August 25, 2014

Rec'd 9/02/2014. DIN 22269, 6013-CDLF-1993, SWS

Mr. John Murray
Solid Waste Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
610 East Center Avenue, Suite 301
Mooresville, NC 28115

Dear Mr. Murray:

Subject: Application for the Modification of Solid Waste Permit
Construction and Demolition Debris Landfill
Permit No. 60-13-CDLF
CEC Project 111-370

On behalf of Greenway Waste Solutions at North Meck, LLC please find the attached three copies of an application for a minor modification of the solid waste Permit to Construct and Operate for the existing Construction and Demolition Debris Landfill (60-13-CDLF) at the Greenway Waste Solutions at North Meck, LLC facility in Huntersville, NC. Included in this application is a summary of the permit modifications, calculations and construction plans.

The flat benches, as depicted in the permitted drawings, have been removed from the landfill face and replaced with "tack-on" drainage swales constructed on the landfill side slopes to intercept sheet flow run-off and convey the storm water to perimeter swales and sediment basins. The proposed revisions associated with this permit modification will increase the capacity for Expansion Area II and the Infill Expansion to 3,442,445 cy. The resulting additional capacity is 301,445 cy, a 9.6% increase in capacity from the permitted Expansion Area II and Infill Expansion combined capacity.

Should you have any questions or require any additional information in support of this application, please do not hesitate to contact me at 704-773-6465.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Scott L. Brown, PE
Vice President

Attachments

cc: Greenway Waste Solutions, LLC.

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WASTE MANAGEMENT

EXPANSION II AND INFILL EXPANSION CLOSURE MODIFICATION FOR CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL FACILITY NO. 60-13-CDLF-1993

Prepared For:

GREENWAY WASTE SOLUTUIONS AT NORTH MECK, LLC.
HUNTERSVILLE, NC

Prepared By:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
CHARLOTTE, NORTH CAROLINA

CEC Project 111-370.001

AUGUST 25, 2014

North Carolina Board of Examiners

For

Engineers and Surveyors

License No. C-3035

NORTH CAROLINA PROFESSIONAL SEAL 026435 ENGINEER SCOTT L. BROWN

August 25, 2014

Civil & Environmental Consultants, Inc.

Charlotte 1900 Center Park Drive, Suite A | Charlotte, NC 28217 | p: 980-237-0373 f: 980-237-0372 | www.cecinc.com

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1.0 SITE DESCRIPTION

This Application for the Modification of Solid Waste Permit for Construction and Demolition Debris Landfill at the North Meck C&D Landfill is being submitted by Civil & Environmental Consultants, Inc. on behalf of Greenway Waste Solutions at North Meck, LLC. This application package includes information regarding the site design, construction and operation.

Project Title:	Expansion II and Infill Expansion Closure Modification for Construction and Demolition Debris Landfill Facility No. 60-13-CDLF-1993
Property Owner:	C&D Management Company, LLC. 19109 West Catawba Avenue, Suite 200 Cornelius, NC 28031-5614 (704) 895-0329
Property Owner Representative:	Mr. Roger Barnes, Landfill Manager
Consulting Engineer:	Civil & Environmental Consultants, Inc. 1900 Center Park Drive Suite A Charlotte, NC 28217
Consulting Engineer's Representative:	Scott L. Brown, P.E.
Proposed Site Operator:	Greenway Waste Solutions at North Meck, LLC. 19109 West Catawba Avenue, Suite 200 Cornelius, NC 28031-5614 (704) 895-0329
Operator's Representative:	Mr. Roger Barnes, Landfill Manager

The Greenway Waste Solutions at North Meck, LLC. Construction and Demolition Debris Landfill is located in Mecklenburg County, NC. The operating landfill is located south of and accessed by Holbrooks Road and east of Old Statesville Road. The Facility is bisected by a creek, with Phase 1 and 2 located south of the creek and Expansion Areas I and II and the Infill Expansion located north of the creek. The original permit for the facility (Phase 1) was issued in 1993 and Phase 2 followed in 1995. Filling operations in Phases 1 and 2 of the landfill are no longer occurring. Expansion Area I began filling operations with a Permit to Operate issued in 2001 and was closed in 2007. The Permit to Operate for Phases 1, 2 and 3 of Expansion Area II were issued in 2006, and filling operations in this area are ongoing. Filling operations are also occurring in the Infill Expansion for which a Permit to Operate was secured in 2012. The Infill Expansion bridges Expansion Areas I and II, with a footprint area of 3.2 acres and the majority of capacity occurring as layover onto Expansion Areas I and II.

The Permitted Capacity and Acreages for the current permitted landfill are shown in the chart below:

C&D Unit	Gross Capacity (cy)	Acreage
Expansion Area II		
Phase 1	1,100,000	14.9
Phase 2 & 3	1,100,000	16.2
Sub-Total	2,100,000	31.1
Infill Expansion		
Phase I	323,724	3.2
Phase II	423,810	Vertical Expansion
Phase III	293,466	Vertical Expansion
Sub-Total	**1,041,000**	
Total for Facility	**3,141,000**	**34.3**

2.0 SUMMARY OF MODIFICATIONS

The requested modifications for the Greenway Waste Solutions at North Meck, LLC. landfill include revised landfill final elevations, stormwater conveyance swales and edge of waste limits for Expansion Area II and the Infill Expansion. The revised final elevations will tie into the existing grades for closed Expansion Area I. The modifications will result in additional landfill capacity and are described in detail below.

The permitted final elevation contours for Expansion Area II and the Infill Expansion depict 3:1 side slopes from the edge of waste to the top of the completed landfill. In addition, flat benches ten feet in width were to be constructed every twenty (20) vertical feet along the face of the completed landfill slope. Stormwater conveyance swales were proposed on the benches to intercept stormwater run-off from the landfill slope face. The bench swales were to discharge to rip-rap downchutes which feed into swales at the base of the landfill, then directed run-off towards permanent sediment control basins. The combination of benches with swales and downchutes reduced the sheet flow distance for stormwater run-off along the landfill slopes.

The revised final elevation contours for the Expansion II and Infill Expansion are shown in the North Meck C&D Landfill Expansion II and Infill Expansion Closure Modification construction drawings dated August 2014 (included with this submittal). The final elevation contours depict a 3:1 slope from the revised edge of waste line to the final top elevation of the landfill. All required buffers are maintained. The flat benches, as depicted in the permitted drawings, have been removed from the landfill face and replaced with “tack-on” drainage swales constructed on the landfill side slopes to intercept sheet flow run-off and convey the storm water to perimeter swales and sediment basins. There are no modifications proposed for the permanent sediment basins. The highest proposed elevation of the modified landfill Phases 1 and 2 will be elevation 802 feet (NAVD 1988), which is less than the permitted top elevation for Expansion II and Infill Expansion of 824 feet.

