CLOSURE AND POST-CLOSURE PLAN WITH FINANCIAL ASSURANCE CALCULATION

C&D Landfill, Inc. – Phase 1

Pitt County, North Carolina
NC DENR Solid Waste Permit #74-07

Prepared for:

C&D Landfill, Inc.
802 Recycling Lane
Greenville, North Carolina 27834

To the Attention of:

Mr. Judson Whitehurst

G. David Garrett, P.G., P.E.
Principal Engineer/Geologist

6-26-2008

June 2008

David Garrett & Associates

Engineering and Geology

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EXECUTIVE SUMMARY

C&D Landfill, Inc. is a privately owned and operated disposal facility for Construction and Demolition (C&D) debris, located south of US 264 in eastern Pitt County, within the Pactolus community. Phase 1 commenced operations in 2001 and is the subject of this document, which presents a Closure and Post-Closure Plan for the facility, along with Financial Assurance analysis based on the closure design and post-closure care program. This work was prepared in accordance with solid waste rule **15A NCAC 13B .0547**. The facility is regulated by the North Carolina DENR Division of Waste Management.

The closure plan is based on the regulatory minimum final cover design, although an alternative is under consideration, consisting of a flexible membrane and a drainage layer (in addition to a vegetative support layer). Both final cover designs are described in this document and the supporting drawings. The closure plan makes reference to a CQA plan that will be followed during the final cover installation – this document will be similar to that prepared for other portions of the project (i.e., future Phase 2, which is under permit review). However, the CQA plan is pertinent to a soil cover (regulatory minimum), and should an alternative cover be selected by the Owner/Operator, the CQA plan will be amended accordingly and presented to the Division for review, in advance of the work.

The following document is divided into two parts: **Section 1** is the closure and post-closure plan (presented in two subparts); **Section 2** presents the Financial Assurance calculations and supporting data. The **Drawings** that accompany this work are collaboration between the author of this document and John A.K. Tucker, P.E, Consulting Engineer, who permitted the original facility with support from the author.

SUMMARY OF FINDINGS

- Phase 1 incorporates approximately 15 acres (the basis for the calculations) and will contain approximately 842,000 cubic yards (421,000 tons) of inert debris

- Final Closure will be a continual process during routine operation of the facility – the maximum anticipated area subject to closure at any given time is 7.5 acres

- Total estimated final closure costs (all 15 acres) are **$578,300** for the regulatory minimum cover and **$768,320** for an alternate final cover design

- For the maximum anticipated area subject to closure at any given time, the calculated closure costs are **$384,160** – this represents third-party contractor costs

- Post Closure maintenance and monitoring costs for 30 years are **$646,500**

- The combined Closure and Post-Closure costs, subject to Financial Assurance (bonding, insurance, irrevocable letter of credit, or other instrument) for Phase 1 is **$1,030,660**, which includes the alternate cover and 7.5 acres to be closed

- These cost estimates are based on unit costs from recent similar-size projects

- All costs are presented in 2008 dollars and should be reviewed periodically – financial assurance obligations reduce with time after closure is completed

TABLE OF CONTENTS

1.0 CLOSURE AND POST-CLOSURE (15A NCAC 13B .0543)

1.1 Summary of Regulatory Requirements

1.1.1 Final Cap

The final cap design for Phase 1 shall conform to the minimum requirements of Solid Waste Rule 15A NCAC 13B .0543 ("regulatory minimum cover section"), i.e., the compacted soil barrier layer shall exhibit a thickness of 18 inches and a field permeability of not more than 1.0×10^{-5} cm/sec. The overlying vegetative support layer shall exhibit a thickness of 18 inches. See **Drawings C1** and **E2** for final contours and final cover details, respectively.

1.1.2 Construction Requirements

Final cap installation shall conform to the approved plans (see accompanying plan set), inclusive of a Sedimentation and Erosion Control Plan. The CQA plan must be followed (see **Section 3.0**) and all CQA documentation must be submitted to the Division. Post-settlement surface slopes must not be flatter than 5% (on the upper cap) and not steeper than 25% (on the side slopes), unless justified with engineered stability calculations.

Per the **2006 C&D Rules**, a gas venting system is required for the cap. A passive venting system will be specified, which will consist of a perforated pipe in crushed stone-filled trench – installed just below the final cap soil barrier layer – with a tentative minimum vent spacing of three vents per acre. **Drawing EC2** shows the gas vent system details.

1.1.3 Alternative Cap Design

The **2006 C&D Rules** make a provision for an alternative cap design, to be used in the event that the permeability requirements for the compacted soil barrier layer cannot be met. Past experience indicates that on-site soils may not meet the required field permeability of not more than 1.0×10^{-5} cm/sec, as supported by the laboratory data for the soils discussed in various site studies (Site Suitability Report). An alternative cap design consisting of a 40-mil LDPE or HDPE barrier, overlain by a single-bonded geonet drainage layer and 24 inches of vegetative support soil is under consideration. Both final cap profiles are shown on **Drawing EC2**.

1.1.4 Division Notifications

The Operator shall notify the Division prior to beginning closure of any final closure activities. The Operator shall place documentation in the Operating Record pertaining to the closure, including the CQA requirements and location and date of cover placement.

1.1.5 Required Closure Schedule

The Operator shall close the landfill in increments as various areas are brought to final grade. The final cap shall be placed on such areas subject to the following:

- No later than 30 days following last receipt of waste;
- No late that 30 days following the date that an area of 10 acres or greater is within 15 feet of final grades;
- No later than one year following the most recent receipt of waste if there is remaining capacity.

Final closure activities **shall be completed within 180 days** following commencement of the closure, unless the Division grants extensions.

Upon completion of closure activities for each area (or unit) the Owner shall notify the Division in writing with a **certification by the Engineer** that the closure has been completed in accordance with the approved closure plan and that said documentation has been placed in the operating record.

1.1.6 Recordation

The Owner shall record on the title deep to the subject property that a CDLF has been operated on the property and file said documentation with the Register of Deeds. Said recordation shall include a notation that the future use of the property is restricted under the provision of the approved closure plan.

1.2 Closure Plan

The following is a tentative closure plan for CDLF Phase 1, based on the prescribed operational sequence and anticipated conditions at the time of closure.

1.2.1 Final Cap Installation

1.2.1.1 Final Elevations – Final elevation of the landfill shall not exceed those depicted on **Drawing C1** when it is closed. The elevations shown include the final cover. A periodic topographic survey shall be performed to verify elevations.

1.2.1.2 Final Slope Ratios – All upper surfaces shall have at least a 5 percent slope, but not greater than a 10 percent slope. The cover shall be graded to promote positive drainage. Side slope ratios shall not exceed 3H:1V. A periodic topographic survey shall be performed to verify slope ratios.

1.2.1.3 Final Cover Section – The terms "final cap" and "final cover" are used interchangeably. The final cover will subscribe to the regulatory minimum requirement for C&D landfills:

- An 18-inch compacted soil barrier layer (CSB), i.e., the "infiltration layer," with a hydraulic conductivity not exceeding 1×10^{-5} cm/sec, overlain by

- An 18-inch "topsoil" or vegetated surface layer (VSL), i.e., the "erosion layer."

*An alternate final cover section is under consideration (see **Section 1.1.3**).*

1.2.1.4 Final Cover Installation – All soils shall be graded to provide positive drainage away from the landfill area and compacted to meet applicable permeability requirements. Suitable materials for final cover soil shall meet the requirements defined above. Care shall be taken to exclude rocks and debris that would hinder compaction efforts. The surface will then be seeded in order to establish a good stand of vegetation.

Test Pad – Whereas the lab data indicate that the required permeability is attainable, the ability to compact the materials in the field to achieve the required strength and permeability values shall be verified with a field trial involving a test pad, to be sampled with drive tubes and laboratory density and/or permeability testing, prior to full-scale construction. The materials, equipment, and testing procedures should be representative of the anticipated actual final cover construction. The test pad may be strategically located such that the test pad may be incorporated into the final cover.

Compacted Barrier – Materials shall be blended to a uniform consistency and placed in two loose lifts no thicker than 12 inches and compacted by tamping, rolling, or other suitable method – the targeted final thickness is 18 inches minimum. A thicker compacted barrier is acceptable. The cover shall be constructed in sufficiently small areas that can be completed in a single day (to avoid desiccation, erosion, or other damage), but large enough to allow ample time for testing without hindering production. The Contractor shall take care not to over-roll the cover such that the underlying waste materials would pump or rut, causing the overlying soil layers to crack – adequate subgrade compaction within the upper 36 inches of waste materials and/or the intermediate cover soil underlying the final cover is critical. All final cover soils shall be thoroughly compacted through the full depth to achieve the required maximum permeability required by Division regulations of 1.0×10^{-5} cm/sec, based on site-specific test criteria (see below). Compaction moisture control is essential for achieving adequate strength and permeability.

