DATE	NO.	REVISION
6-15-2010	1	ADDED ON-SITE BENCH MARK DATA AND GAS VENTS

BENCH MARK NEAR EXIST. 3-36" CMP PIPES

EXIST. SED. BASIN

EXIST. RISER & OUTLET PIPES

FACILITY BOUNDARY

UNNAMED TRIBUTARY

200' BUFFER

RIPARIAN BUFFER LINES SEE DETAIL E/EC3

PERIMETER BERM ACCESS ROAD SEE DETAIL I/EC2

NOTE:
CONTRACTOR SHALL GRADE PERIMETER BERM ACCESS ROAD AT 2% CROSS SLOPE TO DRAIN INTO PERIMETER DITCH

GAS VENT (TYP.) AT 200-FOOT SPACINGS

5% SLOPE

3:1

EXIST. POND

ACCESS ROAD SEE DETAIL J/EC2

NOTE:
ALTERNATE FINAL COVER TO BE USED AT THE DISCRETION OF THE OWNER SEE DETAIL J/EC2

FINAL COVER SEE DETAIL H/EC2

UNNAMED TRIBUTARY

REFERENCE NOTES:

1. EXISTING TOPOGRAPHIC MAPPING OF THE IMMEDIATE C&D LANDFILL AREA PROVIDED BY AMI ENGINEERING, INC. COMPILED FROM AERIAL PHOTOGRAPHY TAKEN BY WESTERN AIR MAP DATED FEBRUARY 20, 2008.

2. EXISTING TOPOGRAPHIC MAPPING OF AREA SURROUNDING THE C&D LANDFILL PROVIDED BY SPATIAL DATA CONSULTANTS, INC., OF HIGH POINT, NORTH CAROLINA FROM AERIAL PHOTOGRAPHY DATED MARCH 27, 2001.

3. FACILITY PROPERTY LINE FROM A MAP ENTITLED "MATERIAL RECOVERY, LLC. & MARGARET TALTON" PREPARED BY TRC TRIANGLE, DATED 7-16-2003, RECORDED IN BOOK OF MAPS BOOK 2003, PAGE 1508, WAKE COUNTY REGISTER OF DEEDS.

4. ADJOINING PROPERTY OWNERS ARE FROM WAKE COUNTY GIS DEPARTMENT.

0 80' 160' 240'
1" = 80'

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

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODIFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

DRAWING TITLE:
CDLF PHASE 2
FINAL COVER CONTOURS

DESIGNED BY: G.D.G.	DRAWN BY: A.W.H.
CHECKED BY: G.D.G.	PROJECT NO.: WCA-2
SCALE: AS SHOWN	DATE: JUNE 2008
FILE NAME: PH2 FINAL COVER CONTOURS	
SHEET NO. 9	DRAWING NO. E3

E:\YAMH-CAD\CAD\DGARRETT\WCA-2\SHEETS\PH2 CDLF PERMIT\dwgs dg\PH2 FINAL COVER CONTOURS.dwg DATE: JUN 19, 2008 TIME: 10:59 AM

DATE	NO.	REVISION
6-15-2010	1	UPDATED BASE GRADES IN PHASE 1 AND 2; PHASING IN PHASE 2

LEGEND

- EXIST. INDEX CONTOURS
- EXIST. INTERMEDIATE CONTOURS
- PROPOSED INDEX CONTOURS
- PROPOSED INTERMEDIATE CONTOURS
- EXIST. STREAM
- FACILITY BOUNDARY
- GROUND WATER CONTOUR (APRIL 2008)
- GROUND WATER CONTOUR (SEASONAL LONG TERM HIGH)
- MW-4 EXISTING MONITORING WELL
- P-18 EXISTING PIEZOMETER WELL
- B-6 TEST BORING (BY OTHERS)
- C-6 TEST BORING (BY OTHERS)
- G-6 TEST BORING (BY DAVID GARRETT & ASSOC. APRIL 2008)
- T-20 TEST PIT
- WELL-18 EXISTING TEST WELL

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SEAL

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODIFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

DRAWING TITLE:
GROUND WATER CONTOURS OBSERVED APR. 2008 AND MAX. W/ BASE GRADES

DESIGNED BY:	DRAWN BY:
G.D.G.	A.W.H.
CHECKED BY:	PROJECT NO.:
G.D.G.	WCA-2
SCALE:	DATE:
AS SHOWN	JUNE 2008
FILE NAME	
GW CONTOURS & BASE GRADES	
SHEET NO.	DRAWING NO.
10	E4

0 80' 160' 240'
1" = 80'

