Contractor shall include a **Prompt Payment Clause** and payment schedule in all subcontracts and purchase orders (including those with non-M/WBE's) stating that payment will be made to the Subcontractor/suppliers within 72 hours of receipt of payment from the County. The Contractor shall pay each Subcontractor and supplier for all work covered under an Application for Payment within the 72 hour timeframe.

This provision in no way creates any contractual relationship between any Subcontractor and Orange County or any liability on Orange County for the Contractor's failure to make timely payments. The timeliness of such payments may be evaluated by the Business Development Division in considering compliance with the Ordinance.

- C. The Contractor shall submit:

- 1) A Monthly Workforce Report (Current Field Employment Data). Contractor shall also ensure that all Subcontractors/suppliers with contracts over \$50,000 supply a Monthly Workforce Report; and
- 2) A Monthly Prime Contractor's Report including M/WBE Utilization Reports

The Contractor shall furnish written documentation evidencing actual dollars paid to each Subcontractor/supplier listed and/or utilized by the Contractor. This will include, but not be limited to: copies of canceled checks, approved invoices, and signed, sworn affidavits certifying the accuracy of payments so that the County may determine actual participation achieved by the Contractor prior to issuance of final payment.

The required reports are to be submitted to the Business Development Division no later than the fifth day of each month beginning one month after the Work begins and to continue until Final Completion. Contractor's Progress Payments may be delayed if reports are not submitted in a timely manner.

The final Prime Contractor's Report-M/WBE Utilization Report shall be signed by the Contractor's authorized agent certifying that all information contained therein is a true and accurate account of M/WBE utilization per the bid and contract documents. Approval of the final Application for Payment is contingent upon receipt of this certification.

- D. Contractor shall not substitute, replace or terminate any M/WBE firm without **prior written authorization of the County**, nor shall the Contractor reduce the scope of work or monetary value of a subcontract without prior written authorization of the County. All modifications, additions and deletions to any and

all Contracts issued to said M/WBE's shall also have prior written authorization of the County.

- E. The Contractor shall expeditiously advise all M/WBE's and the Business Development Division of all Change Orders, contract modifications, additions and deletions to any and all contracts issued to said M/WBE's.
- F. Failure of the Contractor to adhere to the provisions of the Ordinance may subject the Contractor to penalties as outlined in Sec. 17-326 of the Ordinance. The penalties include:
 - 1) Liquidated damages up to 10% of the Contract;
 - 2) Suspension or permanent debarment from bidding;
 - 3) Termination of any present contracts;
 - 4) Withholding retainage;
 - 5) A negative evaluation of good-faith effort on future bids;
 - 6) Withholding of payments.

ARTICLE 22 - FEDERAL REQUIREMENTS

In the event this Contract is paid in whole or in part from any federal government agency or source, the specific terms, regulations and requirements governing the disbursement of these funds shall be specified herein and become a part of this clause.

All Contracts in excess of one hundred thousand dollars (\$100,000) shall comply with all the requirements of Section 114 of the Clean Air Act (42 USC 7401 et seq.) as amended and Section 308 of the Federal Water Pollution Control Act (33 USC 1251 et seq.) as amended.

ARTICLE 23 – VERBAL ORDERS

The Project Manager under the following conditions may issue verbal change orders to the contract:

- A. To address bona fide emergency requirements. Emergency requirements are described as those requiring immediate action due to (1) an imminent or existing threat to the health, safety or welfare of persons or property and (2) conditions which poses serious economic damage to the County.
- B. To ensure the continuity of critical elements of contract performance.

Any such verbal direction shall be confirmed in writing by the Project Manager to the contractor within five (5) calendar days after issuance. Concurrently, a copy of the written direction shall be provided to the Manager, Procurement Division with documentation in the form of an emergency justification to support the action taken.

A formal change order and associated contract amendment, if applicable, will be negotiated in conjunction with the Procurement Division and shall succeed the written confirmation not later than thirty (30) calendar days after issuance of the verbal direction.

Board approval, as applicable, shall be obtained.

ARTICLE 24 – MISCELLANEOUS

Whenever any provision of the Contract Documents requires the giving of written notice, it shall be deemed to have been validly given if delivered in person to the individual, to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail (postage prepaid) to the last business address known to the County.

All Specifications, Drawings and copies thereof furnished by the County shall remain its property. They shall not be used on another Project and, with the exception of those sets which have been signed in connection with the execution of the Contract, shall be returned to the County upon completion of the Work.

The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon the Contractor and the rights and remedies available to the County thereunder shall be in addition to and not a limitation of any otherwise imposed or available by law, by special guarantee or other provisions of the Contract Documents.

Should the County or the Contractor suffer injury or damage to its person or property because of any error, omission or act of the other or of any of his employees, agents or others for whose acts he is legally liable, claim should be made in writing to the other party within a reasonable time of the first observance of such injury or damage.

This Contract shall be governed by the laws of the State of Florida. Any and all legal action necessary to enforce the provisions of this Contract will be held in Orange County, Florida. Venue for any litigation involving this Contract shall be the Ninth Circuit Court in and for Orange County, Florida.

The obligations of Orange County under this award are subject to the availability of funds lawfully appropriated for its purpose by the State of Florida and the Board of County Commissioners, or other specified funding source for this contract.

For construction Contracts valued at \$10,000,000, or lesser amounts as determined by the County, the County may, at its discretion, use the direct purchase method for large dollar value equipment and materials. Direct purchases will be negotiated with the Contractor based on those items identified by the Professional. The final determination as to whether to direct purchase any materials or equipment shall be made by the Manager of the Procurement Division after consultation with the County's Project Manager.

The County will be represented on site by one or more Inspectors who are employed by the County or by a Construction Engineering and Inspection (CEI) firm under contract to the County. The Contractor is to follow all directions provided by these Inspectors. Provided, however, that any such directions shall not be construed to:

- a. Authorize any deviation from the Contract Documents that:
 - Requires a change in the Contract Price or Contract Time;
 - Materially changes any aspect of the work covered by a permit to the extent that the regulatory agency having jurisdiction would require modification of the permit;
 - Materially changes any aspect of the work to the extent that the intent of the design is compromised;
- b. Approve any substitute materials or equipment;
- c. Undertake any of the responsibilities of Contractor, subcontractors or Contractor's superintendent, or expedite the Work; Direct the Contractor as to any aspect of the means, methods, techniques, sequences or procedures of construction unless such is specifically called for in the Contract Documents;
- d. Advise on or issue directions as to safety precautions and programs in connection with the Work.

ARTICLE 25 – CONTRACT CLAIMS

“Claim” as used in this provision means a written demand or written assertion by one of the contracting parties seeking as a matter of right, the payment of a certain sum of money, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract.

Claims made by a Contractor against the County relating to a particular contract shall be submitted to the Procurement Division Manager in writing clearly labeled “Contract Claim” requesting a final decision.

“Claim” as used in this provision applies after failure of the parties to agree to an adjustment as provided in Article 13, Change of Contract Amount and Contract Time.

The Contractor also shall provide with the claim a certification as follows: “I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the County is liable; and that I am duly authorized to certify the claim on behalf of the Contractor.”

Failure to document a claim in this manner shall render the claim null and void. Moreover, no claim shall be accepted after final payment of the contract.

The decision of the Procurement Division Manager shall be issued in writing and shall be furnished to the Contractor. The decision shall state the reasons for the decision reached. The Procurement Division Manager shall render the final decision within sixty (60) days after receipt of Contractor's written request for a final decision. The Procurement Division Manager's decision shall be final and conclusive.

The Contractor shall proceed diligently with performance of this contract pending final resolution of any request for relief, claim, appeal or action arising under the contract and shall comply with any final decision rendered by the Manager of the Procurement Division.

ARTICLE 26 - VALUE ENGINEERING

- A. Intent and Objective:** This Section applies to any cost reduction proposal (hereinafter referred to as a Value Engineering Change Proposal or VECP) initiated and developed by the CONTRACTOR for the purpose of refining the Contract Documents so as to contribute to design cost effectiveness or significantly improve the quality of the Work. This Section does not, however, apply to any such proposal unless it is identified by the CONTRACTOR, at the time of its submission to the COUNTY, as a proposal submitted pursuant to this Section.

VECPs contemplated are those that would result in net savings to the COUNTY by providing either: (A) a decrease in the cost of performance of the Work, or; (B) a reduction in cost of ownership (hereinafter referred to as collateral costs) of the Work, regardless of acquisition costs. VECPs must result in savings without impairing essential functions and characteristics such as safety, service, life, reliability, economy of operation, ease of maintenance, aesthetics and necessary standard design features. However, nothing herein prohibits the submittal of VECPs where the required functions and characteristics could be combined, reduced or eliminated as being nonessential or excessive. Plan errors which are identified by the CONTRACTOR and which result in a cost reduction, will not qualify for submittal as a VECP.

The COUNTY reserves the right to reject at its discretion any VECP submitted. Substitution of another design alternate, which is detailed in the Plans, for the one on which the CONTRACTOR bid, will not be allowed under this Section. Pending execution of a formal supplemental Agreement, implementing an approved VECP, the CONTRACTOR shall remain obligated to perform in accordance with the terms of the existing Contract. No time extensions will be granted due to the time required to review a VECP.

- B. Subcontractors:** The CONTRACTOR is encouraged to include the provisions of this Section in contracts with subcontractors. The CONTRACTOR shall encourage submission of VECPs from subcontractors, however, it is not mandatory that VECPs be submitted nor is it mandatory that the CONTRACTOR accept or transmit to the COUNTY VECPs proposed by his subcontractors.
- C. Data Requirements:** As a minimum, the following information shall be submitted by the CONTRACTOR with each VECP;
- (1) A description of the difference between the existing requirements and the proposed change, and the comparative advantages and disadvantages.
 - (2) Separate detailed cost estimates for both the existing requirements and the proposed change. The cost estimates shall be broken down by item numbers indicating quantity increases or decreases and deleted pay items.

Additional proposed Work, now covered by the Contract Documents, shall be identified by current COUNTY pay item numbers. In preparing the estimates, the CONTRACTOR shall include overhead, profit and bond. No separate pay item(s) for these costs will be allowed.

- (3) An itemization of plan details, plan sheets, design standards and Specifications that must be changed or added if the VECP is adopted. Preliminary plan drawings must be sufficient to describe the proposed changes.
- (4) An estimate of the effects the VECP would have on collateral costs to the COUNTY.
- (5) Engineering Incentive or other analysis in sufficient detail to identify and describe specific features of the Contract Documents which must be changed if the VECP is accepted, with a proposal as to how these changes can be accomplished and an assessment of their effect on other Project elements. The COUNTY may require that Engineering Incentive analyses be performed by a prequalified consultant in the applicable class of Work. Any design changes which result from the VECP must be supported by computations sealed by a Professional registered in the State of Florida.
- (6) A statement of the time by which approval of the VECP must be issued by the COUNTY to obtain the total estimated cost reduction during the remainder of this Contract noting any effect on the Contract completion time or delivery schedule.

D. Processing Procedures: Two copies of each VECP shall be submitted to the County's Project Manager, or his/her duly authorized representative, VECPs will be processed expeditiously; however, the COUNTY will not be liable for any delay in acting upon a VECP submitted pursuant to this Section. The CONTRACTOR may withdraw, in whole or in part, a VECP not accepted by the COUNTY within the period specified in the VECP.

The COUNTY shall not be liable for any VECP development cost in the case where a VECP is rejected or withdrawn.

The COUNTY shall be the sole judge of the acceptability of a VECP and of the estimated net savings in construction and/or collateral costs from the adoption of all or any part of such proposal. In determining the estimated net savings, the right is reserved to disregard the Contract prices if, in the judgment of the COUNTY, such prices do not represent a fair measure of the value of Work to be performed or to be deleted. Prior to approval, the COUNTY may modify a VECP, with the concurrence of the CONTRACTOR, to make it acceptable. If any modification increases or decreases the net savings resulting from the VECP, the CONTRACTOR'S fair share will be determined upon the basis of the VECP

modified and upon determination of final quantities. The net savings shall be computed by subtracting the revised total cost of all bid items affected by the VECP design from the total cost of the same bid items as represented in the Contract Documents. Prior to approval of the VECP, which initiates the supplemental Contract, the CONTRACTOR shall provide acceptable contract quality Plan sheets revised to show all details consistent with the VECP design.

- E. Computations for Change in Contract Cost of Performance:** CONTRACTOR development and implementation costs for the VECP will not be recoverable. If the VECP is adopted, the CONTRACTOR'S share of the net savings as defined hereinafter shall be considered full compensation to the CONTRACTOR for the VECP. COUNTY costs of processing or implementation of a VECP will not normally be considered in the estimate.

However, the COUNTY reserves the right, where it deems such action appropriate, to require the CONTRACTOR to pay the COUNTY'S cost of investigating and implementing a VECP submitted by the CONTRACTOR as a condition of considering such proposal. Where such a condition is imposed, the CONTRACTOR shall indicate his acceptance thereof in writing, and such acceptance shall constitute full authority for the COUNTY to deduct amounts payable to the COUNTY from any monies due or that may become due to the CONTRACTOR under the Contract.

- F. Computations for Collateral Costs:** When collateral cost savings are sought by the CONTRACTOR, separate estimates must be prepared for collateral costs of both the existing Contract requirement and the proposed change. Each estimate shall consist of an itemized breakdown of all costs and the basis for the data used in the estimate. Cost benefits to the COUNTY include, but are not limited to: reduced costs of operation, maintenance or repair, and extended useful service life. Increased collateral costs include the converse of such factors. Computations shall be as follows:

- (1) Costs shall be calculated over a 20-year period on a uniform basis for each estimate.
- (2) If the difference in the estimates as approved by the COUNTY indicate a savings, the CONTRACTOR shall divide the resultant amount by 20 to arrive at the average annual net collateral savings. The resultant savings shall be shared as stipulated in paragraph G below.

- G. Sharing Arrangements:** If a VECP is approved by the COUNTY, the CONTRACTOR may be entitled to share in both construction savings and collateral savings to the full extent provided for in this subsection. Except for innovative ideas, the CONTRACTOR and COUNTY shall each receive 50 percent of net reduction in the cost of performance of this Contract. For innovative ideas, the reduction in the cost of performance shall be shared as follows:

ACCRUED NET SAVINGS	CONTRACTOR'S SHARE %	COUNTY'S SHARE %
Less than \$25,000	85	15
\$25,000 to \$50,000	75	25
Over \$50,000	50	50

If an approved change is identical or similar to a previously submitted VECP or an idea previously utilized by the COUNTY it will not be considered an innovative idea, thus, will only qualify for a 50 percent sharing of savings. When collateral savings occur, the CONTRACTOR shall receive 20 percent of the average one year's net collateral savings. The CONTRACTOR shall not receive construction savings or collateral savings on optional Work listed in this Contract until the COUNTY exercises its option to obtain that Work.

ARTICLE 27 – PATENTS AND ROYALTIES

Unless otherwise provided, the bidder shall be solely responsible for clearing the right to use any patented or copyrighted materials in the performance of the contract.

The Contractor, without exception, shall indemnify and save harmless the County and its employees from liability of any nature or kind, including cost and expenses for or on account of any copyrighted, patented, or unpatented invention, process, or article manufactured or supplied by the Contractor. In the event of any claim against the County of copyright or patent infringement, the County shall promptly provide written notification to the Contractor. If such a claim is made, the Contractor shall use its best efforts to promptly purchase for the County any infringing products or services or procure a license, at no cost to the County, which will allow continued use of the service or product. If none of the alternatives are reasonably available, the County agrees to return the article on request to the Contractor and receive reimbursement, if any, as may be determined by a court of competent jurisdiction

**EXHIBIT A
LEASED EMPLOYEE AFFIDAVIT**

CONTRACT #Y_____

I affirm that an employee leasing company provides my workers' compensation coverage. I further understand that my contract with the employee leasing company limits my workers' compensation coverage to enrolled worksite employees only. My leasing arrangement does not cover un-enrolled worksite employees, independent contractors, uninsured sub-contractors or casual labor exposure.

I hereby certify that 100% of my workers are covered as worksite employees with the employee leasing company. I certify that I do not hire any casual or uninsured labor outside the employee leasing arrangement. I agree to notify the County in the event that I have any workers not covered by the employee leasing workers' compensation policy. In the event that I have any workers not subject to the employee leasing arrangement, I agree to obtain a separate workers' compensation policy to cover these workers. I further agree to provide the County with a certificate of insurance providing proof of workers' compensation coverage prior to these workers entering any County jobsite.

I further agree to notify the County if my employee leasing arrangement terminates with the employee leasing company and I understand that I am required to furnish proof of replacement workers' compensation coverage prior to the termination of the employee leasing arrangement.

I certify that I have workers' compensation coverage for all of my workers through the employee leasing arrangement specified below:

Name of Employee Leasing Company: _____

Workers' Compensation Carrier: _____

A.M. Best Rating of Carrier: _____

Inception Date of Leasing Arrangement: _____

I further agree to notify the County in the event that I switch employee-leasing companies. I recognize that I have an obligation to supply an updated workers' compensation certificate to the County that documents the change of carrier.

Name of Contractor: _____

Signature of Owner/Officer: _____

Title: _____ Date: _____

EXHIBIT B

POLICY NUMBER:

COMMERCIAL GENERAL LIABILITY

CG 25 03 03 97

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**DESIGNATED CONSTRUCTION PROJECT(S)
GENERAL AGGREGATE LIMIT**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Designated Construction Projects:

“Any person or organization on whose behalf you are required to obtain a Designated Construction Project under a written contract or agreement”

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

- A. For all sums which the insured becomes legally obligated to pay as damages caused by “occurrences” under COVERAGE A (SECTION I), and for all medical expenses caused by accidents under COVERAGE C (SECTION I), which can be attributed only to ongoing operations at a single designated construction project shown in the Schedule above:
 - 1. A separate Designated Construction Project General Aggregate Limit applies to each designated construction project, and that limit is equal to the amount of the General Aggregate Limit shown in the Declarations.
 - 2. The Designated Construction Project General Aggregate Limit is the most we will pay for the sum of all damages under COVERAGE A, except damages because of “bodily injury” or “property damage” included in the “products-completed operations hazard”, and for medical expenses under COVERAGE C regardless of the number of:
 - a. Insureds;
 - b. Claims made or “suits” brought or
 - c. Persons or organization making claims or bringing “suits”
 - 3. Any payments made under COVERAGE A for damages or under COVERAGE C for medical expenses shall reduce the Designated Construction Project General Aggregate Limit for that designated construction project. Such payments shall not reduce the General Aggregate Limit shown in the Declarations nor shall they reduce any other Designated Construction Project General Aggregate Limit for any other designated construction project shown in the Schedule above.
- 4. The limits shown in the Declarations for Each Occurrence, Fire Damage and Medical Expense continue to apply. However, instead of being subject to the General Aggregate Limit shown in the Declarations, such limits will be subject to the applicable Designated Construction Project General Aggregate Limit.
- B. For all sums which the insured becomes legally obligated to pay as damages caused by “occurrences” under COVERAGE A (SECTION I), and for all medical expenses caused by accidents under COVERAGE C (SECTION I), which cannot be attributed only to ongoing operations at a single designated construction project shown in the Schedule above:
 - 1. Any payments made under COVERAGE A for damages or under COVERAGE C for medical expenses shall reduce the amount available under the General Aggregate Limit or the Products-Completed Operations Aggregate Limit, whichever is applicable; and
 - 2. Such payments shall not reduce any Designated Construction Project General Aggregate Limit.
- C. When coverage for liability arising out of the “products- completed operations hazard” is provided, any payments for damages because of “bodily injury” or “property damage” included in

the “products-completed operations hazard” will reduce the Products-Completed Operations Aggregate Limit, and not reduce the General Aggregate Limit nor the Designated Construction Project General Aggregate Limit.

- D.** If the applicable designated construction project has been abandoned, delayed, or abandoned and then restarted, or if the authorized contracting parties deviate from plans, blueprints, designs,

specifications or timetables, the project will still be deemed to be the same construction project.

- E.** The provisions of Limits of Insurance (SECTION **III**) not otherwise modified by this endorsement shall continue to apply as stipulated.

EXHIBIT B

BUILDERS RISK COVERAGE FORM

Various provisions in this policy restrict coverage. Read the entire policy carefully to determine rights, duties and what is and is not covered.

Throughout this policy the words “you” and “your” refer to the Named Insured shown in the Declarations. The words “we”, “us” and “our” refer to the Company providing this insurance.

Other words and phrases that appear in quotation marks have special meaning. Refer to Section G., Definitions.

A. Coverage

We will pay for direct physical loss of or damage to Covered Property at the premises described in the Declarations caused by or resulting from any Covered Cause Loss.

1. Covered Property

Covered Property as used in this Coverage Part, means the type of property described in this section, **A.1.**, and limited in **A.2.**, Property Not Covered, If a Limit of Insurance is shown in the Declarations for that type of property.

Building Under Construction, meaning the building or structure described in the Declarations while in the course of construction, including:

a. Foundations;

b. The following property:

(1) Fixtures and machinery;

(2) Equipment used to service the building; and

(3) Your building materials and supplies used for construction;

Provided such property is intended to be permanently located in or on the building or structure described in the Declarations or within 100 feet of its premises;

c. If not covered by other insurance, temporary structures built or assembled on site, including cribbing, scaffolding and construction forms.

2. Property Not Covered

Covered Property does not include:

a. Land (including land on which the property is located) or water;

(b) Subject to **(a)** above, the amount we will pay for debris removal expense is limited to 25% of the sum of the deductible plus

b. The following property when outside of buildings:

(1) Lawns, trees, shrubs or plants;

(2) Radio or television antennas (including satellite dishes) and their lead-in wiring, master or towers; or

(3) Signs (other than signs attached to buildings)

3. Covered Causes of Loss

See applicable Causes Of Loss Form as shown in the Declarations.

4. Additional Coverages

a. Debris Removal

(1) Subject to Paragraphs (3) and (4), we will pay your expense to remove debris of Covered Property caused by or resulting from a Covered Cause of Loss that occurs during the policy period. The expenses will be paid only if they are reported to us in writing within 180 days of the date of direct physical loss or damage.

(2) Debris Removal does not apply to costs to:

(a) Extract “pollutants” from land or water; or

(b) Remove, restore or replace polluted land or water.

(3) Subject to the exceptions in paragraph (4), the following provisions apply:

(a) The most we will pay for the total of direct physical loss or damage plus debris removal expense is the Limit of Insurance applicable to the Covered Property that has sustained loss or damage.

the amount that we pay for direct physical loss or damage to the Covered Property that has sustained loss or damage.

(4) We will pay up to an additional \$10,000 for debris removal expense, for each location, in any one occurrence of physical loss or damage to Covered Property if one or both of the following circumstances apply:

(a) The total of the actual debris removal expense plus the amount we pay for direct physical loss or damage exceeds the Limit of Insurance on the Covered Property that has sustained loss or damage.

(b) The actual debris removal expense exceeds 25% of the sum of the deductible plus the amount that we pay for direct physical loss or damage to the Covered Property that has sustained loss or damage.

Therefore if (4)(a) and/or (4)(b) apply, our total payment for direct physical loss or damage and debris removal expense may reach but will never exceed the Limit of Insurance on the Covered Property that has sustained loss or damage, plus \$10,000.

(5) Examples

The following examples assume that there is no Coinsurance penalty.

Example #1

Limit or Insurance:	\$90,000
Amount of Deductible:	\$ 500
Amount of Loss:	\$50,000
Amount of Loss Payable:	\$49,500
	(\$50,000 - \$500)
Debris Removal Expense:	\$10,000
Debris Removal Expense Payable:	\$10,000
	(\$10,000 is 20% of \$50,000.)

The debris removal expense is less than 25% of the sum of the loss payable plus the deductible. The sum of the loss payable and the debris removal expense (\$49,500 + \$10,000 = \$59,500.) is less than the Limit of Insurance. Therefore, the full amount of debris removal expense is payable in accordance with the terms of Paragraph (3).

Example #2

Limit of Insurance:	\$90,000
Amount of Deductible:	\$ 500
Amount of Loss:	\$80,000
Amount of Los Payable:	\$79,500
	(\$80,000 - \$500)
Debris Removal Expense:	\$30,000
Debris Removal Expense Payable	
Basic Amount:	\$10,500
Additional Amount:	\$10,000

The basic amount payable for debris removal expense under the terms of Paragraph (3) is calculated as follows: \$80,000 (\$79,500 + \$500) x .25 = \$20,000; capped at \$10,500. The cap applies because the sum of the loss payable (\$79,500) and the basic amount payable for debris

removal expense (\$10,500) cannot exceed the Limit of Insurance (\$90,000).

The additional amount payable for debris removal expense is provided in accordance with the terms of Paragraph (4), because the debris removal expense (\$30,000) exceeds 25% of the loss payable plus the deductible (\$30,000 is 37.5% of \$80,000), and because the sum of loss payable and debris removal expense (\$79,500 + \$30,00 = \$109,500) would exceed the Limit of Insurance (\$90,000). The additional amount of covered debris removal expense is \$10,000, the maximum payable under Paragraph (4). Thus the total payable for debris removal expense in this example is \$20,500; \$9,500 of the debris removal expense is not covered.

b. Preservation Of Property

If it is necessary to move Covered Property from the described premises to preserve it from loss or damage by a Covered Cause of Loss, we will pay for any direct physical loss or damage to that property:

- (1) While it is being moved or while temporarily stored at another location; and
- (2) Only if the loss or damage occurs within 30 days after the property is first moved.

c. Fire Department Service Charge

When the fire department is called to save or protect Covered Property from a Covered Cause of Loss, we will pay up to \$1,000, unless a higher limit is shown in the Declarations, for your liability for fire department service charges:

- (1) Assumed by contract or agreement prior to loss; or
- (2) Required by local ordinance.

No Deductible applies to this Additional Coverage.

d. Pollutant Clean-up And Removal

We will pay your expense to extract "pollutants" from land or water at the described premises if the discharge, dispersal, seepage, migration, release or escape of the "pollutants" is caused by or results from a Covered Cause of Loss that occurs during the policy period. The expense will be paid only if they are reported to us in writing within 180 days of the date on which the Covered Cause of Loss occurs.

This Additional Coverage does not apply to costs to test for, monitor or assess the existence, concentration or effects of "pollutants". But we will pay for testing which is performed in the course of extracting the "pollutants" from the land or water.

The most we will pay under this Additional Coverage for each described premises is \$10,000 for the sum of all covered expenses arising out of Covered Causes of

Loss occurring during each separate 12 month period of this policy.

5. Coverage Extensions

a. Building Materials And Supplies Of Others

- (1) You may extend the insurance provided by this Coverage Form to apply to building materials and supplies that are:
 - (a) Owned by others;
 - (b) In your care, custody or control;
 - (c) Located in or on the building described in the Declarations, or within 100 feet of its premises; and
 - (d) Intended to become a permanent part of the building.
- (2) The most we will pay for loss or damage under this Extension is \$5,000 at each described premises, unless a higher Limit of Insurance is specified in the Declarations. Our payment for loss of or damage to property of others will only be for the account of the owner of the property.

b. Sod, Trees, Shrubs And Plants

You may extend the insurance provided by this Coverage Form to apply to loss or damage to sod, trees, shrubs and plants outside of buildings on the described premises, if the loss or damage is caused by or results from any of the following causes of loss:

- (1) Fire;
- (2) Lightning;
- (3) Explosion;
- (4) Riot or Civil Commotion; or
- (5) Aircraft.

The most we will pay for loss or damage under this Extension is \$1,000, but not more than \$250 for any one tree, shrub or plant. These limits apply to any one occurrence, regardless of the types or number of items lost or damaged in that occurrence.

B. Exclusions And Limitations

See applicable Causes Of Loss From as shown in the Declarations.

C. Limits Of Insurance

The most we will pay for loss or damage in any one occurrence is the applicable Limit of Insurance shown in the Declarations.

The most we will pay for the loss or damage to outdoor signs attached to buildings is \$2,500 per sign in any one occurrence.

The limits applicable to the Coverage Extensions and the Fire Department Service Charge and Pollutant Clean-up And Removal Additional Coverage are in addition to the Limit of insurance.

Payments under the Preservation Of Property Additional Coverage will not increase the applicable Limit of insurance.

D. Deductible

In any one occurrence of loss or damage (hereinafter referred to as loss), we will first reduce the amount of

loss if required by Additional Condition – Need For Adequate Insurance. If the adjusted amount of loss is less than or equal to the Deductible, we will not pay for that loss. If the adjusted amount of loss exceeds the Deductible, we will then subtract the Deductible from the adjusted amount of loss, and will pay the resulting amount or the Limit of Insurance, whichever is less.

When the occurrence involves loss to more than one item of Covered Property and separate Limits of Insurance apply, the losses will not be combined in determining application of the Deductible But the Deductible will be applied only once per occurrence.

Example #1

(This example assumes there is no penalty for underinsurance.)

Deductible:	\$ 1,000
Limit of Insurance – Building #1:	\$ 60,000
Limit of Insurance – Building #2:	\$ 80,000
Loss to Building #1:	\$ 60,100
Loss to Building #2:	\$ 90,000

The amount of loss to Building #1 (\$60,100) is less than the sum (\$61,000) of the Limit of Insurance applicable to Building #1 plus the Deductible.

The Deductible will be subtracted from the amount of loss in calculating the loss payable for Building #1:

\$60,100
<u>- 1,000</u>
\$59,100 Loss Payable – Building #1

The Deductible applies once per occurrence and therefore is not subtracted in determining the amount of loss payable for Building #2. Loss payable for Building #2 is the Limit of Insurance of \$80,000.

Total amount of loss payable: \$59,100 + \$80,000 = \$139,100.

Example #2

(This example, too, assumes there is no penalty for underinsurance.)

The Deductible and Limits of Insurance are the same as those in Example #1

Loss to Building #1:	\$ 70,000
(Exceeds Limit of Insurance plus Deductible)	
Loss to Building # 2	\$ 90,000
(Exceeds Limit of Insurance plus Deductible)	
Loss Payable - Building #1:	\$ 60,000
(Limit of Insurance)	
Loss Payable – Building #2	\$ 80,000
(Limit of Insurance)	
Total amount of loss payable:	\$140,000

E. Loss Conditions

The following conditions apply in addition to the Common Policy Conditions and the Commercial Property Conditions.

1. Abandonment

There can be no abandonment of any property to us.

2. Appraisal

If we and you disagree on the value of the property or the amount of loss, either may make written demand for an appraisal of the loss. In this event, each party will select a competent and impartial appraiser. The two appraisers will select and umpire. If they cannot agree, either may request that selection be made by a judge of a court having jurisdiction. The appraiser will state separately the value of the property and amount of loss. If they fail to agree, they will submit their differences to the umpire. A decision agreed to by any two will be binding. Each party will:

- a. Pay its chosen appraiser; and
- b. Bear the other expenses of the appraisal and umpire equally.

If there is an appraisal, we will still retain our right to deny claim.

3. Duties In The Event Of Loss Or Damage

a. You must see that the following are done in the event of loss or damage to Covered Property:

- (1) Notify the police if a law may have been broken.
- (2) Give us prompt notice of the loss or damage. Include a description of the property involved.
- (3) As soon as possible, give us a description of how, when and where the loss or damage occurred.
- (4) Take all reasonable steps to protect the Covered Property from further damage, and keep a record of your expenses necessary to protect the Covered Property, for consideration in the settlement of the claim. This will not increase the Limit of Insurance. However, we will not pay for any subsequent loss or damage resulting from cause of loss that is not a Covered Cause of Loss. Also if feasible, set the damaged property aside and in the best possible order for examination.
- (5) At our request, give us complete inventories of the damaged and undamaged property. Include quantities, costs, values and amount of loss claimed.
- (6) As often as may be reasonably required, permit us to inspect the property proving the loss or damage and examine your books and records. Also permit us to take samples of damaged and undamaged property for inspection, testing and analysis, and permit us to make copies from your books and records
- (7) Send us a signed, sworn proof of loss containing the information we request to investigate the claim. You must do this within 60 days after our request. We will supply you with the necessary forms.
- (8) Cooperate with us in the investigation or settlement of the claim.

b. we may examine any insured under oath while not in the presence of any other insured and at such times as may be reasonably required, about any

matter relating to this insurance or the claim, including an insured's books and records. In the event of an examination, an insured's answer must be signed.

4. Loss Payment

a. In the event of loss or damage covered by this Coverage Form, at our option, we will either:

- (1) Pay the value of lost or damaged property;
- (2) pay the cost of repairing or replacing the lost or damaged property, subject to b. below;
- (3) Take all or any part of property at an agreed or appraised value; or
- (4) Repair, rebuild or replace the property with other property of like kind and quality, subject to b. below.

We will determine the value of lost or damaged property, or the cost of its repair or replacement, in accordance with the applicable terms of the Valuation Condition in this Coverage Form or any applicable provision which amends or supersedes the Valuation Condition.

b. The cost to repair, rebuild or replace does not include the increased cost attributable to enforcement of any ordinance or law regulating the construction, use or repair of any property.

c. We will give notice of our intentions within 30 days after we receive the sworn proof of loss.

d. We will not pay you more than your financial interest in the Covered Property.

e. We may adjust losses with the owners of lost or damaged property if other than you. If we pay the owners, such payments will satisfy your claims against us for the owners' property. We will not pay the owners more than their financial interest in the Covered Property.

f. We may elect to defend you against suits arising from claims of owners of property. We will do this at our expense.

g. We will pay for covered loss or damage within 30 days after we receive the sworn proof of loss, if you have complied with all of the terms of this Coverage Part and:

- (1) We have reached agreement with you on the amount of loss; or
- (2) An appraisal award has been made.

h. A party wall is a wall that separates and is common to adjoining buildings that are owned by different parties. In settling covered losses involving a party wall, we will pay a portion of the loss to the party wall based on your interest in the wall in proportion to the interest of the owner of the adjoining building. However, if you elect to repair or replace your building and the owner of the adjoining building elects not to repair or replace the building, we will pay you the full value of the loss to the party wall, subject to all applicable policy

provisions including Limits of Insurance, the Valuation and Coinsurance Conditions and all other provisions of this Loss Payment Condition. Our payment under the provision of this paragraph does not alter any right of subrogation we may have against any entity, including the owner or insurer of the adjoining building, and does not alter the terms of the Transfer Of Rights Of Recovery Against Others To Us Condition in this policy.

5. Recovery Property

If either you or we recover any property after loss settlement, that party must give the other prompt notice. At your option, the property will be returned to you. You must then return to us the amount we paid to you for the property. We will pay recovery expenses and the expenses to repair the recovered property, subject to the Limit of Insurance.

6. Valuation

We will determine the value of Covered Property at actual cash value as of the time of loss or damage.

F. Additional Conditions

The following conditions apply in addition to the Common Policy Conditions and the Commercial Property Conditions.

1. Mortgageholders

- a. The term mortgageholder includes trustee.
- b. We will pay for covered loss of or damage to buildings or structures to each mortgageholder shown in the Declarations in their order of precedence, as interests may appear.
- c. The mortgageholder has the right to receive loss payment even if the mortgageholder has started foreclosure or similar action on the building or structure.
- d. If we deny your claim because of your acts or because you have failed to comply with the terms of this Coverage Part, the mortgageholder will still have the right to receive loss payment if the mortgageholder:
 - (1) Pays any premium due under this Coverage Part at our request if you have failed to do so;
 - (2) Submits a signed, sworn proof of loss within 60 days after receiving notice from us of your failure to do so; and
 - (3) Has notified us of any change in ownership, occupancy or substantial change in risk known to the mortgageholder.

All of the terms of this Coverage Part will then apply directly to the mortgageholder.

- e. If we pay the mortgageholder for any loss or damage and deny payment to you because of your acts or because you have failed to comply with the terms of this Coverage Part:
 - (1) The mortgageholder's rights under the mortgage will be transferred to us to the extent of the amount we pay; and

- (2) The mortgageholder's right to recover the full amount of the mortgageholder's claim will not be impaired.

At our option, we may pay to the mortgageholder the whole principal on the mortgage plus any accrued interest. In this event, your mortgage and note will be transferred to us and you will pay your remaining mortgage debt to us.

- f. If we cancel this policy, we will give written notice to the mortgageholder at least:
 - (1) 10 days before the effective date of cancellation if we cancel for your nonpayment of premium; or
 - (2) 30 days before the effective date of cancellation if we cancel for any other reason.
- g. If we elect not to renew this policy, we will give written notice to the mortgageholder at least 10 days before the expiration date of this policy.

2. Need for Adequate Insurance

We will not pay a greater share of any loss than the portion that the Limit of Insurance bears to the value on the date of completion of the building described in the Declarations.

EXAMPLE #1 (UNDERINSURANCE)

When: The value of the building on the date of completion is: \$200,000
The Limit of Insurance for it is: \$100,000
The Deductible is: \$ 500 The amount of loss is: \$ 80,000

Step (1): $\$100,000 \div \$200,000 = .50$

Step (2): $\$80,000 \times .50 = \$40,000$

Step (3): $\$40,000 - \$500 = \$39,500$.

We will pay no more than \$39,500. The remaining \$40,500 is not covered.

EXAMPLE #2 (ADEQUATE INSURANCE)

When: The value of the building on the date of completion is: \$200,000
The Limit of Insurance for it is: \$200,000
The Deductible is: \$ 1,000
The amount of loss is: \$ 80,000

The limit of Insurance in the example is adequate and therefore no penalty applies. We will pay no more than \$79,000 (\$80,000 amount of loss minus the deductible of \$1,000).

3. Restriction Of Additional Coverage – Collapse

If the Causes Of Loss – Broad Form is applicable to this Coverage Form, Paragraph C.2.f. of the Additional Coverage – Collapse does not apply to this Coverage Form.

If the Cause Of Loss – Special Form is applicable to this Coverage Form, Paragraphs D.2.c. and D.2.d of the Additional Coverage Collapse do not apply to this Coverage Form.

4. When Coverage Ceases

The insurance provided by this Coverage Form will end when one of the following first occurs:

- a. This policy expires or is cancelled.
- b. The property is accepted by the purchaser;
- c. Your interest in the property ceases;
- d. You abandon the construction with no intention to complete it;
- e. Unless we specify otherwise in writing.
 - (1) 90 days after construction is complete or;
 - (2) 60 days after any building described in the Declarations is:
 - (a) Occupied in whole or in part; or
 - (b) Put to its intended use.

G. Definitions

“Pollutants” means any solid, liquid, gaseous or thermal irritant or contaminant, including smoke, vapor, soot, fumes, acids, alkalis, chemicals and waste. Waste includes materials to be recycled, reconditioned or reclaimed.

CAUSES OF LOSS – SPECIAL FORM

Words and phrases that appear in quotation marks have special meaning. Refer to Section G., Definitions.

A. Covered Causes Of Loss

When Special is shown in the Declarations, Covered Causes of Loss means Risk of Direct Physical Loss unless the loss is:

1. Excluded in Section B., Exclusions; or
2. Limited in Section C., limitations; that follow.

B. Exclusions

1. We will not pay for loss or damage caused directly or indirectly by any of the following. Such loss or damage is excluded regardless of any other cause or event that contributes concurrently or in any sequence to the loss.

a. Ordinance or Law

The enforcement of any ordinance or law:

- (1) Regulating the construction, use or repair of any property; or
- (2) Requiring the tearing down of any property, including the cost of removing its debris.

This exclusion, Ordinance Or Law applies whether the loss results from:

- (a) An ordinance or law that is enforced even if the property has not been damaged; or
- (b) The increased costs incurred to comply with an ordinance or law in the course of construction, repair, renovation, remodeling or demolition of property, or removal of its debris, following a physical loss to that property.

b. Earth movement

- (1) Earthquake, including any earth sinking, rising or shifting related to such event;
- (2) Landslide including any earth sinking, rising or shifting related to such event.
- (3) Mine subsidence, meaning subsidence of a man-made mine, whether or not mining activity has ceased;
- (4) Earth sinking (other than sinkhole collapse), rising or shifting including soil conditions which cause settling, cracking or other disarrangement of foundations or other parts

or realty. Soil conditions include contraction, expansion, freezing, thawing, erosion, improperly compacted soil and the action of water under the ground surface.

But if Earth Movement, as described in b.(1) through (4) above, results in fire or explosion, we will pay for the loss or damage caused by that fire or explosion.

- (5) Volcanic eruption, explosion or effusion. But if volcanic eruption, explosion or effusion results in fire, building glass breakage or Volcanic Action, we will pay for the loss or damage caused by that fire, building glass breakage or Volcanic Action.

Volcanic Action means direct loss or damage resulting from the eruption of a volcano when the loss or damage is caused by:

- (a) Airborne volcanic blast or airborne shock waves;
- (b) Ash, dust or particulate matter; or
- (c) Lava flow.

All volcanic eruptions that occur within any 168-hour period will constitute a single occurrence.

Volcanic Action does not include the cost to remove ash, dust or particulate matter that does not cause direct physical loss or damage to the described property.

c. Governmental Action

Seizure or destruction of property by order of governmental authority.

But we will pay for loss or damage caused by or resulting from acts of destruction ordered by governmental authority and taken at the time of a fire to prevent its spread, if the fire would be covered under this Coverage Part.

d. Nuclear Hazard

Nuclear reaction or radiation, or radioactive contamination, however caused.

But if nuclear reaction or radiation, or radioactive contamination, results in fire, we

will pay for the loss or damage caused by that fire.

e. Utility Services

The failure of power, communication, water or other utility service supplied to the described premises, however caused, if the failure:

- (1) Originates away from the described premises; or
- (2) Originates at the described premises but only if such failure involves equipment used to supply the utility service to the described premises from a source away from the described premises.

Failure of any utility service includes lack of sufficient capacity and reduction in supply. Loss or damage caused by a surge of power is also excluded, if the surge would not have occurred but for an event causing failure of power.

But if the failure or surge of power, or the failure of communication, water or other utility service, results in Covered Cause of loss, we will pay for the loss or damage caused by that Covered Cause of Loss.

Communication services include but are not limited to service relating to Internet access or access to any electronic, cellular or satellite network.

f. War And Military Action

- (1) War, including undeclared or civil war;
- (2) Warlike action by military force, including action in hindering or defending against an actual or expected attack, by any government, sovereign or other authority using military personnel or other agents; or
- (3) Insurrection, rebellion, revolution, usurped power, or action taken by governmental authority in hindering or defending against any of these.

g. Water

- (1) Flood, surface water, waves, tides, tidal waves, overflow of any body of water or their spray, all whether driven by wind or not;
- (2) Mudslide or mudflow;
- (3) Water that backs up or overflows from a sewer, drain or sump; or
- (4) Water under the ground surface pressing on, or flowing or seeping through:

- (a) Foundations, walls, floors or paved surfaces;

- (b) Basements, whether paved or not; or

- (c) Doors, windows or other openings.

But if Water, as described in **g.(1)**. Through **g.(4)**. above, results in fire, explosion or sprinkler leakage, we will pay for the loss or damage caused by that fire explosion or sprinkler leakage.

h. "Fungus", Wet Rot, Dry Rot And Bacteria

Presence, growth, proliferation, spread or any activity of "fungus", wet or dry rot or bacteria.

But if "fungus", wet or dry rot or bacteria results in a "specified cause of loss", we will pay for the loss or damage caused by that "specified cause of loss".

This exclusion does not apply:

- 1. When "fungus", wet or dry rot or bacteria results from fire or lightning; or
- 2. To the extent that coverage is provided in the Additional Coverage – Limited Coverage For "Fungus", Wet Rot, Dry Rot And Bacteria with respect to loss or damage by a cause of loss other than fire or lightning.

Exclusions **B.1.a.** through **B.1h.** apply whether or not the loss event results in widespread damage or affects a substantial area.

2. We will not pay for loss or damage caused by or resulting from any of the following:

- a. Artificially generated electrical, magnetic or electromagnetic energy that damages, disturbs, disrupts or otherwise interferes with any:

- (1) Electrical or electronic wire, device, appliance, system or network; or
- (2) Device, appliance, system or network utilizing cellular or satellite technology.

For the purpose of this exclusion, electrical, magnetic or electromagnetic energy includes but is not limited to:

- (a) Electrical current, including arcing;
- (b) Electrical charge produced or conducted by a magnetic or electromagnetic field;
- (c) Pulse of electromagnetic energy; or
- (d) Electromagnetic waves or microwaves.

But if fire results, we will pay for the loss or damage caused by the fire.

b. Delay, loss of use or loss of market.

c. Smoke, vapor or gas from agricultural smudging or industrial operations

- d. (1)** Wear and tear;
- (2)** Rust or other corrosion, decay, deterioration, hidden or latent defect or any quality in property that causes it to damage or destroy itself;
- (3)** Smog;
- (4)** Setting, cracking, shrinking or expansion;
- (5)** Nesting or infestation, or discharge or release of waste products or secretions, by insects, birds, rodents or other animals.
- (6)** Mechanical breakdown, including rupture or bursting caused by centrifugal force. But if mechanical breakdown results in elevator collision, we will pay for the loss or damage caused by the elevator collision.
- (7)** The following causes of loss to personal property:
 - (a)** Dampness or dryness of atmosphere;
 - (b)** Changes in or extremes of temperature; or
 - (c)** Marring or scratching.

But if an excluded cause of loss that is listed in **2.d.(1)** through **(7)** results in a “specified cause of loss” or building glass breakage, we will pay for the loss or damage caused by that “specified cause of loss” or building glass breakage.

- e.** Explosion of steam boilers, steam pipes, steam engines or steam turbines owned or leased by you, or operated under your control. But if explosion of steam boilers, steam pipes, steam engines or steam turbines result in fire or combustion explosion, we will pay for the loss or damage caused by that fire or combustion explosion. We will also pay for loss or damage caused by or resulting from explosion of gases or fuel within the furnace of any fired vessel or within the flues or passages through which the gases of combustion pass.
- f.** Continuous or repeated seepage or leakage of water, or the presence or condensation of humidity, moisture or vapor, that occurs over period of 14 days or more.
- g.** Water, other liquids, powder or molten material that leaks or flows from plumbing, heating, air conditioning or other equipment (except fire protective systems) caused by or resulting from freezing, unless:
 - (1)** You do your best to maintain heat in the building or structure; or
 - (2)** You drain the equipment and shut off the supply if the heat is not maintained.

- h.** Dishonest or criminal act by you, any of your partners, members, officers, managers, employees (including leased employees), directors, trustees, authorized representatives or anyone to whom you entrust the property for any purpose.

- (1)** Acting alone or in collusion with others; or
- (2)** You drain the equipment and shut off the supply if the heat is not maintained.

This exclusion does not apply to acts of destruction by your employees (including leased employees); but theft by employees (including leased employees) is not covered.

- i.** Voluntary parting with any property by you or anyone else to whom you have entrusted the property if induced to do so by any fraudulent scheme, trick, device or false pretense.

- j.** rain, snow, ice or sleet to personal property in the open.

- k.** Collapse, including any of the following conditions of property or any part of the property:

- (1)** An abrupt falling down or caving in;
- (2)** Loss of structural integrity, including separation of parts of the property or property in danger of falling down or caving in; or
- (3)** Any cracking, bulging, sagging, bending, leaning, setting, shrinkage or expansion as such condition relates to **(1)** or **(2)** above.

But if collapse results in a Covered Cause of Loss at the described premises, we will pay for the loss or damage caused by that Covered Cause of Loss.

The exclusion, **k.**, does not apply:

- (a)** To the extent that coverage is provided under the Additional Coverage – Collapse; or
- (b)** To collapse caused by one or more of the following:
 - (i)** The “specified cause of loss”;
 - (ii)** Breakage of building glass;
 - (iii)** Weight of rain that collects on a roof; or
 - (iv)** Weight of people or personal property.

- l.** Discharge, dispersal, seepage, migration, release or escape of “pollutants” unless the discharge, dispersal, seepage, migration, release or escape is itself caused by any of the “specified causes of loss”. But if the discharge, dispersal, seepage, migration, release or escape of “pollutants” results in “specified cause of loss”, we will pay

for the loss or damage caused by that “specified cause of loss”.

The exclusion, **L.**, does not apply to damage to glass caused by chemicals applied to glass.

m. Neglect of an insured to use all reasonable means to save and preserve property from further damage at and after the time loss.

3. We will not pay for loss or damage caused by or resulting from any of the following, **3.a.** through **3.c.** But if an excluded cause of loss that is listed in **3.a.** through **3.c.** results in a Covered Cause of Loss, we will pay for the loss or damage caused by that Covered Cause of Loss.

a. Weather conditions. But this exclusion only applies if weather conditions contribute in any way with a cause or event excluded in Paragraph **1.** above to produce the loss or damage.

b. Acts or decisions, including the failure to act or decide, of any person, group, organization or governmental body.

c. Faulty, inadequate or defective:

(1) Planning, zoning, development, surveying, siting;

(2) Design, specifications, workmanship, repair, construction, renovation, remodeling, grading, compaction;

(3) Materials used in repair, construction renovation or remodeling; or

(4) Maintenance;

of part or all of any property on or off the described premises.

4. Special Exclusions

The following provisions apply only to the specified Coverage Forms.

a. Business Income (And Extra Expense) Coverage Form, Business Income (Without Extra Expense) Coverage Form, Or Extra Expense Coverage Form

We will not pay for:

(1) Any loss caused by or resulting from:

(a) Damage or destruction of “finished stock”;
or

(b) The time required to reproduce “finished stock”.

This exclusion does not apply to Extra Expense.

(2) Any loss caused by or resulting from direct physical loss or damage to radio or television antennas (including satellite dishes) and their lead in-wiring, masts or towers.

(3) Any increase of loss caused by or resulting from:

(a) Delay in rebuilding, repairing or replacing the property or resuming “operations”, due to interference at the location of the rebuilding, repair or replacement by strikers or other persons; or

(b) Suspension, lapse or cancellation of any license, lease or contract. But if the suspension, lapse or cancellation is directly caused by the “suspension” of “operations”, we will cover such loss that affects your Business Income during the “period of restoration” and any extension of the “period of restoration” in accordance with the terms of the Extended business Income Additional Coverage and the Extended Periods Of Indemnity Optional Coverage or any variation of these.

(4) Any Extra Expense caused by or resulting from suspension, lapse or cancellation of any license, lease or contract beyond the “period of restoration”.

(5) Any other consequential loss.

b. Leasehold interest Coverage Form

(1) Paragraph **B.1.a.**, Ordinance Or Law, does not apply to insurance under this Coverage Form.

(2) We will not pay for any loss caused by:

(a) Your cancelling the lease;

(b) The suspension lapse or cancellation of any license; or

(c) Any other consequential loss.

c. Legal liability Coverage Form

(1) The following exclusions do not apply to insurance under this Coverage Form:

(a) Paragraph **B.1.a.**, Ordinance Or Law;

(b) Paragraph **B.1.c.**, Governmental Action

(c) Paragraph **B.1.d.**, Nuclear Hazard;

(d) Paragraph **B.1.e.**, Utility Services; and

(e) Paragraph **B.1.f.**, War And Military Action

(2) The following additional exclusions apply to insurance under this Coverage Form:

(a) **Contractual Liability**

We will not defend any claim or “suit”, or pay damages that you are legally liable to pay solely by reason of your assumption of liability in a contract or

agreement. But this exclusion does not apply to a written lease agreement in which you have assumed liability for building damage resulting from an actual or attempted burglary or robbery, provided that:

- (i) Your assumption of liability was executed prior to accident; and
- (ii) The building is Covered Property under this Coverage Form.

(b) Nuclear Hazard

We will not defend any claim or “suit”, or pay any damages, loss, expense or obligation, resulting from nuclear reaction or radiation, or radioactive contamination, however caused.

5. Additional Exclusion

The following provisions apply only to the specified property.

LOSS OR DAMAGE TO PRODUCTS

We will not pay for loss or damage to any merchandise, goods or other product caused by or resulting from error or omission by any person or entity (including those having possession under an arrangement where work or a portion of the work is outsourced) in any stage of the development, production or use of the product, including planning, testing, processing, packaging, installation, maintenance or repair. This exclusion applies to any effect that compromises the form, substance or quality of the product. But if such error or omission results in a Covered Cause loss, we will pay for the loss or damage caused by that Covered Cause of Loss.

C. Limitations

The following limitations apply to all policy forms and endorsements, unless otherwise stated.

- 1. We will not pay for loss of or damage to property, as described and limited in the section. In addition, we will not pay for any loss that is a consequence of loss or damage as described and limited in this section.
 - a. Steam boilers, steam pipes steam engines or steam turbines caused by or resulting from any condition or event inside such equipment. But we will pay for loss of or damage to such equipment caused by or resulting from an explosion of gases or fuel within the furnace of any fired vessel or

within the flues or passages through which the gases of combustion pass.

- b. Hot water boilers or other water heating equipment caused by ore resulting from any condition or event inside such boilers or equipment, other than an explosion.

- c. The interior of any building or structure or to personal property in the building or structure, caused by or resulting from rain, snow, sleet, ice, sand or dust, whether driven by wind or not, unless:

- (1) The building or structure first sustains damage by a Covered Cause of Loss to its roof or walls through which the rain, snow, sleet, ice, sand or dust enters; or
- (2) The loss or damage is caused by or results from thawing of snow, sleet or ice on the building or structure.

- d. Building materials and supplies not attached as part of the building or structure caused by or resulting from theft.

However, this limitation does not apply to:

- (1) Building materials and supplies held for sale by you, unless they are insured under the Builders Risk Coverage Form; or
- (2) Business Income Coverage or Extra Expense Coverage.

- e. Property that is missing, where the only evidence of the loss or damage is a shortage disclosed on taking inventory, or other instances where there is no physical evidence to show what happened to the property.

- f. Property that has been transferred to a person or to a place outside the described premises on the basis of unauthorized instructions.

- 2. We will not pay for loss of or damage to the following types of property unless caused by the “specified causes of loss” or building glass breakage:

- a. Animals, and then only if they are killed or their destruction is made necessary.

- b. Fragile articles such as statuary, marbles, chinaware and porcelains, if broken. This restriction does not apply to:

- (1) Glass; or
- (2) Containers of property held for sale.

c. Builders' machinery, tools and equipment owned by you or entrusted to you, provided such property is Covered Property.

- (1) If the property is located on or within 100 feet of the described premises, unless the premises is insured under the Builders Risk Coverage Form; or
- (2) To Business Income Coverage or to Extra Expense Coverage.

3. The special limit shown for each category, a. through d., is the total limit for loss of or damage to all property in that category. The special limit applies to any one occurrence of theft, regardless of the types or number of articles that are lost or damaged in that occurrence. The special limits are:

- a. \$2,500 for furs, fur garments and garments trimmed with fur.
- b. \$2,500 for jewelry, watches, watch movements, jewels, pearls, precious and semiprecious stones, bullion, gold, silver, platinum, and other precious alloys or metals. This limit does not apply to jewelry and watches worth \$100 or less per item.
- c. \$2,500 for patterns, dies, molds and forms.
- d. \$250 for stamps, tickets, including lottery tickets held for sale, and letters for credit.

These special limits are part of, not in addition to, the Limit of Insurance applicable to the Covered Property.

This limitation, C.3., does not apply to Business Income Coverage or Extra Expense Coverage.

4. We will not pay the cost to repair any defect to a system or appliance from which water, other liquid, powder or molten material escapes. But we will pay the cost to repair or replace damaged parts of fire-extinguishing equipment if the damage:

- a. Results in discharge of any substance from an automatic fire protection system; or
- b. Is directly caused by freezing.

However, this limitation does not apply to Business Income Coverage or to Extra Expense Coverage.

D. Additional Coverage – Collapse

The coverage provided under this Additional Coverage – Collapse applies only to an abrupt collapse as described and limited in D.1., through D.7.,

1. For the purpose of this Additional Coverage – Collapse, abrupt collapse means an abrupt falling down or caving in of a building or any part of a building with the result that building or part of

the building cannot be occupied for its intended purpose.

2. We will pay for direct physical loss or damage to Covered Property, caused by abrupt collapse of building or any part of a building that is insured under this Coverage Form or that contains Covered Property insured under this Coverage Form, if such collapse is caused by one or more of the following.

- a. Building decay that is hidden from view unless the presence of such decay is known to an insured prior to collapse;
- b. Insect or vermin damage that is hidden from view, unless the presence of such damage is known to an insured prior to collapse;
- c. Use of defective material or methods in construction, remodeling or renovation if the abrupt collapse occurs during the course of the construction, remodeling or renovation.
- d. Use of defective material or methods in construction, remodeling or renovation if the abrupt collapse occurs after the construction, remodeling or renovation is complete but only if the collapse is caused in part by:
 - (1) A cause of loss listed in 2.a. or 2.b.;
 - (2) One or more of the “specified causes of loss”;
 - (3) Breakage of building glass;
 - (4) Weight of people or personal property; or
 - (5) Weight of rain that collects on a roof.

3. This **Additional Coverage – Collapse** does not apply to:

- a. A building or any part of a building that is in danger of falling down or caving in;
- b. A part of a building that is standing, even if it has a separated from another part of the building; or
- c. A building that is standing or any part of a building that is standing even if it shows evidence of cracking, bulging, sagging, bending, leaning, setting, shrinkage or expansion.

4. With respect to the following property:

- a. Outdoor radio or television antennas (including satellite dishes) and their lead-in wiring, masts or towers;
- b. Awnings, gutters and downspouts;
- c. Yard fixtures;
- d. Outdoor swimming pools;
- e. Fences;

- f. Piers, wharves and docks;
 - g. Beach or diving platforms or appurtenances;
 - h. Retaining walls; and
 - i. Walks, roadways and other paved surfaces;
- if an abrupt collapse is caused by cause of loss listed in **2.a.** through **2.d.**, we will pay for loss or damage to that property only if:

- (1) Such loss or damage is a direct result of the abrupt collapse of a building insured under this Coverage Form.
- (2) The property is Covered Property under this Coverage Form.

5. If personal property abruptly falls down or caves in and such collapse is **not** the result of abrupt collapse of a building, we will pay for loss or damage to Covered property caused by such collapse of personal property only if:

- a. The collapse of personal property was caused by a cause of loss listed in **2.a.** through **2.d.**;
- b. The personal property which collapses is inside a building; and
- c. The property which collapses is not of a kind listed in **4.**, regardless of whether that kind of property is considered to be personal property or real property.

The coverage stated in the Paragraph **5.** does not apply to personal property if marring and/or scratching is the only damage to that personal property caused by the collapse.

6. This Additional Coverage – Collapse does not apply to a personal property that has not abruptly fallen down or caved in, even if the personal property shows evidence of cracking, bulging, sagging, bending, leaning, settling, shrinkage or expansion.

7. This Additional Coverage – Collapse will not increase the Limits of Insurance provided in this Coverage Part.

8. The term Covered Cause of Loss includes the Additional Coverage – Collapse as described and limited in **D.1.** through **D.7.**

E. Additional Coverage – Limited Coverage For “Fungus”, Wet Rot, Dry Rot And Bacteria

1. The coverage described in **E.2.** and **E.6.** only applies when the “fungus”, wet or dry rot or bacteria is the result of one or more of the following causes that occurs during the policy period and only if all reasonable means were used to save and preserve the property from further damage at the time of and after that occurrence.

a. A “specified cause of loss” other than fire or lightning; or

b. Flood, if Flood Coverage Endorsement applies to the affected premises.

2. We will pay for loss or damage by “fungus” wet or dry rot or bacteria. As used in this Limited Coverage, the term loss or damage means:

a. Direct physical loss or damage to Covered Property caused by “fungus”, wet or dry rot or bacteria including the cost of removal of the “fungus”, wet or dry rot or bacteria;

b. The cost to tear out and replace any part of the building or other property as needed to gain access to the “fungus”, wet or dry rot or bacteria; and

c. The cost of testing performed after removal, repair, replacement or restoration of the damaged property is completed, provided there is a reason to believe that “fungus”, wet or dry rot or bacteria are present.

3. The coverage described under **E.2.** of this Limited Coverage is limited to \$15,000. Regardless of the number of claims, this limit is the most we will pay for the total of all loss or damage arising out of all occurrences of “specified cause of loss” (other than fire or lightning) and Flood which take place in a 12 month period (starting with the beginning of the present annual policy period). With respect to a particular occurrence of loss which results in “fungus”, wet or dry rot or bacteria, we will not pay more than a total of \$15,000 even if the “fungus”, wet or dry rot or bacteria continues to be present or active, or recurs, in a later policy period.

4. The coverage provided under this Limited Coverage does not increase the applicable Limit of Insurance on any Covered Property. If a particular occurrence results in loss or damage by “fungus”, wet or dry rot or bacteria, and other loss or damage, we will not pay more, for the total of all loss or damage, than the applicable Limit of Insurance on the affected Covered Property.

If there is covered loss or damage to Covered Property, not caused by “fungus”, wet or dry rot or bacteria, loss payment will not be limited by the terms of this Limited Coverage, except to the extent that “fungus”, wet or dry rot or bacteria causes an increase in the loss. Any such increase

in the loss will be subject to the terms of this Limited Coverage.

5. The terms of this Limited Coverage do not increase or reduce the coverage provided under Paragraph F.2. (Water Damage, Other Liquids, Powder Or Molten Material Damage) of this Causes Of Loss Form or under the Additional Coverage – Collapse.

6. The following, 6.a or 6.b., applies only if Business Income and/or Extra Expense Coverage applies to the described premises and only if the “suspension” of “operations” satisfies all terms and conditions of the applicable Business Income and/or Extra Expense Coverage Form.

a. If the loss which resulted in “fungus”, wet rot or dry rot or bacteria does not in itself necessitate a “suspension” of “operations”, but such “suspension” is necessary due to loss or damage to property caused by “fungus” wet or dry rot or bacteria, then our payment under Business Income and/or Extra Expense is limited to the amount of loss and/or expense sustained in a period of not more than 30 days. The days need not be consecutive.

b. If a covered “suspension” of “operations” was caused by loss or damage other than “fungus”, wet or dry rot or bacteria but remediation of “fungus”, wet or dry rot or bacteria but remediation of “fungus”, wet or dry rot or bacteria prolongs the “period of restoration”, we will pay for loss and/or expense sustained during the delay (regardless of when such delay occurs during the “period of restoration”), but such coverage is limited to 30 days. The days need not be consecutive.

F. Additional Coverage Extensions

1. Property In Transit

This Extension applies only to your personal property to which this form applies.

a. You may extend the insurance provided by this Coverage Part to apply to your personal property (other than property in the care, custody or control of your salespersons) in transit more than 100 feet from the described premises. Property must be in or on a motor vehicle you own, lease or operate while between points in the coverage territory.

b. Loss or damage must be caused by or result from one of the following causes of loss:

(1) Fire, lightning, explosion, windstorm or hail riot or civil commotion, or vandalism.

(2) Vehicle collision, upset or overturn. Collision means accidental contact of your vehicle with another vehicle or object. It does not mean your vehicle’s contact with the roadbed.

(3) Theft of an entire bale, case or package by forced entry into a securely locked body or compartment of the vehicle. There must be visible marks of the forced entry.

c. The most we will pay for loss or damage under this Extension is \$5,000.

This Coverage Extension is additional insurance. The Additional Condition, Coinsurance, does not apply to this Extension.

2. Water Damage, Other Liquids, Powder Or Molten Material Damage

If loss or damage caused by or resulting from covered water or other liquid, powder or molten material damage loss occurs, we will also pay the cost to tear out and replace any part of the building or structure to repair damage to the system or appliance from which the water or other substance escapes. This Coverage Extension does not increase the Limit of Insurance.

3. Glass

a. We will pay for expenses incurred to put up temporary plates or board up openings if repair or replacement of damaged glass is delayed.

b. We will pay for expenses incurred to remove or replace obstructions when repairing or replacing glass that is part of a building. This does not include removing or replacing window displays.

The Coverage Extension, F.3., does not increase the Limit of Insurance.

G. Definitions

1. “Fungus” means type or form of fungus, including mold or mildew, and any mycotoxins, spores, scents or by-products produced or released by fungi.

2. “Specified cause of loss” means the following: fire; lightning; explosion; windstorm or hail; smoke; aircraft or vehicles; riot or civil commotion; vandalism; leakage from fire-extinguishing equipment; sinkhole collapse; volcanic action; falling objects; weight of snow, ice or sleet; water damage.

a. Sinkhole collapse means sudden sinking or collapse of land into underground empty spaces

created by the action of water on limestone or dolomite. This cause of loss does not include:

- (1) The cost of filling sinkholes; or
- (2) Sinking or collapse of land into manmade underground cavities.

b. Falling objects does not include loss or damage to:

- (1) Personal property in the open; or
- (2) The interior of a building or structure, or property inside a building or structure, unless the roof or an outside wall of the

building or structure is first damaged by a falling object.

c. Water damage means accidental discharge or leakage of water or steam as the direct result of the breaking apart or cracking of a plumbing, heating, air conditioning or other system or appliance (other than a sump system including its related equipment and system including its related equipment and parts), that is located on the described premises and contains water or steam.

EXHIBIT E

POLICY NUMBER:

COMMERCIAL GENERAL LIABILITY
CG 20 37 04 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS
SCHEDULED PERSON – COMPLETED OPERATIONS**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):	Location(s) and Description Of Completed Operations
Orange County Board of County Commissioners Procurement Division 400 E. South Street Orlando, FL 32801	
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. Section II – Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule but only with respect to liability for “bodily injury”, or “property damage” caused, in whole or in part by “your work” at the location designated and described in the Schedule of this endorsement performed for that additional insured and included in the “products-completed operations hazard”.

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by laws; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required

by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to Section III-Limits of Insurance:

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable Limits of Insurance shown in the Declarations; Whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

EXHIBIT F

POLICY NUMBER:

COMMERCIAL GENERAL LIABILITY
CG 20 10 04 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS-
SCHEDULE PERSON OR ORGANIZATION**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):	Location(s) Of Covered Operations
Orange County Board of County Commissioners Procurement Division 400 E. South Street Orlando, FL 32801	
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	
<p>A. Section II – Who is An Insured is amended to include as an additional insured the person(s) or organizations(s) shown in the Schedule, but only with respect to liability for “bodily injury”, “property damage” or “personal and advertising injury” caused, in whole or in part, by:</p> <ol style="list-style-type: none"> 1. Your acts omissions; or 2. The acts or omissions of those acting on your behalf; <p>In the performance of your ongoing operations for the additional insured(s) at the location(s) designated above.</p> <p>However:</p> <ol style="list-style-type: none"> 1. The insurance afforded to such additional insured only applies to the extent permitted by law; and 2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured. 	<p>B. With respect to the insurance afforded to these additional insureds, the following additional exclusions apply: This insurance does not apply to “bodily injury” or property damage occurring after::</p> <ol style="list-style-type: none"> 1. All work , including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured (s) at the location of the covered operations has been completed; or 2. That portion of “your work” out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project. <p>C. With respect to the insurance afforded to these additional insureds, the following is added to Section III- Limits of Insurance: If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:</p> <ol style="list-style-type: none"> 1. Required by the contract or agreement; or 2. Available under the applicable Limits of Insurance shown in the Declarations; whichever is less. <p>This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.</p>

EXHIBIT G

WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE POLICY WC 00 03 13
(Ed. 4-84)

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

This agreement shall not operate directly or indirectly to benefit anyone not named in the Schedule.

Schedule

Name of Person or Organization:

ORANGE COUNTY BOARD OF COUNTY COMMISSIONERS
PROCUREMENT DIVISION
400 E. SOUTH STREET
ORLANDO, FL 32801

This endorsement changes the policy to which it is attached and is effective on the date issued unless otherwise stated.

(The information below is required only when this endorsement is issued subsequent to preparation of the policy.)

Endorsement

Effective Policy No.

Endorsement No.

Insured

Insurance Company

Countersigned by _____

WC 00 03 13

EXHIBIT H

POLICY NUMBER: _____

COMMERCIAL GENERAL LIABILITY
CG 24 04 0509

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY

WAIVER OF TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US

This endorsement modifies Insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

SCHEDULE

Name of Person or Organization:

ORANGE COUNTY BOARD OF COUNTY COMMISSIONERS
PROCUREMENT DIVISION
400 E. SOUTH STREET
ORLANDO, FL 32801

(Information required to complete this Schedule, if not shown above, will be shown in the Declarations.)

The following is added to Paragraph 8, Transfer of rights of Recovery Against Others To Us of Section IV – Conditions:

We waive any right to recovery we may have against the person or organization shown in the Schedule above because of payments we make for injury or damage arising out of your ongoing operations or “your work” done under a contract with that person or organization and included in the “Products-completed operations hazard”. This waiver applies only to the person or organization shown in the Schedule above.

IFB NO. Y15-788-J2

INVITATION FOR BIDS

FOR

**SOLID WASTE MANAGEMENT CELL 9-12 CLASS I LANDFILL PHASE-1
SEQUENTIAL CLOSURE**

PART H

TECHNICAL PROVISIONS / SPECIFICATIONS

VOLUME II

**CELL 9-12 CLASS I LANDFILL
PHASE I SEQUENTIAL CLOSURE
ORANGE COUNTY SOLID WASTE MANAGEMENT FACILITY**

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>
DIVISION 1	GENERAL REQUIREMENTS
01010	Summary of Work
01025	Measurement and Payment
01027	Schedule of Values
01028	Application for Payments
01030	Special Project Procedures
01035	Health and Safety Requirements
01040	Project Coordination
01060	Surveying
01065	Permits
01092	Abbreviations
01153	Change Order Procedures
01200	Project Meetings
01300	Submittals
01310	Progress Schedules
01320	Construction Photographs
01380	Construction Field Office
01400	Quality Control
01410	Testing and Testing Laboratory Services
01500	Construction Facilities and Temporary Controls
01568	Temporary Erosion and Sedimentation Control
01630	Substitutions and Product Options
01700	Contract Closeout
DIVISION 2	SITE CONSTRUCTION
02200	Site Clearing
02221	Excavation, Trenching, Backfilling and Embankment
02310	Fabric Formed Concrete Revetment System (FFCRS)
02371	Geotextiles
02373	Composite Drainage Net (CDN)
02480	Sodding, Seeding and Mulching
02502	Terrace Underdrain Systems
02668	High Density Polyethylene (HDPE) Geomembrane
02669	Linear Low Density Polyethylene (LLDPE) Geomembrane
02710	Base Course
02761	Pavement Marking
02772	Asphalt Concrete Pavement

**CELL 9-12 CLASS I LANDFILL
PHASE I SEQUENTIAL CLOSURE
ORANGE COUNTY SOLID WASTE MANAGEMENT FACILITY**

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>
DIVISIONS 3 THROUGH 14 (NOT USED)	
DIVISION 15	MECHANICAL
15052	Landfill Gas (LFG) System Valves
15071	High Density Polyethylene (HDPE) Pipe and Fittings for Letdown Pipes and Culverts
15073	High Density Polyethylene (HDPE) Pipe and Fittings for Gas Management System
DIVISION 16	ELECTRICAL (NOT USED)
ATTACHMENT A	FDEP Permit for Operations and Sequential Closure of Cells 9-12 Class I Landfill
ATTACHMENT B	Liner System Construction Quality Assurance Plan for HDPE and LLDPE Geomembrane, and Composite Drainage Net for Cells 9-12 Class I
ATTACHMENT C	Excerpts from Geotechnical Report in Support of Permit Application for Operations and Closure of Cells 9-12 Class I Landfill
DWG. NO.	TITLE
	COVER SHEET
G-1	SHEET INDEX, LEGEND, LOCATION MAP, AND ABBREVIATIONS
G-2	AERIAL PHOTOGRAPH ORANGE COUNTY SOLID WASTE MANAGEMENT FACILITY
G-3	PROJECT LOCATION AERIAL PHOTOGRAPH
G-4	SURVEY CONTROL POINTS
G-5	EXISTING TOPOGRAPHY AND PROJECT GEOMETRY PLAN
G-6	EXISTING LANDFILL GAS, TEMPORARY DRAINAGE AND LANDFILL CONDITIONS
C-1	PROPOSED PHASE 1 GRADING, LANDFILL GAS SYSTEM AND STORMWATER COLLECTION SYSTEM OVERVIEW

**CELL 9-12 CLASS I LANDFILL
PHASE I SEQUENTIAL CLOSURE
ORANGE COUNTY SOLID WASTE MANAGEMENT FACILITY**

TABLE OF CONTENTS

C-2	FINAL GRADING PLAN
C-3	FINAL GRADING PLAN CROSS-SECTIONS
C-4	STORMWATER COLLECTION PLAN
C-5	STORMWATER STRUCTURE SCHEDULE AND TERRACE SWALE SCHEDULE
C-6	LANDFILL GAS SYSTEM PLAN
C-7	EASTERN PERIMETER DITCH RESTORATION
CD-1	CLOSURE FINAL COVER DETAILS
CD-2	CLOSURE FINAL COVER AND STORMWATER DETAILS
CD-3	STORMWATER MANAGEMENT SYSTEM DETAILS
CD-4	STORMWATER MANAGEMENT SYSTEM AND LFG DETAILS
CD-5	LANDFILL GAS MANAGEMENT SYSTEM DETAILS
CD-6	LANDFILL GAS MANAGEMENT SYSTEM DETAILS

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.01 LOCATION OF WORK

- A. The Project is located at the Orange County Solid Waste Management Facility (OCSWMF) in east Orange County at the terminus of Young Pine road approximately 3 miles southwest of the intersection of Curry Ford Road and Dean Road. The project address is 5901 Young Pine Road, Orlando, Florida 32829.

1.02 WORK TO BE DONE

- A. The Contractor shall furnish all labor, materials, equipment, tools, services and incidentals to complete all Work required by these Contract Documents, Technical Specifications and Drawings for construction of the Phase I sequential closure of Cell 9-12. The closure project includes shaping and grading the side slopes, installation of the closure cover system, installation of secondary stormwater system and making connection to the existing primary stormwater system, installation of landfill gas collection system expansion and connections to the existing active system, restoration of the perimeter ditch along the east side of Cell 9, and all other incidental work as required by the Contract Documents.
- B. The Phase I closure area is generally located on the lower slopes of the north, east and west sideslope of Cell 9. The limits of the closure are depicted on the Drawings. Terminal stormwater structures at the base of the landfill were installed during construction of the landfill base liner system. The perimeter headers and condensate sumps for the landfill gas (LFG) collection system are also in place. Vertical LFG wells and horizontal collectors have been installed within the proposed closure area as shown on the Drawings. The existing vertical LFG wells and horizontal collectors will be connected to the active LFG collection system as shown on the Drawings. Interim LFG collection piping installed to collect the gas will be removed and replaced with permanent new LFG collection piping above the geomembrane liner system as shown on the Drawings. Existing interim LFG collection piping will be buried in place and shall not be reused for the above the liner collection system. Interim stormwater pipes have been installed and connected to the permanent terminal structures on the east, west and north edges of Cell 9-10. The interim stormwater piping on the side slopes will be removed and replaced with the new piping and structures for the permanent secondary stormwater system as shown on the Drawings.

- C. A portion of the existing primary stormwater ditch along the northeast side of Cell 9 will be restored to the permitted conditions. The work includes locating and protecting the underground piping and stormwater structures within the designated restoration area, removing the top 12 inches of existing fill and transporting the fill to the working face of the landfill, installing a minimum of 12 inches of clean fill to the permitted grades shown on the Drawings, grading the ditches for positive flow to the existing stormwater inlets and culverts, and sodding all disturbed areas.
- D. The Contractor shall perform all construction related to the Phase I sequential closure complete and in accordance with the construction Contract Documents, Drawings and Specifications, and specific conditions of the operations and closure permit issued by the Florida Department of Environmental Protection (FDEP.) A copy of the FDEP permit is included and made part of the Contract Documents.
- E. All materials, equipment, skills, tools and labor which are reasonable and properly inferable and necessary for the proper completion of the Work in a substantial manner and in compliance with the requirements stated or implied by the Contract Documents, Specifications or Drawings shall be furnished and installed by the Contractor without additional compensation, whether or not specifically indicated in the Contract Documents.
- F. The Contractor shall protect the intermediate cover, interim LFG collection system, and interim stormwater piping in the adjacent areas to the Phase I closure throughout the construction period and shall repair and restore all damages caused by the Contractor's activities. The Contractor shall document all damages and notify the Engineer, and schedule immediate repair and restoration of the existing LFG system, stormwater piping and intermediate cover and sod to original or better condition if any parts of the adjacent area are damaged by the Contractor or any of his material suppliers, subcontractors or other associates.
- G. The Contractor shall comply with all Municipal, County, State, Federal, and other codes, which are applicable to the proposed construction work.

1.03 GENERAL DESCRIPTION

- A. The sequential closure cover installation work of this Project is limited to the area defined by the limit of closure as delineated on the Drawings. The Work consists of construction of the closure cover system for a portion of the Cell 9-10 active landfill as shown on the Drawings and specified in accordance with the Contract Conditions, permits and quality assurance.

- B. In general, the work components for this project include but are not limited to the following:
1. Clearing and grubbing of vegetation from the sideslopes within the closure construction limits, grading and shaping the existing sideslopes, cutting and re-grading of excess solid waste from the sideslopes and filling in low depression areas of the sideslope;
 2. Preparation of the subgrade for installation of the leveling course, grading of terraces for proper stormwater flow, installation of a 6-inch thick granular fill leveling course on the proposed closure area;
 3. Exposing the existing bottom liner anchor trench at the interface with the closure cover and making repairs to the anchor trench 60-mil geomembrane as necessary to weld the cover liner;
 4. Installation of the barrier layer portion of the final cover system consisting of 40-mil textured LLDPE geomembrane, connection of the closure cover geomembrane to the bottom liner geomembrane, installation of Composite Drainage Net (CDN) where indicated, installation of 24-inch thick granular fill protective cover, sodding;
 5. Installation of underdrain system in terraces, installation of stormwater inlets and letdown piping and connection with the existing stormwater pipes, and all other stormwater management piping and structures including final grading and construction of terrace swales with underdrain piping, concrete works at the inlets, and geomembrane drain flap on the elevation 106 and elevation 166 terraces as shown on the Drawings;
 6. Locating and protecting existing LFG wellheads and interim collection piping throughout construction, installation of geomembrane booth for each wellhead, installation of new collection piping manifolds and laterals to tie in existing wellheads, connections to the existing active LFG collection system as indicated on the Drawings, coordination with the LFG Operator during connection activities to the LFG collection system, and protection of the new LFG Collection piping during installation of protective cover and sodding;
 7. Modification of existing condensate pump stations.
 8. Restoration of the perimeter ditch on the east side of Cell-9 to the limits indicated on the Drawings, removal of existing soil and replacement with clean fill, grading for positive flow and sodding;
 9. All other work required by the plans including liner repair and restorations, site cleanup, sodding and maintenance during construction period, and all other incidental and pertinent earthwork, site work, civil, mechanical construction required for the project to be considered substantially complete and ready for use by the Owner.
- C. Work also includes coordination with the Owner's LFG operator, and the operation of the onsite LFG Pretreatment Plant to minimize the number of shut-down and the duration of the each shut down. The coordination includes participation in pre-activity meetings with the Engineer and County's LFG

operator prior to each shut down. No shut-down shall be allowed without a minimum of 48-hour advance written notice by the Contractor to the Engineer and any shut-down more than 4-hours will not be allowed.

- D. Contractor shall coordinate his work with other contractors working onsite, Owner's forces and others who may be working in same general vicinity.
- E. The Work of this Contract is divided into a lump sum component and a unit price component. The unit price portion of the Contract consists of work associated with the initial solid waste grading, earthwork and installation of landfill gas wells. All other Work required in the Contract Documents, shown on the Drawings, and described in the Specifications is part of the lump sum portion of the Contract.
- F. Existing intermediate cover on the side slopes may be used as part of the initial grading or for filling depression areas in preparation for installation of the 6-inch clean fill for the leveling course. Any excess fill from the intermediate cover including clean left over mulch will be transported by the Contractor to the working face for use by the County forces as daily cover.
- G. All fill material required for this Project including the 6-inch thick leveling course, the 24-inch thick protective cover, and the fill needed for the perimeter ditch restoration and any other incidental fill material shall be provided by the Contractor from either off-site sources as part of the Base-Bid Additive Option No. 1, or from onsite sources as part of the Additive Option No. 2 as described in Section 01025, Measurement and Payment.
- H. Off-site fill material source shall be as designated by the Contractor for a source meeting the minimum requirements of the Specifications for fill material. Onsite borrow for the Contractor's use for this Project will be from the onsite Eastern Borrow Area designated on the Drawings.
- I. The solid waste excavation for construction of the let-down stormwater pipe installations and the waste excavation for shaping the sideslopes for stormwater terraces are required to be done prior to installation of the leveling course so that the top 6 inches of leveling course is not contaminated with any solid waste. Any excess solid waste from the trench excavation operation shall be transported to the working face at the end of each day for proper disposal. The volume of solid waste cut excavated as part of the work for stormwater let down pipes and terrace underdrain pipes system is not considered to be a part of the solid waste cut volume in the unit price portion of the Contract. However, the volume of solid waste cut for shaping the terraces on the side slope is considered part of the unit price portion of the Contract.
- J. The Owner has installed an active LFG collection system with vertical and horizontal gas collectors, laterals, headers, manifolds and condensate sumps on the east, north and west side slopes as shown on the Drawings. The Contractor shall be responsible to field locate and stake all existing LFG

facilities including pipes, valves and structures within the construction limits that may be impacted by this construction. The Contractor shall protect the existing LFG collection system from any damage throughout the construction project. The existing LFG collection system manifold and lateral piping in Cell 9 is planned to be disconnected and remain buried in place once the above-liner LFG collection system is constructed and the existing wellheads are connected to the new piping.

- K. Any damage by the Contractor to the existing LFG collection system shall be reported to the Engineer and Owner's LFG operator immediately in order for the LFG operator to deactivate the LFG collection system for that area and bypass the damaged section. The LFG collection system supplies fuel to the onsite LFG Pretreatment Facility that prepares the LFG to be sent to the adjacent power plant to produce electricity. Any damage to the existing LFG collection system may result in oxygen intrusion in the system requiring the LFG Pretreatment Facility operations to be adjusted or shut down to prevent explosions or other accidents and result in secondary damages. The damages to the LFG collection system shall be repaired immediately by the Contractor to original or better conditions at no cost to the Owner.
- L. An area south of Cell 10 is designated as the laydown area for the Contractor to store fill material and other construction materials and supplies. The Contractor shall document the condition of the site prior to any construction activities and shall restore the site to original or better condition as part of substantial completion. Documentation includes aerial photos, pictures or video of the condition of the laydown area.
- M. The Contractor shall complete all work required by the Contract Documents, Drawings and Specifications, and perform all other incidental work for a complete project whether specifically mentioned or not in accordance with the Drawings, Specifications, and Contract Documents.
- N. The Contractor shall verify all dimensions, quantities and details shown on the Drawings, Supplementary Drawings, Schedules, Specifications of other data received from the Engineer, and shall notify him of all errors, omissions, conflicts, and discrepancies found therein. Contractor shall complete and certify the Contractor Verification Form (attached to this section) at the pre-construction meeting.
- O. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction or improper operation resulting therefrom nor from rectifying such conditions at his own expense. He will not be allowed to take advantage of any errors, or omissions, as full instructions will be furnished by the Engineer, should such errors or omissions are discovered.

- P. All schedules are given for the convenience of the Owner, Engineer and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quality of materials and equipment included in Work to be done under the Contract.
- Q. This project is for sequential side slope closure of an active landfill. The County has filled solid waste to the proposed final elevation of the closure elevation less the cover thickness. The final cover system and the final grading plan is not intended to create additional disposal capacity within the proposed closure area other than filling depressed areas, and the fill volume required for closure cover installation, positive stormwater flow and landfill gas installations.
- R. All work called for in the Specifications applicable to this Contract, but not shown on the Drawings in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the Drawings or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the Work, is required and shall be performed by the Contractor as though it were specifically delineated or described.
- S. The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis.