Vegetated Surface Layer – Materials shall be blended and placed in two loose lifts no thicker than 12 inches and compacted by tamping, rolling, or other suitable method – the targeted final layer thickness is 18 inches minimum per the design criteria. A thicker soil layer is acceptable. A relatively high organic content is also desirable. The incorporation of decayed wood mulch or other organic admixtures (WWTP sludge, with advance permission from the Division) is encouraged to provide nutrient and enhanced field capacity. These surface materials are not subject to a permeability requirement, thus no testing will be specified. Care should be taken to compact the materials sufficiently to promote stability and minimize erosion susceptibility, but not to over-compact the materials such that vegetation would be hindered. Following placement and inspection of the surface layer, seed bed preparation, seeding and mulching should follow immediately. The work should be scheduled for optimal weather conditions.

Inspection and Testing – Soils for the barrier layer are subject to the testing schedule outlined in the Construction Quality Assurance plan. The proposed testing program includes a minimum of one permeability test per lift per acre and four nuclear density gauge tests per lift per acre, to verify compaction of the compacted barrier layer. The moisture-density-permeability relationship of the materials has been established by the laboratory testing (discussed elsewhere in this report). The Contractor shall proof roll final cover subgrade materials (i.e., intermediate cover), which consist of essentially the same materials as the compacted barrier layer (without the permeability requirements), to assure that these materials will support the final cover.

1.2.1.5 Final Cover Vegetation – Seedbed preparation, seeding, and mulching shall be performed accordance the specifications provided in the Construction Plans (see **Drawing EC2**), unless approved otherwise (in advance) by the Engineer. In areas to be seeded, fertilizer and lime typically should be distributed uniformly at a rate of 1,000 pounds per acre for fertilizer and 2,000 pounds per acre for lime, and incorporated into the soil to a depth of at least 3 inches by disking and harrowing. The incorporation of the fertilizer and lime may be a part of the cover placement operation specified above. Distribution by means of an approved seed drill or hydro seeder equipped to sow seed and distribute lime and fertilizer at the same time will be acceptable. Please note that the seeding schedule varies by season.

All vegetated surfaces shall be mulched with wheat straw and a bituminous tack. Areas identified as prone to erosion mat be secured with curled-wood excelsior, installed and pinned in accordance with the manufacturer's recommendations. Certain perimeter channels will require excelsior or turf-reinforcement mat (TRM), as specified in the Channel Schedule. Alternative erosion control products may be substituted with the project engineer's prior consent. All rolled erosion control materials should be installed according to the generalized layout and staking plan found in the Construction Plans or the manufacturer's recommendations.

Irrigation for landfill covers is not a typical procedure, but consideration to temporary irrigation may be considered if dry weather conditions prevail during or after the planting. Care should be taken not to over-irrigate in order to prevent erosion. Collected storm water will be suitable for irrigation water. Maintenance of the final cover vegetation, described in the Post-Closure Plan (see below), is critical to the overall performance of the landfill cover system.

1.2.1.6 Documentation – The Owner shall complete an "as-built" survey to depict final elevations and to document any problems, amendments or deviations from the Construction Plan drawings. Records of all testing, including maps with test locations, shall be prepared by the third-party CQA testing firm. All materials pertaining to the closure shall be placed in the Operational Record for the facility. Whereas the closure will be incremental, special attention shall be given to keeping the closure records separate from the normal operational records.

1.2.2 Maximum Area/Volume Subject to Closure

The total area of Phase 1 is approximately 15 acres. Intermediate cover shall be used on areas that have achieved final elevations until the final cover is installed – it will be more cost effective to close the landfill in two to three increments – thus the maximum anticipated area subject to closure at any given time would be **7.5 acres**. Based on volumetric analyses performed during original permit studies, the planned volume of Phase 1 is estimated at 842,000 cubic yards (421,000 tons) of inert debris. Please note that portions of Phase 1 may already be closed under **Solid Waste Rule 0.510**.

1.2.3 Closure Schedule

Refer to the requirements outlined in **Section 1.1.5** (above).

1.2.4 Closure Cost Estimate

The foregoing cost estimate is considered suitable for the **Financial Assurance** requirements (see **Section 2.0)**.

TABLE 1A
ESTIMATED FINAL CLOSURE COSTS FOR PHASE 1 (in 2007 dollars)

1) Regulatory Minimum Cover with Compacted Soil Barrier

Topsoil (18" over 15 ac)	39,600 c.y.	@	$3.25 / cubic yard	$128,700
Compacted Soil Barrier*	43,200 c.y.	@	$8 / cubic yard	$345,600
Seed and Mulch	15 acres	@	$1,300 per acre	$ 19,500
Storm Water Piping**	1700 LF	@	$10.00 / LF	$ 17,000
CQA	15 acres	@	$4,500 per acre	$ 67,500
Total Construction Cost (if contracted out)* **				**$ 578,300**

2) Alternative Final Cover with Flexible Membrane Barrier

Topsoil (24" over 15 ac)	52,800 c.y.	@	$3.25 / cubic yard	$171,600
Single-bond Geocomposite Drainage Layer	653,400 s.f.	@	$0.45 / s.f.	$ 294,030
40-mil HDPE flexible Membrane	653,400 s.f.	@	$0.35 / s.f.	$ 228,690
Seed and Mulch	15 acres	@	$1,300 per acre	$ 19,500
Storm Water Piping**	1700 LF	@	$10.00 / LF	$ 17,000
CQA	15 acres	@	$2,500 per acre	$ 37,500
Total Construction Cost (if contracted out)				**$ 768,320**

3) Alternative Final Cover with Flexible Membrane Barrier (Largest Open Area)

Topsoil (24" over 7.5 ac)	26,400.7 c.y.	@	$3.25 / cubic yard	$ 85,800
Single-bond Geocomposite Drainage Layer	326,700 s.f.	@	$0.45 / s.f.	$ 147,015
40-mil HDPE flexible Membrane	326,700 s.f.	@	$0.35 / s.f.	$ 114,345
Seed and Mulch	7.5 acres	@	$1,300 per acre	$ 9,750
Storm Water Piping**	850 LF	@	$10.00 / LF	$ 8,500
CQA	7.5 acres	@	$2,500 per acre	$ 18,750
Bonded Construction Cost (if contracted out)				**$384,160**

*Maximum permeability of 1 x 10^{-5} cm/sec, use a shrinkage factor of 15%.

**Preliminary estimates, subject to verification.

***Cost assumes on-site soils will meet permeability of 1 x 10^{-5} cm/sec.

C&D Landfill, Inc., plans to complete the closure work using in-house forces to the extent possible. The costs shown above are for a third-party contractor to complete the work. Some additional costs for equipment rental may be required if C&D Landfill, Inc., performs the work. Please note that the final closure work will be performed incrementally, thus spreading out the costs over the life of the project.

1.3 Post-Closure Plan

1.3.1 Monitoring and Maintenance

1.3.1.1 Term of Post-Closure Care – The facility shall conduct post-closure care for a minimum of 30 years after final closure of the landfill, unless justification is provided for a reduced post-closure care period. The post-closure care period may be extended by the Division if necessary to protect human health and the environment.

1.3.1.2 Maintenance of Closure Systems – Inspections of the final cover systems and sediment and erosion control (S&EC) measures shall be conducted quarterly. Maintenance will be provided during post-closure care as needed to protect the integrity and effectiveness of the final cover. The cover will be repaired as necessary to correct the effects of settlement, subsidence, erosion, or other events. Refer to the **Post Closure Monitoring and Maintenance Schedule** (below).

1.3.1.3 Landfill Gas Monitoring – The presence of gas is not anticipated during the post-closure period, due to the inert nature of the wastes. Gas monitoring will be conducted for the first five years following the closure of Phase 1A via sampling the head-space in monitoring wells with an Organic Vapor Analyzer (OVA), or similar equipment, during routine sampling events and continual monitoring in on-site buildings via a gas detection meter.

After five years, if no explosive gas is detected, the Owner will petition the Division to discontinue landfill gas monitoring. If gas is detected at the sampling points at any time, the Division will be notified and an evaluation of protective measures will be performed.

1.3.1.4 Ground Water Monitoring – Groundwater monitoring will be conducted under the current version of the approved Sampling and Analysis Plan. This plan will be reviewed periodically and may change in the future. Approximately one year prior to the landfill reaching permitted capacity, the facility will submit post-closure monitoring and maintenance schedules, specific to the ground water monitoring. Procedures, methods, and frequencies will be included in this plan. This future plan, and all subsequent amendments, will be incorporated by reference to this document.

1.3.1.5 Record Keeping – During the post closure period, maintenance and inspection records, i.e., a **Post Closure Record**, shall be kept as a continuation of the **Operating Record** that was kept during the operational period. The Post Closure Record shall include future inspection and engineering reports, as well as documentation of all routine and non-routine maintenance and/or amendments. The Post Closure Record shall include the ground water and gas monitoring records collected for the facility.

1.3.1.6 Certification of Completion – At the end of the post-closure care period the facility manager shall contact the Division to schedule an inspection. The facility manager shall make the Post Closure Record available for inspection. A certification that the post-closure plan has been completed, signed by a North Carolina registered professional engineer, shall be placed in the operating/post closure record. C&D Landfill, Inc. shall maintain these records indefinitely.