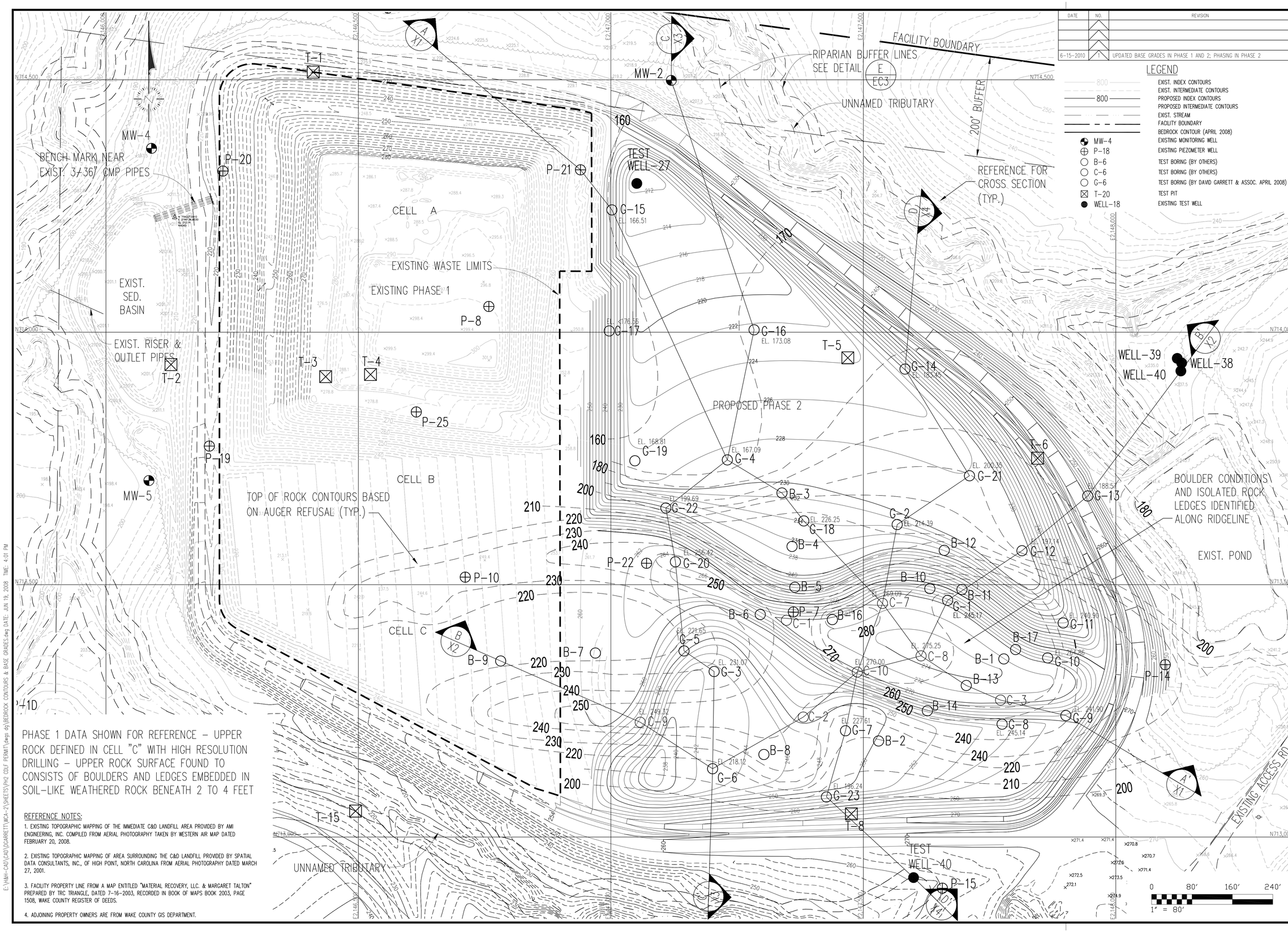
REFERENCE NOTES:

1. EXISTING TOPOGRAPHIC MAPPING OF THE IMMEDIATE C&D LANDFILL AREA PROVIDED BY AMI ENGINEERING, INC. COMPILED FROM AERIAL PHOTOGRAPHY TAKEN BY WESTERN AIR MAP DATED FEBRUARY 20, 2008.

2. EXISTING TOPOGRAPHIC MAPPING OF AREA SURROUNDING THE C&D LANDFILL PROVIDED BY SPATIAL DATA CONSULTANTS, INC., OF HIGH POINT, NORTH CAROLINA FROM AERIAL PHOTOGRAPHY DATED MARCH 27, 2001.

3. FACILITY PROPERTY LINE FROM A MAP ENTITLED "MATERIAL RECOVERY, LLC. & MARGARET TALTON" PREPARED BY TRC TRIANGLE, DATED 7-16-2003, RECORDED IN BOOK OF MAPS BOOK 2003, PAGE 1508, WAKE COUNTY REGISTER OF DEEDS.

E:\WAH-CAD\CAD\DGARRETT\WCA-2\SHEETS\PH2 CDLF PERMIT\dwgs dg\GW CONTOURS & BASE GRADES.dwg DATE: JUN 19, 2008 TIME: 4:00 PM



DATE	NO.	REVISION
6-15-2010	1	UPDATED BASE GRADES IN PHASE 1 AND 2; PHASING IN PHASE 2

LEGEND

800	EXIST. INDEX CONTOURS
	EXIST. INTERMEDIATE CONTOURS
800	PROPOSED INDEX CONTOURS
	PROPOSED INTERMEDIATE CONTOURS
	EXIST. STREAM
	FACILITY BOUNDARY
	BEDROCK CONTOUR (APRIL 2008)
MW-4	EXISTING MONITORING WELL
P-18	EXISTING PIEZOMETER WELL
B-6	TEST BORING (BY OTHERS)
C-6	TEST BORING (BY OTHERS)
G-6	TEST BORING (BY DAVID GARRETT & ASSOC. APRIL 2008)
T-20	TEST PIT
WELL-18	EXISTING TEST WELL

PHASE 1 DATA SHOWN FOR REFERENCE – UPPER ROCK DEFINED IN CELL "C" WITH HIGH RESOLUTION DRILLING – UPPER ROCK SURFACE FOUND TO CONSISTS OF BOULDERS AND LEDGES EMBEDDED IN SOIL-LIKE WEATHERED ROCK BENEATH 2 TO 4 FEET

REFERENCE NOTES:

1. EXISTING TOPOGRAPHIC MAPPING OF THE IMMEDIATE C&D LANDFILL AREA PROVIDED BY AMI ENGINEERING, INC. COMPILED FROM AERIAL PHOTOGRAPHY TAKEN BY WESTERN AIR MAP DATED FEBRUARY 20, 2008.

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4. ADJOINING PROPERTY OWNERS ARE FROM WAKE COUNTY GIS DEPARTMENT.

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SEAL

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODIFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