The edge of waste limits for Expansion II and the Infill Expansion were adjusted slightly to maximize the proposed waste footprint, but still maintain compliance with all NC Solid Waste

regulations and buffers. The revised limits are shown in the construction drawings (sheets C200 and C300). The proposed modifications to Expansion II and Infill Expansion will result in additional capacity for both phases. The combined permitted capacity for Expansion II and Infill Expansion is 3,141,000 cy. The proposed revisions associated with this permit modification will increase the capacity for Expansion II and Infill Expansion to 3,442,445 cy. The resulting additional capacity is 301,445 cy, a 9.6% increase in capacity from the permitted Expansion II and Infill Expansion combined capacity. This information is summarized in the table below:

Area	**Permitted Capacity (cy)**	**Proposed Additional Capacity (cy)**	**Proposed Capacity (cy)**	**Proposed Increase in Capacity**
Expansion II and Infill Expansion	3,141,000	301,445	3,442,445	9.6%

3.0 SUMMARY OF STORMWATER CALCULATIONS

Calculations were performed to ensure that the proposed "tack-on" drainage swales could convey stormwater run-off from the landfill face to slope drains which will discharge to perimeter swales and the existing sediment basins. Sheet C200 of the construction plans detail the location of the proposed drainage swales, slope drains and perimeter swales. Sheet C300 of the construction plans is a drainage basin map proposed tack-on and perimeter swales.

Tack-on and perimeter swales were sized to intercept and convey slope drainage from the 25 year, 24 hour storm event. Stormwater run-off flows were calculated using the rational method. Based on the drainage basin map, the basin area for each tack-on swale will not exceed 2 acres and the basin area for each perimeter swale will not exceed 5 acres. The swales were designed to convey these respective flows, see stormwater calculations in the appendix.

Both types of swales will require matting with temporary erosion control blankets, until vegetated. The flow velocity and erosion control matting calculations have been included in the stormwater calculations in the appendix. Details for the construction of the swales are shown on sheet C400 of the construction plans.

APPENDIX A

Civil & Environmental Consultants, Inc.

		By:	MTB
Project Name:	Greenway Waste Solutions, Permit Modification	Date:	8/2014
CEC Project No.:	111-370.001	Checked By:	TMG
Description:	Erosion and Sediment Control Calculation, 25-Year	Date:	8/2014

Rational Runoff					
Basin	Area (acres)	Composite C	Time of Concentration, Tc (min)	Intensity, I (in/hr)	Flow, Q (cfs)
Tack-on Swale (10% Slope) Basin	2.00	0.40	10.0	6.83	5.46
Type 2 Drainage Swale Basin	5.00	0.40	10.0	6.83	13.66

Trapezoidal Channel Flow Computations

Civil & Environmental Consultants, Inc.

		By:	MTB
Project Name:	Greenway Waste Solutions, Permit Modification	Date:	8/2014
CEC Project No.:	111-370	Checked By:	TMG
Description:	Swale Calculations, Tack-on Swale - 10% Slope	Date:	8/2014

n =	0.040	
B =	2.00	ft
z_L =	3.00	ft:1 ft rise
z_R =	2.00	ft:1 ft rise
S =	0.1000	ft/ft

Input Depth of Flow		
d =	0.38	ft
A =	1.12	sf
P_w =	4.05	ft
R_h =	0.28	ft
Q =	5.61	cfs
v =	5.00	ft/s

Input Flow Rate		
Q =	5.46	cfs
d =	0.37	ft
A =	1.10	sf
P_w =	4.02	ft
R_h =	0.27	ft
v =	4.97	ft/s

n = Manning's roughness coefficient
B = Bottom width of channel (ft)
z_L = Slope of left bank (ft:1 ft rise)
z_R = Slope of right bank (ft:1 ft rise)
S = Channel slope (ft/ft)
d = Flow depth (ft)
A = Cross sectional flow area (ft^2)
P_w = Wetted perimeter (ft)
R_h = Hydraulic radius (ft)
Q = Flow rate (cfs)
v = Flow velocity (ft/s)
T = Top width of flow (ft)

$Q = (1.49/n)(A)(R_h)^{2/3}(S)^{1/2}$

$T = B + (z_L d) + (z_R d)$

$A = (d)[(B + T)/2]$

$P_w = B + [d^2 + (z_L d)^2]^{1/2} + [d^2 + (z_R d)^2]^{1/2}$

$R_h = A/P_w$

$v = Q/A$

Trapezoidal Channel Flow Computations

Civil & Environmental Consultants, Inc.

		By:	MTB
Project Name:	Greenway Waste Solutions, Permit Modification	Date:	8/2014
CEC Project No.:	111-370	Checked By:	TMG
Description:	Swale Calculations, Permiter Drainage Swale	Date:	8/2014

n =	0.040	
B =	5.00	ft
z_L =	3.00	ft:1 ft rise
z_R =	3.00	ft:1 ft rise
S =	0.1000	ft/ft

Input Depth of Flow		
d =	0.40	ft
A =	2.48	sf
P_w =	7.53	ft
R_h =	0.33	ft
Q =	13.93	cfs
v =	5.62	ft/s

Input Flow Rate		
Q =	13.66	cfs
d =	0.40	ft
A =	2.44	sf
P_w =	7.50	ft
R_h =	0.33	ft
v =	5.59	ft/s

n = Manning's roughness coefficient
B = Bottom width of channel (ft)
z_L = Slope of left bank (ft:1 ft rise)
z_R = Slope of right bank (ft:1 ft rise)
S = Channel slope (ft/ft)
d = Flow depth (ft)
A = Cross sectional flow area (ft^2)
P_w = Wetted perimeter (ft)
R_h = Hydraulic radius (ft)
Q = Flow rate (cfs)
v = Flow velocity (ft/s)
T = Top width of flow (ft)

$Q = (1.49/n)(A)(R_h)^{2/3}(S)^{1/2}$

$T = B + (z_L d) + (z_R d)$

$A = (d)[(B + T)/2]$

$P_w = B + [d^2 + (z_L d)^2]^{1/2} + [d^2 + (z_R d)^2]^{1/2}$

$R_h = A/P_w$

$v = Q/A$

Tensar International Corporation
5401 St. Wendel-Cynthiana Road
Poseyville, Indiana 47633
Tel. 800.772.2040
Fax 812.867.0247
www.nagreen.com

Erosion Control Materials Design Software
Version 5.0

Project Name: Permit Mod
Project Number: 50220
Project Location: Huntersville, NC
Channel Name: Tack On

Discharge	5.46
Peak Flow Period	5
Channel Slope	0.1
Channel Bottom Width	2
Left Side Slope	2
Right Side Slope	3
Low Flow Liner	
Retardance Class	C
Vegtation Type	Bunch Type
Vegetation Density	Fair 50-75%
Soil Type	Clay Loam

SC250 - Class C - Bunch Type - Fair 50-75%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
SC250 Unvegetated	Straight	5.46 cfs	4.95 ft/s	0.38 ft	0.04	2.5 lbs/ft2	2.34 lbs/ft2	1.07	STABLE	E
SC250 Reinforced Vegetation	Straight	5.46 cfs	3.02 ft/s	0.54 ft	0.08	8 lbs/ft2	3.37 lbs/ft2	2.37	STABLE	E
Underlying Substrate	Straight	5.46 cfs	3.02 ft/s	0.54 ft	--	0.8 lbs/ft2	0.487 lbs/ft2	1.64	STABLE	--