TABLE 1B
POST-CLOSURE MONITORING AND MAINTENANCE SCHEDULE

Activity	Frequency Yrs. 1 - 5	Frequency Yrs. 6-15	Frequency Yrs. 16-30
General - Inspect access gates, locks, fences, signs, site security	Monthly	Monthly	Monthly
Maintain access roads, monitoring well access	As needed	As needed	As needed
Final Cover Systems/Stability - Inspect cap and slope cover for erosion, sloughing, bare spots in vegetation, make corrections as needed (1)	Monthly	Monthly	Monthly
Storm Water/Erosion Control Systems - Inspect drainage swales and sediment basin for erosion, excess sedimentation (1)	Monthly	Monthly	Monthly
Mow cover vegetation and remove thatch	Semi-Annually	Annually	None (2)
Inspect vegetation cover and remove trees	Annually	Annually	Annually

Landfill Gas Monitoring	Semi-Annually	None (3)	None (3)
Ground Water Monitoring System - Check well head security, visibility (4)	Semi-Annually	Semi-Annually	Annually

Notes:

1. Inspect after every major storm event, i.e., 25-year 24-hour design storm

2. Dependent on vegetation type, periodic mowing may be required

3. Discontinue if no detections occur in monitoring wells or on-site buildings

4. See current Ground Water Sampling and Analysis Plan

1.3.2 Responsible Party Contact

C&D Landfill, Inc.
Mr. Judson Whitehurst, Owner
Mr. Wayne Bell, General Manager
C&D Landfill, Inc.
802 Recycling Lane
Greenville, North Carolina 27834

Tel 252-752-8274
Fax 252-752-9016

1.3.3 Planned Uses of Property

Currently, there is no planned use for the landfill area following closure. The closed facility will be seeded with grass to prevent erosion. Any post-closure use of the property considered in the future will not disturb the integrity of the final cover or the function of the monitoring systems unless necessary (and to be accompanied by repairs or upgrades). Future uses shall not increase the potential threat to human health and the environment.

1.3.4 Post-Closure Cost Estimate

The following cost estimate is considered suitable for the **Financial Assurance** requirements.

TABLE 1C
ESTIMATED POST-CLOSURE COSTS FOR PHASE 1A (in 2008 dollars)

Annual Events	Units		Unit Cost	Cost/ Event	Annual Costs
Reseeding/mulching and erosion repair (Assume 5% cap, once per year)	1	ac.	$1,600	$1,600.00	$1,600.00
Mow final cap (twice per year)	15	ac.	$25	$375.00	$750.00
Ground Water (semi-annual, 16 wells)	7	ea.	$400	$2,800.00	$ 5,600.00
Surface Water (semi-annual, 3 locations)	3	ea.	$350	$1,050.00	$2,100.00
Water quality analysis and reporting	1	ea.	$2500	$2500.00	$5000.00
Engineering inspection (annual basis)	1	ea.	$3,500	$3,500.00	$3,500.00
Maintain storm water conveyances	1	ea.	$2,000	$2,000.00	$2,000.00
Maintain access roads, gates, buildings	1	ea.	$1,000	$1,000.00	$1,000.00
	Total Cost for One Year				**$21,550.00**

2.0 FINANCIAL ASSURANCE

The **2006 C&D Rules** require that Owners/Operators demonstrate financial assurance for closure and post-closure activities. Typically, for local government-owned facilities, said demonstration is based on a local government test. For private facilities, the posting of a performance bond or insurance policy is typically acceptable to the Division.

Cost estimates for closure of CDLF Phase 1A and post-closure activities for the entire C&D landfill are presented in **Sections 1.2.4** and **1.3.4**, respectively. The following is a detailed analysis of the closure and post closure costs, based on the preceding, all in 2008 dollars, projected over the anticipated life of the landfill (Phase 1) and 30 years of post-closure care.

The closure costs will be realized far enough into the future that these costs may be recalculated to account for inflation on a periodic basis (which has not been done here). After closure, the bonded amount should be reduced. The maximum post-closure cost liabilities are realized at the time of closure – these liabilities decrease with time and, thus, the amount of the post-closure instrument should be reduced over time. Thus, the whole financial assurance obligation should be recalculated ideally on an annual basis. The posted amount (bond, insurance, irrevocable letter of credit, etc.) should be adjusted accordingly on a periodic basis.

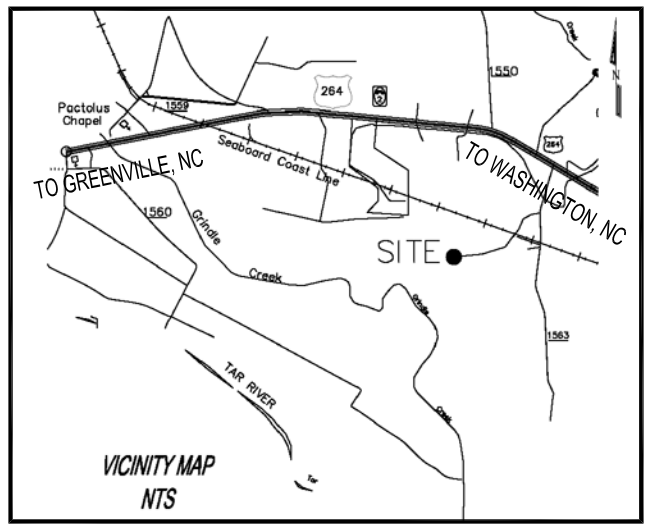
SUMMARY OF CLOSURE AND POST-CLOSURE COST

1.	Final Closure Construction (see **Table 1A, Part 3)**	$384,160
2.	Projected Post-Closure Costs (see **Table 1C * 30**)	$646,500
	TOTAL CLOSURE/POST-CLOSURE COST	**$1,030,660**

NCDENR Division of Waste Management will review these calculations and concur or negotiate a mutually agreeable bond amount. Owners/Operators must complete the demonstration (e.g., irrevocable performance bond, letter of credit, insurance policy, other fiduciary instrument) within 30 days following NCDENR Division of Waste Management concurrence with the calculations.

C&D LANDFILL, INC.
CDLF PHASE 1 CLOSURE PLAN
PITT COUNTY (PERMIT #74-07)

JUNE 2008



VICINITY MAP
N.T.S.

SITE OWNER
C&D LANDFILL, INC.

SITE ADDRESS
802 RECYCLING LANE
GREENVILLE, NC 27834

SITE CONTACT
JUDSON WHITEHURST
WAYNE BELL, MANAGER
TEL. (252)-752-8274

LIST OF DRAWINGS

SHEET NO'S	DRAWING NO'S	DRAWING TITLE
1	--	COVER SHEET W/VICINITY MAP
2	C1	CDLF PHASE1 FINAL COVER CONTOURS AND DRAINAGE PLAN
3	EC1	SEDIMENT EROSION CONTROL DETAILS SHEET 1 OF 3
4	EC2	SEDIMENT EROSION CONTROL DETAILS SHEET 2 OF 3
5	EC3	SEDIMENT & EROSION CONTROL SCHEDULES & NARRATIVE (SHEET 3 OF 3)

THIS PLAN WAS PREPARED IN CONJUNCTION WITH:

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CONSULTING ENGINEER
BOX 297
FUQUAY-VARINA, NC 27526

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NORTH CAROLINA PROFESSIONAL SEAL 13402 ENGINEER DAVID GARRETT
6-22-2008

NORTH CAROLINA LICENSED SEAL 0402 GEOLOGIST DAVID GARRETT
6-22-2008

FILE NAME
WCA-2-COVER

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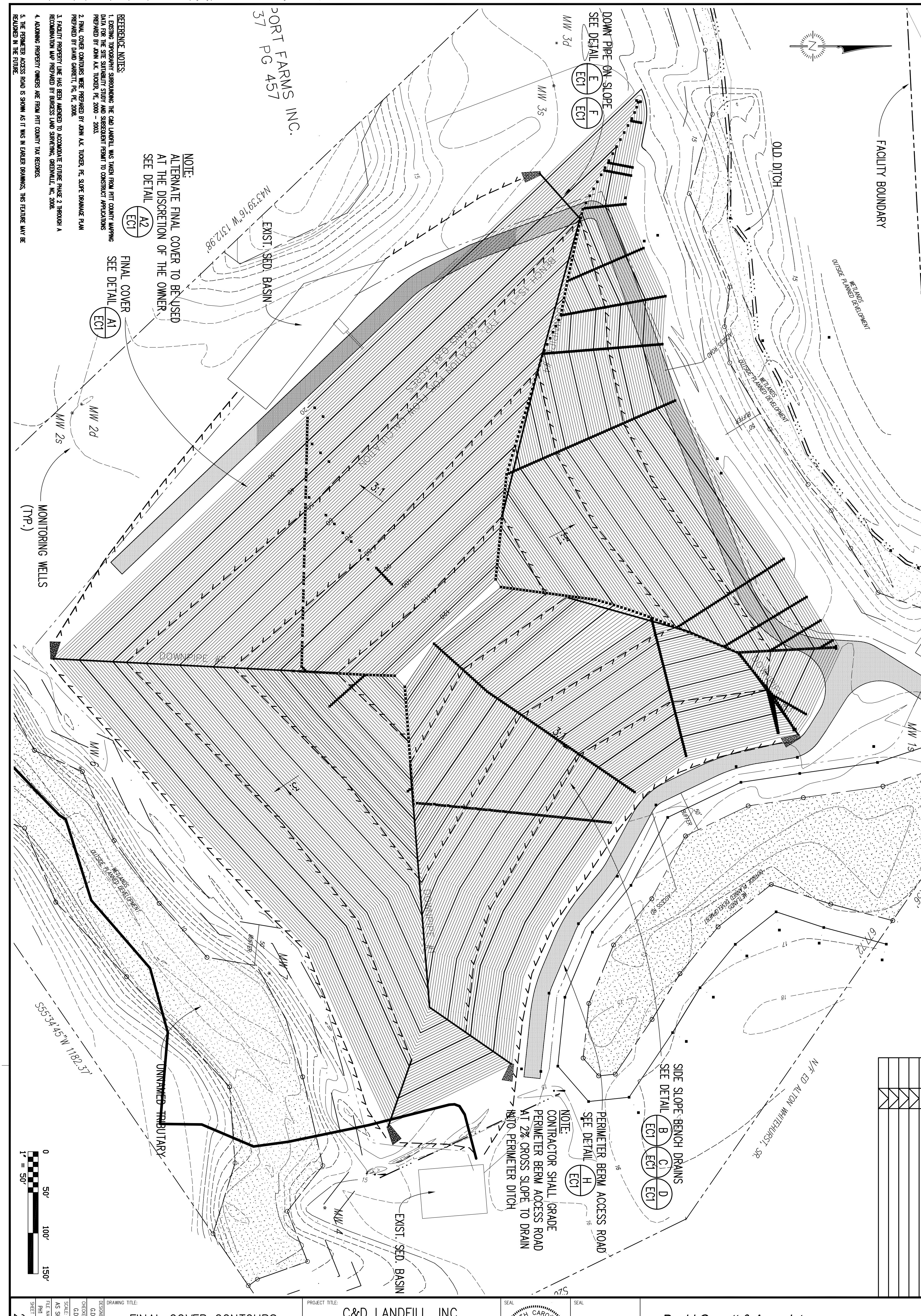