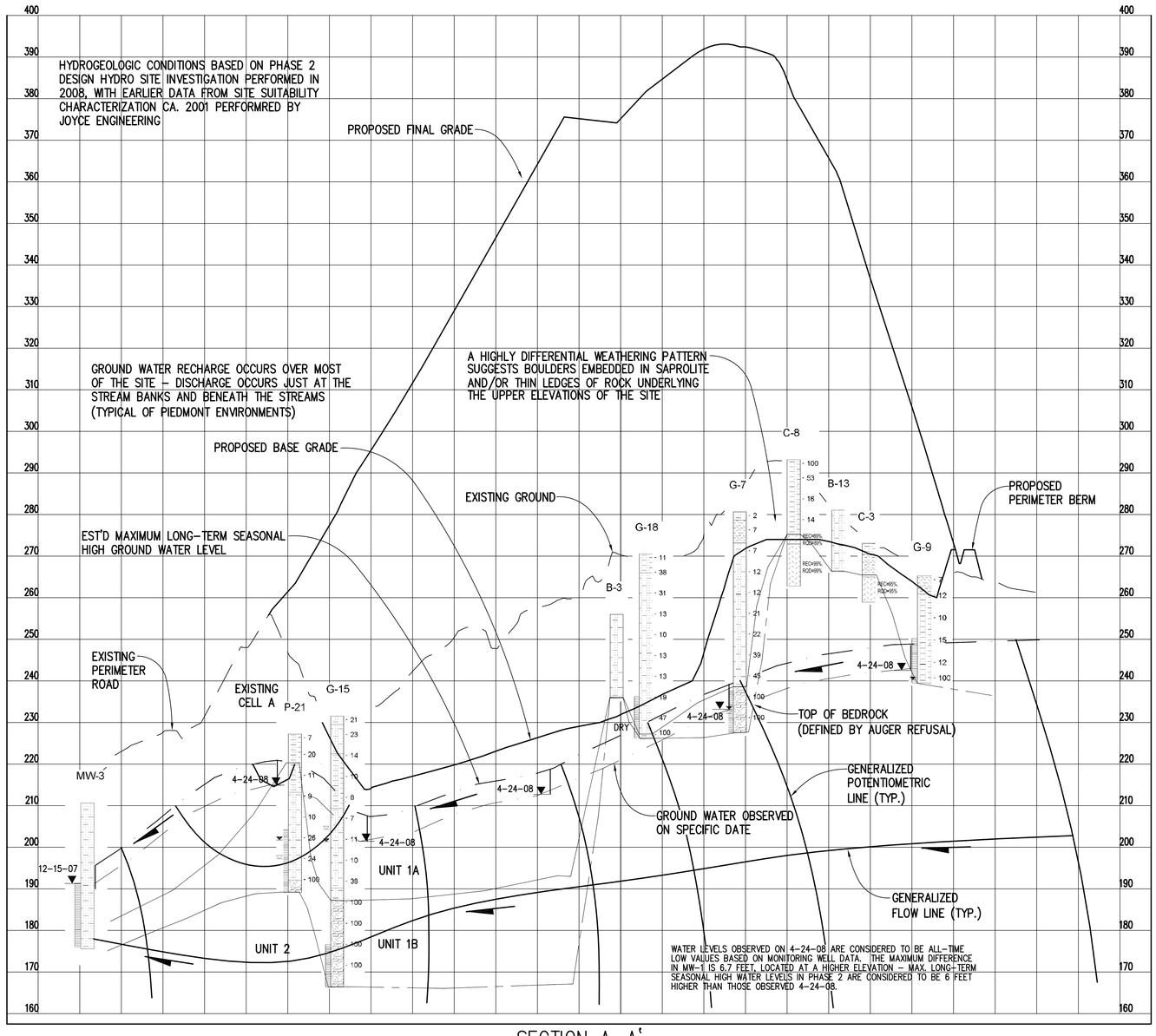
DRAWING TITLE:
BEDROCK CONTOURS WITH BASE GRADES

DESIGNED BY: G.D.G.	DRAWN BY: A.W.H.
CHECKED BY: G.D.G.	PROJECT NO.: WCA-2
SCALE: AS SHOWN	DATE: JUNE 2008
FILE NAME: BEDROCK CONTOURS & BASE GRADES	
SHEET NO. 11	DRAWING NO. E5

E:\H&H-CAD\CAD\DGARRETT\WCA-2\SHEETS\PH2 CDLF PERMIT\dwgs dg\BEDROCK CONTOURS & BASE GRADES.dwg DATE: JUN 19, 2008 TIME: 4:01 PM

LEGEND

- GROUND LINE ALONG PROFILE
- MAXIMUM LONG-TERM SEASONAL HIGH GROUND WATER LEVEL
- SOIL BOUNDARY, E.G., TOP OF PARTIALLY WEATHERED ROCK
- TOP OF BEDROCK DEFINED BY "AUGER REFUSAL"
- SILTY SAND (SAPROLITE)
- SANDY SILT (SAPROLITE)
- SANDY CLAY OR CLAYEY SAND (SAPROLITE)
- SILTY CLAY (SAPROLITE)
- PARTIALLY WEATHERED ROCK (100+ BPF SAPROLITE, PENETRATED BY HOLLOW STEM AUGER)
- ROCK CORE WITH RECOVERY AND ROCK QUALITY DESIGNATION (RQD)
- STANDARD PENETRATION RESISTANCE VALUE (ASTM D-1586)
- WATER LEVEL AT TIME OF COMPLETION OF PIEZOMETER
- WATER LEVEL AT LEAST 24 HOURS AFTER COMPLETION
- WELL SCREEN INTERVAL (ONE COLUMN SHOWN AT COUPLETS FOR CLARITY)
- GROUND WATER FLOW DIRECTION



SECTION A-A'

0 300' 600' 900'

1" = 150'

90' 60' 30' 0

1" = 15' VERT.

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NO.	DATE	REVISION

SEAL

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODIFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

DRAWING TITLE:
HYDROGEOLOGICAL CROSS SECTION A-A'
SHEET 1 OF 4

DESIGNED BY:	DRAWN BY:
G.D.G.	A.W.H.
CHECKED BY:	PROJECT NO.:
G.D.G.	WCA-2
SCALE:	DATE:
AS SHOWN	JUNE 2008
FILE NAME	
CROSS SECTIONS SHT 1 OF 4	
SHEET NO.	DRAWING NO.
12	X1