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5401 St. Wendel-Cynthiana Road
Poseyville, Indiana 47633
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Fax 812.867.0247
www.nagreen.com

Erosion Control Materials Design Software
Version 5.0

Project Name: Permit Mod
Project Number: 50220
Project Location: Huntersville, NC
Channel Name: Perimeter Swale

Discharge	13.66
Peak Flow Period	5
Channel Slope	0.1
Channel Bottom Width	5
Left Side Slope	3
Right Side Slope	3
Low Flow Liner	
Retardance Class	C
Vegtation Type	Mix (Sod & Bunch)
Vegetation Density	Fair 50-75%
Soil Type	Clay Loam

SC250 - Class C - Mix (Sod & Bunch) - Fair 50-75%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
SC250 Unvegetated	Straight	13.66 cfs	5.57 ft/s	0.4 ft	0.04	2.5 lbs/ft2	2.47 lbs/ft2	1.01	STABLE	E
SC250 Reinforced Vegetation	Straight	13.66 cfs	3.9 ft/s	0.53 ft	0.067	8 lbs/ft2	3.32 lbs/ft2	2.41	STABLE	E
Underlying Substrate	Straight	13.66 cfs	3.9 ft/s	0.53 ft	--	0.8 lbs/ft2	0.452 lbs/ft2	1.77	STABLE	--

Tensar International Corporation
5401 St. Wendel-Cynthiana Road
Poseyville, Indiana 47633
Tel. 800.772.2040
Fax 812.867.0247
www.nagreen.com

Erosion Control Materials Design Software
Version 5.0

Project Name: North Meck Landfill Slopes
Project Number: 50992
Slope Name: Swale Slope

Country	United States
State/Region	North Carolina
City	Charlotte
Annual R Factor	175
Adjusted R Factor	64.75
Total Slope Length	30
Protection Type	Permanent
Protection Period	3
Beginning Month	August
Slope Gradient (H:1)	2
Soil Type	Clay Loam
K Factor	0.210

Reach 1
Start: 0ft End: 30ft
Vegetation Type: Mix (Both Sod/Bunch)(75-95%)

Material	ASL bare	ASL mat	MSL bare	MSL mat	Soil Loss Tolerance	SF	Remarks	Staple / App Rate
Estb. Veg.	0.897 in	0.018 in	0 in	0 in	0.03 in	1.672	STABLE	--
SC150	0.25 in	0.017 in	0.437 in	0.03 in	0.25 in	8.289	STABLE	C

NORTH **VICINITY MAP**
N.T.S.

NORTH **LOCATION MAP**
N.T.S.

NORTH MECKLENBURG C&D LANDFILL PERMIT MODIFICATION

PREPARED FOR

GREENWAY WASTE SOLUTIONS OF NORTH MECK, LLC

15300 HOLBROOKS ROAD
HUNTERSVILLE, NC 28078

LIST OF DRAWINGS

C000	COVER SHEET
C100	EXISTING SITE CONDITIONS
C200	PROPOSED LANDFILL CLOSURE GRADING PLAN
C300	PROPOSED LANDFILL CLOSURE DRAINAGE BASIN MAP
C400	DETAILS

OWNER/DEVELOPER:

GREENWAY WASTE SOLUTIONS OF NORTH MECK, LLC
19109 WEST CATAWBA AVE.
SUITE 200
CORNELIUS, NC 28031-5614
CONTACT: ELLIE ALLEN
PHONE: 704.895.0329

NORTH CAROLINA BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS LICENSE NO. C-3035

NORTH CAROLINA PROFESSIONAL SEAL 026435 ENGINEER SCOTT L. BROWN
8-25-14

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
1900 Center Park Drive - Suite A - Charlotte, NC 28217
Ph: 980.237.0373 - Fax: 980.237.0372
www.cecinc.com