1.04 SUBSTANTIAL AND FINAL COMPLETION

- A. In general, the following work shall be completed, tested, and fully operational, by the substantial completion inspection date:
1. Site preparation, office trailer setup and mobilization.
 2. Performing a new topographic survey and special purpose survey.
 3. Clearing and Grubbing and removal of vegetation.
 4. Initial sideslope grading and site preparation, cut and removal of excess solid waste, filling depressions and low spots and preparation of the subgrade.
 5. Final grading and compaction of the subgrade and installation of 6-inch thick clean granular fill leveling course on prepared surfaces.
 6. Installation of all permanent stormwater piping and structures, culverts, headwalls, underdrain systems and all related grading, waste removal, earthwork, concrete work, and all other related work and restorations.
 7. Construction of the LFG collection system, including all pipe booths, valves, laterals, headers and manifolds and connections with existing

- LFG collection system, and connection of existing wellheads to new LFG piping.
8. Final sideslope grading, solid waste cutting and filling depression areas, installation of the leveling course, and other site preparation for construction and installation of the geomembrane barrier layer and protective cover system for the closure areas including all required leveling course final grading and site preparations, compaction, barrier layer installations and QA/QC testing, installation of Composite Drainage Net (CDN), installation and grading of the 24-inch thick protective cover granular fill and sod, shaping of stormwater terraces and sodding to the limits shown, all other required earthwork for the proposed terrace swales, berms, letdown pipes, inlets and terrace underdrain system, and all other related work and restorations.
 9. Restoration, re-grading as necessary and sodding of the interface terrace as delineated on the Drawing.
 10. Removing the top 12 inches of existing soil in and around the perimeter ditch along the east side of Cell-9 and replacing with 12 inches of clean fill, complete in place and graded to the limits shown on the Drawings and sodded.
 11. As-built survey and submittal of acceptable as-built drawings.
 12. Other work incidental to this work including site cleanup, dewatering during construction, protection of existing wetlands, disposal of surplus earth, and furnishing and construction of miscellaneous appurtenances in accordance with the Drawings, Specifications and Contract Documents and all other work necessary for the Phase I closure construction to be considered complete by the Engineer.
 13. Connection of new landfill gas system components to the existing system.
 14. Testing and Startup of all mechanical equipment systems including any required O&M instruction and training.
 15. The Contractor shall provide a one (1) year full material and labor warranty of the Work, unless otherwise required for a longer duration by other parts of the Contract Documents, from the date of Final Acceptance by the Owner.
- B. Final completion of the entire project shall occur when all items not finished at substantial completion are completed and ready for Owner operation with all applications for final payment, final submittals, spare parts, and other requirements in accordance with the Contract.

1.05 SUPPLEMENTS

A. The supplements listed below, following “END OF SECTION,” are part of this Specification.

1. Contractor’s Verification of the Accuracy of Drawings and Specifications.
2. Electronic Media Release.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

CONTRACTOR'S VERIFICATION OF THE ACCURACY OF DRAWINGS AND SPECIFICATIONS

(This form shall be submitted to the Engineer at the pre-construction meeting and prior to the start of Construction)

STATE OF: _____

COUNTY OF: _____

_____, being first duly sworn, deposes and certifies that:

Prior to the start of work on the site, Affiant has carefully studied and compared the Drawings and Specifications and checked and verified all pertinent figures shown thereon and all applicable field measurements;

Affiant hereby verifies that the Reports, Drawings and Specifications in the Contract Documents for the Brevard County Central Disposal Facility Phase V Closure Construction Project accurately represent the existing site conditions and do not contain any conflicts, errors, ambiguities, or discrepancies with the following itemized exceptions:

- A. Number of exceptions _____ (if none, please indicate zero in the space provided).
- B. _____ additional sheets are attached.

AFFIANT: _____
 (Authorized Signature)

 (Name)

 (Title)

Sworn and subscribed before me this _____ day of _____ 200_____.

NOTARY: _____
 (Signature)
 My Commission Expires: _____
 (Date)

END OF CONTRACTOR VERIFICATION FORM

ELECTRONIC MEDIA RELEASE

Neel-Schaffer, Inc., Project No. NS.11415.001 – Orange County Cell-9-10 Phase I Sequential Closure Construction (Contract No. _____ - "PROJECT")

This release for electronic media is dated the _____ day of _____, 201 , between _____ (RECIPIENT) and Neel-Schaffer, Inc., for the exchange of electronic media (disks, tape, optical disk, etc.) containing information on the above referenced construction project (Contract No. _____)- hereinafter referred to as the PROJECT) for use by the RECIPIENT.

Therefore, RECIPIENT and Neel-Schaffer, Inc., agree as follows:

1. The electronic files provided to RECIPIENT by Neel-Schaffer, for the PROJECT may be used by RECIPIENT without restriction except as described herein. If RECIPIENT chooses to alter the electronic files provided for the PROJECT in any way, in whole or in part, or if RECIPIENT chooses to use the electronic files for any purpose other than for the PROJECT for which they were prepared, RECIPIENT agrees that the unrestricted use shall be without liability or legal exposure to Neel-Schaffer
2. Because information and data provided electronically may be altered, whether inadvertently or otherwise, Neel-Schaffer, reserves the right to retain copies of the electronic file(s) and to remove from the electronic files provided to RECIPIENT all identification (such as logo, surveyor's seal, etc.) reflecting the involvement of Neel-Schaffer, in their preparation.
3. The electronic files are provided solely as a convenience to RECIPIENT by Neel-Schaffer, and shall NOT be considered "Drawings of Record" or as "Construction Documents." All documents considered "Drawings of Record" or "Construction Documents" shall be accompanied by a professional's embossed stamp and signature. The stamped and signed hardcopy shall be referred to and shall govern in the event of any inconsistency between the hardcopy and the information provided electronically.
4. RECIPIENT is advised to check all electronic media for viruses before loading the files. RECIPIENT is fully responsible for intercepting and disabling viruses, if any, that may be inadvertently transmitted with the electronic files and hereby agrees to indemnify and hold Neel-Schaffer, harmless from and against all claims of any type or nature asserted by RECIPIENT or any party as a result of viruses inadvertently transmitted with the electronic files.
5. Files distributed electronically are subject to data erosion, erasure, and/or alteration, and computer systems and software become obsolete in time. By accepting these electronic files, RECIPIENT acknowledges these risks and agrees to waive all claims against Neel-Schaffer, should data erosion, erasure, and/or alteration of these electronic files occur.
6. By accepting electronic files, RECIPIENT acknowledges that such files may be incomplete and/or insufficient for use in calculating quantities or bid values or for other purposes relating to the preparation of any bid document. RECIPIENT further acknowledges that it is RECIPIENT's sole responsibility to obtain all additional information required for these purposes.
7. RECIPIENT agrees to defend, indemnify, and hold Neel-Schaffer, harmless from all claims, injuries, damages, losses, expenses, and costs, including attorneys' fees, arising out of breach of this agreement and/or the modification or reuse of these materials in or for any project other than the PROJECT for which they were originally prepared by Neel-Schaffer, Inc.

ACCEPTED FOR RECIPIENT:

ACCEPTED FOR NEEL-SCHAFFER, INC.

Name _____

Name _____

Title _____

Title _____

**SECTION 01025
MEASUREMENT AND PAYMENT**

PART 1 GENERAL

1.01 ADMINISTRATIVE SUBMITTALS

- A. Schedule of Values: Submit schedules on Orange County's standard form (AIA Document G702) at the pre-construction meeting.
- B. Schedule of Estimated Progress Payments:
 - 1. Submit with initially acceptable schedule of values.
 - 2. Submit adjustments thereto with Application for Payments.
- C. Application for Payment.
- D. Final Application for Payment.

1.02 The earthwork included in the unit price portion of the Base Bid-Additive Option # 1 is the unit price for the Contractor to obtain the specified fill material from off-site, transport to the project site, grade and compact in place. The earthwork included in the unit price portion of the Base Bid-Additive Option # 2 is the unit price for the Contractor to obtain the specified fill material from on-site, transport to the project site, grade and compact in place.

1.03 MEASUREMENT – GENERAL

- A. Quantities Based on Profile Elevations: Existing ground profiles shown on Drawings were obtained from a recent aerial topographic mapping, special purpose field survey data and supplementary information from record drawings. Because this Project is in a solid waste disposal area and solid waste decomposes, gets compacted and generally moves in place, it should be assumed the topographic data provided in the bid documents does not represent the site conditions and topographic elevations of the landfill at the time of bidding or at the start of construction. Therefore, the final closure grading plan for the project area will be updated based on update topographic survey performed by the Contractor's surveyor prior to start of construction as described in paragraph 1.04.C.
- B. Quantities for the Lump Sum portion of the Contract will be based on the required amount of materials to construct the work included in the Drawings, Specifications and Contract requirements under the Lump Sum portion. Bidders should include all costs Bidders may anticipate to provide and to perform for the Contract during the length of construction of this Project and execution of the requirements of these Contract Documents.

- C. Where measurement of quantities for the Unit Price portion of the Contract depends on elevation of existing ground, elevations obtained during construction will be compared with those shown on Drawings. Variations of one (1) foot or less will be ignored, and profiles shown on Drawings will be used for determining quantities. The Contractor shall include the cost of material and labor for all work below 1-foot variation in the lump sum portion of the Contract.
- D. Units of measure shown on the Bid Form shall be as follows unless specified otherwise.

<u>ITEM</u>	<u>METHOD OF MEASUREMENT</u>
AC	Acre – Field Measure by Engineer
CY	Cubic Yard – In-place and compacted
CY-VM	Cubic Yard – Measured in the vehicle by Volume
EA	Each – Field Count by RPR & Engineer
GAL	Gallon – Field Measure by RPR & Engineer
HR	Hour
LB	Pound(s) – Weight Measure by Scale
LF	Lineal Foot – Field Measure by Engineer
LS	Lump Sum – Unit is one; no measurement will be made
SF	Square Foot
SY	Square Yard
TON	Ton – Weight Measure by Scale (2,000 pounds)

1.04 PAYMENT

- A. General:
 - 1. Progress payments will be made monthly.
 - 2. The date for Contractor’s submission of monthly Application for Payment shall be established at the Preconstruction Conference.
 - 3. Contractor shall submit an estimated monthly cash draw for this Contract to the Owner at the first construction progress meeting, and will update the estimate as requested by the Owner and as the project progresses.
- B. Payment for Lump Sum Work covers compensation for all Work shown on the Drawings, Specifications and Contract Documents except for compensation for the following items as described in paragraph 1.04.C of this section and in accordance with the requirements of the General Conditions.
 - 1. Solid Waste Grading.
 - 2. Clean Granular Fill.
 - 3. Repair of Primary Geomembrane Bottom Liner System.
 - 4. Installation of additional 40-mil LLDPE Geomembrane.
 - 5. Modification of existing Condensate Pump Stations.

- C. Payment for unit price items covers all Work necessary to furnish the materials, tools, labor and other incidentals to install the following items complete in-place in accordance with the Drawings, Specifications and Contract Documents.
- D. **Granular Fill Hauling, Placing, Grading, and Compacting in-place:** The quantities of solid waste cut, and in-place granular fill material for the updated grading plan will be calculated and submitted by the Contractor for review and confirmation by the Engineer. Contractor will allow in his schedule at least ten (10) workdays for the Engineer to prepare the updated grading plan, and at least ten (10) workdays for Engineer's review and confirmation of the submitted quantities. Once the quantities are confirmed by the Engineer and accepted by the Owner, the Engineer will issue the notice of acceptance of the Owner and the agreed upon solid waste cut and in-place granular fill material quantities. These quantities will be used as the basis for payment of the unit price portion of the Contract.
1. If the Engineer cannot confirm the Contractor's quantities, the Engineer will notify the Contractor and forward a copy of his calculations and analysis. Engineer, Owner and Contractor shall promptly meet to review the calculations and resolve to an agreed upon quantity. No work shall proceed until the quantities are agreed upon between the Contractor and Owner, and the Engineer issues the written notice of acceptance of the Owner and the agreed upon quantities.
 2. The landfill side slopes may settle further during construction as solid waste or the intermediate cover is decomposed or compacted due to heavy equipment traffic, requiring more fill material than initially calculated at the beginning of the construction. The County will compensate the Contractor for the additional fill requirement an amount equal to the product of 5 percent of the agreed upon calculated in-place fill material and the unit price bid for in-place fill. The Contractor agrees this compensation is the full compensation to the Contractor for all additional fill material needed due to potential settlement, decomposition, compaction and all other losses during construction, and compensation for all additional fill needs regardless of the reasons and actual amount of fill used.
 3. Therefore, the total compensation to the Contractor for all earthworks shall be based on the Contractor's Unit Price bid for in-place earthwork multiplied by 105 percent of the agreed upon calculated quantities of fill material. This quantity will be the "agreed upon fill quantity." The Engineer will issue a written notice of acceptance by the Owner of the agreed upon fill quantity and forward to the Contractor. Earthwork can start by the Contractor upon receipt of the written notice.
- E. **Off-site Granular Fill (Additive Option #1):** The granular fill unit price portion of this Contract is for compensation to the Contractor for furnishing all labor, materials and equipment to provide specified granular fill material

and place and grade on prepared surfaces for the leveling course and the protective cover as part of the final cover system, all other fill requirements for letdown pipe trench, terrace and berm, ditch restoration and all other incidental fill required in this construction as necessary and needed for this Project. The base bid unit price for this item is for the Contractor to obtain the specified granular fill from off-site sources, deliver to the project site and install as required in accordance with the Drawings and Specification.

1. Measurement: The quantity of this unit price item shall be determined and agreed upon in writing prior to start of any earthwork as described above.
2. Payment:
 - a. The compensation to the Contractor for this item in the Unit Price portion of this Contract shall be based on the Contractor's Unit Price bid multiplied by the "agreed upon quantities" of granular fill complete in place. For the purpose of monthly pay applications, the estimated quantity of in-place granular fill material will be calculated based on the estimated area completed; however, the total compensation for granular fill for the entire construction shall be the product of unit bid price for this item and the "agreed upon fill quantities" regardless of quantities used by the Contractor.
 - b. Payment for the applicable unit price shall be full compensation to the Contractor for furnishing all plant, labor, materials and equipment necessary to furnish and install the granular fill requirement for construction of the final closure cover system and all other incidental fill requirements for this Project.

F. Onsite Granular Fill (Additive Option #2): The granular fill unit price portion of this Contract is for compensation to the Contractor for furnishing all labor, materials and equipment to clear and grub, remove top soil/roots and stockpile nearby in Section G in an area as designated by the Owner, excavate granular fill material from the County's eastern borrow pit section H, transport to the project site and to place and grade on prepared surfaces for the leveling course and the protective cover as part of the final cover system, all fill requirements for letdown pipe trench, terrace and berm, ditch restoration and all other incidental fill required in this construction as necessary and needed for this Project. The unit price for this item is for the Contractor to clear the borrow pit excavation site, remove top soil and stockpile, develop and operate the Section H of the eastern borrow pit in accordance with the current FDEP permit. The Owner, as permit holder, and Engineer will coordinate with FDEP for permitting and relocation of Gopher Tortoise within section H.

1. Measurement: The quantity of this unit price item shall be determined and agreed upon in writing prior to start of any earthwork as described above.

2. Payment:
 - a. The compensation to the Contractor for this item in the Unit Price portion of this Contract shall be based on the Contractor's Unit Price bid multiplied by the "agreed upon quantities" of granular fill complete in place. For the purpose of monthly pay applications, the estimated quantity of in-place granular fill material will be calculated based on the estimated area completed. The total compensation for on-site granular fill for the entire construction shall be the product of unit bid price for this item and the "agreed upon quantities."
 - b. Payment for the applicable unit price shall be full compensation to the Contractor for furnishing all plant, labor, materials and equipment necessary to develop and operate Section H of the Eastern Borrow Pit, excavate, transport and install the granular fill requirement for construction of the final closure cover system and all other incidental fill requirements for this Project.

G. **Solid Waste Grading:** The solid waste grading quantities will be calculated based on the amount of solid waste cut by the Contractor. Filling depression areas will be considered incidental to cut and shall not be compensable. Variations of 1 foot or less will be ignored. The Contractor shall include the cost of material and labor for all work below 1-foot variation in the lump sum portion of the Contract. Once the Contractor's quantities are confirmed by the Engineer and accepted by the Owner, the Engineer will issue the written notice of acceptance of the Owner and the agreed upon solid waste cut. This quantity will be used as the basis for payment of the unit price portion of the Contract.

1. The solid waste grading unit price portion of this Contract is for compensation to the Contractor for furnishing all labor, materials and equipment for excavation of solid waste, soil, mulch and other related materials from one part of the designated construction limit area and transport to other parts of the designated construction limit area, compacting, and grading it to the lines and grades shown for preparation of the finished subgrade for installation of the Leveling Course. This unit price item does not include waste excavated for construction of stormwater letdown structures and pipes, or as a result of excavation of existing LFG collection system. All cost to the Contractor for any solid waste excavation and grading related to the stormwater letdown structures and pipes, and construction of LFG system shall be included in the lump sum portion of the Contract. For the purpose of this Contract, solid waste filling and grading is incidental to solid waste cut.
 - a. Measurement: The quantity of this unit price item shall be determined and agreed upon in writing prior to start of any waste excavation, grading and earthwork. The quantity shall be calculated based on cubic yards of cut between the updated

topographic survey and the updated closure subgrade surface as described above.

- b. **Payment:** The compensation to the Contractor for this item in the Unit Price portion of this Contract shall be based on the Contractor's Unit Price bid multiplied by the agreed upon quantity of solid waste cut. No payment shall be made for solid waste filling and subgrade grading in preparation of installation of the Leveling Course.

H. Repair of Primary Geomembrane Bottom Liner System: The unit price for repair of the existing primary geomembrane liner is for compensation to the Contractor to provide 60-mil HDPE geomembrane material as specified and repair any existing damage to the primary liner discovered during exposure of the geomembrane anchor trench at the toe bench for the purpose of fusing the closure cover geomembrane liner. The compensation to the Contractor for repair of an existing damage and replacement of the first 1,000 square feet of 60-mil HDPE shall be included in the lump sum portion of the Contract. Compensation for repair of the primary geomembrane liner will be based on the unit price after the first 1,000 square feet of liner replacement. The work for this unit price item does not include new damage caused by the Contractor. The cost to the Contractor for repair of any damage to the primary geomembrane caused by the Contractor's activities shall be included in the lump sum portion of the Contract.

1. **Measurement:** The existing damage to the primary liner will be documented by the Contractor and RPR and area to be replaced measured by the Contractor and verified by the Engineer. The measurement recorded by the Contractor and verified by the Engineer or the RPR shall be used for compensation to the Contractor.
2. **Payment:** The total area replaced with new 60-mil HDPE geomembrane minus initial 1,000 square feet shall be multiplied by the unit price for this item provided in the Bid to calculate the compensation to the Contractor for primary liner repair.

I. Installation of additional 40-mil LLDPE Geomembrane: The unit price for installation of the 40-mil LLDPE geomembrane barrier layer outside the established closing area. This unit price may be used by the Owner to expand the boundaries of the closing in areas where final permitted elevations have been achieved. The unit costs for waste grading, leveling course and protective cover portion of the closure cover is provided elsewhere.

1. **Measurement:** The surface area of additional closure areas as measured by the Contractor's surveyor and verified by the Engineer or the RPR shall be used for compensation to the Contractor.

2. Payment: The total surface area of additional closing area shall be multiplied by the unit price for this item provided in the Bid to calculate the compensation to the Contractor for installation of the barrier portion of the closure cover.
- J. **Modification of existing condensate pump station:** the unit price for excavation of the condensate pump station at the existing 36-inch by 24-inch Tee, installation of a saddle with 24-inch diameter HDPE riser pipe extended to the ground elevation and capping. The unit cost includes all excavations, sheeting and shoring, all pipe installation work as shown on the plans and as specified, backfill with clean fill, compaction, road base installation and pavement replacement and sodding.
1. Measurement: The measurement will be the number of condensate pump stations selected by the County for modification. The County provides no assurance as to the number of condensate pump stations, if any, that will be selected for modifications as part of this Contract.
 2. Payment: The payment to the Contractor will be the number of condensate pump station selected by the County and modifications completed by the Contractor multiplied by the Contractor's unit price for this item.
- K. No separate payment shall be made for the following work, and all costs shall be included in appropriate payment item in the lump sum or unit price portion of the bid:
1. Trench excavation, sheeting, shoring and bracing.
 2. Clearing and grubbing of the Section H of the Eastern Borrow Pit, removal and stockpiling of the top soil in adjacent Section G as designated by the Owner.
 3. Dewatering, stormwater runoff management and disposal of water during construction.
 4. Erosion control, trash fence, protection of work from storms and erosion and construction of temporary structures during construction.
 5. Grading, compaction and filling of all solid waste including grading of waste generated from excavation activities, stormwater letdown structures, sideslope terraces, LFG collection system, and related construction and preparation of the subgrade for the leveling course.
 6. Transportation of any solid waste or fill material from the project site to other locations on the Cell 9-10 landfill.
 7. Transportation of granular fill from off-site or onsite sources to the project site.
 8. Removal of any fill contaminated with solid waste from solid waste cutting, or solid waste from well construction, stormwater letdown structures trench excavation or other construction activities of the Contractor and transport to the working face on Cell 9-10 for disposal.
 9. Surveys, Engineering and preparation of certified as-build drawings.

10. Field location of existing primary liner, liner anchor trench, verifications or locating buried pipes.
11. Excavation of leftover temporary stormwater structures within the closure area and hauling and disposal of construction waste material.
12. Site cleaning and housekeeping; restoration of contractor's material storage area.
13. Traffic control activities.
14. Permits, trash fencing, silt fencing and turbidity barriers.
15. Cleaning, grading and re-sodding of any area inside the construction limits, if impacted by construction.
16. Cleaning existing stormwater inlets, culverts and structures within the construction limit line.
17. Repair and/or restoration of structures and/or property damaged or disturbed by the Contractor during performance of the Work.
18. Taxes, insurance, overhead and profit.
19. All other work required and incidental work included in the Contract.

1.05 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for the following:

1. Loading, hauling, and disposing of rejected material.
2. Quantities of material wasted, eroded, washed away or disposed of in manner not called for under Contract Documents.
3. Rejected loads of material, including material rejected after it has been placed by reason of failure of Contractor to conform to provisions of Contract Documents.
4. Material not unloaded from transporting vehicle.
5. Failure to submit updated progress schedule with pay application.
6. Defective Work not accepted by Owner.
7. Work performed without approved Shop Drawing.
8. Material remaining on hand after completion of Work.

1.06 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

- A. Partial Payment: No partial payments will be made for materials and equipment delivered or stored unless Shop Drawings or preliminary operation and maintenance manual are acceptable to Engineer and Owner.
- B. Final Payment: Will be made only for products incorporated in Work and the product has been completed, tested and accepted by the Owner; remaining products, for which partial payments have been made, shall revert to Contractor unless otherwise agreed, and partial payments made for those items will be deducted from final payment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01027
SCHEDULE OF VALUES

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Submit to the Owner and Engineer a Schedule of Values allocated to the various portions of the Work at the preconstruction meeting, and as otherwise specified or requested to be submitted earlier as evidence of the apparent Low Bidder's bid evaluation.
2. Upon request of the Engineer, support the values with data which will substantiate their correctness including the invoiced cost of material, labor and Overhead and Profit.
3. The Schedule of Values shall establish the actual value of the component parts of the Work to be completed, and shall be used as the basis of the Contractor's Application for Payment.
4. Provide to the Owner a written anticipated cash draw for this Project at the pre-construction conference for Owner's budgeting purposes. Update the anticipated cash draw periodically as project progresses or as requested by Owner.

B. Related Requirements Described Elsewhere:

1. Conditions of the Construction Contract.
2. Section 01028, Application for Payments.

1.02 FORM AND CONTENT OF SCHEDULE OF VALUES

A. Prepare a detailed schedule of values for the Work and submit to the Engineer and Owner at the pre-construction conference. The schedule of values shall be typed on 8-1/2-inch by 11-inch white paper. Standard construction forms and computer format in MS-Excel spreadsheet will be considered acceptable by the Engineer. Identify schedule with:

1. Title of project, location, Owner's name and address, Bid Number.
2. Engineer's name and project number.
3. Name and address of Contractor.
4. Date of submission.

B. Schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing item prices for progress payments during construction.

- C. Each payment item of work shall be detailed for estimated quantities of material and unit prices of various components of work.
- D. Each payment item shall be considered complete when all components are in place, tested and accepted by Owner.
- E. Unit Price Work: Reflect unit price quantity and price breakdown from conformed Bid Form.
- F. Lump Sum Work:
 - 1. Reflect schedule of values format as required by the General Conditions and requested by Owner, specified allowances, alternates, and equipment specified by Owner, as applicable.
 - 2. List Bonds and insurance premiums, mobilization, demobilization, facility startup, and contract closeout separately.
 - 3. List preparation of project schedule and monthly updates as a line item.
 - 4. Breakdown by Divisions 2 through 16 to greatest extent possible, and further breakdown by specific components for each Division of Work including all labor, material, equipment and overhead and profit.
- G. Mobilization and demobilization cost to be no more than 5 percent of total Contract. No less than 25 percent of mobilization/demobilization cost shall be dedicated for payment after completion of demobilization activities.
- H. An unbalanced or front-end loaded schedule will not be acceptable.
- I. Summation of the complete schedule of values representing all Work shall equal the Contract Price.
- J. Provide an estimated drawdown schedule to Owner at pre-construction conference to be used for budgeting purposes by the Owner. Update drawdown schedule quarterly based on the balance of Contract.
- K. Each item shall include a directly proportional amount of the Contractor's overhead and profit.
- L. The sum of all Lump Sum and Unit Price Items values listed in the schedule shall equal the Total Contract Price.

1.03 SUB-SCHEDULE OF UNIT MATERIALS VALUES

- A. Submit a sub-schedule of unit costs and quantities for products on which progress payments will be requested for stored products.
- B. The form of submittal shall parallel that of the Schedule of Values, with each item identified the same as the line item in the Schedule of Values.

- C. The unit values for the materials shall be broken down into the cost of the material, delivered and unloaded at the site, with taxes paid. Copies of paid invoices for component material shall be included with the payment request in which the material first appears.
- D. The installed unit value multiplied by the quantity listed shall equal the cost of that item in the Schedule of Values.

1.04 REVIEW AND RE-SUBMITTAL

- A. After review by Engineer, revise and incorporate any comments, and resubmit Schedule of Values and Schedule of Unit Material Values as required.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01028
APPLICATIONS FOR PAYMENTS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Submit applications for payment to the Engineer in accordance with schedule established at the pre-construction meeting.
- B. Related Requirements Described Elsewhere:
 - 1. Contract between Owner and Contractor.
 - 2. General and Supplementary Conditions; Application and Certification of Payment.
 - 3. Progress Payments, Progress Schedule, Retainage and Final Payment: Conditions of the Contract.

1.02 FORMAT AND REQUIRED DATA

- A. Submit applications typed in format provided by the Owner, with itemized data typed on 8-1/2 inch by 11 inch or 8-1/2 inch by 14-inch white paper continuation sheets. Provide itemized data on continuation sheets.
- B. The monthly Construction Project Schedule update is an integral part of the payment application. Contractor is required to update the Construction Progress Schedule and submit an acceptable project progress schedule update to the RPR and Engineer along with each pay application.
- C. Pay Applications without the required data will be returned to the Contractor as incomplete.

1.03 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

- A. Transmittal Summary: Attach a summary with each detailed Application for Payment and include Request for Payment of stored materials and equipment on hand as applicable.
- B. Execute certification by authorized officer of Contractor.
- C. Use detailed Application for Payment Form furnished by Owner (AIA Document G702.)
- D. Include accepted schedule of values for each portion of Work, the unit price breakdown for Work to be paid on unit price basis.

E. Preparation:

1. Round values to nearest dollar.
2. List each Change Order and Written Amendment executed prior to date of submission as separate line item. Totals to equal those shown on the Transmittal Summary Form for each schedule as applicable.
3. Include consent of surety in each application for payment.
4. To receive approval for payment on component material stored onsite, submit copies of the original invoices with the application for payment. Provide a log sheet for all stored materials, which identifies the type, quantity and value of all stored materials.
5. The Contractor shall certify, for each current pay request, that all previous progress payments received from the Owner, under this Contract, have been applied by the Contractor to discharge in full all obligations of the Contractor in connection with Work covered by prior applications for payment, and all materials and equipment incorporated into the Work are free and clear of all liens, claims, security interest and encumbrances. Additionally, a "Partial Release of Lien" from each subcontractor and supplier for the previous pay draw, shall be attached to each application for payment.
6. Submit a detailed progress report with each Application for Payment to include as a minimum a summary description of work performed during the pay period, and a summary of work anticipated to be performed during the next pay period.
7. Approved updated construction progress schedule and monthly project progress photographs shall be submitted and included with each application for payment.
8. Submit an updated both in hard copy and electronic copy of the approved project schedule reflecting the Contractor's construction progress to the date of Application for Payment. Pay application may be considered incomplete without schedule update.

1.04 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. When the Owner or the Engineer requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:
1. Project.
 2. Application number and date.
 3. Detailed list of enclosures.
 4. For stored products:
 - a. Item number and identification as shown on application.
 - b. Description of specific material.
 - c. Proof that stored products paid for on previous estimates have been paid for by Contractor.
 - d. Certified payroll.

- B. Submit one copy of data and cover letter for each copy of application.

1.05 PREPARATION OF APPLICATION FOR SUBSTANTIAL AND FINAL PAYMENT

- A. The following documents shall accompany the Contractor's Application for Substantial Completion:

1. All documents required with each pay application.
2. Certificate of Occupancy, if required.
3. Warranties and maintenance agreements.
4. Test/adjust/balance records.
5. Maintenance instructions, if any.
6. Meter readings.
7. Startup performance report, if any.
8. Change over information-Owner's occupancy, if required.
9. Final cleaning.
10. Final progress photographs.
11. Certified as-built drawings.

- B. The following documents shall accompany the Contractor's Application for Final Completion:

1. All documents required with each pay application.
2. Complete Final Release of Liens.
3. Completion of project close-out requirements.
4. Completion of repairs identified in the "punch list" at substantial completion.
5. Removal of temporary facilities, and final site cleanup.
6. Proof of paid taxes and fees.
7. A notarized letter on company letterhead stating no asbestos was used on this Project.

1.06 SUBMITTAL PROCEDURE

- A. Review draft pay application and progress schedule with RPR and Engineer a week before formal submittal to eliminate unnecessary delays.
- B. Submit seven (7) complete copies of the certified application for payment to the Engineer at the time stipulated in the Contract Documents or as set forth at the pre-construction conference.
- C. When the Engineer finds application properly completed and correct, he will transmit certificate for payment to Owner, with copy for Contractor.

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PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 01030
SPECIAL PROJECT PROCEDURES**

PART 1 GENERAL

1.01 WORKMANSHIP, MATERIAL, AND EQUIPMENT

- A. When a particular product is specified or called for, it is intended and shall be understood that the proposal tendered by the Contractor included those products in the bid submitted. Should the Contractor desire equal to those specified, the Contractor shall furnish information as described in the General Conditions. The alternate product or products shall meet the requirements of the Specifications and shall, in all respects, be equal to or better than the products specified by name herein. The Engineer shall be the sole person deciding if the proposed product substitution meets the Specifications.
- B. All materials and manufactured articles for incorporation into the Work shall be new and unused standard products of recognized reputable manufacturers.

1.02 SPECIAL REQUIREMENTS

- A. The Work of this Project is sequential closure of an active landfill. This landfill should be assumed by the Contractor to be wet and emitting landfill gas, leachate and condensate requiring dewatering, pumping, disposal and management during construction. No additional payment shall be made for dewatering, pumping, temporary drainage conveyance and/or any other difficulties encountered by the Contractor due to water or any other site conditions. Contractor shall provide equipment and manpower and shall perform all dewatering and/or pumping necessary during construction activities without any additional cost to the Owner. Contractor shall seek and obtain prior approval from the Owner for any discharge of dewatering outside of the construction limit line which may be necessary for the Contractor to perform the Work.
- B. Contractor shall not create a public nuisance including, but not limited to, encroachment on adjacent lands, road closure without the Owner's prior approval, prevention of the Owner from performing normal landfill operations, littering along the main site access road and/or outside of the construction limits, flooding of adjacent land or excessive speed on facility roads.
- C. If construction of the work requires relocation of existing structures, the Contractor shall be responsible for relocation of any above ground or underground structures within the construction limit lines, including but not limited to conduits, piping, rubbish, and drains that interfere with the positioning of the work as set out in the Drawings. The cost of such relocations and replacements shall be included in the Lump Sum Bid.

- D. Any underground or surface combustion in the waste mound caused by the Contractor's waste excavation, well development, subgrade preparation or any other activity shall be put out immediately by the Contractor by application of fill or water. The RPR, Engineer and Owner's Project Manager shall be notified by the Contractor immediately upon discovery of the fire.

1.03 RESPONSIBILITY OF CONTRACTOR

- A. The Contractor shall be responsible for the entire Work required by the Drawings, technical specifications and Contract Documents from the date of the Notice-to- Proceed until the date of final completion and acceptance by the Owner, as evidenced by approval of the Completion Certificate by the Owner. The Contractor shall be responsible for removals, renewals and replacement of Work performed by the Contractor due to action of weather and all other causes except as otherwise provided in the Specifications. The Contractor shall have full responsibility to protect the Work within the construction limit lines at all times and make all precautionary measures to protect the materials installed from damage.
- B. The Contractor shall have full responsibility to see that the Work is properly supervised and carried on faithfully and efficiently. The Contractor shall supervise the work personally and shall have a qualified and competent Superintendent or Project Manager, with experience in landfill closure who shall be on the site of the project at all working hours, or readily accessible by telecommunications during working hours, and who shall be clothed with full authority by the Contractor to direct the performance of the work and make arrangement for all necessary materials, equipment and labor without delay.
- C. Renewals or repairs necessitated because of defective materials or workmanship, or due to action of the elements or other natural causes, including fire, flood, run-off, erosion, washouts and standing water prior to the acceptance by the Owner, as determined by the Completion Certificate, shall be done in accordance with the Contract Documents at the expense of the Contractor.

1.04 PROVISIONS FOR CONTROL OF EROSION AND ENVIRONMENT

- A. Sufficient precautions shall be taken during construction to prevent the run-off of polluting substances such as silt, clay, fuels, oils, bitumens, solid waste, or other polluting materials harmful to humans, fish, or other life, into the wetlands and surface waters of the site. Control measures must be adequate to assure that turbidity in the receiving water will not be increased more than 29 nephelometric turbidity units (NTU) above background unless otherwise permitted. Erosion evident within the limits of construction or other areas affected by the Contractor shall be the responsibility of the Contractor during the full term of the contract period. Areas subject to erosion during this time

shall be fully restored to original or design conditions within 10 days of notice to the Contractor. Contractor shall be responsible to restore any damage to wetlands and pay all costs and fines by regulatory agencies.

- B. No stormwater run-off from the exposed solid waste shall enter the stormwater collection system. Contractor shall take all precautions and install all barriers as necessary to eliminate the potential of runoff from the exposed solid waste within the construction limit area to enter the stormwater collection structures. Any violation shall be reported immediately to the Owner. Contractor shall be responsible for the cost of any cleanup and possible monetary fines from regulatory agencies.
- C. No exposed solid waste shall be permitted overnight. The exposed solid waste is required to be properly covered with soil prior to the end of each day.
- D. Any washout of the sideslopes within the construction limit area shall be repaired immediately. If fill material installed on sideslopes is washed out to the toe of the slope and contaminated with solid waste, the fill shall not be reused for leveling course or protective cover. The contaminated wash out fill shall be transported to the working face of the landfill for disposal.
- E. The Contractor's fuel storage and fueling area shall be set up with primary and secondary containers to prevent fuel spills anywhere on landfill properties.
- F. The Contractor shall be responsible to comply with all applicable permit conditions, and shall prepare the site and facilitate regulatory agency site visits.

1.05 HURRICANE PREPAREDNESS PLAN

- A. The Contractor shall submit to the Engineer and Owner a Hurricane Preparedness Plan at the first construction progress meeting. The plan shall outline the necessary measures, which the Contractor proposes to perform in case of a hurricane warning. Such measures shall be in accordance with local and state requirements.
- B. Contractor and Subcontractors shall protect the Work from inclement weather. Any portion of Work or materials which have been damaged by reason of failure on the part of the Contractor or Subcontractors to so protect the Work, shall be removed and replaced at the expense of the Contractor.
- C. The Contractor agrees that he has been compensated as part of the Lump Sum portion of the Contract for all cost to the Contractor for hurricane preparedness, protection of work from inclement weather and repair and replacement of damaged work, and no additional compensation shall be made by the Owner.

1.06 CONSTRUCTION CONDITIONS AND SUBSURFACE INVESTIGATION

- A. The Contractor shall strictly adhere to the specific requirements of the governmental unit(s) or agency(ies) having jurisdiction over the work. Wherever there is a difference in the requirements of a jurisdictional body and these Specifications, the more stringent shall apply.
- B. Prior to submission of a bid, the Contractor shall determine and investigate the nature and location of the work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the nature of the work conditions, the character of equipment and facilities needed during the execution of the work, the general and specific conditions and all other matters which can in any way affect the work under this Contract. Any claim of the Contractor due to nature of the Work, substrata, groundwater, landfill gas and leachate, and other such site conditions will not be allowed or acceptable by the Owner.

1.07 SUSPENSION OF WORK DUE TO INCLEMENT WEATHER

- A. During inclement weather, all Work which might be damaged or rendered inferior by such weather conditions should be suspended. During suspension of the Work from any cause, the Work shall be suitably covered and protected so as to preserve it from damage by the weather.
- B. If work is suspended due to reports of threat of an incoming hurricane, the Contract Time associated with abnormal weather will be adjusted in accordance with Section 01310, Progress Schedules.

1.08 PERMITS

- A. The Owner has obtained a Florida Department of Environmental Protection permit for construction of sequential closure of the Cell 9-12 Class I landfill. A copy of the permit is attached to these specifications and made part of the Contract Documents.
- B. Upon notice of award, the Contractor shall apply for applicable permits not previously obtained by the Owner to do the work from the appropriate governmental permitting agencies. The costs for obtaining all permits shall be borne by the Contractor. Reference to existing permits is contained in Section 01065, Permits.
- C. The Contractor shall be bound to general and specific conditions of the Owner's permits as part of this Contract and shall be responsible for any environmental impacts caused by Contractor and subcontractors and shall bear the full cost of all fines, penalties, engineering, legal fees and/or additional mitigation which may be imposed by any regulatory agency due to the failure to adhere to all permit requirements.

- D. FDEP staff may visit the site during construction and at the substantial and final completion of the project. Engineer will coordinate such site visits and will coordinate with the Contractor.

1.09 PUMPING

- A. The Contractor shall perform all pumping necessary to prevent flotation of any part of the structures during construction operations.
- B. Dewatering of groundwater should be anticipated and planned in this Project if the Owner elects to allow the Contractor to obtain fill material from onsite sources. If dewatering is needed and exceeds St. Johns River Water Management District (SJRWMD) construction thresholds, a dewatering plan must be prepared by the Contractor's agent and submitted and approved by the SJRWMD prior to commencement of work. The dewatering plan shall not violate the County's Storm Water Pollution Prevention Plan on file with FDEP. Determination of dewatering beyond the construction threshold, any permitted dewatering and compliance with dewatering regulations shall be the responsibility of the Contractor.
- C. The Contractor will not be allowed to pump water off-site, and must discharge groundwater or clean (non-leachate impacted) surface water only to the landfill internal stormwater management system, as approved by the Engineer.
- D. Any collected leachate including leachate impacted stormwater is required to be routed into the Cell 9-10 leachate collection system. No leachate shall be actively pumped into leachate collection system without prior approval of the Engineer.

1.10 EXISTING UNDERGROUND PIPING, STRUCTURES, AND UTILITIES

- A. The locations of existing underground utilities, piping, valves condensate sumps, perimeter stormwater structures, stormwater culverts, temporary letdown pipes and inlets are from information obtained from the available record drawings. Solid waste landfills decompose and settle. The underground piping may not be at the locations shown due to landfill settlement and solid waste decomposition. The locations are shown without express or implied representation, assurance, or guarantee that they are complete or correct or that they represent a true picture of underground piping to be encountered.
- B. Landfill gas collected from the north, east and west slopes is transmitted southward through headers along the north, east and west slopes. The gas flow from the east side of the landfill is routed eastward through a 36-inch header that connects to the LFG Pretreatment Facility. This transmission main is located south of the main access road. The Contractor shall be aware of this critical pipeline and conduct all construction activities and route traffic in a

way to prevent all construction impacts to this LFG header from construction equipment throughout the construction period.

1.11 DAILY REPORTS

- A. The Contractor shall prepare and submit daily reports of construction activities including non-work days. The report shall include as a minimum:
 - 1. Manpower, number of personnel by name and craft.
 - 2. Equipment with Contractor's identification number on the Project.
 - 3. Major deliveries.
 - 4. Activities and work with reference to the schedule activity numbers.
 - 5. New issues or problems; and
 - 6. Other pertinent information.
- B. A similar report shall be prepared by each Subcontractor and submitted along with the Contractor's report.
- C. One copy of the daily reports shall be transmitted to the RPR on a daily basis.
- D. Two signed paper copies of the daily reports submitted to the Engineer and Owner on a weekly basis at the weekly construction progress meeting. Each report shall be signed and dated by the Contractor's Superintendent or Project Manager. Submittal of these daily reports should not be construed to mean that the Owner and Engineer have agreed or disagreed with the content of these reports. However, the monthly pay requests may be evaluated based on the contents of these reports.

1.12 COORDINATION OF WORK

- A. The Contractor shall expect solid waste operations and landfill activities to occur. The Contractor shall coordinate with the Owner and Engineer to facilitate the Owner's ongoing traffic to and from the disposal areas. The Contractor and his subconsultants shall not interfere with the daily solid waste disposal activities. Garbage delivery trucks, landfill equipment and other landfill operation vehicles have the right-of-way at all times.
- B. Contractor shall coordinate with the Owner and Engineer to minimize impacts to the County's landfill and the LFG Pretreatment Facility operations.
- C. The Contractor is notified herein that other construction projects are underway or may get started during this Contract in the vicinity of the Project related or unrelated to the landfill, and the Contractor shall be required to afford other contractors and the Owner reasonable opportunity for the introduction, transportation and storage of their materials and equipment and the execution for their work and shall properly connect and coordinate the Work with such other work. The Contractor shall coordinate his construction work activities

with the Owner and other contractors to store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the Work as will not unduly interfere with the progress of the Work or the work of any other contractors.

- D. If the execution or result of any part of the Work depends upon any work of the Owner or of any separate contractor, the Contractor shall, prior to proceeding with the Work, inspect and promptly report to the Owner in writing any apparent discrepancies or defects in such work of the Owner or of any separate contractor that render it unsuitable for the proper execution or result of any part of the Work.
- E. Failure of the Contractor to so inspect and report shall constitute an acceptance of the Owner's or other Contractor's work as fit and proper to receive the Work, except as to defects which may develop in the Owner's or other Contractor's work after completion of the Work and which the Contractor could not have discovered by its inspection prior to completion of the work.
- F. Should the Contractor cause damage to the work or property of the Owner or of any other contractor on the Project, or to other work on the site, or delay or interfere with the Owner's ongoing operations or facilities or adjacent facilities or said separate contractors work, the Contractor shall be liable for the same; and, in the case of another contractor, the Contractor shall attempt to settle said claim with such other contractor prior to such other contractor's institution of litigation or other proceedings against the Contractor.
- G. If such other Contractor sues the Owner on account of any damage, delay or interference caused or alleged to have been so caused by the Contractor, the Owner shall notify the Contractor, who shall defend the Owner in such proceedings at the Contractor's expense. If any judgement or award is entered against the Owner, the Contractor shall satisfy the same and shall reimburse the Owner for all damages, expenses, attorney's fees and other costs which the Owner incurs as a result thereof.
- H. Should another contractor cause damage to the Work or to the property of the Contractor or cause delay or interference with the Contractor's performance of the Work, the Contractor shall present directly to said other contractor any claims it may have as a result of such damage, delay or interface (with an information copy to the Owner) and shall attempt to settle its claim against said other contractor prior to the institution of litigation or other proceedings against said other contractor.
- I. In no event shall the Contractor seek to recover from the Owner or the Engineer, and the Contractor hereby represents to the Owner and the Engineer that it will not seek to recover from them, or either of them, any costs, or any

expenses including, but not limited to, attorney's fees or losses of profit incurred by the Contractor or time for any delay or interference caused or allegedly caused by any other contractor.

1.13 LFG WELL PROTECTION

- A. Temporary fencing shall be installed around existing piezometer, monitor well, staff gauges, water level recorders, or any other monitoring devices, landfill gas wells, valve boxes, wellheads and other such devices within the limits of construction prior to any construction activity in that area. Any damage to existing features shall be reported to the Owner, repaired immediately without cost to the owner, and noted on the daily report.

1.14 USE OF SOLID WASTE AND INTERMEDIATE COVER MATERIAL

- A. Excavated solid waste from construction of the letdown pipe trenches may be used in the initial solid waste grading of the side slopes to fill in the depressions and low spots in accordance with the updated final grading plan. Excess intermediate cover soil may be used to cover the solid waste in the letdown pipe trenches as a subgrade to the leveling course provided the top 6-inches is not contaminated with solid waste or sharp objects.
- B. Contractor may use the existing intermediate cover on the site slope to prepare the subgrade for installation of the leveling course provided the top 6 inches of the subgrade is not contaminated with visible solid waste. Any sharp objects or bulky waste protruding from the subgrade that may damage the liner shall be removed by the Contractor prior to installation of the leveling course. Once an area has been graded and cleared of visible solid waste and is ready for installation of the leveling course, the Contractor shall notify the Engineer or RPR for a walk through before applying the 6-inch thick leveling course.
- C. Contractor shall prevent contamination of the leveling course with solid waste and shall remove and replace any leveling course fill contaminated with solid waste and dispose the material in Cell 9-10 without any additional cost to the Owner.
- D. The Contractor, with the approval of the Owner, may use on the Project such soil, stone, gravel, or other material determined suitable by the Engineer, as may be found in the execution of the Work. No charge for the materials so used will be made against the Contractor. The Contractor may not reuse existing landfill gas or stormwater piping.
- E. No useful materials may be removed from the Project Site without the express written approval of the Owner.

1.15 DAMAGE ON ACCOUNT OF HIGH SPEED WIND AND WATER

- A. Contractor will hold himself responsible for all damage done to Contractor's Work by rainstorm, run-off, windstorm, hurricanes, tornados or floods and Contractor shall take all reasonable precautions to provide protection against damages.
- B. Contractor shall protect installed geomembrane cap liner and bottom liner from any damage and shall report any damage to the Owner immediately and shall replace and/or repair all damages at no additional cost to the Owner.
- C. Contractor shall protect and maintain the protective cover against windstorms and rainstorms by sequencing his work and covering with sod and placement of erosion control measures such that unprotected areas are not exposed to rainstorm runoff, erosion and washouts.
- D. Contractor shall make all eroded repairs immediately without any additional cost to the Owner. Any solid waste contaminated fill material washed down from the sideslopes will not be allowed to be used as part of the final cover system.

1.16 MAINTENANCE OF TRAFFIC

- A. The Cell 9-10 Landfill is active and receives solid waste on a daily basis. The east perimeter road immediately adjacent to the Phase 1 closure project is currently used for landfill access, and slope, stormwater and gas management system maintenance.
- B. Main construction access to the north portion of Cell 9 will be through the construction entrance near the northwest corner of Pond 5. Due to limited staging/ storage area near this entrance, occasional transport of equipment and materials for the Phase 1 closure project may be necessary over the South Expansion Site main access road. The Contractor shall be responsible for ensuring the normal traffic to the landfill in not interrupted due to this project's construction activities within the limits of construction. The Contractor shall prepare and submit a Traffic Control Plan for the duration of the Project for the construction site and for deliveries of equipment and materials to the mobilization/storage or construction area. Engineer's review of the Contractor's traffic control plan does not mean the Owner's or the Engineer's approval of such plan.
- C. The main access road is the only entrance to the landfill for landfill customers and this road shall not be closed without notification and approval of the Owner. If closure is approved, it shall only be take place outside of normal working hours for the landfill, and the road shall be re-opened and fully operational prior to the start of the next normal landfill operating shift. If closure of a portion of the main access road becomes necessary and is

approved by the Owner, the Contractor shall be responsible for all traffic controls, signs, flagmen, and shall perform such work in accordance with State of Florida DOT and Orange County Standards. Compensation to the Contractor for all traffic control and maintenance shall be included in the Lump Sum portion of the Contract and no additional compensation shall be made.

- D. Contractor and all his subcontractors are not permitted to park their cars along the main access road to Cell 9-10, or along the Cell 9 north, west or east perimeter roads.
- E. Contractor's vehicles and drivers are required to obey the speed limits and traffic signs on all on-landfill site roads. Contractor's personnel shall not drive to other parts of the landfill property without authorization. Contractor will be requested by the Owner to dismiss employees who repeatedly disregard traffic signs and speed limits, or drive to unauthorized parts of the landfill.
- F. Contractor shall inform all his employees and all his onsite subcontractors to allow rights-of-way to the Owner's vehicles, equipment and normal traffic to the landfill.

1.17 EMERGENCIES

- A. The Contractor shall at all times during and after regular working hours, including weekend and holidays, maintain a telephone where he or his representative can be reached on an emergency basis.
- B. The Contractor or his representative shall be prepared to act to correct conditions on the site deemed to constitute an emergency by either the Owner, his agent, the Engineer or local authorities and is obligated to act to prevent threatened damage, injury or loss without special instructions from the Owner or Engineer. The Contractor shall give the Engineer prompt written notice of all significant changes or deviations from the Contract Documents caused thereby.
- C. If a condition on the site requires attention after working hours, either the Owner, Engineer, landfill superintendent or a local authority shall call the Contractor or his representative at the emergency telephone number regarding the emergency condition. The Contractor is expected to dispatch men and equipment to adequately institute corrective measures within 2 hours. If for some reason the Contractor or his agent cannot be reached at the emergency number after a reasonable try, the Owner shall have the right to immediately initiate corrective measures, and the cost shall be borne by the Contractor.
- D. In the event the Contractor fails to maintain safe job conditions and traffic conditions, including, but not limited to, trench settlement and hazardous storage of backfill or construction materials, the Owner, after failure of the

Contractor to commence substantial steps at the jobsite to rectify the situation within 2 hours of the time the Contractor has been notified of the unsafe conditions, may hire guards, take such precautions, make such repairs and take any other steps which the Owner considers necessary to protect the property, persons, or the Owner. The cost of any of these precautions, guards, or steps shall be deducted from the payments due the Contractor.

- E. Emergency phone numbers (fire, medical, police) shall be posted at the Contractor's phone and its location known to all.
- F. Accidents shall be reported immediately to the Owner and Engineer by messenger or phone. All accidents shall be documented and a fully detailed written report submitted to the Owner and Engineer after each accident.

1.18 CLAIMS FOR PROPERTY DAMAGES

- A. In the event of any indirect or direct damage to public or private property caused in whole or in part by an act, omission or negligence on the part of the Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable, the Contractor shall at his own expense and cost promptly remedy and restore such property to a condition equal to or better than that existing before such damage was done. The Contractor shall perform such restoration by underpinning, repairing, rebuilding, replanting, or otherwise restoring as may be required or directed by the Engineer or Owner, and shall make good such damage in a satisfactory and acceptable manner.

END OF SECTION

SECTION 01035
HEALTH AND SAFETY REQUIREMENTS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. This section outlines the health and safety requirements for the construction of the Project. These health and safety requirements shall be followed by the Contractor during the entire performance of the Work specified in this Contract Document. These requirements do not supersede, but are in addition to any federal, OSHA, state, or local requirements. If a conflict occurs between these requirements and current regulations, the more stringent shall apply.
- B. These requirements are in accordance with and incorporate the current health and safety guidelines established in the Standard Operating Safety Guides, prepared by the EPA Office of Emergency and Remedial Response, Hazardous Response Support Division, and the “Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.”

1.02 SUBMITTALS

- A. The submittals for this section shall include the following:
 - 1. Site Specific Health and Safety Plan: A plan meeting the requirements specified in Paragraph 3.01.
 - 2. Personnel Certification: A certificate showing all Contractor personnel have received the minimum safety training as required by federal, OSHA, state, or local requirements and in conformance with the Site Specific Health and Safety Plan.

PART 2 PRODUCTS

2.01 GENERAL

- A. The Contractor shall furnish all labor, materials, equipment, and appurtenances to perform the Work specified in this section.

PART 3 EXECUTION

3.01 GENERAL

- A. The Contractor is solely responsible for the health, safety, and protection of all onsite personnel during the performance of the work. The Contractor shall perform the work specified in these Contract Documents in accordance with the health and safety requirements specified herein, including the current edition of the standard operating safety guide: NIOSH guidance manual, and all federal, OSHA, state, and local health and safety regulations, including OSHA regulations for hazardous waste site work. It shall be the responsibility of the Contractor to be familiar with the required health and safety regulation in the performance of this work.
- B. The Contractor shall provide a Health and Safety Officer other than the site Superintendent to implement, monitor, and enforce the health and safety plan. The Health and Safety Officer shall have a sound working knowledge of federal and state occupational safety and health regulations and formal training in occupational safety and health adequate to comply with current OSHA requirements.
- C. The Health and Safety Officer may implement requirements in addition to those specified herein.
- D. Should any unforeseen or site specific safety concern, hazard or condition become evident during the performance of the work, the Contractor shall take immediate and prudent action to establish and maintain safe working conditions and to safeguard site personnel, the public, and the environment. The Contractor shall also immediately inform the Owner and Engineer of such a condition.
- E. The Contractor is advised that decomposing refuse produces landfill gas (LFG) which is approximately 50 percent methane (natural gas) by volume. LFG is colorless, can be odorless, may contain hydrogen sulfide, is combustible and contains no oxygen. LFG can also migrate through soil near the landfill. The Contractor is advised of the need for precautions against fire, explosion and asphyxiation when working in or near excavations which are in or near refuse filled areas.
- F. Payment for complying with the additional safety requirements for construction on this Project shall be included in the Contract lump sum price, and no separate payment will be made therefor.

3.02 HAZARD COMMUNICATIONS

- A. Contractor shall inform their employees working onsite that the work site is a former World War II training facility that was used for small arms firing, air tactics evaluations, and training demonstrations of strafing, practice bombing, air-to-ground rocket firing and high explosive bombing; and that unexploded ordnance may still be present at the site.

3.03 PERSONNEL PROTECTION PROGRAM

- A. All Contractor and Subcontractor personnel that are working in direct contact with or may reasonably be expected to be exposed to leachate and/or LFG shall be certified in accordance with 29 CFR 1910, OSHA standards. The Contractor shall obtain and make available records attesting to certification of training and medical monitoring, as per 29 CFR 1910, OSHA standards for hazardous waste site workers.
- B. The Contractor shall be required to certify, prior to beginning work, to the Engineer that all Contractor personnel, and service personnel, shall have received safety training adequate to comply with the current OSHA 1910.120 requirements, including those presented in the Federal Register.
- C. The Contractor shall provide and require that all previously trained Contractor personnel, or service personnel, are familiar with the use of safety, health, and protective equipment, and with the safety and security procedures required for this operation.
- D. The Contractor shall be responsible for, and guarantee that personnel not successfully completing the required training are not permitted to work on the landfill.
- E. The Contractor shall provide all onsite personnel with appropriate personal safety equipment and protective clothing. The Contractor shall ensure that all safety equipment and protective clothing is kept clean and well maintained.

3.04 INITIAL ONSITE SAFETY BRIEFING

- A. The Contractor shall provide an appropriate site-specific safety briefing to all onsite employees and subcontractors. This safety briefing shall include all items listed below:
 - 1. Identify the Site Safety Office and distribute his contact information.
 - 2. Physical health hazards identified at the site.
 - 3. Personal hygiene.
 - 4. Safety equipment and procedures required for personal protection.
 - 5. Prohibitions in Working Areas: no eating, smoking, and chewing at the work area.
 - 6. Working when ill.

7. Working under the influence of alcohol or drugs.
 8. Emergency response and procedures.
- B. The Contractor shall inform all onsite employees and subcontractors that smoking, alcoholic beverages, illicit drugs, and guns are prohibited onsite.
- C. Fishing from the onsite ponds, hunting and chasing wildlife is strictly prohibited.

3.05 EMERGENCY AND FIRST AID REQUIREMENTS

- A. In the event of any emergency associated with or resulting from Work at this site, the Contractor shall without delay: cease work activity on the site; contact and notify proper local authorities as deemed appropriate based on the severity of the emergency; take cautious and diligent action to remove or otherwise minimize the cause of the emergency; render full assistance to local authorities; alert the Owner and Engineer and institute whatever measures might be necessary to prevent any repetition of the conditions or actions leading to or resulting in the emergency.
- B. The Contractor shall have at least one trained first aid technician onsite at all times. This person may perform other duties, but must be immediately available to render first aid when needed.
- C. At least one “industrial” first aid kit shall be provided and be maintained fully stocked at a manned location. First aid kit locations shall be specially marked and provided with adequate water and other supplies necessary to cleanse and decontaminate burns, wounds, or lesions.

3.06 PERSONAL HYGIENE AND DECONTAMINATION

- A. The Contractor shall be responsible for and ensure that all Contractor personnel and service personnel observe and adhere to the personal hygiene-related provisions of this section, the EPA Standard Operating Safety Guide, the NIOSH Guidance Manual and all state, federal and OSHA regulations.
- B. Contractor, and service personnel found to be consistently disregarding the personal hygiene-related provisions of this plan, shall at the request of the Engineer, be barred from the site.
- C. The Contractor shall provide:
1. Suitable hardhats and footwear on a daily basis for the use of onsite personnel and visitors.
 2. Contained storage and disposal for used, disposable outerwear.
 3. Hand washing facilities.

END OF SECTION

**SECTION 01040
PROJECT COORDINATION**

PART 1 GENERAL

1.01 RESPONSIBILITY OF CONTRACTOR

- A. The Contractor shall be responsible for the entire Work required by the Drawings, Specifications and Contract Documents from the date of the Notice-to- Proceed until the date of final completion and acceptance by the Owner, as evidenced by approval of the Completion Certificate by the Owner. The Contractor shall be responsible for removals, renewals and replacements due to action of the elements and all other causes except as otherwise provided in the Specifications. The Contractor shall have full responsibility to protect the Work within the construction limit lines at all times and make all precautionary measures to protect the materials installed from damage.
- B. The Contractor shall have full responsibility to see that the Work is properly supervised and carried on faithfully and efficiently. The Contractor shall supervise the work personally and shall have a qualified, English speaking and competent Superintendent employed by the Contractor on-site during all working hours to direct the performance of the Work and make arrangement for all necessary materials, equipment and labor without delay. The Contractor may not delegate this supervisory responsibility to any subcontractor.
- C. Renewals or repairs necessitated because of defective materials or workmanship, or due to action of the elements or other natural causes, including fire, flood, run-off, erosion, washouts and standing water prior to the acceptance by the Owner, as determined by the Completion Certificate, shall be done in accordance with the Contract Documents at the expense of the Contractor.

1.02 CONTRACTOR TO CHECK AND VERIFY DRAWINGS AND DATA

- A. The Contractor shall verify all dimensions, quantities and details shown on the Drawings, Supplementary Drawings, Schedules, Specifications of other data received from the Engineer, and shall notify him of all errors, omissions, conflicts, and discrepancies found therein. Contractor shall complete and certify the Contractor Verification Form attached to this section at the pre-construction meeting.
- B. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction or improper operation resulting therefrom nor from rectifying such conditions at Contractor's own expense. Contractor will not be allowed

to take advantage of any errors, or omissions, as full instructions will be furnished by the Engineer, should such errors or omissions be discovered.

- C. All schedules are given for the convenience of the Owner, Engineer and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quality of materials and equipment included in Work to be done under the Contract.

1.03 PERSONNEL AND EQUIPMENT

- A. The Contractor shall furnish personnel and equipment which will be efficient, in good working condition, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will ensure the completion of the work within the contract time as stipulated in these Specifications.
- B. Submittal: Statement of Qualification (SOQ) for land surveyor, project engineer, Site Safety Officer, Contractor's Superintendent, geomembrane installers, specialty subcontractor site supervisors, and other SOQ required by the Specifications shall be submitted prior to starting work. Qualification documents for the Superintendent submitted as part of the Bid processing do not need to be resubmitted.
- C. If as a condition of the Bid, the Contractor was qualified for this project based on information and resume of Contractor's proposed staff (site superintendent or project manager) for this Project. Contractor is not allowed to change those members of his organization without advance notification to the Owner and Engineer, and prior approval of an equally or more qualified replacement by the Owner.
- D. Owner reserves the right to reject any of Contractor's staff from this project and request that they be transferred from this Project.

1.04 CONTRACTOR'S USE OF PROJECT SITE

- A. The Contractor shall not enter or occupy land outside of the project site, except by prior permission of the Owner. Contractor shall provide Owner a written request for such permission.

- B. The Contractor is informed that the Owner will continue with solid waste disposal and processing operations, and the Contractor is required to perform all Work and make all necessary adjustments such that the Owner's operations is not interrupted at any time during the duration of construction.
- C. Other work may be anticipated to be performed within the designated project limit lines by others prior to, during, and in sequence with scheduled performance of Work under these Contract Documents.

1.05 SEQUENCE OF WORK

- A. Include the Milestones and sequences of work specified herein as a part of the progress schedule required under Section 01310, Progress Schedules.
- B. The Contractor shall provide all labor, material and equipment to substantially complete the construction activities as described in Section 01010, Summary of Work and as required by the Drawings, Specifications and Contract Documents.
- C. Perform Work continuously during critical connections and changeovers and as required to prevent interruption of Owner's operations.
- D. Coordinate proposed Work with the Engineer and facility operations personnel before effecting unit shutdowns. Under no circumstances cease Work at the end of a normal working day if such actions may inadvertently cause a cessation of any facility operating process, in which case, remain onsite until necessary repairs are complete.
- E. Do not close lines, open valves, or take other action which would affect the operation of existing systems, except as specifically required by the Contract Documents and after approval of Owner and Engineer. Except in emergencies, such actions only will be considered by Owner and Engineer upon 48 hours written notice to Engineer.

1.06 PARTIAL UTILIZATION BY THE OWNER

- A. Cell 9-10 has an active landfill gas collection system that is being expanded under this sequential closure project. During the project, the Owner or Owner's operation contractor will continue to adjust, inspect, and operate portions of the LFG collection system in order to meet regulatory requirements. Depending on the Contractor's sequence and completion of the Work, Owner may elect to accept certain portions of the existing LFG collection system in the Phase I closure area that is connected to the LFG collection system to facilitate continued gas collection. This may allow better odor and gas control during construction. Contractor will cooperate with the Owner and Owner's operation contractor in order to control odor and comply with the Title V Air permit and other requirements. If the Owner elects to

accept certain portion of the LFG collection system, the Contractor will be included in the decision making process and will be notified in writing.

- B. Unless agreed in writing prior to Owner's use, the following conditions shall apply:
 - 1. Contractor's Responsibilities: Allow access for Owner's personnel and LFG operations contractor to and from the Cell 9-10 closure areas. Under no circumstance, except new system tie-in and startup, shall the Contractor hinder the Owner's operations contractor personnel's ability to extract LFG from the landfill throughout the construction period.
 - 2. Owner's Responsibilities:
 - a. Assume responsibility for security and fire protection in the existing LFG collection system within the construction limit, but not extending to protection of Contractor's materials and equipment in utilized areas.
 - b. ASSUME RESPONSIBILITY FOR PROPERTY INSURANCE ON EXISTING LFG COLLECTION SYSTEM.

1.07 PUBLIC UTILITY INSTALLATIONS AND STRUCTURES:

- A. Public utility installations and structures understood to include all poles, tracks, pipes, wires, conduits, service connections, vaults, manholes and all other appurtenances and facilities pertaining thereto whether owned or controlled by the Owner, other governmental bodies or privately owned by individuals, firms or corporations, used to serve the operations of the OCSWMF including the operations of the Cell 9-12 LFG-To-Energy Plant, the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage, water or other public or private property which may be affected by the Work shall be deemed to be included hereunder.
- B. The Contract Documents contain data relative to the existing landfill gas collection and control system, utility installations and structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy and it is the responsibility of the Contractor to make his own investigations to inform himself fully of the character, conditions and extent of all such installations and structures as may affect the construction operations.
- C. The Contractor shall protect all Owner and utility installations and structures from damage during the Work. Access across any buried public utility installation or structure shall be made only in such locations and by means approved by the Engineer. The Contractor shall so arrange his operations as to avoid any damage to these facilities. All required protective devices and construction shall be provided by the Contractor at his expense. All existing installations and public utilities damaged by the contractor which are shown

on the Drawings or have been located in the field by the utility shall be repaired by the Contractor, at his expense, as directed by the Engineer. No separate payment shall be made for such protection or repairs to public utility installations or structures.

- D. Public utility installations or structures owned or controlled by the Owner or other governmental body which are shown on the Drawings to be removed, relocated, replaced or rebuilt by the Contractor shall be considered as a part of the general cost of doing the work and shall be included in the prices bid for the various contract items. No separate payment shall be made thereof.
- E. Where public utility installations or structure owned or controlled by the Owner or other governmental bodies are encountered during the course of the work, and are not indicated on the Drawings or in the Specifications, and when, in the opinion of the Engineer, removal, relocations, replacement or rebuilding is necessary to complete the work under this Contract, such work shall be accomplished by the utility having jurisdiction, or such work may be ordered, in writing by the Engineer, for the Contractor to accomplish. If such work is accomplished by the utility having jurisdiction it will be carried out expeditiously and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement or rebuilding as required. If such work is accomplished by the Contractor, it will be paid for as extra work as provided in the Agreement.
- F. The Contractor shall, at all times in performance of the Work, employ approved methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage or destruction of public utility installations and structures; and shall, at all times in the performance of the Work, avoid unnecessary interference with, or interruption of, public utility services, and shall cooperate fully with the owners thereof to that end.
- G. The Owner's and other governmental utility departments and other owners of public utilities which may be affected by the Work will be informed in writing by the Contractor within two weeks after the execution of the Contract or Contracts covering the Work. Such notice will set out, in general, and direct attention to, the responsibilities of the Owner and other governmental utility departments and other owners of public utilities for such installations and structures as may be affected by the Work and will be accompanied by one set of Drawings and Specifications covering the work under such Contract or Contracts.
- H. The maintenance, repair, removal, relocation or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the Engineer.

1.08 DRAWINGS AND SPECIFICATIONS

A. Drawings:

1. The Drawings referred to in the Contract Documents bear the general project name and number as shown in the Notice to Bidders (Advertisement). When obtaining data and information from the Drawings, figures shall be used in preference of scaled dimensions, and large-scale Drawings in preference to small scale Drawings. Contractor is to verify dimensions and is notified that copying and reproduction may reduce or askew the scaled Drawings.
2. Electronic copies of Drawings in pdf may also be distributed to bidders. Contractor is to verify dimensions and is notified that electronic file copying, printer setting and reproduction may reduce or askew the scaled Drawings.

B. Copies Furnished to Contractor:

1. After the Contract has been executed by the Owner, the Contractor will be furnished with six complete sets of paper prints of the conformed construction documents. Additional copies of the Drawings and Specifications, when requested, may be furnished to the Contractor at cost of reproduction. Contractor may copy the Drawings for exclusive purpose and use for this Project.
2. Contractor will be supplied with a computer disk copy of the conformed construction drawings in PDF and AutoCAD and/or MicroStation format. Contractor must sign the Engineer's Electronic Media Release Form attached to this Specification section to receive the electronic documents. The electronic files are to be used by the Contractor for preparation and submittal of record documents.
3. The Contractor shall furnish each of the subcontractors, manufacturers, and material suppliers such copies of the Contact Documents as may be required for their work.

C. Supplementary Drawings:

1. When, in the opinion of the Engineer or Owner, it becomes necessary to explain more fully the work to be done, to illustrate the work further or to show any changes that may be required, additional Drawings known as Supplementary Drawings, with Specifications pertaining thereto, will be prepared by the Engineer and paper prints will be given to the Contractor.

2. The Supplementary Drawings shall be binding upon the Contractor with the same force as the Drawings. Where such Supplementary Drawings require either less or more than the estimated quantities of work, credit to the Owner or compensation to the Contractor shall be subject to the terms of the Agreement.

1.09 MATERIALS AND EQUIPMENT

A. Manufacturer:

1. The names of proposed manufacturers, material suppliers, and dealers who are to furnish materials, fixtures, equipment, appliances or other fittings shall be submitted to the Engineer for approval, as early as possible, to afford proper investigation and checking. Such approval must be obtained before Shop Drawings will be checked. No manufacturer will be approved for any materials to be furnished under this Contract unless the manufacturer is of good reputation and has a plant of ample capacity. He shall, upon the request of the Engineer, be required to submit evidence that he has manufactured a similar product to the one specified and that it has been previously used for a like purpose for a sufficient length of time to demonstrate its satisfactory performance.
2. All transactions with the manufacturers or subcontractors shall be through the Contractor. Any two or more pieces of material or equipment of the same kind, type or classification, and being used for identical types of service, shall be made by the same manufacturer.

- B. Delivery: The Contractor shall coordinate the delivery of materials in ample quantities to insure the most speedy and uninterrupted progress of the work so as to complete the work within the allotted time. The Contractor shall also coordinate deliveries in order to avoid delay in, or impediment of, the progress of the work of any related Subcontractor.

C. Tools and Accessories:

1. The Contractor shall, unless otherwise stated in the Contract Documents, furnish with each type, kind or size of equipment, one complete set of suitably marked high grade special tools and appliances which may be needed to adjust, operate, maintain or repair the equipment. Such tools and appliances shall be furnished in approved painted steel cases, properly labeled and equipped with good grade cylinder locks and duplicate keys. Spare parts shall be furnished as specified.

2. Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight and principal rating data.

D. Installation of Equipment:

1. The Contractor shall have on hand sufficient and proper equipment and machinery of ample capacity to facilitate the work and to handle all emergencies normally encountered in work of this character.
2. Equipment shall be erected in a neat and workmanlike manner on the foundations at the locations and elevations shown on the Drawings, unless directed otherwise by the Engineer during installation. All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary connections can be made readily between the various units.
3. The Contractor shall furnish, install and protect all necessary anchor and attachment bolts and all other appurtenances needed for the installation of the devices included in the equipment specified. Anchor bolts shall be as approved by the Engineer and made of ample size and strength for the purpose intended. Substantial templates and working drawings for installation shall be furnished.
4. The Contractor shall, at his own expense, furnish all materials and labor for, and shall properly bed in non-shrink grout, each piece of equipment on its supporting base that rests on masonry foundations. Grout shall completely fill the space between the equipment base and the foundations.

E. Service of Manufacturer's Engineer:

1. The Contract prices for equipment shall include the cost of furnishing a competent and experienced engineer or superintendent who shall represent the manufacturer and shall assist the Contractor, when required, to install, adjust, test and place in operation the equipment in conformity with the Contract Documents. After the equipment is placed in permanent operation for the Owner, such engineer or superintendent shall make all adjustments and tests required by the Engineer to prove that such equipment is proper and satisfactory operating condition, and shall instruct such personnel as may be designated by the Owner in the proper operation and maintenance of such equipment.

1.10 OWNER FACILITIES

A. Operation of Existing Facilities:

1. Continuous operation of Owner's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified.
2. Do not proceed with Work affecting a facility's operation or road closures without obtaining Owner's advance approval of the need for and duration of such Work. Provide 7 days advance request for approval to Owner of need to shut down a process or facility or to reroute traffic.

B. Relocation of Existing Facilities:

1. During construction, it is expected that minor relocations of Work will be necessary.
2. Provide complete relocation of existing structures and Underground Facilities, including piping, utilities, equipment, structures, electrical conduit wiring, electrical duct bank, and other necessary items.
3. Use only new materials for relocated facility, unless otherwise shown or specified.
4. Perform relocations to minimize downtime of existing facilities.
5. Install new portions of existing facilities in their relocated position prior to removal of existing facilities, unless otherwise shown or specified, or accepted by Engineer.

1.11 TEMPORARY STRUCTURES

- A. Temporary Fences and Railing: If, during the course of the work, it is necessary to remove or disturb any fence, railing, or part thereof, the Contractor shall provide a suitable temporary fence at his own expenses, which shall be maintained until the permanent fence is replaced. The Contractor shall provide temporary litter fence around the construction boundary to prevent windblown trash to other areas of the facility, closed areas of the Cell 9-10 Landfill unit or adjacent water bodies. All windblown trash shall be picked up on a daily basis by Contractor's housekeeping staff. No exposed solid waste shall left overnight. The Contractor shall maintain the litter fence and make all repairs as necessary to prevent windblown litter and trash to other areas. The Owner shall be solely responsible for the determination of the necessity for providing a temporary fence and the type of temporary fence to be used.

- B. Responsibility for Temporary Structures: In accepting the Contract, the Contractor assumes full responsibility for the sufficiency and safety of all temporary structures or work and for any damage which may result from their failure or their improper construction, maintenance or operation and will indemnify and save harmless the Owner and the Engineer from all claims, suites or actions and damages or costs of every description arising by reason of failure to comply with the above provisions.

1.12 PHYSICAL CONDITIONS

- A. Exercise reasonable care to verify locations of existing subsurface structures and underground facilities.
- B. Thoroughly check immediate and adjacent areas subject to excavation by visual examination (and by electronic metal and pipe detection equipment, as necessary) for indications of subsurface structures and Underground Facilities.
- C. Make exploratory excavations where existing underground facilities or structures may potentially conflict with proposed underground facilities or structures.
- D. Conduct exploratory excavations in presence of RPR and sufficiently ahead of construction to avoid possible delays to Contractor's Work.

1.13 ADJACENT STRUCTURES AND LANDSCAPING

- A. Responsibility:
 - 1. The Contractor shall also be entirely responsible and liable for all damage or injury as a result of his operations to all other adjacent public and private property, structures of any kind and appurtenances thereto met with during the progress of the Work. The cost of protection, replacement in their original locations and conditions or payment of damages for injuries to such adjacent public and private property and structures affected by the Work, whether or not shown on the Drawings, and the reconstruction of such items called for on the Drawings or specified shall be included in the various Contract Items and no separate payments will be made therefor.

2. The Contractor is expressly advised that the protection of buildings, landfills, wetlands, structures, tunnels, culverts, roads, tanks, pipelines, pump stations, gas wells, condensate sumps, etc. and related work adjacent and in the vicinity of his operations, wherever they may be within the construction limit lines, is solely his responsibility. Conditional inspection of buildings or structures in the immediate vicinity of the project which may reasonably be expected to be affected by the Work shall be performed by and be the responsibility of the Contractor.
3. The Contractor shall, before starting operations, make an examination of the interior and exterior of the adjacent structures, buildings, facilities, etc., and record by notes, measurements, photographs, etc., conditions which might be aggravated by open excavation and construction. Repairs or replacement of all conditions disturbed by the construction shall be made to the satisfaction of the Owner and to the satisfaction of the Engineer. This does not preclude conforming to the requirements of the insurance underwriters. Copies of surveys, photographs, reports, etc., shall be given to the Engineer.
4. Prior to the beginning of any excavation the Contractor shall advise the Engineer of areas, buildings or structures on which he intends to perform work or which performance of the Project Work will affect.

B. Restoration of Side Slopes and Grassed Areas:

1. The Contractor is not allowed to drive on the side slopes outside the construction limit lines without prior approval of the Engineer and Owner. Any areas outside the construction limit lines used by the Contractor or his subcontractors or his delivery vehicles shall be repaired and re-sodded immediately.
2. No driving on the intermediate cover areas outside of the construction limit line shall be permitted. Any contractor traffic on the intermediate cover areas requires the Contractor to repair the side slope and replace the sod. The cost of all labor, materials, equipment, and work for the replacement or repair shall be deemed included in the lump sum portion of the bid and no additional payment will be made therefor.

1.14 PROTECTION OF WORK AND PUBLIC

- A. Barriers and Lights: During the prosecution of the work, the Contractor shall put up and maintain at all times such barriers and lights as will effectually prevent accidents. The Contractor shall provide suitable barricades, red lights, "danger" or "caution" or "street closed" signs and watchmen at all places where the work causes obstructions to the normal traffic or constitutes in any way a hazard to the public.

- B. Smoke Prevention: The Contractor shall follow strict compliance with ordinances regulating the production and emission of smoke.
- C. Noise: The Contractor shall strictly observe all local regulations and ordinances covering noise control.
- D. Access to Public Services: Neither the materials excavated nor the materials used in the construction of the work shall be so placed as to prevent free access to all facilities on the South Expansion Site. In instances where construction requires a portion or all of the right-of-way be closed, the Contractor shall prepare a traffic plan and submit to the Engineer for review prior to start of such work.
- E. Dust Prevention: The Contractor shall prevent dust nuisance from his operations or from traffic by keeping the roads and the construction areas sprinkled with water at least once per day, or more often as may be required. Contractor may use water from the adjacent stormwater ponds or perimeter ditches for this purpose.
- F. Erosion Control:
 - 1. The Contractor shall provide all labor, materials and equipment to protect the Work throughout the construction period from erosion, and repair all erosions, washouts and other repairs at no cost to the Owner.
 - 2. The cost to the Contractor to protect Work from erosion throughout the construction period shall be included in the Lump Sum portion of the Bid and the Owner will make no additional payments.

1.15 CUTTING AND PATCHING

- A. The Contractor shall do all cutting, fitting or patching of his portion of the Work that may be required to make the several parts thereof join and coordinate in a manner satisfactory to the Engineer and in accordance with the Drawings and Specifications. The work must be done by competent workmen skilled in the trade reburied by the restoration.

1.16 CLEANING

- A. During Construction:
 - 1. During construction of the Work, the Contractor shall, at all times, keep the site of the Work and adjacent premises as free from material, debris and rubbish as is practicable and shall remove the same at the end of every day, from any portion of the site if, in the opinion of the RPR, such material, debris, or rubbish constitutes a nuisance or is objectionable.

2. Contractor shall install temporary litter fence at the boundaries of the construction limit areas to prevent trash blown on the lower slopes. Prior to the end of each day, Contractor shall clean the litter fence and pick up any plastic bags or rubbish which might have flown outside the construction limit.
3. Contractor shall instruct all his workers not to litter on the grounds of the landfill and shall provide garbage dumpsters at employee areas for disposal of Contractor generated trash.
4. No excavated area will be allowed to stay open at night. Excavated trenches shall be filled in at the end of the day, or properly covered with planking or plating to prevent injury to personnel or damage to work, to the satisfaction of RPR.

B. Final Cleaning:

1. At the conclusion of the Work, all surplus material, tools, temporary structures and materials belonging to the Contractor shall be promptly taken away, and he shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances.
2. The Contractor shall thoroughly clean all equipment and materials installed by him and shall deliver such materials and equipment undamaged in a bright, clean, polished and new operating condition.

1.17 HOURS OF WORK

- A. The normal work hours for the RPR, and onsite Engineer are defined as any 10-hour period between 7:00 a.m. and 7:00 p.m., Monday through Friday. Any work outside the daily 10-hour period shall be paid for as overtime work by the Contractor and requested in writing, at least 24 hours in advance. Work on weekends, County Holidays, and all other overtime work by the RPR and onsite Engineer shall be at the rate of \$125/hour each and shall be deducted from payment due the Contractor on a monthly basis.
- B. From time to time, the Contractor may require additional liner installation crew, or protective cover installation crew, or other such construction requiring observation or CQA to be working onsite due to sequence of the construction of the final cover. The additional liner installation crew or the protective cover installation crew will require the Owner to provide additional RPR and onsite engineer for the second crew to observe the geomembrane installation or placement of fill on top of the geomembrane, or other CQA for such construction. Any work by additional crew by the Contractor will require at least 24-hour advance written notice. Work by each additional RPR or onsite engineer shall be at the rate of \$125/hour each and shall be deducted from payment due the Contractor on a monthly basis.

1.18 MISCELLANEOUS

- A. Protection against Siltation and Bank Erosion: The Contractor shall arrange his operations to minimize siltation and bank erosion on construction site and on existing or proposed water courses and drainage ditches. The Contractor, at no additional expense to the Owner, shall remove any siltation deposits and correct any erosion problems as directed by the Engineer which results from these construction operations.
- B. Protection against Erosion: The Contractor shall protect the installed fill material on side slopes against erosion and washouts and shall repair all erosions and reinstall and replace the fill material for all washed out areas. Compensation to the Contractor for all labor and materials to protect the work against erosion shall be included in the Lump Sum portion of the Contract and no additional compensation shall be made.
- C. Protection of Wetland Areas: The Contractor shall properly dispose of all surplus material, including spoil, in accordance with Local, State and Federal regulations. Under no circumstances shall surplus material be disposed of in wetland areas as defined by the Florida Department of Environmental Protection.
- D. Protection of Stormwater Ponds: The Contractor shall install turbidity fence along the discharge points to the existing stormwater ponds in case of a wash down and clean any excessive fill or soils deposit in the perimeter ditches to prevent silted water flow to the ponds. Any accumulated silt at the discharge points in the ponds shall be removed and the pond bank restored.
- E. Existing Facilities: The Work shall be conducted so as to maintain other existing facilities in operation and all associated traffic. Requirements and schedules of operations for maintaining existing facilities in service during construction shall be in accordance with the Orange County Solid Waste Division requirements and schedules.
- F. Use of Chemicals: All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions. Contractor shall maintain Material Safety Data Sheet Notebook onsite.
- G. Cooperation with Other Contractors and Forces:
 - 1. There are other construction projects by other contractors onsite and on adjacent properties. Contractor shall cooperate with the Owner and other contractors and construction activities and shall not allow his activities and his employees to disturb other construction contractors or

- disturb other construction activities. Contractor shall communicate all concerns regarding other contractors or other construction activities with the Owner Project Manager, RPR or Engineer and shall not communicate directly with other contractors or landfill employees.
2. During progress of Work under this Contract, it may be necessary for other contractors and persons employed by the Owner to work in or about the site. The Owner reserves the right to put such other contractors to work and to afford such access to the site of the Work to be performed hereunder at such times as the Owner deems proper. The Contractor shall not impede or interfere with the work of such other contractors engaged in or about the Work and shall so arrange and conduct his work that such other contractor's may complete their work at the earliest date possible.

1.19 SUPPLEMENTS

- A. The supplements listed below, following "END OF SECTION," are part of this Specification.
 1. Electronic Media Release.
 2. Contractor's Verification of the Accuracy of Drawings and Specifications.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTIONS (NOT USED)

END OF SECTION

ELECTRONIC MEDIA RELEASE

Neel-Schaffer, Inc., Project No. NS.11415.001 – Orange County Cell-9-10 Phase I Sequential Closure Construction (Contract No. _____ - “PROJECT”)

This release for electronic media is dated the _____ day of _____, 201____, between _____ (RECIPIENT) and Neel-Schaffer, Inc., for the exchange of electronic media (disks, tape, optical disk, etc.) containing information on the above referenced construction project (Contract No. _____)- hereinafter referred to as the PROJECT) for use by the RECIPIENT.

Therefore, RECIPIENT and Neel-Schaffer, Inc., agree as follows:

1. The electronic files provided to RECIPIENT by Neel-Schaffer, for the PROJECT may be used by RECIPIENT without restriction except as described herein. If RECIPIENT chooses to alter the electronic files provided for the PROJECT in any way, in whole or in part, or if RECIPIENT chooses to use the electronic files for any purpose other than for the PROJECT for which they were prepared, RECIPIENT agrees that the unrestricted use shall be without liability or legal exposure to Neel-Schaffer
2. Because information and data provided electronically may be altered, whether inadvertently or otherwise, Neel-Schaffer, reserves the right to retain copies of the electronic file(s) and to remove from the electronic files provided to RECIPIENT all identification (such as logo, surveyor’s seal, etc.) reflecting the involvement of Neel-Schaffer, in their preparation.
3. The electronic files are provided solely as a convenience to RECIPIENT by Neel-Schaffer, and shall NOT be considered “Drawings of Record” or as “Construction Documents.” All documents considered “Drawings of Record” or “Construction Documents” shall be accompanied by a professional’s embossed stamp and signature. The stamped and signed hardcopy shall be referred to and shall govern in the event of any inconsistency between the hardcopy and the information provided electronically.
4. RECIPIENT is advised to check all electronic media for viruses before loading the files. RECIPIENT is fully responsible for intercepting and disabling viruses, if any, that may be inadvertently transmitted with the electronic files and hereby agrees to indemnify and hold Neel-Schaffer, harmless from and against all claims of any type or nature asserted by RECIPIENT or any party as a result of viruses inadvertently transmitted with the electronic files.
5. Files distributed electronically are subject to data erosion, erasure, and/or alteration, and computer systems and software become obsolete in time. By accepting these electronic files, RECIPIENT acknowledges these risks and agrees to waive all claims against Neel-Schaffer, should data erosion, erasure, and/or alteration of these electronic files occur.
6. By accepting electronic files, RECIPIENT acknowledges that such files may be incomplete and/or insufficient for use in calculating quantities or bid values or for other purposes relating to the preparation of any bid document. RECIPIENT further acknowledges that it is RECIPIENT’s sole responsibility to obtain all additional information required for these purposes.
7. RECIPIENT agrees to defend, indemnify, and hold Neel-Schaffer, harmless from all claims, injuries, damages, losses, expenses, and costs, including attorneys’ fees, arising out of breach of this agreement and/or the modification or reuse of these materials in or for any project other than the PROJECT for which they were originally prepared by Neel-Schaffer, Inc.