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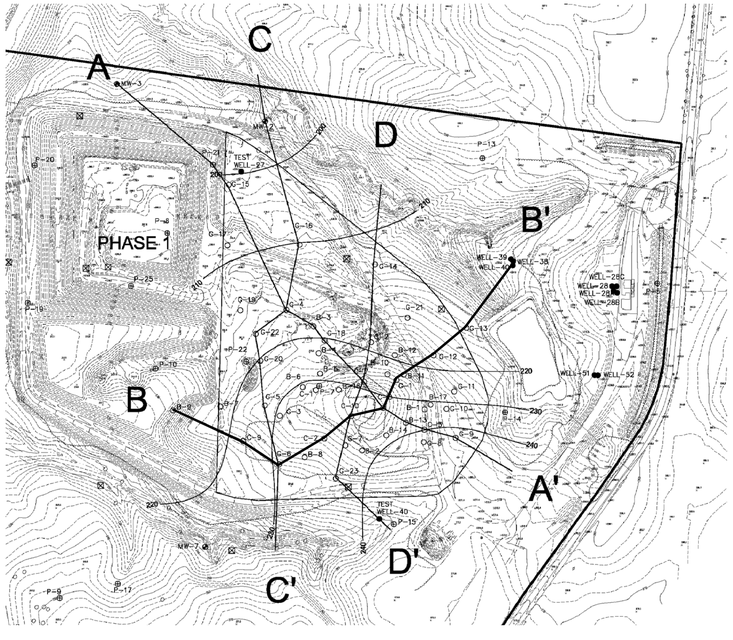
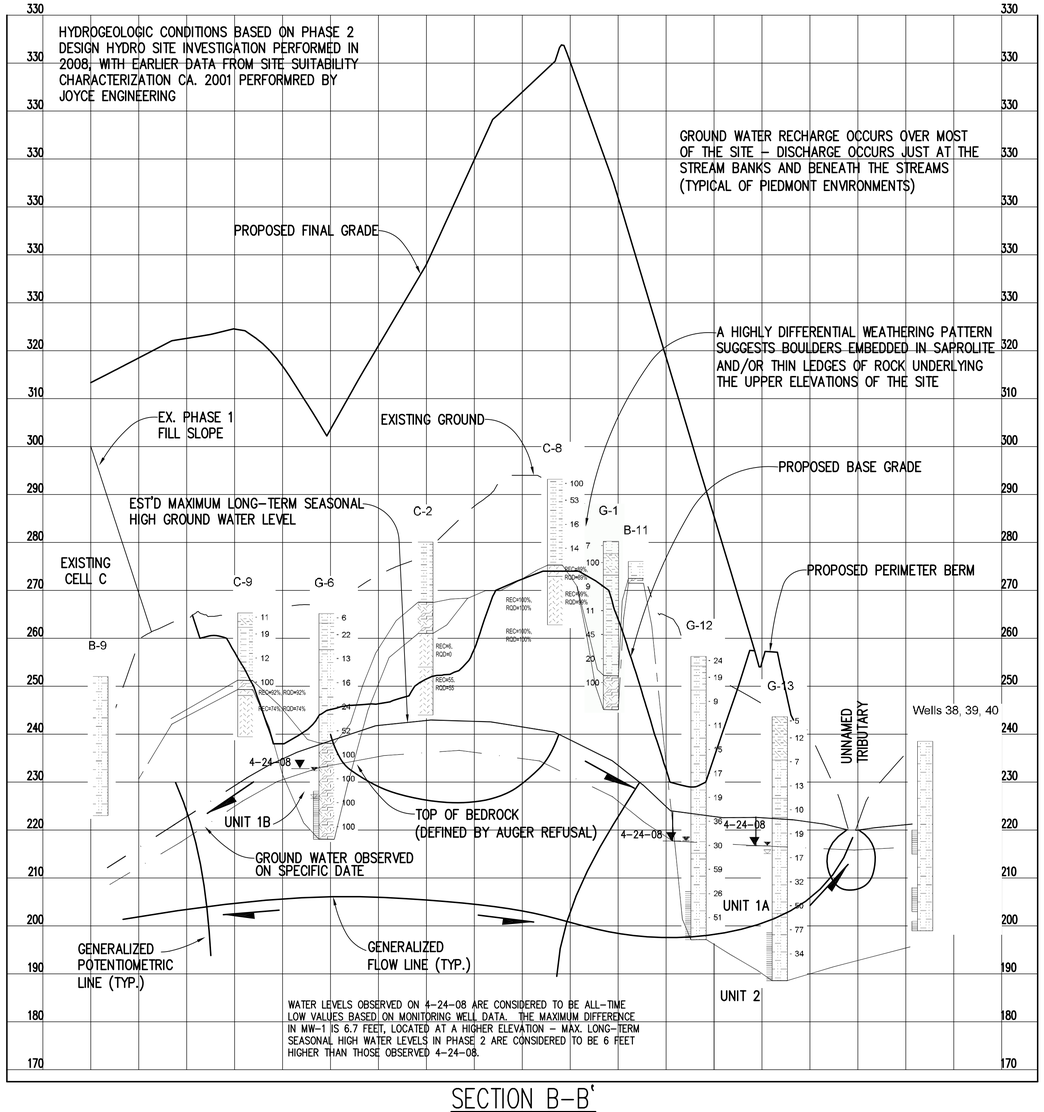
LEGEND

- GROUND LINE ALONG PROFILE
- MAXIMUM LONG-TERM SEASONAL HIGH GROUND WATER LEVEL
- SOIL BOUNDARY, E.G., TOP OF PARTIALLY WEATHERED ROCK
- TOP OF BEDROCK DEFINED BY "AUGER REFUSAL"
- SILTY SAND (SAPROLITE)
- SANDY SILT (SAPROLITE)
- SANDY CLAY OR CLAYEY SAND (SAPROLITE)
- SILTY CLAY (SAPROLITE)
- PARTIALLY WEATHERED ROCK (100+ BPF SAPROLITE, PENETRATED BY HOLLOW STEM AUGER)
- ROCK CORE WITH RECOVERY AND ROCK QUALITY DESIGNATION (RQD)
- STANDARD PENETRATION RESISTANCE VALUE (ASTM D-1586)
- WATER LEVEL AT TIME OF COMPLETION OF PIEZOMETER
- WATER LEVEL AT LEAST 24 HOURS AFTER COMPLETION
- WELL SCREEN INTERVAL (ONE COLUMN SHOWN AT COUPLETS FOR CLARITY)
- GROUND WATER FLOW DIRECTION





SECTION B-B'

90' 60' 30' 0

1" = 15' VERT.