REFERENCE NOTES:

1. EXISTING TOPOGRAPHY SURROUNDING THE C&D LANDFILL WAS TAKEN FROM PITT COUNTY MAPPING DATA FOR THE SITE SUITABILITY STUDY AND SUBSEQUENT PERMIT TO CONSTRUCT APPLICATIONS PREPARED BY JOHN A.K. TUCKER, PE, 2000 – 2003.
2. FINAL COVER CONTOURS WERE PREPARED BY JOHN A.K. TUCKER, PE, SLOPE DRAINAGE PLAN PREPARED BY DAVID GARRETT, PG, PE, 2008.
3. FACILITY PROPERTY LINE HAS BEEN AMENDED TO ACCOMODATE FUTURE PHASE 2 THROUGH A RECOMBINATION MAP PREPARED BY BURGESS LAND SURVEYING, GREENVILLE, NC, 2008.
4. ADJOINING PROPERTY OWNERS ARE FROM PITT COUNTY TAX RECORDS.
5. THE PERIMETER ACCESS ROAD IS SHOWN AS IT WAS IN EARLIER DRAWINGS, THIS FEATURE MAY BE REALIGNED IN THE FUTURE.

DATE	NO.	REVISION

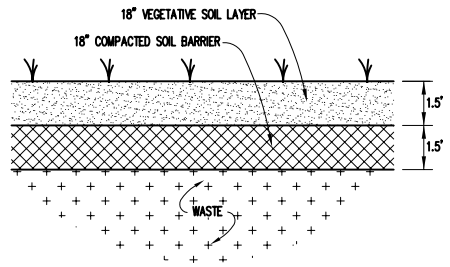
David Garrett & Associates
Engineering and Geology
5105 Harbour Towne Drive, Raleigh, North Carolina 27604
Email: david_garrett_pg@mindspring.com 919-231-1818 (Office and Fax) 919-418-4375 (mobile)

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 25482 DAVID GARRETT 6-22-2008

PROJECT TITLE:
C&D LANDFILL, INC.
CDLF PHASE 1 CLOSURE PLAN
PITT COUNTY (#74-07)

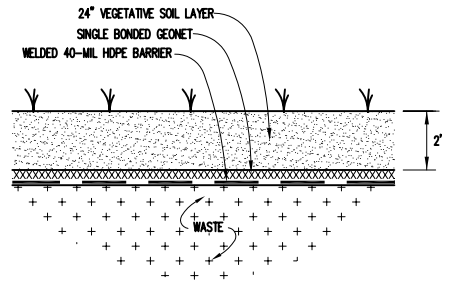
DRAWING TITLE:
FINAL COVER CONTOURS AND SIDE SLOPE DRAINAGE

DESIGNED BY: G.D.G.	DRAWN BY: A.W.H.
CHECKED BY: G.D.G.	PROJECT NO.: C&D PH 1
SCALE: AS SHOWN	DATE: JUNE 2008
FILE NAME: PH1 FINAL COVER CONTOURS	
SHEET NO.: 2	DRAWING NO.: C1



FINAL COVER SOIL DETAIL

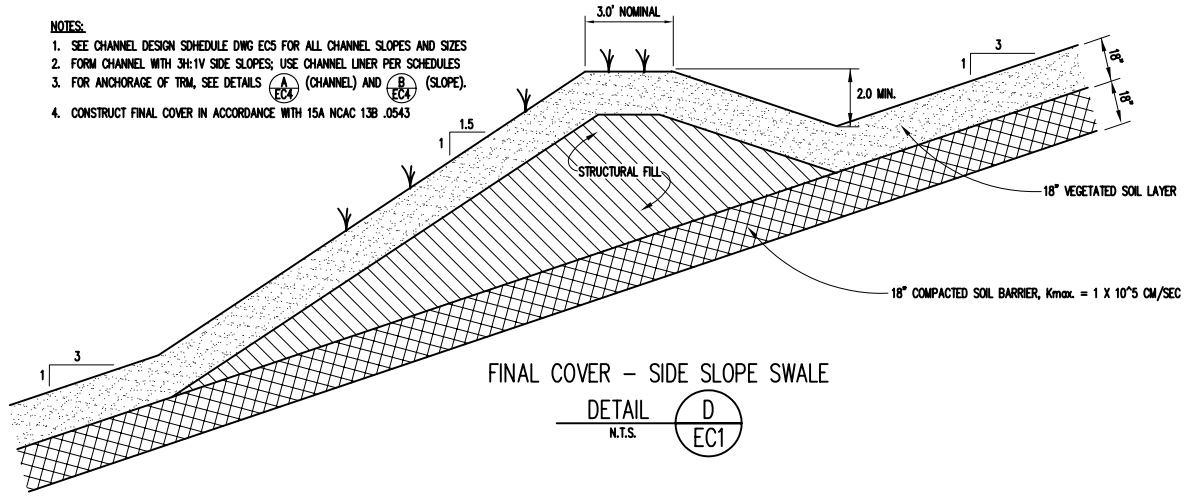
DETAIL A1 / EC1 — N.T.S.



ALTERNATE
FINAL COVER SOIL DETAIL

DETAIL A2 / EC1 — N.T.S.

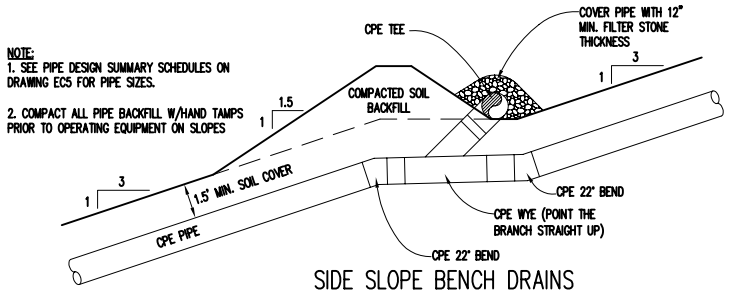
NOTES:
1. SEE CHANNEL DESIGN SDHEDULE DWG EC5 FOR ALL CHANNEL SLOPES AND SIZES
2. FORM CHANNEL WITH 3H:1V SIDE SLOPES; USE CHANNEL LINER PER SCHEDULES
3. FOR ANCHORAGE OF TRM, SEE DETAILS A/EC4 (CHANNEL) AND B/EC4 (SLOPE).
4. CONSTRUCT FINAL COVER IN ACCORDANCE WITH 15A NCAC 13B .0543



FINAL COVER – SIDE SLOPE SWALE

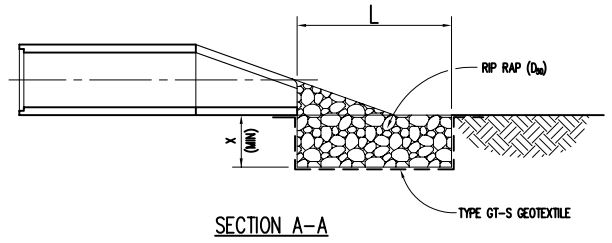
DETAIL D / EC1 — N.T.S.