GREENWAY WASTE SOLUTIONS OF NORTH MECK, LLC.
PERMIT MODIFICATION PLAN
15300 HOLBROOKS ROAD
HUNTERSVILLE, NC 28078

COVER SHEET

DATE:	AUG 2014
DRAWN BY:	MTB
DWG SCALE:	N.T.S.
CHECKED BY:	TMG
PROJECT NO:	111-370.001
APPROVED BY:	SLB

DRAWING NO.: **C000**

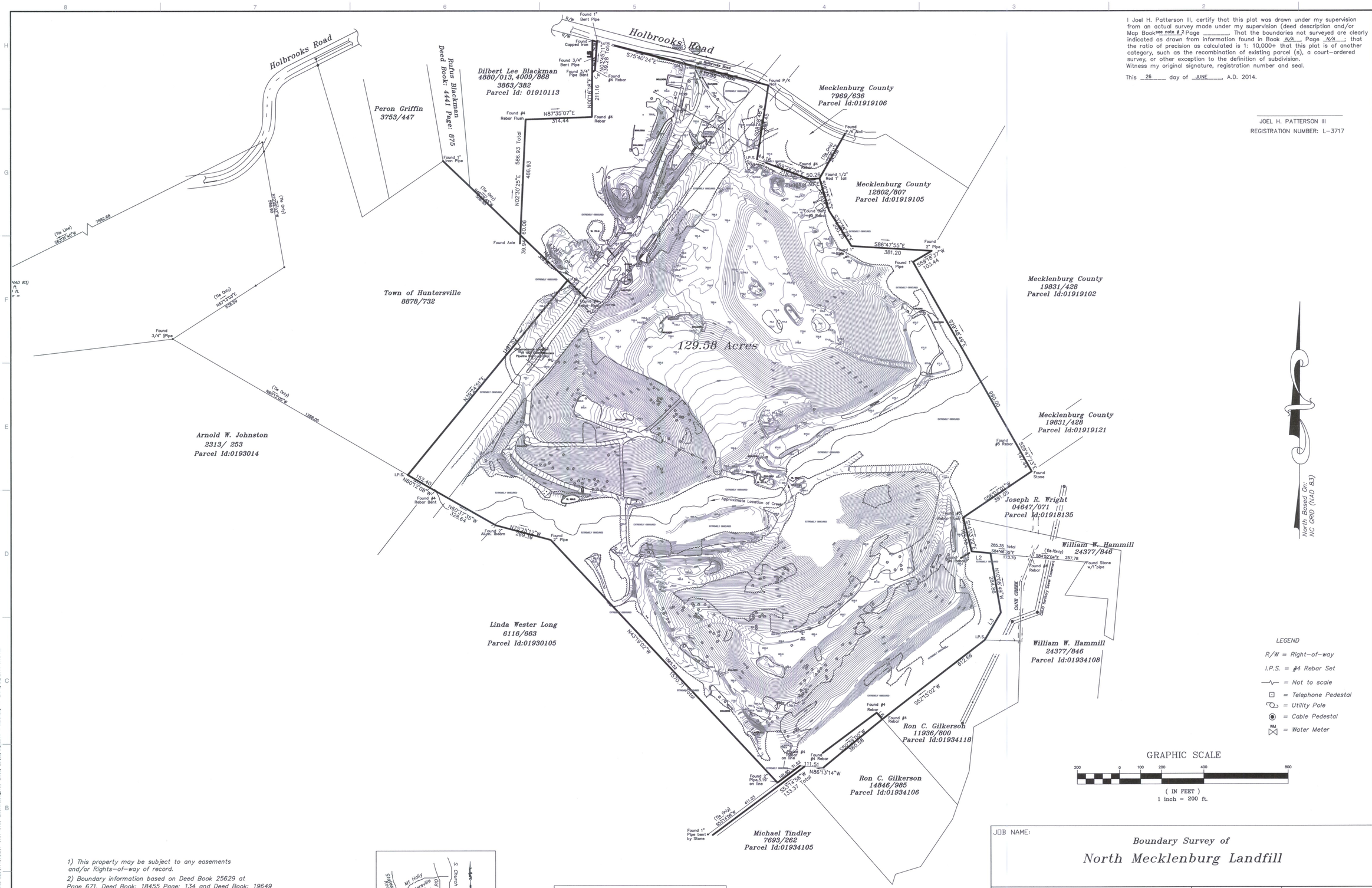
SHEET 1 OF 5

P:\2011\111-370\-CADD\001\Dwg\Permit Mod\111370.001-C101-C200-C300R SHEET.dwg\C00-COVER\ LG:(25/08/2014 - mbartels) - LP: 8/25/2014 1:57 PM

I Joel H. Patterson III, certify that this plat was drawn under my supervision from an actual survey made under my supervision (deed description and/or Map Book see note #2 Page _____. That the boundaries not surveyed are clearly indicated as drawn from information found in Book N/A, Page N/A; that the ratio of precision as calculated is 1: 10,000+ that this plat is of another category, such as the recombination of existing parcel (s), a court-ordered survey, or other exception to the definition of subdivision.
Witness my original signature, registration number and seal.

This 26 day of JUNE, A.D. 2014.

JOEL H. PATTERSON III
REGISTRATION NUMBER: L-3717



LEGEND

R/W = Right-of-way
I.P.S. = #4 Rebar Set
= Not to scale
= Telephone Pedestal
= Utility Pole
= Cable Pedestal
= Water Meter

GRAPHIC SCALE

200 0 100 200 400 800

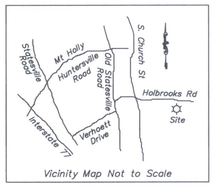
(IN FEET)
1 inch = 200 ft.

1) This property may be subject to any easements and/or Rights-of-way of record.

2) Boundary information based on Deed Book 25629 at Page 671, Deed Book: 18455 Page: 134 and Deed Book: 19649 Page: 894 & 898, Deed Book: 18690 at page: 961, Deed Book: 25629 at page: 675, Deed Book: 25230 at Page: 719, Deed Book: 25230 at Page: 741 Deed Book: 25439 at Page: 587 as recorded in the Mecklenburg County Register of Deeds.

3) Area by coordinate method.

4) This survey is a recombination survey of the following Parcel Id. numbers, 01919107, 01910108, 01919112, 01919202, 01919113, 01910112, 01919114, 01910102, 01910117 and 01934107.



Vicinity Map Not to Scale

LINE TABLE

LINE	LENGTH	BEARING
L2	51.59	N00°11'33"W
L3	66.57	S17°20'23"W
L4	16.05	N55°06'30"E
L5	149.28	S00°15'07"W
L6	41.14	N41°35'50"W

Land Surveying by:
PATTERSON SURVEYING P.A.
C-3390
P.O. Box 5010, Mooresville, NC 28117
704/361-0415 * Fax 704/528-4038

JOB NAME:

Boundary Survey of

North Mecklenburg Landfill

LOCATION: LOCATION: HUNTERSVILLE TOWNSHIP, MECKLENBURG CO., NC
Tax Parcel Number: 019-101-16

OWNERS:
C & D Management Company, LLC
19141 West Catawba Ave.
Cornelius, NC 28031

DRAWN BY: JHP | CHECKED BY: JHP
SCALE: 1" = 200'
DATE OF FIELD SURVEY: JUNE 24, 2014
DATE OF MAP: JUNE 26, 2014
JOB NUMBER 09005/BOUNDARYFINAL | SHEET NUMBER

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
1900 Center Park Drive - Suite A - Charlotte, NC 28217
Ph: 980.237.0373 · Fax: 980.237.0372
www.cecinc.com

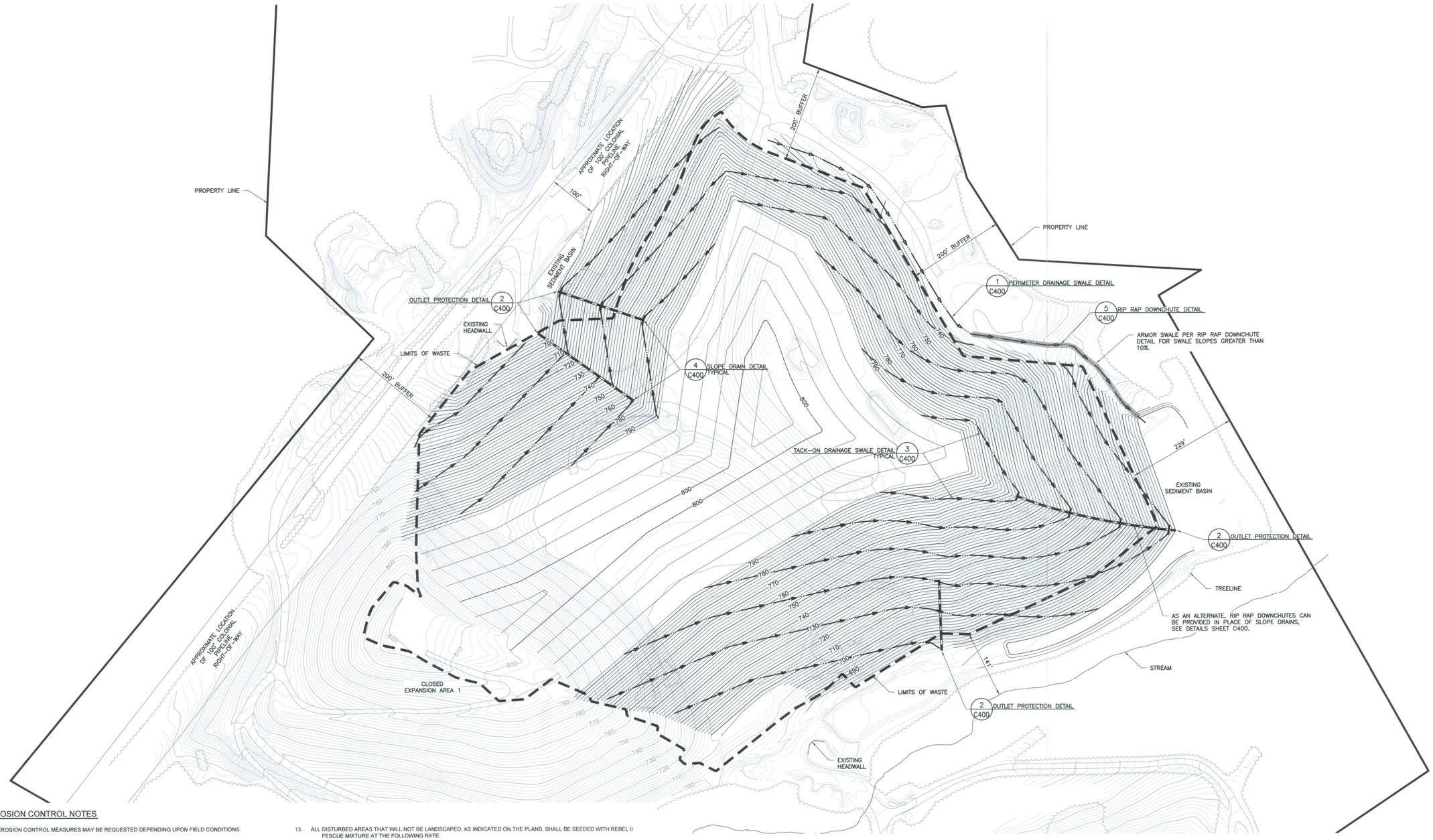
GREENWAY WASTE SOLUTIONS
OF NORTH MECK, LLC.
PERMIT MODIFICATION PLAN
15300 HOLBROOKS ROAD
HUNTERSVILLE, NC 28078