0 300' 600' 900'

1" = 150'

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 DAVID GARRETT 6-22-2008

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODIFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

DRAWING TITLE:
HYDROGEOLOGICAL CROSS SECTION B-B'
SHEET 2 OF 4

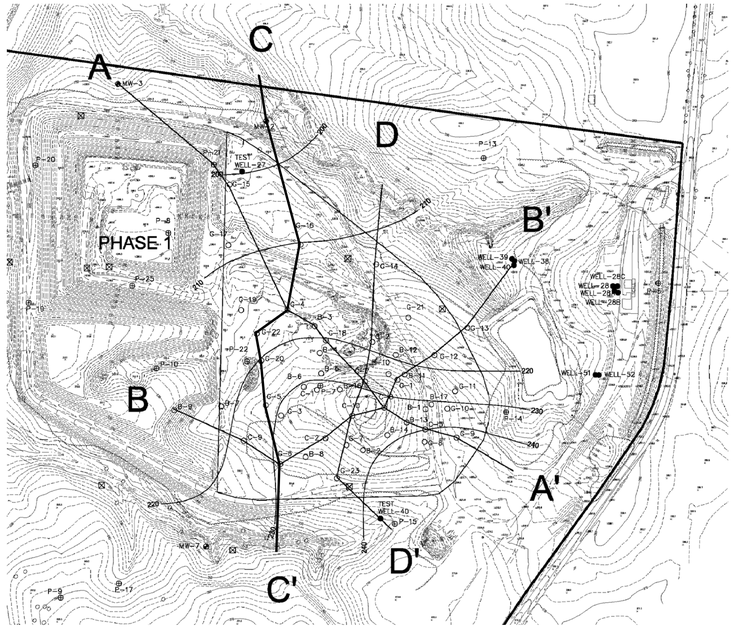
DESIGNED BY: G.D.G.	DRAWN BY: A.W.H.
CHECKED BY: G.D.G.	PROJECT NO.: WCA-2
SCALE: AS SHOWN	DATE: JUNE 2008
FILE NAME: CROSS SECTIONS SHT 2 OF 4	
SHEET NO. 13	DRAWING NO. X2

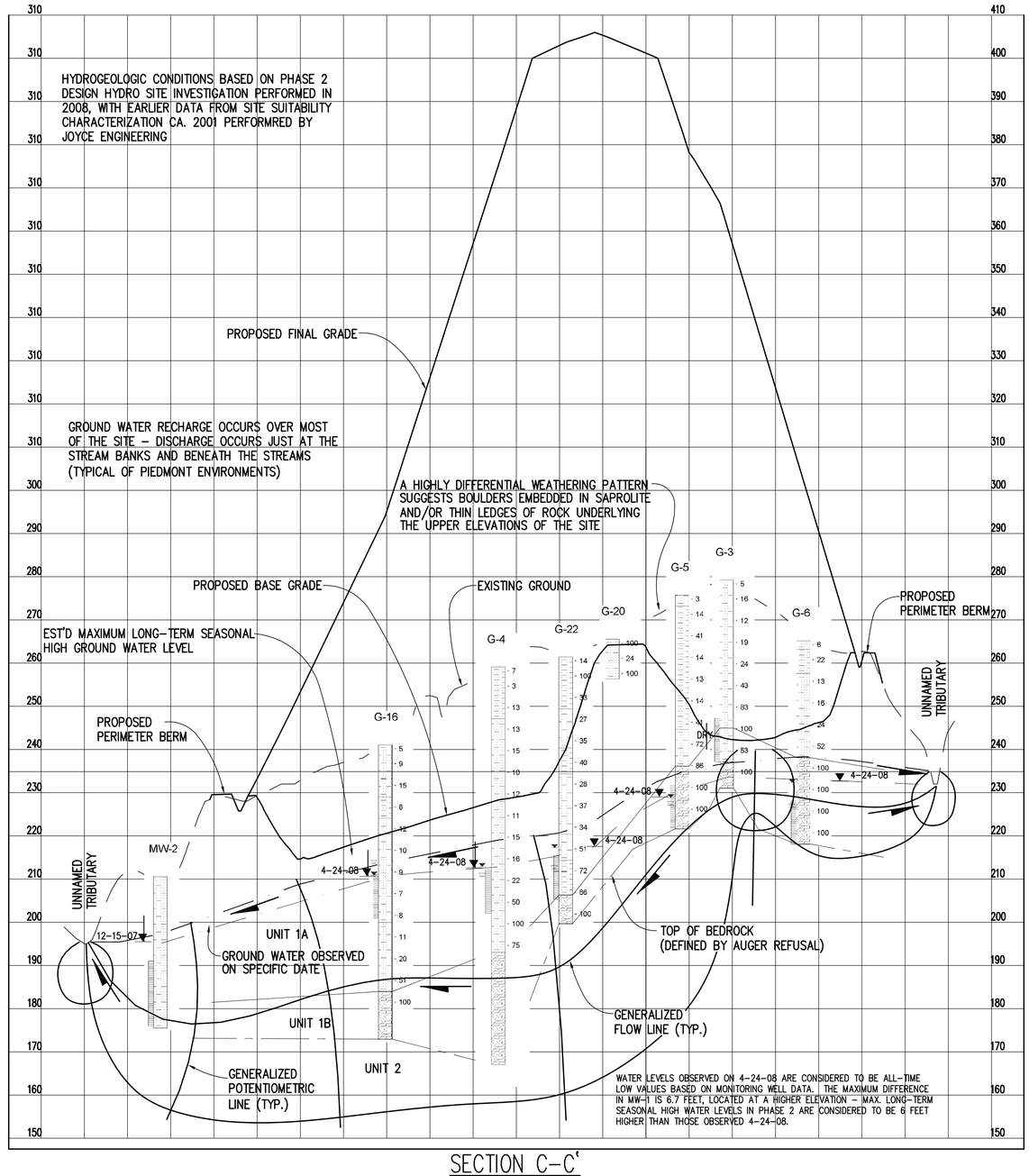
E:\H&H-CAD\CAD\DGARRETT\WCA-2\SHEETS\PH2 CDLF PERMIT\dwgs dg\CROSS SECTIONS SHT 2 OF 4.dwg DATE: JUN 19, 2008 TIME: 4:05 PM

LEGEND

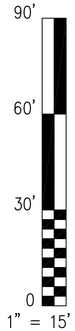
GROUND LINE ALONG PROFILE
MAXIMUM LONG-TERM SEASONAL HIGH GROUND WATER LEVEL
SOIL BOUNDARY, E.G., TOP OF PARTIALLY WEATHERED ROCK
TOP OF BEDROCK DEFINED BY "AUGER REFUSAL"

- SILTY SAND (SAPROLITE)
- SANDY SILT (SAPROLITE)
- SANDY CLAY OR CLAYEY SAND (SAPROLITE)
- SILTY CLAY (SAPROLITE)
- PARTIALLY WEATHERED ROCK (100+ BPF SAPROLITE, PENETRATED BY HOLLOW STEM AUGER)
- ROCK CORE WITH RECOVERY AND ROCK QUALITY DESIGNATION (RQD)
- STANDARD PENETRATION RESISTANCE VALUE (ASTM D-1586)
- WATER LEVEL AT TIME OF COMPLETION OF PIEZOMETER
- WATER LEVEL AT LEAST 24 HOURS AFTER COMPLETION
- WELL SCREEN INTERVAL (ONE COLUMN SHOWN AT COUPLETS FOR CLARITY)
- GROUND WATER FLOW DIRECTION





SECTION C-C'



1" = 15' VERT.