NOTE:
1. SEE PIPE DESIGN SUMMARY SCHEDULES ON DRAWING EC5 FOR PIPE SIZES.
2. COMPACT ALL PIPE BACKFILL W/HAND TAMPS PRIOR TO OPERATING EQUIPMENT ON SLOPES

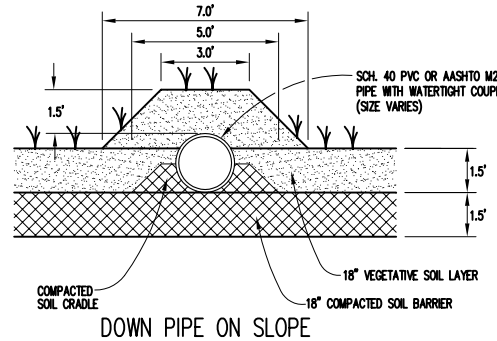


SIDE SLOPE BENCH DRAINS

DETAIL C / EC1 — N.T.S.

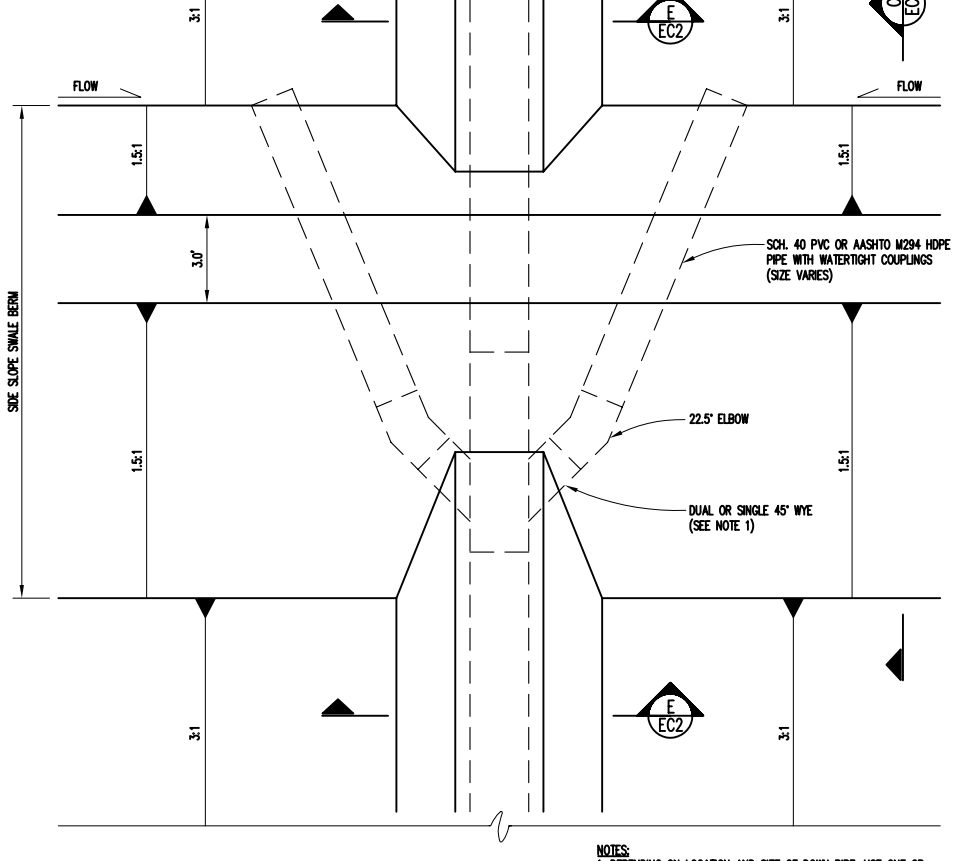


SECTION A–A



DOWN PIPE ON SLOPE

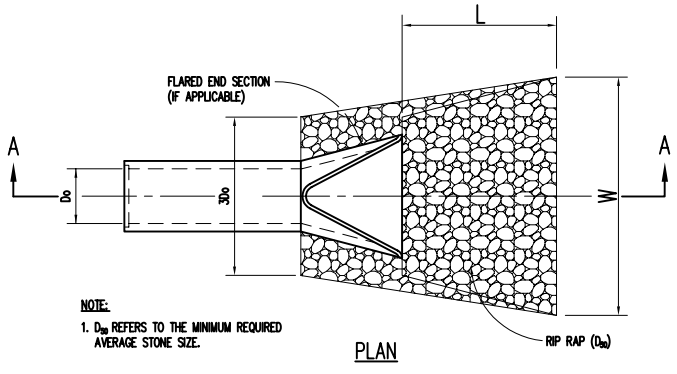
DETAIL E / EC1 — N.T.S.



NOTES:
1. DEPENDING ON LOCATION AND SIZE OF DOWN PIPE, USE ONE OR TWO WYE PIPES AS APPROPRIATE.

DOWN PIPE

DETAIL B / EC1 — N.T.S.



PLAN

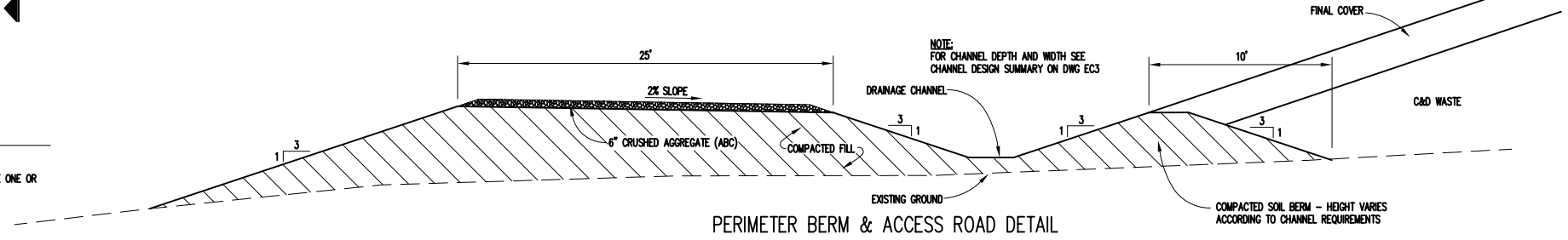
RIP RAP OUTLET PROTECTION
(OUTLET TO FLAT AREA)

DETAIL G / EC1 — N.T.S.

NOTE:
ANCHOR SETS SHALL CONSIST OF TWO STEEL FENCE POSTS AND NO. 9 GALVANIZED WIRE. 3 STRANDS OF WIRE SHALL BE TWISTED TOGETHER AND ENCOMPASS THE ENTIRE CIRCUMFERENCE OF THE PIPE.

DOWN PIPE STAKING DETAIL

DETAIL F / EC1 — N.T.S.



PERIMETER BERM & ACCESS ROAD DETAIL

DETAIL H / EC1 — N.T.S.

DATE	NO.	REVISION

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SEAL

SEAL — NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER — DAVID G. GARRETT — 6-22-2008

PROJECT TITLE:
C&D LANDFILL, INC.
CDLF PHASE 1 CLOSURE PLAN
PITT COUNTY, NC (#74-07)

DRAWING TITLE:
SEDIMENTATION & EROSION CONTROL DETAILS
SHEET 1 OF 3

DESIGNED BY: G.D.G.	DRAWN BY: A.W.H.
CHECKED BY: G.D.G.	PROJECT NO.: C&D PH1
SCALE: AS SHOWN	DATE: JUNE 2008
FILE NAME: S&EC DETAILS SHT 1 OF 3	
SHEET NO.: 3	DRAWING NO.: EC1

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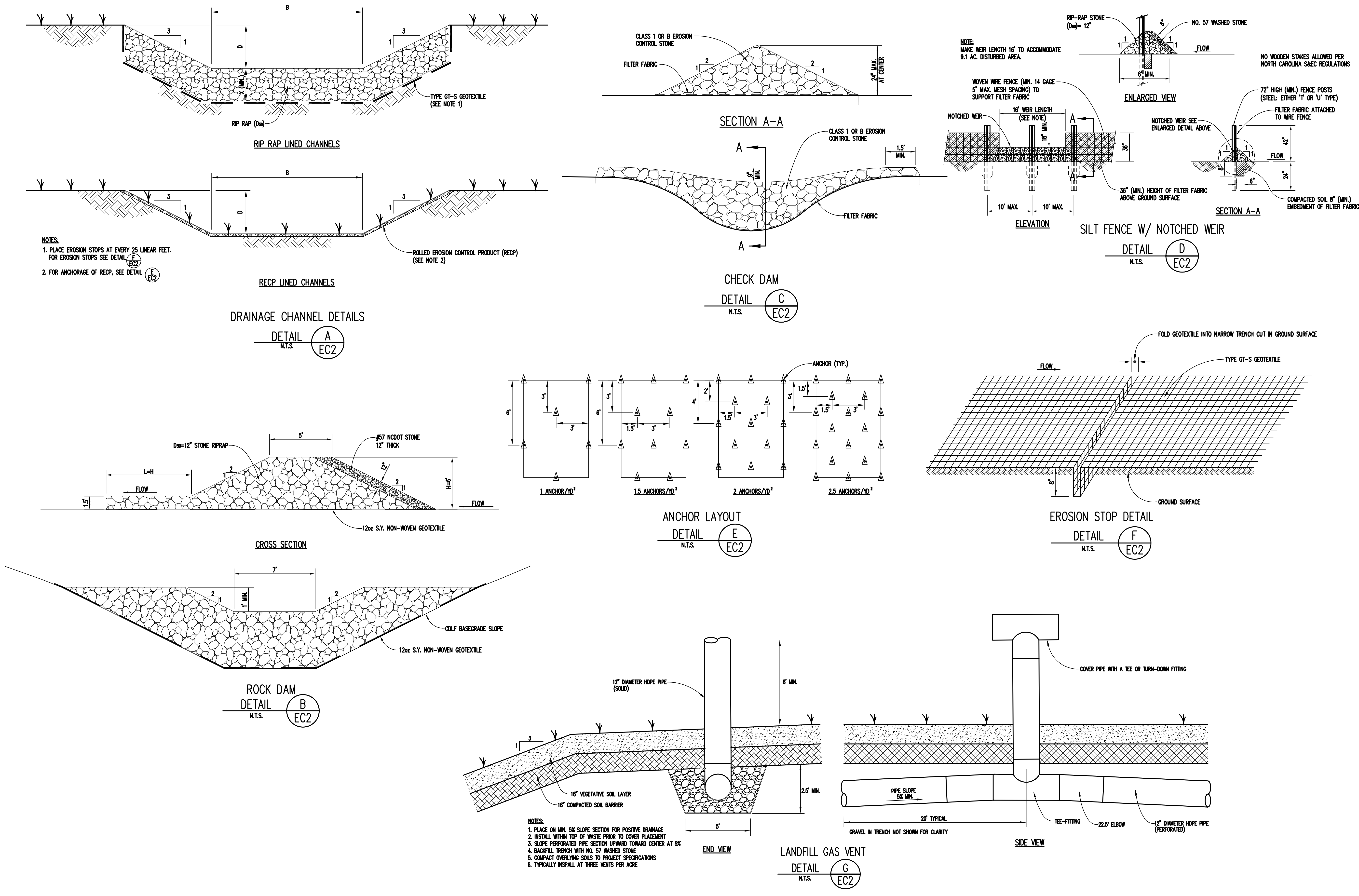