ACCEPTED FOR RECIPIENT:

ACCEPTED FOR NEEL-SCHAFFER, INC.

Name _____

Title _____

Name _____

Title _____

CONTRACTOR’S VERIFICATION OF THE ACCURACY OF DRAWINGS AND SPECIFICATIONS

(This form shall be submitted to the Engineer at the pre-construction meeting and prior to the start of Construction)

STATE OF: _____

COUNTY OF: _____

_____, being first duly sworn,
deposes and certifies that:

Prior to the start of work on the site, Affiant has carefully studied and compared the Drawings and Specifications and checked and verified all pertinent figures shown thereon and all applicable field measurements;

Affiant hereby verifies that the Reports, Drawings and Specifications in the Contract Documents for the Orange County Solid Waste Management Cell 9-12 Class I Phase I Closure Construction Project accurately represent the existing site conditions and do not contain any conflicts, errors, ambiguities, or discrepancies with the following itemized exceptions:

- A. Number of exceptions _____ (if none, please indicate zero in the space provided).
- B. _____ additional sheets are attached.

AFFIANT: _____
 (Authorized Signature)

 (Name)

 (Title)

Sworn and subscribed before me this _____ day of _____ 200_____.

NOTARY: _____
 (Signature)
 My Commission Expires: _____
 (Date)

END OF CONTRACTOR VERIFICATION FORM

**SECTION 01060
SURVEYING**

PART 1 GENERAL

1.01 SUBMITTALS

A. Surveyor Qualifications:

1. Submit to the Engineer the name, address, telephone number, and qualifications of the surveyor, crew chief, and all other persons who are proposed to perform surveys or survey-related duties 30 days prior to start of any survey work.
2. All control survey and layout shall be performed and signed and sealed by a qualified land surveyor registered in the State of Florida.

B. Field Notes and/or Data Collector Output: Within 48 hours of completing and reducing the notes, or downloading and computing using a data collector, for a survey or portion of survey, submit reduced data to the Engineer. Upon completing a field survey book, the original field survey book shall be submitted to the Engineer.

1.02 REFERENCE POINTS AND SURVEYS

- A. Profile Elevations on Topographic Base Map: Existing ground profiles shown on Drawings were developed by photogrammetric methods. Elevations of well-identified features shown on the ground profiles have been measured to an estimated vertical position accuracy of plus or minus 1 foot in accordance with Chapter 61G17-6.003(1)(d) 2 of the Florida Administrative Code.
- B. Owner's Responsibilities: Establish horizontal reference points or coordinate system with bench marks and reference points for Contractor's use as necessary to lay out Work.
- C. Location and elevation of bench marks are shown on Drawings.
- D. Engineer may perform checks to verify accuracy of Contractor's layout Work and that completed Work complies with Contract Documents.
- E. Any existing reference points, survey points or other control markers lost, damaged or destroyed without proper authorization will be replaced by owner of the reference points, survey points or control markers at the Contractor's expense.

F. Contractor's Responsibilities:

1. Locate disposal area boundary and anchor trench within the construction limit area
2. Provide field survey and layout as required.
3. Locate and protect reference points prior to starting site preparation.
4. Notify Engineer at least 5 working days in advance of time when grade and line to be provided by others will be needed.
5. Check and establish exact location of existing facilities prior to construction of new facilities and any connections thereto.
6. In event of discrepancy in data or staking provided by Engineer, request clarification before proceeding with Work.
7. Preserve and leave undisturbed control staking until Engineer has completed checks it deems necessary.
8. Retain professional land surveyor or civil engineer registered in state of Project who shall perform or supervise engineering surveying necessary for additional construction staking and layout.
9. Maintain onsite a complete, accurate log of control of survey work as it progresses. All original field notes, computations, and other records for the purpose of layout and quantity surveys shall be recorded in field books.
10. On request of Engineer, submit documentation.
11. Provide Competent Employee(s), Tools, Stakes, and Other Equipment and Materials as Engineer may require to:
 - a. Check layout, survey, and measurement of Work performed by others.
 - b. Measure quantities for payment purposes.
12. Cooperate with Engineer so that checking and measuring may be accomplished with least interference to Contractor's operations.

PART 2 PRODUCTS

2.01 GENERAL

- A. Unless otherwise specified in individual Specification sections, the following minimum standards shall apply:
1. Control Surveys: Vertical shall close within 0.03 foot. Horizontal control angles shall close to the nearest plus or minus 10 seconds. Measured distances shall be plus or minus 0.01 foot.
 2. Quantity Surveys by Contractor: Elevations shall be to the nearest 0.1 foot. Horizontal distances shall be plus or minus 0.1 foot.
 3. Topographic Survey: Contours shall be shown at 1-foot intervals with 5-foot index contours. Accuracy shall be National Mapping Standards for 1-foot contour intervals.

2.02 EQUIPMENT AND MATERIALS

- A. Contractor shall provide all equipment and materials as required to properly perform the surveys. All material shall be of good professional quality and in first-class condition.
- B. All instruments (conventional or electronic) shall be calibrated according to the manufacturer's recommendations and maintained in accurate calibration throughout the execution of the Work.

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify with the Engineer locations of site reference and survey control points prior to starting work. Promptly notify the Engineer of any discrepancies discovered. Verify layouts periodically during construction.

3.02 SURVEY REFERENCE POINTS

- A. Protect survey points prior to starting Work and preserve permanent reference points during construction.
- B. Promptly report to the Engineer the loss, damage, or destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated survey control points based on original survey control.

3.03 SURVEY REQUIREMENTS

- A. Reference survey monuments or establish new survey monuments referenced to the project horizontal coordinate grid system as shown on the Drawings and the National Geodetic Vertical Datum.
- B. Reference survey and site reference points to the provided control monuments and record locations of survey control points, using horizontal project coordinate grid system and National Geodetic Vertical Datum, on Record Drawings.
- C. Establish lines, levels, and locate and lay out site features to be constructed including necessary stakes for cut, fill, placement, and grading operations and stakes for utility locations, slopes, and invert elevations. When it is necessary to remove a grade marker for construction operations, appropriate offset staking shall be used.

- D. All marks and survey monuments given shall be carefully preserved and, if lost, damaged, destroyed or removed by the Contractor without the Engineer's approval, they shall be reset, if necessary, at no additional cost to this Contract.
- E. All survey work not done with the methods and equipment as submitted by the Contractor and approved by the Engineer shall be removed and replaced using approved methods and equipment.
- F. Identify limits of existing bottom geomembrane liner where the new liner will be interfaced (bottom liner anchor trench to be field located and exposed by the Contractor using small equipment and hand excavation as not to damage the installed geomembrane).
- G. Initial Quantity Survey: Prior to the initiation of construction, the Contractor shall perform an Initial Quantity Survey to verify earthwork quantities estimated from the profile elevations shown on the topographic base map. The cost of the Initial Quantity Survey shall be included in the Lump Sum Bid Price. The Initial Quantity Survey shall serve as a basis for calculating payment due for Unit Price Items.
- H. Certified construction survey of the closure area includes the following:
 - 1. Survey of prepared subbase.
 - 2. Survey of the top of 6-inch Leveling Course.
 - 3. Survey of the top of 24-inch Protective Layer.
 - 4. Other surveys include terrace swales, drainage structures and pipe inlet elevations. LFG pipes and valve locations.
- I. Prior to the start of construction, Contractor shall delineate:
 - 1. Limits of new geomembrane placement.
 - 2. Existing landfill gas wells, piping, connection points, and valves adjacent to and within the Phase 1 closure area or impacted by construction.
 - 3. Alignment of terraces and berms at side slope areas.
 - 4. Alignment of stormwater terraces swales, high-point elevations, swale grade elevations to the inlet, and terrace underdrain piping and invert elevation into the inlet.
 - 5. Alignment and general coordinates of closure geomembrane anchor trench.
 - 6. Termination points, invert elevations of letdown drain piping.
 - 7. Location and extent of geomembrane flap.
 - 8. Location of all stormwater inlets and structures within the construction limits.

9. Location and elevations of all proposed vertical gas wells, location and elevation of all valve locations, laterals, and alignment of all LFG piping within the limits of construction; and
 10. Other elevations required by the Drawings, or as requested by Owner or Engineer.
-
- J. At the completion of subgrade preparation and before the placement of geomembrane, Contractor shall conduct a topographic survey and submit the survey results to the Engineer within 2 weeks after the completion of survey.
 - K. At the completion of the placement of protective layer, Contractor shall conduct a topographic survey and submit the survey results to the Engineer within two weeks after the completion of survey. The survey results will be used to determine the thickness of drainage sand placed at the site.
 - L. Contractor's Record Drawings shall include as-built coordinates and elevation for all data points defined on the Drawings and all additional data points required to accurately define the completed Work. Contractor shall also provide other relevant data and information, included, but not limited to, curve data, radii, necessary to accurately define the completed Work.
 - M. In addition to the items listed above, the Contractor's Record Drawings shall include as-built coordinates and elevations of all underground piping and utilities including, but not limited to, leachate pipes, landfill gas pipes, and condensate pipes.
 - N. It shall be the duty of the Contractor to keep the Engineer informed of the times and places at which he intends to work in order that the Engineer may have an ample opportunity to furnish and/or to check the lines and elevations with a minimum of inconvenience to the Engineer or delay to the Contractor.

3.04 RECORDS

- A. Maintain a complete, up-to-date accurate log of all control and survey work as it progresses. Review as-built drawings with RPR and Engineer as part of Monthly Pay Application.
- B. Submit seven sets of signed and sealed sets of "as-built" drawings in accordance with Section 01720, Project Records Documentation. As-built drawings shall be submitted with bubbles designating changes on the Conformed Drawings. Changes shall include properly designated invert elevations, locations and x-y-z coordinates.

- C. All surveying data to be submitted to the Engineer shall be provided in AutoCAD 2013, 3D View format. In addition, topographic survey and quantity surveys shall be submitted as Digital Terrain Models (DTM) suitable for use in Intergraph's Inroad computer program.

END OF SECTION

**SECTION 01065
PERMITS**

PART 1 GENERAL

1.01 GENERAL

- A. The Contractor shall obtain and pay for all permits, approvals and licenses related to his work as provided for in the Conditions of the Contract except as otherwise provided herein. This may include obtaining building permit for the field office trailers, approval of Orange County Utilities to connect to a water main and other permits as may be required.
- B. Permits by Owner: The Owner prior to the advertisement of the Project has filed and received the following permit:
 - 1. Solid Waste Operation and Closure Permit, Cells 9-12 Class I Landfill Permit Number 0128169-037-SO-01 Orange County Solid Waste Management Facility; Issued by Florida Department of Environmental Protection (FDEP), dated September 22, 2014.
- C. A copy of the FDEP Operations and Closure Permit is provided as an appendix to this Document and made part of the Contract Documents. The Contractor is required to be familiar with the general and specific conditions of this permit and shall not violate any of these conditions. A complete copy of the permit application as filed with the State of FDEP-Central District is available for Contractor review at FDEP-Central District office or the Orange County Landfill Administration Office.
- D. Representatives from the Regulatory Agencies have the right by permit to visit the construction site for the purpose of observing the Work and inspecting the construction. Owner or Engineer will notify the Contractor in advance as much as possible of a pending site visit. Contractor shall cooperate with the permitting agencies during these site visits and accommodate the observations and inspection of the Work.
- E. The Owner has obtained the FDEP permit for development and operation of the Eastern Borrow pit. A copy of the permit is provided as an appendix to this Document.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01092
ABBREVIATIONS

PART 1 GENERAL

- 1.01 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES
- A. Reference to standards and specifications of technical societies, and reporting and resolving discrepancies associated therewith shall be as required herein and in the individual Specification sections.
 - B. Work specified by reference to the published standard or specification of a government agency, technical association, trade association, professional society or institute, testing agency, or other organization shall meet the requirements or surpass the minimum standards of quality for materials and workmanship established by the designated standard or specification.
 - C. Where so specified, products or workmanship shall also meet or exceed the additional prescriptive or performance requirements included within the Contract Documents to establish a higher or more stringent standard of quality than that required by the referenced standard.
 - D. Where two or more standards are specified to establish quality, the product and workmanship shall meet or exceed the requirements of the most stringent.
 - E. Where both a standard and a brand name are specified for a product in the Contract Documents, the proprietary product named shall meet or exceed the requirements of the specified reference standard.
 - F. Copies of standards and specifications of technical societies:
 - 1. Copies of applicable referenced standards have not been bound in these Contract Documents.
 - 2. Where copies of standards are needed by the Contractor, obtain a copy or copies directly from the publication source and maintain in an orderly manner at the site as Work site records, available to the Contractor's personnel, Subcontractors, Owner, and Engineer.

1.02 ABBREVIATIONS

A. Abbreviations for trade organizations and government agencies: Following is a list of construction industry organizations and government agencies to which references may be made in the Contract Documents, with abbreviations used.

1. AA Aluminum Association.
2. AABC Associated Air Balance Council.
3. AAMA American Architectural Manufacturers Association
4. AASHTO American Association of State Highway and Transportation Officials
5. ABMA American Bearing Manufacturers' Association
6. ACI American Concrete Institute
7. AEIC Association of Edison Illuminating Companies
8. AGA American Gas Association
9. AGMA American Gear Manufacturers' Association
10. AI Asphalt Institute
11. AISC American Institute of Steel Construction
12. AISI American Iron and Steel Institute
13. AITC American Institute of Timber Construction
14. ALS American Lumber Standards
15. AMCA Air Movement and Control Association
16. ANSI American National Standards Institute
17. APA APA – The Engineered Wood Association
18. API American Petroleum Institute
19. APWA American Public Works Association
20. ARI Air-Conditioning and Refrigeration Institute
21. ASAE American Society of Agricultural Engineers
22. ASCE American Society of Civil Engineers
23. ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
24. ASME American Society of Mechanical Engineers
25. ASNT American Society for Nondestructive Testing
26. ASTM ASTM International
27. AWI Architectural Woodwork Institute
28. AWPA American Wood Preservers' Association
29. AWPI American Wood Preservers' Institute
30. AWS American Welding Society
31. AWWA American Water Works Association
32. BHMA Builders Hardware Manufacturers' Association
33. CBM Certified Ballast Manufacturer
34. CDA Copper Development Association
35. CGA Compressed Gas Association
36. CISPI Cast Iron Soil Pipe Institute
37. CMAA Crane Manufacturers' Association of America
38. CRSI Concrete Reinforcing Steel Institute

39.	CS	Commercial Standard
40.	CSA	Canadian Standards Association
41.	CSI	Construction Specifications Institute
42.	DIN	Deutsches Institut für Normung e.V.
43.	DIPRA	Ductile Iron Pipe Research Association
44.	EIA	Electronic Industries Alliance
45.	EJCDC	Engineers Joint Contract Documents' Committee
46.	ETL	Electrical Test Laboratories
47.	FAA	Federal Aviation Administration
48.	FCC	Federal Communications Commission
49.	FDA	Food and Drug Administration
50.	FEMA	Federal Emergency Management Agency
51.	FIPS	Federal Information Processing Standards
52.	FM	Factory Mutual
53.	Fed. Spec.	Federal Specifications (FAA Specifications)
54.	FS	Federal Specifications and Standards (Technical Specifications)
55.	GA	Gypsum Association
56.	GANA	Glass Association of North America
57.	HI	Hydraulic Institute
58.	HMI	Hoist Manufacturers' Institute
59.	IBC	International Building Code
60.	ICBO	International Conference of Building Officials
61.	ICC	International Code Council
62.	ICEA	Insulated Cable Engineers' Association
63.	IFC	International Fire Code
64.	IEEE	Institute of Electrical and Electronics Engineers, Inc.
65.	IESNA	Illuminating Engineering Society of North America
66.	IFI	Industrial Fasteners Institute
67.	IGMA	Insulating Glass Manufacturer's Alliance
68.	IMC	International Mechanical Code
69.	INDA	Association of the Nonwoven Fabrics Industry
70.	IPC	International Plumbing Code
71.	ISA	Instrumentation, Systems, and Automation Society
72.	ISO	International Organization for Standardization
73.	ITL	Independent Testing Laboratory
74.	JIC	Joint Industry Conferences of Hydraulic Manufacturers
75.	MIA	Marble Institute of America
76.	MIL	Military Specifications
77.	MMA	Monorail Manufacturers' Association
78.	NAAMM	National Association of Architectural Metal Manufacturers
79.	NACE	NACE International
80.	NEBB	National Environmental Balancing Bureau
81.	NEC	National Electrical Code

82.	NECA	National Electrical Contractor's Association
83.	NEMA	National Electrical Manufacturers' Association
84.	NESC	National Electrical Safety Code
85.	NETA	InterNational Electrical Testing Association
86.	NFPA	National Fire Protection Association
87.	NHLA	National Hardwood Lumber Association
88.	NICET	National Institute for Certification in Engineering Technologies
89.	NIST	National Institute of Standards and Technology
90.	NRCA	National Roofing Contractors Association
91.	NRTL	Nationally Recognized Testing Laboratories
92.	NSF	NSF International
93.	NSPE	National Society of Professional Engineers
94.	NTMA	National Terrazzo and Mosaic Association
95.	NWWDA	National Wood Window and Door Association
96.	OSHA	Occupational Safety and Health Act (both Federal and State)
97.	PCI	Precast/Prestressed Concrete Institute
98.	PEI	Porcelain Enamel Institute
99.	PPI	Plastic Pipe Institute
100.	PS	Product Standards Section-U.S. Department of Commerce
101.	RMA	Rubber Manufacturers' Association
102.	RUS	Rural Utilities Service
103.	Society of Automotive Engineers	
104.	SDI	Steel Deck Institute
105.	SDI	Steel Door Institute
106.	SJI	Steel Joist Institute
107.	SMACNA	Sheet Metal and Air Conditioning Contractors National Association
108.	SPI	Society of the Plastics Industry
109.	SSPC	The Society for Protective Coatings
110.	SWI	Steel Window Institute
111.	TEMA	Tubular Exchanger Manufacturers' Association
112.	TCA	Tile Council of North America
113.	TIA	Telecommunications Industry Association
114.	UBC	Uniform Building Code
115.	UFC	Uniform Fire Code
116.	UL	Underwriters Laboratories Inc.
117.	UMC	Uniform Mechanical Code
118.	USBR	U.S. Bureau of Reclamation
119.	WCLIB	West Coast Lumber Inspection Bureau
120.	WWPA	Western Wood Products Association

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 01153
CHANGE ORDER PROCEDURES**

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Promptly implement Change Order procedures.
 - 1. Provide full written data required to evaluate changes.
 - 2. Maintain detailed records of work done on a time and material/force account basis.
 - 3. Provide full documentation and breakdown of costs to Engineer on request.
- B. Designate in writing the member of Contractor's organization:
 - 1. Who has the authorization to accept changes in the Work.
 - 2. Who has the responsibility for informing others in the Contractor's employ of the authorization of changes in the Work.
- C. Owner will designate in writing the person who is authorized to execute Change Orders.

1.02 RELATED REQUIREMENTS

- A. Schedule of Prices from Bid Form.
- B. General and Supplemental Conditions of the Contract.
- C. Section 01028, Applications for Payment.
- D. Section 01027, Schedule of Values.
- E. Section 01720, Project Record Documents.
- F. Forms attached to this section will be used for this Project.

1.03 DEFINITIONS

- A. Change Order: See Orange County General Conditions.

1.04 PRELIMINARY PROCEDURES

- A. Owner and Engineer may initiate changes by submitting a Request for Proposal (RFP) to the Contractor. Request will include:
 - 1. Detailed description of the change, products, and location of the change in the Project anticipated.
 - 2. Supplementary or revised Drawings and Specifications.
 - 3. The project time span for making the change and a specific statement as to whether overtime work is or is not authorized.
 - 4. A specific period of time during which the requested price will be considered valid.

- B. Contractor may initiate changes by submitting a written Notice of Proposed Change (NPC) to the Engineer, containing:
 - 1. Description of the proposed changes.
 - 2. Statement of the reason(s) for making the proposed changes.
 - 3. Statement of the effect on the Contract Sum and the Contract Time.
 - 4. Statement of the effect on the work of separate Contractors.
 - 5. Documentation supporting any changes in Contract Sum or Contract Time, as appropriate.

- C. The Contractor's response to the Engineer's RFP, once accepted by the Owner, will be an "Accepted Change in Contract" and will be incorporated into a Change Order. Contractor's response to the Engineer's RFP shall include a detailed breakdown of costs for each category of work showing the cost of labor, material, and O&P expenses. Submittal of response to RFP with insufficient cost breakdown detail will not be acceptable.

- D. The Contractor shall not proceed with any change in Work unless the Engineer notifies him in writing that his response to RFP has been accepted by the Owner.

- E. The Contractor's NPC does not constitute a change in Contract, and the Contractor shall not proceed with any change in Work initiated by him until approved in writing by the Owner. The Owner may request the Engineer to issue an RFP to the Contractor for the proposed NPC. Only the Contractor's response to the Engineer's RFP, once accepted by the Owner, be an "Accepted Change in Contract" and will be incorporated into a Change Order.

1.05 CONSTRUCTION CHANGE AUTHORIZATION

- A. All RFPs that may result in a change will describe changes in the Work, both additions and deletions with attachments of revised Contract Documents to define details of the change and will designate the method of determining any change in the Contract Sum and any change in Contract Time.
- B. The RFP, response to RFP from the Contractor, and letter of Owner acceptance from the Engineer shall be preliminary documents to a formal Change Order. All "Accepted Change" in Work will be incorporated into a Change Order for approval by the Board of County commissioners.

1.06 DOCUMENTATION OF PROPOSALS AND CLAIMS

- A. Support each quotation for a lump sum proposal, and for each unit price which has not previously been established, with sufficient substantiating data to allow the Engineer to evaluate the quotation.
- B. On request, provide additional data to support time and cost computations:
 - 1. Labor required.
 - 2. Equipment required.
 - 3. Products required.
 - a. Recommended source of purchase and unit cost.
 - b. Quantities required.
 - 4. Taxes, insurance, and bonds.
 - 5. Credit for work deleted from Contract, similarly documented.
 - 6. Overhead and profit.
 - 7. Justification for any change in Contract Time in accordance with Section 01030, Progress Schedule.
- C. Support each claim for additional costs, and for work done on a time-and-material/force account basis, with documentation as required for a lump sum proposal, plus additional information.
 - 1. Name of the Owner's authorized agent who ordered the work and date of the Order.
 - 2. Dates and times work was performed and by whom.
 - 3. Time record, summary of hours worked, hourly rates paid, and a copy of certified payroll documentation.
 - 4. Receipts and invoices for:
 - a. Equipment used, listing dates, and times of use.
 - b. Products used, listing of quantities.
 - c. Similar supporting documentation from subcontractors.

1.07 PREPARATION OF CHANGE ORDERS

- A. Engineer will prepare each Change Order.
- B. Form: Attached to this section.
- C. Change Order will describe changes in the work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.
- D. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

1.08 LUMP SUM/FIXED PRICE CHANGE ORDER

- A. Engineer initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by Contractor, or requests from Owner, or both.
- B. Once Engineer has completed the form, all copies will be sent to Contractor for signature and return to Engineer for approval. After endorsement by Engineer, all copies will be sent to Owner for approval. Engineer will distribute executed copies.

1.09 UNIT PRICE CHANGE ORDER

- A. Content of Change Orders will be based on either:
 - 1. Engineer's definition of the scope of the required changes.
 - 2. Contractor's proposal for a change, as recommended by Engineer.
 - 3. Survey of complete work.
- B. The amounts of the unit prices to be:
 - 1. Those stated in the Agreement.
 - 2. Those mutually agreed upon between Owner and Contractor.
 - 3. Those contained in the Schedule of Unit Prices for Change Orders.
- C. When quantities of each of the items affected by the Change Order can be determined prior to start of the work:
 - 1. Owner and Engineer will execute a Work Change Directive as authorization for Contractor to proceed with the changes.

- D. When quantities of the items cannot be determined prior to start of the work:
1. Owner will issue a Work Change Directive directing the Contractor to proceed with the change on the basis of established unit prices.
 2. Upon completion of the change, the Engineer will determine the cost of such work based on the unit prices and quantities used.
 3. Engineer will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.
 4. Contractor will sign and date the Change Order to indicate their agreement with the terms therein.
 5. Owner will then sign the change order.

1.10 TIME AND MATERIAL/FORCE ACCOUNT CHANGE
ORDER/CONSTRUCTION CHANGE AUTHORIZATION

- A. Engineer and Owner will issue a Work Change Directive directing Contractor to proceed with the changes.
- B. Upon completion of the change, the Contractor shall submit itemized accounting and supporting data as provided in the Article "Documentation of Proposals and Claims" of this section.
- C. Engineer will determine the allowable cost of such work, as provided in General Conditions and Supplementary Conditions.
- D. Engineer will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.
- E. Contractor will sign and date the Change Order to indicate agreement therewith.
- F. Owner will then sign the Change Order.

1.11 CORRELATION WITH CONTRACTOR'S SUBMITTALS

- A. Monthly, revise Schedule of Values and Request for Payment forms to record each change as a separate item of work and to record the adjusted Contract Sum.
- B. Monthly, revise the Construction Schedule to reflect each change in Contract Time.
- C. Upon completion of work under a Change Order, enter pertinent changes in Record Documents.

1.12 SUPPLEMENTS

A. The supplements listed below, following “End of Section,” are part of this Specification.

1. Work Change Directive.
2. Change Order Form.
3. Field Order by RPR.
4. Request for Proposal.

PART 2 PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

WORK CHANGE DIRECTIVE

WORK CHANGE DIRECTIVE NO. _____

Directive Prepared By: _____
 (Name) (Title)

Date Prepared: _____

PROJECT DATA	CONTRACT DATA
Name: Cell 9-12 Phase I Closure	Contract Document Page Number:
Location: OCSWMF-Cell 9-10	Drawing Number:
Owner's Bid Number:	Specification Section/Number:

WORK CHANGE DIRECTIVE DISTRIBUTION:				
Owner's Home Office: Attn.:	No. Copies		Date Sent:	
Contractor's Home Office: Attn.:	No. Copies		Date Sent:	
Owner's Field Office:	No. Copies		Date Sent:	
Engineer's Field Office:	No. Copies		Date Sent:	
Contractor's Field Office:	No. Copies		Date Sent:	

You are hereby directed to execute promptly this WORK CHANGE DIRECTIVE which orders an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed as provided in the General Conditions, or emergencies as provided in the General Conditions, without change in Contract Price or Contract Time.

If CONTRACTOR determines that a change in Contract Price or Contract Time is required as a result of this WORK CHANGE DIRECTIVE, CONTRACTOR must make such a claim prior to starting the Work in accordance with the General Conditions of the Contract Documents. If a Change Order is issued in accordance with the Contract Documents, this WORK CHANGE DIRECTIVE will be invalidated; otherwise, CONTRACTOR shall promptly proceed with the Work described in this WORK CHANGE DIRECTIVE pursuant to the applicable conditions of the Contract Documents.

DESCRIPTION OF CHANGE IN WORK:

ATTACHMENTS:

	Description of Item Attached	No. of Copies
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

END OF WORK CHANGE DIRECTIVE FORM

CHANGE ORDER FORM

ORANGE COUNTY UTILITIES

57-36 A (2/85)

Contractor:

Change Order #:

Contract No.:

Date:

Original Contract Amount:

Contract Name:

Revised Contract Amount:

Engineer:

Item No.	Quantities	Unit	Description	Unit Price	Additions	Deductions
Percent Complete Time:			Percent Complete Dollars:	Totals		
Total Time (Increase) (Decrease) this Change Order:			Days	Net Dollars This Change Order:		
Total Time (Increase) (Decrease) previous Change Orders:			Days	Net Dollars Previous Change Order:		
Original Contract Time:				Net Dollar Changes		
Revised Contract Time:				To Date:		
CONTRACTOR Accepted:				Original Contract Dollar Amount:		
By: _____				Revised Contract Dollar Amount:		
Print Name				ORANGE COUNTY PUBLIC UTILITIES Approval Recommended:		
By: _____ Date: _____				By: _____ Date: _____		
Sign				Director Public Utilities		
ENGINEER Approval Recommended:				Approved:		
By: _____ Date: _____				By: _____ Date: _____		
Project Manager				Chairman Board of County Commissioners		
This change order includes not only all direct costs of contractor such as labor, material, job overhead, and profit markup but also includes any costs for modifications or changes in sequence of work to be performed, delays, rescheduling, disruptions, extended direct overhead or general overhead, acceleration, material or other escalation which includes wages, and other impact costs.						
Accepted for Contractor By: _____				Title: _____		

FIELD ORDER BY RPR

FIELD ORDER NO. _____

Order Prepared By: _____
 (Name) (Title)

Date Prepared: _____

PROJECT DATA	CONTRACT DATA
Name: Cell 9-12 Phase I Closure	Contract Document Page Number:
Location: OCSWMF-Cell 9-10	Drawing Number:
Owner's Bid Number:	Specification Section/Number:

FIELD ORDER DISTRIBUTION:				
Owner's Home Office:	No. Copies		Date Sent:	
Attn.:				
Contractor's Home Office:	No. Copies		Date Sent:	
Attn.:				
Owner's Field Office:	No. Copies		Date Sent:	
Engineer's Field Office:	No. Copies		Date Sent:	
Contractor's Field Office:	No. Copies		Date Sent:	

You are hereby directed to execute promptly this Field Order which interprets the Contract Documents or orders minor changes in the work without change in Contract Price or Contract Time.

If CONTRACTOR determines that a change in Contract Price or Contract Time is required as a result of this FIELD ORDER, CONTRACTOR must make such a claim prior to starting the Work in accordance with the General Conditions of the Contract Documents. If a Change Order is issued in accordance with General Conditions of the Contract Documents, this FIELD ORDER will be invalidated; otherwise, CONTRACTOR shall promptly proceed with the Work described in this FIELD ORDER pursuant to the applicable conditions of the Contract Documents.

DESCRIPTION OF CHANGE IN WORK:

ATTACHMENTS:

	Description of Item Attached	No. of Copies
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

END OF FIELD ORDER

REQUEST FOR PROPOSAL

REQUEST FOR PROPOSAL (RFP) FOR PROPOSED CHANGE NO. _____

RFP Prepared By: _____
 (Name) (Title)

Date Prepared: _____

Error! Bookmark not defined. PROJECT DATA	CONTRACT DATA
Name: Cell 9-12 Phase I Closure	Contract Document Page Number:
Location: OCSWMF- Cell 9-10	Drawing Number:
Owner's Bid Number:	Specification Section/Number:

RFP DISTRIBUTION BY ENGINEER:				
Owner's Home Office:	No. Copies		Date Sent:	
Attn.:				
Contractor's Home Office:	No. Copies		Date Sent:	
Attn.:				
Owner's Field Office:	No. Copies		Date Sent:	
Engineer's Field Office:	No. Copies		Date Sent:	
Contractor's Field Office:	No. Copies		Date Sent:	
Other:	No. Copies		Date Sent:	
Attn.:				

Please provide the undersigned a proposal for the following change in the work within thirty (30) calendar days from the above date of this request that this by the _____ day of _____, 20____. The written proposal must clearly delineate the scope of the proposed change in work by providing an itemized estimate of time and costs broken down by materials, labor (by trade), subcontracts, overhead costs, and profit. Any amount claimed for subcontracts must be similarly supported in detail. If this proposal is accepted and approved by the Owner, a change order will be issued for changes in the work of the Contract in accordance with the Contract Documents.

Type of Change Proposed:

(Deletion of Work)
 (Addition of Work)
 (Revision of Work)
 (Other)

Please see reverse side for a detailed description of the proposed change in Work.

DESCRIPTION OF PROPOSED CHANGE IN WORK:

ATTACHMENTS:

	Description of Item Attached	No. of Copies
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

END OF REQUEST FOR PROPOSAL FORM

**SECTION 01200
PROJECT MEETINGS**

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. The Engineer will schedule and administer the preconstruction meeting, weekly or bi-weekly construction progress meetings, monthly pay application/progress schedule review meetings and specialty called meetings throughout the progress of the work. The Engineer will:
 - a. Prepare notification and agenda for meetings.
 - b. Preside at meetings.
 - c. Prepare and distribute meeting notes to all attendees.
2. Representatives of Contractor, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
3. Contractor's Superintendent is required to attend all meetings prepared to report activities and issues of the Contractor and construction.
4. The Contractor shall attend meetings to ascertain that work is expedited consistent with Contract Documents and construction schedules. The Engineer will take written minutes of the preconstruction meeting and progress meetings. Draft copies of the meeting minutes will be distributed to the Owner and Contractor prior to or at the next scheduled meeting.

B. Related Requirements Described Elsewhere:

1. Conditions of the Contract.
2. Section 01040, Project Coordination.

1.02 PRE-CONSTRUCTION CONFERENCE

- A. After the execution of the Agreement and in accordance with these Specifications, a joint pre-construction conference shall be held with representatives of the Contractor, major Subcontractors, major suppliers, the Engineer, the Owner, and other invited parties or government agencies, which may be affected by or have jurisdiction over the Project. The meeting will be held at the Orange County Landfill Administration Building or other site as mutually agreed.

- B. This meeting is intended to introduce the various key personnel from each organization and to discuss the Contract Documents, the start of construction, order of work, labor and legal requirements, insurance requirements, names of the major subcontractors, method of payment, Shop Drawing requirements, protection of existing facilities, and other pertinent items associated with the Project. The Contractor shall bring to this conference ten copies each of the following items:
1. Contractor's proposed preliminary work schedule in Primavera P6 with detailed and separate construction activities planned in accordance with the Specifications;
 2. Contractor's preliminary list of Shop Drawing submittals and anticipated schedule for submittal; and
 3. Contractor's detailed schedule of values; and
 4. Contractor's signed and notarized Verification Form.
- C. The Engineer will prepare a pre-construction conference booklet which includes a summary of project administration as specified herein with names, addresses and phone numbers of all contact persons, along with proposed description of project procedures for communication protocol, Shop Drawing and document processing and forms, progress schedule updates and pay application processing procedures and forms, request for contract interpretation and proposal forms, change in contract procedures and other contract administration related information. The draft booklet will be forwarded to the Contractor for review prior to the conference.
- D. The draft pre-construction conference booklet will be distributed at this meeting to all attendees. The booklet will be reviewed and comments/input from attendees will be received, discussed and agreed upon. The modified booklet will be finalized based on input by the Contractor, RPR and those present at this meeting and the final copy will be distributed to attendees.
- E. The pre-construction booklet is intended to be a written summary of project team members and their contact procedure information, project paper work processing procedures and communication protocol and in no way intended to modify the General Conditions of the Contract.
- F. The Engineer will bring five paper copies of conformed documents along with a Computer Disk (CD) of the documents and construction forms to this meeting for submittal to the Contractor.
- G. Suggested Agenda:
1. Distribution and discussion of:
 - a. List of major subcontractors and suppliers.
 - b. Contractor's projected schedule.

- c. Contractor's Schedule of Values.
- d. Contractor's submittal log summary.
- e. M/WBE participation requirement and reporting.
2. Critical work sequencing; Relationships and coordination with other contracts and/or work.
3. Communication Protocol.
4. Project Coordination: Designation and responsible personnel.
5. Procedures and processing of:
 - a. Field decisions.
 - b. Proposal requests.
 - c. Submittals.
 - d. Change Orders.
 - e. Applications for payment.
6. Submittal of Shop Drawings, project data and samples.
7. Adequacy of distribution of Contract Documents.
8. Procedures for maintaining Record Documents.
9. Use of premises:
 - a. Work and storage areas.
 - b. Owner's use of project site and permit requirements.
 - c. Access and traffic control.
 - d. Speed limit, traffic signs and right-of-way.
10. Construction facilities, controls and construction aids.
11. Temporary utilities.
12. Safety and first aid procedures.
13. Check of required bond and insurance certifications.
14. Completion time for contract and liquidated damages.
15. Request for extension of contract time.
16. Request for a weekly project meeting for all involved.
17. Security procedures.
18. Procedures for making partial payments.
19. Guarantees on completed work.
20. Equipment to be used.
21. Survey requirements/staking of work.
22. Project inspection.
23. Labor requirements.
24. Laboratory testing requirements.
25. Provisions for material stored onsite.
26. Housekeeping procedures.
27. Liquidated damages.
28. Posting of signs.
29. Pay request submittal dates.
30. Equal opportunity requirements.

1.03 PROGRESS MEETINGS

- A. Scheduled regular periodic meetings: The construction progress meetings will be held weekly or as otherwise mutually agreed with the first meeting to be scheduled approximately 30 days after the preconstruction meeting or 30 days or less after the date of Notice to Proceed.
- B. Hold meetings as required by progress of the work.
- C. Location of the meetings: Engineer's field office trailer or other site as mutually agreed.
- D. Attendance:
 - 1. Engineer, his professional staff, and consultants as needed.
 - 2. Contractor's project manager and superintendent.
 - 3. Owner's Project Manager and other representatives.
 - 4. Subcontractors as appropriate to the agenda.
 - 5. Suppliers as appropriate to the agenda.
 - 6. Others as appropriate.
- E. Suggested Agenda:
 - 1. Review/comments/approval of minutes of previous meetings.
 - 2. Review of work progress since previous meeting.
 - 3. Field observations, problems, or conflicts.
 - 4. Problems which impede Construction Schedule.
 - 5. Review of off-site fabrication, delivery schedules.
 - 6. Corrective measures and procedures to regain projected schedule.
 - 7. Revisions to Construction Schedule.
 - 8. Progress schedule during succeeding work period.
 - 9. Coordination of schedules.
 - 10. Review submittal schedules; expedite as required.
 - 11. Maintenance of quality standards.
 - 12. Pending changes and substitutions.
 - 13. Shop Drawing submittals.
 - 14. Review proposed changes for:
 - a. Effect on Construction Schedule and on completion date.
 - b. Effect on other contracts of the Project.
 - 15. Other business.
 - 16. Construction progress schedule.
 - 17. Critical/long lead items.

- F. The Contractor's Superintendent is required to attend all progress meetings and is to review draft meeting minutes and current agenda items e-mailed to him in advance in order for him to attend the meeting prepared to discuss pertinent topics of the agenda such project progress, construction activities, mobilizations, demobilization, Shop Drawings and submittals and deliveries of materials and equipment, etc.
- G. The Contractor is required to provide copies of current updated submittal log at each progress meeting.

1.04 PRE-INSTALLATION/PRE-ACTIVITY MEETINGS

- A. When required in individual Specification sections, convene at site prior to commencing work of that section. These include pre-activity meetings for LFG collection system connections that will require shut down of the system; liner installation, protective cover installation, and other pre-activity requiring coordination between several parties as Engineer decides to be appropriate.
- B. Require attendance of entities directly affecting, or affected by, work of that section.
- C. Notify Engineer in writing at least 5 working days in advance of meeting date.
- D. Provide suggested agenda to Engineer to include reviewing conditions of installation, preparation and installation or application procedures, and coordination with related work and work of others.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01300 SUBMITTALS

PART 1 GENERAL

1.01 SUMMARY

- A. This section specifies requirements for handling submittals and procedures for processing.
- B. The Owner, Engineer, and Contractor may agree at the pre-construction meeting to develop procedures for electronic submittal for this Project. The required review times for shop drawings included in this section applies equally to either paper or electronic submittal.

1.02 GENERAL PROCEDURES

- A. Coordinate submittal preparation with performance of construction activities, and with purchasing or fabrication, delivery, other submittals and related activities. Transmit in advance of performance of related activities.
- B. Coordinate transmittal of different submittals for related elements so processing will not be delayed by the need to review concurrently for coordination. The Owner reserves the right to withhold action on a submittal requiring coordination until related submittals are received.
- C. Contractor is required to review the submittals from manufactures and sign the affidavit stating that the submittal meets the Specifications prior to submittal to Engineer. The Contractor's "Shop Drawing Stamp" attached to this section shall be included with all Shop Drawing submittals and signed by the Contractor's Project Manager.
- D. Electronic submittal of shop drawing will be permitted provided two complete paper copies of the Shop Drawings (plus the number of paper Shop Drawings Contractor wants to be returned to them) is submitted to the Engineer. The date of receipt of the Shop Drawing from the Contractor at the field office will be the official date of submittal.
- E. The total number of submittals will be determined at the pre-construction conference based on the Contractor's requirements.
- F. Allow at least 2 weeks (14 days) for initial review and 2 weeks (14 days) for each subsequent review of each submittal. Allow more time if processing must be delayed for coordination with other submittals, manufacturer or other

trades. The Engineer will advise the Contractor when a submittal review must be delayed for coordination.

- G. Contractor shall include in his construction schedule at least 2 weeks from the date of submittal of a Shop Drawing for Engineer's processing of that submittal.
- H. No extension of time will be authorized because of failure to transmit submittals sufficiently in advance of the Work to allow Engineer and Owner time for review and processing.
- I. Fill out the Shop Drawing Submittal Form attached for each Shop Drawing identifying the submittal number, Specification section and other identification and certify the submittal meets the Specifications and Drawings.
- J. Number and Package submittals appropriately for transmittal and handling.
- K. Submittals received by the Engineer from other than the Contractor will be discarded and will not be processed.

1.03 SUBMITTAL SCHEDULE

- A. Coordinate the Submittal Schedule with the submittal list of subcontracts, Schedule of Values and list of products as well as the Construction Schedule.
- B. The Contractor is required to develop a summary list of all submittals required for this project and log in the date each submittal is anticipated to be submitted to the Engineer. The Contractor's initial submittal schedule shall be submitted to the Engineer at the first construction progress meeting after the pre-construction conference.
- C. The submittal schedule log shall be updated for each progress meeting and copies submitted into the records at the weekly progress meetings.
- D. Prepare the Submittal Schedule in chronological order; include anticipated date of submittals required during the construction. Provide the following information for each item:
 - 1. Scheduled date for the submittal to Owner and Engineer.
 - 2. Related Section number.
 - 3. Name and Type of submittal.
 - 4. Description of the construction element covered.
 - 5. Scheduled date for the Engineer's final release or approval.

1.04 DISTRIBUTION OF SCHEDULES

- A. Distribute copies of the approved Construction and Submittal Schedules to the Owner, Subcontractors, and other parties required to comply with schedule dates. Post copies in the field office. When revisions are made, distribute to the same parties and post in the same locations.
- B. Revise each Schedule after each meeting or activity, where revisions have been made. Provide the updated Submittal Schedule at weekly progress meeting. Provide the updated Construction Schedule with the monthly pay application.

1.05 DAILY CONSTRUCTION LOG

- A. Prepare a daily construction log of information concerning events, construction equipment, personnel onsite and construction activities at the site and submit to the Owner and Engineer on a weekly basis. Maintain a 3-ring binder with all daily construction reports onsite for periodic review of the Owner and Engineer.

1.06 SHOP DRAWINGS

- A. Submit new information, drawn to an accurate scale. Indicate deviations from Contract Documents.
 - 1. Dimensions.
 - 2. Identification of products and materials included.
 - 3. Notation of coordination requirements.
 - 4. Notation of dimensions established by field measurement.
- B. Except for templates, patterns and similar full size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inch but no larger than 24 inch by 36 inch.

1.07 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element or system. Mark each copy to show applicable choices and options.
- B. Where Product Data includes information on several products, and some of which are not required, mark copies to indicate the applicable information. Include the following information:
 - 1. Manufacturer's printed recommendations.
 - 2. Compliance with recognized trade association standards.
 - 3. Compliance with recognized testing agency standards.

4. Application of testing agency labels and seals.
5. Notation of dimensions verified by field measurement.
6. Notation of coordination requirements.

1.08 DISTRIBUTION

- A. Shop Drawings that were submitted electronically will be processed and returned to the Contractor electronically. An email will be sent to the Contractor with a link to the Engineer's SHARE FILE where the processed Shop Drawing can be downloaded.
- B. Furnish copies of final submittal to installers and others required for performance of construction activities. Show distribution on transmittal forms. Do not proceed with installation until an applicable copy of Product Data is in the installer's possession.
- C. Do not permit use of unmarked copies of Product Data in connection with construction.
- D. Maintain in separate folders and files, a complete extra set of all approved Shop Drawings onsite for inspection by Engineer, Owner or Regulatory Agencies. Submit the extra set of Shop Drawing submittal files to the Engineer/Owner boxed with contents listed on the box(es) at the final completion.
- E. Prepare additional sets for subcontractors, manufacturers, fabricators, installers, and others as required for performance. Show distribution on transmittal forms.

1.09 SUPPLEMENTS

- A. The supplements listed below, following "End of Section," are part of this Specification.
 1. Contractor's Shop Drawing Certification Stamp.
 2. Submittal Review Comments.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

CONTRACTOR'S SHOP DRAWING CERTIFICATION STAMP

PROJECT NAME:	Orange County Cell 9-12 Class I Phase I Closure
SHOP DRAWING NO.:	_____
SPECIFICATION SECTION:	_____
<p>WITH RESPECT TO THIS SHOP DRAWING OR SAMPLE, I HAVE REVIEWED THIS PACKAGE AND I HAVE DETERMINED AND VERIFIED ALL QUANTITIES, DIMENSIONS, SPECIFIED PERFORMANCE CRITERIA, INSTALLATION REQUIREMENTS, MATERIALS, CATALOG NUMBERS, AND SIMILAR DATA WITH RESPECT THERETO AND REVIEWED OR COORDINATED THIS SHOP DRAWING OR SAMPLE WITH OTHER SHOP DRAWINGS AND SAMPLES AND WITH THE REQUIREMENTS OF THE WORK AND THE CONTRACT DOCUMENTS.</p> <p>I CERTIFY THAT THIS SHOP DRAWING MEETS OR EXCEED THE REQUIREMENTS OF THIS PROJECT.</p> <p>No Variation From Contract Documents. _____</p> <p>Variation From Contract Documents As Noted Below: _____</p>	
_____ (Contractor's PM Name)	_____ (Title)
_____ (Date Reviewed and Verified)	

SUBMITTAL REVIEW COMMENTS



DATE: _____		PROJECT: Cell 9-12 Class I Phase I Closure	
SUBMITTAL NO.: _____		PROJECT NUMBER: _____	
ORANGE COUNTY _____		PAGE: Page 1 of _____	
SUBMITTAL TYPE: SHOP DRAWINGS _____		ADMINISTRATIVE _____	
(Check or Circle One) QUALITY CONTROL _____		SAMPLES _____	
		CLOSE-OUT DOCUMENTS _____	
1. ACCEPTED AS SUBMITTED			
2. ACCEPTED AS NOTED			
3. INCOMPLETE- REVISE AND RESUBMIT			
4. REJECTED AS NOTED			
5. ADMINSTRATIVE			
NO.	COMMENT	RELATED SPEC PARA/ DRAWING	REVIEWER'S INITIALS

**SECTION 01310
PROGRESS SCHEDULES**

PART 1 GENERAL

1.01 SUBMITTALS

- A. Preliminary Progress Schedule: Submit at the pre-construction conference.
- B. Detailed Progress Schedule:
 - 1. Submit initial Detailed Progress Schedule within 30 days of the Effective Date of Agreement/Notice of Proceed, no later than the date of Mobilization/Commencement of Work.
 - 2. Submit updated project Progress Schedule as part of the monthly pay application in accordance with requirements of Section 01028, Application for Payment. Submittal of incomplete progress schedule update may result in delay or rejection of monthly payment application.
 - 3. Submit five copies of monthly updated progress schedule and one disc copy of the electronic file along with each pay request application.
 - 4. No activity duration, exclusive of those for submittals review and product fabrication/delivery, shall be less than 1 day or more than 30 days, unless otherwise approved.
- C. Submit with Each Progress Schedule Submission:
 - 1. Contractor's certification that progress schedule submission is the actual schedule being utilized for execution of the Work.
 - 2. Disk files compatible with the latest version of Primavera P6 or Engineer- approved equal software.
 - 3. Progress Schedule: Ten legible copies of both the Network Graphical Display and the schedule Report.
 - 4. Narrative Progress Report: Same number of copies as specified for Progress Schedule.
- D. Precedent to final payment, submit a final Updated Progress Schedule.

1.02 PRELIMINARY PROGRESS SCHEDULE

- A. In addition to the basic requirements outlined in the General Conditions, show a detailed schedule, beginning with the Notice to Proceed, for the balance of the Project through Final Completion including all components of work and critical construction with milestones.

- B. Show activities including, but not limited to the following:
1. Notice to Proceed.
 2. Permits and Mobilization activities.
 3. Submittals, with review time allocated.
 4. Early procurement activities for long lead equipment and materials.
 5. Pre-construction topographic survey.
 6. Final grading plan update by Engineer and quantity calculations.
 7. Initial site work and solid waste grading.
 8. Offsite borrow area preparation and excavation activities.
 9. Earthwork and installation of leveling course.
 10. Liner installation work and related activities.
 11. Protective cover and partial sod installation activities.
 12. Stormwater system construction and related activities.
 13. Landfill gas collection system construction, tie in of existing vertical wells and horizontal collector wellheads, related pipe installation, and connection activities.
 14. Specified Work sequences and construction constraints.
 15. Contract Milestone and Completion Dates.
 16. Major structural, mechanical, equipment, electrical, architectural, and instrumentation and control Work.
 17. System startup summary.
 18. Substantial Completion.
 19. Project closeout summary.
 20. Demobilization summary.
- C. Format: In accordance with paragraph 1.05 Progress Schedule, Critical Path Network.

1.03 DETAILED PROGRESS SCHEDULE

- A. In addition to the requirements of the General Conditions, submit a Detailed Progress Schedule beginning with the Notice to Proceed and continuing through Final Completion.
- B. Show the duration's and sequences of activities required for complete performance of the Work reflecting the means and methods chosen by Contractor.
- C. When accepted by Engineer, the Detailed Progress Schedule will replace the Preliminary Progress Schedule and become the baseline Schedule. Subsequent revisions will be considered as Updated Progress Schedules.
- D. Format: In accordance with paragraph 1.05 Progress Schedule, Critical Path Network.

- E. Update monthly to reflect actual progress and occurrences to date, including weather delays and submit along with monthly Payment Application. Failure to do so may cause Owner to withhold all or part of the payment until Progress Schedule is updated in a manner acceptable to the Owner.

1.04 PROGRESS SCHEDULE – CRITICAL PATH NETWORK

- A. General: Comprehensive computer-generated schedule using CPM, generally as outlined in Associated General Contractors of America (AGC) Publication No. 1107.1, “Construction Planning and Scheduling, latest edition”. If a conflict occurs between the AGC publication and this Specification, this Specification shall govern.
- B. Contents:
 1. Schedule shall begin with the date of Notice to Proceed and conclude with the date of Final Completion.
 2. Identify Work calendar basis using days as a unit of measure taking into account the Owner’s holidays, Contractor’s planned work week, and all other requirements.
 3. Show complete interdependence and sequence of construction and Project-related activities reasonably required to complete the Work.
 4. Identify work of separate stages and other logically grouped activities, and clearly identify critical path of activities.
 5. Reflect sequences of Work, restraints, delivery windows, review times, Contract Times and Project Milestones set forth in the Agreement and Section 01040, Coordination.
 6. Include as a minimum activities listed in paragraph 1.02.B.
 7. No activity duration, exclusive of those for submittals review and product fabrication/delivery, shall be less than 1 day or more than 30 days, unless otherwise approved.
 8. Activity duration for submittal review shall not be less than review time specified unless clearly identified and prior written acceptance has been obtained from Engineer.
- C. Network Graphical Display:
 1. Plot or print in color on paper not greater than 24 inches by 36 inches or smaller than 11 inches by 17 inches, unless otherwise approved.
 2. Title Block: Show name of Project, Owner, date submitted, revision or update number, and the name of the scheduler. Updated schedules shall indicate data date.
 3. Identify horizontally across the top of the schedule the time frame by year, month, and day.

4. Identify each activity with a unique number and a brief description of the Work associated with that activity.
5. Indicate the critical path.
6. Show, at a minimum, the controlling relationships between activities.
7. Plot activities on a time-scaled basis, with the length of each activity proportional to the current estimate of the duration.
8. Plot activities on an early start basis unless otherwise requested by Engineer.
9. Provide a legend to describe standard and special symbols used.

D. Schedule Report:

1. On 8/12-inch by 11-inch white paper, unless otherwise approved.
2. List information for each activity in tabular format, including, at a minimum:
 - a. Activity Identification Number.
 - b. Activity description.
 - c. Original duration.
 - d. Remaining duration.
 - e. Early Start Date (Actual start on Updated Progress Schedules).
 - f. Early Finish Date (Actual finish on Updated Progress Schedules).
 - g. Late Start Date.
 - h. Late Finish Date.
 - i. Total Float.
3. Sort Reports, in ascending order, with activity number sequence with predecessor and successor activity.

1.05 PROGRESS OF THE WORK

A. The Updated Progress Schedule shall reflect:

1. Progress of Work within 5 working days prior to submission.
2. Approved changes in Work scope and activities modified since submission.
3. Delays in Submittals or resubmittals, deliveries, or work.
4. Adjusted or modified sequences of Work.
5. Other identifiable changes.
6. Revised projections of progress and completion; and
7. A report of changed logic.

B. Produce detailed subschedules during the Project, upon request of Owner or Engineer, to further define critical portions of the Work such as facility shutdowns, etc.

- C. If the Contractor fails to complete activity by its latest scheduled completion date and this failure is anticipated to extend Contract Times (or Milestones), Contractor shall, within 7 days of such failure, submit a written statement as to how Contractor intends to correct nonperformance and return to the acceptable current progress schedule. Actions by Contractor to complete Work within Contract Times (or Milestones) will not be justification for adjustment to Contract Price or Contract Times.
- D. Owner may order Contractor to increase plant, equipment labor force or working hours, at no additional cost to Owner, if Contractor fails to:
 - (i) complete a Milestone activity by its completion date, or (ii) satisfactorily execute Work as necessary to prevent delay to the overall completion of the Project.
- E. Owner may grant an extension of Contract Time in accordance with the General Conditions if the Contractor provides sufficient documentation.

1.06 NARRATIVE PROGRESS REPORT

- A. Format:
 - 1. Organize the same as the Progress Schedule.
 - 2. Identify, on a cover letter, the reporting period, the date submitted, and the name of the author of the report.
- B. Contents:
 - 1. Number of days worked over the period, work force on hand, construction equipment on hand (including utility vehicles such as pickup trucks, maintenance vehicles, stake trucks, etc.).
 - 2. General progress of the Work, including a listing of activities started and completed over the reporting period, mobilization/demobilization of subcontractors, and major milestones achieved.
 - 3. Contractor's plan for management of the site (e.g., lay down and staging areas, construction traffic, etc.), the utilization of construction equipment, the buildup of trade labor, and the identification of all potential Contract changes.
 - 4. Identification of new activities and sequences as a result of executed Contract changes.
 - 5. Documentation of weather conditions over the reporting period, and any resulting impacts to the work.
 - 6. Description of actual or potential delays, including related causes, and the steps taken or anticipated to mitigate their impact.
 - 7. Changes to activity log.
 - 8. Changes to critical path.

9. Identification of, and accompanying reason for, any activities or sequencing added, deleted or revised since the last report.
10. Steps taken to recover the schedule from Contractor-caused delays.

1.07 SCHEDULE ACCEPTANCE

A. Engineer's acceptance will demonstrate agreement that the proposed schedule conforms to the requirements of the Contract including, but not limited to, the following:

1. Contract Times, including Final Completion and all intermediate Milestones are within the specified times.
2. Specified Work sequences and constraints are shown as specified.
3. Complete Scope of Work is included.
4. Specified Owner furnished permits, equipment or Material arrival dates, or range of dates, are included.
5. Access restrictions are accurately reflected.
6. Start-up and testing times are as specified.
7. Training time is as specified.
8. Level of detail is as specified herein.
9. Submittal submission and review times are as specified.
10. Durations of Activities are reasonable.
11. Sequencing is reasonable and does not include preferential logic contrary to the contingency/float sharing clauses of this Specification.
12. Meets all administrative requirements of Contract Documents.
13. Updated schedules reflect actual dates and durations of the Work performed.

B. Preliminary Progress Schedule Review Disposition:

1. Accepted.
2. Rejected as Noted:
 - a. Make requested corrections; resubmit within 10 days.
 - b. Until acceptable to Engineer as the Baseline Progress Schedule, continue the review and revision process, during which the time Contractor shall update the schedule on a monthly basis to reflect actual progress and occurrences to date.

C. Detailed Progress Schedule:

1. Accepted.
2. Rejected as Noted:
 - a. Make requested corrections; resubmit within 10 days.
 - b. Until acceptable to Engineer as the Baseline Progress Schedule, continue the review and revision process.

- D. Narrative Report: All changes to activity durations and sequences, including the addition or deletion of activities subsequent to Engineer's acceptance of the Baseline Progress Schedule, shall be delineated in the Narrative Report current with the proposed Updated Progress Schedule.

1.08 ADJUSTMENT OF CONTRACT TIMES

- A. Reference General Conditions.
- B. Evaluation and reconciliation of Adjustments of Contract Times shall be based on the Updated Progress Schedule at the time of the proposed adjustment or claimed delay.
- C. Float:
 - 1. Float time is a Project resource available to both parties, Owner and Contractor, to meet Contract Milestones and Contract Times.
 - 2. Use of float suppression techniques such as preferential sequencing or logic, special lead/lag logic restraints, and extended activity times are prohibited and use of float time disclosed or implied by use of alternate float-suppression techniques shall be shared to proportionate benefit of Owner and Contractor.
 - 3. Contract Float is defined in the General Conditions; and as a minimum is the number of days that an activity may be delayed from its early start or finish dates without delaying completion of the Work beyond the Contract Time for Substantial Completion or Final Acceptance.
 - 4. Pursuant to above float-sharing requirement, no time extensions will be granted nor delay damages paid until a delay occurs which (i) impacts Project's critical path, (ii) consumes available float or contingency time, and (iii) extends Work beyond contract completion date.
- D. Claims Based on Contract Times:
 - 1. Where Owner has not yet rendered formal decision on Contractor's claim for adjustment of Contract Times, and parties are unable to agree as to amount of adjustment to be reflected in progress schedule, Contractor shall reflect an interim adjustment in the progress schedule as acceptable to Engineer.
 - 2. It is understood and agreed that such interim acceptance will not be binding on either Contractor or Owner, and will be made only for the purpose of continuing to schedule Work until such time as formal decision has been rendered as to an adjustment, if any, of the Contract Times.
 - 3. Contractor shall revise progress schedule prepared thereafter in accordance with Engineer's formal decision.

1.09 CHANGE OF CONTRACT TIME

- A. The Contractor Time (or Milestone) may only be changed by a Change Order to the Contract. Any claim for an adjustment of the Contract Time (or Milestone) shall be based on written notice delivered by the party making the claim to the other party and to Owner promptly but in no event later than 5 calendar days after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within 30 days after such occurrence unless Owner allows an additional period of time to ascertain more accurate data in support of the claim and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. No claim for an adjustment in the Contract Time (or Milestones) will be valid if not submitted in accordance with the requirements of this paragraph.
- B. All time limits stated in the Contract Documents are of the essence of the Agreement.
- C. In the event of a claim under paragraph A, the Contract Time may be extended in an amount equal to time lost due to delays beyond the control of the Contractor. Such delays shall include, but not be limited to, acts or neglect by Owner, acts or neglect by other contractors performing other work on site, acts or neglect by utility owners, fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God.
- D. Extension of time for "abnormal weather" shall be granted only under the following conditions:
 - 1. All weather delays will be considered on a cumulative calendar month basis.
 - 2. Onsite rainfall measurements will be recorded by the Owner at the end of each workday from the Owners onsite rain stations and a rain gauge installed by the Contractor.
 - 3. At the end of each month, the rainfall data for that month sent by the Owner to the Engineer to be tabulated. The Engineer, will include in the tabulation the number of days where the rainfall amount was greater than 0.25 inch.

4. If the total monthly rainfall exceeds the average monthly rainfall and the number of days when the rainfall amount is greater than 0.25 inch exceeds the average historical number of days with rainfall exceeding 0.25 inch for that month, the Contract Time shall be extended by the number of days calculated as follows:
 - a. The actual number of days that Work has stopped completely because of rainfall; or
 - b. The number of days where the rainfall amount is greater than 0.25 inch less the average number of days that rainfall historically exceeds 0.25 inch for the given month.
 5. The average monthly rainfall and average number of days rainfall exceeds 0.25 inch will be determined from the published information of the National Climatological Data Service (for the Orlando International Airport station), or the Owner's rain gauge records onsite as selected by the Engineer.
- E. Contractor shall carry on the Work and adhere to the progress schedule during resolution of any claims made by Contractor pursuant to General Conditions and the requirements of the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 01320
CONSTRUCTION PHOTOGRAPHS**

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Aerial Photographs:

1. The Contractor shall submit a pre-construction video recording of the project site conditions. The recording shall contain coverage of all surface features located within the construction limit lines and surrounding areas. The area for the documentation of surface features shall include, but not be limited to the construction and access areas identified for this Project including perimeter roadways, construction entrance roads, ditches adjacent to construction, ponds adjacent to construction limits and staging area. The video recording may be a combination aerial and on-ground recording crisp and focused. All recording shall be performed during times of good visibility. No recording shall be done during periods of significant precipitation, mist or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subject and to produce bright, sharp video recordings of those subjects. Panning, zoom-in and zoom-out rates shall be sufficiently controlled to maintain a clear view of the object. The recording shall be Digital Video compatible with standard DVD players. The DVD shall include a recording time and date log. Three copies of the pre-construction DVD shall be submitted at the first construction progress meeting.
2. Within the above-defined area, the pre- construction video shall document:
 - a. Existing landfill gas wells, valves and piping within the above-defined area.
 - b. Horizontal wellheads and above ground piping for connection to horizontal collectors.
 - c. Leachate and condensate pump stations.
 - d. Ditches adjacent to construction.
 - e. Culverts that will be impacted by closure construction.
 - f. Terrace berms, terrace swales, culverts, and stormwater structures.
 - g. Access roads, and fences.
 - h. Staging and storage area, including construction trailer locations.

3. The Contractor shall include six sets of color aerial construction photographs and two copies of the HD digital file on a labeled Computer Disk (CD) prior to the start of construction and with each application for payment. Aerial photographs may be necessary for pay request documentation of the Work due to the extent of the closure project. Each set of photographs (eight shots minimum) shall detail all of the work completed during the pay period covering all angles of the construction site and different discipline of work and shall serve as the record of construction in order to satisfy the requirements of these Specifications. The Engineer shall have the authority to reject any or all of the photographs and order those areas to be photographed again. The Contractor shall re-perform unacceptable aerial photographic coverage within 5 days after being notified.
 4. Aerial photographs shall not be taken more than 10 days prior to the submittal of each application for payment in order to satisfy the requirements of these Specifications.
- B. Construction Photographs: Additional digital construction photographs shall be taken to document the work performed during each pay application period.
- C. Photographs and electronic HD files submitted will become the property of the Owner. There shall not be any restrictions or copyrights associated with re-use of the photographs by the Owner or its authorized agents.

1.02 QUALITY ASSURANCE

- A. The Contractor shall engage the service of a competent professional photographer, experienced in construction photo and video documentation. The color photographs shall be prepared by a responsible commercial firm known to be skilled and regularly engaged in the business of color construction photographs. Submit the proposed photographer qualifications for approval in accordance with Section 01300, Submittals.
- B. Additional information to be furnished by the photographer shall include the names, addresses, e-mail addresses, and telephone numbers of two references for projects which the photographer has taken color construction photographs within the last 6 months.

PART 2 PRODUCTS

2.01 GENERAL

- A. The photographs shall be high resolution digital photographs such as to produce a finished product that will fulfill the technical requirements of the Project. The photographs shall produce bright, sharp and clear pictures with accurate colors and shall be free from distortion, tearing, rolls, or any other form of picture imperfection. All photographs shall, by electronic means, display on the photograph the month, day and year of the photograph.
- B. All prints shall be color prints, with double weight paper, a smooth surface, and glossy finish. Prints shall be a minimum size of 8 inches by 10 inches. Each print shall display the month, day and year on the front and shall be identified on the back as follows:
 - 1. Name of Project.
 - 2. Name and Address of Photographer.
- C. The high definition digitized file of the monthly pictures will be saved on a CD, properly labeled and submitted on a monthly basis. The Contractor shall require the photographer to maintain the picture files for a period of two years from the date of final completion. The photographer shall agree for the Owner and Engineer to reproduce and use the digital files for construction completion certification documents, or other purposes and print and use the photographs as needed.

PART 3 EXECUTION

3.01 GENERAL

- A. The photographs taken shall detail all of the construction which has taken place during the payment period. The photographs shall also detail each major stage of construction as follows:
 - 1. Prior to mobilization, and after setup of Contractor's storage staging area.
 - 2. Completion of initial sub-base regarding (multiple segmented areas).
 - 3. Progress of sideslope grading and installation of leveling course.
 - 4. Completion of grading for terraces and letdown pipe trenches.
 - 5. Placement of final leveling course and grading, geomembrane barrier layer installation, attachment to bottom geomembrane, geomembrane repair/replacement, CDN placement, Protective Cover placement and sodding.

6. During installation of terrace underdrain, inlets and letdown pipes.
7. During installation of LFG wells, manifolds, header piping.
8. Installation of stormwater structures, terrace underdrains.
9. Perimeter berm and slope restorations; and
10. Substantial and final completion of the Project.

END OF SECTION

SECTION 01380
CONSTRUCTION FIELD OFFICE

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish, install, and maintain separate temporary field offices for the Contractor and the Owner/Engineer during the entire construction period. The temporary offices shall be adequately furnished and maintained in a clean and orderly condition by the Contractor until final completion.
- B. Upon final completion of work, remove the field offices from the Project Site and restore the area to original or better conditions.
- C. Prior to installation of office, consult with the Engineer and Owner on location, access, and related facilities.
- D. The Contractor's authorized representative shall be present in the field office or onsite at all times and able to be contacted via telephone or cell phone while work is in progress. Instructions received there from the Engineer shall be considered as delivered to the Contractor.

PART 2 PRODUCTS

2.01 GENERAL

- A. Submittals:
 - 1. Copies of permits and approvals for construction of the temporary office trailers as required by laws and regulations and governing agencies.
 - 2. Shop Drawings for the trailer site plan showing location of field office trailers, site access; gravel parking for the field offices, storage yard, storage buildings, fencing and protective barriers.
 - 3. Shop Drawing for the Owner/Engineer's field office and proposed floor plans.
 - 4. Shop Drawings shall be submitted to the Engineer for review.
- B. General:
 - 1. Establish a field office trailer for the use of the Owner and Engineer. Site office is to be available for use within 30 days after Notice to Proceed date and prior to first construction progress meeting. This field office trailer shall be separate from the Contractor field office.

2. Locate the field office on the jobsite in a location satisfactory to the Owner and Engineer.
3. Provide a parking area with a minimum of six parking spaces in front of the Owner/Engineer's field office.

C. Specific Requirements:

1. Provide one office trailer (minimum 1,200 square feet in AC area) for the exclusive use of the Owner's project manager, RPR, the Engineer, and the CQA Consultant throughout the period of construction until final completion.
2. The floor plan for the Owner/Engineer trailer shall be divided into rooms with doors and locks, with a minimum of four offices with an area of 100 square feet each, a 500 square feet conference/main room, and the remainder configured for comfort facilities and storage room and space. The proposed floor plan shall be submitted for approval by Engineer.
3. The office trailer shall be weather-tight and have a tight floor at least 24 inches off the ground, leveled properly and securely attached with hurricane straps. The office shall be insulated, air-conditioned, have suitable screened ventilation and a solid door provided with a cylinder lock, deadbolt and five sets of keys.
4. The office shall be provided with weekly janitorial service. The schedule for weekly janitorial service shall be coordinated with the Engineer. The trailer is required to be safe, clean and maintained in good working conditions throughout the construction and any necessary repairs are to be performed immediately.
5. The office shall be provided with heating equipment, air conditioning equipment, electrical wiring, outlets, and light fixtures suitable to light the tables and desk adequately, and window blinds.
6. The office shall be provided with:
 - a. Telephone: Five each, with one intercom line and four incoming/outgoing lines, Touch-Tone, with conference speaker, and 12-foot coiled handset cord.
 - b. Internet Service Provider: Fastest available in the market DSL line for computers in each of the four offices or wireless Internet connectivity.
 - c. Voice Mail: Voice mail (answering) service through Southern Bell or other approved carrier.
7. Toilet facilities in the Owner/Engineer's office trailer shall be connected to an existing non-potable water supply well and supplied with a holding tank and pump out service for wastewater provided by the Contractor.
8. Contractor shall file application, pay fees, and coordinate with Orange County Building Department to obtain building permit for the temporary office trailers.

- D. Furniture and Equipment: The Owner/Engineer's office trailer shall have the following furniture and equipment:
1. Two plan tables, 4 feet by 6 feet, and two new adjustable stools.
 2. A desk for each of the offices in the trailer, approximately 2-1/2 feet by 5 feet, with a swivel chair for each desk, and a 2-foot by 6-foot folding table with a folding chair.
 3. A conference table (or four side by side 2-foot by 6-foot folding tables) with eight chairs.
 4. A wastebasket for each office and one garbage can.
 5. Four 4-drawers, legal size, filing cabinet with locks and key.
 6. Air conditioning/heating unit, 12,000 BTU (1 ton) rating.
 7. Hot and cold bottled water cooler and a small refrigerator.
 8. An office size photocopy/printer/scanner machine network wired to the offices' computer line (or wireless) and operational capable of printing and copying letter, legal and ledger size paper at a minimum of 30 PPM with maintenance and service throughout construction period, Kyocera TASKalfa 3050ci or approved equal.
 9. A first aid kit suitable for twelve people, fully stocked and containing proper manuals, for the Owner/Engineer's trailer.
- E. Minimum Features:
1. 110-volt lighting and wall plugs, with Fluorescent ceiling lights.
 2. Arrange and provide all wiring, connections and appropriate number of jacks necessary for a complete telephone, fax and computer system.
- F. Operating Expense: Supply all materials and replenishments, bottled water and cups, copying paper, power, and janitorial services, and pay all electrical bills for the Owner/Engineer's field offices.
- G. Provide and maintain on-site adequate firefighting equipment capable of extinguishing incipient fires, and comply with NFPA No.241.

PART 3 EXECUTION

3.01 PREPARATION

- A. Clean existing drainage structures if needed for proper surface drainage.
- B. Maintain an access road and parking lot as needed.

3.02 INSTALLATION

- A. Have office equipped and ready for use within 30 days after Notice to Proceed.

- B. Construct temporary field office trailer on proper foundations; provide connections for utility services.
 - 1. Secure portable or mobile buildings when used.
 - 2. Provide steps and landings at entrance doors. Adjust for settlement periodically.
 - 3. Provide hurricane tie-downs.
- C. Locate temporary office trailer at the location approved by the Owner.

3.03 MAINTENANCE AND CLEANING

- A. Furnish, replace, and replenish light bulbs, fluorescent tubes, printer cartridge, copier ink cartridge, toilet paper, paper towels, soap, bottled water, first-aid and other things required to maintain the office in a clean working condition.
- B. Provide a weekly cleaning service to sweep and mop the office trailer floors, dust furnishings, and clean water closets and inside.
- C. Maintain the parking area in front of the field office by removing weed and re-grading the site on a regular basis to prevent standing water.
- D. Remove trash and debris from the site weekly as a minimum.

3.04 REMOVAL

- A. Remove temporary field offices, contents, and services upon final completion.
- B. Remove foundations and debris; clean site and the remove debris from the stormwater inlets, structures and other areas.
- C. Sod all disturbed areas used for parking, staging materials and field office.

END OF SECTION

**SECTION 01400
QUALITY CONTROL**

PART 1 GENERAL

1.01 CONTRACTOR'S REQUIREMENTS

- A. Quality control and control of installation.
- B. References.
- C. Field samples.
- D. Inspection and testing laboratory services.
- E. Manufacturer's field services and reports.

1.02 RELATED SECTIONS

- A. Section 01300, Submittals.
- B. Section 01410, Testing and Testing Laboratory Services.
- C. Section 02221, Excavation, Trenching, Backfilling and Embankment.
- D. Section 02373, Composite Drainage Net.
- E. Section 02668, High Density Polyethylene Geomembrane Liner.
- F. Section 02669, Linear Low Density Polyethylene Geomembrane Liner.
- G. Section 02710, Base Course.
- H. Section 02772, Asphalt Concrete Pavement.
- I. Attachment A, FDEP SWL Operations Permit.
- J. Attachment B, Closure Cap System Construction Quality Assurance Plan for LLDPE Geomembrane, GCL and Geocomposite CDF Slurry Wall Landfill.

1.03 CONTRACTOR'S QUALITY CONTROL

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.

- C. If manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.04 REFERENCES

- A. Conform to reference standard by date of issue current on date of Contract Documents.
- B. Should specified reference standards conflict with Contract Documents request clarification from Engineer before proceeding.
- C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 FIELD SAMPLES

- A. Perform field samples at the site as required by individual Specifications sections.
- B. Acceptable samples represent a quality level for the Work.
- C. Document field sample locations, procedures, and time, etc. thoroughly to establish quality control record.

1.06 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual Specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Individual to report in writing observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions. Submit report in within 2 days of observation to the Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01410
TESTING AND TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 WORK INCLUDED

- A. All Quality Control (QC) testing costs necessary to ensure conformance of material and installation conformance with the Specifications shall be provided by the Contractor's qualified independent laboratory and shall be fully paid by the Contractor. The cost to the Contractor for all QC testing shall be included in the lump sum portion of the Contractor's bid.
- B. All construction Quality Assurance (QA) testing specifically identified to be done by Owner's independent testing laboratory will be paid by the Owner. The Owner and the Engineer will employ and pay for services of an independent testing laboratory (CQA Consultant or QA Consultant), different from Contractor's laboratory to perform QA testing specifically indicated in the Contract Documents.
 - 1. Contractor shall cooperate with the Owner's QA Consultant to facilitate the execution of its required services.
 - 2. Employment of the Owner's laboratory by the Owner shall in no way relieve Contractor's obligations to perform Quality Control testing of the work of the Contract and provide results to Owner.
- C. The Owner may at any time during the progress of the work request additional testing beyond that testing that is specified in the Contract. This testing will be at the Owner's expense if the test result is satisfactory and in compliance with the Contract requirements. The Contractor will assist the testing laboratory personnel in all ways so as to facilitate access to the location of the material or equipment to be tested.
- D. Five copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Engineer as a prerequisite for the acceptance of any material or equipment.
- E. If, in the making of any test of any material or equipment, it is ascertained by the Engineer that the material or equipment does not comply with the Contract, the Contractor will be notified thereof and the Contractor will be directed to refrain from delivering said material or equipment, or to remove it promptly from the site or from the work and replace it with acceptable material, without cost to the Owner.

- F. Materials and equipment submitted by the Contractor as the equivalent to those specifically named in the Contract may be tested by the Owner for compliance. The Contractor shall reimburse the Owner for the expenditures incurred in making such test on materials and equipment which may be rejected for non-compliance.
- G. Certificate of Manufacture: When inspection is waived or when the Engineer so requires, the Contractor shall furnish to him authoritative evidence in the form of Certificates of Manufacturer that the materials to be used in the work have been manufactured and tested in conformity with the Contract Documents. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer. The certificates shall be delivered to the Engineer prior to shipment of the materials.

1.02 RELATED REQUIREMENTS

- A. General Conditions: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.
- B. Respective sections of Specifications: Certification of products.
- C. Testing laboratory inspection, sampling and testing is required for, but not limited to, the following:
 - 1. Section 02221, Excavation, Trenching, Backfilling and Embankment.
 - 2. Section 02373, Composite Drainage Net.
 - 3. Section 02668, High Density Polyethylene Geomembrane.
 - 4. Section 02669, Linear Low Density Polyethylene Geomembrane Liner.
 - 5. Other CQC and CQA and Testing as indicated in the Drawings and Contract Documents.

1.03 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

- A. Laboratory is not authorized to:
 - 1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Approve or accept any portion of the Work.
 - 3. Perform any duties of the Contractor.

1.04 CONTRACTOR'S RESPONSIBILITIES

- A. Provide test results as required by the Specifications in a timely manner to the Engineer for review and approval.

- B. Cooperate with Owner's laboratory personnel; provide access to the Project and to manufacturer's operations.
- C. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
- D. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes that require control by the testing laboratory.
- E. Materials and equipment used in the performance of work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents. The Engineer will require the Contractor to provide statements of certification from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no additional charge to the Owner shall be allowed on account of such testing and certification.
- F. Furnish incidental labor and facilities:
 - 1. To provide access to work to be tested.
 - 2. To obtain and handle samples at the Project Site or at the source of the product to be tested.
 - 3. To facilitate inspections and tests.
 - 4. To facilitate storage and curing the test samples.
- G. The Contractor shall notify the Owner in writing at least 24 hours in advance for the Owner to schedule the laboratory and to allow for laboratory assignment of personnel and scheduling of tests. Contractor shall fill out the Test Request Form attached to this Specification section and submit to the Owner at the field office.
- H. The Owner's laboratory technician will come on site at a time and place requested by the Contractor to perform the test designated on the request form. The test results will be conveyed to the Contractor verbally if possible and written certified results will be mailed to the Engineer by the testing laboratory.
- I. When tests cannot be performed by the laboratory personnel at the time requested by the Contractor due to actions of the Contractor, delays or improper planning, Contractor shall reimburse the Owner the expenses for laboratory personnel and travel time incurred. Contractor shall also pay for standby time and/ or results caused by Contractor's delay.

- J. If the test results indicate the material or equipment complies with the Contract Documents, the Owner will pay for the cost of the testing laboratory. If the tests, and any subsequent retests, indicate the work, material or equipment fail to meet the requirements of the Contract Documents, the Contractor shall pay the laboratory costs incurred in such tests.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Temporary Utilities.
- B. Temporary Controls.
- C. Construction Facilities.

1.02 RELATED REQUIREMENTS

- A. Section 01010, Summary of Work.
- B. Section 01380, Construction Field Office.
- C. Section 01700, Contract Closeout.
- D. Section 02200, Site Clearing.

1.03 ELECTRICITY, LIGHTING

- A. Provide all coordination with the power company to provide power. Pay for power service required for construction operations, with branch wiring and distribution boxes located to allow service and lighting by means of construction-type power cords.
- B. Provide power to the Owner/Engineer's field office trailer. Proposed alternate power sources/connection points may be discussed with the Owner.

1.04 TEMPORARY VENTILATION

- A. Ventilate enclosed areas in compliance with the Federal Rules working in and around landfill gas and landfills.
- B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

1.05 TEMPORARY WATER SERVICE

- A. No potable water service is available adjacent to the landfill construction area. Construction water may be obtained by the Contractor from the onsite ponds with Contractor's equipment with prior approval of the Owner.

- B. Non-potable water for use in the restroom at the office trailers may be obtained from an existing well located near the Contractor's Field Office Location provided on the Drawings.
- C. Contractor shall provide bottled water for the Contractor's and Owner/Engineer's Field Office Trailers.

1.06 SANITARY FACILITIES

- A. Provide and maintain required sanitary facilities and hygiene stations for construction personnel during construction period.

1.07 SUBMITTALS

- A. Administrative Submittals: Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies. Maintain permits and approvals onsite posted as required.
- B. Shop Drawings:
 - 1. Temporary Construction Facility Submittals:
 - a. Contractor's field office, storage yard, and storage building drawings, including personnel parking area.
 - b. A site plan indicating the location of the Owner/Engineer field offices and a dedicated parking area.
 - c. Staging area site and location plan.
 - d. Traffic Control and Routing Plans: As specified herein, and proposed revisions thereto.
 - e. Plan for maintenance of existing operations and other housekeeping plans.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 MOBILIZATION

- A. Mobilization shall include, but not be limited to, these principal items:
 - 1. Obtaining required permits.
 - 2. Delivery and setup of field office trailers and equipment.
 - 3. Installing temporary construction power, wiring, and lighting facilities.
 - 4. Providing onsite communication facilities, including telephones, fax and computer DSL line.
 - 5. Providing onsite sanitary facilities.
 - 6. Coordinating with Owner and construction of Contractor's work and storage yard.

7. Posting OSHA required notices and establishing safety programs and procedures.
8. Having the Contractor's Superintendent at the site full time.

3.02 PROTECTION OF WORKERS AND PERSONNEL

- A. Comply with Owner's landfill standard operation procedures and safety rules while on Owner's property.
- B. Keep Owner informed of accidents and incidents on the site and related claims.
- C. The Contractor shall adapt the means, methods, techniques, sequences and procedures of construction to allow Owner to maintain full operation at the existing level of facility production and consistent with applicable permit requirements, and Laws and Regulations. In performing such Work and in cooperating with the Owner to maintain operations, it may be necessary for the Contractor to plan, design, and provide various temporary services, utilities, connections, temporary piping and heating, access, and similar items which will be included within the Lump Sum Contract Price.

3.03 VEHICULAR TRAFFIC AND TRAFFIC CONTROL PLAN

- A. Adhere to traffic control plan reviewed by the Engineer. Observe traffic signs and speed limits posted. Changes to the traffic plan shall be made only by written notification to the Engineer. Secure approvals for necessary changes so as not to delay progress of the Work.
- B. Contractor is not allowed to carry personnel in truck beds onsite.

3.04 PROTECTION OF WORK AND PROPERTY

- A. General:
 1. Maintain in continuous service all existing gas pipelines, underground power, telephone or communication cable, sewers, poles and overhead power, and all other utilities encountered along the line of work, unless other arrangements satisfactory to Owners of said utilities have been made.
 2. Where completion of Work requires temporary or permanent removal and/or relocation of an existing utility, coordinate all activities with owner of said utility and perform all work to their satisfaction.
 3. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
 4. Keep fire hydrants and water control valves free from obstruction and available for use at all times.

5. In areas where the Contractor's operations are adjacent to or near a utility such as gas, telephone, electric power, or sewer, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection thereof have been made by the Contractor.
6. Notify property owners and utility offices which may be affected by the construction operation at least 72 hours in advance. Before exposing a utility, obtain utility's permission.

B. Trees and Plantings:

1. Protect from damage and preserve trees, shrubs, wetlands and other plants outside the limits of the Work and within the limits of the Work which are designated on the Drawings to remain undisturbed and protected.
 - a. Employ hand excavation as necessary to prevent tree injury.
 - b. Do not stockpile materials or permit traffic within drip lines of trees.
 - c. Provide and maintain temporary barricades around trees.
 - d. Water vegetation as necessary to maintain health.
 - e. Cover temporarily exposed roots with wet burlap, and keep the burlap moist until soil is replaced around the roots.
2. In the event of damage to bark, trunks, limbs, or roots of plants that are not designated for removal, treat damage by corrective pruning, bark tracing, application of a heavy coating of tree paint, and other accepted horticultural and tree surgery practices.
3. Replace each plant that dies as a result of construction activities.
4. Repair any damage to the wetlands as a result of construction activities by the Contractor or his subcontractors to original or better conditions and to the satisfaction of regulatory agencies.

C. Waterways and Perimeter Ditch: Keep ditches, culverts, and natural drainage continuously free of construction materials and debris.