0 300' 600' 900'

1" = 150'

REVISION | NO. | DATE

David Garrett & Associates
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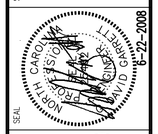
SEAL



PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODIFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

DRAWING TITLE:
HYDROGEOLOGICAL
CROSS SECTION C-C'
SHEET 3 OF 4

DESIGNED BY:	DRAWN BY:
G.D.G.	A.W.H.
CHECKED BY:	PROJECT NO.:
G.D.G.	WCA-2
SCALE:	DATE:
AS SHOWN	JUNE 2008

FILE NAME
CROSS SECTIONS SHT 3 OF 4

SHEET NO.	DRAWING NO.
14	X3

E:\K&H-CAD\CAD\GARRETT\WCA-2\SHEETS\PH2 COLF PERMIT\dwgs dg\CROSS SECTIONS SHT 3 OF 4.dwg DATE: JUN 19, 2008 TIME: 4:06 PM

LEGEND

GROUND LINE ALONG PROFILE
MAXIMUM LONG-TERM SEASONAL HIGH GROUND WATER LEVEL
SOIL BOUNDARY, E.G., TOP OF PARTIALLY WEATHERED ROCK
TOP OF BEDROCK DEFINED BY "AUGER REFUSAL"

SILTY SAND (SAPROLITE)

SANDY SILT (SAPROLITE)

SANDY CLAY OR CLAYEY SAND (SAPROLITE)

SILTY CLAY (SAPROLITE)

PARTIALLY WEATHERED ROCK (100+ BPF SAPROLITE, PENETRATED BY HOLLOW STEM AUGER)

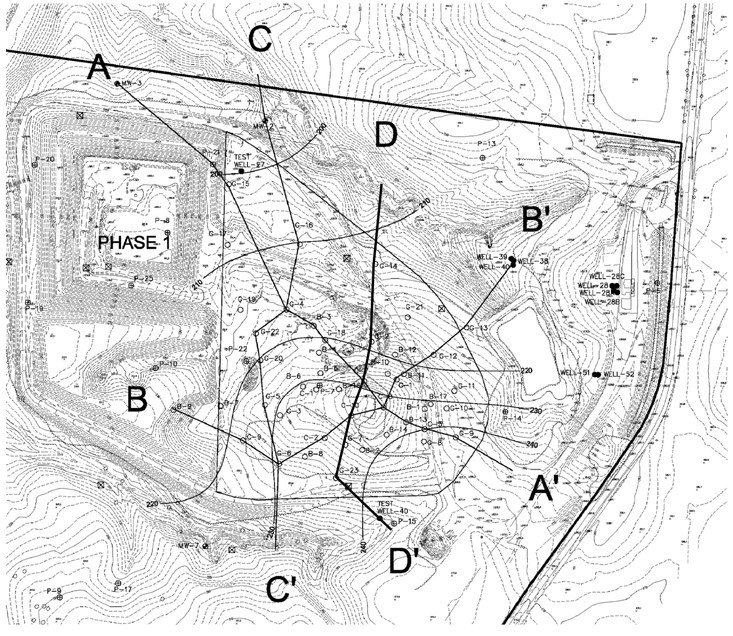
ROCK CORE WITH RECOVERY AND ROCK QUALITY DESIGNATION (RQD)

STANDARD PENETRATION RESISTANCE VALUE (ASTM D-1586)

WATER LEVEL AT TIME OF COMPLETION OF PIEZOMETER
WATER LEVEL AT LEAST 24 HOURS AFTER COMPLETION

WELL SCREEN INTERVAL (ONE COLUMN SHOWN AT COUPLETS FOR CLARITY)

GROUND WATER FLOW DIRECTION



HYDROGEOLOGIC CONDITIONS BASED ON PHASE 2 DESIGN HYDRO SITE INVESTIGATION PERFORMED IN 2008, WITH EARLIER DATA FROM SITE SUITABILITY CHARACTERIZATION CA. 2001 PERFORMRED BY JOYCE ENGINEERING

WATER LEVELS OBSERVED ON 4-24-08 ARE CONSIDERED TO BE ALL-TIME LOW VALUES BASED ON MONITORING WELL DATA. THE MAXIMUM DIFFERENCE IN MW-1 IS 6.7 FEET, LOCATED AT A HIGHER ELEVATION - MAX. LONG-TERM SEASONAL HIGH WATER LEVELS IN PHASE 2 ARE CONSIDERED TO BE 6 FEET HIGHER THAN THOSE OBSERVED 4-24-08.

PROPOSED FINAL GRADE

EXISTING GROUND

A HIGHLY DIFFERENTIAL WEATHERING PATTERN SUGGESTS BOULDERS EMBEDDED IN SAPROLITE AND/OR THIN LEDGES OF ROCK UNDERLYING THE UPPER ELEVATIONS OF THE SITE

GROUND WATER RECHARGE OCCURS OVER MOST OF THE SITE - DISCHARGE OCCURS JUST AT THE STREAM BANKS AND BENEATH THE STREAMS (TYPICAL OF PIEDMONT ENVIRONMENTS)

PROPOSED BASE GRADE

EST'D MAXIMUM LONG-TERM SEASONAL HIGH GROUND WATER LEVEL

PROPOSED PERIMETER BERM

PROPOSED PERIMETER BERM

DRAINAGE FEATURE

P-15

P-15 IS ABANDONED

UNNAMED TRIBUTARY

4-24-08

DRY

UNIT 1A

UNIT 1B

UNIT 2

GROUND WATER OBSERVED ON SPECIFIC DATE

GENERALIZED POTENTIOMETRIC LINE (TYP.)

TOP OF BEDROCK (DEFINED BY AUGER REFUSAL)

GENERALIZED FLOW LINE (TYP.)