DATE	NO.	REVISION

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SEAL: NORTH CAROLINA PROFESSIONAL SEAL 25462 ENGINEER G. DAVID GARRETT 6-22-2008

PROJECT TITLE:
C&D LANDFILL, INC.
CDLF PHASE 1 CLOSURE PLAN
PITT COUNTY, NC (#74-07)

DRAWING TITLE:
SEDIMENTATION & EROSION CONTROL DETAILS SHEET 2 OF 3

DESIGNED BY: G.D.G.	DRAWN BY: A.W.H.
CHECKED BY: G.D.G.	PROJECT NO.: C&D PH2
SCALE: AS SHOWN	DATE: JUNE 2008
FILE NAME: S&EC DETAILS SHT 2 OF 3	
SHEET NO.: 4	DRAWING NO.: EC2

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CHANNEL DESIGN SCHEDULE

Channel design based on Normal-Depth Procedure calculations

All channels are trapezoidal in profile with dimensions shown below (see diagram)

Refer to the Erosion Control Plan sheet in the plan set for channel locations

All vegetation to be installed per Seed Bed Preparation detail and Seeding Schedule shown on the Erosion Control Details sheet

Drainage and Flow Characteristics					Assumed	25-year Design Storm Flow Characteristics				Required Channel Flow Dimensions				Required
Channel No.	Drained Area	Drainage Area Relief	Channel Length	Channel Slope	Manning's n-coefficient	Peak Flow, Q100	Normal Depth, Q100	Velocity at Q100	Max. Shear Stress at Q100	Bottom Width, B	Minimum Depth, D	Top Width, W	Side Slope, m	Lining Type
	acres	feet	feet	%		cfs	feet	fps	psf	feet	feet	feet		
1S-1*	0.81	30	482	2.0%	0.033	3	0.37	2.6	0.5	2	1	8	3H:1V	Grass w/ straw net, check dams**

Notes: *typical profile for ALL slope berms/channels (based on largest drainage area and 100-year, 5-minute storm intensity
**vary lengths per final cover drainage plan

PIPE DESIGN SCHEDULE

Pipe No.	Diam. inches	Type	Length feet	Slope ft./ft.	Q25 cfs	Inlet Structure Invert Elev.*	Inlet Structure Type	Outlet Structure Invert Elev.*	Outlet Structure Type	Rip-Rap Apron: Length, ft.	Pipe End Width, ft.	Ditch End Width, ft.
DPIPE #1	12	PVC/PE	421	0.21	5	104.0	Projecting tee	15.0	Projecting end	12	3	15
DPIPE #2	12	PVC/PE	352	0.21	7	107.0	Projecting tee	19.0	Projecting end	12	3	15
DPIPE #3	12	PVC/PE	346	0.27	6	113.0	Projecting tee	17.0	Projecting end	12	3	15
DPIPE #4	12	PVC/PE	452	0.20	8	107.0	Projecting tee	19.0	Projecting end	12	3	15

USE SAME PIPE DIAMETER AND METARIAL FOR SMALLER PIPES

Notes: Lengths and elevations are estimated values, must field verify and adjust as needed - depth of all inlets/outlets shall be a minimum of two feet plus the pipe diameter below finished grade, invert of exit pipe shall be one-tenth of a foot below the invert of the inlet at all pass-though catch basins

USE SMOOTH-WALL SCH. 40 PVC PIPE OR HIGHWAY GRADE POLYETHYLENE PIPE (E.G., HANCOR SUR-LOK, OR EQUIV.)

DOUBLE CHECK ALL REQUIRED PIPE LENGTHS AND GRADES BASED ON FIELD INSPECTION PRIOR TO ORDERING MATERIALS!

INSTALL ALL PIPES AND OUTLET PROTECTION IN ACCORDANCE WITH THE STANDARDS AND GUIDELINES OF THE NORTH CAROLINA SEDIMENTATION AND EROSION CONTROL DESIGN MANUAL (SEE BELOW)

All inlets shall be protected from sediment intrusion during construction with wire-backed gravel filters (straw bales are not acceptable)

For outlet structure, use Class B rip-rap with a d50 = 12 inches; place rip-rap a minimum thickness of 2 feet in two interlocking layers provide geotextile erosion blanket (minimum 8 o.s.y., non-woven) underneath stone, with water stops placed at 25 feet centers (minimum of one); water stop shall be at least 12 inches wide and 12 inches deep; place rip-rap apron to specified length and full-width of ditch on downstream end

ALL PIPES SHALL BE CRADLED IN COMPACTED SOIL (FORMING A V-PROFILE). BACKFILL SHALL BE SELECT SOIL (FREE OF ROCKS, DEBRIS, OR VEGETATIVE MATTER) AND COMPACTED TO SAME STANDARDS AS FINAL COVER

SEEDING SCHEDULE

Shoulders, Side Ditches, Slopes (Max 3:1)

DATE	TYPE	PLANTING RATE
Aug 15 – Nov 1	Tall Fescue	300 lbs/acre
Nov 1 – Mar 1	Tall Fescue & Abruzzi Rye	300 lbs/acre
Mar 1 – Apr 15	Tall Fescue	300 lbs/acre
Apr 15 – Jun 30	Hulled Common Bermudagrass	25 lbs/acre
Jul 1 – Aug 15	Tall Fescue and	125 lbs/acre
	***Browntop Millet	35 lbs/acre
	***or Sorghum–Sudan Hybrids	30 lbs/acre

Shoulders, Side Ditches, Slopes (3:1 to 2:1)

DATE	TYPE	PLANTING RATE
Mar 1 – Jun 1	Sericea Lespedeza (scarified) & use the following combinations:	50 lbs/acre
(Mar 1 – Apr 15)	Add Tall Fescue	120 lbs/acre
(Mar 1 – Jun 30)	Or Add Weeping Lovegrass	10 lbs/acre
(Mar 1 – Jun 30)	Or Add Hulled Common Bermudagrass	25 lbs/acre
Jun 1 – Sep 1	***Tall Fescue and	120 lbs/acre
	***Browntop Millet	35 lbs/acre
	***or Sorghum–Sudan Hybrids	30 lbs/acre
Sep 1 – Mar 1	Sericea Lespedeza (unhulled–unscarified)	70 lbs/acre
	and Tall Fescue	120 lbs/acre
(Nov 1 – Mar 1)	Add Abruzzi Rye	25 lbs/acre

Consult Conservation Engineer or Soil Conservation Service for additional information concerning other alternatives for vegetation of denuded areas. The above vegetation rates are those which do well under local conditions; other seeding rate combinations are possible.

***Temporary – Reseed according to optimum season for desired permanent vegetation. Do not allow temporary cover to grow over 12" in height before mowing, otherwise fescue may be shaded out.

SEEDBED PREPARATION

1. CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 3 INCHES DEEP OVER ADVERSE SOIL CONDITIONS, IF AVAILABLE.
2. RIP THE ENTIRE AREA TO 6 INCHES DEEP.
3. REMOVE ALL LOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
4. APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL (SEE BELOW*).
5. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.
6. SEED ON A FRESHLY PREPARED SEEDBED AND COVER SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING.
7. MULCH IMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. IF STAND SHOULD BE OVER 60% DAMAGED, RESTABLISH FOLLOWING ORIGINAL LIME, FERTILIZER AND SEEDING RATES.
9. CONSULT CONVERSATION INSPECTOR ON MAINTENANCE TREATMENT AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED.