D. Dewatering: Construct, maintain, and operate cofferdams channels, flume drains, sumps, pumps, or other temporary diversion and protection works. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the Work. Maintain the Work area free from water.

E. Endangered Species:

1. Take precautions necessary and prudent to protect native endangered flora and fauna.

2. Notify Engineer of construction activities that might threaten endangered species or their habitats.

3.05 TEMPORARY CONTROLS

A. Air Pollution Control:

1. Minimize air pollution from construction operations.
2. Burning: Burning of materials, rubbish, or other debris will not be permitted on or adjacent to the site.
3. Conduct operations of dumping soil and of carrying solid waste away in trucks to cause a minimum of dust. Give unpaved roads, detours, or haul roads used in the construction area a dust-preventative treatment or periodically water to prevent dust. Strictly adhere to applicable environmental regulations for dust prevention.

B. Water Pollution Control:

1. Prior to commencing excavation and construction, obtain Engineer's approval with detailed Drawings showing procedures intended to handle and dispose of groundwater and stormwater flow, including dewatering pump discharges.
2. Comply with procedures outlined in U.S. Environmental Protection Agency manual entitled, "Guidelines for Erosion and Sedimentation Control Planning" and "Implementation, Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity," and "Erosion and Sediment Control –Surface Mining in Eastern United States."
3. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm drains on landfill. Disposal of volatile wastes into streams, waterways or the landfill is prohibited. Provide acceptable containers for collection and disposal of hazardous waste materials, debris, and rubbish.

C. Erosion, Sediment, and Flood Control:

1. Provide, maintain, and operate temporary facilities to control erosion and sediment releases, and to protect Work and existing facilities from flooding during construction period.
2. Design erosion and sediment controls to handle peak runoff resulting from 25-year, 24-hour storm event based on U.S. Weather Bureau, "Rainfall-Frequency Atlas of the United States for Duration from 30 minutes to 24 Hours and Return periods from 1 to 100 Years," Technical Paper No. 40,1981. The NOAA Atlas 14 Precipitation-Frequency Atlas of the United States Volume 9 Version 2.0: Southeastern States (Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi) 2013 is also an acceptable document to use.

3. Size temporary stormwater conveyances based on procedures presented in U.S. Department of Agriculture, "Urban Hydrology for Small Watersheds," Soil Conservation Service Engineering Technical Release No. 55, 1986. Temporary flood control facilities for design flood with minimum of 2 feet of freeboard. The design flood shall be as published by FEMA for 100-year recurrence interval.

3.06 STORAGE YARD AND BUILDINGS

- A. Temporary Storage Yard: Construct temporary storage yards for storage of products consistent with the manufacturer's recommendations, and which would not be subject to damage by weather conditions during the course of construction. Location to be approved by Owner.
- B. Temporary Storage Buildings:
 1. Provide environmental control systems that meet recommendations of manufacturers of equipment and materials stored.
 2. Arrange or partition to provide security of contents and ready access for inspection and inventory.
 3. Store combustible materials (paints, solvents, fuels, etc.) in a well-ventilated and remote building meeting safety standards.
- C. Fuel Storage: Follow all required guidelines and regulations for storage of fuel onsite. Prevent fuel spills while fueling.

3.07 TEMPORARY ACCESS ROADS AND BERMS

- A. Construct temporary access roads as needed for access to the closure area, stockpiles materials or construction trailers. Access road from the storage yard to the landfill access road will be coordinated with the RPR. Remove temporary construction roads upon completion of construction and restore the site to original conditions. Photographs prior to use, and after restoration are required to be submitted with requests for payment. Restore sod to original or better condition.

- B. Delivery on-road vehicles will be allowed to drive on top of the geomembrane liner provided there is at least 4-foot thick of granular fill in areas where vehicles are driving and care is taken not to damage the liner. Any damage to the liner as a result of driving on top of the liner shall be repaired at Contractor's expense and no cost to the Owner. The fill used for building temporary access road on top of the liner can be reused as part of the protective cover provided it is not contaminated and meets Project Specifications.
- C. Maintain Drainage Ways: Install and maintain culverts to allow water to flow beneath temporary access roads. Provide corrosion-resistant culvert pipe of adequate strength to resist construction loads.
- D. Provide gravel, crushed rock, or other stabilization material to permit access by all motor vehicles at all times.
- E. Maintain road grade throughout construction to eliminate potholes, rutting, and other irregularities that restrict access.

3.08 PARKING AREAS

- A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations. Do not park any place in the landfill except in designated parking area.
- B. Provide parking facilities for personnel working on the Project. No employee or equipment parking will be permitted on Owner's existing paved areas and landfill roads other than the Contractor's staging area.
- C. Sod all disturbed areas in accordance with Section 02480, Sodding, Seeding and Mulching.

END OF SECTION

SECTION 01568
TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 DESCRIPTION

- A. The Work specified in this section consists of designing, providing, maintaining and removing temporary erosion and sedimentation controls as necessary to protect the Work, prevent sedimentation from the Contractor's activities to enter water bodies or enter other parts of the Owner's site outside the construction limits.
- B. Temporary erosion controls include, but are not limited to, grassing, mulching, netting, watering and reseeded on-site surfaces and soil and borrow area surfaces, and providing interceptor ditches at end of berms and at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by the regulatory agencies having jurisdiction.
- C. Temporary sedimentation controls include, but are not limited to, silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the regulatory agencies having jurisdiction.
- D. Contractor is responsible for providing effective temporary erosion and sediment control measures during construction or until final controls become effective.
- E. Contractor shall be responsible for filing Notice of Intent for Construction Activities with regulatory agencies (FDEP NPDES Construction and SJRWMD) as required by law, if thresholds are expected to be exceeded.
- F. Contractor shall prepare and submit an Erosion and Sedimentation Control Plan (Storm Water Pollution Prevention Plan) for Engineer's review and FDEP approval. The Plan shall be in effect throughout the construction duration.
- G. The areas of unstabilized soil cover shall be minimized at all times to limit erosion and sedimentation.

PART 2 PRODUCTS

2.01 EROSION CONTROL

- A. Netting: Fabricated of material in conformance with Section 985 FDOT Specification for Road and Bridge Construction.

2.02 SEDIMENTATION CONTROL

- A. Bales: Synthetic material, do not use hay materials.
- B. Netting: Fabricated of material in conformance with Section 985 FDOT Specification for Road and Bridge Construction.
- C. Filter Stone: Crushed stone conforming to Florida Department of Transportation specifications.
- D. Concrete Block: Hollow, non-load bearing type.
- E. Concrete: Exterior grade not less than 1-inch thick.

PART 3 EXECUTION

3.01 EROSION CONTROL (TEMPORARY GRASSING)

- A. Minimum procedures for grassing are:
 - 1. Scarify slopes to a depth of not less than six inches and remove large clods, rock, stumps, roots larger than 1/2 inch in diameter and debris.
 - 2. Install Sod as needed for temporary erosion control after performing procedure A1.
 - 3. If seed is used, sow seed within 24 hours after the ground is scarified with either mechanical seed drills or rotary hand seeders.
 - 4. Apply mulch loosely and to a thickness of between 3/4-inch and 1-1/2-inches. Apply netting over mulched areas on sloped surfaces.
 - 5. Roll and water seeded areas in a manner which will encourage sprouting of seeds and growing of grass. Reseed areas which exhibit unsatisfactory growth. Backfill and seed eroded areas.

3.02 SEDIMENTATION CONTROL

- A. Install and maintain silt fences and dams, traps, barriers, and appurtenances as needed. Hay bales which deteriorate and filter stone which is dislodged shall be replaced.

3.03 PERFORMANCE

- A. Should any of the temporary erosion and sediment control measures employed by the Contractor fail to produce results which comply with the requirements of the regulatory agency having jurisdiction, Owner or Engineer, the Contractor shall immediately take whatever steps necessary to correct the deficiency at his own expense to protect the Work and the Owner's site.
- B. The side slope areas with un-stabilized or un-protected soil cover shall be minimized at all times to limit erosion and sedimentation.
- C. No exposed solid waste shall be allowed at the end of the day. All solid waste shall be covered and prevented to mix with stormwater run-off.

END OF SECTION

SECTION 01630
SUBSTITUTIONS AND PRODUCT OPTIONS

PART 1 GENERAL

1.01 SUBMISSIONS FOR PRODUCT SUBSTITUTIONS

- A. General: Product substitutions may be proposed by the Contractor, as indicated by the "or approved equal" phrase appearing throughout these Specifications, provided the substitute product is equal to or better than the named products.
- B. The Contractor shall furnish sufficient detailed information so that an evaluation can be made of any proposed "equal" product. This information shall be submitted with the Shop Drawings. Submission of inadequate or incomplete information as required to properly evaluate a proposed "equal" product will be sufficient grounds for rejection.
- C. Submission shall include, but not be limited to, the following:
 - 1. Performance capabilities.
 - 2. Materials and construction details.
 - 3. Manufacturer's production and service capabilities.
 - 4. Evidence of proven reliability.
 - 5. Specific references to characteristics either superior or inferior to specified requirements.
 - 6. Detailed estimate of operating and maintenance costs.

1.02 EVALUATION OF PRODUCT SUBSTITUTIONS

- A. The information required to be furnished for evaluation of product substitutions will be evaluated as follows:
 - 1. Performance capabilities and materials and construction details will be evaluated based upon conformance with the Specifications. Products that do not conform to the Specifications will not be acceptable.
 - 2. Manufacturer's production and service capabilities and evidence of proven reliability will be acceptable if the following is furnished:
 - a. Written evidence that the manufacturer has been employed in the manufacture of specified equipment for sufficient time to enable them to produce a quality product, which meets or exceeds the design and manufacture quality of the substituted product.
 - b. Written evidence of at least three applications, of a type and size similar to the proposed substitute product, in successful operation for a period of at least 1 year.

- B. Specific reference to characteristics either superior or inferior to specified requirements will be evaluated based on their net effect on the Project. Products with any characteristics inferior to those specified will not be acceptable unless offset by characteristics that, in the opinion of the Engineer, will cause the overall effect of the product on the project to be at least equal to that of those specified.
- C. The detailed estimate of operating and maintenance costs will be evaluated based on comparison with similar data on the specified products. Proposed substitute products, which have an operating and maintenance cost that, in the opinion of the Engineer, exceeds that of the specified products, will not be considered equal and will not be acceptable.

1.03 REIMBURSEMENT

- A. The Contractor shall be responsible for all costs associated with product substitutions that require major design changes to related or adjacent work made necessary by the substitutions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 01700
CONTRACT CLOSEOUT**

PART 1 GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Comply with requirements stated in Conditions of the Contract and in Specifications for administrative procedures in closing out the Work.
- B. Related Requirements Described Elsewhere:
 - 1. Conditions of the Contract. Fiscal provisions, legal submittals and additional administrative requirements.
 - 2. Cleaning.
 - 3. Section 01720, Project Record Documents.
 - 4. The respective sections of Specifications: Closeout Submittals Required of Trades.
- C. Substantial and Final Inspection: During such inspections, the work shall be clean and free from water. In no case will the final pay request be prepared until the Contractor has complied with all requirements set forth and the Engineer has made his final inspection of the entire work and is satisfied that the entire work is properly and satisfactorily constructed in accordance with the requirements of the Contract.

1.02 SUBMITTALS

- A. Quality Control Submittals: Written procedures for maintaining and markup of record documents.
- B. Contract Closeout Submittals: Submit prior to application for final payment.
 - 1. Record Documents: As required in the General Conditions.
 - 2. Special Bonds, Special Warranties, and Service Agreements.
 - 3. Consent of Surety to Final Payment: As required in the General Conditions.
 - 4. Releases or Waivers of Liens and Claims: As required in the General Conditions.
 - 5. Releases from Agreements.
 - 6. Final Application for Payment: Submit in accordance with procedures and requirements stated in Section 01028, Applications for Payments.
 - 7. Spare Parts and Special Tools: As required by individual Specification sections.

8. Evidence of compliance with requirements of governing authorities.
9. Certificate of Insurance for Products and Completed Operations.
10. Asbestos free letter as per General Conditions.

1.03 SUBSTANTIAL COMPLETIONS

- A. Contractor shall provide the following liner system related materials and certifications prior to requesting a substantial completion inspection:
 1. Geomembrane Installer's Certification of Subgrade Acceptability.
 2. Geomembrane Manufacturer's Certification of Proper Installation.
 3. Geomembrane Record Documents Including:
 - a. Panel and sheet numbers.
 - b. Panel layout drawing.
 - c. Seaming equipment and operator identification.
 - d. Temperature and speed setting of seaming equipment.
 - e. Identity and location of each repair, cap strip, penetration, boot, and sample taken from installed geomembrane for testing.
 4. All material and seam test results.
 5. Geomembrane Manufacturer's Special Guarantee.
 6. Geomembrane Installer's Special Guarantee.
 7. All quality assurance and quality control data and certifications required by Section 02373, Composite Drainage Net (CDN); Section 02668, High Density Polyethylene Geomembrane Liner; 02669, Linear Low Density Polyethylene (HDPE) Geomembrane.
 8. All soil test data required by Section 02221, Excavation, Trenching, Backfilling for furnishing and placement of drainage sand.
- B. Prior to the designated substantial completion inspection date, the Contractor shall deliver all specified spare parts and equipment along with a list of the equipment as a submittal for review and approval by the Engineer. If the submittal is complete and approved, the equipment will be forwarded to the Owner.
- C. When Contractor believes the Work has achieved substantial completion, he shall submit to the Engineer.
 1. A written notice that the Work or designated portion has reached substantial completion and ready for inspection.
 2. A punch list of items to be completed or corrected.
- D. Within a reasonable time after receipt of such notice, the Engineer will make an inspection to determine the status of completion. The Contractor's Superintendent will be present during the substantial inspection and walk through.

- E. Should the Engineer determine that the Work is not substantially complete:
 - 1. The Engineer will promptly notify the Contractor in writing, providing a list of deficiencies and the reasons therefore.
 - 2. Contractor shall remedy the deficiencies in the Work and send a second and last written notice of substantial completion to the Engineer.
 - 3. The Engineer will re-inspect the Work upon notification.

- F. When the Engineer finds that the Work is substantially complete, the Engineer will:
 - 1. Prepare and deliver to Owner a tentative Certificate of Substantial Completion on form provided herein, with a tentative list of items to be completed or corrected before final payment.
 - 2. After consideration of any objections made by the Owner as provided in Conditions of the Contract, and when the Engineer considers the Work substantially complete, he will execute and deliver to the Owner and the Contractor a definite Certificate of Substantial Completion with a revised tentative list of items to be completed or corrected.

1.04 FINAL INSPECTION

- A. When Contractor considers the Work is complete, the Contractor shall submit written certification to the Engineer stating that:
 - 1. Contract Documents have been reviewed.
 - 2. Work has been inspected for compliance with Contract Documents.
 - 3. Work has been completed in accordance with Contract Documents.
 - 4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.

- B. The Engineer will make one inspection to verify the status of completion with reasonable promptness after receipt of the Contractor's certification.

- C. Should the Engineer consider that the Work is incomplete or defective:
 - 1. The Engineer will promptly notify the Contractor in writing, listing the incomplete or defective work.
 - 2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to the Engineer that the Work is complete.
 - 3. The Engineer will reinspect the Work.

- D. When the Engineer finds that the Work is acceptable under the Contract Documents, he shall request the Contractor to make closeout submittals.

1.05 REINSPECTION FEES

- A. Should the Engineer perform re-inspection due to failure of the Work to comply with the Contractor's written certification of substantial and/or final completion:
1. The Owner will compensate the Engineer for such additional services.
 2. The Owner will deduct the amount of such compensation from the final payment to the Contract.

1.06 RECORD DOCUMENTS

- A. Quality Assurance:
1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
 2. Accuracy of Records:
 - a. Coordinate changes within record documents, making legible and accurate entries on each page of Specifications and each sheet of Drawings and other documents where such entry is required to show change.
 - b. Purpose of Project record documents is to document factual information regarding aspects of Work, both concealed and visible, to enable future modification of Work to proceed without lengthy and expensive site measurement, investigation, and examination.
 3. Make entries within 24 hours after receipt of information that a change in Work has occurred.
 4. Prior to submitting each request for progress payment, request Engineer's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may result in a referral by Engineer to recommend that the Contractor's Application for Payment, either partial or final be withheld in whole or in part.

1.07 RELEASES FROM AGREEMENTS

- A. Furnish Owner written releases from property owners or public agencies where side agreements or special easements have been made, or where Contractor's operations have not been kept within the Owner's construction right-of-way.

- B. In the event Contractor is unable to secure Written Releases, inform the Owner of the reasons:
1. Owner or its representatives will examine the site, and Owner will direct Contractor to complete Work that may be necessary to satisfy terms of the easement.
 2. Should Contractor refuse to perform this Work, Owner reserves the right to have it done by separate Contract and deduct the cost of same from the Contract Price, or require the Contractor to furnish a satisfactory Bond in a sum to cover legal claims for damages.
 3. When Owner is satisfied that Work has been completed in agreement with the Contract Documents and terms of easements, the right is reserved to waive the requirement for written release if: (i) Contractor's failure to obtain such statement is due to the grantor's refusal to sign, and this refusal is not based upon any legitimate claims that Contractor has failed to fulfill the terms of the easement, or (ii) Contractor is unable to contact or has had undue hardship in contacting the grantor.

1.08 FINAL APPLICATION FOR PAYMENT

- A. Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the General Conditions of the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 MAINTENANCE OF RECORD DOCUMENTS

- A. General:
1. Promptly following commencement of Contract Times, secure from Engineer at no cost to Contractor, one complete electronic copy and one set of paper copy of Contract Documents. Drawings will be full size. In addition, secure from the Owner/Engineer, one extra set of civil site as-build drawing documenting the location of underground utilities.
 2. Delete Engineer title block and seal from all documents.
 3. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.
 4. Record information concurrently with construction progress and within 24 hours after receipt of information that change has occurred. Do not cover or conceal Work until required information is recorded.
- B. Preservation:
1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

2. Make documents and Samples available at all times for observation by Engineer.
- C. Making Entries on Drawings:
1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
 - a. Color Coding:
 - 1) Green when showing information deleted from Drawings.
 - 2) Red when showing information added to Drawings.
 - 3) Blue and circled in blue to show notes.
 2. Date entries.
 3. Call attention to entry by “cloud” drawn around area or areas affected.
 4. Legibly Mark to Record Actual Changes Made During Construction, Including, but Not Limited to:
 - a. Information and data required by Section 01060, Surveying
 - b. Depths of various elements of foundation in relation to finished first floor data if not shown or where depth differs from that shown.
 - c. Horizontal and vertical locations of existing and new Underground Facilities and appurtenances, and other underground structures, equipment, or Work. Reference to at least two measurements to permanent surface improvements.
 - d. Location of internal utilities and appurtenances concealed in the construction referenced to visible and accessible features of the structure.
 - e. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.
 - f. Changes made by Addenda, Work Change Directive, Change Order, and Engineer's written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.
 5. Dimensions on Schematic Layouts: Show on Record Drawings, by dimension, the centerline of each run of items such as are described in previous subparagraph above.
 - a. Clearly identify the item by accurate note such as “cast iron drain,” “HDPE Pipe,” and the like.
 - b. Show, by symbol or note, vertical location of item (“under slab,” “in ceiling plenum,” “exposed,” and the like).
 - c. Make identification so descriptive that it may be related reliably to Specifications.

3.02 FINAL CLEANING

- A. At completion of Work or of a part thereof and immediately prior to Contractor's request for certificate of Substantial Completion; or if no certificate is issued, immediately prior to Contractor's notice of completion, clean entire site or parts thereof, as applicable.
 - 1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to Owner and Engineer.
 - 2. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
 - 3. Leave water courses, gutters, and ditches open and clean.
- B. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.

3.03 FINAL GUARANTEE

- A. All work shall be guaranteed by the Contractor for a period of 1 year from the date of final acceptance of the work by the Owner unless otherwise required by other sections of these Contract Documents.
- B. If mitigation/restoration of wetlands occurs due to Contractor violations of permit conditions and impact caused by Contractor activities aside from approved permitted activities, work shall be guaranteed by the Contractor for a minimum period of 3 years or as long as required by the regulatory agencies.
- C. If, within the guarantee period, repairs or changes are required in connection with guaranteed work, which, in the opinion of the Engineer, is rendered necessary as the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, the Contractor shall, promptly upon receipt of notice from the Owner and without expense to the Owner, do the following:
 - 1. Place in satisfactory condition in every particular all of such guaranteed work and correct all defects therein.
 - 2. Make good all damage to the site, or contents thereof, which, in the opinion of the Engineer, is the result of the use of materials or workmanship which are inferior, defective, or not in accordance with the terms of the Contract.
 - 3. Make good any work or material and contents of structure or site disturbed in fulfilling any such guarantee.

- D. If the Contractor, after notice, fails within ten (10) calendar days to proceed to comply with the terms of this guarantee, the Owner may have the effects corrected, and the Contractor and his surety shall be liable for all expense incurred, provided, however, that in case of an emergency where, in the opinion of the Owner, delay would cause loss or damage, repairs may be started without notice being given to the Contractor and the Contractor shall pay the cost thereof.
- E. All special guarantees or warranties applicable to specific parts of the work as may be stipulated in the Contract Specifications or other papers forming a part of this Contract shall be subject to the terms of this paragraph during the first year of life of such guarantee. All special guarantees and manufacturer's warranties shall be assembled by the Contractor and delivered to the Engineer, along with a summary list thereof, before the acceptance of the Work

3.04 SUPPLEMENTS

- A. The supplements listed below, following "END OF SECTION," are part of this Specification.
 - 1. Supplement 1, Punch List.
 - 2. Supplement 2, Certificate of Substantial Completion.

END OF SECTION



CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT: _____ PROJECT NO: _____

OWNER: _____

CONTRACTOR: _____

ENGINEER: _____

DATE OF ISSUANCE: _____

Designated Area Shall Include:

The Work performed under this contract has been inspected by authorized representatives of the Owner, Contractor, and Engineer, and the Project (or designated area of the project, as indicated above) is hereby declared substantially completed. The Substantial Completion Date for the designated area _____ which is also the date of commencement of all warranties and guarantees required by the Contract Document, unless otherwise specified.

The Contractor has complied with all the requirements of Substantial Completion, as stated in the GENERAL CONDITIONS of the Contract for this project, or designated portion thereof.

Engineer Date

The Contractor acknowledges receipt of this Certificate of Substantial Completion and agrees to complete or correct the Work on the list of items appended hereto within the Contract completion period.

Contractor Title Date

The Owner accepts the Project, or designated portion thereof, as substantially complete and will assume full possession thereof at _____ o'clock, (AM, PM) on _____, 20 _____

Owner Title Date

The responsibility of the Owner and the Contractor for security, operation, safety, maintenance, heat, and utilities shall be set forth on the attachments. (NOTE: Owner's and Contractor's legal and insurance counsel should determine and review insurance requirements and coverage.)

Attachments (Describe):

**SECTION 02200
SITE CLEARING**

PART 1 GENERAL

1.01 SUMMARY

- A. The Work specified in this section includes clearing (i.e., removal of materials found on the ground surface including brush, waste, etc.) and grubbing (i.e., removal of materials at, or protruding from, the ground surface such as roots, rebar, sharp objects, metals, etc.) materials which are understood by generally accepted practice to be unsuitable for placement of the soil layer under the geomembrane and under stormwater management facilities as shown on the Drawings and specified herein.
- B. The Contractor shall provide necessary protection as required to prevent damage to existing improvements including protection of the bottom liner system and leachate pumps and collection system, and protection of existing landfill gas system and other improvements indicated to remain in place. Any repairs, replacement, testing and/or sampling required as a result of damage to existing facilities will be the responsibility of the Contractor at no additional cost to the Owner.
- C. If the Owner accepts Additive Option 2 for obtaining fill material on-site, Contractor shall furnish all labor, materials and equipment to clear and grub, remove top soil/roots and stockpile nearby on a designated area of Section G as designated by the Owner.

1.02 EROSION AND SEDIMENTATION CONTROL PLAN

- A. Prior to initiating site-clearing activities, the Contractor shall implement the appropriate provisions of an Erosion and Sedimentation Control Plan as submitted by the Contractor and approved by the Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SITE CLEARING AND INITIAL SOLID WASTE GRADING

- A. Sod placed on the sideslope will be stripped from the side slopes in order to re-grade and prepare the sub-base side slopes for installation of the leveling course. Contractor shall locate and flag the existing LFG wells and piping and prevent damage. All clearing shall be conducted to minimize interference with other adjacent facilities.

- B. Initial solid waste grading includes grading and shaping of the side slopes to fill-in the depressions provided the slopes are no steeper than 4H:1V, removal of existing temporary spillways, cutting the proposed terraces and cutting the trenches for the new stormwater letdown pipes.
- C. All rubbish and waste generated as a result of site clearing and initial solid waste grading are to be buried in the landfill, used to fill depression areas and low spots provided no sharp objects such as rebar or other metals are protruding from the waste surface that could damage the liner.
- D. The top 6 inches of Granular fill used for the leveling course shall be free of any solid waste contamination. As areas are prepared and prior to liner installation, Contractor will inform Engineer of readiness to perform tests as may be required to confirm the top 6 inches of leveling course is free of any solid waste. Any contaminated area will be flagged by the Engineer for replacement of the fill at no additional cost to the Owner.

END OF SECTION

SECTION 02221
EXCAVATION, TRENCHING, BACKFILLING AND EMBANKMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals necessary to perform all excavation, waste grading, backfill, fill and grading required to complete the work shown on the Drawings and specified herein. The work shall include, but not necessarily be limited to, all excavations and trenching, all backfilling, embankment and grading, and all related work such as sheeting, bracing, dewatering, solid waste excavation, solid waste grading, solid waste removal, all earthwork and all other requirements shown on the Drawings and specified in the Contract Documents.
- B. The Contractor shall examine the site and collect all data necessary prior to submitting his bid and taking into consideration all conditions that may affect his work. The Owner and Engineer do not assume responsibility for variations of subsurface and site conditions.
- C. The work of this section shall include, but not necessarily be limited to excavating, hauling, backfilling, compaction, and grading of soil and solid waste materials. The work will pertain all or in part to construction of earthen berms, drainage swales, down comer pipes and structures, drainage ditches and culverts, access roads, pipes, solid waste excavation, removal and grading, installation of final cover system and disposal of surplus materials. Contractor shall conform to the dimension lines, grades and sections specified on the Drawings.

1.02 RELATED WORK

- A. Section 01568, Temporary Erosion and Sedimentation Control.
- B. Section 02669, Linear Low Density Polyethylene Geomembrane.
- C. Section 02480, Sodding, Seeding and Mulching.
- D. Section 15071, High Density Polyethylene (HDPE) Pipe and Fittings for Letdown Pipes and Culverts.
- E. Section 15073, High Density Polyethylene (HDPE) Pipe and Fittings for LFG Management System.

1.03 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest version of standards in effect shall be used.
- B. American Association of State Highway and Transportation Officials (AASHTO) Standards:
 - 1. M145-82, The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes.
 - 2. T180-74, Moisture-Density Relations of Soils Using a 10-lb. (4.54 kg) Rammer and an 18-inch (457 mm) Drop.
 - 3. T 191-61, Density of Soil In-Place by the Sand-Cone Method. (R 1982).
- C. Florida Department of Transportation; "Standard Specifications for Road and Bridge Construction FDOT", 2015 or latest revision to date.
- D. American Society for Testing and Materials (ASTM):
 - 1. D422, Standard Method for Particle-Size Analysis of Soils.
 - 2. D698, Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using a 5.5-lb (2.49-kg) Rammer and 12-in. (305-mm) Drop.
 - 3. D1556, Standard Test Method for Density of Soil In-Place by the Sand-Cone Method.
 - 4. D2216, Standard Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil Aggregate Mixtures.
 - 5. D2487, Standard Test Method for Classification of Soils for Engineering Purposes.
 - 6. D2922, Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Density Methods (Shallow).
 - 7. D3017, Standard Test Method for Water Content of Soil and Rock In-Place by Nuclear Methods (Shallow Depth).
 - 8. D2937, In-Place Density as a Check of Nuclear Densometer Measurements.

1.04 DEFINITIONS

- A. Off-Site Granular Fill: Granular fill from off-site shall consist of soil material classified as SW, SW-SM, SP, or SW-SC under the Unified Classification System (ASTM D2487) which does not contain any roots, stones or clods larger than 1 inch in any dimension (diameter and length) and which has no more than 10 percent of its material by weight passing the No. 200 sieve.

- B. **Unsatisfactory Materials:** Unsatisfactory materials shall be materials that do not comply with the requirements for granular fill. Unsatisfactory materials in off-site or onsite fill material include, but are not limited to, those materials containing roots and other organic matter, trash, debris, shells and stones larger than 1 inch, and materials classified in AASHTO M145 as groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7. Unsatisfactory materials also include man-made fills, refuse, reclaimed construction materials, fill material contaminated with solid waste, or backfills from previous construction.
- C. **Unyielding Material:** Unyielding material shall consist of rock and gravelly soils with stones greater than 2 inches in any dimension.
- D. **Unstable material** shall consist of material without the sufficient bearing capacity to support the utility pipe conduit or appurtenance structure.
- E. **Limerock for Incidental Road Base Repair Construction** shall be FDOT Section 230.
- F. **Crushed material for swale underdrain piping drainage media** shall be non-limestone rock, washed, free of any overburden and spoil meeting FDOT No.57 size gradation and as described in FDOT Section 901-1.4 physical properties and product specifications
- G. **Bedding Rock:** Coarse aggregate structural bedding and support for stormwater structures, piping and appurtenances equal to FDOT No. 57.
- H. **River Run Rock:** Drainage gravel shall be imported, washed, well rounded natural river run rock or well-rounded granite, FDOT No. 3 or No. 4, free from roots, organic material with maximum size of 2-1/2 inches with less than 5 percent passing the 1/2-inch sieve. Aggregate shall be sound, hard and durable quality with LA Abrasion of no more than 20 percent in accordance with ASTM C535.
- I. FDOT No. 89 aggregate may be used as 8-inch subbase under concrete structures in wet areas if granular fill or subbase is unstable. Particle size gradation shall be as follows:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1/2 inch	100
3/8 inch	90 to 100
No. 4	20 to 55
No. 8	0 to 30
No. 16	0 to 10
No. 50	0 to 5

Coarse aggregate shall have a carbonate content of less than 1 percent as determined by ASTM D4373.

- E. Degree of compaction: Degree of compaction shall be expressed as a percentage of the maximum density modified proctor obtained by the test procedure presented in AASHTO T180. Field verification will be obtained by the test procedure presented in AASHTO T191. The term "maximum density" shall mean the maximum density determined under AASHTO T180. the following table summarizes the earthwork compaction requirements for this Project:

Summary of Soil Compaction Requirements				
	<u>Lifts- inches</u>		<u>Percent Compaction</u>	
Granular Fill- Subgrade under Geomembrane Liner no structures	6	AASHTO T-180	90	Top lift compacted with passes of a wide track dozer for each layer
Granular Fill- Protective Layer over Geomembrane Liner- 18-inch minimum thickness when used with humic topsoil, 24-inch thickness when amended for topsoil layer- no structures	12	AASHTO T-180	90	12-inch minimum thickness per lift, with wide track dozer. No track equipment allowed if thickness is less than 12 inches
Granular Fill over Composite Drainage Net-18 inch minimum thickness when used with humic topsoil, 24-inch thickness when amended for topsoil layer	12	AASHTO T-180	90	12-inch minimum thickness per lift, No track equipment allowed if thickness is less than 12 inches
Granular Fill within influence of Structures	6	AASHTO T-180	98	Areas under piping, slabs, structures and other facilities
Granular Fill for Embankment (Berm)	12	AASHTO T-180	95	Minimum of six passes of 5-ton vibratory roller for each layer
Granular Fill under Disposal Cell Roads (on Disposal Cell)	6	AASHTO T-180	95	Minimum of six passes of 5-ton vibratory roller for each layer
Granular Fill under Non Disposal Cell Roads	6	AASHTO T-180	98	Minimum of six passes of 5-ton vibratory roller for each layer
Topsoil-Top Soils under Sod or Seed and mulch	6	AASHTO T-180	90	Water flooding or jetting methods of compaction not allowed

- J. Topsoil: is defined as humus media to dark brown organic amorphous earth consisting of partly decomposed vegetative matter for use as described in Section 02480, Sodding, Seeding, and Mulching.

1.05 PROTECTION

- A. Prior to commencing excavation or dewatering, the Contractor shall take precautions to ensure that existing structures, which may be subject to settlement or distress resulting from excavation or dewatering are protected. Such precautions shall include establishing reference elevation markings on structures which are adjacent to new work and monitoring them to ascertain evidence of settlement or distress throughout construction. If settlement or distress becomes evident, modifications to the excavation, dewatering, or protection procedures shall be made to prevent additional settlement or distress and any damage caused to the structure shall be repaired at the Contractor's expense.
- B. The Contractor shall furnish, put in place, and maintain such sheeting and bracing as may be required to support the sides of excavations, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction, and to protect adjacent structures and other facilities from undermining or other damage. The stability of all excavated faces shall be maintained in compliance with the Occupational Safety and Health Administration's excavation safety standards, 29 C.F.R. S. 1926.650 Subpart P until final acceptance of the work. The Contractor shall also comply with all applicable requirements of the Florida "Trench Safety Act" (90-96, Laws of Florida).
- C. The Contractor shall, at all times during construction, provide and maintain proper equipment and facilities to remove all water entering excavations, and shall keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition until the fills, structures or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural levels. Dewatering shall be conducted in such a manner as to preserve the undisturbed bearing capacity and composition of the subgrade soils at the proposed bottom of the excavation. Grading shall be done as may be necessary to prevent surface water from flowing into the excavation, and any water accumulating therein shall be removed so that the stability of the bottom and sides of the excavations is maintained.
- D. The Contractor shall install and maintain all erosion control features including silt fences around all areas downslope of soil disturbance, and wetland boundaries and water bodies. Other areas which may require erosion protection or silt fences shall be identified by the Contractor and reviewed

with RPR during construction. Silt fences shall not be removed until the contained areas are successfully revegetated.

1.06 SUBMITTALS

- A. Submit to the Engineer, the proposed methods of construction, including dewatering, excavation, bedding, filling, grading, compaction, and backfilling for the various portions of the work. The Contractor shall remain responsible for adequacy and safety of the methods.
- B. For off-site granular fill specified in Part 2 of this section, the Contractor shall submit to the RPR and the CQA Consultant the following information and samples prior to start of earthwork construction:
 - 1. The proposed source of materials and evidence that sufficient quantities are available for this Project.
 - 2. The results of grain-size analyses conducted on the proposed material in accordance with ASTM D422.
 - 3. The results of a moisture-density relation test (ASTM D698).
 - 4. A 50-pound sample of each of the proposed soils.
- C. The testing results for the above submittals shall be certified by the Contractor's QC independent laboratory.
- D. The Contractor shall make arrangement for the Owner's CQA Consultant to visit the borrow site and take samples for confirmation of testing, if requested.

1.07 CONSTRUCTION QUALITY ASSURANCE

- A. All earthworks shall be performed in accordance with the requirements of the Drawings, Specification documents and as permitted by the FDEP. A copy of the FDEP permit is included in Attachment A to the Specifications and made part of these Contract Documents by reference. The CQA Consultant has a complete copy of the CQA plan submitted to FDEP as part of the permitting and will be responsible to follow the requirements. A copy of the CQA plan is included in Attachment B to the specifications.

1.08 SOIL TESTING

- A. Contractor shall be responsible for quality control (QC) and all required soil testing shall be performed by Contractor's qualified independent testing laboratory at Contractor's expense. Contractor shall provide the Engineer or RPR with copies of QC testing results upon request.
- B. The Owner will employ the services of a qualified testing laboratory to perform all soils testing for quality assurance (QA) purposes needed to assure

conformance. Contractor shall employ a testing laboratory different from the laboratory used by Owner.

- C. The RPR shall have sole authority to increase the frequency of QA testing and shall direct the testing laboratory in its work. The RPR may order the excavation down to any depth of backfilled material, which had not been tested and have a test performed. The Contractor shall excavate for the test and backfill after the test at no cost to the Owner. The Contractor shall re-excavate to the depth required and compact any areas found improperly backfilled at no cost to the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

- A. For Base Bid, all soils material required for this Project shall be from off-site sources.
- B. For Alternate Bid, all soils material will be required to be excavated from an on-site permitted borrow area and transported to the project site.
- C. Only granular fill as defined in this section shall be used as backfill unless otherwise specified by the Drawings and Specifications.
- D. The existing intermediate cover soil installed by the Owner and the slope stabilization contractor may be used as part of the Leveling course if the top 12 inches of the leveling course is not contaminated with solid waste.

2.02 CONFORMANCE TESTING BY CONTRACTOR

- A. Conformance testing shall be performed by the Contractor’s laboratory on samples from the soil source for the granular fill materials. Material identified for use, as granular fill shall be tested at the specified frequency for the following:

<u>Test</u>	<u>Method</u>	<u>Frequency</u>
Grain size	ASTM D422	@ 2,500 cubic yards
Moisture/density	ASTM D698	@ 5,000 cubic yards or change in material
Natural moisture	ASTM D2216	@ 5,000 cubic yards

The Contractor’s laboratory will perform conformance testing on soil moisture, dry unit weight, and lift thickness tests in the field on each lift of granular fill material for compliance with this Specification. Results will be made available to the CQA Consultant.

Results of the tests shall be available to the Engineer and RPR within 24 hours of test completion. The CQA Consultant may reject material based on the results of the conformance tests.

- B. For coarse aggregates, at least one sample per 250 cubic yards of FDOT No. 3 or No. 4 river run rock, FDOT No. 57 and FDOT No. 89 aggregate shall be provided for conformance testing. Sieve analysis (ASTM D422), Carbonate Content (ASTM D4373), LA Abrasion (ASTM C535), and Particle Shape (ASTM D2488) shall be performed by the Contractor's laboratory on samples from each source of the coarse aggregates to assure compliance with the Specifications.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL PROCEDURES

- A. The minimum frequency of QC testing is provided in these Specifications.
- B. Sampling locations shall be selected by the CQA Consultant. If necessary, the location of routine in-place moisture content and dry density test shall be determined using a non-biased sampling plan.
- C. An increased testing frequency shall be used at the discretion of the CQA Consultant when visual observations of construction performance indicate a potential problem.
- D. All perforations resulting from testing shall be filled by the Contractor with soil compacted to the satisfaction of the CQA Consultant.
- E. If a defective area is discovered in the earthwork the CQA Consultant shall immediately notify the engineer and RPR and determine the extent and nature of the defect. If the defect is indicated by an unsatisfactory test result, the CQA Consultant shall determine the extent of the defective area by additional tests, observations, a review of record, or other means. The Contractor shall be responsible for the cost of these additional tests. If the defect is related to material, and/or adverse site conditions, such as overly wet soils or surface desiccation, the Engineer shall define the limits and nature of the defect.
- F. After determining the extent and nature of a defect, the Contractor shall correct the deficiency to the satisfaction of the CQA Consultant. The cost of corrective actions shall be borne by the Contractor.
- G. Additional testing shall be performed to verify that the defect has been corrected before any additional work is performed by the Contractor in the area of the deficiency.

3.02 EASTERN BORROW PIT

- A. If the Owner selects Alternative bid for the granular fill requirements of this Project, Section H of the eastern borrow pit will be available to the Contractor to develop and excavate the required fill.
- B. Based on the agreed upon quantity of fill required for this Project, an area within Section H will be designated to the Contractor for excavation and obtaining the fill material for this Project.
- C. The Owner's Engineer will perform the Gopher Tortoise (GT) survey and will obtain the permit to relocate the GT if any is found.
- D. After the site is cleared of Gopher Tortoise, the site will be turned over to the Contractor to be developed.
- E. The Contractor shall clear and grub the site, remove and stockpile the top soil/root layer in an area nearby in Section G (within 1,000 feet) as designated by the Owner.
- F. A survey to document final grade elevations within the borrow area will be performed by the Contractor's surveyor at the completion of the excavation operation. Provide the final survey files to the Owner prior to final completion.

3.03 TRANSPORTATION AND STOCKPILING OF FILL MATERIAL

- A. Transporting fill material to the site, whether from onsite or off-site source, shall be through the Contractor's entrance road shown on the Drawings.
- B. All internal unpaved roads used by the Contractor shall be maintained in good working condition throughout construction and shall be restored to current condition or better prior to substantial completion of the Project.
- C. Paved roads on the west side of Cell-9, north side of Cell -9 and a portion of east side of Cell-9 shall be resurfaced prior to substantial completion of the Project to the limits shown on the Drawings.
- D. Prior to the start of delivery of soil material to the project site, the Contractor shall prepare a sketch and a written stockpiling plan, if he plans to stockpile soil instead of direct haul to the project site. The plan shall indicate the location of stockpiling areas for different material (e.g. granular fill, river rock, coarse aggregate, etc.) This plan shall also include temporary roads, protection against weather and erosion, protection of the liner and LFG system and must be reviewed and approved by the Engineer prior to any delivery to

the site. Engineer's review of the Contractor's plan will not relieve the Contractor of supplying and installing materials as specified.

- E. If the soil material is to be delivered directly to the project site, the Contractor is required to construct a suitable haul road to protect the Work, especially the geomembrane liner.
- F. Excavated materials classified as granular fill shall be stockpiled in designated areas free of incompatible soil, debris, roots or other objectionable materials.
- G. Excavated material from the ditch restoration operation shall be segregated from clean granular fill and stockpiled or disposed of in the manner shown on the Drawings or as specified by the Engineer.
- H. Excavated solid waste or excess intermediate cover shall be transported to the working face of the landfill and stockpiled as directed by the Owner.
- I. Stockpiles of clean fill shall be no steeper than 3:1 (horizontal: vertical), graded to drain, sealed by tracking parallel to the slope with a dozer or other means approved by the RPR.
- J. Stockpiles shall be recontoured daily during periods when fill is taken from the stockpile.
- K. The Contractor may cover fill stockpiles with plastic sheeting or other material in order to preserve the moisture content of the fill.
- L. Stockpiles that will remain out of active use for a period greater than 3 months shall be maintained in accordance with paragraph I above.

3.04 WASTE SURFACE GRADING AND UPDATING FINAL GRADING PLAN

- A. The Contractor shall grade the existing refuse surface in accordance with the updated final grading plan and to prepare the surfaces for installation of the leveling course, geomembrane, and the protective cover. The Engineer will update the proposed grading plan based on the Contractor's topographic survey to balance the refuse cut and fill to the extent possible such that cut solid waste can be disposed of in the cell to fill depressions and low spots.

- B. The refuse grading is limited to filling the depression areas and low spots for proper stormwater flow, contouring the side slopes for proposed terraces, and excavation of stormwater trenches and down pipes, filling the existing spillways and contouring the interface areas, and grading the surfaces such that the sides will be no more than 4H: 1V sloped, and permitting the stormwater terraces to function as intended.
- C. The intent of the final grading plan is to close the landfill generally in place by installing the leveling course, geomembrane liner and the protective cover system along with earthwork and grading for construction of terraces, stormwater collection and conveyance and other features to create positive stormwater flow from the side slopes to the primary stormwater management system. This Project is for construction of the final closure of a landfill and is intended to maximize remaining airspace available under existing operational permits.

3.05 EXCAVATION

- A. Excavation of every description and of whatever substance encountered shall be performed to the lines and grades indicated. During excavation activities, materials planned by the Contractor for backfilling and cover shall be stockpiled in an orderly and safe manner at a distance from the banks of the excavation, or trench, sufficient to avoid overloading and to prevent slides, cave-ins, washouts, and erosions. Adequate drainage shall be provided for the stockpiles and surrounding areas and measures shall be taken to prevent contamination with unsatisfactory material or other material that may destroy the quality and suitability of the stockpiled material. Should any stockpiled material become so contaminated as to be unsatisfactory, such material shall be removed and replaced with satisfactory material at the Contractor's expense. Excavated material not required or no longer meeting specifications, or unsatisfactory for backfill shall be removed from the project site by the Contractor and disposed in the working face of the landfill or in a place as directed by the Owner.
- B. All roots 2 inch and greater in diameter and any sharp objects shall be removed for a depth of 6 inches below the bottom of the leveling course. The excavation shall then be backfilled up to a specified grade in the manner specified.
- C. Ground surfaces on which structures are to be placed shall be cleared of live, dead, and decayed vegetation, debris, and all other unsatisfactory loose material. Limits of clearing shall be determined by the Contractor. In no case shall unsatisfactory material remain exposed in the cleared area. Before placement of concrete or grout, the upper 12 inches of subgrade material shall

be compacted to a minimum of 95 percent of maximum compaction (modified proctor).

3.06 TRENCHING

- A. The trench shall be excavated as recommended by the manufacturer of the pipe to be installed and as shown on Drawings. Trench walls below and above the top of the pipe shall be sloped, or made vertical, as shown on the Drawings.
- B. The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom half of each section of the pipe. Trench bottoms shall be excavated to the necessary size at each joint or coupling to eliminate point bearing. The trench bottom is preferred to be free from unyielding material. Where unyielding material is encountered in the bottom of the trench, such material shall be removed 6 inches below the required grade and replaced with granular fill.
- C. Unless otherwise specified or indicated on the Contract Drawings, pipe trenches shall be of a depth to provide a minimum cover of 24 inches over the top of the pipe from the lower of the existing ground surface, or from the indicated finished grade.

3.07 MISCELLANEOUS EXCAVATION AND REMOVAL OF WATER

- A. The Contractor shall perform all the remaining miscellaneous excavation. The Contractor shall make all excavations necessary to permit the completion of the Work as shown on the Drawings and specified herein.
- B. The landfill surface may be assumed to be wet. The Contractor shall design, provide and operate equipment adequate to keep sideslopes and all excavations and trenches free of water and remove all water as required for efficient and safe execution of the Work throughout the construction of this Project. The existing perimeter ditch may be used by the Contractor for disposal of removed water that does not contain any leachate. Water conveyed to the perimeter stormwater ditch or wet detention ponds shall not be mixed with any leachate. If removed water is mixed with leachate, it is considered leachate and must be collected and properly disposed in the leachate pump station on-site with prior notification and approval of the Owner.

3.08 BACKFILLING OF GRANULAR FILL

- A. The berms, access roads, channels, fill slopes, pipes, and stormwater structures shall be constructed to the lines and grades shown on the Drawings.

- B. For fill under structures, fill material shall consist of granular fill as defined herein and as shown on the Drawings. Backfill shall be placed in layers (lifts) not exceeding 6 inches loose thickness for compaction by hand-operated machine compactors, and 8 inches loose thickness for other than hand-operated machines, unless otherwise specified. Each layer shall be compacted to at least 95 percent of the maximum dry density as determined by AASHTO T180 for cohesionless soils unless otherwise specified. The dry density and moisture content shall be measured in accordance with ASTM D2922 method B, and ASTM D3017, respectively. The bottoms of all excavations shall be compacted to at least 95 percent of the maximum density prior to backfill.
- C. For trenches, unyielding material removed from the bottom of the trench, and unsuitable or unstable material removed from the trench shall be replaced with granular fill as shown on the Drawings. Replacement materials and backfill materials shall be placed in layers not exceeding 6 inches loose thickness. In unpaved areas, each layer of replacement material, or backfill material, shall be compacted to at least 95 percent of maximum density. In paved areas, each layer of replacement material, or backfill material, shall be compacted to at least 98 percent of maximum dry density.
- D. For paved areas, backfill shall be placed up to the elevation indicated and compacted to not less than 98 percent maximum dry density as determined by AASHTO T180 in not more than 12-inch lifts. Water flooding or jetting methods of compaction will not be permitted.
- E. For sodded areas and miscellaneous areas: Backfill shall be deposited in layers of a maximum of 12-inch loose thickness, and compacted to 90 percent maximum dry density as determined by AASHTO T180. Compaction by water flooding or jetting will not be permitted. This requirement shall also apply to all other areas not specifically designated above.
- F. Moisture control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface or subgrade, or layer of soil material. Prevent free water from appearing on surface during or subsequent to compaction operations.
1. Remove and replace, or scarify and air-dry, soil material that is too wet to permit compaction to specified density.
 2. Soil material that has been removed because it is too wet to permit compaction, but is otherwise satisfactory, may be stockpiled or spread and allowed to dry until moisture is reduced to a satisfactory value.

3.09 PLACEMENT OF GRANULAR FILL BELOW GEOMEMBRANE (LEVELING COURSE)

- A. After the grading and compaction of the refuse surface, place granular fill at low depression areas to first smooth out the refuse surface. Place granular fill in 6-inch lifts and compact each lift to 90 percent relative compaction. Compact the last lift of granular fill before placement of geomembrane in accordance with requirements of paragraph 1.04.J.
- B. The existing soil may be used as part of the leveling course if the soil is not contaminated as a result of the Contractor's clearing activity, LFG construction or other activities.
- C. Contractor to locate and flag the existing stormwater and related permanent structures and LFG piping within the project area and protect these during fill operations.
- D. Contractor to protect the sideslope from erosion and make all interim improvements for stormwater run-off and repair all erosions as part of the lump sum portion of the Contract. If any portion of the granular fill material (leveling course and protective cover) is washed down the slope and the material is visibly contaminated, the material cannot be reused for closure cover system and shall be removed and replaced at Contractor's expense.

3.10 PLACEMENT OF GRANULAR FILL ABOVE CDN AND GEOMEMBRANE (PROTECTIVE COURSE)

- A. Place the first lift of granular fill above the barrier layer in 12-inch lifts to protect the geomembrane. Compact the upper 6 inches of the granular fill to 90 percent relative compaction. The Contractor shall exercise caution throughout placement of the granular fill above the geomembrane to protect the liner and the CDN from damage and keep construction equipment off the geomembrane. Track mounted equipment with low ground pressure treads, no larger than a D-6 shall be used for spreading granular fill over the geomembrane. No track equipment shall be allowed to operate on less than 12 inches of cover over the geomembrane or CDN. No delivery truck shall be allowed on geomembrane with less than 4 feet of granular fill. The granular fill shall be compacted with steel wheel or pneumatic roller only. The Contractor shall avoid sharp turns, sudden starts and stops, spinning and digging of tracks, or any other operation that could damage the landfill cover system. All damages to the geomembrane and CDN as a result of Contractor's operations and construction activities will be repaired by the Contractor immediately.

- B. The granular fill shall be placed from toe to the top of the landfill were indicated in such manner that no air is trapped beneath the geomembrane and no wrinkles are created. The Contractor shall have a spotter at each of the granular fill placement areas to make sure fill material is not placed on wrinkles. Contractor shall un-wrinkle the liner before placement of fill material. Contractor shall repair all wrinkles larger than 2 inches high prior to placement of fill material.
- C. The Contractor shall follow the requirements of the Section 02669, Linear Low Density Polyethylene Geomembrane Liner when placing fill material on the liner.
- D. Contractor shall exercise all caution throughout placement of the granular fill above the geomembrane to protect the geomembrane and the CDN from any damage and repair all damages discovered at no additional cost to the Owner.

3.11 BACKFILLING OF GRANULAR FILL NEAR PIPE OR STRUCTURES

- A. Preparations for Placing Backfill:
 - 1. Fill around concrete structures only after the concrete has attained the specified compressive strength. Remove all form materials and trash from the excavation before placing any backfill. Obtain the Engineer's acceptance of concrete work and attained strength prior to backfilling.
 - 2. Do not operate earth-moving equipment within 5 feet of walls of concrete structures for the purpose of depositing or compacting backfill material. Compact fill adjacent to concrete walls with hand-operated tampers or similar equipment that will not damage the structure.
- B. Granular Fill Under Facilities:
 - 1. Place specified granular fill in areas under piping, slabs, structures, facilities, and other areas as shown on the Drawings. Do not exceed loose lifts of 6 inches.
 - 2. Compact each lift to not less than 95 percent compaction. Moisten material as required to aid compaction. Place material in horizontal lifts and in a manner which avoids segregation.
 - 3. Any subsequent damage to slabs, piping, concrete structures, facilities, or other structures caused by settlement of fill material shall be corrected and repaired by the Contractor at the Contractor's sole expense.

3.12 EMBANKMENT

- A. Earth embankments shall be constructed with granular fill as specified. The material shall be placed in uniform layers not to exceed 12 inches in thickness measured loose. Material too wet for compaction shall be dried prior to compaction and moisture shall be added to materials too dry prior to compaction. When each layer of material has been conditioned to the best practicable moisture content for compaction purposes, it shall be uniformly compacted by a 5-ton or heavier vibrating roller with a minimum of six passes made for each layer. Material shall be compacted to at least 95 percent of maximum dry density determined by AASHTO T180 Modified Proctor.
- B. Granular fill shall be used to raise the subgrade elevation for structures and as backfill around structures where conduit and piping join structures. Granular fill shall be compacted by a minimum of six coverages with approved compaction equipment to at least 98 percent of maximum dry density as determined by AASHTO T180 Modified Proctor.
- C. The surfaces of filled areas shall be graded to smooth true lines, strictly conforming to grades indicated on the grading plan, and no soft spots or uncompacted areas will be allowed in the Work.

3.13 CQA TESTING

- A. Notify CQA Consultant when:
 - 1. Structure or tank is ready for backfilling, and whenever backfilling operations are resumed after a period of inactivity.
 - 2. Soft or loose subgrade materials are encountered wherever embankment or site fill is to be placed.
 - 3. Fill material appears to be deviating from Specifications.
- B. The CQA Consultant will conduct the following tests:
 - 1. Gradation Tests for Offsite Excavated Granular Fill:
 - a. One sample from each 1,000 cubic yards of finished product or more often as determined by Engineer, if variation in gradation is occurring, or if material appears to depart from Specifications.
 - b. If test results indicate material does not meet Specification requirements, terminate material placement until corrective measures are taken. Remove material placed in Work that does not meet Specification requirements.

2. In-Place Density Tests: In accordance with ASTM D1556 or D2922. During placement of materials, test as follows:
 - a. Granular fill: One test for every 10,000 square feet or one test per lift.
 - b. Other fill material: One test for every 20,000 square feet or one test per list.

3.14 SURPLUS MATERIAL

- A. Suitable excavated soils to be used in construction shall be neatly piled so as to inconvenience, as little as possible, the public and Owner until used or otherwise disposed. Suitable excavated soil material may be used on different parts of the Work as noted on the Drawings or as approved by the Engineer.
- B. Surplus soil material shall become the property of the Owner and shall not be removed from the property. The Contractor shall store this surplus soil in a location on site as directed by the Owner.

3.15 GRADING

- A. Grading shall be performed at all places that are indicated on the Contract Drawings, to the lines, grades, and elevations shown and otherwise as directed by the Engineer and shall be performed in such a manner that the requirements for formation of embankments can be followed. During the process of grading, the subgrade shall be maintained in such condition that it will be well-drained at all times.
- B. In cuts, all loose or protruding rocks on the back slopes shall be removed to line or finished grade of slope. All cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings or as directed by the Engineer.
- C. The Owner's rights are reserved without changing the Contract to make minor adjustments or revisions in lines or grade, if found necessary, as the work progresses, due to discrepancies on the Drawings or in order to obtain satisfactory construction.

3.16 SETTLEMENT DURING CONSTRUCTION

- A. This Contract is for construction of a sequential closure of a solid waste landfill. The Contractor is advised that landfills may develop differential settlements during construction possibly due to waste compaction, and waste grading, Contractor's heavy equipment activities and traffic and other earthwork by the Contractor.

- B. Contractor and Owner agree that the amount of differential settlement and compaction during construction is not definable. As such, both parties have agreed the total compensation to the Contractor for all additional fill material needed due to settlement, compaction, or due to any other reason during construction is in accordance with Section 01025 paragraph 1.04.F.
- C. The Contractor shall be responsible to repair all post-construction differential settlements on closed sideslopes, and maintain slopes and grades for the closed sideslope to drain as designed, and grade other areas as needed during construction and during warranty period.

END OF SECTION

SECTION 02310
FABRIC FORMED CONCRETE REVETMENT SYSTEM (FFCRS)

PART 1 GENERAL

1.01 SUMMARY

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to perform all operations in connection with the installation of the proposed fabric formed concrete lining in accordance with the lines, grades, design and dimensions shown on the Contract Drawings and as specified herein.
- B. The Work shall consist of installing a non-reinforced concrete mat lining, by positioning a specially woven double-layer synthetic fabric form on the surface to be protected and filling it up with a pumpable fine aggregate concrete (structural grout) in such a way as to form a stable mat of required thickness, weight and configuration.
- C. Related sections include but are not necessarily limited to:
 - 1. Division 1, General Requirements.
 - 2. Section 02221, Excavation Trenching, Backfilling, and Embankment.
 - 3. Section 02371, Geotextiles.

PART 2 PRODUCTS

2.01 FINE AGGREGATE CONCRETE

- A. Fine aggregate concrete shall consist of a mixture of Portland cement, fine aggregate (sand), and water so proportioned and mixed as to provide a pumpable grout. Pozzolan and grout fluidifier conforming to these Specifications may be used at the option of the Contractor. The mix shall exhibit a compressive strength of 2,500 psi at 28 days when made and tested in accordance with ASTM C31 and C39.
- B. Portland cement shall conform to ASTM C150, Type I or Type II. The average compressive strength of fabricform test cylinders shall be 20 percent higher at 7 days than that of comparison test cylinders made in accordance with ASTM C31, and not less than 2,500 psi at 28 days.
- C. Fine aggregate shall conform to ASTM C33, except as to grading. Aggregate grading shall be reasonably consistent and shall be well graded from the maximum.

- D. Water for mixing shall be clean and free from injurious amounts of oil, acid, salt, alkali, organic matter or other deleterious substances.
- E. Pozzolan, if used, shall conform to ASTM C350.

2.02 FABRIC FORM

- A. The fabric form shall be 10-inch Filter Point Mat (FMP) as manufactured by Construction Techniques, or approved equal. Each layer of fabric shall meet or exceed the statistical mean (average) results as shown below:

Property	Test Method	Unit	Minimum Values
Physical:			
Composition			Nylon
Weight (double-layer)	ASTM D3776-9	oz/yd	15.6
Thickness (single-layer)	ASTM D1777-75	mils	31
Mill width		in	80
UV light resistance	ASTM D4355	hour	500
Mechanical:			
Grab Tensile Strength:	ASTMD1682-75	lbs	
Warp			350
Fill			275
Grab Tensile Elongation:	ASTM D4632	%	
Warp		%	31
Fill		%	41
Burst strength		psi	750
Trapezoid Tear Strength:	ASTM D4533		
Warp		lbs/in	80
Fill		lb/in	40
Puncture strength	ASTM D3737	lbs	80
Break strength-warp	ASTM D3787	%	70
Hydraulic:			
Water flow rate	ASTM D4491		
Coefficient of permeability (K)			
Permittivity (k/1) (two layers)	ASTM D4491	cm/sec	0.09
Porosity (one layer)	ASTM D4491	per sec	0.28
	ASTM D737-75	gal/min/sf	1.3

- B. The Contractor shall furnish the Engineer, in duplicate, manufacturer's certified test results showing actual test values obtained when the above physical properties were tested for compliance with the Specifications.

- C. Fabric form fabric shall consist of double-layer woven fabric joined together by spaced interwoven filter points to produce a mat with a finished average thickness of 6 inches, and a nominal weight of 70 pounds per square foot. Nominal density of fabric shall be at least 2.0 pounds per square foot. Material shall be 100 percent nylon, industrial grade. No carpet or staple yarns will be allowed. The filter points shall be on approximately 10-inch centers. The filter points shall relieve hydrostatic uplift pressure and provide a deeply cobbled surface appearance.
- D. Individual mill width rolls of fabric form shall be a minimum width of 80 inches. Mill width rolls shall be cut to the length required, and the two layers of fabric separately jointed bottom edge to bottom edge, and top edge to top edge by means of sewing thread, to form multiple mill width panels. All factory sewn seams shall be downward facing. The grab tensile strength of all sewn seams shall not be less than 150 pounds per inch when tested in accordance with ASTM 1682.
- E. Grout stops shall be installed at predetermined, mill width, intervals to regulate the flow of fine aggregate concrete.
- F. Immediately following receipt of fabric forms to the jobsite, forms should be inspected and stored in a clean dry area where they will not be subject to mechanical damage, exposure to moisture or direct sunlight.

PART 3 EXECUTION

3.01 SITE PREPARATION

- A. Areas on which fabric forms are to be placed shall be constructed to the lines and grades shown on the Contract Drawings. Where such areas are below the allowable grades they shall be brought to grade by placing compacted layers of granular fill material. Suitable material shall be placed in 6-inch lifts compacted to 95 percent of maximum modified proctor as determined by ASTM D1557, or as specified by Engineer. All obstructions such as roots and projecting stones shall be removed.
- B. Excavation and preparation of anchor trenches, terminal trenches, and toe trenches or aprons shall be done in accordance with the manufacturer's recommendations.
- C. Immediately prior to placing the fabric forms, the prepared area shall be inspected by the Engineer and tested for compaction. No forms shall be placed thereon, until the area has been tested.

3.02 FABRIC FORM PLACEMENT

- A. Fabric form panels shall be placed within the limits shown on the Contract Drawings.
- B. Fabric forms shall be placed over a layer of geotextile filter fabric. See Section 02371, Geotextiles for geotextile material specification.
- C. Adjacent fabric form panels shall be joined before fine aggregate concrete injection, by field sewing or zippering the two bottom layers of fabric together and shall be downward facing except with the approval of the Engineer.
- D. When conventional joining of panels is impractical, or when called for on Contract Drawings, adjacent top panels may be overlapped a minimum of two feet pending approval by the Engineer. In no case shall simple butt joints between panels be permitted.
- E. Lap joints and expansion joints shall be provided at intervals recommended by the manufacturer. Folding over of panels is unacceptable.
- F. Immediately prior to injection of fine aggregate concrete, the assembled fabric form panels shall be inspected by the Engineer/RPR and no fine aggregate concrete shall be pumped therein until the fabric seams and panel connections have been approved.

3.03 FINE AGGREGATE CONCRETE PLACEMENT

- A. Following panel placement, small slits shall be cut in the top layer of the fabric form to allow for the insertion of the injection pipe. Fine aggregate concrete shall be injected between the top and bottom layers of fabric, filling the panel to the recommended thickness and configuration.
- B. Fine aggregate concrete shall be injected in such a way that excessive pressure on the fabric form and cold joints are avoided.
- C. Holes in the fabric left by the removal of the injection pipe shall be temporarily closed by inserting a piece of burlap or similar material. The burlap shall be removed when the concrete is no longer fluid and the concrete surface at the hole has hardened. The concrete at the hole shall be smoothed by hand. Foot traffic on the filled mat shall be restricted to an absolute minimum for one hour after pumping.
- D. Upon completion of installation, filter points shall be cleaned and cleared from grout before concrete hardens.

- E. Upon completion of the fine aggregate concrete placement, all the anchor trenches, terminal trenches and toe trenches shall be backfilled, compacted, and protected as specified or as required by the Drawings.

END OF SECTION

**SECTION 02371
GEOTEXTILES**

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required to install filter fabric geotextile complete as shown on the Drawings and as specified herein. Geotextile shall be used for soil retention outside of and around underdrains. Filter fabric is also used at fabric concrete revetment system locations.

1.02 RELATED WORK

- A. Section 02221, Excavation, Trenching, Backfilling and Embankment.
- B. Section 02310, Fabric Formed Concrete Revetment System (FFCRS).
- C. Section 02373, Composite Drainage Net.
- D. Section 02502, Terrace Underdrain Systems.
- E. Section 15071, High Density Polyethylene (HDPE) Pipe and Fittings for Letdown Pipes and Culverts.

1.03 SUBMITTALS

- A. Within 30 calendar days following the Notice to Proceed, submit the following information in accordance with Section 01300, Submittals.
 - 1. Manufacturer's background information.
 - 2. List of material properties and samples of filter fabric with attached certified test results.
 - 3. Manufacturer's quality control program and manual including description and results of laboratory testing.
 - 4. Manufacturer's Certification that the material meets the requirements of the Specifications.
 - 5. Shop Drawing, including:
 - a. Proposed panel layout for terraces showing the installation layout identifying field seams.
 - b. Details of overlap, seaming, anchoring, connections, and other construction details.

6. A manual that specifically defines the installation procedures and quality assurance program during installation including manufacturer's installation instructions for the Contractor to follow.
7. Copy of quality control certificate in conformance with paragraph 2.02.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):

1. D1777, Standard Test Method for Measuring Thickness of Textile Materials.
2. D3776, Standard Test Method for Mass Per Unit Area (Weight) of Woven Fabric.
3. D3786, Standard Test Method for Hydraulic bursting Strength of Knitted Goods and Nonwoven Fabrics – Diaphragm Bursting Strength Tester Method.
4. D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
5. D4533, Standard Test Method for trapezoid Tearing Strength of Geotextiles.
6. D4632, Standard Test Method for Breaking Load and Elongation of Geotextiles (Grab Method).
7. D4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
8. D4833, Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products.

- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 FABRIC APPLICATIONS

- A. The filter fabric is to be used for: Placement beneath and around underdrain pipe gravel envelope, toe drain envelope, and other areas where indicated. Filter fabric is also used under Section 02310, Fabric Formed Concrete Revetment System (FFCRS) and other areas as indicated in the Drawings.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. The filter fabric shall be shipped, stored and handled in accordance with manufacturer's recommendations and as specified herein.
- B. The filter fabric shall be stored with a cover so that it is protected from exposure to sunlight and shall be elevated from the ground (a minimum of 3 inches) to protect the filter fabric from stones and other sharp objects.

1.07 REQUIREMENTS PRIOR TO INSTALLATION

- A. The subgrade shall be inspected and approved by the Engineer prior to installation of the filter fabric. The subgrade shall be smooth, uniform and compacted for the installation of the fabric.

1.08 MATERIAL WARRANTY

- A. The manufacturer shall warrant the material, against manufacturing defects and material degradation for a period of 20 years from the date of installation. The manufacturer shall replace any material which fails within the warranty covering the requirements at no cost to the Owner.

1.09 GUARANTEE

- A. The Contractor shall guarantee the filter fabric against defects in installation and workmanship for the period of 1 year commencing with the date of Final Completion and acceptance by Owner. The guarantee shall include the services of qualified service technicians and all materials required for the repairs at no expense to the Owner.

PART 2 PRODUCTS**2.01 GENERAL**

- A. The use of a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration.

2.02 MATERIALS

- A. Nonwoven Fabric:
 - 1. All fabric shall be a nonwoven needle punched polypropylene fabric consisting of filaments formed into a stable network.
 - 2. A nominal 10 ounces per square yard unit weight fabric shall be used for encasement of underdrain drainage rock (river run rock or well-rounded granite) around terrace and toe drain underdrains.

3. The fabric shall be non-biodegradable, nonreactive within a pH range of three to eleven, resistant to ultraviolet light exposure, and resistant to insects and rodents. Test results from any sampled roll in the lot, when tested in accordance with ASTM D4759, shall meet or exceed the values listed in Table 02371-1 below.

Table 02371-1

Properties	Test Method	Minimum Average Roll Values	
		Unit	Value
Fabric weight	ASTM D5261	oz./yd ²	10
Grab strength	ASTM D4632	lbs	160
Grab elongation	ASTM D4632	% minimum	50
Puncture resistance	ASTM D4833	lbs	90
Trapezoidal tear strength	ASTM D4533	lbs, minimum ARV	75
Ultraviolet radiation resistance	ASTM D4355	70% strength retention minimum, ARV after 500 hrs	
Permittivity	ASTM D4491	SEC-1	1.0
Apparent opening size, maximum ARV	ASTM D4751	Std. sieve	70

2.03 QUALITY CONTROL DOCUMENTATION

- A. Prior to installation, the Contractor shall provide to the Owner the following information certified by the manufacturer for the delivered fabric.
1. Each roll delivered to the Project site shall have the following identification information.
 - a. Manufacturer's name.
 - b. Product identification.
 - c. Thickness.
 - d. Roll number.
 - e. Roll dimensions.

2. Quality control certificates, signed by the manufacturer's quality assurance manager. Each certificate shall have roll identification number, sampling procedures, and frequency and test results. At a minimum the following test results shall be provided every 50,000 square feet of manufactured fabric in accordance with test requirements specified in article 2.02.
 - a. Thickness.
 - b. Trapezoid Tear.
 - c. Puncture Resistance.
 - d. Mullen Burst Strength.
 - e. Grab Tensile.

PART 3 EXECUTION

3.01 PREPARATION

A. General:

1. Preparation of the subgrade shall be in accordance with Section 02221, Excavation Trenching Backfilling and Embankment.
2. The subgrade of FFRCS lined ditches or FFRCS at structure locations shall be inspected by the Engineer and CQA Consultant prior to installation of the filter fabric.

3.02 INSTALLATION

A. Fabric Placement:

1. The subgrade shall be maintained in a smooth, uniform and compacted condition during installation of the filter fabric beneath the drainage stone.
2. No mechanical equipment shall be driven directly on top of the filter fabric.
3. Granular fill materials shall be installed in accordance with Section 02221, Excavation Trenching Backfilling and Embankment.
4. HDPE underdrain pipe shall be installed in accordance with Section 02502, Terrace Underdrain Systems.
5. Drainage rock and protective cover shall be placed with mechanical equipment; however, no mechanical equipment shall be allowed directly on top of the filter fabric. Equipment shall be driven on pre-deposited material.
6. Drainage rock and protective cover shall be brought to the work area with earth-carrying equipment, deposited on the previously spread soil cover (minimum of 3 feet thick), then pushed onto the uncovered portion of the filter fabric with graders or bulldozers.

7. Damage to the filter fabric occurring during the placement of protective cover shall be repaired immediately at no additional expense to the Owner.

B. Field Overlap: The fabric shall be overlapped a minimum of 24 inches. Overlaps shall be field stitched or heat bonded.

3.03 FIELD QUALITY CONTROL

A. Two duplicate documentation files for fabric placement shall be maintained. One shall be maintained by the Contractor and the other shall be updated and checked by the CQA Consultant to assure that all copies of pertinent project information are included in each file. The Contractor shall submit daily copies of the documentation to the RPR and CQA Consultant.

B. The filter fabric installation and related work shall be inspected by the Engineer. All work in the system therein being inspected shall be complete, clean and ready for use. All work shall meet the requirements of workmanship, as determined by the Engineer.

C. Discrepancies shall be noted and repaired at no additional expense. Final acceptance of the system shall be contingent upon the approval of the Engineer.

END OF SECTION

SECTION 02373
COMPOSITE DRAINAGE NET (CDN)

PART 1 GENERAL

1.01 SUMMARY

- A. The Work specified in this section includes the manufacture, fabrication, testing, and installation of Composite Drainage Net (i.e., composite geonet). The CDN shall be tri-planar or tri-axial geocomposite based on protective layer soil permeability and CDN transmissivity. The CDN is comprised of an inner core high density polyethylene (HDPE) geonet between an upper and lower layer of non-woven geotextile. The geotextile is thermally fused to both sides of the geonet.
- B. The CDN shall be used on sideslope terraces, under letdown pipes and other areas as shown on the Drawings.
- C. The CDN shall be the end product of one manufacturer in order to achieve standardization for performance, appearance, maintenance, and replacement.
- D. Single Source: All products or components of the product, used for construction shall be obtained from a single manufacturer. Fusion of the geonet and geotextile, for each product, shall be completed by a single manufacturer.
- E. The Contractor is responsible to provide samples of materials to the Owner's CQA Consultant to perform QA testing as described in these Specifications, or for the purpose of confirming the Contractor's submitted test results.
- F. Soils testing results and interface friction angle testing performed during project permitting are provided in Attachment C to these Specifications.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. D1505, Standard Test Method for Density of Plastics by the Density-Gradient Technique.
 - 2. D4218, Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle Furnace Technique.
 - 3. D4355, Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
 - 4. D4491, Standard Test Method for Water Permeability of Geotextiles by Permittivity.

5. D4632, Standard Test Method for Breaking Load and Elongation of Geotextiles (Grab Method).
6. D4716, M-14 Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head, January 1, 2014.
7. D4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
8. D5199, Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes.
9. D5261, (1996) Standard Test Method for Measuring the Mass per Unit Area of Geotextiles.
10. D5321M-14, Standard Test Method of Determining the Shear Strength of Soil Geosynthetic and Geosynthetic-Geosynthetic Interfaces by Direct Shear, January 1, 2014.
11. D7005-03, Determining the Bond Strength (Ply-Adhesion) of Geocomposites.

B. Geosynthetic Research Institute: GRI-GC8 Standard Guide for Determination of the Allowable Flow Rate of a Drainage Geocomposite.

C. Relevant publications from the Environmental Protection Agency (EPA): Daniel, D.E. and R.M. Koerner, (1993), Technical Guidance Document: Quality Assurance and Quality Control for Waste Containment Facilities, EPA/600/R-93/182.

1.03 MANUFACTURER'S QUALIFICATIONS

A. Manufacturer:

1. Tenflow 350-6-6 Geocomposite as manufactured by GSE Environmental, LLC is the basis for design for soils having a permeability of 4.0 by 10^4 cm/sec. or lower. Equivalency of performance to these products will be based on manufacturer's documentation and certified results for the properties required in Tables 02373-2, 02373-3 and 02373-4, as provided by independent (third-party) testing laboratories. Properties in these tables are representative of Tenflow 350-6-6. Lower permeability soils may allow lower transmissivity geocomposite.
2. Single Source: All products or components of the product, used for construction shall be obtained from a single manufacturer. Fusion of the geonet and geotextile, for each product, shall be completed by a single manufacturer.
3. Manufacturer shall have a GAI-LAP accredited laboratory at the manufacturing facility.
4. Manufacturer shall have ISO 9001; 2008 certification.

5. Manufacturer shall have manufactured a minimum of 10,000,000 square feet of polyethylene geocomposite during the last year.
6. If the use of an alternate geocomposite design or geocomposite/geomembrane design is elected, the Manufacturer shall submit, at no expense to the Owner, the following items to the Engineer for acceptance and pre-approval.
 - a. Product literature.
 - b. A representative product sample, approximately 12 inch by 12 inch in size.
 - c. Installation quality assurance manual.
 - d. Detailed theoretical design engineering calculations and drawings of the alternate geocomposite design.
 - e. Use the same performance criteria, as indicated in Part 2 of this Specification and illustrated or noted in the Project Drawings, that was used for the “as designed” geocomposite. Theoretical design calculations should verify that the alternate geocomposite or geocomposite/geomembrane design meets the filtration, transmissivity, compression strength, and interface shear requirements.
 - f. The alternate geocomposite design shall be completed, signed, and sealed by a professional engineer licensed in the state that the Project Site resides in. The first sheet of calculations should, for the alternate geocomposite design, show a professional engineer’s seal, signature, and the date signed.
 - g. The alternate geocomposite thickness shall not be less than that shown in Table 2.
 - h. The geotextile shall not be glued or bonded to the geonet in any manner other than heat bonding.
7. The alternate geocomposite design cannot change the line and grade illustrated in the Project Drawings or as established by the Engineer.

1.04 INSTALLER'S QUALIFICATIONS

A. Installer:

1. Installer shall have installed a minimum of 2,000,000 square feet of geocomposite during the past 4 years.
2. Installer shall have worked in a similar capacity on at least two projects similar in complexity to the project described in the Contract Documents, and with at least 500,000 square feet of geocomposite installation on each project.
3. The installation supervisor shall have worked in a similar capacity on projects similar in size and complexity to the project described in the Contract Documents.

4. Each Installer is required to identify their intended geocomposite supplier as part of their bid submittal. If the use of an alternate geocomposite supplier is elected, the Installer shall submit the alternate geocomposite design, for acceptance, to the Engineer at least 14 calendar days prior to the advertised bid date. After evaluating and verifying that the alternate design meets the specified project criteria, this allows the Engineer time to issue an addendum pre-approving the alternate geocomposite design such that each Installer may have the same opportunity to bid the approved alternate. Bids with other suppliers that have not been pre-approved as equal by addendum will not be accepted. Alternate filtration and drainage layers, such as crushed stone or sand will not be allowed as an approved alternate.

1.05 SUBMITTALS

- A. Product Information: The Contractor shall submit to the Engineer field and laboratory test data prior to delivery and prior to any construction using the geocomposite. Submit the following information for each product within 30 calendar days of notice to proceed to the Engineer for approval:
 1. Prequalification: Submit independent laboratory test results demonstrating compliance with the material properties listed in Table 02373-1, Table 02373-2, and Table 02373-3. In addition, the manufacturer must provide a certificate of compliance which certifies that the material to be delivered and installed will use the same manufacturing techniques, resin type, and formulation as that for which test results are submitted.
 2. Transmissivity: Submit manufacturers test data that indicates transmissivity values shown in Table 02373-4 can be met at 100 hours of testing.
 3. Roll Layout Drawings: Submit at a minimum, a roll layout drawing and installation details. The roll layout drawing shall be drawn to scale, and shall be coordinated with the geomembrane panel layout. Installation details shall include cross sections, temporary anchorage, anchor trenches, and other terminations.
 4. Protection from Wind and Weather: Submit methodology to protect each product from wind, dirt, and direct sunlight. At a minimum, the methodology shall reflect that materials shall be shipped and stored in rolls furnished at the manufacturing facility to prevent exposure of the geotextile to ultraviolet light, precipitation, moisture, mud, dirt, dust, puncture, or other damaging conditions.

5. Handling: Rolls of products shall not be stacked upon one another to the extent that deformation of the core occurs. If stored outdoors, they shall be elevated from the ground and protected with a waterproof cover. Outdoor storage should not be allowed to exceed 6 months. For storage for more than 6 months, a temporary enclosure shall be constructed so that the geocomposite rolls are stored inside an enclosed facility.
6. Material Data: Submit complete manufacturer's specifications, descriptive drawings, and literature for each product, including the product identification and suppliers of the polymer resin and recommended method for handling and storage of all materials prior to installation. Describe the manufacturer's methodology to comply with the requirements specified for manufacturing quality control.
7. Manufacturing Quality Control: Submit a complete description of the manufacturer's formal quality control/quality assurance programs for manufacturing, fabricating, handling, installing, and testing. The description shall include, but not be limited to, polymer resin supplier and product identification, acceptance testing, production testing, installation inspection, installation techniques, repairs, and acceptance. The document shall include a complete description of methods for both roll end and roll side joining.
8. Installation Instructions: Submit samples of the product with a complete set of Specifications, and manufacturer's complete written instructions for storage, handling, installation and joining.
9. Qualifications: Submit manufacturer's qualifications for each product.
10. Geonet Resin: Submit the name of HDPE resin supplier, the production plant, the brand name, and name of resin used to manufacture the product.
11. Interface Friction Angle (ASTM D5321): Two representative tests with the proposed geocomposite and the geomembrane material. This performance test shall be performed by the Contractor's quality control consultant testing laboratory. Manufacturer shall supply samples of CDN and geomembrane used in the project for testing. Interface testing is site condition specific and material-specific. Submit direct shear test results that indicate the interface friction values shown in Table 02373-3 can be achieved using the specified project materials.
12. Interface Friction Angle (ASTM D5321 M-14): Two representative tests with the proposed geocomposite and the protective soil material. This performance test shall be performed by the Contractor's quality control consultant testing laboratory. Manufacturer shall supply samples of geocomposite used in the project for testing. Contractor shall provide representative soil from the soil source to be used on project. Interface testing is site condition specific and material-specific. Submit direct shear test results that indicate the interface friction values shown in Table 02373-3 can be achieved using the specified project materials.

13. Transmissivity: Manufacturers must submit material performance properties and samples of drainage net with attached certified test results:
 - a. In-situ transmissivity (ASTM D4716) in accordance with paragraph 2.03.A.
 - b. Index transmissivity (ASTM D4716) in accordance with Table 02374-4 Note 2.
 - c. Report and calculations for geocomposite hydraulic conductivity under load. Hydraulic Conductivity shall be derived from transmissivity and thickness measurements in conformance with 62-701.400 (3) (c) (2) F.A.C.
- B. Submit the following manufacturing quality control information and certifications to the QA consultant prior to material shipment:
 1. Submit factory quality control test results certified by the manufacturer as being equal product as specified and demonstrating conformance with the requirements of these Specifications. Submit statement of production dates for each product.
 2. Submit the manufacturer's certification stating that the material proposed is similar and of the same formulation as that for which test results are submitted and which by actual usage has been demonstrated to be satisfactory for the intended application and meeting or exceeding the parameters specified.
 3. Include test results in accordance with test frequencies specified herein.
- C. Submit record document CDN panel plan depicting as-built panel placement. Panel plan shall be signed and sealed by a Florida registered surveyor or professional engineer.

PART 2 PRODUCTS

2.01 GEONET

- A. The geonet/geotextile shall be manufactured by GSE Corporation, Agru-America, or an Engineer-approved manufacturer.
- B. The geonet shall be manufactured by extruding two or three sets of strands to form a structure to provide planar water flow meeting the requirements listed in Table 02373-2.
- C. The geonet shall consist of new, first-quality products designed and manufactured specifically for the intended purpose designated in this Specification, as satisfactorily demonstrated by prior use. The geonet shall contain stabilizers to prevent ultraviolet light degradation. The HDPE shall be unmodified HDPE containing no plasticizer, fillers, chemical additives,

reclaimed polymers, or extenders. Approximately 2 percent carbon black shall be added to the resin for ultraviolet resistance. The only other allowable compound elements shall be anti-oxidants and heat stabilizers, of which up to 1.5 percent total, as required for manufacturing, may be added.

2.02 GEOTEXTILE

- A. The geotextile shall meet the requirements listed in Table 02373-3.

2.03 CDN

- A. The CDN shall be tested in accordance with ASTM D4716 with a normal stress of 1,000 psf; water at 20 degrees C (68 degrees F); gradient of 0.25; profile of upper load plate, soil to be used on the CDN, geomembrane, and lower load plate; and a test time period of 100 hours. Apply normal stress, under saturated conditions, for 1 hour minimum prior to start of test. Test data from the manufacturer using the identical testing configuration and parameter shall indicate that transmissivity values when tested in excess of 100 hours do not fall below the minimum value of Table 02373-3. Thickness of the core geonet must be monitored during application of the normal compressive load and flow testing. Report to provide hydraulic conductivity and transmissivity. One manufacturer in-situ transmissivity test using the soils proposed for the project is required.
- B. The final CDN shall meet requirements listed in Table 02373-4. Geocomposite shall be selected based on properties in Table 2373-2 and Table 2373-3.
- C. CDN shall have a minimum transmissivity of $3.5 \text{ by } 10^{-3} \text{ m}^3/\text{sec-m}$ using the following test conditions: 100-hour test, soil layer over composite drainage net, composite drainage net over textured LLDPE geomembrane, applied pressure of 1,000 psf. Soil shall be from the soil source that will be used for the Project.
- D. Manufacturer: The CDN shall be fabricated by heat bonding the geotextile to both sides of the geonet. No burn-through of geotextile shall be permitted. No glue or adhesive shall be permitted. The bond between the geotextile and the geonet shall meet the requirements listed in Table 02373-3.
- E. Labels: CDN shall be supplied in rolls, marked or tagged with the following information:
 - 1. Manufacturer's name.
 - 2. Product identification.
 - 3. Lot number.
 - 4. Roll number.
 - 5. Roll dimensions.

- F. Roll Dimensions: The product shall be supplied as a continuous sheet with no factory seams. During installation, the roll length shall be maximized to provide the largest manageable roll for the fewest field seams.