EXISTING SITE CONDITIONS

DATE: AUG 2014 | DRAWN BY: MTB
DWG SCALE: 1"=200' | CHECKED BY: TMG
PROJECT NO: 111-370.001
APPROVED BY: SLB

DRAWING NO.: C100

SHEET 2 OF 5



GENERAL EROSION CONTROL NOTES

1. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUESTED DEPENDING UPON FIELD CONDITIONS.
2. ON-SITE BURIAL PITS REQUIRE AN ON-SITE DEMOLITION LANDFILL PERMIT.
3. ANY ADDITIONAL CLEARING OR GRADING REQUIRED FOR STOCKPILES OR BURIAL PITS WILL BE COORDINATED IN THE FIELD WITH THE EROSION CONTROL OFFICER WHO WILL DETERMINE APPROPRIATE EROSION CONTROL MEASURES FOR SAME.
4. ALL EXISTING CONTOURS SHOWN ON PLAN ARE AT 2' INTERVALS AND ALL PROPOSED CONTOURS SHOWN ON PLAN ARE AT 2' CONTOUR INTERVALS.
5. STABILIZATION IS THE BEST FORM OF EROSION CONTROL. TEMPORARY SEEDING IS NECESSARY TO ACHIEVE EROSION CONTROL ON LARGE DENUDED AREAS. ALL GRADED SLOPES SHOULD HAVE GROUNDCOVER PROVIDED ON EXPOSED GRADED SLOPES STEEPER THAN 3:1 AND HIGH QUALITY WATER ZONES (HQW) WITHIN 7 CALENDAR DAYS; SLOPES THAT ARE 3:1 OR FLATTER MUST ESTABLISH GROUNDCOVER WITHIN 14 CALENDAR DAYS.
6. GRADING MORE THAN ONE ACRE WITHOUT AN APPROVED EROSION CONTROL PLAN IS A VIOLATION OF THE TOWN EROSION CONTROL ORDINANCE AND IS SUBJECT TO A FINE.
7. CONTRACTOR TO INSTALL SILT FENCE FOR SITE GRADING WHERE NO ADEQUATE EROSION CONTROL MEASURES HAVE BEEN PROVIDED OR IN LOCATIONS WHERE CONDITIONS ARE NOT AS THEY APPEAR ON THESE PLANS.
8. INSTALL MATTING AND SEED ALL PROPOSED CHANNELS AS SOON AS THE CHANNELS HAVE BEEN CUT.
9. ANY GRADING BEYOND THE DENUDED LIMITS, SHOWN ON THE PLAN IS A VIOLATION OF THE TOWN EROSION CONTROL ORDINANCE, AND IS SUBJECT TO A FINE.
10. ADDITIONAL MEASURES TO CONTROL EROSION AND SEDIMENT MAY BE REQUIRED BY A REPRESENTATIVE OF THE TOWN ENGINEERING DEPARTMENT.
11. SLOPES SHALL BE GRADED NO STEEPER THAN 2:1.
12. SEEDBED PREPARATION - APPLY GROUND AGRICULTURAL LIMESTONE AT A RATE OF 1 TO 1 1/2 TONS/ACRE ON COARSE-TEXTURED SOILS AND 2-3 TONS/ACRE ON FINE-TEXTURED SOILS. APPLY LIMESTONE UNIFORMLY AND INCORPORATE INTO THE TOP 4-6 INCHES OF SOIL. APPLY A 10-10-10 GRADE FERTILIZER AT 700-1,000 LB/ACRE. FERTILIZER SHOULD BE INCORPORATED INTO THE TOP 4-6 INCHES OF SOIL. IF A HYDRAULIC SEEDER IS USED, DO NOT MIX SEED AND FERTILIZER MORE THAN 30 MINUTES BEFORE APPLICATION.
13. ALL DISTURBED AREAS THAT WILL NOT BE LANDSCAPED, AS INDICATED ON THE PLANS, SHALL BE SEEDED WITH REBEL II
    FESCUE MIXTURE AT THE FOLLOWING RATE:
    FESCUE AT 5-6 LBS/1000 S.F.
    10-10-10 FERTILIZER AT 20 LBS/1000 S.F.
    LIME AT 100 LBS/1000 S.F.
    STRAW MULCH AT 1 1/2 BALES/1000 S.F.