* APPLY: AGRICULTURAL LIMESTONE – 2 TONS/ACRE (3 TONS/ACRE IN CLAY SOILS)
FERTILIZER – 1,000 LBS./ACRE –10–10–10
SUPERPHOSPHATE – 500 LBS.>/ACRE –20% ANALYIS
MULCH – 2 TONS/ACRE – SMALL GRAIN STRAW
ANCHOR – ASPHALT EMULSION @ 300 GALS./ACRE

EROSION AND SEDIMENTATION CONTROL CONSTRUCTION NARRATIVE

NOTIFICATIONS

PRIOR TO COMMENCING EARTH WORK IN ANY CRITICAL AREAS, E.G., NEAR STREAM BUFFERS OR WETLANDS FEATURES, THE CONTRACTOR SHALL NOTIFY THE NCDENR DIVISON OF ENVIRONMENTAL MANAGEMENT, WATER QUALITY SECTION AND NCDENR DIVISION OF LAND RESOURSES, LAND QUALITY SECTION AND THE PROJECT ENGINEER FOR AN INSPECTION OF SEDIMENTATION AND EROSION CONTROL MEASURES. NO GROUND DISTURBING WORK SHALL TAKE PLACE WITHOUT PROPER MEASURES IN PLACE. THE PROJECT ENGINEER SHALL BE KEPT INFORMED OF ALL NEW WORK.

GENERAL

ALL WORK SHALL CONFORM TO THE RULES AND GUIDELINES OF THE NORTH CAROLINA SEDIMENTATION CONTROL LAW, AS ADMINISTERED BY NC DENR DIVISION OF LAND QUALITY.

CRITICAL SEDIMENTATION CONTROL FEATURES, E.G., CLEARING LIMITS, SEDIMENT TRAPS, GRADED CHANNELS, BASINS, OUTLET STRUCTURES, LEVEL SPREADERS, ETC., SHALL BE FIELD STAKED BY A LICENSED SURVEYOR OR OTHER PARTY APPROVED BY THE PROJECT ENGINEER AND CONSTRUCTED ACCORDING TO PLAN DIMENSIONS. ALL WORK SHALL PROCEED IN A METHODICAL AND WORKMANLIKE MANNER. THE OWNER/OPERATOR IS RESPONSIBLE FOR SECURING ANY REQUIRED LAND DISTURBING PERMITS AND PAYING FEES.

THIS S&EC PLAN DESCRIBES TEMPORARY AS WELL AS PERMANENT SEDIMENTATION AND EROSION CONTROL MEASURES. THIS PLAN ASSUMES THAT ALL DESIGNED MEASURES WILL BE INSTALLED. FIELD ADJUSTMENTS ARE ALLOWABLE WITH THE ADVANCE PERMISSION OF THE PROJECT ENGINEER.

SEDIMENTATION AND EROSION CONTROL MEASURES ARE SUBJECT TO FIELD INSPECTION AND PERFORMANCE EVALUATION BY WAKE COUNTY. IF ANY MEASURES ARE FOUND INADEQUATE, A REVIEW OF THE MEASURES AS CONSTRUCTED SHALL BE PERFORMED TO ENSURE ADHERENCE TO THE PLANS. THEN, IF NEEDED, ADDITIONAL DESIGNS SHALL BE SUBMITTED TO NCDENR DIVISION OF LAND RESOURCES FOR REVIEW. SUBSTANTIAL DEVIATIONS FROM THIS PLAN SHALL BE REVIEWED IN ADVANCE BY THE ENGINEER AND MAY BE SUBJECT TO PRIOR APPROVAL BY WAKE COUNTY ENVIRONMENTAL SERVICES.

SILT FENCING

ADEQUATE SILT FENCING SHALL BE INSTALLED AND PROPERLY MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. THE PLANS SHOW THE MINIMUM REQUIRED AREAS INTENDED FOR SILT FENCE CONSTRUCTION. THE SILT FENCE SHALL BE OF THE TYPE DESIGNATED IN THE PLANS, UNLESS THE ENGINEER APPROVES A SUBSTITUTE. PREFABRICATED SILT FENCING ATTACHED TO WOODEN STAKES WILL NOT BE APPROVED – ONLY METAL POSTS AND WIRE-BACKED SILT FENCING WILL BE ACCEPTABLE. THE BASE OF THE FABRIC SHALL BE EMBEDDED IN A TRENCH PER THE PLANS AND AN APPROVED BACKFILL USED TO SECURE THE FABRIC. OUTLETS SHALL BE INSTALLED AT LOCATIONS SHOWN ON THE PLANS, OR AS DESIGNATED IN THE FIELD BY THE ENGINEER.

DIVERSIONS DITCHES AND SOIL BERMS

TEMPORARY AND PERMANENT DIVERSION DITCHES (SWALES) AND SOIL BERMS ARE REQUIRED THROUGHOUT THE PROJECT TO CONVEY SURFACE RUNOFF. ALL DITCHES SHALL BE BUILT TO THE DIMENSIONS AND GIVEN THE CHANNEL–LINING MATERIAL SPECIFIED IN THIS PLAN, UNLESS THE ENGINEER HAS APPROVED AN ALTERNATIVE. ALL SOIL BERMS SHALL BE BUILT TO THE MINIMUM DIMENSIONS SHOWN ON THE PLANS. SOIL SHALL BE COMPACTED AND STABILIZED WITH VEGETATION IMMEDIATELY UPON COMPLETION OF THE CONSTRUCTION. ADDITIONAL DITCHES AND SOIL BERMS MAY BE REQUIRED. ALL WATER–DIVERSION STRUCTURES, WHETHER SHOWN ON THE PLANS OR ADDED AS A FIELD ADJUSTMENT, SHALL BE MADE TO DRAIN TO AN APPROVED MEASURE.

TEMPORARY SEDIMENT TRAPS

SEDIMENT TRAPS SHALL CONFORM TO WAKE COUNTY "CUSTOM BASIN" STANDARDS AND SHALLL BE CONSTRUCTED AT THE LOCATIONS AND DIMENSIONS SHOWN IN THE PLANS DURING THE EARLY STAGES OF CLEARING. ASSOCIATED DITCHES AND SILT FENCES SHALL BE INSTALLED. FIELD ADJUSTMENTS OF LOCATIONS MAY BE ALLOWABLE SUBJECT TO APPROVAL BY THE PROJECT ENGINEER. ALL TEMPORARY SEDIMENT TRAPS SHALL BE CLEANED OUT AND MAINTAINED AS NEEDED FOR AS LONG AS NECESSARY TO PROTECT WATER QUALITY. ALL EARTHWORK ASSOCIATED WITH THE SEDIMENT TRAPS SHALL BE VEGETATED UPON COMPLETION. THE TRAPS MAY BE LEFT IN PLACE INDEFINITELY, OR, ONCE THE ENGINEER DEEMS A TRAP TO BE OBSOLETE, IT MAY BE REMOVED AND THE GROUND RESTORED TO PROMOTE POSITIVE DRAINAGE. VEGETATION OR OTHER PROTECTIVE MEASURES SPECIFIED BY THE ENGINEER SHALL BE ESTABLISHED IMMEDIATELY AT THE SITE OF ANY ABANDONED TRAPS.

SEDIMENT BASINS

THE PERMANENT SEDIMENT BASIN (SB–1) LOCATED WEST OF THE LANDFILL SHALL SERVE AS THE PRIMARY SEDIMENT BASIN THROUGHOUT THE CONSTRUCTION AND OPERATION OF THE FACILITY. THE SEDIMENT BASINS WILL BE CONVERTED TO PERMANENT STORM WATER QUALITY BASINS AT THE END OF CONSTRUCTION. THE BASIN SHALL BE INSPECTED AND CLEANED OUT OR MAINTAINED AS NEEDED PRIOR TO INITIATING SITE–WIDE GRADING WORK. THE OUTLET STRUCTURES WILL REMAIN IN PLACE INDEFINITELY. AT SOME FUTURE TIME, IT MAY BE NECESSARY TO REFURBISH THE BASIN BY REPLACING THE BARREL OR RISER STRUCTURES. A PROCEDURE FOR OUTLET STRUCTURE REPAIR IS PROVIDED AT THE END OF THIS SECTION.