C-10 C-7 G-7 G-23 G-2 G-21 G-14

330 320 310 300 290 280 270 260 250 240 230 220 210 200 190 180 170

SECTION D-D'

90' 60' 30' 0
1" = 15' VERT.

0 300' 600' 900'
1" = 150'

REVISION		
NO.	DATE	

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

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 019324 DAVID GARRETT
6-22-2008

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODIFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

DRAWING TITLE:
HYDROGEOLOGICAL
CROSS SECTION D-D'
SHEET 4 OF 4

DESIGNED BY:	DRAWN BY:
G.D.G.	A.W.H.
CHECKED BY:	PROJECT NO.:
G.D.G.	WCA-2
SCALE:	DATE:
AS SHOWN	JUNE 2008
FILE NAME	
CROSS SECTIONS SHT 4 OF 4	
SHEET NO.	DRAWING NO.
15	X4

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ALL EXTERIOR LANDFILL SLOPES ARE STABILIZED WITH VEGETATION

EXISTING CHANNEL

CHANNEL 30

CHANNEL 29

CHANNEL 28

CHANNEL 27

CHANNEL 26

CHANNEL 31

CHANNEL 32

CHANNEL 33

CHANNEL 34

WAKC COUNTY CUSTOM BASIN #1 SEE DETAILS F EC3 G EC3

FACILITY BOUNDARY

200' BUFFER

BENCH MARK NEAR EXIST. 3-36" CMP PIPES

EXIST. SED. BASIN

EXIST. RISER & OUTLET PIPES

SILT FENCE SEE DETAIL D EC3

RIPARIAN BUFFER LINES SEE DETAIL E EC3

DIVERSION DITCHES SEE DETAIL A EC3

THIRD STAGE OF GRADING WILL BE POSTPONED UNTIL MID-2020, IS NOT AUTHORIZED WITH THE PHASE 2A PERMIT, ALTHOUGH PERIMETER EMBANKMENT IS SCHEDULED FOR MID-2012

PERIMETER BERM ACCESS ROAD SEE DETAIL I EC2

NOTE:
CONTRACTOR SHALL GRADE PERIMETER BERM ACCESS ROAD AT 2% CROSS SLOPE TO DRAIN INTO PERIMETER DITCH

SECOND STAGE OF GRADING MAY BE POSTPONED UNTIL MID-2012 BUT IS AUTHORIZED WITH THE PHASE 2A PERMIT

EXIST. POND

INITIAL STAGE OF GRADING IS SCHEDULED TO COMMENCE IN SUMMER 2010

EXISTING AND FUTURE PERIMETER CHANNELS WILL CONVEY ALL RUNOFF FROM FINAL SLOPES TO THE MAIN SEDIMENT POND

ACCESS ROAD SEE DETAIL I EC2

EX. WAKE COUNTY CUSTOM BASIN

SILT FENCE SEE DETAIL D EC3

THIS FACILITY HAS BEEN SUBJECT TO PERIODIC INSPECTION BY WAKE COUNTY ENVIRONMENTAL ENGINEERING SINCE FIRST CONSTRUCTION IN 2003

REFERENCE NOTES:

1. EXISTING TOPOGRAPHIC MAPPING OF THE IMMEDIATE C&D LANDFILL AREA PROVIDED BY AMI ENGINEERING, INC. COMPILED FROM AERIAL PHOTOGRAPHY TAKEN BY WESTERN AIR MAP DATED FEBRUARY 20, 2008.

2. EXISTING TOPOGRAPHIC MAPPING OF AREA SURROUNDING THE C&D LANDFILL PROVIDED BY SPATIAL DATA CONSULTANTS, INC., OF HIGH POINT, NORTH CAROLINA FROM AERIAL PHOTOGRAPHY DATED MARCH 27, 2001.

3. FACILITY PROPERTY LINE FROM A MAP ENTITLED "MATERIAL RECOVERY, LLC. & MARGARET TALTON" PREPARED BY TRC TRIANGLE, DATED 7-16-2003, RECORDED IN BOOK OF MAPS BOOK 2003, PAGE 1508, WAKE COUNTY REGISTER OF DEEDS.

4. ADJOINING PROPERTY OWNERS ARE FROM WAKE COUNTY GIS DEPARTMENT.

NOTES:

1. FOR ALL CHANNEL SIZES AND SLOPES SEE CHANNEL DESIGN SUMMARY ON DWG EC5.

2. FOR ALL DOWN PIPE SIZES SEE PIPE DESIGN SUMMARY ON DWG EC5.

LEGEND

- EXIST. INDEX CONTOURS
- EXIST. INTERMEDIATE CONTOURS
- PROPOSED INDEX CONTOURS
- PROPOSED INTERMEDIATE CONTOURS
- EXIST. STREAM
- FACILITY BOUNDARY
- SIDE SLOPE BENCH DRAIN
- DIVERSION DITCH CHANNEL

0 80' 160' 240'
1" = 80'

DATE	NO.	REVISION
6-15-2010	1	NEW DRAWING CREATED FROM EC-1 DEPICTING MEASURES FOR GRADING

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

SEAL

6-15-2010

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL (#92-31)
PH2 PERMIT MODIFICATIONS
WAKE COUNTY, NORTH CAROLINA

DRAWING TITLE:
BASE GRADING
SEDIMENTATION & EROSION
CONTROL PLAN

DESIGNED BY:	DRAWN BY:
G.D.G.	A.W.H.
CHECKED BY:	PROJECT NO.:
G.D.G.	WCA-2
SCALE:	DATE:
AS SHOWN	JUNE 2008
FILE NAME	
S&EC PLAN	
SHEET NO.	DRAWING NO.
16A	EC1A

E:\YR8H-CAD\CAD\GARRETT\WCA-2\SHEETS\PH2 CDLF PERMIT\dwgs dg\S&EC PLAN.dwg DATE: JUN 19, 2008 TIME: 11:09 AM

DATE	NO.	REVISION
6-15-2010	1	NEW DRAWING CREATED FROM EC-1 DEPICTING MEASURES FOR CLOSURE

NOTES:
1. FOR ALL CHANNEL SIZES AND SLOPES SEE CHANNEL DESIGN SUMMARY ON DWG EC5.
2. FOR ALL DOWN PIPE SIZES SEE PIPE DESIGN SUMMARY ON DWG EC5.