    113A-57. MANDATORY STANDARDS FOR LAND-DISTURBING ACTIVITY.
14. NO LAND-DISTURBING ACTIVITY DURING PERIODS OF CONSTRUCTION OR IMPROVEMENT TO LAND SHALL BE PERMITTED IN PROXIMITY TO A LAKE OR NATURAL WATERCOURSE UNLESS A BUFFER ZONE IS PROVIDED ALONG THE MARGIN OF THE WATERCOURSE OF SUFFICIENT WIDTH TO CONFINE VISIBLE SILTATION WITHIN THE TWENTY-FIVE PERCENT (25%) OF THE BUFFER ZONE NEAREST THE LAND-DISTURBING ACTIVITY. WATERS THAT HAVE BEEN CLASSIFIED AS TROUT WATERS BY THE ENVIRONMENTAL MANAGEMENT COMMISSION SHALL HAVE AN UNDISTURBED BUFFER ZONE 25 FEET WIDE OR OF SUFFICIENT WIDTH TO CONFINE VISIBLE SILTATION WITHIN THE TWENTY-FIVE PERCENT (25%) OF THE BUFFER ZONE NEAREST THE LAND-DISTURBING ACTIVITY, WHICHEVER IS GREATER. PROVIDED, HOWEVER, THAT THE SEDIMENTATION CONTROL COMMISSION MAY APPROVE PLANS WHICH INCLUDE LAND-DISTURBING ACTIVITY ALONG TROUT WATERS WHEN THE DURATION OF SAID DISTURBANCE WOULD BE TEMPORARY AND THE EXTENT OF SAID DISTURBANCE WOULD BE MINIMAL. THIS SUBDIVISION SHALL NOT APPLY TO A LAND-DISTURBING ACTIVITY IN CONNECTION WITH THE CONSTRUCTION OF FACILITIES TO BE LOCATED ON, OVER, OR UNDER A LAKE OR NATURAL WATERCOURSE.
15. THE ANGLE FOR GRADED SLOPES AND FILLS SHALL BE NO GREATER THAN THE ANGLE WHICH CAN BE RETAINED BY VEGETATIVE COVER OR OTHER ADEQUATE EROSION CONTROL DEVICES OR STRUCTURES. IN ANY EVENT, SLOPES STEEPER THAN 3:1 AND HIGH QUALITY WATER ZONES (HQW) MUST ESTABLISH GROUND COVER WITHIN 7 CALENDAR DAYS; SLOPES THAT ARE 3:1 OR FLATTER MUST ESTABLISH GROUNDCOVER WITHIN 14 CALENDAR DAYS, OR BE PLANTED OR OTHERWISE PROVIDED WITH GROUND COVER, DEVICES, OR STRUCTURES SUFFICIENT TO RESTRAIN EROSION.
16. WHENEVER LAND-DISTURBING ACTIVITY IS UNDERTAKEN ON A TRACT COMPRISING MORE THAN ONE ACRE, IF MORE THAN ONE ACRE IS UNCOVERED, THE PERSON CONDUCTING THE LAND-DISTURBING ACTIVITY SHALL INSTALL SEDIMENTATION AND EROSION CONTROL DEVICES AND PRACTICES AS ARE SUFFICIENT TO RETAIN THE SEDIMENT GENERATED BY THE LAND-DISTURBING ACTIVITY WITHIN THE BOUNDARIES OF THE TRACT DURING CONSTRUCTION UPON AND DEVELOPMENT OF SAID TRACT, AND SHALL PLANT OR OTHERWISE PROVIDE A PERMANENT GROUND COVER SUFFICIENT TO RESTRAIN EROSION AFTER COMPLETION OF CONSTRUCTION OR DEVELOPMENT, GRADED SLOPES STEEPER THAN 3:1 AND HIGH QUALITY WATER ZONES (HQW) MUST ESTABLISH GROUND COVER WITHIN 7 CALENDAR DAYS; SLOPES THAT ARE 3:1 OR FLATTER MUST ESTABLISH GROUNDCOVER WITHIN 14 CALENDAR DAYS.
17. NO PERSON SHALL INITIATE ANY LAND-DISTURBING ACTIVITY ON A TRACT IF MORE THAN ONE ACRE IS TO BE UNCOVERED UNLESS, 30 OR MORE DAYS PRIOR TO INITIATING THE ACTIVITY, AN EROSION AND SEDIMENTATION CONTROL PLAN FOR SUCH ACTIVITY IS FILED WITH THE AGENCY HAVING JURISDICTION. THE AGENCY HAVING JURISDICTION SHALL FORWARD TO THE DIRECTOR OF THE DIVISION OF WATER QUALITY A COPY OF EACH EROSION AND SEDIMENTATION CONTROL PLAN FOR A LAND-DISTURBING ACTIVITY THAT INVOLVES THE UTILIZATION OF DITCHES FOR THE PURPOSE OF DE-WATERING OR LOWERING THE WATER TABLE OF THE TRACT.

GENERAL NOTES

1. THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND APPROVALS PRIOR TO COMMENCING WORK.
2. ANY CONFLICTS BETWEEN THESE PLANS AND THE PERMIT DRAWINGS SHOULD BE BROUGHT TO THE ATTENTION OF THE DESIGN ENGINEER (OLVER INCORPORATED).
3. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO COMMENCING WORK.
4. CONDITIONS AT THE SITE, FOR PURPOSE OF THIS WORK, MAY VARY FROM THOSE SHOWN AND ARE THE RESPONSIBILITY OF THE CONTRACTOR TO INCORPORATE THE ACTUAL EXISTING CONDITIONS IN THE EXECUTION OF THE WORK.
5. THE CONTRACTOR SHALL NOT BLOCK WASTE HAULING OR OTHER LANDFILL OPERATIONS.
6. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE SITE SAFETY ASSOCIATED WITH THE WORK UNDER THIS CONTRACT AND FOR COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL HEALTH AND SAFETY LAWS, CODES, REGULATIONS AND ORDINANCES INCLUDING BUT NOT LIMITED TO THOSE MANDATED BY OSHA.
7. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING THE LOCATION OF ALL UTILITIES PRIOR TO BEGINNING WORK.
8. THE CONTRACTOR SHALL RESTORE TO THE OWNERS SATISFACTION ALL AREAS DISTURBED BY CONSTRUCTION; INCLUDING ROADWAY SURFACES, ROADWAY SHOULDERS AND DITCHES, DRAINAGE STRUCTURES, UTILITIES AND OTHER EXISTING FEATURES.
9. THE CONTRACTOR IS RESPONSIBLE FOR DEWATERING (IF REQUIRED) ALL EXCAVATION, FILL AREAS, ETC. TO WORK IN DRY CONDITIONS. EXCESS EXCAVATED MATERIALS FROM THE WORK SHALL BE STOCKPILED IN THE AREA DESIGNATED AND STABILIZED.
10. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND AVOIDING DAMAGE TO ALL MONITORING WELLS. IN THE EVENT OF DAMAGE, THE CONTRACTOR WILL PAY FOR WELL REPLACEMENT.