PART 3 EXECUTION

3.01 MANUFACTURING QUALITY CONTROL TESTING

- A. All of the specified tests are the Contractor's responsibility. Testing during manufacturing shall be accomplished by the manufacturer's laboratory.
- B. HDPE resin shall be tested at a frequency of one test per resin batch for compliance with Table 02373-1. One batch is defined as one rail car load of resin. The finished rolls shall be identified by a roll number corresponding to the resin batch used. The following minimum test frequencies shall be observed:

Property	Test Method	Minimum Frequency
Polymer density	ASTM D1505	1 per batch
Polymer melt index	ASTM D1238	1 per batch

- C. The geonet shall be tested during manufacturing for compliance with Table 02373-1. The following minimum test frequencies shall be observed:

Property	Test Method	Minimum Frequency
Polymer density	ASTM D1505	1/100,000 sf
Mass per unit area	ASTM D5261	1/100,000 sf
Thickness	ASTM D1777	1/100,000 sf

- D. Geotextile shall be tested during manufacturing for compliance with Table 02373-2. The following minimum test frequencies shall be observed:

Property	Test Method	Minimum Frequency
Mass per unit area	ASTM D5261	1/100,000 sf
AOS	ASTM D4751	1/540,000 sf
Grab tensile	ASTM D4632	1/100,000 sf
Trapezoidal tear strength	ASTM D4533	1/100,000 sf
Puncture resistance	ASTM D4833	1/100,000 sf

- E. Upon fusion of the geotextile and geonet, the product shall be tested during manufacturing for compliance with Table 02373-3. The following minimum test frequencies shall be observed:

Property	Test Method	Minimum Frequency
Transmissivity	ASTM D4716	1/300,000 sf
Ply adhesion (minimum)	ASTM D7005	1/100,000 sf

- F. The Contractor shall inspect every roll for bonding integrity between the geonet and the geotextile. All poorly bonded and/or delaminated material shall be rejected.

3.02 FIELD QUALITY CONTROL

- A. Field Joining: The Contractor shall inspect all roll end joints and roll side joints. The results of these inspections shall be documented in the daily reports. Field joints shall comply with the requirements of Table 02373-4.
- B. Quality Control Reporting Procedures: All information regarding the installation of the geocomposite will be recorded in the Contractor's daily report. This information shall include:
1. Reference to product submittals, certifications, substitutions and approvals.
 2. Dates of installation.
 3. Location and quantity of materials installed.
 4. Statement of whether materials were installed in accordance with the Technical Specifications.
 5. Additional information as required.
 6. All product certifications, filed appropriately for future reference.

3.03 MANUFACTURER'S RECOMMENDATIONS

- A. Each Product shall be installed in accordance with the Drawings, Specifications, and the manufacturer's recommendations. In case of a conflict between these documents, the more stringent requirements shall apply.

3.04 CLEANLINESS

- A. The interface between the CDN and the geomembrane shall be clean, dry, and free of dirt and dust during installation. If dirt, dust, or water is present, the Contractor shall clean the work area. Products which are clogged with silts shall be discarded and shall not be installed.

3.05 ROLL JOINING METHODS

- A. Table 02373-5 summarizes acceptable roll joining methods.
- B. Lap Seams: The bottom layer of geotextile shall be lap seamed. Lap seaming is accomplished by overlapping adjacent geotextile a minimum of 6 inches.
- C. Nylon Ties: The geonet shall be overlapped and fastened with nylon ties. Nylon ties shall be yellow or white in color to facilitate inspection.
- D. Machine Sewn Seams: The top layer of geotextile shall be sewn. Sewing shall be accomplished with a lock-stitching sewing machine. The thread shall be polymeric thread which complies with manufacturer's recommendations. The seam shall be placed at a minimum of 6 inches from the geotextile edges. The finished seam shall be folded to one side.
- E. End Treatment: the geotextile shall be extended at least 12 inches beyond the ends of the drainage net and wrapped around the drainage net neatly to prevent dirt entering the drainage net from the ends. The cost of additional geotextile shall be included in the lump sum portion of the Contract and no additional compensation will be made.

3.06 ROLL JOINING REQUIREMENTS

- A. The minimum requirements for joining rolls are specified in Table 02373-4.
- B. Roll Ends: The end of each roll of CDN shall be overlapped a minimum of 6 inches. The geonet portion shall be shingled, with the uphill end overlapping the downhill end. The geonet portion shall be tied 2 feet on-center at a minimum. The bottom layer of geotextile shall be overlapped a minimum of 6 inches. The upper layer of geotextile shall be machine sewn. Where CDN is to terminate, the upper geotextile shall be folded over the ends with a minimum of 6 inches of geotextile placed under the CDN.
- C. Adjacent Roll Sides: At roll sides, the material shall be overlapped a minimum of 4 inches. The bottom geotextile shall be overlapped. The geonet shall be overlapped and tied a minimum of 5 feet on-center with nylon ties as described above. The upper layer of geotextile shall be machine sewn as described above.

3.07 INSTALLATION

- A. The product shall be installed in accordance with the manufacturer's recommendations or as specified herein, whichever is more stringent.

- B. Orientation: CDN shall be rolled down the slope in such a manner as to continually keep the material in tension. If necessary, the material shall be positioned by hand after unrolling to minimize wrinkles. The CDN shall not be unrolled laterally (i.e., across the slope) in the storm water letdown pipe areas. CDN should be unrolled in terrace swale areas laterally in the direction of the flow.
- C. The Contractor shall provide sufficient ballast and temporary anchorage to protect the CDN. The Contractor is responsible for protecting the CDN from damage due to weather at all times.
- D. Physical Damage:
 - 1. Personnel walking on the CDN shall not engage in activities or wear footwear that could damage the material. Smoking shall not be permitted on or near the CDN.
 - 2. Vehicular traffic shall not be permitted on the geosynthetics. Equipment shall not damage the material by handling, trafficking, or leakage of hydrocarbons. The surface shall not be used as a work area for preparing patches, storing tools and supplies, or other uses.
- E. Bridging: The CDN shall be installed to avoid bridging.
- F. Wrinkles of any size will not be allowed. CDN shall be laid smooth touching the geomembrane without any visible wrinkles prior to installation of granular fill. Contractor will provide a spotter to spot wrinkles at the time of installation of granular fill protective cover and repair wrinkles with approval of the CQA consultant.
- G. Corners: in corners, where overlaps between rolls are staggered, an extra roll shall be installed from the top to the bottom of the slope.
- H. Weather Protection: Each product shall be protected from direct sunlight or precipitation prior to installation. After installation this product shall not be exposed to direct sunlight and shall be covered within 30 days of installation. Product which is exposed to direct sunlight for 30 days or more shall be replaced at the Contractor's expense.
- I. It is the Contractor's responsibility to provide all labor and materials for protection of the CDN during the period of time prior to installation of overlying soils. The Contractor's protection method is subject to the approval of the Engineer.

3.08 REPAIRS

- A. Limitations: In general, all damaged, soiled, wrinkled or delaminated CDN shall be discarded. CDN which have major damage, which require extensive repairs or replacement, shall be not allowed to be used for construction and shall be discarded by the Contractor.
- B. Minor Damage: Minor damage is defined as a hole 1-1/2 inches or smaller in diameter in the product. Minor damage shall be repaired by snipping out protruding geonet and machine sewing or thermal bonding a geotextile patch over the hole. The patch shall square and be a minimum of 12 inches larger than the damaged area in all directions. If thermal bonding is conducted, care shall be taken to prevent excessive heat damage to the surrounding geosynthetic.
- C. Major Damage: Major damage is defined as a hole larger than 1-1/2 inches in diameter or wrinkles that has caused the drainage net media to break, sheared or snapped through. Major damage shall be repaired by replacing the entire panel width.

Table 02373-1 Geonet Properties				
Property	Qualifier	Unit	Test Method	Specified Value
Thickness	Minimum	mils	ASTMD5199	300 or greater
Tensile strength (machine direction)	Minimum	lbs./in	ASTMD5035	50
Carbon black	Range	Percent	ASTMD4218	2-3
Polymer density, resin	Minimum	g/cm ³	ASTMD1505	0.94
Melt index	Maximum	g/10 minutes	ASTMD1238 Condition 190/2.16	1.0 g/ 10 minutes

Table 02373-2 Geotextile Properties				
Property	Qualifier	Unit	Test Method	Specified Value
Fabric weight	MARV	oz/yd ²	ASTM D3776	6
Grab tensile	MARV	lbs.	ASTM D4632	160
Puncture resistance	MARV	lbs.	ASTM D4833 /D6241	400
Permittivity	MARV	1/sec	ASTM D4491	1.25
Flow rate	MARV	Gal/min-ft ²	ASTM D4491	110 gal/ min-ft ²
AOS maximum opening size	MaxARV	sieve size(mm)	ASTM D4751	70 (0.212)
UV resistance (500 hours)	Minimum	Percent	ASTM D4355	70 percent

Table 02373-3 CDN Properties				
Property	Qualifier	Unit	Test Method	Specified Value
In-situ transmissivity (Note 1)	Minimum	m ² /sec	ASTMD4716	3.5X 10 ⁻³ m ³ /m-sec
Index transmissivity (Note 2)	Minimum	m ² /sec	ASTMD4716	6.5 X 10 ⁻³ m ² /sec
Ply adhesion	Average	lbs./inch	GRIGC7 and ASTM D7005	1.0
Coefficient of interface friction with geomembrane (Note 3)	Minimum	degrees	ASTM D5321 M-14	Peak 26° with saturated soils, interface friction angle necessary to achieve slope stability interface safety factor of 1.50 Peak 20.6° Drained soil without hydraulic head

Table 02373-3 CDN Properties				
Property	Qualifier	Unit	Test Method	Specified Value
Coefficient of interface friction with protective cover soil (Note 4)Not	Minimum	degrees	ASTMD5321 M-14	Peak 27° with saturated soils, interface friction angle necessary to achieve slope stability interface safety factor of 1.50 Peak 20.6° Drained soil without hydraulic head
<p>Table 02373-3 Footnotes:</p> <ol style="list-style-type: none"> In accordance with ASTM D4716 with a normal stress of 1,000 psf; water at 20 degrees C (68 degrees F); gradient of 0.25; profile of upper load plate, soil, CDN, geomembrane, and lower load plate; and a test time period of 100 hours. Apply normal stress, under saturated conditions, for 1 hour minimum prior to start of test. Test data from the manufacturer using the identical testing configuration and parameter shall indicate that transmissivity values when tested in excess of 100 hours do not fall below the minimum value of Table 02373-3. Thickness of the core geonet must be monitored during application of the normal compressive load and flow testing. A minimum of two tests shall be conducted by the Contractor. Report to provide hydraulic conductivity and transmissivity. Report must be signed and sealed by a State of Florida professional engineer. Metal Plate/ Ottawa Sand/CDN/geomembrane/ metal plate, gradient=0.1 at 1,000 psf, 1-hour seat time, Test frequency one per 300,000 square feet. Interface friction angle (ASTM D5321M-14), one representative test with the proposed CDN and geomembrane material. The testing criteria are as follows: The direct shear box shall be a minimum of 12 inches by 12 inches. Each normal load shall be preloaded at the specified normal load, for a minimum of 24 hours, prior to testing to dissipate pore pressures. Fully saturate soil prior to testing for each normal load. Specified testing normal stresses are 250, 500, and 1,000 psf. The strain rate is 1 mm/min (0.04 in/min). The interface friction angle shall be the result of a linear regression line drawn continuously through the three shear strength results obtained for the normal loads specified following the procedures outlined in ASTM D5321M-14. Provide the results of peak and residual values. Adhesion value may be considered in determining the effective interface friction angle. Direct shear testing is a performance test not an index test. As such manufacturer does not perform or certify to direct shear results since the test relies on site specific conditions. Interface values can be affected by material interface, rate of displacement and the normal load applied. Interface Friction Angle (ASTM D 5321 M-14), one representative test with the proposed geocomposite and the protective soil material. The testing criteria are as follows: The proposed protective soil material shall be prepared and molded to a minimum of 95 percent of the Standard Proctor (ASTM D698). The direct shear box shall be a minimum of 12 inches by 12 inches. Each normal load shall be preload at the specified normal load, for a minimum of 24 hours, prior to testing to dissipate pore pressures. Fully saturate soil prior to testing for each normal load. The specified testing normal stresses are 250, 500, and 1,000 psf. The strain rate is 1 mm/min (0.04 in/min). The interface friction angle shall be the result of a linear regression line drawn continuously through the three shear strength results obtained for the normal loads specified following the procedures outlined in ASTM D5321. Provide the results of peak and residual values. Adhesion value may be considered in determining the effective interface friction angle. Direct shear testing is a performance test not an index test. As such Manufacturer does not perform or certify to direct shear results since the test relies on site specific conditions. Interface values can be affected by material interface, rate of displacement and the normal load applied. 				

Table 02373-4 CDN Joining Methods				
Location	Layer	Joining Method	Min. Overlap	Tying Frequency
Roll end (see Note 1)	Upper geotextile	Machine sewing	4"	N/A
	Geonet	Nylon ties	6"	2' on center
	Lower geotextile	Overlap	6"	N/A
Roll side	Upper geotextile	Machine sewing	4"	N/A
	Geonet	Nylon ties	4"	5' on center
	Lower geotextile	Overlap	6"	N/A
Repair of minor damage (see Note 2)	Upper geotextile	Machine sewing/ thermal bonding	12"	N/A
	Geonet	N/A	N/A	N/A
Table 02373-4 Footnotes:				
1. At termination of geocomposite fold over upper geotextile as defined in Article 3.06.				
2. Minor damage is defined in Article 3.08.				

3.09 PLACEMENT OF CDN

- A. Place and anchor the CDN in the manner and at the locations shown in the Drawings and as directed by the Engineer and RPR. At, before and after the time of installation, CDN shall be rejected if it has defects, ribs, holes, flaws, deterioration, or damage incurred during manufacture, transportation, storage, or installation.
- B. Place CDN with the long dimensions downslope, with upslope panel over the downslope panel in a shingle fashion, unless otherwise directed by the Engineer. Install CDN smooth and free of tensions, stress, folds, wrinkles, or creases. CDN panels shall be laid smooth to provide a minimum width of 6 inches of geonet overlap along each joint. CDN joints shall be tied at 5-foot intervals using a method approved by the CQA Consultant and RPR. Plastic ties or tying materials shall be of contrasting color to the CDN panels for inspection. Metallic connectors shall not be allowed. Secure and leak proof bags of sand shall be used to secure the CDN during installation. Securing pins shall not be used.
- C. Fold an extra 12-inch extension of the Geotextile over the edge of the feonet and tuck beneath and secure in place with plastic ties to prevent cover soil to enter the Geonet.

- D. Protect CDN at all times during construction from contamination by surface runoff. Remove contaminated CDN and replace with uncontaminated CDN.
- E. Should the geotextile on the CDN be damaged during any step of the installation, torn or punctured sections shall be repaired by placing a piece of geotextile which extends at least 6 inches in all directions beyond the damaged area. Geotextile repair patches shall be secured by sewing or bonding as approved by the Engineer. Creased CDN shall be replaced.
- F. The orientation of CDN panels shall result in approximate alignment of the drainage paths between bottom ribs of the geonet with the drainage paths indicated by the elevations shown.
- G. Overlap the excess geotextile at each edge of the geonet panels in a manner that results in a smooth geotextile surface free of wrinkles and openings across the overlapped panels of geonet. Sew the Geotextile in accordance with the Manufacturer's recommendations.

3.10 PLACEMENT OF MATERIAL ON CDN

- A. Place soil materials on CDN in minimum thicknesses and as specified in Section 02221, Excavation, Trenching, Backfilling, and Embankment. If tears occur in the CDN during the spreading operation, the overlying material shall be cleared from the CDN and the damaged area repaired or replaced as specified.
- B. Spread overlying soil material in the direction of CDN overlap. Soil placement should be from the toe to the top of the landfill.
- C. During the placement of the granular fill material, no construction equipment shall be allowed directly on the geonet or geotextile, and any damage shall be repaired or replaced immediately. Contractor must maintain 1 foot of granular fill material above the CDN when using spreading, or grading equipment.
- D. Care shall be taken to protect the CDN. Soil ramps shall be provided at down slopes and in other heavily traveled areas. Only large radius turns by the loader and other equipment shall be permitted as sharp turns may damage the CDN and the liner.
- E. Granular materials shall not be placed over a fold in the geonet or geotextile.
- F. The granular layer final grade shall be laid to elevations as shown on the Drawings to a tolerance of 1.0 inch above the required thickness.
- G. The granular fill layer shall be compacted by rolling with a smooth drum roller. The final grade shall be laid to elevations as shown on the Drawings.

- H. Placement of granular materials on the CDN shall not proceed at an ambient temperature below 40 degrees F or above 104 degrees F, unless otherwise specified. Equipment used for placing granular material shall not be driven directly on the exposed CDN.
- I. The Contractor shall meet the minimum requirement of cover for traffic operations on top of CDN, and Contractor's disregard for this minimum cover requirement and traffic operations shall result in the Owner requesting the Contractor to replace impacted CDN at no cost to the Owner.
- J. A minimum thickness of 1 foot of granular material is specified between a light dozer (such as a wide pad caterpillar D-3 or lighter) and the liner. The dozer movement shall be forward and backward, no turning will be allowed until a minimum of 3 feet of cover is placed above the CDN and liner. All turning of dozer and other equipment will be off the area underlain by CDN. A minimum thickness of 4 feet of granular material is specified between rubber-tired delivery vehicles and the CDN or the liner. In areas of heavy traffic such as access ramps, granular material thickness should be at least 4 feet extending 2 feet on either side of the vehicle (4 feet wider than the vehicle). In any case, the Contractor shall comply with following table.

Equipment Ground Pressure (psi)	Minimum Lift Thickness (inches)
Less than 4	12
4 to 8	24
8 to 16	36
Greater than 16	48

END OF SECTION

SECTION 02480
SODDING, SEEDING AND MULCHING

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, equipment and incidentals required to prepare sod bed, install sod, and maintain sod as shown on the Drawings or specified herein.
- B. Sod shall be Argentine Bahia. Seed shall be as specified in this section and only used as temporary erosion control on areas flatter than 10H:1V.
- C. Areas to receive sod are as designated on the Drawings to the limits indicated. Any area within the limits of construction that have no final vegetative cover designation on the Drawings shall receive sod.
- D. All areas within the designated project limits of construction of the Phase 1 closure including the outside top of liner berm at upper limit of closure, the sideslope between terraces, the terrace width, and the bottom anchor berm at approximate elevation 98 shall receive sod.
- E. Any portion of the elevation 98 berm requiring re-grading due to attachment of the cap geomembrane to the bottom geomembrane or for any other construction related disruption will require complete re-sodding of the affected area.
- F. All areas outside of the closure area and elevation 98 anchor berm disturbed by the Contractor within the construction limits which are flatter than 10H:1V and are not indicated on the Drawings to receive sod shall be seeded and mulched.
- G. Seed and mulch may be used for temporary erosion control on areas flatter than 10H:1V.

1.02 DEFINITIONS

- A. Maintenance Period: Begin maintenance immediately after each area is planted and continue for a period of 12 weeks after substantial completion (12-week lawn maintenance period) or until established after all planting under this section is completed.

- B. Satisfactory Stand: Section of grass of 5,000 square feet or larger that has:
 - 1. No bare spots larger than 18 by 18 inches.
 - 2. Not more than 10 percent of total area with bare spots larger than 1 square foot.
 - 3. Not more than 15 percent of total area with bare spots larger than 6 inches square.

1.03 SUBMITTALS

- A. Quality Control Submittals:
 - 1. Certification of sod includes source and harvest date of sod, and sod seed mix.
 - 2. Seed for Erosion Control: Certification of seed analysis, germination rate, and inoculation:
 - a. Certify that each lot of seed has been tested by attesting laboratory certified in seed testing, within 6 months of date of delivery. Include with certification:
 - 1) Name and address of laboratory.
 - 2) Date of test.
 - 3) Lot number or each seed specified.
 - 4) Test Results: (i) name, (ii) percentages of purity and of germination, and (iii) weed content of each kind of seed furnished.
 - b. Mixtures: Proportions of each kind of seed.
- B. Contract Closeout Submittals: Description of required maintenance activities and activity frequency.

1.04 DELIVERY, STORAGE, AND PROTECTION

- A. Sod:
 - 1. Do not harvest if sod is excessively dry or wet to the extent survival may be adversely affected.
 - 2. Harvest and deliver sod only after laying bed is prepared for sodding.
 - 3. Roll or sack to prevent yellowing.
 - 4. Deliver and lay within 24 hours of harvesting. Do not store sod onsite more than 1 day.
 - 5. Keep moist and covered to protect from drying from time of harvesting until laid.

- B. Seed for erosion control:
 1. Furnish in standard containers with seed name, lot number, net weight, percentages of purity, germination, and hard seed and maximum weed seed content, clearly marked for each container of seed.
 2. Keep dry during storage.
- C. Hydro seeding Mulch: Mark package of wood fiber mulch to show air dry weight.

1.05 WEATHER RESTRICTIONS

- A. Perform Work under favorable weather and soil moisture conditions as determined by accepted local practice.

1.06 SEQUENCING AND SCHEDULING

- A. Complete Work under this section following completion of soil surface preparation.
- B. Notify Engineer/RPR in advance of work under this section.
- C. Planting Season: Those times of year that are normal for such Work as determined by accepted local practice.

1.07 MAINTENANCE SERVICE

- A. Contractor to perform maintenance operations during maintenance period including but not limited to:
 1. Watering on a frequency as needed to keep surface moist.
 2. Washouts: Repair by filling with topsoil, liming, fertilizing, and sodding.
 3. Mulch: Replace wherever and whenever washed or blown away.
 4. Mowing: Mow to 2 inches after grass height reaches 3 inches, and mow on a periodic schedule to maintain grass height from exceeding 3-1/2 inches. Repair or replace damaged grass.
 5. Repair and maintain until satisfactory stand of grass is established. Contractor is required to deliver a satisfactory stand of grass at substantial and final completion.
 6. Resod unsatisfactory areas or portions thereof immediately at the end of the maintenance period if a satisfactory stand has not been produced.

PART 2 PRODUCTS

2.01 TOPSOIL

- A. General: Imported or onsite, natural, friable, sandy loam, obtained from well drained areas, free from objects larger than 1-inch maximum dimension, and free of subsoil, roots, grass, other foreign matter, hazardous or toxic substances, and deleterious material that may be harmful to plant growth or may hinder grading, planting, or maintenance.
- B. Granular fill may be used as topsoil layer.
- C. The Contractor shall take at least five representative granular fill, on-site topsoil, or off-site topsoil samples to Orange County Agriculture Extension Service for soil analysis. Based on the test results and recommendations by the extension service, lime and fertilizer shall be added to amend the topsoil or granular fill if needed.
- D. For bidding purposes, the amounts of amendments are the Contractor's responsibility to determine. The Owner makes no representations about how much amendment might be required. The cost to the Contractor for possible amendment shall be part of the lump sum portion of the contract and no additional compensation will be made to the Contractor for the differences in the amendment rate.

2.02 LIME

- A. Composition: Ground limestone with not less than 85 percent total carbonate ASTM C602.
- B. Gradation:
 - 1. Minimum 50 percent passing No. 100 sieve.
 - 2. Minimum 90 percent passing No. 20 sieve.

2.03 FERTILIZER

- A. Commercial, uniform in composition, free-flowing, suitable for application with equipment designed for that purpose. Minimum percentage of plant food by weight.
- B. Mix:
 - 1. Nitrogen: 10.
 - 2. Phosphoric Acid: 10.
 - 3. Potash: 10.

4. Use either bone meal or superphosphate. Bone meal to be commercial, raw, finely ground, with minimum analysis of 4 percent nitrogen and 20 percent phosphoric acid.
5. Superphosphate to be soluble mixture of phosphate obtained from treated mineral phosphates with minimum analysis of 20 percent available phosphoric acid.

C. Top Dress Type: As recommended by local authority.

2.04 SOD

- A. Certified, containing grass mix: Species to be Argentine Bahia grass.
- B. Strongly rooted pads, capable of supporting own weight and retaining size and shape when suspended vertically from a firm grasp on upper 10 percent of pad.
 1. Grass Height: Normal.
 2. Strip Size: Supplier's standard.
 3. Soil Thickness: Uniform; 1-1/2-inch plus or minus 1/4-inch at time of cutting.
 4. Age: Not less than 10 months or more than 30 months.
 5. Condition: Health, green moist; free of diseases, nematodes and insects, and of undesirable grassy and broadleaf weeds. Yellow sod, or broken pads, or torn or uneven ends will not be accepted.

2.05 SEED FOR TEMPORARY EROSION CONTROL

- A. Fresh, clean new-crop seed that complies with the tolerance for purity and germination established by Official Seed Analysts of North America.
- B. Summer Seed Mix:

<u>Species</u>	<u>Proportion by Weight</u>
Bahia or Bahia (80%)/Bermuda (20%) mix	350 pounds per acre
- C. Winter Protective Seed: Annual ryegrass.

2.06 STRAW MULCH

- A. Threshed straw of oats, wheat, barley, or rye, free from (i) seed of noxious weeds or (ii) clean salt hay.

2.07 HYDROSEEDING MULCH

A. Wood Cellulose Fiber Mulch:

1. Specially processed wood fiber containing no growth or germination inhibiting factors.
2. Dyed a suitable color to facilitate inspection of material placement.
3. Manufactured such that after addition and agitation in slurry tanks with water, the material fibers will become uniformly suspended to form homogenous slurry.
4. When hydraulically sprayed on ground, material will allow absorption and percolation of moisture.

PART 3 EXECUTION

3.01 PREPARATION

A. Grade areas to smooth, even surface with loose, uniform fine texture.

1. Roll and rake, remove ridges, fill depressions to meet finish grades.
2. Limit such Work to areas to be plated within immediate future.
3. Remove debris, and stones larger than 1 inch diameter, and other objects that may interfere with planting and maintenance operations.

B. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry off before seeding. Do not create muddy soil.

C. Uniformly distribute top soil to within 1/2 inch of final grades. Fine grade topsoil elimination rough or low areas and maintaining levels, profiles, and contours of subgrade.

3.02 FERTILIZER AND LIME

A. Apply evenly over area in accordance with manufacturer's instructions. Mix into top 6 inches of top soil.

B. Application Rate: As recommended by soil test results.

3.03 SODDING

A. Install sod on all closure system areas, ditches, sideslopes and all other areas within the construction limit lines and in areas as shown on the Drawings and specified herein.

B. Install sod on prepared sideslopes soon after Protective Cover installation as quickly as possible to protect the sideslopes from erosion and wash downs.

- C. Rolled sod on sideslopes will be preferred.
- D. Do not plant dormant sod.
- E. Lay sod to form solid mass with tightly fitted joints; butt ends and sides, do not overlap.
 - 1. Stagger strips to offset joints in adjacent courses.
 - 2. Work from boards to avoid damage to subgrade or sod.
 - 3. Tamp or roll lightly to ensure contact with subgrade; fill cracks with topsoil/sod between pieces of sod, remove excess to avoid smothering adjacent grass.
 - 4. Complete sod surface true to finished grade, even, and firm.
- F. Fasten sod on slopes to prevent slippage with wooden pins 6 inches long driven through sod into subgrade, until flush with top of sod. Install at sufficiently close intervals to securely hold sod.
- G. Water sod with fine spray immediately after planting. During first week, water daily or more frequently to maintain moist soil to depth of 4 inches.
- H. Apply top dress fertilizer at recommended rate.
- I. Maintain all the sodded areas as required in this section for substantial completion inspections.

3.04 SEEDING FOR TEMPORARY EROSION CONTROL

- A. Start within 2 days of preparation completion.
- B. Mechanical: Broadcast seed in two different directions, compact seeded area with roller.
 - 1. Sow seed at uniform rate of 8 pounds per 1,000 square feet.
 - 2. Use Brillion type seeder.
 - 3. Broadcasting will be allowed only in areas too small to use Brillion type seeder. Where seed is broadcast, increase seeding rate 20 percent.
 - 4. Roll with ring roller to cover seed, and water with fine spray.
- C. Hydroseeding:
 - 1. Application Rate: 8 pounds per 1,000 square feet.
 - 2. Apply on moist soil, only after free surface water has drained away.
 - 3. Prevent drift and displacement of mixture into other areas.
 - 4. Upon application, allow absorption and percolation of moisture into ground.

- 5. Mixtures: Seed and fertilizer may be mixed together, apply within 30 minutes to prevent fertilizer from burning seed.
- D. Cover Crop Seeding: Apply seed at rate of 120 pounds per acre to areas that are bare or incomplete during the period of September 15 through February.
- E. Mulching: Apply uniform cover of straw mulch at a rate of 2 tons per acre.
- F. Water: Apply with fine spray after mulching to saturate top 4 inches of soil.
- G. Provide temporary seeding for stockpiled topsoil. Stockpiles to be seeded within 14 days of stockpiling.

3.05 GUARANTEE

- A. If, after the end of the 12-week lawn maintenance period, a satisfactory stand of grass has not been produced, the Contractor shall renovate, re-sod or re-seed the grass or unsatisfactory portions thereof immediately. If it is not accepted, a complete replanting will be required during the planting season meeting all of the requirements specified herein.
- B. If a satisfactory stand of grass develops within the 12-week maintenance period, it will be accepted. Guarantee period for satisfactory stand of grass shall be one year from final completion date.

3.06 FIELD QUALITY CONTROL

- A. Twelve weeks after seeding is complete and on written notice from Contractor, Engineer will, within 15 days of receipt, determine if a satisfactory stand has been established.
- B. If a satisfactory stand has not been established, Engineer will make another determination after written notice from Contractor following the next growing season.

3.07 PROTECTION

- A. Protect from vehicular and pedestrian traffic by erecting temporary fence around each newly seeded area.

END OF SECTION

SECTION 02502
TERRACE UNDERDRAIN SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. This section describes the material and work necessary for installation of the terrace underdrain systems on the landfill cover systems.

1.02 REFERENCES

- A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only:
1. American Association of Highway and Traffic Organizations (AASHTO): AASHTO M252, Standard Specification for Corrugated Polyethylene Drainage Tubing (Latest Revision).
 2. American Society for Testing and Materials (ASTM):
 - a. F449, Recommended Practice for Subsurface Installation of Corrugated Thermoplastic Tubing and Agricultural Drainage of Water Table Control (Latest Revision).
 - b. F405, Specification for Corrugated Polyethylene Tubing and Fittings (Latest Revision).

1.03 DEFINITIONS

- A. Standard Specifications: Where the term “Standard Specifications” is used, such reference shall mean the current edition, including all supplements, of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. Where reference is made to a specific part of the Standard Specifications, such applicable part shall be considered as part of this section of the Specifications. In case of a conflict in the requirements of the Standard Specifications and the requirements stated herein, the requirements herein shall prevail.

1.04 SUBMITTALS

- A. The following shall be submitted to the Engineer for approval.
1. Certificate of compliance of underdrain line with the requirements specified, prior to delivery.
 2. Certificate of compliance of underdrain line fittings with the requirements specified, prior to delivery.

PART 2 PRODUCTS

2.01 PERFORATED UNDERDRAIN PIPING

- A. The perforated underdrain pipe used for the sideslope (transition) underdrain piping and swale underdrain piping will be 6-inch diameter corrugated perforated HDPE pipe as shown on the Drawings and as manufactured by Advanced Drainage Systems (N-12LF-Landfill Grade), pipe or approval equal. The terrace underdrain and transition drain piping shall meet USDA Soil Conservation's Service Engineering Standard Code Material Specification 606 for subsurface drains and conform to ANSI/ASTM F405.
- B. The perforated polyethylene piping shall have a water inlet area of at least 1.0 square inch per foot of pipe length. The inlets shall be slot perforations approximately equally spaced along the length and circumference of the pipe in not less than three rows. Slotted perforations shall be no wider than 1/8 inch or longer than 1-1/4 inches and located in the middle of the corrugations so there is a shoulder on each side of the slot. Dimensions of the water inlet area shall be measured on a straight specimen with no external forces applied. All measurements shall be made with instruments accurate to 0.01 inch. Minimum pipe stiffness shall be 86 psi, tested in accordance with ASTM D2412.

2.02 PERFORATED UNDERDRAIN LINE FITTINGS

- A. All underdrain line fittings, including elbows, tees, branch connections, snap end caps, and reducing couplers, shall be polyethylene drainage fittings conforming to ANSI/ASTM F405. Fittings installed shall be the clamp type rather than the snap type.

2.03 NON-PERFORATED HDPE PIPE AND FITTINGS

- A. The solid wall portion of the terrace underdrain piping shall be 6-inch diameter corrugated HDPE pipe as shown on the Drawings and as manufactured by Advanced Drainage Systems (N-12) or approval equal. Contractor is required to provide all fittings and make all field adjustments as required for installation and connection of the toe drain pipes and terrace underdrain pipes by these Drawings in accordance with and as recommended by the pipe manufacturer. Pipe couplings shall be split couplings with corrugations each side of pipe joint as shown on the Drawings and recommended by the manufacturer. Underdrain coupling shall be jointed with polyethylene or polypropylene ties (two ties per coupling) and wrapped with polypropylene geotextile. Two ties shall be used for securing filter fabric at pipe joint.

2.04 FILTER FABRIC

- A. Filter fabric as specified in Section 02371, Geotextiles and required by drawings, Geotextile shall be used to wrap the required drainage layer material for the terrace underdrain system and transition drain systems, in accordance with the Drawings. Overlap edges of filter fabric a minimum of 24 inches for terrace underdrains and transition drains.

2.05 DRAINAGE LAYER MATERIAL

- A. Drainage layer material shall be FDOT approved product No. 57 drain gravel or river rock (non-limestone).

PART 3 EXECUTION**3.01 UNDERDRAIN LINE FITTING INSTALLATION**

- A. Use standard fittings specified under Article Perforated Underdrain Piping, to complete connections where required and in conformance with ANSI/ASTM F449. For nonstandard connections, join underdrain lines using manufacturer's recommended methods to complete the connection.

3.02 UNDERDRAIN PIPE BACKFILL

- A. Place underdrain pipe with the drainage layer material specified in paragraph Drainage Layer Material and filter fabric before placing backfill over the pipe envelope. Underdrain line backfill shall be placed in such a manner that displacement of the underdrain line will not occur and that the filter after backfilling shall meet the requirements of these Specifications. It is especially important that the first lift of backfill be placed with a minimum of disturbance of the underdrain line. The first lift of backfill material shall be placed immediately following the placement of the underdrain line, drain gravel, and filter fabric. The remaining backfill shall be placed as soon as practical. In no event shall underdrain piping trenches be left open overnight.

END OF SECTION

SECTION 02668
HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards that may be referenced in this section:
1. American Society for Testing and Materials (ASTM):
 - a. A194, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
 - b. A276, Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes.
 - c. B211, Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
 - d. C881, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
 - e. D413, Standard Test Methods for Rubber Property-Adhesion to Flexible Substrate.
 - f. D570, Standard Test Method for Water Absorption of Plastics.
 - g. D638, Standard Test Method for Tensile Properties of Plastics.
 - h. D696, Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics between Minus 30 Degrees C and 30 Degrees C with Vitreous Silica Dilator Meter.
 - i. D746, Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
 - j. D751, Standard Test Methods for Coated Fabrics.
 - k. D792, Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
 - l. D816 Standard Test Methods for Rubber Cement.
 - m. D882, Standard Test Methods for Tensile Properties of Thin Plastic Sheeting.
 - n. D1004, Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.
 - o. D1693, Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics.
 - p. D2240, Standard Test Method for Rubber Property-Durometer Harness.
 - q. D4437, Standard Practice for Determining the Integrity of Field Seams Used in Joining Flexible Polymeric Sheet Geomembranes.
 - r. D4833, Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

- s. D5199, Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes.
 - t. D5321, Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method.
 - u. D5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.
- 2. Federal Specifications and Standards: FED-STD 101/2065, Puncture Resistance and Elongation Test (1/8-inch Radius Probe Method).
 - 3. National Sanitation Foundation (NSF): Standard 54 for Flexible Membrane Liners.

1.02 DEFINITIONS

- A. Film Tearing Bond: Failure in ductile mode of one bonded sheet, by testing, prior to complete separation of bonded area.
- B. Geomembrane: Essentially impermeable geosynthetic composed of one or more layers of polyolefin materials fusion bonded into single-ply integral sheet.
- C. Panel: Piece of geomembrane composed of two or more sheets seamed together.
- D. Sheet: Seamless piece of geomembrane.
- E. Watertight: Geomembrane installation free of flaws and defects that will allow passage of water and gases, liquids, and solids to be contained under anticipated service conditions.

1.03 SUBMITTALS

- A. Administrative Submittals:
 - 1. Production dates for geomembrane.
 - 2. Qualification documents for Geomembrane Manufacturer(s).
 - 3. Qualification documents for Geomembrane Installer and Crew.
 - 4. Qualifications for Independent Testing Laboratory.
- B. Shop Drawings:
 - 1. Manufacturer's specifications, literature for each geomembrane furnished, and products used to complete installation.
 - 2. Compensation allowance calculation and numerical values for temperature induced geomembrane expansion and contraction.
 - 3. Polymer Resin: Product identification and Supplier.

4. Geomembrane sheet layout with proposed size, number, position, and sequence of sheet placement, and location of field seams.
5. Proposed equipment for material placement.
6. Procedures for material installation.

C. Quality Control Submittals:

1. Quality Assurance Program: Written description of geomembrane manufacturer's and installer's formal programs for manufacturing, fabricating, handling, installing, seaming, testing, and repairing geomembrane.
2. Manufacturer's Certificate of Compliance, in accordance with Section 01300, Submittals.
3. Factory quality control test results for materials manufactured for this Project.
4. Friction test results.

D. Contract Closeout Submittals:

1. Manufacturer's Certificate of Proper Installation.
2. Record Documents: Include panel and sheet numbers, seaming equipment and operator identification, temperature and speed setting of equipment, date seamed, identity and location of each repair, cap strip, penetration, boot and sample taken from installed geomembrane for testing.
3. Material and seam test results.
4. Special guarantee.

E. Submittal Review Conference:

1. In order to expedite the Shop Drawing submittal and review process, a Submittal Review Conference will be scheduled by the Engineer 7 days after the Contractor's submittal of the Shop Drawings, samples, qualifications, and quality control documents for CDN, HDPE Geomembrane, and LLDPE Liner.
2. Engineer will coordinate with the Contractor to set the time and place for this conference. The representatives of Contractor, Installer, and Manufacturers are required to attend this conference to receive review comments, and to discuss with the Engineer, if needed, submittal questions regarding the specification requirements.
3. The Contractor shall prepare the shop drawing re-submittal for CDN, HDPE Geomembrane and LLDPE Liner, if required, based on the final review comments received at this conference.

4. If the initial submittal for any one of these products (LLDPE Liner, HDPE Geomembrane, CDN) meets the specifications in the opinion of the Engineer and there are no resubmittals required, attendance will not be needed and discussion of the Shop Drawing for that product will not be included in the conference agenda.

1.04 QUALIFICATIONS

- A. Independent Testing Agency: Certified in the State of Florida, 5 years experience in field of geomembrane testing. Calibrated instruments and equipment, and documented standard procedures for performing specified testing.
- B. Manufacturer and Fabricator: Successfully manufactured minimum of 10 million square feet of each type of geomembrane material specified for applications similar to Project.
- C. Installer:
 1. Successfully installed a minimum of 10 million square feet of each type of geomembrane product specified in applications for landfill bottom liner projects in Florida similar to this Project.
 2. Qualified Installation Crew: Project Manger, Superintendent, Field Supervisor(s), QC officer, Master Seamer(s) with a minimum of 10 million square feet of each type of geomembrane product specified in applications for landfill bottom liner similar to Project.

1.05 COORDINATION MEETINGS

- A. Meet at Least Once Prior to Commencing Each of the Following Activities:
 1. Submission of Submittals.
 2. Manufacture of geomembrane sheets.
 3. Fabrication of panels and boots.
 4. Installation of geomembrane.
- B. Attendees:
 1. Contractor's designated quality control representative.
 2. Engineer.
 3. Representatives of geomembrane installer.
 4. Others requested by Engineer.
- C. Topics:
 1. Specifications and Drawings.
 2. Submittal requirements and procedures.
 3. Schedule for beginning and completing geomembrane installation.

4. Training for installation personnel.
5. Installation crew size.
6. Establishing geomembrane marking system, to include sheet identification, defects, and satisfactory repairs, to be used throughout Work.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Conform to requirements of Section 01600, Material and Equipment.
- B. Geomembrane:
 1. Individually package each sheet and protect from damage during shipment.
 2. Mark each package with identification of material type, size and weight.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Do not install geomembrane or perform seaming under the following conditions, unless it can be demonstrated to satisfaction of Engineer that performance requirements can be met under these conditions:
 1. Air temperature is less than 35 degrees F or more than 90 degrees F.
 2. Relative humidity is more than 90 percent.
 3. Raining, snowing, frost is in ground, or wind is excessive.
- B. Do not place cover materials on geomembrane when ambient temperature is less than 35 degrees F or more than 90 degrees F, unless it can be demonstrated to satisfaction of Engineer that materials can be placed without damage.

1.08 SEQUENCING AND SCHEDULING

- A. Factory test results must be acceptable to Engineer prior to shipment of geomembrane.
- B. Before placing geomembrane on soil surfaces, prepare subgrade as specified in Section 02221, Excavation, Trenching, Backfill and Embankment.
- C. Do not attach geomembrane to new concrete surfaces until after concrete has attained 2/3 of design compressive strength specified in Section 03300, Cast-In-Place Concrete.
- D. Do not place geomembrane over concrete surfaces until finish of concrete surfaces is acceptable to Engineer.

- E. The prequalified installation crew and the position which they were qualified shall not be changed throughout the project without advance written notification to the Engineer and obtaining approval of pre-qualification of the new crew members at least 14 days in advance of needing to make a change in crew. No crew member shall be onsite unless prequalified.

1.09 SPECIAL GUARANTEE

- A. Provide manufacturer's extended guarantee or warranty with Owner named as beneficiary, as special guarantee. Special guarantee shall provide for correction, or at option of Owner, removal and replacement of Work specified in this Specification Section found defective during periods below, commencing on date of Substantial Completion. Duties and obligations for correction or removal and replacement of defective Work as specified in Article 17 of the General Conditions.
 - 1. Guaranty geomembrane against manufacturing defects, deterioration due to ozone, ultraviolet, and exposure to leachate and other elements for period of 20 years on pro rata basis.
 - 2. Guaranty geomembrane against defects in material and factory seams for period of 2 years.
 - 3. Guaranty geomembrane against defects resulting from installation for period of 2 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Geomembrane:
 - 1. GSE Lining Technology, Inc., Houston, TX.
 - 2. Poly-America Inc., Grand Prairie, TX.
 - 3. AGRU American, Georgetown, SC.
 - 4. Or approved equal.

2.02 HDPE GEOMEMBRANE

- A. Composition: High Density Polyethylene (HDPE) containing no plasticizers, fillers, extenders, reclaimed polymers, or chemical additives, except following:
 - 1. Approximately 2 percent by weight of carbon black to resin for ultraviolet resistance.
 - 2. Antioxidants and heat stabilizers, not to exceed 1.5 percent total by weight, may be added as required for manufacturing.
- B. Furnish in rolled single-ply continuous sheets with no factory seams.

- C. Sheet Thickness: Minimum values determined in accordance with ASTM D5199 and shall not include ridges of rough-surfaced HDPE geomembrane, 60 mils.
- D. Sheet Width: Minimum 22 feet.
- E. Roll Length: Longest that will be manageable and reduce field seams.
- F. Rough-Surfaced HDPE Geomembrane: Manufactured so that surface irregularities that produce specified friction are adequately fused into sheet or are extruded with sheet, on both sides of sheet. Texture is to be in addition to base thickness specified for sheet.
- G. Meet manufacturer's most recent published specifications and required minimum values in this table.

Property	Required Value	Test Method
Specific Gravity	≥ 0.940 - 0.960 g/cc not more than 15% greater than base resin density	ASTM D792, Method A-1 or ASTM D1505
Smooth-Surface, HDPE Minimum Properties, Each Direction		
Tensile Stress at Yield	2.1 lb/in-width/mil thickness	ASTM D638
Elongation at Yield	12% minimum	
Thickness, Nominal, plus or minus 5%	60 mil	ASTM D5199
Puncture Resistance	1.25 lb/mil thickness	ASTM D4833
Tear Resistance	0.70 lb/mil thickness	ASTM D1004, Die C
Modulus of Elasticity	80,000 lb/sq in	ASTM D882, Method A or ASTM D638
Bonded Seam Strength in Shear	2 lb/in-width/mil thickness, min. and FTB	ASTM D6392
Bonded Seam Strength in Peel	1.2 lb/in-width/mil thickness, min. and FTB	ASTM D6392
Rough-Surfaced, HDPE Minimum Properties, Each Direction		
Thickness, min., for thinner areas of textured sheet	57 mil	ASTM D5199, Modified Note 2, or ASTM D5994
Tensile Stress at Yield	2 lb/mil thickness	ASTM D638
Elongation at Yield	12% plus or minus 3%	

Property	Required Value	Test Method
Puncture Resistance	1 lb/mil thickness	ASTM D4833
Tear Resistance	0.70 lb/mil thickness	ASTM D1004, Die C
Angle of friction between rough-surfaced HDPE, & soil or geotextile	28, min. (Note 1)	ASTM D5321, state conditions of test
Brittleness Temperature	Minus 70° F, no cracks	ASTM D746 (Proc. B)
Coefficient of Linear Thermal Expansion	1.2×10^{-4} in/in/degree C	ASTM D696
Environmental Stress Crack	1,500 hours	ASTM D1693, Condition B (50°C) and 10% Igepal Solution
Bonded Seam Strength in Shear	2 lb/in-width/mil thickness, min. & FTB	ASTM D 6392
Bonded Seam Strength in Peel	1.2 lb/in-width/mil thickness, min. & FTB	ASTM D6392
<p>NOTES</p> <ol style="list-style-type: none"> 1. Provide certified results for angle or coefficient of friction tests between rough-surfaced HDPE and actual soils and geotextiles to be used. Perform tests on Samples of similar length and width of 0.8 to 1 square foot minimum area. Submit test results to Engineer for review prior to shipment of rough-surfaced HDPE. Friction tests are not required for smooth 60-mil HDPE. 2. Commercially available micrometers may be used that have a 60-degree taper to a point with a radius of 1/32-inch. Engineer shall make enough measurements of thinner areas of textured sheet to develop statistical basis for thickness. 		

- H. Extrudate for Fusion Welding of HDPE Geomembranes: Formulated from same HDPE resin as geomembrane and shall meet applicable physical property requirements.

2.03 FACTORY TESTING

A. Interface Friction Testing:

1. Minimum peak and residual friction angles between geomembrane and adjacent materials shall be at least 28 degrees as determined by ASTM D5321. Confining pressures should approximate loading conditions in field. Soil in contact with geomembrane shall be the actual soil that is going to be used for this construction in consolidated, undrained state.

2. Test results shall include description of specimen size, supporting substrate conditions, soil installation method, unit weight, and moisture condition, normal loads used, and rate of strain.
3. Rough-Surfaced Geomembrane:
 - a. Perform coefficient of interface friction tests between textured 60 mil-HDPE geomembrane and GCL, and textured 60 mil-HDPE geomembrane and composite drainage net with geotextile bonded on both sides. Use Samples of similar length and width.
 - b. Test Results: Include specimen size, supporting substrate, and rate of strain, and normal loads.
 - c. A minimum of two tests shall be conducted for each type of interface.

2.04 BOOTS

- A. Fabricated of same material as geomembrane sheets to fit around penetrations, without folds, stretching, or unsupported areas.
- B. Flanges:
 1. Angle: Match slope or bottom where penetration passes through liner.
 2. Width: Minimum 2 feet plus dimension of penetration, (except as otherwise shown on the Drawings-i.e. Detail No.12).

2.05 SEALANT CAULKING

- A. Two-component sealant formulated of 100 percent polyurethane elastomer.
- B. Manufacturer and Product: United Paint and Coatings, Greenacres, WA; Elastuff 120 Mastic, or approved equal.

2.06 STAINLESS STEEL BANDS

- A. As manufactured by Breeze Clamp Products Div., Saltsburg, PA or approved equal.

2.07 MANUFACTURER'S CONFORMANCE TESTING

- A. Resin Quality Documentation: Prior to liner delivery and installation, the manufacturer shall provide Engineer with the following information:
 1. The origin (resin supplier's name, resin production plant), (identification brand name, number), and production date of the resin.
 2. A copy of the quality control certificates issued by the resin supplier noting results of density and melt index.

3. Reports on the tests conducted by the manufacturer to verify the quality of the resin used to manufacture the geomembrane rolls assigned to the project facility (these tests should include specific gravity (ASTM D792 Method A or ASTM D1505) and melt index (ASTM D1238 Condition 190/2.16).
 4. Reports on the tests conducted by the manufacturer to certify the quality of the sheet.
- B. Property Conformance Documentation: Prior to liner delivery and installation, the manufacturer shall provide the Owner's Representative with the following:
1. A properties sheet including, at a minimum, all specified properties, measured using test methods indicated in the Specification, or equivalent.
 2. The Engineer will verify that:
 - a. The property values certified by the geosynthetic manufacturer meet all of the specifications.
 - b. The measurements of properties by the geosynthetic manufacturer are properly documented, and that the test methods used are acceptable.
- C. Geosynthetic Roll Documentations: Prior to shipment, the manufacturer shall provide Engineer with one quality control certificate for every roll of geosynthetic provided. The quality control certificate shall be signed by the manufacturer's responsible party. The quality control certificate shall include at a minimum:
1. Roll numbers and identification.
 2. Results of quality control tests. As a minimum, ASTM test methods shall be used to test for thickness, tensile strength, and tear resistance.

PART 3 EXECUTION

3.01 PREPARATION

- A. Geomembrane Inspection: During unwrapping visually inspect and mark each imperfection for repair.
- B. Do not place geomembrane until condition of subgrade or geosynthetics installed is acceptable to Engineer.
- C. Subgrade: Maintain in smooth, uniform, and compacted condition as specified in Section 02221, Excavation, Trenching, Backfill, and Embankment, during installation of geomembrane.

3.02 WELDING UNITS

- A. Single or double hot-wedge fusion seam welding.
- B. Extrusion welding systems.
- C. Hot-air welding is not acceptable.

3.03 GEOMEMBRANE INSTALLATION

- A. Do not install membrane or seam unless Contractor can demonstrate successful performance and test results showing seams meet strength Specifications.
- B. Protection:
 - 1. Do not use geomembrane surfaces as work area for preparing patches, storing tools and supplies, or other uses. Use protective cover as work surface, if necessary.
 - 2. Instruct workers about requirements for protection of geomembrane, such as, handling geomembrane material in high winds, handling of equipment, and walking on geomembrane surfaces. Shoes of personnel walking on geomembrane shall be smooth bonded sole or be covered with smooth type of overboot. Prohibit smoking, eating, or drinking in vicinity of geomembrane, placing heated equipment directly on geomembrane, or other activities that may damage geomembrane.
 - 3. Do not operate equipment without spark arrestors in vicinity of geomembrane material nor place generators or containers of flammable liquid on geomembranes.
 - 4. Protect from vehicle traffic and other hazards.
 - 5. Keep free of debris during placement. Pick-up all debris and trash at the end of each work day.
 - 6. Prevent uplift, displacement, and damage.
 - 7. Only small rubber-tired equipment, with maximum tire inflation pressure of 5 pounds per square inch, shall be allowed directly on geomembrane unless otherwise approved by Engineer. Demonstrate that proposed equipment can be operated without damaging geomembrane.
- C. Placement:
 - 1. Miscellaneous products required for completion of geomembrane installation shall be in accordance with this Specification and geomembrane manufacturer's recommendations.
 - 2. Reduce field seaming to minimum. Horizontal seams on slopes will not be acceptable. Seams parallel to toe shall be at least 5 feet from toe. Align rough-sided sheets in manner that maximizes their frictional capabilities along slope.

3. Prevent wrinkles, folds, or other distress that can result in damage or prevent satisfactory alignment or seaming. Provide for factors such as expansion, contraction, overlap at seams, anchorage requirements, seaming progress, and drainage.
4. Temporarily weight sheets with sandbags to anchor or hold them in position during installation. Use continuous holddowns along edges to prevent wind flow under sheet.
 - a. Bag Fabric: Sufficiently close knit to preclude fines from working through bags.
 - b. Bags: Contain not less than 40 or more than 60 pounds of sand having 100 percent passing No. 8 screen and shall be securely closed after filling to prevent sand loss.
 - c. Do not use tires or paper bags, whether or not lined with plastic. Burlap bags, if used, shall be lined with plastic.
 - d. Immediately remove damaged or improperly sealed bags from work area, and clean up spills.
5. Anchor perimeter of geomembrane as shown or as otherwise approved by Engineer. Anchor and seal geomembrane to structures, pipes, and other types of penetrations as shown.
6. Place overlying drainage net and composite drainage net immediately following completion of geomembrane installation and field testing as acceptable to Engineer.

D. Field Seams:

1. Wipe sheet contact surfaces clean to remove dirt, dust, moisture, and other foreign materials and prepare contact surfaces in accordance with seaming method accepted by Engineer.
2. Lap sheet edges to form seams. Adjust edges to be seamed and temporarily anchor to prevent wrinkling and shrinkage.
3. Seams shall not go through a boot. Locate seams minimum of 2 feet from boot.
4. Avoid seam intersections involving more than three thicknesses of geomembrane material. Offset seam intersections at least 2 feet. Extend seams through anchor trench to sheet edges.
5. Seal seam "T" intersections by removing excess material and extrusion welding lap joint.
6. Seam sheets together, using fusion-extrusion or hot-wedge welding system, equipment, and techniques.
7. Capping of Field Seams: Use 8-inch wide (minimum) cover strip of same thickness as geomembrane (and from same roll, if available). Position strip over center of field seam and weld to geomembrane using fillet weld each side, including copper wire as described above for spark testing.

3.04 PLACING PRODUCTS OVER GEOMEMBRANE

- A. Prior to placing material over CDN, which overlies geomembrane, notify Engineer and geomembrane installer. Do not cover installed geomembrane until after Engineer provides authorization and geomembrane installer approves to proceed.
- B. During the placement of drainage sand over CDN and geomembrane, a spotter representing geomembrane installer shall be present at all times to observe and approve the placement of drainage sand. The spotter shall be within 100 feet of the sand placement operation, in visual contact of the liner system surface and sand placement and have no other duties that could distract from their spotting responsibility.
- C. Wrinkles greater than 6 inches in height are unacceptable. Do not place CDN over Geomembrane, or cover materials over CDN, which overlies geomembrane when the height of any wrinkle is less than 2 inches and spacing between wrinkles is greater than 10 feet. Do not place cover materials when the height of any wrinkle is greater than 6 inches. All wrinkles meeting this limitation of this paragraph shall be repaired.
- D. Do not place cover materials in manner that will cause wrinkles to fold over or become confined to form a vertical ridge. Repair all such wrinkles prior to placement of cover material.
- E. Place cover materials when liner is cool and contracted and wrinkles are minimized.
- F. If tears, punctures, or other geomembrane damage occurs during placement of overlying products, remove overlying products as necessary to expose damaged geomembrane, and repair damage as specified in Article Repairing Geomembrane.
- G. Geomembrane installer shall provide a spotter for each location where materials are being placed over geomembrane, and shall remain onsite and available during placement of overlying products to repair geomembrane if damaged.
- H. Contractor shall provide a certification to the Owner certifying that geomembrane was not damaged during cover material placement.

3.05 REPAIRING GEOMEMBRANE

- A. Geomembrane surface showing injury due to scuffing, penetration by foreign objects or distress from rough subgrade shall be replaced or covered and sealed with an additional layer of geomembrane material of proper size.

- B. Repair damage or rejected seams with pieces of flat and unwrinkled geomembrane material free from defects and seams. Patches shall be tightly bonded on completion of repair Work.
- C. Patch shall be neat in appearance and of size 6 inches larger in all directions than area to be repaired. Round corners of patch to minimum 1-inch radius.
- D. Prepare contact surfaces and seam patch in accordance with paragraph Field Seams.
 - 1. Pull and hold flat receiving surface in area to be patched.
 - 2. Seal each patch by extrusion welding continuous bead along edge, with no free edge remaining.
 - a. Vacuum box test each patch on completion.

3.06 FIELD QUALITY CONTROL

- A. Identify each test by date of Sample, date of test, Sample location, name of individual who performed test, standard test method used, and list of departures from standard test methods, at minimum.
- B. In-Place Observation and Testing:
 - 1. Visually inspect geomembrane sheets, seams, anchors, seals, and repairs for defects as installation progresses and again on completion.
 - 2. Depending on seam welding equipment used, test each seam and repair using vacuum testing device, spark testing device or air channel pressure test for double wedge welded seams.
 - 3. Perform testing in presence of Engineer.
- C. Field Testing Equipment:
 - 1. Tensiometer:
 - a. Motor driven with jaws capable of traveling at measured rate of 2 inches per minute.
 - b. Equipped with gauge, which measures force in unit pounds exerted between jaws.
 - c. Force Tech 5002 DPR portable tensile tester as furnished by Columbine International, Ltd., Placerville, CA.
 - 2. Vacuum Box: Conform to ASTM D5641.
- D. Field Seam Sampling:
 - 1. Verify that seaming equipment and operators are performing adequately. Produce test seam Samples at beginning of each shift for each seaming crew. In addition, if seaming has been suspended for more than 1/2 hour, or if breakdown of seaming equipment occurs, produce test seam Samples prior to resuming seaming.

2. Sample Size: 12 inches wide plus seam width, and 30 inches long.
 3. Nondestructive Sampling shall be the Responsibility of the Contractor:
 - a. For boots and seams that cannot be otherwise tested, insert copper wire for spark test at edge of overlapping sheet in extrudate of weld prior to fillet welding. Position to within 1/8 inch of sheet edge.
 - b. Frequency: One at the beginning of a continuous seam and one at the end of a continuous seam, and minimum one Sample per seaming crew per 4-hour work period. The seaming temperature shall be recorded at the beginning and the end of the seam and once every 500 feet.
 - c. Produce Samples using same materials, equipment, personnel, and procedures as field seams made at time of Work in progress and under same conditions.
 4. Destructive Sampling shall be the Responsibility of the Engineer:
 - a. Frequency: Minimum one Sample per 500 feet of field seam.
 - b. Remove Samples from field seams at locations selected by Engineer.
 - c. Repair field seams in accordance with repair procedures specified in these Specifications.
 5. Sample Identification:
 - a. Number, date, and identify each Sample as to personnel making seam and location of Sample or location of field seam Work in progress at time Sample is made.
 - b. Mark location of Sample, or location of field seam in progress at time Sample is made, on panel/sheet layout Drawing.
 6. Conform ASTM D4437 and this Specification:
 - a. Seam testing for HDPE includes strength tests, vacuum box testing, air channel pressure tests, and probing.
- E. Field Seam Strength Sample Testing:
1. General:
 - a. Test each Sample for seam peel and tensile strength.
 - b. Save test Samples, including specimens tested, until notified by Engineer relative to their disposal.
 - c. Each Sample that fails under test shall be shipped immediately by express delivery to Engineer for determination of corrective measures required.
 2. Field Seam Acceptance Criteria: Seam strength equal to 90 percent of that of parent material. Parent material shall be tested in accordance with ASTM D638.
 - a. Bonded Shear Strength of HDPE:
 - 1) In Shear: Minimum 2 pounds per inch width per mil thickness as determined in accordance with ASTM D6392, and ASTM D816, Method B.

- 2) In Peel: Minimum 1.5 pounds per inch width per mil thickness as determined in accordance with ASTM D6392 and ASTM D413, Method A.
3. Test Failure: If Sample fails, entire field seam from which it was taken shall be considered a failure and shall be rejected due to nonconformance with Specification requirements. Comply with following corrective measures:
 - a. For nondestructive Sample failure, rerun field weld test using same Sample. If that test passes, Engineer may assume error was made in first test and accept field seam. If second test fails, cap each field seam represented by failed Sample and submit new test Sample made during capping procedure.
 - b. Destructive Sample Failure: Rerun field weld test using new Sample from same seam. If that test passes, Engineer may assume error was made in first test and accept field seam. If second test fails, either cap field seam between two previous passed seam test locations that include failed seam or take another Sample on each side of failed seam location (10-foot minimum), and test both. If both pass, cap field seam between two locations. If either fails, repeat process of taking Samples for test. Each field seam shall be bounded by two passed test locations prior to acceptance.
- F. Vacuum Box Testing of HDPE Welds shall be the Responsibility of the Contractor: Vacuum box test each of these types of welds: Fillet, extrusion lap, and single hot-wedge fusion lap.
 1. Testing Procedures: Conforming to ASTM D5641.
- G. Air Channel Pressure Testing of Double Hot-Wedge Seam shall be the Responsibility of the Contractor:
 1. Insert needle with gauge in air space between welds. Pump air into space to 30 psi and hold for 5 minutes.
 2. At end of 5 minutes, depressurize seam by placing needle hole in air space between welds at opposite end of seam and observe gauge.
 3. If seam maintains at least 27 psi during 5-minute hold and pressure drops within 30 seconds of depressurization, seam is acceptable.
 4. If pressure drops below 27 psi during test period, or does not drop during 30-second depressurization period, repair needle holes and retest seam by same procedure or vacuum box test along entire length of seam. If seam maintains a minimum of 27 psi, seam is acceptable.
 5. If second air pressure test fails, vacuum box test entire length of seam.
 - a. If no bubbles appear in vacuum box, lower weld will be considered defective, and upper seam is acceptable.
 - b. If bubbles appear in vacuum box, repair each defective area by extrusion welding and test again by vacuum box.

6. As alternative to vacuum box testing, apply soap solution to exposed seam edge while maintaining required air channel test pressure.
 - a. If bubbles appear, mark, trim unbonded edge, and extrusion weld defective areas.
 - b. If no bubbles appear and test pressure cannot be maintained, leak is judged to be in bottom or second seam.
7. If leak is judged to be in bottom seam, cap strip length of seam tested.
8. Mark and repair needle holes.

3.07 MANUFACTURER'S SERVICES

- A. Provide Representative of Geomembrane Manufacturer Onsite for Technical Supervision and Assistance During the Following:
 1. Preparation and inspection of surfaces on which geomembrane is to be placed.
 2. Inspection of geomembrane prior to installation.
 3. Installation of geomembrane.
 4. Placement of cover over installed geomembrane.
- B. The manufacturer may provide an affidavit assigning the Geomembrane Installer as their field representative. The affidavit is required to be signed by a principal of the manufacture corporation specifically stating the assignment and including name of the person (i.e. Installer's Site Supervisor) who will be their representative onsite for this Project.

3.08 CLEANUP

- A. Clean up work area as Work proceeds and remove all trash at the end of each workday. Take particular care to ensure that no trash, tools, and other unwanted materials are trapped beneath geomembrane and that scraps of geomembrane material are removed from work area prior to completion of installation.

3.09 SUPPLEMENT

- A. The supplement listed below, following "END OF SECTION" is a part of this Specification.
 1. Supplement 1, HDPE Manufacturer's Certification of Proper Installation.

END OF SECTION

HDPE Manufacturer's Certificate of Proper Installation

Contract Name:

Owner: Orange County Solid Waste Division

Contractor:

Engineer: CH2M/Neel-Schaffer

Material: High Density Polyethylene Geomembrane (HDPE)

Specification Section No.: 02668

I, the undersigned Manufacturer's Representative, hereby certify that I am:

- 1) A duly authorized representative of the Manufacturer
- 2) Empowered by the Manufacturer to inspect and approve the installation and repair of the material(s) identified above
- 3) Authorized to make recommendations required to assure that the installation and/or repair of the material(s) furnished by the Manufacturer are complete and functional, except as may be otherwise indicated herein

I further certify that:

- 1) The above referenced material(s) was installed in accordance with the (i) Owner's plans and specification, (ii) Manufacturer's and Installer's Quality Assurance Programs, and (iii) Manufacturer's Pro-Rata Limited Installation Warranty
- 2) All repairs to the above referenced material(s) performed by the Manufacturer and/or Installer prior to the Final Completion date of _____ were performed in accordance with the (i) Owner's plans and specification, (ii) Manufacturer's and Installer's Quality Assurance Programs, and (iii) Manufacturer's Special Guarantees and warranties.
- 3) All information contained herein is true and accurate

Date: _____

Manufacturer:

Manufacturer's Authorized Representative: _____
(Authorized Signature)

(Print Name)

SECTION 02669
LINEAR LOW DENSITY POLYETHYLENE
GEOMEMBRANE LINER (LLDPE)

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Society for Testing and Materials (ASTM):
 - a. D1004, Initial Tear Resistance of Plastic Sheeting.
 - b. D1238, Flow Rates of Thermoplastics by Extrusion Plastometers.
 - c. D 505, Density of Plastics by the Density-Gradient Technique.
 - d. D1603, Carbon Black in Olefin Plastics.
 - e. D3895, Test Method for Oxidative Induction Time of Polyolefin by Thermal Analysis.
 - f. D4833, Index Puncture Resistance of Geotextiles, Geomembrane and Related Products.
 - g. D5321M-14, Standard Test Method of Determining the Shear Strength of Soil Geosynthetic and Geosynthetic-Geosynthetic Interfaces by Direct Shear, January 1, 2014.
 - h. D5323, Determination of 2% Secant Modulus for Polyethylene Geomembrane.
 - i. D5596, Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics.
 - j. D5617, Multi-axial Tension Test for Geosynthetics.
 - k. D5721, Practice for Air-Oven Aging of Polyolefin Geomembranes.
 - l. D5885, Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High Pressure Differential Scanning Calorimetry.
 - m. D5994, Test Method for Measuring the Core Thickness of Texture Geomembrane.
 - n. D6392, Determining the Integrity of Non-reinforced Geomembrane Seams Produced Using Thermo-Fusing Methods.
 - o. D6693, Determining Tensile Properties of Non-Reinforced Polyethylene and Non-Reinforced Flexible Polypropylene Geomembrane.
 2. Geosynthetic Research Institute (GRI):
 - a. GM 10, Specification for the Stress Crack Resistance of Geomembrane Sheet.
 - b. GM 11, Accelerated Weathering of Geomembranes Using a Fluorescent UVA Condensation Exposure Device.

- c. GM 12, Measurement of the Asperity Height of Textured Geomembrane Using a Depth Gauge.
- d. GM 17 Rev. 6, Test Methods, Test Properties and Testing Frequency for Linear Low Density Polyethylene (LLDPE Smooth and Textured Geomembranes dated June 1, 2009.
- e. GM 19 Rev. 6, Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes dated October 3, 2011.

1.02 DEFINITIONS

- A. Boot: Watertight collar fabricated from geomembrane sheet for sealing geomembrane to pipes and other objects that penetrate geomembrane.
- B. Film Tearing Bond: A failure in the ductile mode of one of the bonded sheets by testing prior to complete separation of the bonded area.
- C. Geomembrane: An essentially impermeable geosynthetic composed of one or more layers of polyolefin materials fusion bonded into single ply integral sheet.
- D. Panel: Piece of geomembrane composed of two or more sheets seamed together.
- E. Sheet: Seamless piece of geomembrane.
- F. Watertight: Geomembrane installation free of flaws and defects that will allow passage of water and gases, liquids, and solids to be contained under anticipated service conditions.

1.03 SUBMITTALS

- A. Contractor shall schedule Work to provide sufficient time as required to perform satisfactory quality control testing, and complete the submittals for manufacturing, delivery, storage, handling and installation of the geomembrane.
- B. Administrative Submittals:
 - 1. Qualifications documentations for the manufacturer.
 - 2. Qualification documentations for the installer and designated crew.
 - 3. Qualification documents for the independent construction quality control testing agency (CQC consultant).
 - 4. Production dates for geomembrane.

C. Shop Drawings:

1. Manufacturers specifications, and literature for each geomembrane furnished, and all products used to complete the installation.
2. Compensation allowance calculation and numerical values for temperature induced geomembrane expansion and contraction.
3. Polymer Resin: Product identification and supplier.
4. Geomembrane sheet layout with proposed size, number, position, and sequence of sheet placement, and location of field seams.

D. Quality Control Submittals:

1. Quality Control Program(s): Written description of geomembrane manufacturer's and installer's formal programs for manufacturing, fabricating, handling, installing, seaming, testing, and repairing geomembrane.
2. Manufacturer's certification of compliance for geomembrane production, testing and processing.
3. Factory quality control test results for materials manufactured for this Project.
4. Rough-Surface (textured) Geomembrane Coefficient of Interface Friction Test Results: Include, but is not limited to, specimen size, supporting substrate soil installation method and unit weight, soil moisture at molding and test, rate of strain and normal loads, and test results. This is a performance test and shall be performed by a GRI accredited laboratory independent of the geomembrane manufacturer. Testing shall simulate field boundary conditions and utilize the actual materials proposed to be used for this Project.
5. Laboratory Testing Equipment: Certified calibrations, manufacturer's product data, and test procedures.
6. Certified test results.

E. Contract Closeout Submittals:

1. The following contract closeout submittals shall be submitted and accepted by the Engineer as complete prior to issuance of Substantial Completion:
 - a. Manufacturer's certification of specified product manufacturing.
 - b. Geomembrane installer's certification of subsurface acceptability.
 - c. Geomembrane installer's Certificate of Proper Installation.
 - d. Record Documents: Include panel and sheet numbers, seaming equipment and operator identification, temperature and speed setting of equipment, date seamed, identity and location of each repair, cap strip, penetration, boot and sample taken from installed geomembrane for testing.

- e. Six paper copies and six electronic copies of all material and seam test results in bound reports and computer disk.
- f. Special guarantee(s).

1.04 QUALIFICATIONS

- A. Independent Testing Agency (CQC Consultant): A GRI-accredited laboratory certified in the State of Florida, and 10 years of recent continuous experience in the field of landfill geomembrane testing is required for this Project. Calibrated instruments and equipment, and documented standard procedures for performing specified testing.
- B. Manufacturer and Fabricator: Successfully manufactured minimum of 50 million square feet of the type of geomembrane material specified for landfill closure cover applications similar to Project.
- C. Installer: Successfully installed a minimum of 10 million square feet of the type of geomembrane product specified in landfill closure cover applications similar to Project.

1.05 COORDINATION MEETINGS

- A. Meet at least once prior to commencing each of the following activities: Submission of Submittals, manufacture of geomembrane sheets, fabrication of panels and boots, and installation of geomembrane.
- B. Engineer will coordinate time, location, attendees and agenda for meeting.
- C. Attendees: Owner, Contractor's designated quality control representative, superintendent, Engineer, RPR, CQC consultant, representative of geomembrane supplier, installer project manager and superintendent, and others requested by Engineer.
- D. Topics:
 - 1. Specifications and Drawings, Submittal requirements and procedures, schedule for beginning and completing geomembrane installation, training for installation personnel, and installation crew size.
 - 2. Establishing geomembrane marking system, to include sheet identification, defects, and satisfactory repairs, to be used throughout Work.
- E. Seam Installation and Testing Demonstration: Performed by geomembrane installer, for each type of seam required.

1.06 QUALITY CONTROL AND QUALITY ASSURANCE

- A. Contractor shall be responsible to provide a qualified independent CQC consultant registered in State of Florida for construction quality control of geocomposite and geomembrane raw material, production, delivery, storage, and installation. The quality control laboratory shall have at least 10 years of experience in testing geomembrane and be familiar with ASTM and other applicable test standards. The CQC consultant shall be retained by the Contractor and will be responsible to perform all the duties of CQC consultant as described in these Technical Specifications for this Project including review of the geomembrane and geocomposite manufacturing, delivery, storage and installation Drawings for completeness and perform all quality control testing as required by these Specifications. The CQC consultant shall prepare a final report including all test results and project documentations, and certify the materials and installations are in accordance with the approved Specifications and installation plan. Eight original copies of the final report of the CQC consultant shall be submitted by the Contractor at the completion of geomembrane and final protective cover installation. All costs and fees associated with the CQC consultant shall be paid by the Contractor as part of the Lump sum portion of this Contract.
- B. The Owner and Engineer will be responsible to provide services of the CQC consultant for quality assurance of the Contractor's work. The CQC consultant will observe and inspect the geomembrane delivery, installation and testing at random frequencies and locations as specified. The CQC consultant will observe placement of protective cover over the geomembrane and will also perform other tests as required for quality assurance. The CQC consultant shall prepare a final report, signed and sealed by a professional engineer registered in State of Florida for submittal to FDEP for certification of completion. The Contractor shall cooperate with the CQC consultant and provide all assistance necessary for the testing performed by the CQC consultant.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Geomembrane rolls shall be protected from damage during shipment in accordance with the manufacture's recommendations. Mark each package with identification of material type, size and weight. Repair or replace the factory package upon delivery, if damaged or torn during shipment.

- B. Upon delivery to the project site, the geomembrane material shall be received and inspected by the Contractor to confirm the proper labeling, transportation, handling, and storage procedures are followed. Materials damaged during transportation and handling will be identified and segregated from the other geomembrane materials for evaluation by the CQC consultant and Engineer for repair or rejection. All rejected materials will be identified and removed from the project site at no cost to the Owner.
- C. Each roll shall be delivered to the site bearing the markings which provide the roll number, thickness of the material, length and width of the roll, and the proper direction to unroll the material to facilitate layout and positing in the field. Copies of the shipping manifest and manufacture's roll tickets shall be submitted to the CQC consultant to verify.
- D. The Contractor shall provide transportation, labor, and handling for delivery of the geomembrane to and from the project location. Special transportation, storage and handling requirements as required by the manufacturer and these Specifications for the geomembrane shall be provided by the Contractor.
- E. The equipment for transportation, handling, loading and unloading the geomembrane shall be sufficient size and capacity to safely and efficiently handle the materials without damage or injury to personnel in accordance with the manufacturer/fabricator/installer's requirements.
- F. The material shall be unloaded by the contractor in the designated areas as approved by the Engineer and the CQC consultant. The material shall not be unloaded in areas that may impair the operation of the landfill facility or be deleterious to the material.
- G. Storage requirements for the materials shall be as required by the manufacturer, and fabricator/installer. At a minimum, the geomembrane material shall not be stacked upon one another to the extent that deformation of the core or flattening of the rolls occurs. The storage area shall be dry and water shall be prevented from accumulating beneath the rolls. Rolls shall be fully supported on pallets or other devices to be prevented from contacting the ground.
- H. Protection shall be provided, at a minimum, from puncture, cutting, ultraviolet radiation, precipitation, dirt or other damaging or deleterious conditions.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Do not install geomembrane or perform seaming when the following occurs unless Contractor can demonstrate successful performance and test results showing the seams meet strength specifications.
 - 1. Air temperature is less than 32 degrees F and decreasing or more than 104 degrees F.
 - 2. Relative humidity is more than 90 percent.
 - 3. Raining, or frost is in ground.
 - 4. Excessive wind which may damage the geomembrane.
- B. Do not place granular materials on geomembrane when ambient temperature is less than 32 degrees F or more than 104 degrees F.
- C. Do not place soil materials in any manner that will cause wrinkles to fold over or become confined to form a vertical ridge.
- D. Place soil materials when the geomembrane is cool and contracted and wrinkles are minimized.
- E. A height of a wrinkle more than 2 inches and the spacing between wrinkles less than 10 feet is an unacceptable condition.

1.09 SEQUENCING AND SCHEDULING

- A. Factory test results must be in compliance with these Specifications and acceptable to Engineer prior to shipment of geomembrane.
- B. Before placing geomembrane on soil surfaces, prepare subgrade as specified in Section 02221, Excavation, Trenching, Backfilling and Embankment and obtain a written certification of acceptability of the subgrade from the geomembrane installer.
- C. Do not attach geomembrane to new concrete surfaces until after concrete has attained 2/3 of the design compressive strength specified.
- D. Do not place geomembrane over concrete surfaces until finish of concrete surfaces is acceptable to the RPR and Engineer.
- E. Do not attach the geomembrane to the LFG boots and the geomembrane around the landfill gas well head (minimum 10-ft radius or square around the wellhead) until after placement of the final protective cover unless gas collection pipes are in place and active.
- F. Do not leave large areas of geomembrane without protective cover.

- G. Sequence the work so that geomembrane is covered with the protective cover and install the sod over the protective cover shortly after installation in order to protect the geomembrane and the final cover system from damage due to rain, washouts, wind, and erosion.
- H. Any geomembrane damaged as a result of washouts, wind, gas entrapment (walling) or damaged due to lack of protective cover shall be removed from the site and replaced with new geomembrane at no cost to the Owner.

1.10 SPECIAL GUARANTEE

- A. Provide manufacturer's extended guarantee or warranty with Owner named as beneficiary, as special guarantee. Special guarantee shall provide for correction, or at option of Owner, removal and replacement of Work specified in this Specification section found defective during periods below, commencing on date of Substantial Completion. Duties and obligations for correction or removal and replacement of defective Work as specified in Article 17 of the General Conditions.
 - 1. Guaranty geomembrane against manufacturing defects, deterioration due to ozone, ultraviolet, and exposure to leachate and other elements for period of 20 years on pro rata basis.
 - 2. Guaranty geomembrane against defects in material and factory seams for period of 2 years.
 - 3. Guaranty geomembrane against defects resulting from installation for period of 2 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS, SUPPLIERS AND FABRICATORS

- A. Geomembrane:
 - 1. GSE Lining Technology.
 - 2. Agru/America, Inc.
 - 3. A manufacturer of geomembrane with experience in manufacturing of materials specified, as approved equal.

2.02 LLDPE GEOMEMIBRANE

- A. Composition: Linear low density polyethylene (LLDPE) containing no plasticizers, fillers, extenders, reclaimed polymers, or chemical additives, except following:
 - 1. Approximately 2 percent by weight of carbon black to resin for ultraviolet resistance.

2. Antioxidants and heat stabilizers, not to exceed 1.5 percent total by weight, may be added as required for manufacturing.
- B. Furnish in rolled single-ply continuous sheets with no factory seams.
 - C. Sheet Thickness: Nominal thickness shall be 40-mil. Minimum average thickness determined in accordance with ASTM D5994 for textured-surface LLDPE geomembrane shall be 38 mils.
 - D. Sheet Width: Minimum 22 feet.
 - E. Roll Length: Longest that will be manageable and minimize field seams.
 - F. Rough-Surfaced LLDPE Geomembrane: Manufactured so that surface irregularities that produce specified friction coefficient are adequately fused into sheet or are extruded with sheet, on both sides of sheet.
 - G. Meet manufacturer's most recent published specifications and required minimum values in Table 02669-1 for the 40-mil LLDPE provided herein.
 - H. The textured LLDPE geomembrane and the granular fill as specified in Section 02221, Excavation, Trenching, Backfilling and Embankment shall have a friction angle of at least 29.8 degrees as determined in accordance with ASTM D5321. The Contractor shall provide to the Engineer a minimum of two test results performed by a qualified laboratory certifying compliance with this requirement. Tests shall be conducted using the actual granular fill material that the Contractor intends to use for this project and the material specified.
 - I. The textured LLDPE geomembrane and the geocomposite as specified in Section 02221, Excavation, Trenching, Backfilling and Embankment shall have a friction angle of at least 26 degrees as determined in accordance with ASTM D5321. The Contractor shall provide to the Engineer a minimum of two test results performed by a qualified laboratory certifying compliance with this requirement. Tests shall be conducted using the actual geomembrane and geocomposite that the Contractor intends to use for this project and the material specified.
 - J. Extrudate for Fusion Welding of LLDPE Geomembrane: Formulated from same LLDPE resin as geomembrane and shall meet applicable physical property requirements.

2.03 BOOTS

- A. Fabricated of same material as geomembrane sheets to fit around penetrations, i.e., pipe, without folds, stretching, or unsupported areas.

- B. Boots for landfill gas wells shall be constructed as shown on the Drawings.
- C. Flanges: Angle shall match the angle of the slope or bottom where the penetration passes through the geomembrane, width shall be minimum 2 feet plus diameter of penetration.

2.04 SEALANT CAULKING

- A. One-component sealant formulated of 100 percent polyurethane elastomer.
- B. Manufacturer and Product: Biddle Co., St. Louis, MO; Butylgrip sealant, or approved equal.

2.05 NEOPRENE RUBBER PAD

- A. Two-inch wide by 1/4-inch thick.
- B. Thirty five to 45 durometer, in accordance with ASTM D2240-86 hardness.
- C. Manufacturer: Aero Rubber Co., Inc., Bridgeview, IL, or approved equal.
- D. Contact Cement: As recommended by neoprene rubber pad manufacturer.

Table 02669-1 Geomembrane Material Properties- 40 Mil Black Textured LLDPE		
Property Values	Test Method	Minimum Average
Thickness, mils	ASTM D5994	40
Minimum average		38
Lowest individual of 10 readings		36
Asperity Height ¹ , mils (min)	ASTM D7466	18
Sheet Density, g/cc (min.)	ASTM D1505	0.939
Tensile Properties ²	ASTM D6693	60
1. Break strength, lb/in 2. Break elongation, %		250
2% modulus, lb/in ² (maximum)	ASTM D5323	60,000
Tear resistance, lb	ASTM D1004	22
Puncture resistance, lb	ASTM D4833	44
Axi-symmetric break strain, %	ASTM D5617	30
Carbon black content ³ , %	ASTM D4218	2.0 to 3.0
Carbon black dispersion ⁴	ASTM D5596	Note 4

Table 02669-1 Geomembrane Material Properties- 40 Mil Black Textured LLDPE		
Property Values	Test Method	Minimum Average
Oxidative induction time (OIT) Standard OIT, minutes	ASTM D3895	100
Oven Aging at 85°C Standard OIT - % retained after 90 days High Pressure OIT-% retained after 90 days	ASTM D5721 ASTM D3895 ASTM 3895, See Note 7	35 60
UV resistance ⁵ High pressure OIT ⁶ - % retained after 1600 hours Seam Properties	GRI GM11 ASTM D5885 ASTM D6392 (@ 2 in/min)	35
1. Shear Strength, lb/in		60
2. Peel Strength, lb/in - Hot Wedge		50
Extrusion Fillet, lb/in		44
Notes for Table 02669-1		
1 Of the 10 readings; 8 must be \geq 38 mils and lowest individual reading must be 36 mils.		
2 Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction. Break elongation is calculated using a gauge length of 2.0 inches.		
3 Other methods such as ASTM D 4218 or microwave methods are acceptable if an appropriate correlation can be established.		
4 Carbon black dispersion for 10 different views: Nine in Categories 1 and 2 with one allowed in Category 3.		
5 The condition of the test should be 20-hour UV cycle at 75 degrees C followed by 4-hour condensation at 60 degrees C.		
6 UV resistance is based on percent retained value regardless of the original HP-OIT value.		
7. In accordance with GRI GM-17, the manufacturer has the option to select one of the OIT methods listed to evaluate the antioxidant content of the geomembrane.		

2.06 POLYURETHANE FOAM

A. High density rigid board.

B. Manufacturer: General Plastics Manufacturing Co., Tacoma, WA, or approved equal.

2.07 MANUFACTURER'S CONFORMANCE TESTING

- A. Resin Quality Documentation; prior to geomembrane delivery and installation, the Manufacturer shall provide the Owner's Representative with the following information:
1. The origin (resin supplier's name, resin production plant), identification brand name, number), and production date of the resin.
 2. A copy of the quality control certificates issued by the resin supplier noting results of density and melt index. One test per 200,000 pounds of resin.
 3. Reports on the tests conducted by the manufacturer to verify the quality of the resin used to manufacture the geomembrane rolls assigned to the project facility (these tests should include specific gravity (ASTM D792 Method A or ASTM D1505) and melt index (ASTM D1238 Condition E).
 4. Reports on the tests conducted by the manufacturer to certify the quality of the sheet.
- B. Property Conformance Documentation: Prior to geomembrane delivery and installation, the manufacturer shall provide the CQA representative with the following:
1. A properties sheet including, at a minimum, all specified properties, measured using test methods indicated in the Specification, or equivalent.
 2. The Owner's representative shall verify that:
 - a. The property values certified by the geosynthetic manufacturer meet all of the Specifications.
 - b. The measurements of properties by the geosynthetic manufacturer are properly documented, and that the test methods used are acceptable.
- C. Geosynthetic Roll Documentations: Prior to shipment, the manufacturer shall provide the Owner's representative (CQA consultant) with one quality control certificate for every roll of geosynthetic provided. The quality control certificate shall be signed by the manufacturer's responsible party. The quality control certificate shall include at a minimum:
1. Roll numbers and identification.
 2. Results of quality control tests. As a minimum, ASTM test methods shall be used to test for thickness, tensile strength, and tear resistance.
 3. The geomembrane quality control testing shall meet the testing frequency requirements in Table 02669-2:

Table 02669-2 Testing Frequency Requirements		
Property	Test Method	Testing Frequency (minimum)
Thickness (smooth sheet) (textured sheet)	ASTM D5199 ASTM D5994	per roll per roll
Asperity height (textured sheet only) Alternate the measurement side for double-sided textured sheet.	ASTM D7466	every second roll
Sheet density	ASTM D1505/D792	200,000 lb (90,000 kg)
Tensile Properties: 1. Yield strength (HDPE only-not used for LLDPE) 2. Break strength 3. Yield elongation (HDPE only-not used for LLDPE) 4. Break elongation	ASTM D6693	20,000 lb (9,000 kg)
2% modulus (LLDPE only)	ASTM D5323	per each formulation
Tear resistance	ASTM D1004	45,000 lb (20,000 kg)
Puncture resistance	ASTM D4833	45,000 lb (20,000 kg)
Axi-symmetric break strain (LLDPE only)	ASTM D5617	per each formulation
Stress crack resistance (HDPE only)	ASTM D5397 (App.)	per GRI GM10
Carbon black content	ASTM D4218	20,000 lb (9,000 kg)
Carbon black dispersion	ASTM D5596	45,000 lb (20,000 kg)
Oxidative induction time (OIT) Standard OIT	ASTM D3895	200,000 lb (90,000 kg)
Oven aging at 85°C Standard OIT	ASTM D5721 ASTM D3895	per each formulation
UV resistance High pressure OIT	GRI GM11 ASTM D5885	per each formulation

D. Coefficient of Friction Test Documentation:

1. Rough-Surface Geomembrane: Coefficient of friction tests between geomembrane and actual materials that will be in contact with it. Test shall use samples of similar length and width. Soil at geomembrane interface should be consolidated un-drained material. Tests shall be performed using actual granular fill cover soil from the pit the Contractor intends to use for this Project.