CONSTRUCTION SEQUENCE

FINAL CLOSURE OF PHASE 1 (EXISTING CDLF LANDFILL) – UPGRADE EXISTING CHANNELS LEADING TO SB–1 (CHANNELS #26 – #30) TO DESIGN DIMENSIONS AND/OR CHANNEL LINER MATERIAL AS NEEDED. INSTALL TEMPORARY MEASURES SHOWN ON CONSTRUCTION PLANS AND REMOVE SEDIMENT BUILDUP IN SB–1. PLACE AND COMPACT COVER SOIL ON SIDE SLOPES IN ACCORDANCE WITH PROJECT SPECIFICATIONS. CONSTRUCT PERMANENT CAP DIVERSION BERMS AT 2 PERCENT GRADES (SEE CONSTRUCTION PLANS) AND INSTALL SLOPE DRAIN PIPES. BE SURE TO COMPACT ALL SOIL WORK AND INSTALL INLET PROTECTION ON SLOPE DRAINS. DELIVER SOILS TO THE SLOPES FROM THE TOP OF THE LANDFILL, BUT COMPLETE THE SIDE SLOPE CLOSURE IN INCREMENTS WORKING FROM THE BOTTOM UPWARDS TO HIGHER ELEVATIONS. VERY IMPORTANT – VEGTATE SIDE SLOPES (USING STRAW MULCH AND TACK) AS SOON AS SECTIONS ARE COMPLETED TO STABILIZE THE SLOPES. REFER TO THE SEEDBED PREPARATION NOTES AND SEEDING SCHEDULE. IT MAY BE NECESSARY TO ESTABLISH A NURSE CROP OF RYE AND OTHER SHORT–TERM VEGETATION, DEPENDING ON THE TIMING OF THE CONSTRUCTION START UP, FOLLOWED BY OVER–SEEDING DURING MORE FAVORABLE CONDITIONS TO ESTABLISH PERMANENT VEGETATION. IF EXCESSIVELY WET OR DRY WEATHER CONDITIONS PREVAIL DURING CONSTRUCTION, COVERING THE SLOPES WITH WOODY MULCH IS ADVISED, THEN FOLLOW UP DURING MORE FAVORABLE WEATHER BY PLOWING THE MULCH INTO THE TOPSOIL AND SEEDING IN A TYPICAL MANNER WITH SOIL AMENDMENTS, SEED, STRAW MULCH AND TACK.

SOIL BORROW ACTIVITIES AND PHASE 2 SITE PREPARATION – INSTALL TEMPORARY MEASURES (E.G., SILT FENCE) SHOWN ON CONSTRUCTION PLANS, FOLLOWED BY CLEARING AND GRUBBING FOR NEW EMBANKMENT AND CONVEYENCES. PLACE ALL MEASURES INTO SERVICE PRIOR TO INITIATING FULL–SCALE GRADING ACTIVITIES. COMPLETE PERIMETER EMBANKMENT AND STABILIZE EXTERIOR SLOPES WITH VEGETATION AND/OR EROSION CONTROL MAT, STONE, MULCH, ETC., TO PREVENT EROSION. ONCE PERIMETER EMBANKMENT IS COMPETED, GRADE INTERIOR PORTIONS OF LANDFILL, KEEPING ALL RUNOFF DIRECTED TOWARD INTERNAL SUMPS (LOWEST ELEVATIONS WITHIN TWO SEPARATE CELLS, LOCATED ON NORTH AND SOUTH SIDE OF CENTRAL RIDGE. SUMPS SHALL STAY OPERATIONAL THROUGHOUT CONSTRUCTION AND EARLY STAGES OF OPERATIONS – WATER SHALL BE REMOVED VIA PUMPS AS NEEDED TO PREVENT WASTE DEPOSITION INTO STANDING WATER, PER NCDENR REGULATIONS.

DURING DISPOSAL OPERATIONS – AS WASTE SLOPES BECOME POSITIVE (ABOVE THE ELEVATIONS OF THE PERIMTER CHANNELS), USE VEGETATION AND/OR WOODY MULCH TO STABILIZE INTERIM COVER SOIL. WORK THE LANDFILL IN SMALL INCREMENTS TO MINIMIZE EXPOSED SLOPE AREAS – IDEALLY, THE WORKING FACE SHOULD BE KEPT TO A HALF–ACRE IN SIZE. ONCE AN AREA IS BROUGHT TO FINAL GRADE, IT SHOULD BE CLOSED WITH APPROVED FINAL COVER. INTERIM COVER SHALL BE APPLIED AND VEGETATED OR COVERED WITH WOODY MULCH IN AREAS THAT WILL NOT RECEIVE ADDITIONAL ACTIVITY FOR 20 DAYS, OR MORE. DURING ALL PHASES OF OPERATIONS, INSPECT THE SEDIMENT BASINS AND/OR OTHER MEASURES FOR EXCESS SEDIMENT BUILDUP OR DAMAGE – INSPECTIONS SHOULD BE CONDUCTED WEEKLY OR AFTER ANY RAINFALL EVENT MEASURING IN EXCESS OF ONE–HALF INCH WITHIN 24 HOURS. REMOVE EXCESS SEDIMENT AND/OR MAKE REPAIRS AS NEEDED. INSPECT SLOPES FREQUENTLY AND CORRECT OBVIOUS EROSION PROBLEMS.

FINAL CLOSURE OF PHASE 2 – FINAL COVER SHALL BE APPLIED AND VEGETATED INCREMENTALLY AS AREAS ARE BROUGHT TO FINAL DESIGN GRADES. SEE PROCEDURES FOR FINAL CLOSURE OF PHASE 1 (ABOVE). INSPECT AND REFURBISH SEDIMENT CONTROL MEASURES AS NEEDED, ESTABLISH VEGETATION WITHIN 20 DAYS FOLLOWING COMPLETION OF GRADING ACTIVITIES ON ALL PORTIONS OF THE LANDFILL FINAL COVER.

CONVERTING SEDIMENT BASIN TO STORM WATER QUALITY POND

AFTER THE SITE IS STABILIZED WITH VEGETATION, INCLUDING THE DAM AND SIDE SLOPES WITHIN THE BASIN, THE BASIN SHALL BE INSPECTED AND ACCUMULATED SEDIMENT REMOVED. REPAIR ANY EROSION AND UPGRADE STONE ENERGY DISSIPATERS AND/OR VEGETATIVE COVER AS NEEDED. ENSURE THAT THE POND DRAIN IS FUNCTIONAL (MAKE SURE THE DRAIN IS SHUT). REMOVE ANY ACCUMULATED DEBRIS FROM THE TRASH RACK AND/OR RISER PIPE AND CHECK THE SECURITY OF THE RISER PIPE AND TRASH RACK. ENSURE ALL ENERGY DISSIPATERS, INCLUDING INLETS TO BASIN THAT EXTEND TO BOTTOM, ARE IN PLACE. ENSURE ALL PIPES, INLETS, GRATES, AND APPROPRIATE PROTECTIVE MEASURES ARE FUNCTIONAL.

PROCEDURE FOR REPLACING A PIPE OR RISER/BARREL STRUCTURE

PERMANENT STORM DRAIN PIPES AND RISER/BARREL STRUCTURES FOR THE SEDIMENT BASIN ARE DESIGNED FOR AN OPERATIONAL LIFE OF SEVERAL DECADES. IF A PIPE OR SEDIMENT BASIN RISER/BARREL STRUCTURE FAILS OR MUST BE REFURBISHED, THE STRUCTURE MAY BE TEMPORARILY BYPASSED DURING THE REPAIRS VIA PUMPING TO A TEMPORARY SEDIMENT TRAP. IDEALLY, THIS SHOULD BE PERFORMED DURING A TIME OF FAIR WEATHER. INLETS TO AFFECTED PIPES SHOULD BE BLOCKED AND RUNOFF DIVERTED TO AN APPROVED MEASURE.

REMOVAL – INITIAL BARREL/RISER REMOVAL ACTIVITIES SHALL CONSIST OF DEWATERING THE BASIN (IF NEEDED), INSTALLING TEMPORARY SEDIMENT CONTROL MEASURES (E.G., SILT FENCING, TEMPORARY SEDIMENT TRAPS, DIVERSION SWALES AND/OR BERMS, THEN REMOVING ALL SEDIMENT BUILD–UP. THE REMOVED SEDIMENT SHOULD BE STOCKPILED WITHIN THE BASIN (AWAY FROM THE MAIN FLOW CHANNEL) OR WITHIN A SEPARATE AREA THAT IS PROTECTED BY APPROPRIATE SEDIMENT CONTROL MEASURES. THE SEDIMENT SHALL BE ALLOWED TO DRAIN THEN DISPOSED OFF–SITE OR UTILIZED ON–SITE.

REPLACEMENT – THE DAMAGED PORTION OF THE STRUCTURE SHALL BE EXCAVATED AND REPLACED WITH EQUAL OR BETTER MATERIALS AS THE ORIGINAL. ALL BACKFILL SHALL BE COMPACTED AND VEGETATED IMMEDIATELY UPON COMPLETION. IF THE ENERGY DISSIPATERS ARE DISTURBED, E.G., RIP–RAP APRONS, THAT WORK SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION. THE ENGINEER SHALL BE GIVEN AN OPPORTUNITY TO EVALUATE WHETHER THE ORIGINAL MATERIALS AND SIZES ARE ADEQUATE FOR REPLACEMENT FUNCTION. IT IS ANTICIPATED THESE STORM WATER CONTROL FEATURES WILL REMAIN INDEFINITELY.

DATE	NO.	REVISION

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SEAL: NORTH CAROLINA PROFESSIONAL SEAL 25462 ENGINEER DAVID GARRETT 6-22-2008

SEAL:

PROJECT TITLE: C&D LANDFILL, INC. CDLF PHASE 1 CLOSURE PLAN PITT COUNTY (#74-07)

DRAWING TITLE: SEDIMENTATION & EROSION CONTROL SCHEDULES & NARRATIVE (SHEET 3 OF 3)

DESIGNED BY: G.D.G.	DRAWN BY: A.W.H.
CHECKED BY: G.D.G.	PROJECT NO.: C&D PH1
SCALE: AS SHOWN	DATE: JUNE 2008
FILE NAME: S&EC SCHEDULES & NARRATIVE	
SHEET NO.: 5	DRAWING NO.: EC3