LEGEND

	EXISTING	NEW
CONTOURS (2')		
CONTOURS (10')	90	400
EDGE OF ROAD		N/A
PROPERTY LINE		N/A
LIMITS OF WASTE	N/A	
TACK-ON DRAINAGE SWALE	N/A	
PERIMETER DRAINAGE SWALE	N/A	
SLOPE DRAIN	N/A	

SCALE IN FEET
0 100 200

NORTH CAROLINA BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS LICENSE NO. C-3035

NORTH CAROLINA PROFESSIONAL SEAL 026435 ENGINEER SCOTT L. BROWN
8-25-14

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION

CEC
Civil & Environmental Consultants, Inc.
1900 Center Park Drive - Suite A - Charlotte, NC 28217
Ph: 980.237.0373 - Fax: 980.237.0372
www.cecinc.com

GREENWAY WASTE SOLUTIONS OF NORTH MECK, LLC. PERMIT MODIFICATION PLAN 15300 HOLBROOKS ROAD HUNTERSVILLE, NC 28078

PROPOSED LANDFILL CLOSURE GRADING PLAN

DATE:	AUG 2014
DRAWN BY:	MTB
DWG SCALE:	1"=100'
CHECKED BY:	TMG
PROJECT NO.	111-370.001
APPROVED BY:	SLB

DRAWING NO.: C200

SHEET 3 OF 5

P:\JOB111\111-370\-CADD\DWG\Dwg\Permit Mod\111370.001-CV01-C200-CLOSURE.dwg\200-CLOSURE\ Layout\Permit Mod - LP, 8/25/2014 10:39 AM

NORTH

PROPERTY LINE

APPROXIMATE LOCATION OF 100' COLONIAL PIPELINE RIGHT-OF-WAY

100'

200' BUFFER

EXISTING SEDIMENT BASIN

OUTLET PROTECTION DETAIL 2 C400

EXISTING HEADWALL

LIMITS OF WASTE

4 C400 SLOPE DRAIN DETAIL TYPICAL

1 C400 PERIMETER DRAINAGE SWALE DETAIL

5 C400 RIP RAP DOWNCHUTE DETAIL

ARMOR SWALE PER RIP RAP DOWNCHUTE DETAIL FOR SWALE SLOPES GREATER THAN 10%.

TACK-ON DRAINAGE SWALE DETAIL TYPICAL 3 C400

2 C400 OUTLET PROTECTION DETAIL

EXISTING SEDIMENT BASIN

TREELINE

STREAM

CLOSED EXPANSION AREA 1

EXISTING HEADWALL

0.81 ACRES
0.73 ACRES
1.06 ACRES
0.47 ACRES
0.84 ACRES
2.00 ACRES
0.28 ACRES
0.35 ACRES
1.19 ACRES
1.47 ACRES
0.58 ACRES
1.36 ACRES
1.16 ACRES
0.38 ACRES
0.49 ACRES
1.59 ACRES
0.65 ACRES
1.89 ACRES
1.90 ACRES
1.85 ACRES
0.66 ACRES
0.46 ACRES
1.09 ACRES
1.57 ACRES

LEGEND

	EXISTING	NEW
CONTOURS (2')		
CONTOURS (10')	90	400
EDGE OF ROAD		N/A
PROPERTY LINE		N/A
LIMITS OF WASTE	N/A	
TACK-ON DRAINAGE SWALE	N/A	
PERIMETER DRAINAGE SWALE	N/A	
SLOPE DRAIN	N/A	

SCALE IN FEET
0 100 200

NORTH CAROLINA BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS LICENSE NO. C-3035

NORTH CAROLINA PROFESSIONAL SEAL 026435 ENGINEER SCOTT L. BROWN

8-25-14

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NO	DATE	DESCRIPTION

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GREENWAY WASTE SOLUTIONS OF NORTH MECK, LLC. PERMIT MODIFICATION PLAN 15300 HOLBROOKS ROAD HUNTERSVILLE, NC 28078

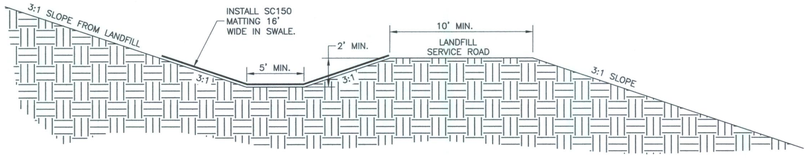
PROPOSED LANDFILL CLOSURE DRAINAGE BASIN MAP

DATE:	AUG 2014
DRAWN BY:	MTB
DWG SCALE:	1"=100'
CHECKED BY:	TMG
PROJECT NO:	111-370.001
APPROVED BY:	SLB

DRAWING NO.: C300

SHEET 4 OF 5

P:\2011\111-370\-CADD\001\Dwg\Permit Mod\111370.001-C001-C300-BASIN MAP.dwg[300-BASIN MAP] LS:(29.00)(24 - mbarnes) - LP: 8/26/2014 10:30 AM

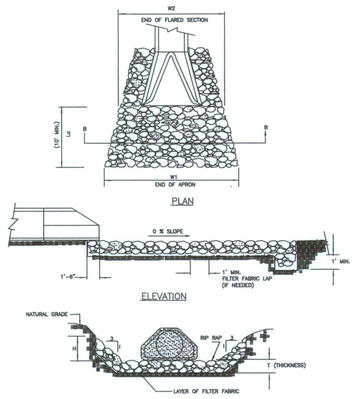


NOTE:

1. PERIMETER DRAINAGE SWALE CHANNEL SHOULD BE PROPERLY LINED WITH NA GREEN SC250 EROSION CONTROL MATTING. MATTING AND INSTALLATION SHOULD MEET MANUFACTURERS SPECIFICATIONS AND ALL REQUIREMENTS SET FORTH IN THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
2. LONGITUDINAL SLOPE OF SWALE NOT TO EXCEED 10%.
3. VEGETATE SWALE IMMEDIATELY AFTER SWALE CONSTRUCTION IS COMPLETED AND MATTING IS INSTALLED.
4. INSPECT SWALES IN ACCORDANCE WITH NCDENR REQUIREMENTS.

1/C200 1/C300 PERIMETER DRAINAGE SWALE DETAIL

NOT TO SCALE



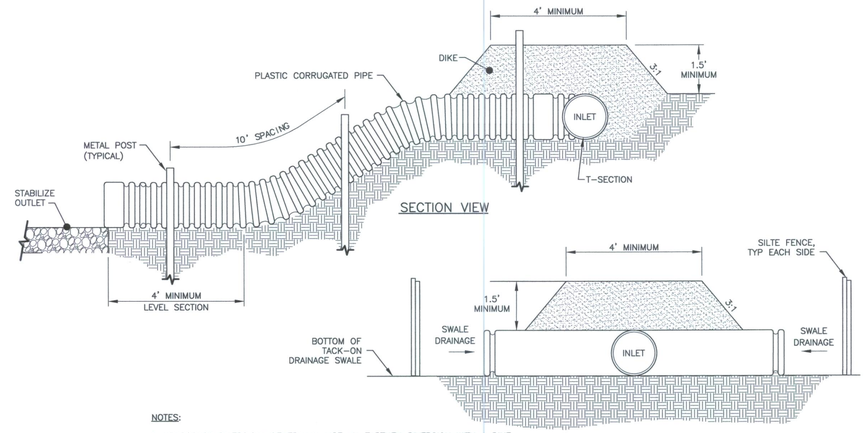
NOTES:

1. CLASS OR MEDIAN SIZE OF RIPRAP AND LENGTH, WIDTH AND DEPTH OF APRON TO BE DESIGNED BY THE ENGINEER AND ARE SUMMARIZED BELOW.
2. RIPRAP SHOULD EXTEND UP BOTH SIDES OF THE APRON AND AROUND THE END OF THE PIPE OR CULVERT AT THE DISCHARGE OUTLET AT A MAXIMUM SLOPE OF 2:1 AND A HEIGHT NOT LESS THAN TWO THIRDS THE PIPE DIAMETER OR CULVERT HEIGHT.
3. THERE SHALL BE NO OVERFLOW FROM THE END OF THE APRON TO THE SURFACE OF THE RECEIVING CHANNEL. THE AREA TO BE PAVED OR RIPRAPPED SHALL BE UNDERCUT SO THAT THE INVERT OF THE APRON SHALL BE AT THE SAME GRADE (FLUSH) WITH THE SURFACE OF THE RECEIVING CHANNEL. THE APRON SHALL HAVE A CUTOFF OR TOE WALL AT THE DOWNSTREAM END.
4. THE WIDTH OF THE END OF THE APRON SHALL BE EQUAL TO THE BOTTOM WIDTH OF THE RECEIVING CHANNEL. MAXIMUM TAPER TO RECEIVING CHANNEL 5:1.
5. ALL SUBGRADE FOR STRUCTURE TO BE COMPACTED TO 95% OR GREATER.
6. THE PLACING OF FILL, EITHER LOOSE OR COMPACTED IN THE RECEIVING CHANNEL SHALL NOT BE ALLOWED.
7. NO BENDS OR CURVES IN THE HORIZONTAL ALIGNMENT OF THE APRON WILL BE PERMITTED.
8. FILTER FABRIC SHALL BE INSTALLED ON COMPACTED SUBGRADE PRIOR TO PLACEMENT OF RIP RAP.
9. ANY DISTURBED AREA FROM END OF APRON TO RECEIVING CHANNEL MUST BE STABILIZED.

OUTLET	Lo	W1	W2	T	H	d_{50}	d_{MAX}
SLOPE DRAIN OUTLET	14 FT	16 FT	6 FT	14 IN.	6 IN.	6 IN.	9 IN.

2/C200 2/C300 OUTLET PROTECTION DETAIL

NOT TO SCALE

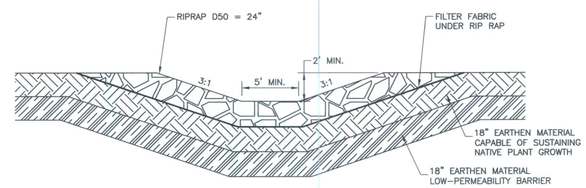


NOTES:

1. TEMPORARY DIVERSION: GENERALLY, USE AN EARTHEN DIVERSION WITH A DIKE RIDGE TO DIRECT SURFACE RUNOFF INTO THE TEMPORARY SLOPE DRAIN. MAKE THE HEIGHT OF THE RIDGE OVER THE DRAIN CONDUIT A MINIMUM OF 1.5 FEET AND AT LEAST 6 INCHES HIGHER THAN THE ADJOINING RIDGE ON EITHER SIDE. THE LOWEST POINT OF THE DIVERSION RIDGE SHOULD BE A MINIMUM OF 1 FOOT ABOVE THE TOP OF THE DRAIN SO THAT DESIGN FLOW CAN FREELY ENTER THE PIPE.
2. OUTLET PROTECTION: PROTECT THE OUTLET OF THE SLOPE DRAIN FROM EROSION, SEE OUTLET PROTECTION DETAIL 2/C400.
3. PIPE TO BE 24" HDPE.
4. AS AN ALTERNATE RIP RAP DOWNCHUTES CAN BE USED IN PLACE OF SLOPE DRAINS, SEE DETAIL THIS SHEET.

4/C200 4/C300 SLOPE DRAIN DETAIL

NOT TO SCALE

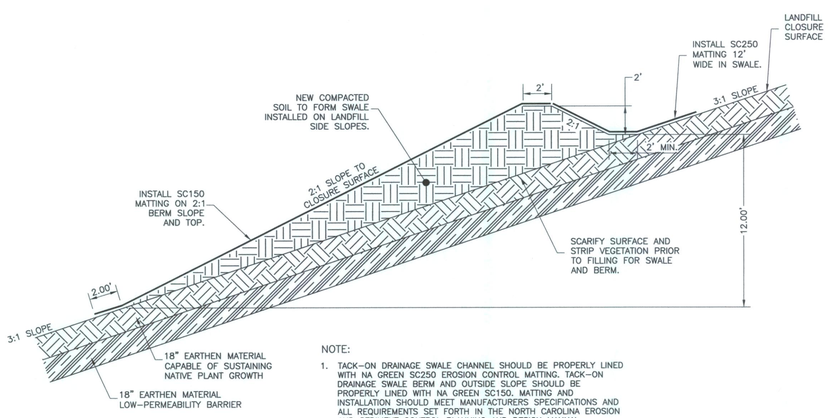


NOTE:

1. RIP RAP DOWNCHUTE CHANNEL SHOULD BE PROPERLY LINED WITH FILTER FABRIC. FABRIC INSTALLATION SHOULD MEET MANUFACTURERS SPECIFICATIONS.
2. LONGITUDINAL SLOPE OF DOWNCHUTE NOT TO EXCEED 3:1.

5/C200 5/C300 RIP RAP DOWNCHUTE

NOT TO SCALE



NOTE:

1. TACK-ON DRAINAGE SWALE CHANNEL SHOULD BE PROPERLY LINED WITH NA GREEN SC250 EROSION CONTROL MATTING. TACK-ON DRAINAGE SWALE BERM AND OUTSIDE SLOPE SHOULD BE PROPERLY LINED WITH NA GREEN SC150. MATTING AND INSTALLATION SHOULD MEET MANUFACTURERS SPECIFICATIONS AND ALL REQUIREMENTS SET FORTH IN THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
2. LONGITUDINAL SLOPE OF SWALE NOT TO EXCEED 10%.
3. VEGETATE SWALE, SLOPE AND BERM IMMEDIATELY AFTER SWALE CONSTRUCTION IS COMPLETED AND MATTING IS INSTALLED.
4. INSPECT SWALES IN ACCORDANCE WITH NCDENR REQUIREMENTS.

3/C200 3/C300 TACK-ON DRAINAGE SWALE DETAIL

NOT TO SCALE

NORTH CAROLINA BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS LICENSE NO. C-3035

NORTH CAROLINA PROFESSIONAL SEAL 026435 ENGINEER SCOTT L. BROWN
8-25-14

SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION

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GREENWAY WASTE SOLUTIONS OF NORTH MECK, LLC.
PERMIT MODIFICATION PLAN
15300 HOLBROOKS ROAD
HUNTERSVILLE, NC 28078

DETAILS

DATE:	MAY 2014
DRAWN BY:	MTB
DWG SCALE:	N.T.S.
CHECKED BY:	TMG
PROJECT NO:	111-370.001
APPROVED BY:	SLB

DRAWING NO.: C400

SHEET 5 OF 5

P:\2011\111-370\-CADD\001\Dwg\Permit Mod\111370.001-C401-C400-DETAILS.dwg\400-DETAILS\ LS:(25/08/2014 - mbartley) - LP: 8/25/2014 9:39 AM