PART 3 EXECUTION

3.01 WELDING UNITS

- A. Single or double hot-wedge fusion seam welding.
- B. Extrusion welding systems.
- C. Hot-air welding is not acceptable.

3.02 TENSIO METER FOR FIELD TESTING

- A. Motor driven with jaws capable of traveling at measured rate of 2 inches per minute.
- B. Equipped with gauge which measures force in unit pounds exerted between jaws.
- C. Force Tech 5002 DPR portable tensile tester as furnished by Columbine International, Ltd., Placerville, CA, or approved equal.

3.03 VACUUM BOX FOR WELD TESTING

- A. Housing: Rigid with transparent viewing window on top and soft, close-cell neoprene gasket attached to bottom and equipped with bleed valve.
- B. Vacuum Source: Separate and connected to vacuum box so negative pressure can be applied and maintained inside box.
- C. Manufacturer and Product: American Parts and Service Co., Alhambra, CA; American Vacuum Seam Tester, Series AI00, or approved equal.

3.04 PREPARATION

- A. Do not place geomembrane until condition of previously installed underlying materials has been formally inspected and accepted by geomembrane installer, Owner and CQA consultant/ RPR.
- B. Subgrade: Maintain in smooth, uniform, and compacted condition as specified in Section 02221, Excavation, Trenching, Backfilling and Embankment during installation of geomembrane. Subgrade within 6 inches of geomembrane should contain no sharp objects, no rocks or shells of any size, and it shall not contain any refuse, trash, or any organic material such as branches, roots or any wood having a diameter greater than 1/8 inch. Subgrade within 6 inches of the geomembrane shall be free from any deleterious material, any soil clods or other clodded material greater than 1/4 inch in diameter. Roots or other small organic material less than 1/8 inch in diameter

may be allowed in the upper 6 inches of the leveling layer if acceptable to the RPR, CQC consultant and the installer.

- C. Prior to starting geomembrane installation and daily thereafter, geomembrane Installer shall certify in duplicate that the surface(s) upon which geomembrane shall be installed is acceptable (form provided at end of this section.) Copies of the signed form shall be initialed by the RPR/CQC consultant prior to work.
- D. If any portion of the sub grade is washed down the side slopes or eroded due to rain and storms, the granular fill material may be reused by the Contractor if not contaminated with solid waste. Any portion of the washed down granular fill material that is considered contaminated with solid waste by the RPR and the CQC consultant shall be removed from the Project and disposed properly.

3.05 GEOMEMBRANE INSTALLATION

- A. Geomembrane Inspection: During unwrapping of the rolls visually inspect, mark each imperfection for repair.
- B. Protection:
 - 1. Do not use geomembrane surfaces as work area for preparing patches, storing tools and supplies, or other uses. Use protective cover as work surface, if necessary.
 - 2. Instruct workers about requirements for protection of geomembrane such as handling geomembrane material in high winds, handling of equipment, and walking on geomembrane surfaces. Shoes of personnel walking on geomembrane shall be smooth bonded sole or be covered with smooth type of overboot. Prohibit smoking, eating, or drinking in vicinity of geomembrane, placing heated equipment directly on geomembrane, or other activities that may damage geomembrane.
 - 3. Do not operate equipment without spark arrestors in vicinity of geomembrane material.
 - 4. Do not place generators or containers of flammable liquid on geomembrane.
 - 5. Protect from vehicle traffic and other hazards.
 - 6. Keep clean and free of debris during placement.
 - 7. Prevent uplift, displacement, and damage by wind.
 - 8. Protect against landfill gas build-up beneath the geomembrane.
- C. General:
 - 1. Each miscellaneous product required for completion of geomembrane installation shall be of types, sizes, and installed in strict accordance

with this Specification and the geomembrane manufacturer's recommendations.

2. Reduce field seaming to minimum. Horizontal seams on slopes shall be minimized and will only be acceptable in the inside slope of the terraces. Seams parallel to toe shall be at least 5 feet from toe. Align rough-sided sheets in manner that maximizes their frictional capabilities along slope.
3. Prevent wrinkles, folds, or other distress that can result in damage or prevent satisfactory alignment or seaming. Provide for factors such as expansion, contraction, overlap at seams, anchorage requirements, seaming progress, and drainage.
4. Temporarily weight sheets with sandbags as necessary to anchor or hold them in position during installation. Use continuous holddowns along edges to prevent wind flow under sheet.
 - a. Sandbag fabric shall be sufficiently close knit to preclude fines from working through bags.
 - b. Supply sand bags as needed. Bags shall contain 40 to -60 pounds of sand having 100 percent passing No. 8 screen and shall be securely closed after filling to prevent sand loss.
 - c. Do not use tires or paper bags, whether or not lined with plastic. Burlap bags, if used, shall be lined with plastic.
 - d. Immediately remove damaged or improperly sealed bags from work area, and immediately clean up spills.
5. Anchor perimeter of geomembrane as shown, or as otherwise approved in writing by Engineer. Anchor, weld and seal geomembrane to structures, pipes, and other types of penetrations as shown.
6. Place overlying soil cover immediately following completion of geomembrane installation and field testing as acceptable to Engineer.
7. Protect the soil cover against erosion and washouts by placing sod and other temporary erosion protection.

3.06 FIELD SEAMS

A. General:

1. Wipe sheet contact surfaces clean to remove dirt, dust, moisture, and other foreign materials and prepare contact surfaces in accordance with seaming method accepted by Engineer.
2. Lap sheet edges to form seams to seam geomembrane sheets together. Adjust edges to be seamed and temporarily anchor to prevent wrinkling and shrinkage
3. Seams shall not go through a boot. Locate seams a minimum of 2 feet from boot.

- B. LLDPE:
 - 1. Seam sheets together, using fusion-extrusion or hot-wedge welding system, equipment, and techniques.
 - 2. Capping of Field Seams: Use 8-inch wide (minimum) cover strip of same thickness as geomembrane (and from same roll, if available). Position strip over center of field seam and weld to geomembrane using fillet weld each side, including copper wire for spark testing.

3.07 BOOT SEALS

- A. Preparation: Thoroughly clean contact surfaces.
- B. Assemble boot with geomembrane material with double wedge welding method. Pressure test seam.
- C. Place boot around penetrations so flange is supported everywhere in full contact with the subgrade, and is free of wrinkles.
- D. Install the boot around the landfill gas vent pipe in accordance with the detailed drawings.
- E. Seal boot to surrounding geomembrane as specified and test.
- F. Place a 3/8-inch thick neoprene rubber pad between the geomembrane and the stainless steel worm-gear clamp. Tighten steel clamping bands until neoprene rubber pads are compressed 12 to 15 percent of total pad thickness.

3.08 PROTECTION OF WORK

- A. Geomembrane surface showing injury due to scuffing, penetration by foreign objects or distress from rough subgrade shall be replaced or covered and sealed with an additional layer of geomembrane material of proper size.
- B. Protect the geomembrane by installing the protective cover as soon as practicable to prevent damage, displacement and ballooning of the geomembrane due to gas entrapment. Sod the protective cover to prevent erosion as soon as practicable.

3.09 FIELD QUALITY CONTROL

- A. The CQC independent testing laboratory retained by the Contractor shall conduct all quality control sampling and testing except for laboratory testing of destructive samples and tests, as needed to confirm strength of parent material for field seam acceptance criteria.

B. Field Seam Sampling:

1. Verify that seaming equipment and operators are performing adequately. Produce test seam Samples at beginning of each shift for each seaming crew. In addition, if seaming has been suspended for more than 1/2 hour, or if breakdown of seaming equipment occurs, produce test seam samples prior to resuming seaming.
2. Sample Size: 12 inches wide plus seam width, and 30 inches long.
3. Nondestructive Sampling:
 - a. Frequency: One at the beginning of a continuous seam and one at the end of a continuous seam, and minimum one sample per seaming crew per 4-hour work period. The seaming temperature shall be recorded at the beginning and the end of the seam and once every 500 feet.
 - b. Produce samples using same materials, equipment, personnel, and procedures as field seams made at time of work in progress and under same conditions.
4. Destructive Sampling:
 - a. Frequency: Minimum one sample per 500 feet of field seam.
 - b. Remove Samples from field seams at locations selected by Engineer. Repair field seams in accordance with repair procedures specified in these Specifications.
5. Sample Identification:
 - a. Number, date, and identify each sample as to personnel making seam and location of sample or location of field seam Work in progress at time sample is made.
 - b. Mark location of sample, or location of field seam in progress at time sample is made, on panel/sheet layout thawing.

C. General: Conform to ASTM D6392 and this Specification. Seam testing includes strength tests, vacuum box testing, air channel pressure tests, and probing.

D. Field Seam Strength Sample Testing:

1. General:
 - a. Test each sample for seam peel and tensile strength.
 - b. Save test samples, including specimens tested, until notified by Engineer relative to their disposal.
 - c. Each sample that fails under test shall be shipped immediately by express delivery to Engineer for determination of corrective measures required.

- E. Field Seam Acceptance Criteria: Assessment of seam test results.
1. For both smooth and textured seams the strength of four out of five 1.0 inch (25 mm) wide strip specimens should meet or exceed values given in this Specification. The fifth must meet or exceed 80 percent of the given values.
 2. The shear percent elongation should exceed 50 percent. The assumed gauge length is considered to be the unseamed sheet material on either side of the welded area. Elongation measurements should be omitted for field testing. In addition, the peel separation should not exceed 25 percent based on the proportion of area of separated bond to the area of the original bonding.
 3. Regarding the locus-of-break patterns of the different seaming methods in shear and peel, the following are unacceptable break codes per their description in ASTM D6392. In this regard, SIP is an acceptable break code.
 4. Unacceptable Break Codes:
 - a. Hot Wedge: AD and AD-BRK greater than 25 percent.
 - b. Extrusion Fillet: AD1, AD2 and AD-Weld (unless strength is achieved).
 5. Test Failure: If sample fails, entire field seam from which it was taken shall be considered as failure shall be rejected due to nonconformance with specification requirements. Comply with following corrective measures:
 - a. For nondestructive sample failure, rerun field weld test using same sample. If that test passes, Engineer may assume an error was made in first test and accept field seam. If second test fails, cap each field seam represented by failed sample and submit new test sample made during capping procedure.
 - b. Destructive Sample Failure: Rerun field weld test using new sample from same seam. If that test passes, Engineer may assume an error was made in first test and accept field seam. If second test fails, either cap field seam between any two previous passed seam test locations that include failed seam or take another sample on each side of failed seam location (10-foot minimum), and test both. If both pass, cap field seam between two locations. If either fails, repeat process of taking samples for test. Each field seam shall be bounded by two passed test locations prior to acceptance.
- F. In-Place Observation and Testing:
1. Visually inspect geomembrane sheets, seams, anchors, seals, and repairs for defects as installation progresses and again on completion.

2. Depending on seam welding equipment used, test each seam and repair using vacuum testing device, spark testing device, and/or air channel pressure test for double wedge welded seams.
 3. Clearly mark defective and questionable areas, and repair them to Engineer's and CQA consultant satisfaction.
 4. Each area showing injury due to scuffing, penetration by foreign objects or distress from rough subsurface shall be replaced or covered with an additional layer of geomembrane material.
 5. Perform testing only in presence of Engineer or CQC consultant.
- G. Vacuum Box Testing of LLDPE Welds: Vacuum box test each of these types of welds: Fillet, extrusion lap, and single hot-wedge fusion lap.
1. Testing Procedures: Conforming to ASTM D5641.
- H. Air Channel Pressure Testing of Double Hot-Wedge Seam:
1. Insert needle with gauge in air space between welds. Pump air into space to 30 psi and hold for 5 minutes.
 2. At end of 5 minutes, depressurize seam by placing needle hole in air space between welds at opposite end of seam and observe gauge.
 3. If seam maintains at least 27 psi during 5-minute hold and pressure drops within 30 second of depressurization, seam is acceptable.
 4. If pressure drops below 27 psi during test period, or does not drop during 30-second depressurization period, repair needle holes and retest seam by same procedure or vacuum box test along entire length of seam. If seam maintains a minimum of 27 psi, seam is acceptable.
 5. If second air pressure test fails, vacuum box test entire length of seam.
 - a. If no bubbles appear in vacuum box, lower weld will be considered defective, and upper seam is acceptable.
 - b. If bubbles appear in vacuum box, repair each defective area by extrusion welding and test again by vacuum box.
 6. As alternative to vacuum box testing, apply soap solution to exposed seam edge while maintaining required air channel test pressure.
 - a. If bubbles appear, mark, trim unbonded edge, and extrusion weld defective areas.
 - b. If no bubbles appear and test pressure cannot be maintained, leak is judged to be in bottom or second seam.
 7. If leak is judged to be in bottom seam, cap strip length of seam tested will be accepted.
 8. Mark and repair needle holes.
- I. Spark Testing: shall be conducted for penetrations or difficult areas not accessible for vacuum testing in accordance with ASTM D6365.

3.10 REPAIRING GEOMEMBRANE

- A. Repair damage or rejected seams with pieces of flat and unwrinkled geomembrane material free from defects and seams. Patches shall be tightly bonded on completion of repair Work.
- B. Patch shall be neat in appearance and of size 4 inches larger in all directions than areas to be repaired. Round corners of each patch to minimum 1-inch radius.
- C. Prepare contact surfaces and seam patch in accordance with paragraph on "Field Seams."
 - 1. Gently pull and hold flat receiving surface in area to be patched.
 - 2. Fully bond patches less than 12 inches in narrowest plan dimension across their entire width.
 - 3. Seam each patch more than 12 inches across in narrowest dimension with minimum bonded width of 4 inches along edge, with no free edge remaining.

3.11 RECORD DATA

- A. Identify each test by date of sample, date of test, sample location, name of individual who performed test, standard test method used, and list of departures from standard test methods, at a minimum.
- B. Include identification and location of repairs, cap strips, penetrations, and areas selected for destructive test samples on Record Drawings. Provide state plane coordinates of repair location.

3.12 CLEANUP

- A. Cleanup work area as Work proceeds. Take particular care to ensure that no trash, tools, and other unwanted materials are trapped beneath geomembrane and that scraps of geomembrane material are removed from work area prior to completion of installation.
- B. Instruct crew not to litter and collect all trash generated by the crew in designated trash containers provided by the Contractor and dispose at the end of each working day.

3.13 PLACING PRODUCTS OVER GEOMEMBRANE

- A. Prior to placing material over geomembrane, notify CQC consultant and Engineer. Do not cover installed geomembrane until after CQC consultant and Engineer provides authorization to proceed.

- B. Provide a full time spotter during placement of the fill material to observe placement of the overlaying product and notify the equipment operator and superintendent to stop equipment and work in case of any damage to the geomembrane.
- C. If tears, punctures, or other geomembrane damage occurs during placement of overlying products, remove overlying products as necessary to expose damaged geomembrane, and repair damage as specified in Article Repairing Geomembrane.
- D. Geomembrane installer shall remain available during placement of overlying products to install boots around LFG wells and repair geomembrane if damaged.
- E. Prior to the installation of the gas venting system, if gas bubbles are observed in the geomembrane cover, the Contractor shall install temporary vents as necessary to vent landfill gas. The temporary gas vents shall be capped or welded before the placement of cover soil. Locations of temporary vents shall be documented.
- F. Place soil materials on geomembrane in minimum thicknesses and as specified in Section 02221, Excavation, Trenching, Backfilling and Embankment. If tears occur in the geomembrane during the spreading operation, the overlying material shall be cleared from the geomembrane and the damaged area repaired.
- G. Soil placement shall be from the toe to the top of the landfill. Soil shall not be pushed down slope or sideways.
- H. During the placement of the granular fill material, no construction equipment shall be allowed directly on the geomembrane, and any damage shall be repaired or replaced immediately.
- I. Only rubber-tired equipment with maximum tire inflation pressure of 5-pounds per square inch shall be allowed directly on geomembrane unless otherwise approved by the Engineer.
- J. Contractor must maintain 2 feet of granular fill material above the geomembrane when using spreading or grading equipment.
- K. Care shall be taken to protect the geomembrane. Soil ramps shall be minimum of 4 feet thick for delivery vehicles and shall be provided at down slopes and in other heavily traveled areas. Only large radius turns by the loader and other equipment on prepared ramps shall be permitted as sharp turns may damage the geomembrane.

- L. Granular materials shall not be placed over a fold in the geomembrane. Fold larger than 4-inch in height and spacing smaller than 10 feet shall be repaired prior to placement of soil cover.
- M. Do not place cover materials in manner that will cause wrinkles to fold over or become confined to form a vertical ridge. Repair the fold prior to placement of protective cover.
- N. The thickness of sod shall in addition to the required 24-inch Protective Cover. (24 inches of granular fill plus 1 to 1-1/2 inches of sod).

3.14 SUPPLEMENT

- A. The supplement listed below, following “End of Section,” is part of this Specification.
 - 1. Geomembrane Installer's Certification of Subsurface Acceptability.

END OF SECTION

GEOMEMBRANE INSTALLER'S CERTIFICATION OF SUBSURFACE ACCEPTABILITY

Geomembrane installer _____, for OCSWMF Cell 9-10 Phase I Sequential Closure, hereby certify that supporting surfaces are acceptable for installation of geomembrane, undersigned having personally inspected condition of prepared surfaces. This certification is for areas shown on Attachment or defined as follows:

It is hereby certified at condition of supporting surfaces for geomembrane installation in defined area meets or exceeds minimum requirements for installation of LLDPE geomembrane.

Representative of Geomembrane Installer:

Signed: _____
(Representative of Geomembrane Installer)

Name and Title: _____

Date: _____

Representative of Contractor-Superintendent:

Signed: _____

Name and Title: _____

Date: _____

Copy Received by: _____ (CQA Consultant/RPR)

Name and Title: _____

Date: _____

**SECTION 02710
BASE COURSE**

PART 1 GENERAL

1.01 DEFINITIONS

- A. Completed Course: Compacted, unyielding, free from irregularities, with smooth, tight, even surface, true to grade, line, and cross-section.
- B. Completed Lift: Compacted with uniform surface reasonably true to cross-section.
- C. Standard Specifications: When referenced in this section, shall mean the current edition, including all supplements, of the Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction. Where reference is made to a specific part of the Standard Specifications, such applicable part shall be considered as part of this section of the Specifications. In case of a conflict in the requirements of the Standard Specifications and the requirements stated herein, the requirements herein shall prevail.

1.02 SUBMITTALS

- A. Samples: Submit for specified materials 20 days prior to deliver to site.
- B. Quality Control Submittals:
 - 1. Certified Test Results on Source Materials: Submit copies from commercial testing laboratory 20 days prior to delivery of materials to Project.

PART 2 PRODUCTS

2.01 BASE COURSE ROCK

- A. As specified for limerock in Section 911 of the FDOT Standard Specifications.

2.02 GRAVEL SURFACING ROCK

- A. Limerock as specified in Section 911 of the FDOT Standard Specifications.

2.03 SOURCE QUALITY CONTROL

- A. Contractor: Perform tests necessary to locate acceptable source of materials meeting specified requirements.
- B. Final approval of aggregate material will be based on materials' test results on installed materials.
- C. Should separation of coarse materials from fine materials occur during processing or stockpiling, immediately change methods of handling materials to correct uniformity in grading.

PART 3 EXECUTION

3.01 SUBGRADE PREPARATION

- A. As specified in Section 02221, Excavation, Trenching, Backfilling and Embankment.
- B. Obtain Engineer's acceptance of subgrade before placement of base course rock.
- C. Do not place base materials on soft, muddy, subgrade.

3.02 EQUIPMENT

- A. In accordance with FDOT Section 230, of the Standard Specifications.
- B. Compaction Equipment: Adequate in design and number to provide compaction and obtain the specified density for each layer.

3.03 HAULING AND SPREADING

- A. Hauling and Spreading: In accordance with FDOT Section 230, of the Standard Specifications.

3.04 CONSTRUCTION OF COURSES

- A. Construction of Courses: In accordance with FDOT Section 230 of the Standard Specifications.
- B. General: Complete each lift in advance of laying succeeding lift to provide required results and adequate inspection.

3.05 ROLLING AND COMPACTION

- A. Rolling and Compaction: In accordance with FDOT Standard Specifications.
- B. Commence compaction of each layer of base after spreading operations and continue until density of 98 percent of maximum density has been achieved as determined by ASTM D1557.

3.06 SURFACE TOLERANCES

- A. Finished Surface of Base Course: Within plus or minus 0.04-foot of grade shown at any individual point.

3.07 FIELD QUALITY CONTROL

- A. In-Place Density Tests:
 - 1. Construct base course so areas shall be ready for testing.
 - 2. Allow reasonable length of time for Engineer to perform tests and obtain results during normal working hours.

3.08 CLEANING

- A. Remove excess material; clean stockpile areas of aggregate.

END OF SECTION

**SECTION 02761
PAVEMENT MARKING**

PART 1 GENERAL

1.01 DEFINITIONS

- A. Standard Specifications: When referenced in this section, shall mean the current edition, including all supplements, of the Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction. Where reference is made to a specific part of the Standard Specifications, such applicable part shall be considered as part of this section of the Specifications. In case of a conflict in the requirements of the Standard Specifications and the requirements stated herein, the requirements herein shall prevail.
- B. Scope of Work:
1. Replace all pavement markings after resurfacing the Cell 9 construction entrance road and any portions of Cell 9 perimeter road designated for repaving as shown in the Drawings.
 2. Pavement markings for construction entrance road shall be a 6-inch white stripe on both edges of the road and a double yellow strip in the center of the road in accordance with FDOT Standard Specifications.
 3. Pavement markings for Cell 9 perimeter road shall be a 6-inch white stripe on both edges of the road and a double yellow strip in the center of the road in accordance with FDOT Standard Specifications.
 4. No striping is required for the parking/mobilization areas, except as described above.
 5. Pavement markings at all stop signs along the main access road shall be a 24-inch wide white strip across the entire lane with the word "STOP" stenciled in white in accordance with FDOT Specifications.

1.02 SUBMITTALS

- A. Shop Drawings: Product Data- Paint.
- B. Quality Control Submittals: Manufacturer's Certificate of Compliance for products specified in this section.
- C. Equipment List: Proposed equipment to be used, including descriptive data.

PART 2 PRODUCTS

2.01 GENERAL

- A. All products shall conform to Code T-1 traffic paint, suitable for paved surfaces and shall be in accordance with Section 971-12 of the Standard Specifications.

2.02 PAINT

- A. Color: White, yellow or blue replacing existing pavement markings after resurfacing. Reflective pavement markers will not be required.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

- A. Cleaning:
 1. Thoroughly clean surfaces to be marked before application of pavement marking material.
 2. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water or a combination of these methods.
 3. Completely remove rubber deposits, surface laitance, existing paint markings, and other coatings adhering to pavement with scrapers, wire brushes, sandblasting, approved chemicals, or mechanical abrasion.
 4. Scrub areas of pavement affected with oil or grease with several applications of tri-sodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application.
 5. Surfaces shall be completely free of dry dirt and dry of water at the time of application of any of the materials specified herein.
 6. Oil-Soaked Areas: After cleaning, seal with cut shellac to prevent bleeding through the new paint.
 7. Re-clean surfaces when Work has been stopped due to rain.

3.02 PAINT APPLICATION

- A. General:
 1. Thoroughly mix pigment and vehicle together prior to application, and keep thoroughly agitated during application.
 2. Do not add thinner.
 3. Apply only when air and pavement temperatures are above 40 degrees F.
 4. Apply only when surface is dry.

5. Do not apply when conditions are windy to the point of causing overspray or fuzzy line edges.
6. New Asphalt Pavement: Allow a minimum pavement cure time of 30 days before applying paint.
7. Provide guide lines and templates to control paint application.
8. Take special precautions in marking numbers, letters, and symbols.
9. Sharply outline edges of markings and apply without running or spattering.
10. All markings which fail to have a uniform satisfactory appearance shall be corrected by the Contractor at his expense.

B. Rate of Application:

1. Paint: Apply evenly, 105 plus or minus 5 square feet per gallon.

C. Drying:

1. Provide maximum drying time to prevent undue softening of bitumen and pickup, displacement, or discoloration by traffic.
2. If drying is abnormally slow, discontinue painting operations until cause is determined and corrected.

3.03 PROTECTION

- A. Protect markings from traffic until paint is thoroughly dry.
- B. Protect surfaces from disfiguration by paint spatters, splashes, spills, or drips.

3.04 CLEANUP

- A. Remove paint spatters, splashes, spills, or drips from Work and staging areas and areas outside of the immediate Work area where spills occur.

END OF SECTION

SECTION 02772
ASPHALT CONCRETE PAVEMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials and equipment necessary to complete all milling, surface preparations, and asphaltic concrete paving and resurfacing required for this Project as indicated on the Drawings.
- B. The milling and paving includes but not be limited to milling and removal of existing pavement from designated portion of the Cell 9 landfill perimeter road, and the construction entrance road at the northwest corner of Cell 9 and resurfacing with new pavement as specified herein.

1.02 REFERENCES

- A. The following is a list of American Standard of Testing Materials (ASTM) which may be referenced in this section:
 - 1. D2041, Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.
 - 2. D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - 3. E329, Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
- B. Latest edition of Florida Department of Transportation Specifications and Guidelines (Standard Specifications).

1.03 DEFINITIONS

- A. Combined Aggregate: All mineral constituents of asphalt concrete mix, including mineral filler and separately sized aggregates.
- B. RAP: Reclaimed asphalt pavement.
- C. Standard Specification: Where the term “Standard Specifications” is used, such reference shall mean the current edition, including all supplements, of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. Where reference is made to a specific part of the Standard Specifications, such applicable part shall be considered as part of this section of the Specifications. In case of a conflict in the requirements of

the Standard Specifications and the requirements stated herein, the requirements herein shall prevail.

1.04 SUBMITTALS

- A. Asphalt Concrete Mix Formula: Submit minimum of 15 days prior to start of production.
 - 1. Certification that the asphaltic concrete mix supplied is being mixed and supplied from an FDOT-approved asphaltic concrete plant and that the material provided is an FDOT-approved mix design for the specified asphaltic concrete. In lieu of FDOT Certification, submittal as listed in paragraph 2 is required.
 - 2. Submittals shall include the following information:
 - a. Gradation for each of the aggregate constituents used in the mixture and the proposed proportion of each constituent to be used to produce a single gradation of aggregate within specified limits.
 - b. Bulk specific gravity for each aggregate constituent.
 - c. Measured maximum specific gravity of mix at optimum asphalt content determined in accordance with ASTM D2041.
 - d. Properties as stated in Section 331 of Standard Specification, for at least four different asphalt contents other than optimum, two below optimum, and two above optimum.
 - e. Percent of asphalt lost due to absorption by the aggregate.
 - f. Index of Retained Strength (TSR) at optimum asphalt content as determined by AASHTO T283.
 - g. Percentage of asphalt cement, to the nearest 0.1 percent, to be added to the mixture.
 - h. Optimum mixing temperature.
 - i. Optimum compaction temperature.
 - j. Temperature-viscosity curve of the asphalt cement to be used.
 - k. Brand name of any additive to be used, and the percentage added to the mixture.
- B. Test Report for Asphalt Cement:
 - 1. Submit minimum 10 days prior to start of production.
 - 2. Show appropriate test method(s) for each material and the test results, in accordance with FDOT procedures.
- C. Manufacturer's Certificate of Compliance for the following materials:
 - 1. Aggregate: Gradation, source test results as defined in Section 331 of Standard Specification.
 - 2. Asphalt for Binder: Type and grade and viscosity-temperature curve.

3. Prime Coat: Type and grade of asphalt.
4. Tack Coat: Type and grade of asphalt.
5. Additives.
6. Mixes: Conforms to job-mix formula.

D. Statement of qualification for independent testing laboratory.

E. Test Results:

1. Mix design.
2. Asphalt concrete cores.
3. Uncompacted mix.
4. Field density.

1.05 QUALITY ASSURANCE

A. Qualifications:

1. Independent Testing Laboratory: In accordance with ASTM E329.
2. Asphalt concrete mix formula shall be prepared by an approved certified independent laboratory under the supervision of a certified asphalt technician.
3. Provide certification that the material is being supplied from a FDOT-approved asphaltic concrete plant and the material provided is an FDOT-approved mix design.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Temperature: Do not apply asphalt materials or place asphalt mixes when ground temperature is lower than 10 degrees C (50 degrees F), or air temperature is lower than 4 degrees C (40 degrees F).
- B. Moisture: Do not apply asphalt materials or place asphalt mixes when application surface is wet or during rainfall.

1.07 MAINTENANCE OF TRAFFIC

- A. The Contractor shall be responsible for ensuring the normal traffic to the landfill is not interrupted due to his activities and responsible for the maintenance of vehicular traffic on the Cell 9/Cell 10 main access road and the Cell 9 perimeter road during special construction activities such as milling, resurfacing and stripping.
- B. The Contractor shall perform the work in a manner that will allow at least one travel lane of main access road to be open between the hours of 10:00 a.m. and 4:00 p.m. Additionally, the Contractor shall perform the work in a manner

that will allow two travel lanes to be open between 6:00 a.m. and 10:00 a.m., and 4:00 p.m. and 6:00 p.m.

- C. The Contractor shall be responsible for all traffic controls, signs, flagmen, and shall perform such work in accordance with State and Owner Standards. Contractor's vehicles and drivers are required to obey the posted speed limits on all on-site roads and allow the Owner's vehicles and normal traffic to the landfill to have the rights of way.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Prime Coat: Material shall be as allowed in Section 300 of the Standard Specifications and shall conform to Section 916 of the Standard Specifications.
- B. Tack Coat: Material shall be as allowed in Section 300 of the Standard Specifications and shall conform to Section 916 of the Standard Specifications.

2.02 ASPHALT CONCRETE MIX

- A. General:
 - 1. Mix formula shall not be modified except with the written approval of Engineer.
 - 2. Source Changes:
 - a. Should material source(s) change, establish a new asphalt concrete mix formula before the new material(s) is used.
 - b. Perform check tests of properties of the plant-mix bituminous materials on the first day of production and as requested by Engineer to confirm that properties are in compliance with design criteria.
 - c. Make adjustments in gradation or asphalt content as necessary to meet design criteria.
- B. Asphalt Concrete:
 - 1. For patching/ leveling use Type S-3 as specified in Section 331 of the Standard Specifications.
 - 2. For traffic layer use 1.5 inches Type SP-12.5 as specified in Section 334 of the FDOT Standard Specifications.

- C. Mineral Filler: In accordance with Section 917 of Standard the Specifications.
- D. Asphalt Cement: Paving Grade AC-20 as specified in Section 916 of the Standard Specification.

PART 3 EXECUTION

3.01 GENERAL

- A. Traffic Control:
 - 1. In accordance with MOT Plan.
 - 2. Minimize inconvenience to normal landfill traffic, but keep vehicles off freshly treated or paved surfaces in accordance with FDOT Standard Specifications to avoid pickup and tracking of asphalt until cured.

3.02 LINE AND GRADE

- A. Provide and maintain intermediate control of line and grade, independent of the underlying base to meet finish surface grades and minimum thickness.
- B. Shoulders: Construct to line, grade, and cross-section shown.

3.03 APPLICATION EQUIPMENT

- A. In accordance with Section 320 of the Standard Specifications.

3.04 PREPARATION

- A. Prepare subgrade as specified in Section 02221, Excavation, Trenching, Backfilling and Embankment.
- B. Existing Roadways, access roads and Parking areas:
 - 1. Modify profile by grinding, milling, or by other approved methods the existing pavement to provide clean lines and surfaces for application of the pavement to produce a smooth riding road.
 - 2. Repair and patch any depressions or loose areas of the subgrade after milling.
 - 3. Remove dirt from the edge of the road and re-grade the shoulder if needed.
 - 4. Remove existing pavement material to a minimum depth 1 inch.
 - 5. Paint edges of meet line with tack coat prior to placing new pavement.
 - 6. Thoroughly coat edges of contact surfaces (curbs, manhole frames) with emulsified asphalt or asphalt cement prior to laying new pavement. Prevent staining of adjacent surfaces.

3.05 PAVEMENT APPLICATION

- A. General: Place asphalt concrete mixture on an approved, prepared base in conformance with Section 330 of the Standard Specifications.

- B. Prime Coat:
 - 1. Heat cut-back asphalt as specified in Section 300 of the Standard Specifications prior to application.
 - 2. Apply uniformly to clean, dry surfaces. Avoiding overlapping of applications.
 - 3. Do not apply when moisture content of upper 75 mm (3 inches) of base exceeds optimum moisture content of base, or if free moisture is present.
 - 4. Application Rate: Minimum 0.68 to maximum 2.28 liters per square meter of surface area.
 - 5. Remove or redistribute excess material.
 - 6. Allow a minimum of 5 full days for curing of primed surface before placing asphalt concrete.

- C. Tack Coat:
 - 1. Prepare material, as specified in Section 300 of the Standards Specification, prior to application.
 - 2. Apply uniformly to clean, dry surfaces. Avoiding overlapping of applications.
 - 3. Do not apply more tack coat than necessary for the day's paving operation.
 - 4. Touchup missed or lightly coated surfaces and remove excess material.
 - 5. Application Rate: Minimum 0.25-liter to maximum 0.70-liter of asphalt (residual if diluted emulsified asphalt) per square meter of surface area.

- D. Pavement Mix:
 - 1. Prior to Paving:
 - a. Sweep primed surface free of dirt, dust, or other foreign matter.
 - b. Patch holes in primed surface with asphalt concrete pavement mix.
 - c. Blot excess prime material with sand.
 - 2. Place asphalt concrete pavement mix in two equal lifts.
 - 3. Compacted Lift Thickness:
 - a. Minimum: Twice the maximum aggregate size, but in no case less than 25 mm (1 inch).
 - b. Maximum: 100 mm (4 inches).
 - 4. Total Compacted Thickness: As shown.
 - 5. Apply such that meet lines are straight and edges are vertical.

6. Collect and dispose of segregated aggregate from raking process. Do not scatter material over finished surface.
7. Joints:
 - a. Offset edge of each layer a minimum of 150 mm (6 inches) so joints are not directly over those in underlying layer.
 - b. Offset longitudinal joints in roadway pavements, so longitudinal joints in wearing layer coincide with pavement centerlines and lane divider lines.
 - c. Form transverse joints by cutting back on previous day's run to expose full vertical depth of layer.
8. Succeeding Lifts: Apply tack coat to pavement surface between each lift.
9. After placement of pavement, seal meet line by painting a minimum of 150 mm (6 inches) on each side of the joint with cut-back or emulsified asphalt. Cover immediately with sand.

E. Compaction:

1. Roll until roller marks are eliminated and a minimum compaction of 96 percent of the measured maximum density determined in accordance with ASTM D2041 is obtained.
2. Joint Compaction:
 - a. Place top or wearing layer as continuously as possible.
 - b. Pass roller over unprotected end of freshly laid mixture only when placing of mix is discontinued long enough to permit mixture to become chilled.
 - c. Cut back previously-compacted mixture when Work is resumed to produce a slightly beveled edge for full thickness of layer.
 - d. Cut away waste material and lay new mix against fresh cut.

F. Tolerances:

1. General: Conduct measurements for conformity with crown and grade immediately after initial compression. Correct variations immediately by removal or addition of materials and by continuous rolling.
2. Completed Surface or Wearing Layer Smoothness:
 - a. Uniform texture, smooth, and uniform to crown and grade.
 - b. Maximum Deviation: 1/8 inch from lower edge of a 3.6 meter (12 feet) straightedge, measured continuously parallel and at right angle to centerline.
 - c. If surface of completed pavement deviates by more than twice the specified tolerances, remove and replace wearing surface.
3. Transverse Slope Maximum Deviation: 1/8 inch in 3.6 meters (12 feet) from the rate of slope shown.

4. Finished Grade: Maximum Deviation: 6 mm (0.02 foot) from the grade shown.

G. Seal Coat:

1. General: Apply seal coat of paving grade or emulsified asphalt to finished surface at longitudinal and transverse joints, joints at abutting pavements, areas where the asphalt concrete was placed by hand, patched surfaces, and other areas as directed by the RPR.
2. Preparation:
 - a. Maintain surfaces that are to be sealed free of holes, dry, and clean of dust and loose material.
 - b. Seal in dry weather and when the temperature is above 2 degrees C (35 degrees F).
3. Application:
 - a. Fill cracks over 1.5 mm (1/16 inch) in width with an asphalt-sand slurry or approved crack sealer prior to sealing.
 - b. When sealing patched surfaces and joints with existing pavements, extend minimum 150 mm (6 inches) beyond edges of patches.

3.06 FIELD QUALITY CONTROL

- A. General: CQA Consultant will conduct the following tests.

B. Field Density Tests:

1. Perform tests from cores or sawed samples.
2. Measure with properly operating and calibrated nuclear density gauge.
3. Maximum Density: In accordance with ASTM D2041, using a sample of mix taken prior to compaction from the same location as the density test sample.

C. Testing Frequency:

1. Density Tests: Once every 500 tons of mix or once every 4 hours, whichever is greater.

END OF SECTION

SECTION 15052
LANDFILL GAS (LFG) SYSTEM VALVES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Scope of Work: The Contractor shall provide all materials, equipment, and labor needed to install complete and ready for use all header isolation valves as specified herein and as indicated on the Drawings. Valves are for landfill gas service under vacuum or pressurized conditions, in the conditions normally found in landfill gas collection systems.
- B. Related Work Described Elsewhere: Section 15073, High Density Polyethylene (HDPE) Pipe and Fittings for Gas Management Systems.

1.02 SUBMITTALS

- A. The Contractor shall prepare and submit to the Engineer, for review and approval, certificates of compliance on materials furnished and manufacturer's brochures containing complete information and instructions pertaining to the storage, handling, installation, inspection, maintenance, operation, and repair of each type of valve furnished. Shop Drawings shall be submitted for butterfly valve assemblies requiring spacers in accordance with paragraph 3.01.B. of this section. Shop Drawings shall be submitted for gate valves.
- B. The Contractor shall submit the following Quality Control (QC) information:
 - 1. Tests and inspection data.
 - 2. Manufacturer's Certificate of Proper Installation.
 - 3. Operation and maintenance manual.

PART 2 PRODUCTS

2.01 BUTTERFLY VALVES (LFG TRANSMISSION PIPE)

- A. All valves shall be complete with all necessary operators, actuators, handwheels, extension stems, worm gear operators, operating nuts, wrenches, spacers, and other accessories or appurtenances which are required for the proper completion of the work. Operators and other accessories shall be sized and furnished by the valve supplier and be factory mounted.

- B. Valves shall be suitable for the intended service. Renewable parts including discs, packing, and seats shall be of types recommended by valve manufacturer for intended service, but not of a lower quality than specified herein.
- C. Valves and operators shall be suitable for burial within a landfill.
- D. Unless otherwise shown, valves shall be the same size as the adjoining pipe.
- E. Valves and operators shall be suitable for the intended use (i.e., located within landfill disposal area, and subjected to landfill gas, condensate, and leachate).
- F. Valve position indicators shall be installed correctly to properly identify the valve position.
- G. Valves shall open by turning counterclockwise.
- H. Operator, actuator, and accessories shall be factory mounted to valve.
- I. LFG main or header valves shall be butterfly bubble tight, wafer design, with a PVC or polypropylene body, polypropylene disc, Viton (FKM) seats and seals, valve stem Type 316 stainless steel for sizes 1-1/2 to 12 inches, valve stem Type 403 stainless steel for sizes above 12 inches, and compatible with a flat face flange. Valve body to fit between ANSI B16.1 150-pound flanges.
- J. Bearings shall be self-lubricating sleeve type.
- K. Valves shall have permanent O-ring stem seals or self-adjusting packing, with stainless steel machine screws.
- L. Valves shall be suitable for temperatures up to 176 degrees F, and bubble-tight under 10-inch Hg vacuum.
- M. Valves shall be Asahi/America (800-343-3618), Type 57 or 75, as appropriate, or approved equal.
- N. Stem extensions, where indicated or scheduled, shall be stainless steel in an epoxy coated carbon steel outer housing with a die-cast aluminum alloy gear box assembly mounted on top and equipped with a removable manual operating wheel. Stem extensions shall be housed in HDPE valve box.

2.02 GATE VALVES

- A. The gate shall be constructed of Type 1, Grade 1 PVC with socket fittings and a polypropylene wedge. No metal parts shall be in contact with the LFG flowing through the valve. The valves shall meet the requirements of ASTM D1784 for rigid PVC compounds. The gate shall be of a tapered

cylindrical plug design made of PVC or polypropylene, thickly lined with styrene butadiene rubber (SBR) material, flanged, non-rising stem with position indicator. ANSI face to face dimensions, flanged ends, rated for 50 psi differential at 176 degrees F.

B. Manufacturers and Products:

1. ASAHI-America.
2. Spears Manufacturing Co.
3. Or approved equal.

2.03 OPERATORS

A. Manual Operator:

1. General Requirements:
 - a. Operator force not to exceed 40 pounds under any operating condition, including initial breakaway. Gear reduction operator shall be used when force exceeds 40 pounds.
 - b. Operator shall be self-locking type or equipped with self-locking device.
 - c. Operators shall have position indicator on quarter-turn valves.
 - d. Worm and gear operators shall be one-piece design worm gears of gear bronze material, worm hardened alloy steel with thread ground and polished. Traveling nut type operators shall have threaded steel reach rods with internally threaded bronze or ductile iron nut.
2. Exposed Operator Requirements:
 - a. Galvanized and painted handwheels.
 - b. Lever operators allowed on quarter-turn valves 8 inches and smaller.
 - c. Cranks on gear type operators.
 - d. Valve handles to take a padlock, and wheels a chain and padlock.
3. Buried Operator Requirements:
 - a. Buried service valves shall have geared operators exposed above ground. Enclose moving parts of valve and operator in HDPE or PVC housing to prevent contact with the soil.
 - b. Design buried service operators for quarter-turn valves to withstand 450 inch-pounds of input torque at the FULLY OPEN or FULLY CLOSED positions, grease packed and gasketed to withstand a submersion in water to 10 psi.
 - c. Buried valves shall have extension stems, and bonnets.

2.04 MONITORING PORTS

- A. Monitoring ports shall be installed at each header isolation valve and shall include the following items, or approved substitutes. Monitoring hose shall be stainless steel with outer braid Swagelok flexible metal hose, Part No. SS-H04PM4PF4, of adequate length to extend above grade as shown on the Drawings. The male NPT end shall be threaded into the top of the header. Sampling end shall have a 1/4-inch NPT polypropylene monitoring quick disconnect ports by Ryan Herco (800-848-1141), Part No. 0812-002 or Colder Products Part No. LCD 240 04 or equal. The hose shall be secured to the valve stem outer boring by stainless steel worm-gear clamps.
- B. Quick connects may be replaced by SCH 80 PVC labcock valves subject to approval by the Engineer. Labcock valves shall be 1/4-inch PVC with EPDM seats and seals. Valves shall have 1/4-inch MPT on one end and hose connection on the end, and the body shall be single piece construction.

2.05 IDENTIFICATION TAGS

- A. Contractor shall supply and affix to each header isolation valve monitoring port a plastic tag marked with pre-printed letters designating the valve number followed by the letters "A" or "B" (e.g., V-1A, V-1B, V-2A, etc.). The tags imprinted with an "A" shall be placed on the monitoring port closest to the blower/flare station. Those marked with a "B" shall be affixed to the other valve monitoring port. Tags shall not be marked with pen or marker.
- B. Tags shall be 2-1/2-inch square tag, yellow with black lettering, Square Setonply® tag, style M4550, by Seton (800-243-6624), or equal. Tag shall be secured to the valve stem housing with a plastic "zip tie" or as approved by the Engineer.

2.06 FACTORY FINISHING

- A. Exposed Valves: Safety isolation valves and lockout valves with handles, hand wheels, or chain wheels "safety yellow."

PART 3 EXECUTION

3.01 INSTALLATION

- A. Valves shall be installed in accordance with the manufacturer's recommendations and the following:
 - 1. Butterfly valves shall be installed between two flanges as shown on the Drawings; care shall be taken to avoid stripping bolts when tightening.

2. Flanges shall be joined with hot dipped galvanized steel studs and nuts. Stud lengths shall accommodate the required distance between flanges including spacers, if necessary. Stainless steel studs and nuts are not acceptable substitutes.
 3. All below grade back-up rings, studs, nuts and washers shall be thoroughly coated with Polyken Technologies 1027 Primer (508-261-6200), or rubberized emulsion undercoating spray, or approved substitute. There shall be no "holidays", or areas where the coating is not completely applied.
 4. The Contractor shall wrap and tape the valve, flanges, and bolts in 5 mil polyethylene sheeting prior to backfilling.
- B. Flanged butterfly valves require spacers between the flange adapters and the valve body in order to allow full travel of the internal disk. The Contractor shall install valve spacers for all isolation valves and with the approval by the Engineer.
1. Flanged valve bolt holes shall straddle vertical centerline of pipe.
 2. Clean flanged faces, insert gasket and bolts, and tighten nuts progressively and uniformly.
- C. Valve Orientation:
1. Install operating stem vertical when valve is installed in horizontal runs of pipe, unless otherwise shown.
 2. Orient butterfly valve shaft so that unbalanced flows or eddies are equally divided to each half of the disc, i.e., shaft is in the plane of rotation of the eddy.
 3. All Butterfly valves shall open by turning the valve wheel in a counterclockwise direction and close by turning the valve wheel in a clockwise direction.
- D. Valve to be located to provide accessibility for control and maintenance.

3.02 TESTS AND INSPECTION

- A. Valve may be either tested while testing pipelines, or as a separate step.
- B. Test that valves open and close smoothly with operating pressure or vacuum on one side and atmospheric pressure on the other.

3.03 MANUFACTURER'S FIELD SERVICES

- A. The valve(s) as listed below require manufacturer's field services:
 - 1. Butterfly Valve.

- B. Manufacturer's Representative: Present at site for minimum person-days listed below, travel time excluded:
 - 1. 1 working day for installation assistance and inspection.
 - 2. 1 day for functional and performance testing and completion of Manufacturer's Certificate of Proper Installation.

END OF SECTION

**SECTION 15071
HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS
FOR LETDOWN PIPES AND CULVERTS**

PART 1 GENERAL

1.01 WORK INCLUDED

- A. This section covers the Work necessary for the construction of the HDPE down drain pipes, HDPE inlet manholes, underdrains and connections to existing perimeter piping. HDPE corrugated pipe is used for letdown pipes, except for connection to stormwater inlets at the elevation 106 and elevation 166 terraces where solid-wall SDR 17 is used at stormwater pipe penetrations.
- B. The Contractor shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for installation of all corrugated (smooth interior wall) high density polyethylene (HDPE) pipe, fittings and appurtenances as specified herein, and for solid-wall HDPE SDR 17 stormwater piping and fittings as specified herein, or as shown on the Drawings.
- C. The Contractor shall coordinate the installation of the HDPE pipe and fittings with other construction activities and subcontractors at the site.

1.02 RELATED SPECIFICATIONS

- A. Section 02221, Excavation, Trenching, Backfilling and Embankment.
- B. Section 02502, Terrace Underdrain Systems.

1.03 REFERENCES

- A. Latest version of the American Society for Testing and Materials (ASTM) standards:
 - 1. D1248 Standard Specifications for Polyethylene Plastics Molding and Extrusion Materials.
 - 2. D1603 Standard Test Method for Carbon Black in Olefin Plastics.
 - 3. D2412 Test Method for Determination of External Loading Characteristics of Plastic Pipe of Parallel Plate Loading.
 - 4. D3350 Standard Specification of Polyethylene Plastics Pipe and Fittings Materials.
 - 5. F405 Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings.

1.04 QUALIFICATIONS

- A. The Contractor shall provide the services of the HDPE pipe and fitting manufacturer, and installer. The Contractor shall accept and retain full responsibility for all materials and installation and shall be held responsible for any defects in the material and installation of HDPE pipes and fittings complete and in place.
- B. Manufacturer shall be responsible for the production and delivery of the corrugated HDPE pipe and fittings and shall be a well-established firm with more than 10 years' experience in the manufacture of HDPE pipes and fittings.
- C. Installer shall be experienced with field handling, storing, installing, and other site aspects of the installation of the HDPE pipes and fittings, and connections to other structures and features of the Project.

1.05 SUBMITTALS

- A. The Contractor shall submit to the Engineer for approval complete detailed Shop Drawings of all corrugated HDPE pipe and fittings, a list of materials to be furnished, the names of the suppliers and other qualification information.
- B. The Contractor shall submit to the Engineer the HDPE (corrugated and solid-wall SDR17) pipe manufacturer's certification of compliance with these Specifications for all materials delivered to the site, and shall comply with the corrugated and solid-wall HDPE pipe manufacturer's recommendations for handling, storing, and installing HDPE pipes and fittings.
- C. Contractor shall submit qualifications information for HDPE pipe and fittings installer.
- D. The Contractor shall submit to the Engineer the following raw materials documentation from the corrugated HDPE pipe manufacturer, prior to transporting any HDPE pipe or fittings to the site:
 - 1. Certificate stating the specific resin, its source and the information required by ASTM D1248;
 - 2. Certification that no recycled compound has been added to the resin; and;
 - 3. Certificate stating pipe stiffness is in accordance with ASTM D2412.
- E. The Contractor shall submit to the Engineer for approval complete detailed Shop Drawings of all corrugated and solid-wall SDR 17 HDPE pipe and

fittings, a list of materials to be furnished, the names of the suppliers and other qualification information.

1.06 CONSTRUCTION QUALITY ASSURANCE

- A. The Engineer will make periodic observation of installation of corrugated HDPE pipe and fittings and solid-wall SDR 17 pipe and fittings to assure installation is in conformance with these Specifications.
- B. The Contractor shall provide an installation schedule for stormwater down drains, pipes connected to manholes and energy dissipation structures.

PART 2 PRODUCTS

2.01 HIGH DENSITY POLYETHYLENE COMPOUND

- A. The corrugated HDPE pipe and fittings shall be manufactured from new, HDPE resin conforming to ASTM D1248 (Type III, Class C, Category 4 or 5, Grade P 33), ASTM D3350 (Cell Classification PE 324420C). The resin shall be pre-compounded. In plant blending of non-compounded resins shall not be permitted.
- B. The polyethylene compound shall contain no less than 2 percent and no more than 5 percent carbon black.

2.02 CORRUGATED HIGH DENSITY POLYETHYLENE PIPES AND FITTINGS

- A. All corrugated HDPE pipe and fittings shall comply with the ASTM F405.
- B. Corrugated pipes and fittings shall be N-12 Type by Advanced Drainage Systems, Inc. or approved equal.
- C. All corrugated HDPE pipe shall have a nominal inside diameter in accordance with the stormwater pipe schedule on the Drawings. The 36-inch diameter corrugated HDPE pipe shall have a minimum pipe stiffness value of 22 psi at 5 percent deflection, as determined in accordance with ASTM D2412. The 30-inch diameter corrugated HDPE pipe shall have a minimum pipe stiffness value of 26 psi at 5 percent deflection, as determined in accordance with ASTM D2412.

- D. Corrugated HDPE pipes and fittings shall be homogeneous throughout and free of visible cracks, holes (other than intentional manufactured perforations), foreign inclusions, or other deleterious effects, and shall be uniform in color, density, melt index and other physical properties.
- E. The ends of the pipe shall be squarely and cleanly cut to facilitate joining. Temporary end caps shall be placed on the upper end stub-outs and also be used to prevent entry of foreign materials during construction. Do not use internal pipe plugs.
- F. All fittings (bends, wyes) shall be corrugated. Fittings may be either molded or fabricated. Fittings may be fuse-welded or fabricated to accept split couplings with stainless steel coupling bands.

2.03 HIGH DENSITY POLYETHYLENE (HDPE) PIPE

- A. Pipe shall be extruded from a Type III, Class C, Grade P44 compound as described in ASTM D1248. It shall be classified as cell PE 445474C according to ASTM D3350 and have the material designation of PE 4710. The pipe shall be manufactured to meet the requirements of ASTM D2513. Manufacturer's literature shall be adhered to when "manufacturer's recommendations" are specified. All pipe and fittings shall be provided by one manufacturer. Acceptable manufacturers include Performance Pipe, JM pipe, or approved equal.
- B. All HDPE pipe and fittings 12-inch diameter or larger used for stormwater piping as indicated on the Drawings shall be Standard Dimension Ratio (SDR) 17 high density polyethylene pipe using a 4710 type resin or approved equal.
- C. All polyethylene pipe shall meet the requirements of ASTM F714.
- D. The pipe shall be joined with butt, thermal fusion joints to the same pipe type. All joints shall be made in strict compliance with the manufacturer's recommendations. Transition to other types of piping shall be transition coupling or by special fabrication fitting.
- E. Pipe shall be furnished in standard laying lengths not exceeding 50 feet.
- F. The following shall be continuously printed on the pipe or spaced as intervals not to exceed 5 feet:
 - 1. Name and/or trademark of the pipe manufacturer.
 - 2. Nominal pipe size.
 - 3. Dimension ratio.

4. The letter PE followed by the polyethylene grade in accordance with ASTM D1248, followed by the hydrostatic design basis in psi.
 - a. Manufacturing standard reference, e.g., ASTM F714.
 - b. Production code from which the date and place of manufacture can be determined.
5. Ultra violet protection using carbon black, not less than 2 percent well dispersed in the resin.

2.04 FITTINGS AND JOINTS FOR SOLID-WALL HDPE PIPING

- A. All fittings shall be molded fittings, butt-fusion joined, conforming to ASTM D3350. All fittings shall have the same or higher pressure rating as pipe. Fittings shall be fabricated by the manufacturer.

2.05 IDENTIFICATION

- A. The following shall be continuously printed on the pipe, or spaced at intervals not exceeding 5 feet:
 1. Name and/or trademark of the pipe manufacturer;
 2. Nominal pipe size;
 3. Manufacturing Standard Reference (e.g., ASTM F405), the pipe stiffness, and the pipe designation (e.g., standard or heavy duty);
 4. The Manufacturer's identification symbol; and
 5. A production code from which the date and place of manufacture can be determined.

2.06 PIPE BEDDING MATERIAL

- A. Pipe bedding material shall be granular fill as specified in Section 02221, Excavation, Trenching, Backfilling and Embankment and as indicated on the Drawings.

2.07 TERRACE DRAIN INLETS

- A. HDPE drain basins shall be 48-inch outside diameter structures fabricated using PE 3408 HDPE SDR 17 pipe. HDPE drainage basins shall be fabricated per structure schedule.
- B. HDPE manholes shall be designed at a minimum for H-20 wall loading. Inlets shall also have an 18-inch minimum width external ring integrally molded to the barrel bottom to provide anchorage in backfill, and "dog-ears" shall be provided on the upper portion of the inlet for integration into the concrete collar. Inlet and outlet pipe connections shall be molded with connection

provided for split-couplings. Grates for inlets shall be as specified in the Drawings.

- C. Forty-eight inch diameter terrace Inlets should be fabricated to accept 18- to 24-inch diameter corrugated pipe. Stub-outs for corrugated pipe shall have at least four corrugations. Manholes shall be fabricated to accept underdrain piping as shown on the Drawings.

PART 3 EXECUTION

3.01 PREPARATION FOR INSTALLATION

- A. The Contractor shall become familiar with all portions of the work to be completed under this section.
- B. Prior to beginning installation, the Contractor shall carefully inspect all preparation and work specified in other sections which is related to the down drain system and culvert installation. Contractor shall verify that all work is complete to the point where installation under this section may commence without adverse impact.

3.02 INSTALLATION

- A. General:
 - 1. All corrugated HDPE pipe and fittings shall be installed in accordance with the manufacturer's instructions.
 - 2. The Contractor shall carefully examine all pipe and fittings for cracks, damage, or defects before installation. Defective materials shall be immediately removed from the site and replaced at no additional cost to the Owner.
 - 3. The interior of all pipe and fittings shall be inspected, and any foreign material shall be completely removed from the pipe interior before it is moved into final position.
- B. Trench Excavation: Excavate trenches for culverts or down drains to the grade shown. Make width of trench sufficient to permit complete tamping of the backfill under and around the pipe but no greater than OD plus 18 inches. Shape bottom of the trench to fit accurately the lower part of the pipe exterior.

C. Laying Pipe:

1. Inspect pipe before laying and remove any damaged or defective pipe from the job and replace at the Contractor's sole expense. Begin laying at the lowest end of culvert. Backfill and tamp fill to ensure that it fills the annular space between corrugations to assure proper bedding of pipe. Compact granular fill adjacent to pipe by hand or small mechanical tamper to one foot above spring line of pipe.
2. Do not machine-compact backfilled granular soil near or over pipes unless there is a minimum 1-foot granular fill layer thickness over the crown of the pipe.
3. Thoroughly clean ends of the pipes.
4. Join down drain pipes with split couplings, and underdrain pipes to manholes using manufacturer's recommendations to provide a secure connection.
5. Solid-wall high density polyethylene (HDPE) pipe shall be installed in accordance with the instructions of the manufacturer, as shown on the Drawings and as specified herein. Pipe installation shall comply with the requirements of ASTM D2321, PPI TR-31/9-79.

3.03 HANDLING AND PLACEMENT

- A. The Contractor shall exercise care when transporting, handling and placing corrugated HDPE pipe and fittings, such that they will not be cut, or otherwise damaged.
- B. Ropes, fabric or rubber-protected slings and straps shall be used when handling corrugated HDPE pipe. Chains, cables, or hooks shall not be inserted into the pipe ends as a means of handling pipe.
- C. Under no circumstances shall pipe or fittings be dropped into trenches, or dragged over sharp and cutting objects.
- D. Pipe shall be stored on clean level ground, preferably turf or sand, free of sharp objects. The pipes should be stored out of direct sunlight.
- E. The maximum allowable depth of cuts, gouges, or scratches on the exterior surface of corrugated HDPE pipe or fittings is 10 percent of the wall thickness. The interior of the pipe and fittings shall be free of cuts, gouges, and scratches. Sections of pipe with excessive cuts, gouges, or scratches shall be removed at no cost to the Owner.
- F. No pipe shall be placed until the RPR or Engineer has approved the subgrade, bedding, and materials.

- G. Blocking under piping shall not be permitted unless specifically accepted by the Engineer due to special conditions.

3.04 JOINTS AND CONNECTIONS

- A. Corrugated HDPE (CHDPE) pipe shall be joined with split couplings secured by stainless steel bands or fused welds. The split couplings shall be ADS split premium type or approved equal having a length of at least four corrugations (two on either side of pipe joint) or approved equal, for pipe diameters up to 42 inches.
- B. HDPE pipe shall be installed with strict adherence to manufacture recommendations. Manufacturers shall conduct field instruction for installation personnel. Bid cost shall include cost of instruction and partial inspection of installation. Manufacturer shall approve installation technique.
- C. Bends and specialized fittings shall be joined to pipe using split-couplings or fusion-butt welded as specified or as shown on the Drawings.
- D. All joints and fittings shall be wrapped with a non-woven geotextile, two corrugations minimum on each side of split-coupling to prevent fines/soil intrusion after pipe settlement. Geotextile shall be as specified in Section 02371, Filter Fabric. The ends of the geotextile shall be securely fastened with plastic ties.
- E. Connection of CHDPE to solid-wall HDPE Pipe at the seepage flap (elevation 106 and elevation 166 terraces).
 - 1. Mar Mac Polyseal Repair Coupler manufactured by Mar Mac Construction Products, Inc. and distributed by ADS, Inc. Installation shall be in accordance with the manufacturers recommended installation instructions. Mar Mac coupler is designed to provide a soil tight connection.
- F. Connection of CHDPE letdown pipe to existing solid-wall HDPE pipe at existing perimeter manholes (east and west slopes):
 - 1. Fabricated CHDPE to solid-wall HDPE fitting by custom fabricator.
 - 2. Fusion-weld fitting to existing solid-wall HDPE pipe.
- G. Connection of CHDPE letdown pipe to existing PVC pipe at existing perimeter manholes (east and west slopes):
 - 1. Remove PVC pipe section and expose end of solid-wall HDPE pipe.
 - 2. Fusion weld fabricated CHDPE to solid-wall HDPE pipe.

- H. Connection of CHDPE letdown pipe to existing solid-wall HDPE pipe at north perimeter berm MES structures (MES-1, MES-2, MES-4, MES-5):
1. Fabricated CHDPE to solid-wall HDPE Fitting by custom fabricator.
 2. Fusion weld fabricated CHDPE to solid-wall HDPE pipe.
- I. Connection of CHDPE letdown pipe to north perimeter berm MES-3 (36-inch diameter reinforced concrete pipe):
1. RCP to double-wall CHDPE adapter by ADS, Inc. (36-inch diameter by 36-inch diameter fitting).
 2. Reduce from 36-inch diameter to 24-inch diameter for connection of CHDPE letdown pipe.

3.05 PROTECTION OF WORK

- A. The Contractor shall use all means necessary to protect all products during shipment, storage, and installation and to protect all prior work and materials installed or completed under other sections of these Specifications.
- B. In the event of damage to prior work or work completed as specified in this section, the Contractor shall immediately make all repairs and replacements necessary, to the approval of the Engineer, at no additional cost to the Owner.

3.06 DRAINAGE PIPING AND MATERIALS SCHEDULE

- A. The following schedule provides a summary of drainage piping and materials:

Component	Material	Specification Section
Stormwater letdown piping	CHDPE pipe	15071
Swale or sideslope underdrain piping (perforated)	CHDPE drainage pipe (N-12 LF or equal)	02502
Swale or sideslope underdrain piping (non-perforated)	CHDPE drainage pipe (N-12 LF or equal)	02502
Swale inlet manholes (per structure schedule)	Fabricated HDPE SDR-17	15071
Connection to existing perimeter piping (solid-wall HDPE SDR17 pipe, PVC, RCP to CHDPE pipe)	HDPE SDR-17 to CHDPE adapter, RCP to CHDPE adapter per Part 3.04	15071

END OF SECTION

SECTION 15073
HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS
FOR GAS MANAGEMENT SYSTEM

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required, and install high-density polyethylene (HDPE) pipe and appurtenances for gas management system, as shown on the Drawings and as specified herein. Joints and fittings shall be butt-fusion joined.
- B. The location of all pipes shall conform to the Contract Documents. However, in some cases, a certain amount of flexibility in pipe position shall be allowed where new pipes connect to existing piping or when avoiding potential conflicts. All field modification shall be approved by the Engineer prior to the work being performed.
- C. All HDPE pipe used for landfill gas collection system shall be SDR 17 HDPE pipe.

1.02 RELATED REQUIREMENTS

- A. The Contract Documents include, but are not limited to, the following related sections:
 - 1. Section 02221, Evacuation, Trenching, Backfilling and Embankment.
 - 2. Section 02560, Gas Extraction Wells and Wellheads.

1.03 SUBMITTALS

- A. Within 10 days following the Effective Date of the Agreement, submit the following information in accordance with Section 01300, Submittals:
 - 1. List of materials to be furnished, the names of suppliers, and the date of delivery of materials to the site.
 - 2. The origin of the resin to be used in the manufacturing of the pipe including the supplier's name and production plant, as well as brand name and number.
 - 3. Documentation from the resin's manufacturer showing results of the following tests for resin identification:
 - a. Melt Flow Index: ASTM D1238.
 - b. Density: ASTM D1505.

4. Manufacturer quality control manual describing implementation of quality control procedures during pipe manufacturing process.
5. Pipe Manufacturer's certification of compliance with these Specifications.
6. Complete, detailed Shop Drawings of all polyethylene pipe, including the location of all fittings, joints, and connections to structures. Dimensions and Technical Specifications for all piping shall be furnished. Submit manufacturing methods for butt-fusion joints and connections between dissimilar materials.
7. Manufacturer's recommendations for handling, storing, and installing pipe shall be furnished.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):

1. D1238, Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer.
2. D1248, Standard Specification for Polyethylene Plastic Molding and Extrusion Materials.
3. D1505, Standard Test Method for Density of Plastics by the Density-Gradient Technique.
4. ASTM Slow Crack Growth Resistance of Plastics.
5. D2657, Standard Practice for Heat-Joining Polyolefin Pipe and Fittings.
6. D2837, Hydrostatic Design Basis for Thermoplastic Pipe Materials.
7. D3350, Specification for Polyethylene Plastic Pipe and Fittings Materials.
8. F714, Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.
9. D1603, Standard Test Method for Carbon Black in Olefin Plastics.
10. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
11. A194, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Bridges.

B. American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges.

C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 DESIGN REQUIREMENTS

- A. Where pipe diameter, thickness, pressure class, pressure rating, or thrust restraint is not shown or specified, design piping system in accordance with the following: Buried Piping: H20-S16 traffic load with 1.5 impact factor, AASHTO Standard Specifications for Highway Bridges, as applicable.

1.06 QUALITY ASSURANCE

- A. The polyethylene pipe shall be furnished by manufacturers who are fully experienced, reputable, and qualified in the manufacture of the polyethylene pipe to be furnished. The pipe shall be designed, constructed, and installed in accordance with the best practices and methods and shall comply with these Specifications.
- B. Finished Product Evaluation:
 - 1. Each length of pipe produced shall be checked by production staff for the items listed below. The results of all measurements shall be recorded on the production sheets that become part of the manufacturer's permanent quality control records.
 - 2. Pipe shall be checked visually, inside and out for cosmetic defects (grooves, pits, hollows, etc.).
 - 3. Pipe outside diameter shall be measured using a suitable periphery tape to ensure conformance with ASTM F714.
 - 4. Pipe wall thickness shall be measured at 12 equally spaced locations around the circumference at both ends of the pipe to ensure conformance with ASTM F714.
 - 5. Pipe length shall be measured.
 - 6. Pipe marking shall be examined and checked for accuracy.

1.07 WARRANTY

- A. The pipe manufacturer shall provide a warranty against manufacturing defects of material and workmanship for a period of 20 years after the final acceptance of the project by the Owner. Within the warranty period, the manufacturer shall replace at no expense to the Owner, including labor, any defective piping material.

PART 2 PRODUCTS

2.01 HDPE PIPE

- A. Pipe shall be extruded from a Type III, Class C, Grade P44 compound as described in ASTM D1248. It shall be classified as cell PE445474C according to ASTM D3350 and have the material designation of PE 4710. The pipe shall be manufactured to meet the requirements of ASTM D2513. Manufacturer's literature shall be adhered to when "manufacturer's recommendations" are specified. All pipe and fittings shall be provided by one manufacturer. Acceptable manufacturers include Performance Pipe, JM pipe, or approved equal.
- B. All HDPE pipe and fittings shall be standard dimension ratio (SDR) 17 HDPE pipe using a 4710 type resin or approved equal.
- C. All HDPE tubing and fittings for landfill gas, air line and condensate force main that are less than or equal to 2-inch diameter shall be SDR 11.
- D. All polyethylene pipe shall meet the requirements of ASTM F714.
- E. The pipe shall be joined with butt, thermal fusion joints. All joints shall be made in strict compliance with the manufacturer's recommendations.
- F. Pipe shall be furnished in standard laying lengths not exceeding 50 feet.
- G. The following shall be continuously printed on the pipe or spaced as intervals not to exceed 5 feet:
 - 1. Name and/or trademark of the pipe manufacturer.
 - 2. Nominal pipe size.
 - 3. Dimension ratio.
 - 4. The letter PE followed by the polyethylene grade in accordance with ASTM D1248, followed by the hydrostatic design basis in psi.
 - a. Manufacturing standard reference, e.g., ASTM F714.
 - b. A production code from which the date and place of manufacture can be determined.
 - 5. Ultra violet protection using carbon black, not less than 2 percent well dispersed in the resin.

2.02 FITTINGS AND JOINTS

- A. All fittings shall be molded fittings, butt-fusion joined, conforming to ASTM D3350. All fittings shall have the same or higher pressure rating as pipe. Fittings shall be fabricated by the manufacturer.

- B. Fittings shall be manufactured from polyethylene compound having cell classification equal to or exceeding the compound used in the pipe.
- C. All fittings 12 inches and smaller shall be molded, unless approved by the Engineer.
- D. All pipe and fittings must be supplied by the same manufacturer.
- E. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures shall be capable of meeting all conditions recommended by the pipe manufacturer. Butt fusion foiling shall result in a joint weld strength equal to or greater than the tensile strength of the pipe. Socked fusion shall not be used. Flanges, unions, grooved couplers, transition fittings, and some mechanical couplers may be used to connect HDPE pipe mechanically without butt fusion only where shown in the Drawings.

2.03 FLANGES AND GASKETS

- A. Mechanical connections of the HDPE pipe to auxiliary equipment such as valves, pumps, tanks and other piping systems shall be through flanged connections consisting of the following unless otherwise shown on the Drawing.
- B. Flanges for HDPE pipe shall be convoluted ductile iron back-up rings with a minimum thickness of 1-inch, as manufactured by Improved Piping Products (925-254-0962), Inc., of Orinda, California or approved equal. Back-up rings shall be finished with zinc chromate primer.
 - 1. The studs, nuts, and washers for the flanges shall be hot dipped galvanized steel. Stainless steel studs and nuts are not an acceptable alternative. All below grade studs and nuts shall be thoroughly coated with Polyken Technologies 1027 Primer (508-261-6200), or rubberized emulsion undercoating spray, or approved substitute, with no gaps in coverage. Below grade flanges shall be coated with polycoat rubberized primer and wrapped in 5-mil polyethylene shrink-wrap sheeting just after installation and prior to backfilling to help prevent corrosion.
 - 2. Flange gaskets shall be full-face Neoprene.

3. Where flanges are needed for appurtenance connection use ASTM A240 Type 304 structure steel, 125-pound ANSI B16.1-89 standard, Van Stone Type with one piece molded polyethylene stud ends, having the same pressure as pipe.

2.04 LOCATION WIRE AND IDENTIFICATION MARKINGS

A. Location Detection Wire:

1. Materials: Continuous, insulated 10-gauge copper wire or metallic warning tape.
2. Installation: Directly above (6-inch maximum) centerline of pipe terminating at top of each valve box collar and be capable of extending 12 inches above top of box in a manner so as not to interfere with valve operation.

PART 3 EXECUTION

3.01 QUALIFICATION OF FUSION OPERATORS

- A. Each operator performing fusion joining shall be qualified in the use of the manufacturer's recommended fusion procedure(s) by the following.
- B. Appropriate training or experience in the use of the fusion equipment and procedure.
- C. Making a sample joint according to the procedure that passes the following inspections and tests:
 1. The joint shall be visually examined during and after joining and found to have the same appearance as a photograph or sample of an acceptable joint that joined in accordance with the manufacturer's procedure.
 2. The joint shall be tested or examined by one of the following methods:
 - a. Pressure and tensile as described in 49 CRF 192.283.
 - b. Ultrasonic inspection and found to be free of flaws that would cause failure.
 - c. Cut into at least three longitudinal straps, each of which is:
 - 1) Visually examined and found to be free of voids or unbonded areas on the cut surface of the joint.
 - a) Deformed bending, torque, or impact and if failure occurs, it must not initiate in the joint area.

3. Each operator shall be re-qualified under the procedure, if, during any 12-month period the operator:
 - a. Does not make any joints under the procedure.
 - b. Has three joints or three percent of the joints he has made, whichever is greater, that are found unacceptable by testing under 49 CFR 192.513.

3.02 INSTALLATION

- A. HDPE pipe shall be installed in accordance with the instructions of the manufacturer, as shown on the Drawings and as specified herein. Pipe installation shall comply with the requirements of ASTM D2321, PPI TR-31/9-79.
- B. All heat fusion joints shall be butt fused in accordance with the requirements of ASTM D2657, and done by a factory-qualified technician as designated by the pipe manufacturer.
- C. Lengths of fused pipe to be handled as one segment shall not exceed 500 feet.
- D. Pipe inspection procedure shall be as follows:
 1. The Engineer shall be notified prior to any pipe being installed in the trench in order to have an opportunity to inspect the following items:
 - a. All butt and saddle fusions.
 - b. Pipe integrity.
 - c. Trench excavation and bedding material for rocks and foreign material.
 - d. Proper trench slope.
 - e. Trench contour to ensure the pipe will have uniform and continuous support.
 - f. Proposed backfill sand and soil.
 2. Any irregularities found by the Engineer during this inspection must be corrected before lowering the pipe into the trench. Pipe shall be allowed sufficient time to adjust to trench temperature prior to any testing, segment tie-ins, and/or backfilling.
 3. Tie-ins shall be made out of the trench whenever possible. When tie-ins are to be made only in the trench, a bell hole shall be excavated large enough to ensure an adequate and safe work area.
 4. Below grade piping shall be marked with metallic locator/warning tape to be buried in the trench above the pipe as indicated on the Drawings.
 5. Contractor shall collect all pipe shavings and discard in a trash receptacle. Shavings shall not be left on the ground.

6. All installed HDPE pipe shall be marked in 10-foot intervals corresponding to the stationing required for slope confirmation and conformance surveying. For main pipeline, station numbering shall be continuous and sequential. Station numbering shall be referenced in daily logs to document pipe installation progress.
- E. Pipe shall be laid to lines and grade shown on the Drawings with bedding and backfill as shown on the Drawings.
- F. When laying is not in progress, the open ends of the pipe shall be closed by fabricated plugs, or by other approved means. All plugs shall be OD fitting type plugs. No plugs will be allowed that require insertion of the plug into pipe.
- G. Pipe shall be stored on clean, level ground to prevent undue scratching or gouging. The handling of the pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. The maximum allowable depth of cuts, scratches, or gouges on the exterior of the pipe is 10 percent of wall thickness. The interior pipe surface shall be free of cuts, gouges, or scratches.
- H. Sections of pipe with cuts, scratches, or gouges deeper than allowed shall be removed completely and the ends of the pipeline rejoined.

3.03 DELIVERY, STORAGE AND HANDLING

- A. Care shall be taken during transportation of the pipe such that it will not be cut, punctured, or otherwise damaged.
- B. Ropes, fabric, or rubber protected slings and straps shall be used when handling pipes. Chains, cables, or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped onto rocky or unprepared ground.
- C. Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects which could damage the pipe. Stacking of the polyethylene pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions.

- D. The handling of the joined pipeline shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Slings for handling that pipeline shall not be positioned at butt fused joints.
- E. Before installation, check pipe and fittings for cuts, scratches, gouges, buckling, kinking or splitting. Remove any pipe section containing defects by cutting out the damaged section in a complete cylinder.

3.04 SANITATION OF PIPE INTERIOR

- A. During fusion operations and laying operations, do not place tools, clothing, or other materials in the pipe.
- B. When pipe laying is not in progress, including the noon hour, close the ends of the pipe by a vermin proof plug.

3.05 HEAT FUSION

- A. Use fusion equipment specially designed for heat fusion of HDPE such as offered by McElroy Manufacturing, Inc. Tulsa, Oklahoma. The equipment utilized shall be regulated for the different melt strength materials. Compatibility fusion techniques shall be used when polyethylene of different melt indexes are fused together. Operator of fusion equipment must be certified to use the equipment.
- B. Use the following procedure to butt fuse HDPE pipe. If an operation contradicts Manufacturer's directions, follow the manufacturer's recommendation.
 1. Maintain the proper temperature of the heater plate as recommended by the pipe manufacturer. Check it with tempilsilk or pyrometer for correct surface temperature.
 2. Clean pipe ends inside and outside with a clean cotton cloth to remove dirt, water, grease, and other foreign materials.
 3. Square (face) the pipe ends using facing tools of the fusion machine. Remove all burns, chips and fillings before joining pipe or fittings.
 4. Check line-up of pipe ends in fusion machine to see that pipe ends meet squarely and completely over the entire surface to be fused. Make sure the clamps are tight so that the pipe does not slip during fusion process.
 5. Insert clean heater plate between aligned ends and bring ends firmly in contact with plate but do not apply pressure while achieving melt pattern. Allow pipe ends to heat and soften.
 6. Carefully move the pipe ends away from the heater plate and remove the plate (if the softened materials sticks to the heater plate, discontinue the joint, clean heater plate, re-square pipe ends, and start over).

7. Bring melted ends together rapidly. Do not slam. Apply enough pressure to form a double roll-back bead to the body of the pipe around the entire circumference of the pipe. Pressure is necessary to cause the heated material to flow together.
8. Allow the joint to cool and solidify properly. Remove the pipe from the clamps and inspect the joint appearance.

3.06 SIDEWALL FUSION

- A. All sidewall fusion connections must be pre-approved by engineer. Standard fittings or fabricated fittings are required unless field conditions necessitate sidewall fusion.
- B. Side fusion procedure for HDPE shall be accomplished in the field using 6-inch through 12-inch McElory (or equal) Fusion units and proper heater plate adapters. When branch outlets are larger than 12 inches in outside diameter, sidewall fusion shall be accomplished in a fitting fabrication shop.
- C. Use the following procedure to side fuse the HDPE pipe. If an operation contradicts manufacturer's directions, follow manufacture's recommendation.
 1. Clean the pipe with a cotton cloth. Prepare surface of the pipe (main) by roughing with 60 grit or coarser utility cloth.
 2. Prepare the base of the branch by roughing with 60 grit or coarser utility cloth.
 3. Align branch on the main and tighten clamp.
 4. Check branch for square alignment on main.
 5. Retract moveable clamp, roll in, and center heater plat with adapter between base branch and main.
 6. For all sizes, apply a strong, firm, continuous pressure until compete melt bead can be seen on main. Release pressure to light pressure.
 7. Retract movable clamp and cleanly remove heater plate.
 8. Bring melted surfaces together rapidly. Do not slam. Apply continuous progressive pressure until proper fusion bead is formed. Maintain pressure until joint has cooled.

3.07 OPERATIONS INCIDENTAL TO JOINT COMPLETION

- A. Install identification wire where detailed in the Drawings.
- B. Plan joint completion to accommodate temporary test bulkheads for pneumatic testing on the day of installation.

3.08 FLANGED CONNECTIONS

- A. Mechanical joining to other piping materials (fittings, valves, sumps, etc.) shall be accomplished as follows:
1. Ductile Iron to HDPE Connections:
 - a. Connections between ductile iron pipe or fittings and PVC pipe or fitting shall use ductile iron mechanical joint glands conforming to AWWA C111 and AWWA C 153. Gaskets, bolts and hexagonal nuts shall be standard rubber gaskets conforming to AWWA C111. Follower gland shall match class 350 “compact” fittings.
 - b. HDPE pipe stiffeners shall be constructed of stainless steel and shall be flanged on one end to prevent over-insertion into the receiving pipe.
 - c. Install mechanic joints in accordance with AWWA C600 and manufacturer’s recommendations.
 - d. When connection is being made to HDPE pipe or fitting, insert pipe stiffener into connection end of HDPE pipe until flared end of HDPE pipe seats against cut face.
 2. PVC to HDPE Connections:
 - a. The joining end of the HDPE pipe shall have a butt-fused flange piece attached in accordance with manufacture’s recommendations.
 - b. Connection to PVC shall use a fully-restrained ductile iron mechanical joint confirming to the requirements of AWWA C111 to C153.
 - c. Butt-fuse flange piece to connection end of HDPE pipe in accordance with manufacturer’s recommendation.
 - d. Install fully-restrained mechanical joint on PVC connection end in accordance with AWWA C600 and manufacturer’s recommendation.
- B. Flange adapters shall be pressure rated the same as the pipe. Flange adapters shall be heat fused to the pipe as outlined in the heat fusion section.
- C. Gaskets shall be used between the polyethylene flange adapters when recommended by the HDPE pipe manufacturer. Sufficient torque shall be applied evenly to the bolts to prevent leaks. After initial installation and tightening of flanged connections, allow the connections to set for a few hours. Then conduct a final tightening of the bolts.
- D. Check operation of valves connected to molded stub end flange adapters. Insert polyethylene spacer if recommended by pipe manufacturer for clearance.

- E. For flanged connections in virgin soil, the Contractor shall wrap and tape the flanges and bolts in 5 mil polyethylene sheeting prior to backfilling to help protect the assembly from corrosion.
- F. Flanges shall be joined with hot dipped galvanized steel studs and nuts. Stud lengths shall accommodate the required distance between flanges including spacers, if necessary. Stainless steel studs and nuts are not an acceptable alternative.
- G. For flanged connections within the limits of refuse, all below grade back-up rings, studs, nuts and washers shall be thoroughly coated with Polyken Technologies 1027 Primer (508-261-6200), or rubberized emulsion undercoating spray, or approved substitute.
- H. The Contractor shall wrap and tape the flanges and bolts in 5 mil polyethylene sheeting prior to backfilling.

3.09 VISUAL INSPECTION AND PNEUMATIC TESTING

- A. Field inspection by the Engineer shall include checking pipe markings; field measuring pipe diameter and wall thickness; inspecting the pipe exterior for cuts, gouges, and scratches; inspecting all thermal butt welds and flanges connections; and inspecting the inside of the pipes for removal of all dirt and debris.
- B. Quality Control Submittals:
 - 1. Contractor shall submit a testing plan prior to testing and include at least the following information:
 - a. Testing dates.
 - b. Piping systems and section (s) to be testing.
 - c. Test type.
 - d. Method of isolation.
 - e. Certifications of Calibration for testing equipment.
 - f. Certified test report format.
- C. Preparation:
 - 1. The Contractor shall notify the Engineer in writing 7 days in advance of testing. Leak testing will be performed in the presence of the Engineer.
 - 2. Pressure Piping will be tested after the following preparation steps are completed.
 - a. Install temporary thrust blocking or other restraint as necessary to protect adjacent piping or equipment and make taps in piping prior to testing.

- b. Wait 5 days minimum after concrete thrust blocking is installed to perform pressure tests. If high-early strength cement is used for thrust blocking, wait may be reduced to 2 days.
 - c. Prior to test, remove or suitably isolate appurtenant instruments or devices that could be damaged by pressure testing.
 - d. New Piping Connected to Existing Piping:
 - 1) Isolate new piping with grooved-end pipe caps, spectacle blinds, blind flanges, or as acceptable to Engineer.
 - 2) Test joint between new piping and existing piping by methods that do not place entire existing system under test load, as approved by Engineer.
 - e. Test pressure for LFG HDPE piping: vacuum, 130 inches H₂O.
- D. Do not perform pneumatic testing on:
- 1. PVC or CPVC pipe.
 - 2. Buried and other non-exposed piping.
- E. Equipment required for pneumatic testing:
- 1. Pneumatic compressor separator-dryer system capable of providing oil-free dry air and equipped with one or more full capacity safety relief valves set at a pressure of not more than 105 percent of the required primary test pressure.
 - 2. Vacuum pump.
 - 3. Calibrated pressure gauges.
 - 4. Calibrated temperature gauges.
 - 5. Other miscellaneous equipment necessary to conduct the leak test.
- F. Procedures for pneumatic testing of gas system piping:
- 1. Perform pneumatic testing using accurately calibrated instruments and oil-free, dry air.
 - 2. Take necessary precautions to protect test personnel and Owner's operating personnel from hazards associated with air testing.
 - 3. Secure piping to be tested to prevent damage to adjacent piping and equipment in event of a joint failure.
 - 4. Prior to test, remove or suitably isolate appurtenant instruments or devices that could be damaged by test.
 - 5. Testing shall be performed below grade (inside the trench).
 - 6. Segments shall be connected to a testing apparatus on one end and fitted with fusion-welded caps on all openings.

7. The segment to be tested shall be allowed time to reach constant and/or ambient temperature before initiating the test.
8. The test must be performed during a period when the pipe segment will be out of direct sunlight; i.e., early morning, late evening, or cloudy days. This will minimize the pressure changes which will occur during temperature fluctuations.
9. The test pressure for LFG laterals shall be 4 psig. The test pressure for air supply line and condensate force main shall be 110 psig.
10. Pressure drop during the test shall not exceed one percent of the testing gauge pressure over a period of one hour. This pressure drop shall be corrected for temperature changes before determining pass or failure. The Engineer shall sign off on a test form to indicate test compliance.
11. All equipment for this testing procedure, including an adequately sized air compressor, fittings, caps/pipe plugs, etc., shall be furnished by the Contractor. Other necessary equipment includes a flange adaptor with a steel or brass blind flange. Tapped and threaded into the blind flange will be a temperature gauge 0 to 100 degrees C with 1-degree. interval, a pressure gauge with a scale that spans the test pressure range with increments equal to 0.1 percent of the test pressure, an appropriate valve to facilitate an air compressor hose, and a ball valve to release pipe pressure at completion of test. Pipe reducers shall be utilized to adapt test flange to size of pipe being tested.

G. Correction of Leakage:

1. Apply soap bubbles to joints and connections for examining leakage.
2. Perform leak tests on piping exposed at all fusion welded, flanged and other joints. Perform initial leak testing by gradually bringing the piping system up to 4 psig and hold continuously during inspection of all joints and connections. Examine joints and connections for leakage with soap bubbles. The piping system shall show no visual evidence of leaking. Correct any visible leakage and retest as directed by Engineer.
3. Correct visible leaks, and repeat the test until all visible leaks are corrected.
4. Repair or replace any test section of pipe or joint with leakage.

H. Test Report Documentation will be prepared and include the following:

1. Test date.
2. Description and identification of piping tested.
3. Test fluid.

4. Test pressure.
5. Remarks, including:
 - a. Leaks (type, location).
 - b. Repair/replacement performed to remedy excessive leakage.
6. Signature by Contractor and Engineer to represent that test has been satisfactorily completed.

3.10 CLEANING

- A. At the conclusion of the work, thoroughly flush and clean all of the new pipes to remove all dirt, stones, pieces of wood, or other material that may have entered during the construction period.

END OF SECTION

Attachment A
FDEP Permit for Operations and Sequential
Closure of Cells 9-12 Class I Landfill,
Orange County, Florida



FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION

BOB MARTINEZ CENTER
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

RICK SCOTT
GOVERNOR

CARLOS LOPEZ-CANERA
LT. GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

September 22, 2014

NOTICE OF PERMIT

E-Mail

Jim.Becker@ocfl.net

In the Matter of an
Application for Permit by:
James W. Becker
Solid Waste Division Manager
5901 Young Pine Road
Orlando, FL 32829

Orange County
WACS # 21847
Orange County Solid Waste
Management Facility

Attention: Mr. Becker

DEP File No: 0128169-037-SO-01

Enclosed is Permit Number 0128169-037-SO-01 to operate and sequentially close the Class I landfill, issued pursuant to Section 403.061(14) and 403.707, Florida Statutes.

Any party to this order (permit) has the right to seek judicial review of the permit under Section 120.68, Florida Statutes, by the filing of a Notice of Appeal under rule 9.110 of the Florida Rules of Appellate Procedure, with the Clerk of the Department of Environmental Protection, Office of General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000 and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within thirty days after this Notice is filed with the Clerk of the Department.

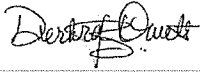
Executed in Leon County, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Tim Bahr, P.G., Program Administrator
Permitting and Compliance Assistance Program

FILING AND ACKNOWLEDGEMENT

FILED, on this date, pursuant to Section 120.52, F.S. with the designated Department Clerk, receipt of which is hereby acknowledged.



Digitally signed by Owete_D
DN: o=Florida Dept of Environmental Protection,
email=Derbra.Owete@dep.state.fl.us, cn=Owete_D
Date: 2014.09.22 12:58:36 -0400'

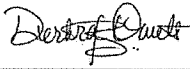
9/22/2014

Clerk

Date

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT and all copies were sent before the close of business on September 22, 2014 to the listed persons.



Digitally signed by Owete_D
DN: o=Florida Dept of Environmental Protection,
email=Derbra.Owete@dep.state.fl.us,
cn=Owete_D
Date: 2014.09.22 12:58:55 -0400'

Clerk

Enclosure: Permit No. 0128169-037-SO-01

Cc:

James Flynt, P.E., Chief Engineer, Orange County Solid Waste Division, James.Flynt@ocfl.net

Daniel Courcy, P.E., Sr. Engineer, Orange County Solid Waste Division, Daniel.Courcy@ocfl.net

Mehran (Ron) Beladi, P.E., Neel-Schaffer, Inc., Ron.Beladi@neel-schaffer.com

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FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

BOB MARTINEZ CENTER
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

RICK SCOTT
GOVERNOR

CARLOS LOPEZ-CANTERA
LT. GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

Permit Issued to:

Orange County Utilities Department, Solid Waste Division
5901 Young Pine Road
Orlando, Florida
(407) 836-6600

WACS Facility ID No.: 21847
Facility Name: Orange County Solid Waste Management Facility
5901 Young Pine Road
Orlando, Florida

Contact Person:
James Becker, Manager, Solid Waste Division
Jim.Becker@ocfl.net
(407) 836-6600

Solid Waste Operation & Closure Permit – Cells 9 – 12, Class I Landfill
Permit No.: 0128169-037-SO-01
Replaces Permit No.: SO48-0128169-025

Permit Issued: September 22, 2014
Permit Renewal Application Due Date: July 23, 2034
Permit Expires: September 22, 2034

Permitting Authority
Florida Department of Environmental Protection
Tallahassee Solid Waste Program & Permitting
2600 Blair Stone Road, MS 4565
Tallahassee, Florida 32399-2400
(850) 245-8707
Fax (850) 245-8811

SECTION 1 - SUMMARY INFORMATION

A. Authorization

The permittee is hereby authorized to operate and close the facility described below in accordance with the specific and general conditions of this permit and any documents attached to this permit or specifically referenced in this permit and made a part of this permit.

This solid waste operation and sequential closure permit is issued under the provisions of Chapter 403, Florida Statutes, (F.S.), and Chapters 62-4 and 62-701, Florida Administrative Code, (F.A.C.).

This permit does not relieve the permittee from complying with any other appropriate local zoning or land use ordinances or with any other laws, rules or ordinances. Receipt of any permits from the Department does not relieve the applicant from obtaining other federal, state, and local permits and/or modifications required by law, including those from other Sections within the Department or of the Water Management District.

B. Facility Location

The Class I landfill is a part of the Orange County Solid Waste Management Facility. The facility is located at the terminus of Young Pine Road, approximately 3 miles southeast of the Curry Ford Road and Dean Road Intersection, Orlando, in Orange County, Florida, at latitude 28°28'54" N and longitude 81°11'30" W.

C. Facility Description

The above named permittee is hereby authorized to perform the work and maintain the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Florida Department of Environmental Protection (DEP or Department) and made a part hereof, and specifically described as follows:

- Operate the Orange County Solid Waste Management Facility, Class I Landfill, Cells 9, 10, 11, & 12.
 - This permit authorizes the continued operation of disposal of Class I solid waste in Cells 9 & 10 (Bays 1 through 16).
 - Cell 11 & 12 operations will be permitted following: (1) the completion of construction of each stage adjacent to the current permitted disposal area and (2) the completion of each stage is certified by the Department. While this permit authorizes operations of Cell 11 (Bays 17 through 25) and Cell 12 (Bays 26 through 36), the construction of Cells 11 & 12 will be permitted separately at a later date.

- Sequentially close the side slopes as final elevations are achieved and final closure of the entire 301.1 acre Cell 9 – 12 solid waste disposal area (side slopes and top).
- Installation and extension of leachate recirculation drain piping in Cells 9 & 10. The dedicated leachate recirculation force main from the leachate storage tanks back to the disposal cells operates the transportation of leachate to a horizontal leachate recirculation line system. The infrastructure for the leachate recirculation system will be included in the permit application for construction of Cells 11 & 12.

The Southern Expansion Site is approximately 3,500 acres and lies south of Young Pine Road. The total area of this project, Cells 9-12 within the Southern Expansion Site, is 301.1 acres of planned disposal area. Cell 9 covers 65 acres (Bays 1 through 7); it is located immediately south of Young Pine Road and has been in operation since January 14, 2005. Cell 10 covers approximately 82 acres (Bays 8 through 16) and is located directly south and adjacent to Cell 9. The combined Cells 9-10 have a disposal area of 147 acres. The County will construct Cells 11 and 12 southward, making infrastructure improvements as needed to serve the new cells.

The leachate is pumped from the disposal areas to the two existing above-ground leachate storage tanks each with a storage capacity of one-half million gallons to temporarily store leachate. Leachate is transmitted from the storage tank facility through a master pump station and force main to the Orange County Eastern Water Reclamation Facility for treatment and disposal. The leachate storage tanks are also equipped to load leachate onto tanker trucks as back-up.

A landfill gas collection system (LGCS) master plan has been designed to control odors and prevent migration of methane (in accordance with Section 2.E.). Horizontal Landfill Gas (LFG) collectors are proposed for each lift and are authorized to be built as part of continuing operations and are connected to the perimeter LFG collection piping. The active gas collection system is permitted to be operated in accordance with the requirements of the Title V (NSPS) Air Permit No. 0950113-008-AV (expires 3/30/2016). The onsite LFG treatment and transmission facility is owned and operated by the Orlando Utilities Commission (OUC). The agreement between the County and OUC allows the County to take over and operate the LFG exhausters and flares if necessary to maintain regulatory compliance.

The stormwater system for Cells 9-12 is permitted by an overall conceptual Environmental Resource Permit for the Southern Expansion Site. The permit was updated with modification ERP48-0177603-009-EM issued July 7, 2014.

Other operations at the County landfill included in this permit are waste tire collection, household hazardous waste collection (operated in accordance with Chapter 62-730, F.A.C.), white goods storage, yard waste composting, and asbestos disposal.

Disposal Areas	Total Area (Cells 9-12): 301.1 acres Cell 9: 65 acres Cell 10: 82.2 acres Cells 11 & 12: 153.9 acres
Bottom Liner design (Top to Bottom)	<ul style="list-style-type: none"> • Protective layer: 24" of sand • Primary leachate collection and removal system: composite drainage net • Primary geomembrane liner: 60-mil HDPE • Leak detection system: a drainage net between the primary and secondary geomembranes • Secondary geomembrane: 60-mil HDPE • Subbase: geosynthetic clay liner
Leachate Storage	Two 500,000 gallon storage tanks
Side Slopes	4H:1V
Top Deck Grade	8%
Terraces	<ul style="list-style-type: none"> • Cell 9 & Northern portion of Cell 10: 20 feet wide every 20 vertical feet • Revised for remainder of Cells 10-12: 20 feet wide every 30 vertical feet
Final Cover (Top to Bottom) Cell 9 and northern Cell 10	<ul style="list-style-type: none"> • Vegetative cover: Sod • Protective cover: 24" granular fill capable of supporting vegetation • Partial drainage layer: 300-mil Composite Drainage Net on terraces and letdown pipe valleys from top terrace at elevation +240 feet NGVD to the bottom terrace at +110 feet NGVD • Barrier layer: Textured 40-mil linear low density polyethylene (LLDPE) geomembrane • Leveling course: 6" clean fill over existing intermediate cover
Final Cover (Top to Bottom) Southern portion of Cell 10 & all of Cells 11 - 12	<ul style="list-style-type: none"> • Vegetative cover: Sod • Protective cover: 24" granular fill with top 6" capable of supporting vegetation • Drainage layer: 300-mil Composite Drainage Net on all side slopes from top of the landfill top-deck berm at elevation +240 feet NGVD to the bottom terrace at +110 feet NGVD • Barrier layer: Textured 40-mil linear low density polyethylene (LLDPE) geomembrane • Leveling course: 6" clean fill over existing intermediate cover

There is one water quality monitoring plan (called Monitoring Plan Implementation Schedule) for the entire Orange County Solid Waste Management Facility (active and closed Class I and Class

III landfill areas). The current version, dated 9/22/2014, is included as APPENDIX 3. It is made a part of this permit and all other permits for the Orange County Solid Waste Management Facility.

D. Appendices Made Part of This Permit

APPENDIX 1 - General Conditions

APPENDIX 2 – List of Approved Documents Incorporated into the Permit

APPENDIX 3 –Monitoring Plan Implementation Schedule

APPENDIX 4 – Locations for Landfill Gas Migration Probes and Structures

E. Attachments for Informational Purposes Only

ATTACHMENT 1 - Time Sensitive Action Chart - If any of the time deadlines in the Time Sensitive Action Chart are inconsistent with the time deadlines in the permit conditions, the time deadline in the permit condition shall be followed.

ATTACHMENT 2 - Facility Permit History

SECTION 2 - SPECIFIC CONDITIONS

A. Administrative Requirements

1. Documents Part of This Permit. The permit application as revised in final form replaced or amended in response to the Department's Request(s) for Additional Information are contained in the Department's files and are made a part of this permit. Those documents that make up the complete permit application are listed in APPENDIX 2.
2. Permit Modification. Any change to construction, operation, monitoring, or closure requirements of this permit may require a modification to this permit, in accordance with the provisions of Rule 62-701.320(4), F.A.C.
3. Permit Renewal. In order to ensure uninterrupted operation of this facility, a timely and sufficient permit renewal application must be submitted to the Department in accordance with Rule 62-701.320(10), F.A.C. A permit application submitted at least 61 days prior to the expiration of this permit is considered timely and sufficient.
4. Transfer of Permit or Name Change. In accordance with Rule 62-701.320(11), F.A.C., and Rule 62-4.120, F.A.C., the Department must be notified by submitting Form 62-701.900(8)

within 30 days: (a) of any sale or conveyance of the facility; (b) if a new or different person takes ownership or control of the facility; or (c) if the facility name or Permittee's legal name is changed.

5. Submittals Required Every Five Years. No later than September 22, 2019, September 22, 2024, and September 22, 2029, the permittee shall submit a report to the Department that contains the following:
 - a. An updated closure plan to reflect changes in closure design, long-term care requirements, and financial assurance requirements. If no changes have been made to the closure plan, a statement reflecting no changes in the plan must be included in the report.
 - b. A revised closure cost estimate, made by recalculating the total cost of closure or long-term care, in current dollars, per Rule 62-701.630(4)(b), F.A.C.
 - c. A demonstration that the leachate collection system has been water pressure cleaned or inspected by video recording.
 - d. An updated operation plan, if operational procedures have changed.

6. Permit Fee Payments. The total permit fee required for this permit is \$40,000 for a 20-year permit. The applicant has elected to pay this fee in installments in accordance with Rule 62-701.315(13), F.A.C., and submitted a fee of \$10,000 with this application. No later than September 22, 2019, September 22, 2024, and September 22, 2029 the permittee shall submit to the Department an installment payment of this fee in the amount of \$10,000. This fee is due the State regardless of whether the permittee closes the facility, surrenders the permit, has the permit revoked, or transfers the permit before it expires. If the permittee elects to transfer the permit, it must either pay the entirety of the fee due before submitting the application for transfer, or it must include with the transfer application a signed agreement from the proposed transferee to accept responsibility for the remainder of the permit fee due.

B. Construction Requirements

1. Construction Authorized. This Permit does not authorize any new bottom liner construction activities in Cells 9 - 12.

C. Operation Requirements

1. General Operating Requirements. The Permittee shall operate the landfill in accordance with the approved Operation Plan, dated August 4, 2014, as listed in APPENDIX 2, Item 4. The Department shall be notified before any changes, other than minor deviations, to the approved Operation Plan are implemented in order to determine whether a permit modification is required.

2. Operation Plan. A copy of the approved Operation Plan, including the operating record as defined in Rule 62-701.500(3), F.A.C., shall be kept at the facility and shall be accessible to landfill operators.
3. Authorized Waste Types. Cells 9 - 12 are authorized to manage only the following waste types:
 - a. Waste types defined in Rule 62-701.200, F.A.C.:
 - 1) Class I waste.
 - 2) Class III waste.
 - 3) Construction and demolition debris.
 - 4) Industrial sludge.
 - 5) Domestic sludge.
 - 6) Incinerator/WTE ash.
 - 7) Waste tires – shredded and cut.
 - 8) Whole off-road tires.
 - b. Other Wastes Specifically Authorized:
 - 1) Regulated Asbestos Containing Materials. Each active waste disposal site that receives asbestos containing waste material from a source covered under the National Emission Standards for Asbestos, 40 CFR Part 61, Subpart M, shall meet the requirements of 40 CFR Part 61.154 and Rule 62-701.520(3), F.A.C. The disposal location shall be recorded in accordance with 40 CFR Part 61.154, and a record of the asbestos location shall be maintained. After placement of the asbestos, landfill operation personnel shall immediately place a minimum of six inches of cover soil over the asbestos. Records shall be kept on site for all asbestos containing material received at the landfill.
4. Unauthorized Waste Types. Cells 9 – 12 are not authorized to accept, process or dispose any waste types not listed in C.3. above. Any unauthorized waste inadvertently received at the Southern Expansion Site/Cells 9-12 shall be managed in accordance with the approved Operation Plan Section 4 Waste Control.
5. Waste Management and Handling.
 - a. Solid waste shall be formed into cells to construct horizontal lifts. The working face of the cell, and side grades above land surface, shall be at a slope no greater than three feet horizontal to one-foot vertical rise or as authorized by this permit in accordance with the approved operation plan.
 - b. No solid waste shall be disposed of outside of the permitted footprint of the solid waste disposal units.
 - c. The sequence of waste filling shall be as specified in the approved operation plan.
6. Waste Tire Site Operation. Waste tires shall be received and stored in accordance with the Waste Tire Rule, Chapter 62-711, F.A.C. and Section 4.8 of the approved operation plan.

7. Yard Waste Storage, Processing and Composting Facility. The yard waste storage, processing, and composting facility shall be operated in accordance with requirements of Rule 62-701, F.A.C. and Rule 62-709, F.A.C.
- a. Monthly records of incoming and outgoing material shall be kept at the facility for at least three years. An Annual Report shall be submitted to the Department using DEP Form 62-709.901(3) no later than July 1 of each year in accordance with Rule 62-709.320(4)(a), F.A.C. This report should summarize the monthly records for the preceding calendar year, and shall be submitted to the Department through the DEP Business Portal located at <http://www.fldepportal.com/go> with a copy to the Department of Environmental Protection, Central District, Solid Waste Program at DEP_CD@dep.state.fl.us.
 - b. Chromated Copper Arsenate (CCA) Treated Wood. CCA treated wood shall not be incorporated into compost or mulch, decorative landscape chips, or any other wood product that is applied as a ground cover, soil, or soil amendment. CCA treated wood may be ground and used as initial cover on interior slopes of lined solid waste disposal facilities provided it meets the criteria of Rule 62-701.200(53), F.A.C. CCA treated wood shall not be disposed of through open burning or through combustion in an air curtain incinerator.
8. Landfill Elevation. The final (maximum) elevation of the Landfill, Orange County Solid Waste Management Facility, Cell 9, 10, 11, and 12 shall not exceed 244 feet NGVD as shown on Drawing C-2, APPENDIX 2, Item 1, Volume III.
9. Initial Waste Placement. The first layer of waste placed above the 24" sand protective layer shall be a minimum of four feet in compacted thickness and consist of selected wastes containing no large rigid objects that may damage the liner or leachate collection system.
10. Cover Requirements. All solid waste disposed of in the Class I Landfill, Cells 9 - 12 shall be covered as required by Rule 62-701.500(7), F.A.C.
- a. Initial Cover: Initial cover shall be applied and maintained at the end of each working day in accordance with Rule 62-701.500(7)(e)&(f), F.A.C., so as to protect public health and welfare.
 - b. Alternate initial cover: Alternate initial cover material not identified herein must be approved by the Department prior to use at the facility. Alternate initial cover materials approved for use at this facility are:
 - Reusable tarps.
 - Posi-Shell Base Mix.
 - Mulch/compost consistent with Section 4.6.2 of the Cell 9-12 Solid Waste Landfill Operation Plan.

- Glass cullet mixed with soil. Glass cullet mixed with soil may be applied inside the disposal area and not on the side slopes.
- c. Intermediate Cover: Intermediate cover shall be applied and maintained in accordance with Rule 62-701.500(7)(g), F.A.C. An intermediate cover of one (1) foot of compacted earth in addition to the six (6) inch layer of initial cover shall be applied within seven (7) working days of bay completion if final cover or an additional lift is not to be applied within 180 days.
 - d. All or part of the intermediate cover may be removed and reused only if the materials are substantially free of waste in accordance with Rule 62-701.500(7)(g), F.A.C.
11. Erosion Control. Erosion control measures shall be employed to correct any erosion which exposes waste or causes malfunction of the storm water management system. Such measures shall be implemented within three days of occurrence. If the erosion cannot be corrected within seven days of occurrence, the landfill operator shall notify the Department and propose a correction schedule.
 12. Contingency Plan and Notification of Emergencies. The Permittee shall notify the Department in accordance with the approved Contingency Plan. Notification shall be made to the Solid Waste Section of DEP's Central District at (407) 897-4100.
 13. Housekeeping. The facility shall be operated to control dust, vectors, litter and objectionable odors. If objectionable odors are confirmed beyond the landfill property boundary, the owner or operator shall comply with the gas management requirement in Section 2, Part E.10.
 14. Leachate Management.
 - a. The permittee shall operate the leachate management system (including the collection, removal, and storage), and maintain the system as designed, so that the liner leachate depth shall not exceed one foot under normal operating conditions and leachate is not discharged from the system except as provided for in the Operation Plan.
 - b. Routine inspections and maintenance of the leachate management system shall be conducted in accordance with the Operation Plan.
 - c. The leachate collection pipes shall be cleaned or video inspected at least once every five years. A summary of the results shall be submitted in accordance with Specific Condition 2.A.5.c.
 - d. The permittee, on a daily basis, shall record quantities of leachate generated in gal/day and precipitation at the facility, and shall compare these measurements.
 15. Leachate Recirculation. The leachate recirculation shall be constructed and operated in accordance with Rule 62-701.400(5), F.A.C., only in the lined Class I areas that have received waste and are connected to the leachate collection system.

- a. The leachate recirculation system is detailed in Drawings CD-8 & CD-9 (APPENDIX 2, Item 1, Volume III). Following expansion of the leachate recirculation system, the Certificate of Construction Completion using DEP Form 62-701.900(2), F.A.C., shall be submitted to the FDEP Solid Waste Section for approval prior to starting leachate recirculation in that bay.
 - b. Leachate recirculation shall be performed in accordance with the approved Operation Plan (APPENDIX 2, Item 4).
-

16. Spotters and Operators. This facility shall have the minimum number of spotters specified in the Operation Plan present when waste is accepted. The spotters must be located as specified in the Operation Plan. A trained operator shall be on duty at the facility at all times the facility is operating. Approved training courses can be found at the following web site: <http://www.treeco.ufl.edu/sw>.
17. Record Keeping Requirements.
 - a. Waste Quantity Records. Waste records shall be compiled monthly, and copies shall be provided to the Department no less than annually by January 20th each year. This information shall be reported to the Department through the DEP Business Portal located at: <http://www.fldepportal.com/go>.
 - b. Estimate of Remaining Life. The permittee shall submit the annual estimate of the remaining life and capacity by January 20th each year. The report is required by Rule 62-701.500(13)(c), F.A.C. and must be submitted to the District Office and to:
Florida Department of Environmental Protection
Solid Waste Section, MS 4565
2600 Blair Stone Road
Tallahassee, Florida, 32399-2400
18. Hazardous Waste. If any regulated hazardous wastes are discovered to be deposited at the facility, the facility operator shall promptly notify the Department, the person responsible for shipping the wastes to the facility, and the generator of the wastes, if known. The area where the wastes are deposited shall immediately be cordoned off from public access. If the generator or hauler cannot be identified, the facility operator shall assure the cleanup, transportation, and disposal of the waste at a permitted hazardous waste management facility. In the event that hazardous wastes are discovered they shall be managed in accordance with the procedures provided in the Solid Waste Landfill Operation Plan for Cells 9-12.
19. Stormwater. Leachate shall not be discharged into the stormwater management system. Stormwater or other surface water which comes into contact with or mixes with the solid waste or leachate shall be considered leachate and is subject to the requirements of Rule 62-701.500(8), F.A.C.

20. Control of Nuisance Conditions. The Permittee shall be responsible for the control of odors and fugitive particulates arising from this operation. Such controls shall prevent the creation of nuisance conditions that may arise from adverse odors and fugitive particulates, and their effect on adjacent or nearby properties and users. The Permittee shall immediately investigate any complaints received from the general public, and where warranted, take corrective actions to abate the adverse odor or nuisance condition. The Permittee must prepare a written report on each complaint describing the action taken to resolve the complaint, and submit the report to the Department within 10 days of receiving the complaint. If the complaint has not been resolved by that time, the Permittee must prepare and submit an additional report no later than 10 days from the date of resolution.

D. Water Quality Monitoring Requirements

1. Zone of Discharge. There is one zone of discharge for the entire Orange County Solid Waste Management Facility (both Class I and Class III landfills). The zone of discharge for this facility shall be a three dimensional volume defined in the vertical plane as extending from the top of the ground to the bottom of the screen of the deep surficial monitoring wells, and defined in the horizontal plane as extending 100 feet from the footprint of the waste disposal area or to the property boundary, whichever is less. The horizontal boundary is shown in APPENDIX 3, Attachment B1 – Monitoring Locations. The permittee shall ensure that Class G-II water quality standards will not be exceeded at the boundary of the zone of discharge, per Rule 62-520.420, F.A.C., and that ground water minimum criteria will not be exceeded outside the boundary of the zone of discharge, per Rule 62-701.320(17), F.A.C.
2. Monitoring Plan Implementation Schedule. The Monitoring Plan Implementation Schedule, dated September 22, 2014, for this permit is included in APPENDIX 3.

E. Gas Management System Requirements

1. General Requirements. The Permittee shall construct and operate the gas management system in accordance with the requirement of Rule 62-701.530, F.A.C. and any applicable requirements of the air construction or air operation permits issued for the facility by the Department.
2. Active Gas Collection and Treatment Construction Requirements.
 - a. All construction shall be done in accordance with Department approved gas management system design, drawings, and specifications. Except as described in Specific Condition 2.E.3. of this permit, the Department shall be notified before each construction event and before any changes, other than minor deviations, to the approved design are implemented in order to determine whether a permit modification is required.

- b. The existing permitted landfill gas collection system for Cell 9 & Cell 10 will be expanded as the landfill development proceeds. The layout and construction details for the expansion of the landfill gas collection system through final build-out is specified in Drawings C-11 through C-19 (APPENDIX 2, Item 1, Volume III).
3. Actions Not Requiring Solid Waste Permit Modifications. Modifications to the solid waste permit shall not be required for the following changes to the approved landfill gas management system.
- a. In areas of the landfill without a final cover, provided the Permittee notifies the Department prior to implementing any of these modifications.
- 1) Raising, replacing or re-drilling existing gas extraction wells.
 - 2) Decommissioning or abandoning existing gas extraction wells.
- b. The Permittee may re-drill existing gas wells and install additional gas extraction wells in areas of the landfill with final cover if a construction plan for this work is submitted to and approved by the Department prior to construction. This construction plan shall provide reasonable assurance that:
- 1) Disturbed final cover shall be repaired per the current CQA plan;
 - 2) Any solid waste uncovered during the installation of the extraction wells will be properly managed; and,
 - 3) Odors and stormwater will be controlled.
4. Gas Collection System Drawing. The Permittee shall maintain an engineering drawing showing the locations of all existing temporary or permanent gas collection wells and piping at the site. This drawing shall be updated and submitted to the Department annually by March 1st each year.
5. Certification of Construction Completion. After completion of construction of gas probes or of gas management system modifications, other than those that are exempted in accordance with Specific Condition 2.E.3., the engineer of record shall certify to the Department in accordance with Rule 62-701.320(9)(b), F.A.C., that the permitted construction is complete and was performed in substantial conformance with the approved construction plans except where minor deviations were necessary. All deviations shall be described and the reasons therefore enumerated.
6. Gas Monitoring Locations. Gas monitoring ambient sampling points and soil probe locations are specified in APPENDIX 4. Gas monitoring probes are to be clearly labeled and their location easily visible at all times.
7. Monitoring Requirements. Monitoring for methane gas at the property boundary and within structures on the property shall be performed quarterly to determine the effectiveness of the gas migration controls. Quarterly reports shall be submitted to the Department, Central District Office under separate cover no later than the 15th of

January, April, July, and October of each year. The gas monitoring results shall be reported as a percent of the lower explosive limit (LEL), calibrated to methane.

8. Operational Requirements. Gas controls shall be operated and maintained so that they function as designed.
9. Gas Remediation Plan. The facility landfill gas management system shall be operated to prevent the concentration of combustible gases from exceeding 25% of the lower explosive limit in structures, excluding gas control or recovery components, and from exceeding the lower explosive limit at or beyond the property boundary. If either of these limits is exceeded then a gas remediation plan shall be designed and implemented in accordance with Rule 62-701.530(3)(a), F.A.C.
10. Odor Remediation Plan. The facility shall be operated to control objectionable odors. If objectionable odors are confirmed beyond the property boundary then upon notification by the Department the permittee shall develop and implement an odor remediation plan in accordance with the requirements of Rule 62-701.530(3)(b), F.A.C.

F. Financial Assurance and Cost Estimates

1. Financial Assurance Mechanism. The permittee may not receive waste for disposal or storage in any disposal unit for which financial assurance has not been approved. Proof that the financial mechanisms are established and funded in accordance with Rule 62-701.630, F.A.C. shall be submitted to the Department at least sixty (60) days prior to the planned acceptance of solid waste in any disposal unit. When established, the permittee shall maintain, in good standing, the financial assurance mechanisms. Supporting documentation and evidence of increases associated with cost estimate increases shall be submitted within the time frames specified in Rule 62-701.630, F.A.C.

All submittals in response to this specific condition shall be sent to:

Florida Department of Environmental Protection
Financial Coordinator - Solid Waste Section
2600 Blair Stone Road, MS 4565
Tallahassee, Florida 32399-2400

2. Cost Estimates.
 - a. The permittee shall submit closure cost estimates, including annual adjustments for inflation, in accordance with the requirements of Rule 62-701.630(3) and (4), F.A.C., and 40 CFR Part 264.142(a) using Form 62-701.900(28).
 - b. An owner or operator using an escrow account shall submit the annual inflation adjusted estimate(s) between July 1 and September 1. An owner or operator using a letter of credit, guarantee bond, performance bond, financial test, corporate

- guarantee, trust fund or insurance shall submit the inflation adjusted cost estimate(s) between January 1 and March 1.
- c. A cost estimate covering disposal units not previously covered by financial assurance mechanisms must be submitted prior to submitting financial assurance for such disposal units.
 - d. All submittals in response to this specific condition shall be sent to the District Office and a copy to the address identified in Specific Condition F.1. or to the following email address: Solid.Waste.Financial.Coordinator@dep.state.fl.us.
-

G. Closure Requirements

1. Closure Permit Requirements. Prior to initiating closure of a solid waste disposal unit, or part of a solid waste disposal unit, the Permittee shall receive authorization from the Department in one of the following ways.
 - a. If there are no substantive changes to the Closure Plan submitted for this permit, the Permittee shall notify the Department, including a drawing showing the extent of the planned sequential closure event and construction duration, at least 30 days prior to initiating each sequential closure construction event and receive written notice to proceed from the Department prior to beginning the work.
 - b. If substantive changes to the closing activities in the permitted Closure Plan are necessary, then the Permittee shall request a modification of this permit to include sufficient design detail to ensure compliance with the closing requirements of Rule 62-701.600, F.A.C., and shall initiate closing only after the permit has been modified.
2. Closure Design. All closure construction shall be done in accordance with the approved closure design plan. The closure plan includes APPENDIX 2, Item 1, Volume I Section 12, APPENDIX 2, Item 1, Volume III, APPENDIX 2, Item 1, Volume I – Exhibit D, APPENDIX 2, Item 1, Volume I – Exhibits E, F, G, I, J & K, and APPENDIX 2, Item 3. The Department shall be notified before any changes, other than minor deviations, to the approved closure design are implemented in order to determine whether a permit modification is required.
3. Closure Operation Plan. All closure shall be done in accordance with the approved closure operation plan submitted for this permit.
4. Certification of Closure Construction Completion. After each phase of closure construction has been completed, the engineer of record shall certify to the Department on Form 62-701.900(2) that the closure is complete and that it was done in accordance with the plans submitted to the Department except where minor deviation was necessary. All deviations shall be described in detail and the reasons therefore enumerated.
5. List of Closed Units Not in Long-Term Care. There are no closed units in long-term care within the Cell 9 – 12 Class I Landfill.

H. Long Term Care Requirements

No units in the Cells 9 – 12, Class I Landfill of the Orange County Solid Waste Management Facility are currently in long-term care.

Executed in Leon County, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION



Tim Bahr, P.G., Program Administrator
Permitting and Compliance Assistance Program

FILED, on this date, pursuant to Section 120.52, F.S. with the designated Department Clerk, receipt of which is hereby acknowledged.



Digitally signed by Owete_D
DN: o=Florida Dept of Environmental Protection,
email=Derbra.Owete@dep.state.fl.us,
cn=Owete_D
Date: 2014.09.22 13:02:34 -0400

Clerk

9/22/14

Date

APPENDIX 1

General Conditions

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.161, 403.727, or 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of rights, nor any infringement of federal, State, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law

and at reasonable times, access to the premises where the permitted activity is located or conducted to:

- (a) Have access to and copy any records that must be kept under conditions of the permit;
- (b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
- (c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

- (a) A description of and cause of noncompliance; and
- (b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit or a copy thereof shall be kept at the work site of the permitted activity.

12. The permittee shall comply with the following:

- (a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

- (c) Records of monitoring information shall include:
1. the date, exact place, and time of sampling or measurements;
 2. the person responsible for performing the sampling or measurements;
 3. the dates analyses were performed;
 4. the person responsible for performing the analyses;
 5. the analytical techniques or methods used;
 6. the results of such analyses.

13. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

APPENDIX 2

Approved Documents Incorporated Into the Permit

The approved application documents for Orange County Solid Waste Management Facility – Class I Landfill Cells 9-12. Operations Permit Renewal and Sequential Closure consist of the following:

1. Initial permit renewal application prepared by Neel-Schaffer, Inc. for Orange County dated June 18, 2014 received by the Tallahassee Solid Waste Section on June 20, 2014, consisting of three volumes.

Volume I of III

[http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&\[guid=8.205665.1\]&\[profile=Permitting_Authorization](http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&[guid=8.205665.1]&[profile=Permitting_Authorization)

Volume II of III

[http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&\[guid=8.205666.1\]&\[profile=Permitting_Authorization](http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&[guid=8.205666.1]&[profile=Permitting_Authorization)

Volume III of III - Drawings

[http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&\[guid=8.205667.1\]&\[profile=Permitting_Authorization](http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&[guid=8.205667.1]&[profile=Permitting_Authorization)

2. First Request for Additional Information from DEP dated July 16, 2014.

[http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&\[guid=8.207514.1\]&\[profile=Permitting_Authorization](http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&[guid=8.207514.1]&[profile=Permitting_Authorization)

3. Supplemental information provided by Orange County dated July 25, 2014 received by the Tallahassee Solid Waste Section on July 25, 2014.

[http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&\[guid=8.208162.1\]&\[profile=Permitting_Authorization](http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&[guid=8.208162.1]&[profile=Permitting_Authorization)

4. Approved Operations Plan dated August 4, 2014 provided by the applicant including all attachments.

[http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&\[guid=8.208758.1\]&\[profile=Permitting_Authorization](http://depedms.dep.state.fl.us:80/Oculus/servlet/shell?command=getEntity&[guid=8.208758.1]&[profile=Permitting_Authorization)

APPENDIX 3
ORANGE COUNTY LANDFILL

WACS_FACILITY: 21847

MONITORING PLAN IMPLEMENTATION SCHEDULE
September 22, 2014

GENERAL

1. This MPIS is effective when the permit **SO48-0128169-031** is issued. It replaces all previous MPIS issued for the Orange County solid waste management facility, WACS #21847. **[62-701.510(1)(b)&(c), 62-520.600(5),(F.A.C.)]**
2. The field testing, sample collection and preservation and laboratory testing, including quality control procedures, shall be in accordance with Chapter 62-160 (F.A.C.) Approved methods as published by the Department or as published in Standard Methods, ASTM, or EPA Methods shall be used. **[62-701.510(2)(b), F.A.C.]**
3. The organization collecting samples at this site must use the Field and Laboratory Standard Operating Procedures (DEP-SOP-001/01) referenced in Chapter 62-160, F.A.C. Sampling personnel must have a copy of the SOP for purging and sampling in the field when sampling and must be knowledgeable of its contents, procedures, and forms. The laboratory designated to conduct the chemical analyses must be certified by the Florida Department of Health Environmental Laboratory Certification Program (DoH ELCP). This Certification must be for the test method and analyte(s) that are reported. **[62-160.210(1), 62-160.300(1), F.A.C.]**

NOTE: DEP-SOP-001/01 can be accessed at: <http://www.dep.state.fl.us/water/sas/sop/sops.htm>

4. If, at any time, analyses detect parameters which are significantly above background water quality, or which are at levels above the Department's water quality standards or criteria specified in Chapter 62-520, F.A.C., in the detection wells or at the edge of the Zone of Discharge, the Permittee, to confirm the data, shall resample the wells within thirty (30) days of receipt of the sampling data. Should the permittee choose not to resample, the Department will consider the water quality analysis as representative of current ground water conditions at the facility. The permittee must notify the Department within 14 days of receipt of the sampling data whether the original data will be accepted as representative of current ground water conditions or whether resampling will be accomplished to confirm the data.

If the resampling event detects parameters which are significantly above background water quality, or which are at levels above the Department's water quality standards or criteria specified in Chapter 62-520, F.A.C., the Permittee shall notify the Department in writing within 14 days of receipt of the sampling data. Confirmed data must be submitted to the Department within 60 days from completion of lab analyses. Use "CONF" (for confirmation data) in the report type column. **[62-701.510(6)(a), F.A.C.]**

Upon notification by the Department, the permittee shall initiate evaluation monitoring in accordance with Rule 62-701.510(6) F.A.C. **[62-701.510(6)(a), F.A.C.]**

GROUND WATER QUALITY MONITORING

5. The one hundred and thirteen (113) active ground water monitoring wells designated for water quality testing and water level measurements are listed on **Attachments A1 & A2** and are shown on **Attachment B**. (Note: **Attachment A2** includes a more detailed lists of Monitoring Locations including the wells associated with the two closed landfill areas.) [62-701.510(3)(d)2. & 3., F.A.C.]

Included in the 113 active ground water monitoring wells are thirty-three (33) monitoring wells for the Closed Class I long term monitoring program and twenty-three (23) wells for the Closed Class III long term monitoring program. These wells are listed separately in **Attachment A2** on the spreadsheet tab "Master List".

6. Any Initial Sample collected from a new ground water monitoring well shall be analyzed for the following Initial Ground Water Monitoring Parameters. [62-701.510(5)(b)2, F.A.C.]

Initial Ground Water Monitoring Parameters	
Field Parameters	Laboratory Parameters
1. Static water level in wells before purging	1. Ammonia – N, Total
2. Dissolved oxygen	2. Chlorides
3. pH	3. Iron
4. Specific conductivity	4. Nitrate
5. Temperature	5. Sodium
6. Turbidity	6. Total dissolved solids (TDS)
7. Colors and sheens (by observation)	7. Those parameters listed in 40 CFR Part 258, Appendix II.*

* Mercury not listed because it is included in Appendix II.

* Appendix I is not listed because it is a subset of Appendix II

A replacement well does not need to have an Initial Sample if the replacement well:

- Is within 20' of the original well
 - Has the same sampling depth as the original well
 - Has Appendix II results in the WACS data system
- [62-701.510(5)(b)1., F.A.C.]

7. Semi-annual samples from the ground water monitoring wells shall be collected in **May** and **November**.
8. The one hundred and thirteen (113) active monitoring wells landfill shall be sampled and analyzed semi-annually for the following Ground Water Monitoring Parameters. [62-701.510(5)(c) & (7)(a), F.A.C.]

Semi-Annual Ground Water Monitoring Parameters	
Field Parameters	Laboratory Parameters
1. Static water level in wells before purging	1. Ammonia – N, Total
2. Specified conductivity	2. Chlorides
3. pH	3. Iron
4. Dissolved oxygen	4. Mercury
5. Turbidity	5. Nitrate
6. Temperature	6. Phenols* (Required of the 15 wells noted on Attachment A)
7. Colors sheens (by observation)	7. Sodium
	8. Total dissolved solids (TDS)
	9. Those parameters listed in 40 CFR Part 258 Appendix I

9. Unless otherwise approved by the Department, wells with high turbidities must be remediated or reinstalled to reduce the turbidity value to less than 20 NTU prior to sample collection. Should any ground water sample exhibit dissolved oxygen concentrations greater than 20% of oxygen saturation at the field measured temperature, the sampled well must be repurged then resampled as soon as an acceptable dissolved oxygen value has been attained unless it can be demonstrated that in situ ground water contains higher levels of dissolved oxygen. All water quality analyses will be performed on unfiltered samples unless approved by the Department.
10. Please confer with your consultant and analytical laboratory prior to sampling to ensure the analytical method is capable of achieving detection limits at or below the Groundwater Cleanup Target Levels (GCTLs) in Table I, Chapter 62-777, F.A.C. except those listed in Table C of the "FDEP Guidance for the Selection of Analytical Methods and for the Evaluation of Practical Quantitation Limits dated 10/12/2004". GCTLs that are not water quality standards are used as screening tools and interim guidelines for ground water minimum criteria until standards are promulgated.

SURFACE WATER MONITORING

11. The eleven (11) surface water sites included in this monitoring plan are LFO, BRM, SBRM-E, SBRM-W, SW-P5, SW-P6, SW-P7, SW-P8-1, SW-P8-2, SW-P11 and SW-P12. They are listed on **Attachment A1** and shown on **Attachment B**. [62-701.510(4)(c), F.A.C.]
12. Semi-annual samples from the eleven (11) surface water monitoring sites shall be collected in **May** and **November**. The samples shall be analyzed for the following Surface Water Monitoring Parameters. [62-701.510(5)(d) & (7)(b), F.A.C.]

Semi-Annual Surface Water Monitoring Parameters	
Field Parameters	Laboratory Parameters
1. Surface Water Elevation	1. Unionized ammonia as N
2. Specific Conductivity	2. Total hardness as CaCO ₃
3. pH	3. Biochemical oxygen demand (BOD ₅)
4. Dissolved oxygen	4. Iron
5. Turbidity	5. Mercury
6. Temperature	6. Nitrate
7. Colors and sheens (by observation)	7. Total Dissolved Solids (TDS)
	8. Total Organic Carbon (TOC)
	9. Fecal Coliform
	10. Total Phosphorus as P
	11. Chlorophyll A
	12. Total nitrogen
	13. Chemical Oxygen Demand (COD)
	14. Total Suspended Solids (TSS)
	15. Those parameters listed in 40 CFR Part 258 Appendix I
	16. Phenols (new-added 2012-03)

13. Please confer with your consultant and analytical laboratory prior to sampling to ensure the analytical method is capable of achieving detection limits at or below the Freshwater Surface Water Criteria in Table I, Chapter 62-777, F.A.C. except those listed in Table C of the "FDEP Guidance for the Selection of Analytical Methods and for the Evaluation of Practical Quantitation Limits dated 10/12/2004". Freshwater Surface Water Criteria that are not water quality standards are used as screening tools and interim guidelines for ground water minimum criteria until standards are promulgated.

MONITORING WELL REQUIREMENTS

14. If a monitoring well or piezometer becomes damaged or inoperable, the Permittee shall notify the Department in writing within seven (7) days. The written report shall describe what problem has occurred and the remedial measures that have been taken to prevent a recurrence. The Department can require the replacement of inoperable monitoring wells or piezometers. [62-4.070(3), F.A.C.]
15. New or replacement monitoring well design or placement must be approved by the Department. Either:
- a. Proposed well construction details based on site-specific borings must be submitted with all supporting data (grain size distribution analyses, in-situ hydraulic conductivity testing, depth to water, etc.) for the Department's approval prior to well installation. or
 - b. The Department approves in advance of installation that the anticipated lithology and the proposed well construction is similar to close wells in the MPIS and that the final determination of this information (grain size distribution analyses, in-situ hydraulic conductivity testing, depth to water, etc.) can be evaluated by an engineer or geologist at the time of well installation and submitted with the well completion information.
16. Use of hollow stem auger equipment is recommended. Other drilling methods must be approved by the Department prior to well installation. [62-520.600(3), F.A.C.]

17. All wells and piezometers shall be clearly and permanently labeled and the well site maintained so that the well is visible at all times. Unless otherwise authorized in a Department permit, new monitoring wells, and existing monitoring wells at the time of permit renewal, shall have protective bollards or other devices installed around them if they are located in areas of high traffic flow to prevent damage from passing vehicles. [62-701.510(3)(d)5., F.A.C.]
18. An abandonment plan for abandoning any well that is unsuitable for ground water monitoring or for any piezometer must be approved by the Department prior to abandonment. [62-701.510(3)(d)6., F.A.C.]

REPORTING REQUIREMENTS

FIELD ACTIVITIES

19. The Department must be notified in writing, hard copy or e-mail, at least fourteen (14) days prior to the installation and/or sampling of any monitoring well(s). [62-701.510(8)(a), F.A.C.]

MONITORING WELL COMPLETION

20. One (1) paper copy and one (1) electronic copy (Adobe pdf format) of **Attachment C Monitoring Well Completion Report** (as modified by the Central District) and required Attachments (for example, construction diagram and lithologic log), must be submitted to the Department within thirty (30) days after installation of any new or replacement monitoring well(s). In addition, as-built well construction diagrams and soil boring logs that cover the entire depth of the monitoring well(s) must be submitted to the Department.

NOTE: The top of casing elevation of each well, to an accuracy of 0.01 feet, and the latitude and longitude of each well in degrees, minutes and seconds, to two (2) decimal places, with an accuracy of 15 feet, must be determined and certified by a Florida Licensed Surveyor and Mapper and provided on the form. [62-701.510(3)(d)1. & 62-532.410, F.A.C.]

SURVEYING

21. One (1) paper copy and one (1) electronic copy (Adobe pdf format) of a drawing must be submitted within thirty (30) days following monitoring well installation showing the location of all monitoring sites (active, abandoned, and Evaluation Monitoring), piezometers, water bodies and waste filled areas. The location of features on the drawing must be horizontally and vertically located by standard surveying techniques. The drawing shall include all monitoring well locations, each monitoring well name and identification (WACS) number, the top of casing, pad elevation, permanent benchmark(s) and/or corner monument marker(s) referenced to NGVD 1929 with an accuracy of 0.01 feet. The latitude and longitude of each well in degrees, minutes and seconds, to two (2) decimal places, with an accuracy of 15 feet, must be determined and provided on the drawing. The survey shall be conducted and certified by a Florida Licensed Surveyor and Mapper. [62-701.510(1)(c)&(3)(d)1., F.A.C.]

22. If a monitoring well is being replaced or new wells are being added to an existing ground water monitoring plan, only the new wells need to be surveyed as long as all other monitoring wells in the MPIS have been surveyed and certified by a Florida Licensed Surveyor and Mapper and there is no reason to believe that the elevations have changed. The location and elevation determinations and the certification must be provided with the Monitoring Well Completion Form for the new well.

INITIAL AND SEMI-ANNUAL SAMPLING

23. Required monitoring reports must be submitted to the Department within sixty (60) days from completion of laboratory analyses. Requirement for submitting the report is outlined in **Attachment D (ADaPT electronic reporting requirements) [Rule 62-701.510(8), F.A.C.]**

WATER ELEVATIONS

24. Water levels in all monitoring wells, whether sampled or not, all piezometers and all surface water sites must be measured to the nearest 0.01 foot. The depth to water shall be converted to feet NGVD and this elevation shall be reported semi-annually. Surface water elevations at sampling locations must be measured to the nearest 0.01 foot on the same day as ground water levels in the wells and piezometers, and the elevations reported semi-annually. All water level measurements must be made within a one-day period. These measurements should be reported in a table that includes well or surface water point name, date water level measured, measuring point elevation referenced to NGVD 1929, depth to water and calculated water level elevation referenced to NGVD 1929. The ground water elevations shall be reported in the ADaPT data for the upload into WACS. **[62-701.510(8)(a)8, F.A.C.]**

GROUND WATER CONTOUR MAPS

25. Ground water elevation contour maps for each monitored aquifer zone must be submitted semi-annually to the Department. Ground water elevation contour map(s) should include monitoring well and piezometer locations, ground water elevation at each monitoring well or piezometer location referenced to NGVD 1929, a bar scale, north arrow, ground water contour interval, date of measurement and ground water flow direction. The map(s) must incorporate adjacent and on-site surface water elevations where appropriate. These maps shall be signed and sealed pursuant to Florida Statutes (F.S.) Chapters 471 and 492 which require that documents requiring the practice of professional engineering or professional geology, as described in Chapter 471 or 492, F.S., be signed and sealed by the professional(s) who prepared or approved them. This certification must be made by a licensed professional who is able to demonstrate competence in this subject area. **[62-701.510(8)(a)9, F.A.C.]**

MPIS Technical Report (formerly Biennial Report)

26. A technical report, signed and sealed by a professional geologist or professional engineer with experience in hydrogeologic investigations, shall be submitted to the Department approximately every two and one-half years during the active life of the facility, and every five years during the long-term care period. The report shall summarize and interpret the water quality monitoring results and water level measurements collected since the last Technical Report. The report shall contain, at a minimum, the following [62-701.510(8)(b), F.A.C.]:
- a. Tabular displays of any data which shows that a monitoring parameter has been detected, and graphical displays of any leachate key indicator parameters detected (such as pH, specific conductance, TDS, TOC, sulfate, chloride, sodium and iron), including hydrographs for all monitor wells;
 - b. Trend analyses of any monitoring parameters consistently detected;
 - c. Comparisons among shallow, middle, and deep zone wells;
 - d. Comparisons between background water quality and the water quality in detection and compliance wells;
 - e. Correlations between related parameters such as total dissolved solids and specific conductance;
 - f. Discussion of erratic and/or poorly correlated data;
 - g. An interpretation of the ground water contour maps, including an evaluation of ground water flow rates; and
 - h. An evaluation of the adequacy of the water quality monitoring frequency and sampling locations based upon site conditions. (NOTE: Although there is only one MPIS for the entire Orange County solid waste management facility, there are two closed disposal areas that are being monitored separately (that is, each disposal area is surrounded by its own set of monitoring wells). Therefore, each is considered to have its own zone of discharge. They are Class I Cells 7B / 8 and Class III Cell 1. This section of the Technical Report must specifically address whether the water quality in the ZOD for each is being impacted by the waste in each area and whether the current MPIS is adequately monitoring the ZODs of the closed areas.).

27. One (1) paper and one (1) electronic copy (Adobe pdf format) of the MPIS Technical Report shall be submitted to the Department:

Report	Sampling Periods Covered	Number Of Semi-Annual Sampling Events in Report	MPIS Technical Report Due
1	February 2010 through May 2014	9	October 2014
2	November 2014 through November 2016	5	May 2017
3	May 2017 through May 2019	5	November 2019
4	November 2019 through November 2021	5	May 2022
5	May 2022 through May 2024	5	November 2024
6	November 2024 through November 2026	5	May 2027
7	May 2027 through May 2029	5	November 2029
8	November 2029 through November 2031	5	May 2032
Renewal Report	May 2032 through May 2034	5	At the time of Application for Renewal for active landfill Permit 0128169-037-SO-01 (July 23, 2034)

Requirements for Electronic Reporting of Water Quality Data

28. Required water quality monitoring reports and all ground water, and surface water analytical results shall be submitted as described in Attachment D (**ADaPT electronic reporting requirements**). Required monitoring reports must be submitted to the Department within sixty (60) days from completion of laboratory analyses. (**62-160.240 and 62-160.340, F.A.C.**)

29. Monitoring Plan Implementation Schedule Tracking MPIS for current permit period:

MPIS Document Version Date	Type	Notation
5/16/2005		
9/1/2005	Modification	Additional sampling point locations of groundwater, surface water and leachate
2/27/2006	Modification	Specified semi-annual sampling months
7/25/2006	Revision	Changed semi-annual sampling months and semi-annual water quality report submittal due date
6/13/2007	Modification	Requirement for submittal of electronic copy of documents in addition to paper copy.
4/1/2008	Issuance	Issued with permit SC48-0128169-022
6/16/2009	Update	Requirement for electronic submittal of ADaPT electronic data and semi-annual water quality report
9/8/2009	Revision	Revised to require semi-annual sampling of Phenols only for wells: <ol style="list-style-type: none"> 1. Phenol CTL of 10 ug/L was exceeded in 2008 2. Phenol concentration in 2007 was \geq 100 ug/L
1/12/2010	MPIS Modification with Permit Renewal	<ol style="list-style-type: none"> 1. Issued with permit SC48-0128169-025 2. Require sampling of Floridan well at American Recycling MW-AR. 3. Changes for MW-495S and MW-495I having been installed and sampled. 4. Changed Technical Report submittal requirement
1/12/2010	Permit Modification	MPIS version included 10/20/10 with permit modification SC48-0128169-027
1/5/2011	Closure Renewal Application	Permit Renewal SF48-0128169-028 MPIS dated 01/05/2011 for revision of Current Condition #29 (Technical Review Due Dates) All attachments unchanged and dated 12/2009.
3/7/2012	Permit Renewal DRAFT MPIS	<ul style="list-style-type: none"> • Current ADaPT electronic reporting requirement language. • Add 15 new wells to isolate the Closed Class III landfill • Add 2 wells (MW-55S & 55I) for the western expansion • Suspend sampling in 23 of the 26 "D" zone wells. • Leachate parameters reduced from Appendix II to the routine semi-annual parameters including ammonia, total phenols and un-ionized ammonia. • Add total phenols to the surface water monitoring parameters • Reword MPIS Current Condition #26 to clarify that ground water elevations –rather than depth to water--are needed in ADaPT.
4/13/2012	3/7/2012 minor edits	<ul style="list-style-type: none"> • Attachment A as Corrected Phenol lists to include MW-71D • Attachment B Add UT-105 (S,I,D) location
10/23/2012	Revision to remove Leachate Sampling	<ul style="list-style-type: none"> • MPIS document Leachate Removal • Attachment A1 Leachate Removal (No change to any other 4/13/2012 attachments)
9/22/2014	Operation Permit Renewal	<ul style="list-style-type: none"> • Revised Rule references to current (2012) Rule version • Revised Condition #29 – Technical Report Submittal Dates • Attachment A1 & A2 – 17 wells to be installed are now active

List of Attachments

Attachment A1 & A2 – Monitoring Well and Surface Water Sampling Point Lists

Attachment B – Monitoring Locations Map MPIS

Attachment C – Monitoring Well Completion Report Form

Attachment D – ADaPT Electronic Reporting Requirements

Attachment E – Ground Water Monitoring Report Certification Form

Attachment F – Water Sampling Log

Count	Active Monitoring Wells	WACS Well Site Number	Well Type	Zone/ Screen	GW Class	WACS Report Type
I Ground Water						
1	MW-4S	13098	DE	UPPER SURFICIAL	G-II	SEMGW
2	MW-17S	14103	DE	UPPER SURFICIAL	G-II	SEMGW
3	MW-17I	14104	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
4	MW-26S	14106	DE	UPPER SURFICIAL	G-II	SEMGW
5	MW-26I	14107	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
6	MW-41S	14109	BG	UPPER SURFICIAL	G-II	SEMGW
7	MW-41I	14110	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
8	MW-43	14112	BG	UPPER SURFICIAL	G-II	SEMGW
9	MW-44I	14113	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
10	MW-47S**	14115	DE	UPPER SURFICIAL	G-II	SEMGW
11	MW-47I	14116	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
12	MW-51S	14118	BG	UPPER SURFICIAL	G-II	SEMGW
13	MW-51I	13787	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
14	MW-55S	28652	DE	UPPER SURFICIAL	G-II	INTGW/SEMGW
15	MW-55I	28653	DE	INTERMEDIATE SURFICIAL	G-II	INTGW/SEMGW
16	MW-62S**	13795	BG	UPPER SURFICIAL	G-II	SEMGW
17	MW-62I	13990	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
18	MW-64S	13992	BG	UPPER SURFICIAL	G-II	SEMGW
19	MW-64I	13993	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
20	MW-65S	13995	BG	UPPER SURFICIAL	G-II	SEMGW
21	MW-65I	13996	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
22	MW-66S	13998	BG	UPPER SURFICIAL	G-II	SEMGW
23	MW-66I	13999	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
24	MW-70S	14039	DE	UPPER SURFICIAL	G-II	SEMGW
25	MW-70I	14040	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
26	MW-71S	14041	DE	UPPER SURFICIAL	G-II	SEMGW
27	MW-71I**	14042	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
28	MW-71D	14119	DE	DEEP SURFICIAL	G-II	SEMGW
29	MW-72S	14043	DE	UPPER SURFICIAL	G-II	SEMGW
30	MW-72I	14044	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
31	MW-73S	14045	DE	UPPER SURFICIAL	G-II	SEMGW
32	MW-73I	14046	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
33	MW-74S	14047	DE	UPPER SURFICIAL	G-II	SEMGW
34	MW-74I	14048	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
35	MW-75S	14049	DE	UPPER SURFICIAL	G-II	SEMGW

Count	Active Monitoring Wells	WACS Well Site Number	Well Type	Zone/ Screen	GW Class	WACS Report Type
36	MW-75I**	14050	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
37	MW-75D**	14121	DE	DEEP SURFICIAL	G-II	SEMGW
38	MW-76S	14051	DE	UPPER SURFICIAL	G-II	SEMGW
39	MW-76I**	14052	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
40	MW-77S	14053	BG	UPPER SURFICIAL	G-II	SEMGW
41	MW-77I	14054	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
42	MW-77D**	14122	CO	DEEP SURFICIAL	G-II	SEMGW
43	MW-78S**	14187	DE	UPPER SURFICIAL	G-II	SEMGW
44	MW-78I**	14188	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
45	MW-79S	14189	DE	UPPER SURFICIAL	G-II	SEMGW
46	MW-79I	14190	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
47	MW-80S	14123	BG	UPPER SURFICIAL	G-II	SEMGW
48	MW-80I	14124	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
49	MW-81S	14126	BG	UPPER SURFICIAL	G-II	SEMGW
50	MW-81I	14127	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
51	MW-82S	14129	BG	UPPER SURFICIAL	G-II	SEMGW
52	MW-82I	14130	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
53	MW-83S	14132	BG	UPPER SURFICIAL	G-II	SEMGW
54	MW-83I	14133	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
55	MW-84S**	14135	BG	UPPER SURFICIAL	G-II	SEMGW
56	MW-84I**	14136	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
57	MW-85S	14138	DE	UPPER SURFICIAL	G-II	SEMGW
58	MW-85I	14139	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
59	MW-88S	14141	CO	UPPER SURFICIAL	G-II	SEMGW
60	MW-88I	14142	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
61	MW-89S	14144	DE	UPPER SURFICIAL	G-II	SEMGW
62	MW-89I	14145	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
63	MW-90S	14148	BG	UPPER SURFICIAL	G-II	SEMGW
64	MW-90I**	14149	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
65	MW-91S**	14192	DE	UPPER SURFICIAL	G-II	SEMGW
66	MW-91I	14193	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
67	MW-92S	14194	DE	UPPER SURFICIAL	G-II	SEMGW
68	MW-92I	14195	DE	INTERMEDIATE SURFICIAL	G-II	SEMGW
69	MW-93S	14197	BG	UPPER SURFICIAL	G-II	SEMGW
70	MW-93I	14198	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
71	MW-94S	28654	DE	UPPER SURFICIAL	G-II	INTGW/SEMGW

Count	Active Monitoring Wells	WACS Well Site Number	Well Type	Zone/ Screen	GW Class	WACS Report Type
72	MW-94I	28655	DE	INTERMEDIATE SURFICIAL	G-II	INTGW/SEMGW
73	MW-95S	28656	DE	UPPER SURFICIAL	G-II	INTGW/SEMGW
74	MW-95I	28657	DE	INTERMEDIATE SURFICIAL	G-II	INTGW/SEMGW
75	MW-96S	28658	DE	UPPER SURFICIAL	G-II	INTGW/SEMGW
76	MW-96I	28659	DE	INTERMEDIATE SURFICIAL	G-II	INTGW/SEMGW
77	MW-96D	28660	DE	DEEP SURFICIAL	G-II	INTGW/SEMGW
78	MW-97S	28661	DE	UPPER SURFICIAL	G-II	INTGW/SEMGW
79	MW-97I	28662	DE	INTERMEDIATE SURFICIAL	G-II	INTGW/SEMGW
80	MW-98S	28663	DE	UPPER SURFICIAL	G-II	INTGW/SEMGW
81	MW-98I	28664	DE	INTERMEDIATE SURFICIAL	G-II	INTGW/SEMGW
82	MW-99S	28665	DE	UPPER SURFICIAL	G-II	INTGW/SEMGW
83	MW-99I	28666	DE	INTERMEDIATE SURFICIAL	G-II	INTGW/SEMGW
84	MW-100S	28667	DE	UPPER SURFICIAL	G-II	INTGW/SEMGW
85	MW-100I	28668	DE	INTERMEDIATE SURFICIAL	G-II	INTGW/SEMGW
86	MW-425S	19440	CO	UPPER SURFICIAL	G-II	SEMGW
87	MW-425I	19441	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
88	MW-430S	19442	CO	UPPER SURFICIAL	G-II	SEMGW
89	MW-430I	19443	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
90	MW-450S	19444	CO	UPPER SURFICIAL	G-II	SEMGW
91	MW-450I	19445	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
92	MW-455S	19446	CO	UPPER SURFICIAL	G-II	SEMGW
93	MW-455I	19447	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
94	MW-460S	19448	CO	UPPER SURFICIAL	G-II	SEMGW
95	MW-460I	19449	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
96	MW-465S	19450	CO	UPPER SURFICIAL	G-II	SEMGW
97	MW-465I	19451	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
98	MW-470S	19452	CO	UPPER SURFICIAL	G-II	SEMGW
99	MW-470I	19453	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
100	MW-475S	19454	CO	UPPER SURFICIAL	G-II	SEMGW
101	MW-475I	19455	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
102	MW-E	13797	CO	FLORIDAN	G-II	SEMGW
103	MW-F**	13798	CO	FLORIDAN	G-II	SEMGW
104	MW-420I	22891	BG	INTERMEDIATE SURFICIAL	G-II	SEMGW
105	MW-480S	22892	CO	UPPER SURFICIAL	G-II	SEMGW
106	MW-480I	22893	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
107	MW-485S	22894	CO	UPPER SURFICIAL	G-II	SEMGW

Count	Active Monitoring Wells	WACS Well Site Number	Well Type	Zone/ Screen	GW Class	WACS Report Type
108	MW-485I	22895	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
109	MW-490S	22896	CO	UPPER SURFICIAL	G-II	SEMGW
110	MW-490I	22897	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
111	MW-495S	22898	CO	UPPER SURFICIAL	G-II	SEMGW
112	MW-495I	22899	CO	INTERMEDIATE SURFICIAL	G-II	SEMGW
113	MW-AR	23906	CO	Floridan Well @ American Recycling	G-II	SEMGW
	↑					
	*Phenol Sampling					

Well Type Codes (BG) Background (CO) Compliance (DE) Detection

II Surface Water						
1	LFO	13548	IM	BORROW PIT OUTFALL TO SWAMP	SW-IIIIF	SEMSW
2	BRM	13214	IM	MID BERM	SW-IIIIF	SEMSW
3	SBRME	14147	CO	SOUTH BERM EAST	SW-IIIIF	SEMSW
4	SBRMW	13654	CO	SOUTH BERM WEST	SW-IIIIF	SEMSW
5	SW-P5	19456	CO	BORROW PIT OUTFALL TO SWAMP	SW-IIIIF	SEMSW
6	SW-P6	19457	CO	MIDBERM	SW-IIIIF	SEMSW
7	SW-P7				SW-IIIIF	SEMSW
8	SW-P8-1				SW-IIIIF	SEMSW
9	SW-P8-2				SW-IIIIF	SEMSW
10	SW-P11	19458	CO	SOUTH BERM EAST	SW-IIIIF	SEMSW
11	SW-P12	19459	CO	SOUTH BERM WEST	SW-IIIIF	SEMSW

Count	Previous MPIS Wells to be Sampled for Phenols Semi-Annually
1	MW-17D
2	MW-47S
3	MW-62S
4	MW-71I
5	MW-71D
6	MW-75I
7	MW-75D
8	MW-76I
9	MW-77D
10	MW-78S
11	MW-78I
12	MW-84S
13	MW-84I
14	MW-89D
15	MW-90I
16	MW-91S
17	MW-F

Count	Revised List of Wells to be Sampled for Phenols Semi-Annually
1	MW-47S
2	MW-62S
3	MW-71I
4	MW-71D
5	MW-75I
6	MW-75D
7	MW-76I
8	MW-77D
9	MW-78S
10	MW-78I
11	MW-84S
12	MW-84I
13	MW-90I
14	MW-91S
15	MW-F

Legend

All Sampling Suspended
Deep Well Retained in MPIS for Semi-annual sampling including Phenols

Count	All MWs (Active & Suspended)	Count	Active MWs	MW Suspended	MW Suspended	Count	MW Closed Class I	Count	MW Closed Class I	Count	MW Closed Class III	Count	MWs Sample Phenols	WACS Well Site Number	Well Type	Zone/ Screen	GW Class	WACS Report Type
1	MW-4S	1	MW-4S											13098	DE	Upper Surficial	G-II	SEMGW
2	MW-17S	2	MW-17S											14103	DE	Upper Surficial	G-II	SEMGW
3	MW-17I	3	MW-17I											14104	DE	Intermediate Surficial	G-II	SEMGW
4	MW-17D			1 MW-17D									MW-17D	14105	DE	Deep Surficial	G-II	SEMGW
5	MW-26S	4	MW-26S											14106	DE	Upper Surficial	G-II	SEMGW
6	MW-26I	5	MW-26I											14107	DE	Intermediate Surficial	G-II	SEMGW
7	MW-26D			2 MW-26D										14108	DE	Deep Surficial	G-II	SEMGW
8	MW-41S	6	MW-41S											14109	BG	Upper Surficial	G-II	SEMGW
9	MW-41I	7	MW-41I											14110	BG	Intermediate Surficial	G-II	SEMGW
10	MW-41D			3 MW-41D										14111	CO	Deep Surficial	G-II	SEMGW
11	MW-43	8	MW-43											14112	BG	Upper Surficial	G-II	SEMGW
12	MW-44I	9	MW-44I											14113	BG	Intermediate Surficial	G-II	SEMGW
13	MW-44D			4 MW-44D										14114	CO	Deep Surficial	G-II	SEMGW
14	MW-47S	10	MW-47S											14115	DE	Upper Surficial	G-II	SEMGW
15	MW-47I	11	MW-47I											14116	DE	Intermediate Surficial	G-II	SEMGW
16	MW-47D			5 MW-47D										14117	BG	Deep Surficial	G-II	SEMGW
17	MW-51S	12	MW-51S											14118	BG	Upper Surficial	G-II	SEMGW
18	MW-51I	13	MW-51I											13787	BG	Intermediate Surficial	G-II	SEMGW
19	MW-51D			6 MW-51D										13788	CO	Deep Surficial	G-II	SEMGW
20	MW-55S	14	MW-55S											28652	DE	Upper Surficial	G-II	INTGW/SEMGW
21	MW-55I	15	MW-55I											28653	DE	Intermediate Surficial	G-II	INTGW/SEMGW
22	MW-55D			7 MW-55D										13789	DE	Deep Surficial	G-II	SEMGW
23	MW-62S	16	MW-62S											13795	BG	Upper Surficial	G-II	SEMGW
24	MW-62I	17	MW-62I											13990	BG	Intermediate Surficial	G-II	SEMGW
25	MW-62D			8 MW-62D										14246	DE	Deep Surficial	G-II	SEMGW
26	MW-64S	18	MW-64S											13992	BG	Upper Surficial	G-II	SEMGW
27	MW-64I	19	MW-64I											13993	BG	Intermediate Surficial	G-II	SEMGW
28	MW-64D			9 MW-64D										13994	CO	Deep Surficial	G-II	SEMGW
29	MW-65S	20	MW-65S											13995	BG	Upper Surficial	G-II	SEMGW
30	MW-65I	21	MW-65I											13996	BG	Intermediate Surficial	G-II	SEMGW
31	MW-65D			10 MW-65D										13997	CO	Deep Surficial	G-II	SEMGW
32	MW-66S	22	MW-66S											13998	BG	Upper Surficial	G-II	SEMGW
33	MW-66I	23	MW-66I											13999	BG	Intermediate Surficial	G-II	SEMGW
34	MW-66D			11 MW-66D										14000	BG	Deep Surficial	G-II	SEMGW
35	MW-70S	24	MW-70S											14039	DE	Upper Surficial	G-II	SEMGW
36	MW-70I	25	MW-70I											14040	DE	Intermediate Surficial	G-II	SEMGW
37	MW-71S	26	MW-71S											14041	DE	Upper Surficial	G-II	SEMGW

Count	All MWs (Active & Suspended)	Active MWs	MW Suspended	MW Suspended Count	MW Closed Class I	MW Closed Class I Count	MW Closed Class III	MW Closed Class III Count	MW Sample Phenols	Count	WACS Well Site Number	Well Type	Zone/ Screen	GW Class	WACS Report Type
75	MW-85S	MW-85S									14138	DE	Upper Surficial	G-II	SEMGW
76	MW-85I	MW-85I									14139	DE	Intermediate Surficial	G-II	SEMGW
77	MW-85D		MW-85D	19							14140	DE	Deep Surficial	G-II	SEMGW
78	MW-88S	MW-88S									14141	CO	Upper Surficial	G-II	SEMGW
79	MW-88I	MW-88I									14142	CO	Intermediate Surficial	G-II	SEMGW
80	MW-88D		MW-88D	20							14143	CO	Deep Surficial	G-II	SEMGW
81	MW-89S	MW-89S									14144	DE	Upper Surficial	G-II	SEMGW
82	MW-89I	MW-89I									14145	DE	Intermediate Surficial	G-II	SEMGW
83	MW-89D		MW-89D	21					MW-89D		14146	DE	Deep Surficial	G-II	SEMGW
84	MW-90S	MW-90S									14148	BG	Upper Surficial	G-II	SEMGW
85	MW-90I	MW-90I							MW-90I	13	14149	BG	Intermediate Surficial	G-II	SEMGW
86	MW-90D		MW-90D	22							14150	BG	Deep Surficial	G-II	SEMGW
87	MW-91S	MW-91S			MW-91S	28				14	14192	DE	Upper Surficial	G-II	SEMGW
88	MW-91I	MW-91I			MW-91I	29					14193	DE	Intermediate Surficial	G-II	SEMGW
89	MW-92S	MW-92S			MW-92S	30					14194	DE	Upper Surficial	G-II	SEMGW
90	MW-92I	MW-92I			MW-92I	31					14195	DE	Intermediate Surficial	G-II	SEMGW
91	MW-92D		MW-92D	23	MW-92D	32					14196	DE	Deep Surficial	G-II	SEMGW
92	MW-93S	MW-93S			MW-93S	32					14197	BG	Upper Surficial	G-II	SEMGW
93	MW-93I	MW-93I			MW-93I	33					14198	BG	Intermediate Surficial	G-II	SEMGW
94	MW-94S	MW-94S					MW-94S	9			28654	DE	Upper Surficial	G-II	INTGW/SEMGW
95	MW-94I	MW-94I					MW-94I	10			28655	DE	Intermediate Surficial	G-II	INTGW/SEMGW
96	MW-95S	MW-95S					MW-95S	11			28656	DE	Upper Surficial	G-II	INTGW/SEMGW
97	MW-95I	MW-95I					MW-95I	12			28657	DE	Intermediate Surficial	G-II	INTGW/SEMGW
98	MW-96S	MW-96S					MW-96S	13			28658	DE	Upper Surficial	G-II	INTGW/SEMGW
99	MW-96I	MW-96I					MW-96I	14			28659	DE	Intermediate Surficial	G-II	INTGW/SEMGW
100	MW-96D							15			28660	DE	Deep Surficial	G-II	INTGW/SEMGW
101	MW-97S	MW-97S					MW-97S	16			28661	DE	Upper Surficial	G-II	INTGW/SEMGW
102	MW-97I	MW-97I					MW-97I	17			28662	DE	Intermediate Surficial	G-II	INTGW/SEMGW
103	MW-98S	MW-98S					MW-98S	18			28663	DE	Upper Surficial	G-II	INTGW/SEMGW
104	MW-98I	MW-98I					MW-98I	19			28664	DE	Intermediate Surficial	G-II	INTGW/SEMGW
105	MW-99S	MW-99S					MW-99S	20			28665	DE	Upper Surficial	G-II	INTGW/SEMGW
106	MW-99I	MW-99I					MW-99I	21			28666	DE	Intermediate Surficial	G-II	INTGW/SEMGW
107	MW-100S	MW-100S					MW-100S	22			28667	DE	Upper Surficial	G-II	INTGW/SEMGW
108	MW-100I	MW-100I					MW-100I	23			28668	DE	Intermediate Surficial	G-II	INTGW/SEMGW
109	MW-425S	MW-425S									19440	CO	Upper Surficial	G-II	SEMGW
110	MW-425I	MW-425I									19441	CO	Intermediate Surficial	G-II	SEMGW
111	MW-430S	MW-430S									19442	CO	Upper Surficial	G-II	SEMGW

CH2MHILL.

NEEL-SCHAFFER

2000 W. UNIVERSITY BLVD. SUITE 1000
ORANGE COUNTY, FLORIDA

CG SOLID WASTE MANAGEMENT FACILITY
UTILITIES SOLID WASTE DIVISION

SE5 CELLS 9-10 CLOSURE

MONITORING LOCATIONS

GROUND AND SURFACE WATER

CWL

NO.	DATE	REVISION	BY	AP/VD

DATE: MARCH 2014
 PROJ: DWS
 SHEET: 01

PLOT DATE: 20140315
 FILENAME: 006-C-002_46073.dgn



LEGEND

- SUBJECT PROPERTY LINE
- LEAD-VIAL SAMPLING LOCATION
- LOCATION USED FOR GROUNDWATER LEVELS ONLY
- LOCATION OF EXISTING GROUNDWATER MONITORING WELL CLUSTER
- EXISTING SURFACE WATER QUALITY STATION
- LOCATION OF PROPOSED GROUNDWATER MONITORING WELL CLUSTER
- PROPOSED SURFACE WATER QUALITY STATION

NOTE: FIELD USE ONLY. GROUNDWATER MONITORING WELLS AND SURFACE WATER MONITORING STATIONS WELLS BE INSTALLED IN CONJUNCTION WITH FUTURE CELL CONSTRUCTION. LOCATION OF WELLS SHOWN FOR THE CELL CONSTRUCTION ONLY. CELL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CELL CONSTRUCTION PLAN.

ATTACHMENT C

Florida Department of Environmental Protection

3319 Maguire Boulevard, Suite 232, Orlando, Florida 32803-3767

MONITORING WELL COMPLETION REPORT FORM

Facility Name: Orange County Landfill Young Pine Road		Date:
DEP Permit No.:	WACS Facility ID #:21847	
WACS Monitoring Site ID #:	WACS Monitoring Site Name:	
Well Type: <input type="checkbox"/> Background <input type="checkbox"/> Detection <input type="checkbox"/> Compliance <input type="checkbox"/> Other _____		
LATITUDE AND LONGITUDE (See Next Page For Requirements):		
Coordinate Accuracy:	Datum:	Elevation Datum:
Collection Method:	Collection Date:	
Collector Name:	Collector Affiliation:	
Aquifer Monitored:		
Drilling Method:	Date Installed:	
Installed By:		
Bore Hole Diameter:	Total Depth:(BLS)	
Casing Type:	Casing Diameter:	Casing Length:
Screen Type:	Screen Slot Size:	Screen Length:
Screen Diameter:	Screen Interval: _____ To _____ (BLS)	
Filter Pack Type:	Filter Pack Grain Size:	
Filter Interval Covered:	Filter Interval: _____ To _____ (BLS)	
Sealant Type:	Sealant Interval: _____ To _____ (BLS)	
Grout Type:	Grout Interval: _____ To _____ (BLS)	
Top Of Casing Elev. (NGVD):	Ground Surface Elev. (NGVD):	
Post Development Water Level Elev. (NGVD):	Date And Time Measured:	
Describe Well Development:		
Remarks:		
Name Of Person Preparing Report:		
Organization:	Phone Number:	

NOTE Attach As-Built Mw Construction Diagram, Lithologic Log, And Survey Drawing (See Next Page).
 (NGVD)=National Geodetic Vertical Datum Of 1929 (BLS) = Below Land Surface

Additional Survey Notes:

1. Latitude and Longitude Requirements and Definitions:
 - a. **Latitude** must be measured in degrees, minutes and seconds, to at least two (2) decimal places.
 - b. **Longitude** must be measured in degrees, minutes and seconds, to at least two (2) decimal places.
 - c. **Eastings and northings** (State Plane Coordinates) **must** be converted to latitude and longitude.
 - d. **Coordinate Accuracy:** the measured, estimated degree of correctness of the measurement. An accuracy of 15 feet or 5 meters is required.
 - e. **Datum:** the horizontal reference for measuring locations on the Earth's surface. NAD83-North American Datum of 1983 is preferred.
 - f. **Elevation Datum:** the reference datum from which elevation measurements are made. NGVD29 (National Geodetic Vertical Datum of 1929 is required.
 - g. **Collection Method:** the method or mechanism used to derive the measurements, e.g. GPS, map, aerial photo, etc.
 - h. **Collection Date:** the date and time on which the measurements were taken.
 - i. **Collector Name:** the name of the person taking the measurement.
 - j. **Collector Affiliation:** the agency or company for whom the collector works.
2. As specified in the MPIS, One (1) paper copy and one (1) electronic copy of a drawing must be submitted within thirty (30) days following monitoring well installation showing the location of all monitoring wells (active and abandoned), water bodies and waste filled areas. The location of features on the drawing must be horizontally and vertically located by standard surveying techniques. The drawing shall include all monitoring well locations, each monitoring well name and identification (WACS) number, the top of casing, pad elevation, permanent benchmark(s) and/or corner monument marker(s) referenced to NGVD with an accuracy of 0.01 feet. The latitude and longitude of each well in degrees, minutes and seconds, to two (2) decimal places, with an accuracy of 15 feet, must be determined and provided on the drawing. The survey shall be conducted and certified by a Florida Licensed Surveyor and Mapper. [**62-701.510(1)(c)&(3)(d)1, F.A.C.**]
3. If a monitoring well is being replaced or new wells are being added to an existing ground water monitoring plan, only the new wells needs to be surveyed as long as all other monitoring wells in the MPIS have been surveyed and certified by a Florida Licensed Surveyor and Mapper and there is no reason to believe that the elevations have changed. This location and elevation determinations and the certification must be provided with the Monitoring Well Completion Form for the new well,.

Attachment D
Guidance for Submitting Electronic Water Quality Data
To the FDEP Central District Waste & Air Resource Programs

General Information

Water quality monitoring reports and all groundwater, surface water, and leachate (when required) analytical results for the Solid Waste Program shall be submitted to the Department electronically via email, FTP site, compact disc, or flash drive media readable by Microsoft Windows. **(Rules 62-160.240 and 62-160.340, F.A.C.)**

Water quality monitoring reports shall be submitted in Adobe pdf format. The water quality Electronic Data Deliverable (EDD) shall be compatible with software called Florida DEP Automated Data Processing Tool (ADaPT) --unless otherwise approved by the Department.

ADaPT has been developed to evaluate and upload water quality data into the Department's Water Assurance Compliance System (WACS) database. A copy of this ADaPT software with installation instructions and EDD specifications can be downloaded from the following website address:

<http://www.dep.state.fl.us/waste/categories/shw/pages/ADaPT.htm>

Monitoring Report

The groundwater monitoring report shall be submitted in Adobe PDF format, with the EDDs as an attachment. The report shall include the following items:

1. Cover letter;
2. Summary of exceedances and sampling issues (if any, for example, variation from SOP field criteria);
3. Conclusions and recommendations;
4. Groundwater contour maps;
5. Chain of custody forms;
6. Water levels, water elevation table;
7. Groundwater Monitoring Report Certification, using the appropriate Department form **(Attachment E)**;
8. Appropriate sampling information on Form FD 9000-24 (DEP-SOP-001/01); **(Attachment F)**;
9. Laboratory EDDs and associated Lab EDD Error Logs, Field EDDs that are compatible with ADaPT software and ADaPT export file(s).

(NOTE: You no longer have to complete or submit the DEP Form 62-522.900(2), Parameter Monitoring Report.)

The monitoring report (including ADaPT EDDs) should be emailed to Tallahassee using the following email address: ADaPT.EDDs.and.Reports@dep.state.fl.us

Submit all ADaPT files in a single zip file named as follows:

12345_200811_swldd.zip

Submit the monitoring report in a single (text, no scanned content) PDF file named as follows:

12345_200811_swgwmr.pdf

Please do not submit multiple documents for the monitoring report; combine all documents in a single PDF document. Less preferable, zip these documents into a single zip file named as follows:

12345_200811_swgwmr.zip

(Note: refer to Section III below for details of file nomenclature.)

If attachments are too large to email, monitoring reports may also be transmitted to the FDEP Solid Waste program in Tallahassee using the following FTP site:

ftp://ftp.dep.state.fl.us/pub/WACS-ADaPT/EDDS_and_Reports

Note: When submitting files to the FTP site, please combine all ADaPT EDDs and the groundwater monitoring report into a single zip file (sw_12345_200811_gwmr.zip).

Please email us at ADaPT.EDDs.and.Reports@dep.state.fl.us informing us of what files were transmitted via FTP for which facility sampling event.

If you are unable to submit the groundwater monitoring report electronically via email or FTP, it can also be sent by regular mail to:

Florida Department of Environmental Protection
Solid Waste Section, MS 4565
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

III. ADaPT EDDs

The ADaPT EDD consists of two electronic deliverables:

- (1) a Laboratory EDD, identified as swldd.txt; and
- (2) a Field EDD identified as swfdd.txt.

The Laboratory EDD shall be submitted in a comma separated (csv format) text file using the .txt filename extension. The Laboratory EDD file name format shall be:

[WACS Facility I.D.] underscore [Begin Sampling Year and Month (yyyymm)] underscore SWldd.txt
For example, with WACS Facility I.D. # 12345 where sampling started in November and ended in December of 2008, the Laboratory EDD file name should be: 12345_200811_swldd.txt

The Field EDD shall be submitted in the same comma separated (.csv format) text file as the Laboratory EDD. The Field EDD file name format shall be:

[WACS Facility I.D.] underscore [Begin Sampling Year and Month (yyyymm)] underscore swfdd.txt
For example, with WACS Facility I.D. # 12345 where sampling started in November and ended in December of 2008, the file name should be: 12345_200811_swfdd.txt

For confirmation sampling, add the term “_conf” to the EDD filenames as follows:
12345_200811_conf_swfdd.txt for the Laboratory EDD or
12345_200811_conf_swfdd.txt for the Field EDD.

For radiochemistry results, add the term “_rad” similar to confirmation sampling indicated above.

IV. Signatures Required

Water quality monitoring reports and interpretative documents (such as recommendations about exceedances and/or contour maps) shall be signed and sealed by a Florida registered professional geologist or professional engineer with experience in hydrogeological investigations.

An electronic signed and sealed signature page may be submitted with the report provided a stamped seal is used. If a raised seal is used, ensure that the seal is legible (gray the embossed seal and scan). Otherwise, you must separately mail the signed and sealed page.

V. Process Required

Three steps are generally required.

First, the Laboratory EDD, in comma separated text format, must be submitted by the laboratory. In order to validate the QA/QC aspects of the Laboratory EDD, the permittee shall ensure the laboratory processes the Laboratory EDD through ADaPT using both their laboratory specific library and the Department's Division of Waste Management Master library and corrects all critical errors and explains all non-critical errors prior to submittal.

Second, the appropriate entity (laboratory, consultant, or permittee) shall process the Field EDD through ADaPT and correct all Field EDD errors prior to submittal.

Third, as a completeness check, the laboratory, permittee or consultant shall process both the Laboratory EDD and the Field EDD through ADaPT and confirm a successful export to disk and submit the ADaPT generated export file (ADaPTYYYYMMDDHHMMSS.txt).

VI. Resources

In the event help is needed to prepare these EDDs, or monitoring testsite information needs updating in the WACS Oracle database, or if you need help in submitting the groundwater monitoring report, please contact the Laxsabee Levin (407-897-4313) at the Central District office:

Florida Department of Environmental Protection
Central District Office
Waste and Air Resource Programs
3319 Maguire Blvd., Ste. 232
Orlando, FL 32803-3767

DEP_CD@dep.state.fl.us

You can also receive assistance by contacting Clark Moore, clark.b.moore@dep.state.fl.us, (850) 245-8739 or by emailing ADaPT.EDDs.and.Reports@dep.state.fl.us

ATTACHMENT E

Florida Department of Environmental Protection

3319 Maguire Boulevard, Suite 232, Orlando, Florida 32803-3767

GROUND WATER MONITORING REPORT

Rule 62-522.600(11)

PART I GENERAL INFORMATION

(1) Facility Name Orange County Landfill Young Pine

Address _____

City _____ Zip _____ County _____

Telephone Number (_____) _____ E-mail address _____

(2) WACS_Facility 21847

(3) DEP Permit Number _____

(4) Authorized Representative's Name _____ Title _____

Address _____

City _____ Zip _____ County _____

Telephone Number (_____) _____ E-mail address _____

(5) Type of Discharge _____

(6) Method of Discharge _____

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submission of false information including the possibility of fine and imprisonment.

Date

Owner or Authorized Representative's Signature

PART II QUALITY ASSURANCE REQUIREMENTS

Sampling Organization Comp QAP # _____

Analytical Lab NELAC #/ HRS Certification _____

Lab Name _____

Address _____

Phone Number (_____) _____

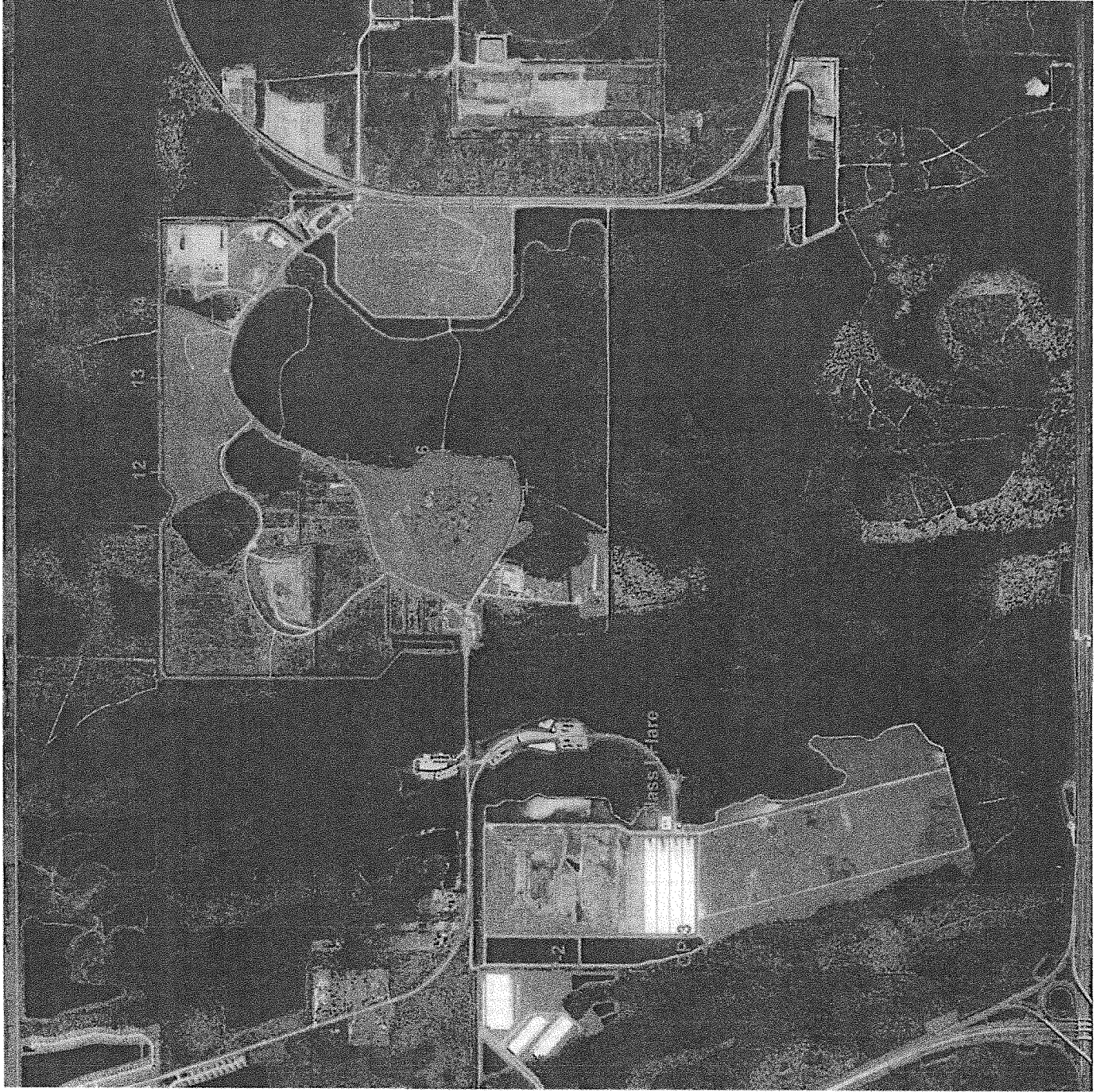
E-mail Address _____

Appendix 4 - Locations for Landfill Gas Migration Probes and Structures



LEGEND

+ Gas Probes



ATTACHMENT 1
Time Sensitive Action Chart

Specific Condition	Submittal Due Date	Required Item
A.3.	No later than July 23, 2034	Submit permit renewal application
A.5.a,b,c,d	September 22, 2019, September 22, 2024, and September 22, 2029	Report containing an updated closure plan, revised closure cost estimate, demonstration the LCS has been water pressure cleaned or inspected by video recording, and an updated operation plan, if procedures have changed
A.6.	September 22, 2019, September 22, 2024, and September 22, 2029	Permit fee of \$10,000
C.7.a.	No later than July 1 each year	Submit Annual Report on DEP Form 62-709.901(3), F.A.C.
C.14.c.	At least once every 5 years	Jet cleaning or video inspection of LCS piping
C.15.a.	Following expansion of the leachate recirculation system	Submit the Certificate of Construction Completion on DEP Form 62-701.900(2), F.A.C.
C.17.a.	Annually, by January 20 th	Submit waste quantity records
C.17.b	Annually, by January 20 th	Annual estimate of remaining life and capacity calculations
E.4.	Annually, by March 1 st	Submit an updated drawing of all existing temporary or permanent gas collection wells and piping at the site
E.5.	After completion of construction	Submit the Certificate of Construction Completion on DEP Form 62-701.900(2), F.A.C.
E.7.	Quarterly, by January 15 th , April 15 th , July 15 th , and October 15 th of each year	Submit results of routine landfill gas monitoring events
F.1.	Annually	Submit proof financial mechanisms are established and funded
F.2.a. and b.	Annually, by March 1 st each year	Submit revised cost estimate and financial test

G.1.a.	At least 30 days prior to initiating each closure construction event	Notify the Department
Specific Condition	Submittal Due Date	Required Item
APPENDIX 3 MPIS Item 4	Within 14 days of this finding	Notify the Department if an exceedance is confirmed, or if the Permittee chooses not to resample following an exceedance
APPENDIX 3 MPIS Item 7	Semi-annually in May and November	Sample groundwater monitoring wells
APPENDIX 3 MPIS Item 12	Semi-annually in May and November	Sample surface water monitoring sites
APPENDIX 3 MPIS Item 14	Within 7 days	Notify the Department of a damaged or inoperable monitoring well or piezometer
APPENDIX 3 MPIS Item 18	Prior to abandonment	Submit an abandonment plan for any well unsuitable for groundwater monitoring
APPENDIX 3 MPIS Item 19	At least 14 days prior	Notify the Department prior to installation and/or sampling of any monitoring well(s)
APPENDIX 3 MPIS Item 20	Within 30 days after installation	Submit the Monitoring Well Completion Report
APPENDIX 3 MPIS Item 21	Within 30 days after installation	Submit a drawing with all the location of all monitoring sites (active and abandoned), water bodies, and waste filled areas
APPENDIX 3 MPIS Item 23	Within 60 days from completion of laboratory analyses	Submit monitoring reports
APPENDIX 3 MPIS Item 25	Semi-annually	Submit groundwater elevation contour maps for each monitored aquifer zone
APPENDIX 3 MPIS Items 26 & 27	October 2014, May 2017, November 2019, May 2022, November 2024, May 2027, November 2029, May 2032, and at time of permit renewal	Submit water quality monitoring plan evaluation technical reports
APPENDIX 3 MPIS Item 28	Within 60 days from completion of laboratory analyses	Submit required water quality monitoring reports and all ground water and surface water analytical results electronically in the specified format

ATTACHMENT 2

Southern Expansion Site Cells 9 – 12 Facility Permit History

<u>Permit #</u>	<u>Name</u>	<u>Received Date</u>	<u>Issued Date</u>	<u>Description</u>
SC48-0128169-009	Orange County Landfill Southern Expansion Site, Cell 9, Class I	10/31/2000	8/9/2001	Construction Permit for Cell 9
SO48-0128169-010	Orange County Landfill Southern Expansion Site, Cell 9, Class I	10/31/2000	8/9/2001	5-year Operation Permit for Cell 9
SC48-0128169-012	Orange County Landfill Southern Expansion Site, Cell 9, Class I Landfill Gas Collection and Control System – Initial Phase	10/24/2001	1/8/2002	Modification to incorporate the construction of landfill gas piping and condensate pumping system around the perimeter of Cell 9
SO48-0128169-018	Orange County Landfill Southern Expansion Site, Cell 9, Class I	4/14/2006	9/26/2006	5-year Operation Permit for Cell 9
SC48-0128169-022	Orange County Landfill Southern Expansion Site, Cell 10, Class I – Construct	12/24/2007	6/20/2008	5-year Construction Permit for Cell 10
SO48-0128169-025	Solid Waste Operating Permit – Class I Orange County Solid Waste Management Facility	8/18/2009	1/12/2010	5-year Operation Permit for Existing Cell 9 and New Cell 10 – Bays 8 through 10
SO48-0128169-027	Orange County Landfill Intermediate Modification	5/6/2010	10/20/2010	Modification of permit SO48-0128169-025 to extend operations into Cell 10 (Bays 11-16) and construct and operate a landfill gas management system
SO48-0128169-033	OCLF Leachate Testing Removal Modification	10/23/2012	10/26/2012	Modification of permit SO48-0128169-025 for the removal of the requirement for annual leachate sampling
0128169-037-SO-01	OCLF Operation and Sequential Closure	6/20/2014	9/22/2014	20-year Operation and Sequential Closure Permit for Cells 9 through 12

Attachment B
Liner System Construction Quality Assurance
Plan for HDPE and LLDPE Geomembrane, and
Composite Drainage Net for Cells 9-12 Class I
Landfill, Orange County, Florida

Mehran S. Beladi
Florida P.E.
License No. 41819

This quality assurance plan has been prepared under the direction of a professional engineer registered in the State of Florida.

Contents

Section	Page
1.0 Introduction	1-1
1.1 Liner System Description (Interface of Closure cap with Bottom Liner System)	1-1
1.2 Cover System Description	1-1
2.0 Definitions and Responsibilities.....	2-1
2.1 Quality Assurance and Quality Control.....	2-1
2.2 Lining Materials	2-1
2.3 Scope of Quality Assurance and Quality Control	2-1
2.4 References	2-1
2.5 Definitions, Qualifications, and Responsibilities of Parties (62-701.400(3)(e)(1), FAC.....	2-2
2.5.1 Contractor	2-2
2.5.2 Contractor's Representative	2-2
2.5.3 Designer	2-3
2.5.4 Designer's Field Representative.....	2-3
2.5.5 Installer.....	2-5
2.5.6 Field Installation Manager.....	2-7
2.5.7 Installation Supervisor	2-8
2.5.8 Master Seamer	2-8
2.5.9 Manufacturer	2-9
2.5.10 Quality Control Consultant Laboratory	2-10
2.5.11 Quality Control Technician	2-11
3.0 Coordination and Scheduling.....	3-1
3.1 Coordination Meetings	3-1
3.2 Delivery, Storage, and Handling	3-1
3.3 Environmental Requirements	3-1
3.4 Sequencing and Scheduling	3-1
4.0 Material Specifications (62-701.400(3)(e)(2) FAC	4-1
4.1 HDPE Geomembrane	4-1
4.2 Linear Low Density Polyethylene (LLDPE) Geomembrane.....	4-2
4.3 Geonet.....	4-2
4.4 Geotextile	4-3
4.5 Geosynthetic Clay Liner (GCL).....	4-3
4.6 Factory Testing.....	4-3

Contents, Continued

Section	Page
5.0 Installation Specifications (62-701.400(3)(e)(4) FAC.....	5-1
5.1 HDPE and LLDPE Geomembrane	5-1
5.1.1 Welding Units.....	5-1
5.1.2 Tensionmeter for Field Testing	5-1
5.1.3 Vacuum Box for Weld Testing	5-1
5.1.4 High Voltage Spark Detector	5-1
5.1.5 Preparation	5-1
5.1.6 Geomembrane Installation	5-2
5.1.7 Field Seams	5-3
5.1.8 Geomembrane Attachment to Flat Concrete Surfaces.....	5-3
5.1.9 Manufacturer's Services	5-3
5.1.10 Protection of Work.....	5-3
5.1.11 Field Quality Control.....	5-3
5.1.12 Repairing Geomembrane.....	5-5
5.1.13 Record Data	5-6
5.1.14 Cleanup	5-6
5.1.15 Placing Products Over Geomembrane.....	5-6
5.2 Geonet.....	5-6
5.2.1 Installation of Geonet	5-6
5.2.2 Field Quality Control of Geonet	5-7
6.0 List of Installation/Documentation Forms.....	6-1

Introduction

1.1 Liner System

The Cell 11 and Cell 12 Class I landfill will be lined with double liner system. Cell 9 and Cell 10 have been constructed using the liner system described below. Description of the bottom liner system is provided because the cap liner system proposed for Cells 9-12 must connect to the bottom liner system primary liner. The double liner system used on the floor of Cells 9-12 includes the following components from top to bottom:

A primary leachate collection and removal system consisting of 24 inches of locally available sand placed over a *composite drainage net (CDN)*, with leachate collection pipes spaced every 220 feet on a 0.5 percent slope. A CDN consists of a *drainage net (DN)* bonded on one or both sides to *geotextile* fabric. A CDN with geotextile bonded on both sides will be used for side slopes, while a CDN with geotextile bonded only on the top will be used for the cell bottom liner system.

A primary geomembrane liner composed of HDPE with a 60-mil minimum thickness. The geomembrane will be textured on the berm side slopes to at least 50 feet from the toe of the berm to increase the friction between the geomembrane and the leak-detection layer.

A leak detection and secondary leachate collection system containing a DN placed between the primary and secondary geomembranes. On the side of the cells, where steeper slopes make slope stability a concern, a CDN will be used because the geotextile in the CDN increases the friction between the DN and the geomembrane. Leachate collection piping will be placed at the same interval and slope as the primary leachate collection system.

A secondary geomembrane liner composed of 60-mil thick HDPE with the same properties as the primary geomembrane.

Subbase consisting of geosynthetic clay (GCL) liner. A GCL consists of processed clay sandwiched between two geotextiles.

1.2 Cover System

The cover system for the Cells 9 through 12 Class I landfill will consist of 24 inches of granular fill overlying 40-mil of linear low density polyethylene (LLDPE) geomembrane. The geomembrane will overlay six-inches of granular fill to protect the geomembrane from the underlying refuse. Composite drainage net is proposed for portions of the sideslopes between terraces, along the terrace swales, and under the stormwater letdown pipes. There are two grading configurations that determine the final elevations of the cover system:

Cell 9 and the Northern Third of Cell 10 Twenty foot wide terraces are proposed at Elevation 106, 126, 146,166,186, 206 and 226 feet NGVD. Sideslopes between terraces are at 4:1. Maximum elevation is 244 feet NGVD. A stormwater diversion berm to capture runoff for the 8 percent top slope is planned for Elevation 240. This configuration reflects the lift

sequence to date. CDN is used only along the terraces and under the stormwater letdown pipes. No CDN is used on the sideslopes downslope of the elevation 106 terrace.

Southern Two-Thirds of Cell 10, Cell 11 and Cell 12

Twenty-foot wide terraces are proposed at Elevation 106, 136, 166,196 and 226 feet NGVD. Sideslopes between terraces are at 4:1. The maximum elevation varies from elevation 244 to elevation 230, declining to the south. This configuration reflects a change from the previous which was the same as the Cell 9 configuration above. Due to longer slope length between terraces (30 feet vertical interval), CDN is used to increase conveyance of infiltration to the downslope terrace. CDN is also used along the terraces and under the stormwater letdown pipes. No CDN is used on the sideslopes downslope of the elevation 106 terrace.

The purpose of this Construction Quality Assurance (CQA) Plan is to provide procedures and guidelines for construction management and operating personnel to ensure that the LLDPE geomembranes used in the closure layer are constructed in compliance with the Florida Department of Environmental Protection (FDEP) technical requirements outlined in Chapter 62-701, FAC, for solid waste facilities. Included in the CQA plan are specifications, construction methods, quality control testing procedures, and sampling frequencies to be followed while constructing the geomembranes and geonet. Sampling and testing will be conducted by a qualified designer's field representative under the direction of a designer registered as a professional engineer to ensure that the geomembranes and geonet are installed in accordance with the specified performance standards.

Definitions and Responsibilities

2.1 Quality Assurance and Quality Control

In the context of this CQA Plan, quality assurance and quality control are defined as follows:

Quality Assurance - A planned and systematic pattern of all means and actions designed to provide adequate confidence that items or services meet contractual and regulatory requirements and will perform satisfactorily in service.

Quality Control - Those actions which provide a means to measure and regulate the characteristics of an item or service to contractual and regulatory requirements.

In the context of liner production and installation:

Quality assurance refers to means and actions employed by the geomembrane Manufacturer to assure conformity of the lining system, production, and installation in accordance with the CQA Plan drawings and specifications.

Quality control refers to those actions taken by the Manufacturer, Fabricator and Installer to ensure that the materials and workmanship meet the requirements of the drawings and specifications.

2.2 Lining Materials

For the purposes of this document, the term "geomembrane" is applied to flexible membrane liners. More specifically, "geomembrane" refers to synthetic liners having either smooth, or textured surfaces. These geomembranes include LLDPE and HDPE membranes.

The quality assurance of the geomembrane is addressed herein in its entirety, including all stages from manufacture to installation.

2.3 Scope of Quality Assurance and Quality Control

The scope of this CQA Plan includes the quality assurance applicable to manufacturing, shipment, handling, onsite storage, and installation of all geomembranes.

2.4 References

The CQA Plan was prepared in accordance with EPA Technical Guidance Document EPA/600/R-93/182, Quality Assurance and Quality Control for Waste Containment Facilities.

2.5 Definitions, Qualifications, and Responsibilities of Parties (62-701.400(3) (e) (1), FAC

The parties discussed in this section are associated with the ownership, design, manufacture, transportation, installation, and quality assurance of the liner system. The definitions, qualifications, and responsibilities of these parties are outlined in the following subsections.

2.5.1 Contractor

2.5.1.1 Definition

The Contractor is the firm(s) or corporation(s) with which the Owner has entered into agreement to construct the project.

2.5.1.2 Responsibilities

The Contractor is responsible for all submittals by the Manufacturer and the Installer, and for scheduling and coordinating the required work with the Manufacturer and the Installer to complete the project. The Contractor shall have a representative present at all times during any construction activity on site. The Contractor is responsible for furnishing as-built drawings and a copy of complete documentation for the construction of the liner and cover systems. The Contractor is also responsible for updating all design drawings, incorporating all deviations from the contract drawings. All deviations must be initialed and approved daily by the responsible Designer's Field Representative on site. Initiating, updating, and approving must take place daily.

2.5.1.3 Qualifications

The Contractor shall be qualified to perform all aspects of work required to successfully construct the project. The Contractor shall be registered in the State of Florida and shall demonstrate prior related experience.

2.5.2 Contractor's Representative

2.5.2.1 Definition

The Contractor's Representative is a qualified individual assigned by the Contractor to represent him/her on site at all times during all construction activity.

2.5.2.2 Responsibilities

The Contractor's Representative is responsible for coordinating and supervising the Contractor's crew and subcontractors' work on site. The Contractor's Representative is responsible for making sure that construction activities are conducted in accordance with the drawings and specifications. The Contractor's Representative is responsible for pointing out to the Designer's Field Representative any discrepancies between the drawings and specifications and the field conditions. The Contractor's Representative is responsible for attending all meetings held regarding the project. The Contractor's Representative is responsible for keeping a daily log of all onsite construction activities. The Contractor's Representative is responsible for proposing alternative methods, where necessary, to the Designer's Field Representative for approval and signature as required per the specifications.

2.5.2.3 Qualifications

The Contractor's Representative shall be a qualified individual who is able to perform all the tasks associated with the construction activities. The Contractor's Representative shall demonstrate prior and similar experience to the Designer's Field Representative. The Contractor's Field Representative shall have the authority to direct and instruct the crew and subcontractors.

2.5.3 Designer

2.5.3.1 Definition

The Designer is the individual and/or firm responsible for the preparation of the design, including drawings and specifications for the lining system. The designer shall be registered as a professional engineer with the State of Florida.

2.5.3.2 Responsibilities

The Designer is responsible for performing the engineering design and preparing the associated drawings and specifications for the lining system. The Designer is responsible for approving all design and specification changes and making any necessary design clarifications during construction of the lining system. The Designer is responsible for reviewing and approving shop drawings submitted by the Contractor. Deviations from the drawings and specifications approved by the agency that substantially modify the intent of the design will be discussed with the agency prior to approval by the Designer. The Designer will attend the pre-construction and progress meetings outlined in this plan. The Designer will supervise the Designer's Field Representative. The Designer is responsible for issuing a final sealed certification report that will be submitted to FDEP.

2.5.3.3 Qualifications

The Designer shall be qualified, certified, or licensed as required by Florida Department of Professional Regulation. The Designer shall be familiar with geomembranes (including detailed geomembrane design methods and procedures) and all applicable regulatory requirements.

2.5.4 Designer's Field Representative

2.5.4.1 Definition

The Designer's Field Representative is an individual under the direction and supervision of the Designer.

2.5.4.2 Responsibilities

The Designer's Field Representative is responsible for observing and documenting activities related to the quality control of the production, handling, storage, and installation of the liner or final cap geomembrane system. The Designer's Field Representative is responsible for implementation of this CQA Plan and coordination of the quality control laboratory.

The specific duties of the Designer's Field Representative are as follows:

- a. Reviews all design drawing and specifications

- b. Reviews other site-specific documentation, including proposed layouts, and manufacturer's and installer's literature
- c. Develops a site-specific addendum for quality control of geomembranes (if necessary) with the assistance of the Owner's Representative
- d. Reviews all changes to design drawings and specifications as issued by the Designer
- e. Acts as the onsite (resident) representative of the Owner
- f. Attends all quality control related meetings, e.g., resolution, preconstruction, daily, weekly
- g. Reviews all Manufacturer and Installer certifications and documentation and makes appropriate recommendations
- h. Reviews the Installer's personnel qualifications for conformance with those qualifications pre-approved for onsite work.
- i. Reviews the calibration certification of the onsite tensiometer, if applicable
- j. Reviews all daily reports, logs, and photographs
- k. Notes and documents any onsite activities that could result in damage to the liner system
- l. Reports to the Owner's Representative and logs in the daily report any relevant observations
- m. Prepares a personal daily report
- n. Prepares a daily summary of the quantities of geomembranes installed that day
- o. Prepares the weekly summary of the liner system quality control activities
- p. Oversees the marking, packaging, and shipping of all laboratory test samples
- q. Reviews the results of laboratory testing and makes appropriate recommendations
- r. Reports any approved and unapproved deviations from the CQA Plan to the Owner's Representative
- s. Prepares the final certification report
- t. Monitors, logs, photographs, and/or documents all geomembrane installation operations. Takes routine photographs in critical areas during the installation sequence
- u. Monitors the following operations for all lining system materials:
 - 1) Material delivery
 - 2) Onsite unloading, transportation, and storage

- 3) Sampling for conformance testing
 - 4) Deployment operations
 - 5) Joining and/or seaming operations
 - 6) Condition of panels as placed
 - 7) Visual inspection by walkover
 - 8) Repair operations
- v. Monitors and documents the geomembrane seaming operations, including:
- 1) Trial seams
 - 2) Seam preparation
 - 3) Seaming
 - 4) Nondestructive seam testing
 - 5) Sampling for destructive seam testing
 - 6) Photographs of all destructive seam testing with clear identification marks
 - 7) Appropriate log for seaming and patching destructive testing
 - 8) Field tensiometer testing
 - 9) Laboratory sample marking
 - 10) Repair operations

2.5.4.3 Qualifications

Designer's Field Representative shall be experienced in the implementation and preparation of quality control documentation including quality control forms, reports, certifications, and manuals.

The Designer's Field Representative shall have at least 3 years of experience in geomembrane installation.

2.5.5 Installer

2.5.5.1 Definition

The Installer is the firm responsible for installation of the geomembrane. In the context of this plan, the Installer is the Manufacturer or an approved Installer trained and certified to install the Manufacturer's geomembrane.

2.5.5.2 Responsibilities

The Installer shall be responsible for the field handling, storing, deploying, seaming, and temporary restraining of the geomembranes, as well as other aspects of installation.

2.5.5.3 Qualifications

The Installer shall be certified to install the Manufacturer's geomembrane material. The Installer shall be pre-qualified and approved by the Owner's Representative. The Installer shall be able to provide qualified personnel to meet the demands of the project. The Installer shall be required to provide a Field Installation Manager, Installation Supervisor, and a Master Seamer as described below.

2.5.5.4 Submittal

Pre-qualification. To be considered for pre-qualification, the Installer shall submit the following information:

- a. Corporate background and information
- b. Description of installation capabilities:
 - 1) Information on equipment (numbers and types) and personnel (number of site managers, number of crews)
 - 2) Average daily production anticipated
 - 3) Samples of field geomembrane seams and a list of minimum values for geomembrane seam properties
- c. A list of at least five completed facilities, totaling a minimum of 10,000,000 SF for which the Installer has installed geomembranes. For each installation, the following information shall be provided:
 - 1) Name and purpose of facility, its location, and date of installation
 - 2) Name of owner, project manager, designer, manufacturer, fabricator (if any), and name of contact at the facility who can discuss the project
 - 3) Name and qualifications of the Supervisor(s) of the Installer's crew(s)
 - 4) Type of geomembrane and surface area installed
 - 5) Type of seaming and type of seaming apparatus used
 - 6) Time required for installation
 - 7) Available information on the performance of the lining system and the facility
- d. The Installer's quality control manual
- e. A copy of a letter of recommendation supplied by the geomembrane manufacturer

Pre-installation. Prior to commencement of the installation, the Installer must submit to the Designer's Field Representative:

- a. Resumé of the Supervisor to be assigned to this project, including dates and duration of employment.

- b. Resumé of the Field Installation Manager and Master Seamer to be assigned to this project, including dates and duration of employment.
- c. A panel layout drawing showing the installation layout identifying field seams as well as any variance or additional details which deviate from the engineering drawings. The layout shall be adequate for use as a construction plan and shall include dimensions, details, etc.
- d. Installation schedule.
- e. A list of personnel performing field seaming operations along with pertinent experience information.
- f. All geomembrane quality control certificates as required by this CQA Plan (unless submitted directly to the Designer's Field Representative by the Manufacturer).
- g. Certification that extrudate to be used is composed of the same resin as the geomembrane to be used.

Installation. During the installation, the Installation Supervisor shall sign, and be responsible for the submission of subgrade surface acceptance certificates for each area to be covered by the lining system. (Sample appears in Section 6 of this plan.)

Completion. Upon completion of the installation, the Installer shall submit:

- a. The warranty obtained from the Manufacturer.
- b. The installation warranty.

2.5.6 Field Installation Manager

2.5.6.1 Definition

The Field Installation Manager is the individual provided and assigned by the Installer to be the Field Representative. Depending on the size and type of the job, the Field Installation Manager's and the Installation Supervisor's positions can be held by the same individual.

2.5.6.2 Responsibilities

The Field Installation Manager is responsible for providing guidance and supervision to the installation crew to ensure that the geomembrane is installed in accordance with the manufacturer's guidelines and the project drawings and specifications. The Field Installation Manager is responsible for conducting all the required field testing and coordinating, and reporting all conflicts to the Contractor's Representative and the Designer's Field Representative. The Field Installation Manager is responsible for attending all related project meetings.

2.5.6.3 Qualifications

The Field Installation Manager must possess related experience, management ability, and authority. The Field Installation Manager's experience shall include managing the installation of at least 2,000,000 square feet SF of geomembrane using the same type of seaming apparatus to be used at the site.

2.5.7 Installation Supervisor

2.5.7.1 Definition

The Installation Supervisor is the individual provided and assigned by the Installer to be the Installer's Field Representative.

2.5.7.2 Responsibilities

The Installation Supervisor is responsible for coordinating the seaming and installation of the geomembrane and for providing supervision and guidance to the installation crew. The Installation Supervisor shall obtain samples for field testing and coordinate testing activities with the Contractor's Representative, Field Installation Manager, and Designer's Field Representative. The Installation Supervisor should keep a daily log of all activities related to geomembrane installation and testing, and attend all related project meetings.

2.5.7.3 Qualifications

The Installation Supervisor must possess related experience, management ability, and authority. The Installation Supervisor's experience shall include supervising the installation of at least 2,000,000 SF of geomembrane using the same type of seaming apparatus to be used at the site.

2.5.8 Master Seamer

2.5.8.1 Definition

The Master Seamer is the individual assigned by the Installer to conduct seaming operations of the geomembrane.

2.5.8.2 Responsibilities

The Master Seamer is responsible for seaming the geomembrane in accordance with the Manufacturer's guidelines and the project drawings and specifications. The Master Seamer is responsible for maintaining a top-quality seaming product free from defects and irregularities. The Master Seamer is responsible for reporting seaming problems and defects to the Field Installation Manager and Installation Supervisor.

2.5.8.3 Qualifications

The Master Seamer shall be a qualified individual who has previous experience in seaming geomembranes. The Master Seamer shall provide documentation of experience seaming a minimum of 500,000 SF of geomembranes using the same type of seaming apparatus to be used at the site.

2.5.9 Manufacturer

2.5.9.1 Definition

The Manufacturer is the firm or corporation responsible for production of the geomembrane material to be used in the project.

2.5.9.2 Responsibilities

Each Manufacturer is responsible for the production of its geomembrane. In addition, each Manufacturer is responsible for the condition of the geomembrane until the material is accepted by the Owner or Designer's Field Representative upon delivery. Each

Manufacturer shall produce a consistent product meeting the project specifications and shall provide quality control documentation for the project and its product as specified in this CQA Plan.

2.5.9.3 Qualifications

Prior to shipment of any material, each Manufacturer shall be pre-qualified by the Owner's Representative. Each Manufacturer shall provide sufficient production capacity and qualified personnel to meet the demands of the project. Each Manufacturer shall have internal quality assurance and control programs for its product that meets the specified requirements.

Pre-qualifications. Each Manufacturer shall meet the following requirements and submit the following information to be considered for pre-qualification:

- a. Corporate background and information.
- b. Manufacturing capabilities:
 - 1) Information on plant size, equipment, personnel, number of shifts per day, and capacity per shift.
 - 2) A list of material properties including certified test results, to which are attached geomembrane samples.
 - 3) Documentation indicating 50,000,000 SF of production of geomembranes with similar properties to the geomembrane used for the proposed closure project.
 - 4) A list of at least 10 completed landfill or surface impoundment facilities totaling a minimum of 5,000,000 SF for which the Manufacturer has manufactured the geomembrane. For each facility, the following information shall be provided:
 - a) Name and purpose of facility, its location and date of installation
 - b) Name of owner, project manager, designer, fabricator (if any) and installer
 - c) Type of geomembrane and the surface area of installed geomembrane
 - d) Available information on the performance of the lining system and the facility
- c. The Manufacturer's quality control manual, including a description of the quality control laboratory facilities.
- d. The Manufacturer's field installation quality control manual. As a minimum, the manual shall contain procedures and recommendations for the following:
 - 1) Geomembrane deployment

- 2) Field panel placement
 - 3) Geomembrane field seaming
 - 4) Seam testing (destructive, non-destructive for field and laboratory settings)
 - 5) Repair of defects
- e. The origin (supplier's name and production plant) and identification (brand name and number) of resin used to manufacture the product.

Pre-installation. Prior to the installation of any geomembrane, each Manufacturer must submit to the Designer's Representative all quality control documentation required by the appropriate section of this CQA Plan. This documentation shall be reviewed and approved by the Designer's Representative before installation can begin.

2.5.10 Quality Control Consultant Laboratory

2.5.10.1 Definition

The Quality Control Laboratory is a firm, independent from the Owner's Representative, Contractor, Manufacturer, and Installer, responsible for conducting tests on samples of geomembranes taken from the site.

2.5.10.2 Responsibilities

The Quality Control Laboratory shall be responsible for conducting the appropriate laboratory tests as directed by the Designer's Field Representative and the project drawings and specifications. The test procedures shall be done in accordance with the test methods outlined in this CQA Plan. The Quality Control Laboratory shall be responsible for providing tests results as outlined in the Plan.

2.5.10.3 Qualifications

The Quality Control Laboratory shall have at least 10 years of experience in testing geomembranes and be familiar with American Society for Testing and Materials (ASTM), Federal Test Method Standards (FTMS), National Sanitation Foundation (NSF) and other applicable test standards. The Quality Control Laboratory shall be capable of providing verbal results of destructive seam tests within 24 hours of receipt of test samples and shall maintain that schedule throughout the installation.

2.5.10.4 Submittals

The Quality Control Laboratory shall submit all destructive seam test results to the Designer's Field Representative in written form within 48 hours of receipt of test samples unless otherwise specified by the Owner. Geomembrane destructive test results shall be provided verbally to the Designer's Field Representative within 24 hours of receipt of test samples. Written test results shall be in an easily readable format and include references to the standard test methods used.

2.5.11 Quality Control Technician

2.5.11.1 Definition

The Quality Control Technician is a qualified individual provided by the Quality Control Laboratory. The Quality Control Technician shall be present on site throughout the duration of construction.

2.5.11.2 Responsibilities

The Quality Control Technician is responsible for obtaining all necessary samples that require field and/or lab testing. The Quality Control Technician is responsible for conducting, observing, and recording all of the required field testing. The Quality Control Technician shall supervise the installation and sampling procedures conducted by the Contractor and report all activities to the Designer's Field Representative. The Quality Control Technician shall not deviate or allow the Contractor to deviate from the drawings and specifications without the approval of the Designer's Field Representative.

2.5.11.3 Qualifications

The Quality Control Technician shall have at least 5 years of similar previous experience in the construction and installation of geomembranes including experience with the type of geomembrane used at the site.

Coordination and Scheduling

3.1 Coordination Meetings

A meeting should take place at least once prior to commencing each of the following activities: submission of submittals, fabrication of panels and boots, and installation of geomembranes. Attendees should include the Contractor's designated quality control representative, the Engineer, representatives of the geomembrane Installer, and others requested by the Engineer.

The topics that should be addressed include specifications and drawings; submittal requirements and procedures; schedules for beginning and completing geomembrane installation; training for installation personnel; installation crew size; and the establishment of a geomembrane marking system to be used throughout the project, which includes sheet identification, defects, and satisfactory repairs.

The meetings should include a seam installation demonstration performed by the geomembrane Installer, for each type of seam required.

3.2 Delivery, Storage, and Handling

The procedures should conform to the following requirements: each sheet of geomembrane should be individually packaged and protected from damage during shipment; mark each package with identification of material type, size and weight.

3.3 Environmental Requirements

Do not install geomembrane or perform seaming when the air temperature is less than 35°F and decreasing, or more than 90°F; the relative humidity is more than 90 percent; when it is raining or snowing; when frost is on the ground; or when the wind is excessive. Do not place granular materials on geomembrane when ambient temperature is less than 35°F or more than 104°F.

3.4 Sequencing and Scheduling

Factory test results must be acceptable to the Engineer prior to shipping the geomembrane. Before placing the geomembrane on soil surfaces, prepare subgrade as specified. Do not attach geomembrane to new concrete surfaces until after concrete has attained 2/3 of the design compressive strength specified. Do not place geomembrane over concrete surfaces until finish of concrete surfaces is acceptable to Engineer.

SECTION 4.0

Material Specifications

(62-701.400(3) (e) (2) FAC

4.1 HDPE Geomembrane

The composition of the HDPE geomembrane must contain no plasticizers, fillers, extenders, reclaimed polymers, or chemical additives, except approximately 2 percent by weight of carbon black to resin for ultraviolet resistance. Antioxidants and heat stabilizers, not to exceed 1.5 percent total by weight, may be added as required for manufacturing.

The geomembrane shall be furnished in rolled, single-ply continuous sheets with no factory seams. The sheets shall have a thickness of 60 mils and a minimum width of 22 feet. The rolls shall be as long as possible without affecting manageability or adding field seams. The geomembrane must meet manufacturer's most recent published specifications and required minimum values in this table.

Property	Required Value	Test Method
Specific Gravity	0.941 to 0.936, g/cc; not more than 15% greater than base resin density	ASTM D792 , Method A-1 or ASTM D-1505
Minimum Properties, Each Direction		
Tensile Stress at Yield	2.2 lb/in-width/mil thickness	ASTM D638-90
Elongation at Yield	12% plus or minus 3%	
Thickness, mils	60 mils plus or minus 5%	ASTM D5199-91
Puncture Resistance	1.25 lb/mil thickness	ASTM D4833
Tear Resistance	0.75 lb/mil thickness	ASTM D1004, Die C
Modulus of Elasticity	90,000 lb/in ²	ASTM D882-90, Method A or ASTM D-638
Maximum Vapor Transmission Rate	0.24 g/(m ² x day)	ASTM E96-60
Bonded Seam Strength in Shear	2 lb/in-width/mil thickness, min. and FTB	ASTM D 816 Method B, Modified by N.S.F. Standard 54, part 3 or ASTM D-6392
Bonded Seam Strength in Peel	1.2 lb/in-width/mil thickness, min. and FTB	ASTM D 6392 Method A, and FTB

Extrudate for fusion welding of HDPE geomembranes shall be formulated from the same HDPE resin as the geomembrane and shall meet applicable physical property requirements.

4.2 Linear Low Density Polyethylene (LLDPE) Geomembrane

The composition of the LLDPE membrane must contain no plasticizers, fillers, extenders, reclaimed polymers, or chemical additives, except approximately 2 percent by weight carbon black to resin for ultraviolet resistance. Antioxidants and heat stabilizers, not to exceed 1.5 percent total by weight, may be added as required for manufacturing.

The geomembrane shall be furnished in rolled, single-ply continuous sheets with no factory seams. The sheets shall have a thickness of 40 mils and a minimum width of 22 feet. The rolls shall be as long as possible without affecting manageability or adding field seams. The geomembrane must meet manufacturer's most recent published specifications and required minimum values in this table.

Property	Required Value	Test Method
Color	Black, standard	None
Thickness, mils.	40 mil \pm 5%	ASTM D5199-91
Specific Gravity, max.	0.939, g/cc	ASTM D1505-
Environmental Stress Crack, min.	1,500 hours	ASTM D1693-70, Condition C (1000 C)
Low Brittleness Temperature	Minus 760 F, pass	ASTM D746-79 (Proc. B)
Tensile Strength, min.	60 lb/in-width	ASTM D638-90, Type IV, 2-inch min.
Ultimate Elongation, min.	250%	ASTM D638-90, Type IV, 2-inch min.
Tear Resistance	0.45 lbs./mil	ASTM D1004-90, Die C
Dimensional stability, linear change, maxes.	plus/minus 3%	ASTM D1204-84, 2120 F, 1-hour

4.3 Geonet

The geonet shall have the following minimum properties when measured in accordance with the referenced standard:

Property	Required Value	Test Method
Roll Length (typical)	300 ft.	
Roll Width (typical)	14 ft.	
Roll Weight (typical)	840-1000 lbs.	
Specific Gravity (g/cm ³ minimum)	.94	ASTM D1505
Melt Flow Index (g/10 minutes) (maximum)	0.3	ASTM D1238 Condition E
Thickness (minimum)	7.6-8.9 mm 300 mil-350 mil .300-.350 in.	ASTM D374 at Strand Intersection
Percent Carbon Black (minimum)	2%	ASTM D4218
Transmissivity (minimum)	4 X 10 ⁻³ m ² /s, See Technical Specification.	ASTM D4716, under 1000 psf compressive load between 40-mil LLDPE geomembrane and protective layer soils at 0.25 Gradient.

4.4 Geotextile

Geotextile shall be a pervious sheet of polyester, polyethylene, nylon, or polypropylene filaments, woven or nonwoven, and formed into a uniform patten. The geotextile shall have the following minimum properties when measured in accordance with the referenced standard:

Property	Test Method	Value
Grab Tensile, lbs./, (minimum)	ASTM D4632	280
Mullen Burst, psi (minimum)	ASTM D3786	150
Puncture, lbs., (minimum)	ASTM D6241	35
Permittivity, l/sec (minimum)	ASTM D4491	0.5
Apparent Opening Size, mm (maximum)	ASTM D4751	0.45
Weight oz/yd ² Min.	ASTM D5261	5.6 for nominal 6 oz.

4.6 Factory Testing

When using a rough-surface geomembrane, the following procedure must be followed: Perform coefficient of friction tests between the geomembrane and the actual materials that will be in contact with it, using samples of similar length and width. Soil at geomembrane interface should be consolidated-undrained material.

Installation Specifications

(62-701.400(3) (e) (4) FAC

5.1 HDPE and LLDPE Geomembrane

5.1.1 Welding Units

Single or double hot-wedge fusion seam welding is acceptable. Hot-air welding is not acceptable. Extrusion welding is acceptable only in locations where hot wedge fusion is impossible.

5.1.2 Tensiometer for Field Testing

The tensiometer for field testing must be: motor-driven with jaws capable of traveling at measured rate of 2 inches per minute; equipped with a gauge which measures force in unit pounds exerted between the jaws. The Force Tech 5002 DPR portable tensile tester as furnished by Columbine International, Ltd., Placerville, CA, is recommended.

5.1.3 Vacuum Box for Weld Testing

The housing shall be rigid with a transparent viewing window on top; a soft, close-cell neoprene gasket attached to bottom; and a bleed valve. The vacuum source must be separate and connected to the vacuum box so negative pressure can be applied and maintained inside box.

- Manufacturer and Product: American Parts and Service Co., Alhambra, CA; American Vacuum Seam Tester, Series A100.

5.1.4 High Voltage Spark Detector

The preferred model is the Tinker and Razor Holiday Detector, Model AP-W, set at 20,000 volts.

5.1.5 Preparation

Do not place geomembrane until condition of previously installed underlying materials has been formally accepted by Designer. Maintain subgrade in smooth, uniform, and compacted condition during installation of geomembrane.

Concrete surfaces in contact with geomembrane shall be smooth, free of projections, rough spots, voids, honeycombs, or other irregularities. Uneven concrete surfaces to which geomembrane is to be attached, should be ground until flat and smooth. Round edges should have a minimum 1/2-inch radius. Surfaces should be sandblasted clean and be free of dirt, dust, oil, curing compounds, and other coatings.

Prior to starting geomembrane installation, and daily thereafter for installation on subgrade, geomembrane installer shall certify in duplicate that the surface(s) upon which geomembrane shall be installed is acceptable, on form located in Section 6 of this plan.

5.1.6 Geomembrane Installation

When geomembrane is being unwrapped, it should be visually inspected and each imperfection marked for repair. To protect the geomembrane during installation, its surfaces should not be used as work areas for preparing patches, storing tools and supplies, or other uses. Use the protective cover as work surface, if necessary.

Workers shall be instructed about requirements for protection of the geomembrane, such as handling geomembrane material in high winds, handling equipment, and walking on geomembrane surfaces. The shoes of personnel walking on geomembrane shall have smooth-bonded soles or be covered with a smooth type of overboot. Smoking, eating, or drinking in vicinity of geomembrane, placing heated equipment directly on geomembrane, or other activities that may damage geomembrane shall be strictly prohibited.

Equipment lacking spark arrestors shall not be operated in the vicinity of geomembrane material, nor shall generators or containers of flammable liquids be placed on geomembranes.

The geomembranes shall be protected from vehicle traffic and other hazards, and kept clean and free of debris during placement. Care should be taken to prevent uplift, displacement, and/or damage by wind.

Each miscellaneous product required for completion of geomembrane installation shall be of the recommended types and sizes, and installed in strict accordance with geomembrane Manufacturer's recommendations. Field seaming should be kept to a minimum. Horizontal seams on slopes will not be acceptable. Seams parallel to toe shall be at least 5 feet from toe. Rough-sided sheets shall be aligned in a manner that maximizes their frictional capabilities along slope.

Care must be taken to prevent wrinkles, folds, or other distress that can result in damage or prevent satisfactory alignment or seaming; and to provide for factors such as expansion, contraction, overlap at seams, anchorage requirements, seaming progress, and drainage. Sheets should be temporarily weighted with sandbags as necessary to anchor or hold them in position during installation. Continuous hold-downs along edges will reduce wind flow under sheet.

Sandbag fabric shall be sufficiently close knit to preclude fines from working through bags. Bags shall contain not less than 40 or more than 60 pounds of sand having 100 percent passing No. 8 screen and shall be securely closed after filling to prevent sand loss. Burlap bags, if used, shall be lined with plastic. Tires and paper bags, even those lined with plastic, shall not be used. Damaged or improperly sealed bags must be removed immediately from work area; spills must be cleaned up immediately.

The perimeter of the geomembrane shall be anchored as instructed, or as otherwise approved in writing by Designer. Geomembrane shall be anchored and sealed to structures, pipes, and other types of penetrations. Overlying soil cover shall be placed immediately

following completion of geomembrane installation and field testing as acceptable to Designer.

5.1.7 Field Seams

Sheet contact surfaces shall be wiped clean to remove dirt, dust, moisture, and other foreign materials, and prepared in accordance with seaming method accepted by Designer.

Sheet edges must be lapped to form seams to join geomembrane sheets together. Edges to be seamed should be adjusted and temporarily anchored to prevent wrinkling and shrinkage. Seams shall not go through a boot. Locate seams a minimum of 2 feet from boot. Seam intersections involving more than three thicknesses of geomembrane material should be avoided. Offset seam intersections at least 2 feet. Extend seams through anchor trench to sheet edges.

For boots and seams on HDPE membranes that cannot be otherwise tested, insert copper wire for spark test at edge of overlapping sheet in extrudate of weld prior to fillet welding. Position to within 1/8 inch of sheet edge. Seam sheets together, using fusion-extrusion or hot-wedge welding system, equipment, and techniques.

In areas where field seams have to be capped, cap field seams using 8-inch wide (minimum) cover strip of same thickness as geomembrane (and from same roll, if available). Position strip over center of field seam and weld to geomembrane using fillet weld each side, including copper wire as described above for spark testing.

5.1.8 Geomembrane Attachment to Flat Concrete Surfaces

Install concrete anchors in accordance with anchor manufacturer's written instructions, and using manufacturer's drills and equipment. Position and fit geomembrane to be free of wrinkles at locations of attachment. Tighten anchor bolt nuts to uniformly deform rubber pad beneath battens 12 to 15 percent of total thickness of rubber pad to obtain watertight connection of geomembrane to concrete surface.

5.1.9 Manufacturer's Services

A representative of the geomembrane Manufacturer shall be on site for technical assistance during installation of geomembrane system, during inspection of geomembrane prior to installation, during preparation and inspection of surfaces on which geomembrane is to be placed, and during placement of soil cover or other products over installed geomembrane.

5.1.10 Protection of Work

Any part of the geomembrane surface showing injury due to scuffing, penetration by foreign objects, or distress from rough subgrade shall be replaced or covered and sealed with an additional layer of geomembrane material of proper size.

5.1.11 Field Quality Control

Field seam sampling shall be performed to verify that seaming equipment and operators are performing adequately. Samples should be taken at beginning of each shift for each seaming crew. In addition, if seaming has been suspended for more than 1/2 hour, or if breakdown

of seaming equipment occurs, take test seam samples prior to resuming seaming. Sample sizes shall be 12 inches wide plus seam width, and 30 inches long.

Nondestructive sampling should also take place at the following frequency: a minimum of one sample per 500 feet of field seam, and a minimum of one sample per seaming crew per 4-hour work period. Produce samples using same materials, equipment, personnel, and procedures as field seams made at time of work in progress and under the same conditions.

Destructive sampling frequency should be determined by Designer. Samples should be removed from field seams at locations selected by Designer. Repair field seams in accordance with repair procedures outlined in the specifications.

Each sample shall be numbered, dated, and identified as to the personnel making seam and location of sample or location of field seam work in progress at time the sample is taken. Location of the sample or location of the field seam in progress should be marked, at the time sample is made, on panel/sheet layout drawing.

In general, sampling should conform to ASTM D4437 and the specifications. Seam testing includes strength tests, vacuum box testing, high voltage spark tests, air channel pressure tests, and probing.

Specifically, field seam strength sample testing should include:

- Testing each sample for seam peel and tensile strength
- Saving test samples, including specimens tested, until notified by Designer regarding their disposal
- Shipping to the Designer, by express delivery, each sample that fails testing in order to determine the corrective measures required.

An acceptable field seam criterion is seam strength equal to 90 percent of that of parent material. Parent material shall be tested in accordance with ASTM D638-90.

The bonded shear strength of HPDE should be measured accordingly:

- In shear: Minimum 2 pounds/inch width/mil thickness as determined in accordance with ASTM D4437-84/D882-90, Method a (Modified).
- In peel: Minimum 1.5 pounds/inch width/mil thickness as determined in accordance with ASTM D4437-84/D413-82, Method A.

If a sample fails, the entire field seam from which it was taken shall be considered a failure and shall be rejected due to nonconformance with specification requirements. The following corrective measures should be implemented:

- For nondestructive sample failure, rerun the field weld test using the same sample. If that test passes, the Designer may assume an error was made in first test and accept the field seam. If the second test fails, cap each field seam represented by failed sample and submit a new test sample made during capping procedure.
- For destructive sample failure, rerun field weld test using new sample from same seam. If that test passes, the Designer may assume an error was made in first test and accept

field seam. If the second test fails, either cap the field seam between any two previous passed seam test locations that include the failed seam or take another sample on each side of failed seam location (10-foot minimum), and test both. If both pass, cap field seam between the two locations. If either fails, repeat the process of taking test samples. Each field seam shall be bounded by two passed test locations prior to acceptance.

For in-place observation and testing, geomembrane sheets, seams, anchors, seals, and repairs shall be visually inspected for defects as installation progresses, and again on completion. Depending on the seam welding equipment used, test all seams and repaired seams using a vacuum testing device, spark testing device, and/or air channel pressure test for double-wedge welded seams. Defective and questionable areas should be clearly marked and repaired to the Designer's satisfaction. All areas showing injury due to scuffing, penetration by foreign objects or distress from rough subsurface shall be replaced or covered with an additional layer of geomembrane material. Testing must be performed in the presence of the Designer.

Vacuum box testing (HDPE and VLDPE welds) includes a test of fillet, extrusion lap, and single hot-wedge fusion lap welds. Testing procedures should conform to ASTM D4437-84.

During high voltage spark testing of fillet welds, provide each seam to be tested with copper wires properly embedded in seam and with provisions for electrical grounding to test equipment. Test procedures should conform to ASTM D4437-84.

Air channel pressure testing of double hot-wedge seam should be performed accordingly:

- Insert needle with gauge in air space between welds. Pump air into space to 30 psi and hold for 5 minutes.
- At end of 5 minutes, depressurize seam by placing needle hole in air space between welds at opposite end of seam and observe gauge.
- If seam maintains at least 27 psi during 5-minute hold and pressure drops within 30 second of puncture, seam is acceptable.
- If pressure drops below 27 psi during test period, or does not drop during 30-second depressurization period, repair needle holes with extruded HDPE and retest segments by same procedure. If seam maintains a minimum of 27 psi, seam is acceptable.
- If second air pressure test fails, cap the seam and test the capped seams using vacuum box.
- If leak is judged to be in bottom seam, cap strip length of seam tested will be accepted.
- Mark and repair needle holes.

5.1.12 Repairing Geomembrane

Repair damage or rejected seams with pieces of flat and unwrinkled geomembrane material free from defects and seams. Patches shall be tightly bonded on completion of repair work. Patch shall be neat in appearance and 6 inches larger in all directions than areas to be repaired. Round corners of each patch to minimum 1-inch radius. Prepare contact surfaces and seam patch in accordance with field seams:

- Gently pull and hold flat receiving surface in area to be patched.
- Fully bond patches less than 12 inches in narrowest plan dimension across their entire width.
- Seam each patch more than 12 inches across in narrowest dimension with minimum bonded width of 6 inches along edge, with no free edge remaining.

5.1.13 Record Data

At minimum, identify each test by date of sample, date of test, sample location, name of individual who performed test, standard test method used, and departures from standard test methods. Include identification and location of repairs, cap strips, penetrations, and areas selected for destructive test samples on record drawings.

5.1.14 Cleanup

Areas should be cleaned as work proceeds, taking particular care to ensure that no trash, tools, and other unwanted materials are trapped beneath geomembrane, and that scraps of geomembrane material are removed from work area prior to completion of installation.

5.1.15 Placing Products over Geomembrane

Notify the Designer prior to placing material over geomembrane. Do not cover installed geomembrane until after Designer provides authorization to proceed. If tears, punctures, or other geomembrane damage occurs during placement of overlying products, remove overlying products as necessary to expose damaged geomembrane, and repair damage as specified. Geomembrane Installer shall remain available during placement of overlying products to repair geomembrane if damaged.

5.2 Geonet

5.2.1 Installation of Geonet

Care shall be taken to keep the geonet clean and free from debris prior to installation. If the geonet is not clean, it should be washed prior to installation.

The geonet in such a manner as to ensure that it is not damaged in any way, and the following shall be compiled with during installation:

- On slopes, the geonet shall be secured and rolled down the slope in such a manner as to continually keep the geonet sheet in tension. If necessary, the geonet shall be positioned by hand after being unrolled to minimize wrinkles.
- In the presence of wind, all geonet shall be weighted with sandbags or by other means. Such sandbags shall be installed during placement and shall remain until replaced with cover material.
- Geonet shall only be cut using scissors or other cutting tools approved by the manufacturer.

- During placement of geonet, care shall be taken not to entrap in the geonet dirt or excessive dust that could cause clogging of the geonet system.
- Adjacent rolls shall be overlapped by at least 4 inches.
- Overlaps shall be secured by tying. Tying can be achieved by plastic fasteners or polymer braid. Tying devices shall be white or yellow for easy inspection. Metallic devices are not allowed.
- No horizontal seams shall be allowed on side slopes.
- In the corners of the side slopes where overlaps between perpendicular geonet strips are required, an extra layer of geonet shall be unrolled along the slope, on top of the previously installed geonet from top to bottom of the slope.
- When more than one layer of geonet is installed, joints shall be staggered.

5.2.2 Field Quality Control of Geonet

Two duplicate documentation files for panel placement shall be maintained. One shall be maintained by the Installer and the other by the Designer. At the end of each work week, the files shall be updated and checked to assure that all copies of pertinent project information are included in each file. The Installer shall submit daily copies of the documentation to the Designer.

Any holes or tears in the geonet shall be repaired by placing a patch extending 1-ft beyond the edges of the hole or tear. The patch shall be secured to the original geonet by placing ties every 6 inches.

SECTION 6.0

List of Installation/Documentation Forms (62-701.400 (7) (b) (5) FAC)

The CQA Consultant will provide the installation and documentation forms for each project. Installer installation forms may be used after review and approval of CQA Consultant. Forms shall include but not be limited to the following:

Daily Field Report-CQA Consultant

Certificate of Subbase Acceptance- CQA Consultant (Daily)

Geomembrane Placement Log-Installer (Daily)

Geomembrane Seaming Log-Installer (Daily)

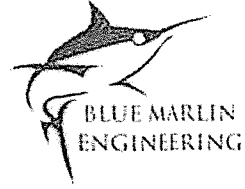
Non- Destructive Test Log-Installer (Daily)

Destructive Test Log-Installer (Daily)

Geomembrane Repair Log-Installer (Daily)

Trial Weld Log-Installer (Daily)

Attachment C
Excerpts from Geotechnical Report in Support
of Permit Application for Operations and
Closure of Cells 9-12 Class I Landfill,
Orange County, Florida



Technical Memorandum

Geotechnical Update for Phase I Closure of Cells 9 and 10 of the Southern Expansion Site.

FROM: Blue Marlin Engineering, Inc.

DATE: March 17, 2014

Blue Marlin Engineering, Inc. (BME) is pleased to present this Technical Memorandum for the above referenced project. This study was performed in general accordance with our Proposal No. 14-001 dated January 16, 2014.

We previously submitted a Technical Memorandum entitled Geotechnical Update for Phase I Closure of Cells 9 and 10 of the Southern Expansion Site, dated October 18, 2013. The purpose of the additional work for this subtask was to perform additional foundation and side slope stability analysis. It is our understanding that a side-slope configuration for cells 10-12 is being considered from a 20 feet rise and 20 feet set back to a 30 feet rise and 20 feet set back.

Objective

Orange County Solid Waste Division is preparing the Phase I closure permit for Cells 9 and 10 of the Southern Expansion Site (SES) located on Young Pine Road. This geotechnical update is based on the 2000 geotechnical investigation used for development of the solid waste disposal units located in the Southern Expansion Site. The scope of this update is limited to a global stability analysis evaluating the major slip surfaces for Cells 9 through 12 adjacent to ponds 5, 7, and 8. These ponds were not included in the global stability analysis performed for the original geotechnical investigation.

In addition to updating the global stability analysis, bulk samples of fill soils from an onsite area and an offsite borrow pit were obtained for interface friction testing. The testing was performed to determine the friction value between the soils and the potential geomembrane materials to be used in the cell closure. The results of the friction interface analysis are summarized herein and appended at the end of this report.

Project Description

The Southern Expansion Site is located off of Young Pine Road in Sections 21 and 28, Township 21 South and Range 31 East of Orange County, Florida. The northern border of the Southern Expansion Site and Cell 9 is located south of Young Pine Road. Cells 10 through 12 are located south of Cell 9. The SES makes a dog leg to the southeast at Cell 11. It is at this point the top elevation of the landfill decreases from the transition of Cell 11 to

below. The STABL for Windows 3 computer generated **printouts** are included in the Appendix.

Cross-Section	Analysis Type	Minimum Factor of Safety
Cells 9-10, Pond 5	Bishop	2.3
Cells 9-10, Pond 5	Janbu	2.1
Cells 11-12, Pond 8	Bishop	2.5
Cells 11-12, Pond 8	Janbu	2.2
Cells 12, Borrow Pit Area	Bishop	2.5
Cells 12, Borrow Pit Area	Janbu	2.2
Cell 10, Pond 7	Bishop	2.3
Cell 10, Pond 7	Janbu	2.1

Interface Friction Test Results

The shear resistance between a geosynthetic and soil can be determined by placing the geosynthetic and one or more contact surfaces, such as soil, within a direct shear box. A constant normal force representative of design stresses is applied to the specimen and a tangential (shear) force is applied to the apparatus so that one section of the box moves in relation to the other section. The shear force is recorded as a function of the horizontal displacement of the moving section of the shear box. The test is performed at a minimum of three different normal stresses to model appropriate field conditions. The limiting values of shear stresses are plotted against the applied normal compressive stresses used for testing. The test data are generally represented by a best fit straight line whose slope is the coefficient of friction between the two materials where the shearing occurred. The y-intercept of the straight line is the adhesion.

Four interface friction tests were performed for this study. The interface friction tests were performed by TRI/Environmental, Inc, in general accordance with ASTM D-5321.

In order to facilitate testing, representatives from BME obtained bulk soil samples from an onsite area (southern borrow area) and soils collected from an offsite borrow pit (Bithlo Borrow Pit). BME conducted modified Proctor tests on the bulk samples. The modified Proctor test results are appended to this report.

The interface friction test results are summarized in the Table below and appended to this report.

Sample Number	Friction Angle (degrees)	Coefficient of Friction
Southern Borrow Soil vs. GSE Double Sided Geocomposite	38.1	0.681 psf
Southern Borrow Soil vs. GSE 40 mil LLDPE Textured Geomembrane	29.7	0.504 psf
GSE Double-Sided Geocomposite vs GSE 40 mil LLDPE Textured Geomembrane	26.0	0.433 psf
Offsite Pit Sand vs. GSE 40 mil LLDPE Textured Geomembrane	31.8	0.546 psf

Closure

BME appreciates the opportunity to be of service to you on this project and we trust that the information contained in this report is sufficient for your current needs. Should you have any questions concerning the contents of this memorandum, or if we may be of further assistance, please contact us.

Sincerely,

Blue Marlin Engineering, Inc.
 Certificate of Authorization Number 29218

Derek G. Hajjar, P.E.
 Geotechnical Project Manager
 Florida Registration No. 57470

Osciel F. Plaza, P.E.
 Senior Geotechnical Engineer
 Florida Registration No. 73262



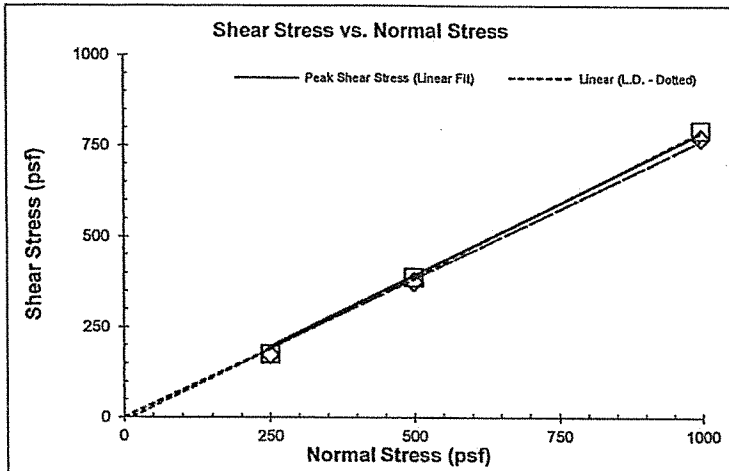
Interface Friction Test Report

Client: Terracon Consultants
Project: Orange County, Cell 9 Closure
Test Date: 10/16/13-10/17/13

TRI Log#: E2373-92-04
Test Method: ASTM D5321

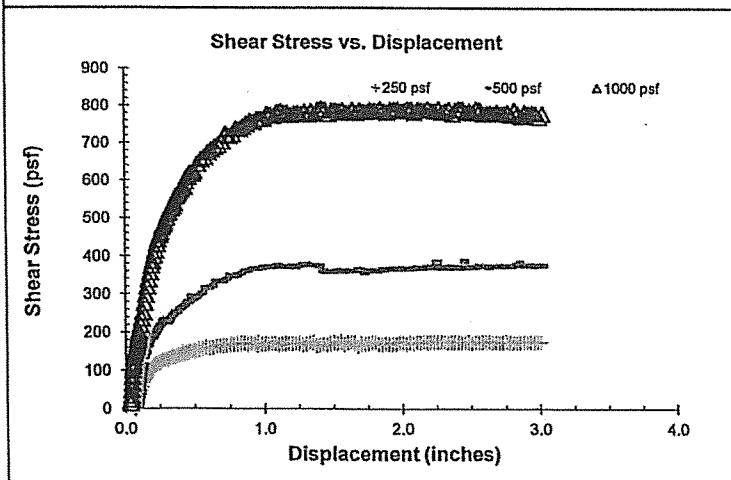
John M. Allen, P.E., 10/18/2013
Quality Review/Date

Tested Interface: Southern Borrow Soil vs. GSE Double-sided Geocomposite (131326378)



Test Results		
	Peak	Large Displacement (@ 3.0 in.)
Friction Angle (degrees):	38.1	37.4
Y-intercept or Adhesion (psf):	0	0

Shearing occurred at the interface. Peak & large displacement friction angle regression analyses were adjusted to fit a zero y-intercept.



Test Conditions	
Upper Box & Lower Box	Southern Borrow Soil remolded to 90% of maximum dry density at the optimum moisture content or 92.3 pcf at 13.0% GSE double-sided geocomposite
Box Dimensions:	12"x12"x4"
Interface Conditioning:	Interface soaked and loading applied for a minimum of 24 hours prior to shear.
Test Condition:	Wet
Shearing Rate:	0.04 inches/minute

Test Data			
Specimen No.	1	2	3
Bearing Slide Resistance (lbs)	10	13	18
Normal Stress (psf)	250	500	1000
Corrected Peak Shear Stress (psf)	176	387	792
Corrected Large Displacement Shear Stress (psf)	174	375	771
Peak Secant Angle (degrees)	35.1	37.8	38.4
Large Displacement Secant Angle (degrees)	34.8	36.9	37.6

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



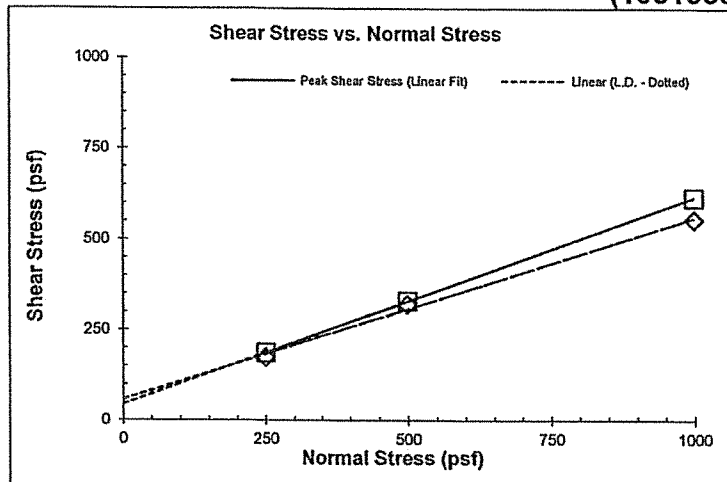
Interface Friction Test Report

Client: Terracon Consultants
 Project: Orange County, Cell 9 Closure
 Test Date: 10/15/13-10/16/13

TRI Log#: E2373-92-04
 Test Method: ASTM D5321

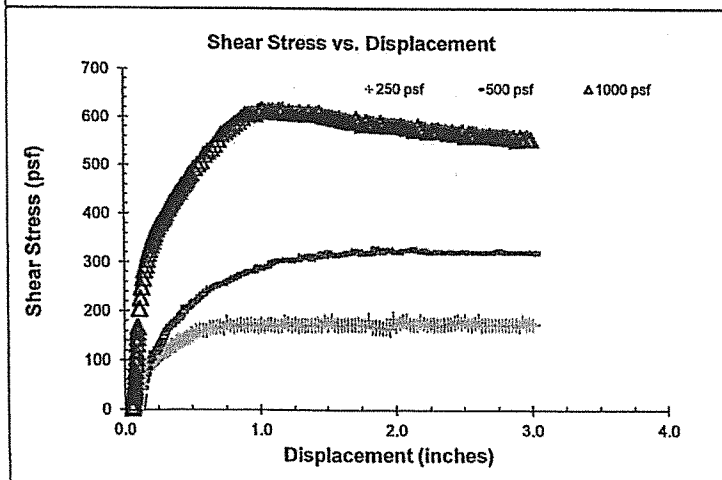
John M. Allen, P.E., 10/16/2013
 Quality Review/Date

Tested Interface: Southern Borrow Soil vs. GSE 40 mil LLDPE Textured Geomembrane (103195838)



Test Results		
	Peak	Large Displacement (@ 3.0 in.)
Friction Angle (degrees):	29.7	26.6
Y-intercept or Adhesion (psf):	44	57

Shearing occurred at the interface.



Test Conditions	
Upper Box &	Southern Borrow Soil remolded to 90% of maximum dry density at the optimum moisture content or 92.3 pcf at 13.0%
Lower Box	GSE 40 mil LLDPE textured geomembrane
Box Dimensions: 12"x12"x4"	
Interface Conditioning:	Interface soaked and loading applied for a minimum of 24 hours prior to shear.
Test Condition: Wet	
Shearing Rate: 0.04 inches/minute	

Test Data			
Specimen No.	1	2	3
Bearing Slide Resistance (lbs)	10	13	18
Normal Stress (psf)	250	500	1000
Corrected Peak Shear Stress (psf)	186	330	614
Corrected Large Displacement Shear Stress (psf)	174	321	554
Peak Secant Angle (degrees)	36.6	33.4	31.6
Large Displacement Secant Angle (degrees)	34.8	32.7	29.0
Asperity (mils)	16.2	17.2	16.8

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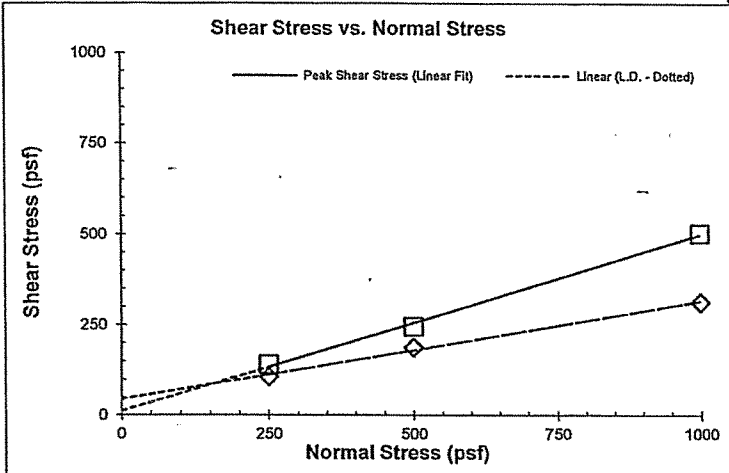
Interface Friction Test Report

Client: Terracon Consultants
 Project: Orange County, Cell 9 Closure
 Test Date: 10/11/13-10/16/13

TRI Log#: E2373-92-04
 Test Method: ASTM D5321

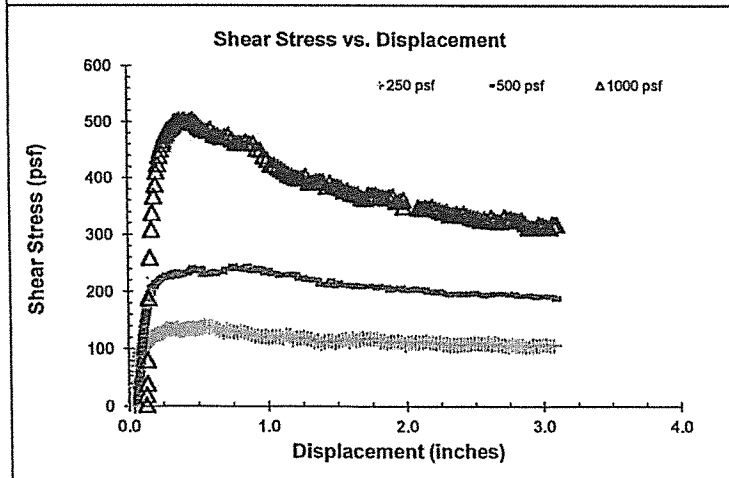
John M. Allen, P.E., 10/16/2013
 Quality Review/Date

Tested Interface: GSE Double-sided Geocomposite (131326378) vs. GSE 40 mil LLDPE Textured Geomembrane (103195838)



Test Results		
	Peak	Large Displacement (@ 3.0 in.)
Friction Angle (degrees):	26.0	15.2
Y-intercept or Adhesion (psf):	11	44

Shearing occurred at the interface.



Test Conditions	
Upper Box &	GSE double-sided geocomposite
Lower Box	GSE 40 mil LLDPE textured geomembrane
Box Dimensions:	12"x12"x4"
Interface Conditioning:	Interface soaked and loading applied for a minimum of 24 hours prior to shear.
Test Condition:	Wet
Shearing Rate:	0.04 inches/minute

Test Data			
Specimen No.	1	2	3
Bearing Slide Resistance (lbs)	10	13	18
Normal Stress (psf)	250	500	1000
Corrected Peak Shear Stress (psf)	140	245	502
Corrected Large Displacement Shear Stress (psf)	106	188	313
Peak Secant Angle (degrees)	29.3	26.1	26.7
Large Displacement Secant Angle (degrees)	23.0	20.6	17.4
Asperity (mils)	20.0	20.0	21.2

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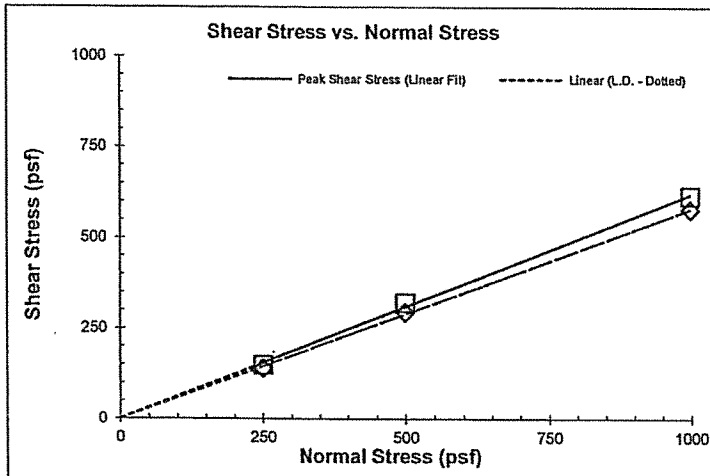
Interface Friction Test Report

Client: Terracon Consultants
Project: Orange County, Cell 9 Closure
Test Date: 10/13/13-10/14/13

TRI Log#: E2373-92-04
Test Method: ASTM D5321

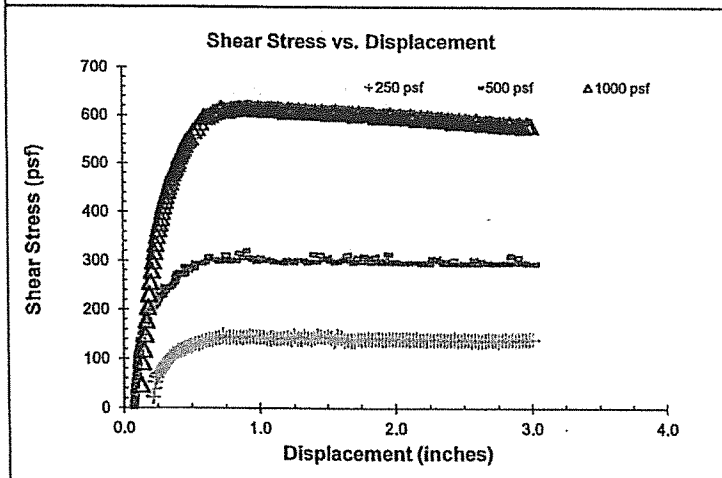
John M. Allen, P.E., 10/16/2013
Quality Review/Date

Tested Interface: Bithlo Pit Sand vs. GSE 40 mil LLDPE Textured Geomembrane (103195838)



Test Results		
	Peak	Large Displacement (@ 3.0 in.)
Friction Angle (degrees):	31.8	30.1
Y-intercept or Adhesion (psf):	0	0

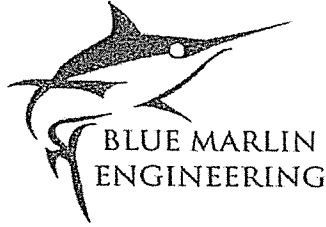
Shearing occurred at the interface. The large displacement friction angle regression analysis was adjusted to fit a zero y-intercept.



Test Conditions	
Upper Box & Lower Box	Bithlo Pit Sand remolded to 90% of maximum dry density at the optimum moisture content or 102.5 pcf at 11.5% GSE 40 mil LLDPE textured geomembrane
Box Dimensions:	12"x12"x4"
Interface Conditioning:	Interface soaked and loading applied for a minimum of 24 hours prior to shear.
Test Condition:	Wet
Shearing Rate:	0.04 inches/minute

Test Data			
Specimen No.	1	2	3
Bearing Slide Resistance (lbs)	10	13	18
Normal Stress (psf)	250	500	1000
Corrected Peak Shear Stress (psf)	148	320	615
Corrected Large Displacement Shear Stress (psf)	139	294	579
Peak Secant Angle (degrees)	30.6	32.6	31.6
Large Displacement Secant Angle (degrees)	29.1	30.5	30.1
Asperity (mils)	14.0	17.0	17.0

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MODIFIED PROCTOR TEST

TESTED FOR: CH2M Hill

PROJECT: Orange County Landfill SE

TEST METHOD: ASTM D1557, Method A

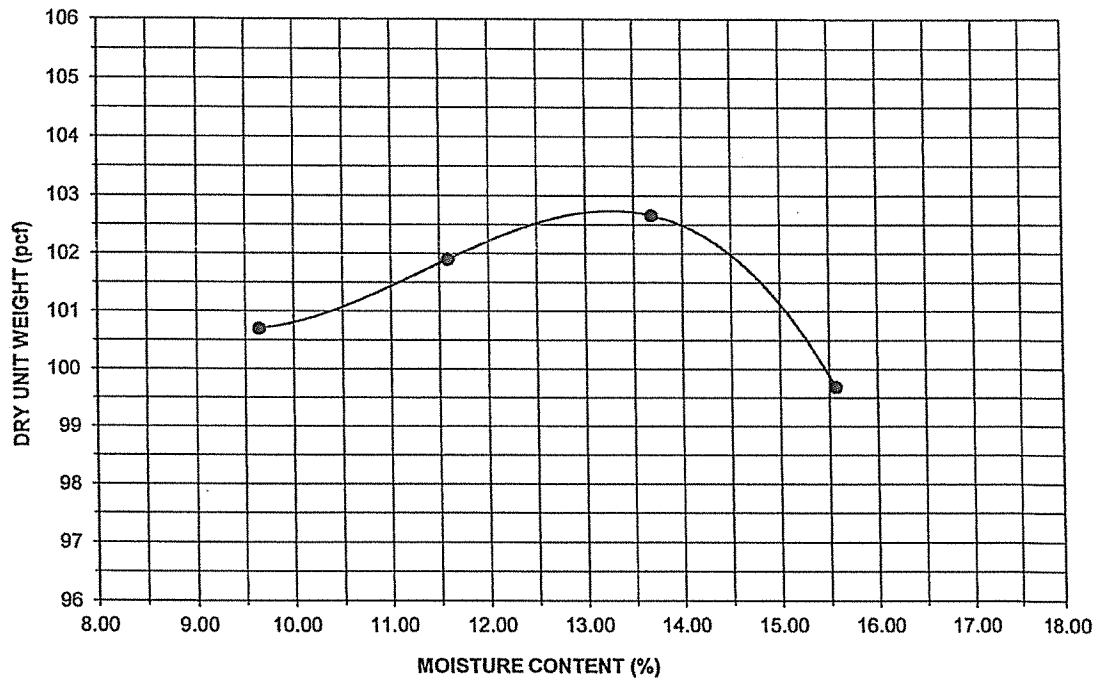
PROJECT NO: 12-008

DATE TESTED: September 24, 2013

SAMPLE NO: 1054

SAMPLE LOCATION: Southern Borrow Area

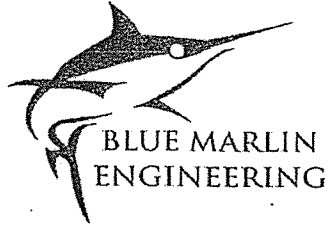
SOIL DESCRIPTION: Gray to Dark Gray Fine Sand with Trace of Roots



Maximum Dry Unit Weight (pcf): 102.5

Optimum Moisture Content (%): 13.0

Percent Passing No. 200 Sieve (%): 2.8



MODIFIED PROCTOR TEST

TESTED FOR: CH2M Hill

PROJECT: Orange County Landfill SE

TEST METHOD: ASTM D1557, Method A

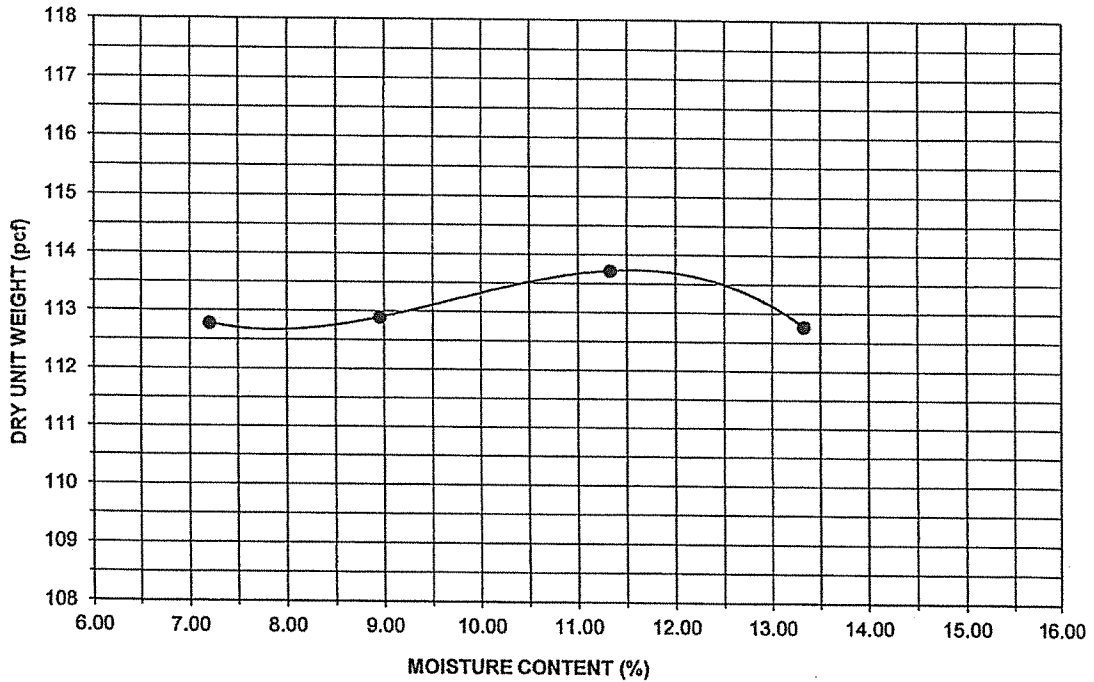
PROJECT NO: 12-008

DATE TESTED: September 24, 2013

SAMPLE NO: 1055

SAMPLE LOCATION: Bithlo Pit

SOIL DESCRIPTION: Tan Slightly Silty Fine Sand



Maximum Dry Unit Weight (pcf): 113.5

Optimum Moisture Content (%): 11.5

Percent Passing No. 200 Sieve (%): 8.7