BENCH MARK NEAR EXIST. 3-736" CMP PIPES

EXIST. SED. BASIN

EXIST. RISER & OUTLET PIPES

SIDE SLOPE BENCH DRAINS SEE DETAIL B EC2 C EC2 D EC2

DOWN PIPE ON SLOPE FOR SOIL BERM PASS-THRU SEE DETAIL E EC2

FOR OPEN PIPE ON SLOPES SEE DETAIL F EC2

NOTE:
ALTERNATE FINAL COVER TO BE USED AT THE DISCRETION OF THE OWNER SEE DETAIL J EC2

FINAL COVER SEE DETAIL H EC2

WAKC COUNTY CUSTOM BASIN #1 SEE DETAILS F EC3 G EC3

FACILITY BOUNDARY

200' BUFFER

SILT FENCE SEE DETAIL D EC3

RIPARIAN BUFFER LINES SEE DETAIL E EC3

DIVERSION DITCHES SEE DETAIL A EC3

PERIMETER BERM ACCESS ROAD SEE DETAIL I EC2

NOTE:
CONTRACTOR SHALL GRADE PERIMETER BERM ACCESS ROAD AT 2% CROSS SLOPE TO DRAIN INTO PERIMETER DITCH

CAP DIVERSION BERM SEE DETAIL A EC2

EXIST. POND

ACCESS ROAD SEE DETAIL I EC2

SILT FENCE SEE DETAIL D EC3

EX. WAKE COUNTY CUSTOM BASIN

CHANNEL 30, CHANNEL 21, CHANNEL 22, CHANNEL 29, CHANNEL 20, CHANNEL 19, CHANNEL 28, CHANNEL 18, CHANNEL 27, CHANNEL 43, CHANNEL 8, CHANNEL 3, CHANNEL 31, CHANNEL 23, CHANNEL 14, CHANNEL 9, CHANNEL 4, CHANNEL 33, CHANNEL 10, CHANNEL 5, CHANNEL 7, CHANNEL 12, CHANNEL 17, CHANNEL 26, CHANNEL 32, CHANNEL 24, CHANNEL 15, CHANNEL 1, CHANNEL 6, CHANNEL 11, CHANNEL 16, CHANNEL 25, CHANNEL 34

DP 1, DP 2, DP 3, DP 4, DP 5, DP 6

DB 1, DB 2, DB 3, DB 4, DB 5, DB 6, DB 7, DB 8

REFERENCE NOTES:

1. EXISTING TOPOGRAPHIC MAPPING OF THE IMMEDIATE C&D LANDFILL AREA PROVIDED BY AMI ENGINEERING, INC. COMPILED FROM AERIAL PHOTOGRAPHY TAKEN BY WESTERN AIR MAP DATED FEBRUARY 20, 2008.

2. EXISTING TOPOGRAPHIC MAPPING OF AREA SURROUNDING THE C&D LANDFILL PROVIDED BY SPATIAL DATA CONSULTANTS, INC., OF HIGH POINT, NORTH CAROLINA FROM AERIAL PHOTOGRAPHY DATED MARCH 27, 2001.

3. FACILITY PROPERTY LINE FROM A MAP ENTITLED "MATERIAL RECOVERY, LLC. & MARGARET TALTON" PREPARED BY TRC TRIANGLE, DATED 7-16-2003, RECORDED IN BOOK OF MAPS BOOK 2003, PAGE 1508, WAKE COUNTY REGISTER OF DEEDS.

4. ADJOINING PROPERTY OWNERS ARE FROM WAKE COUNTY GIS DEPARTMENT.

LEGEND

- EXIST. INDEX CONTOURS
- EXIST. INTERMEDIATE CONTOURS
- PROPOSED INDEX CONTOURS
- PROPOSED INTERMEDIATE CONTOURS
- EXIST. STREAM
- FACILITY BOUNDARY
- SIDE SLOPE BENCH DRAIN
- DIVERSION DITCH CHANNEL

0 80' 160' 240'
1" = 80'

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919-231-1818 (Office and Fax) 919-418-4375 (mobile)

SEAL

SEAL

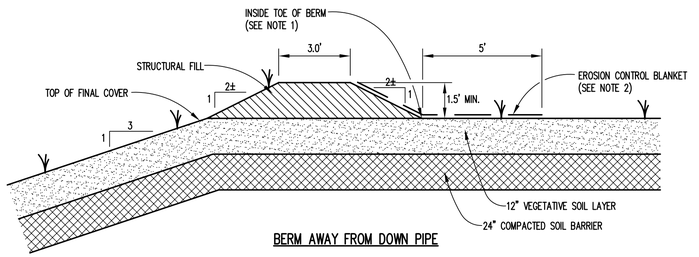
NORTH CAROLINA PROFESSIONAL ENGINEER DAVID GARRETT 6-22-2008

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODIFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

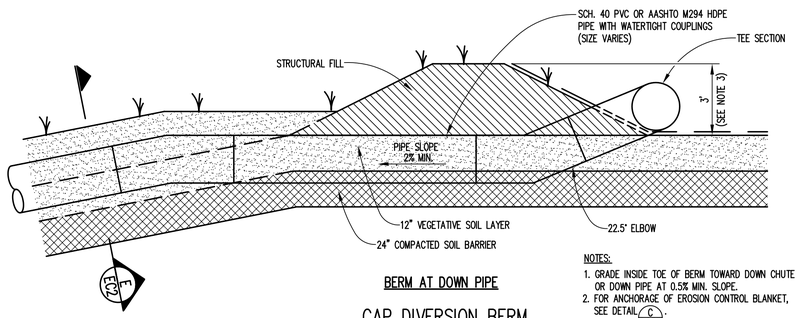
DRAWING TITLE:
FINAL CLOSURE
SEDIMENTATION & EROSION
CONTROL PLAN

DESIGNED BY:	DRAWN BY:
G.D.G.	A.W.H.
CHECKED BY:	PROJECT NO.:
G.D.G.	WCA-2
SCALE:	DATE:
AS SHOWN	JUNE 2008
FILE NAME	
S&EC PLAN	
SHEET NO.	DRAWING NO.
16B	EC1B

E:\H&H-CAD\CAD\GARRETT\WCA-2\SHEETS\PH2 CDLF PERMIT\dwgs dg\S&EC PLAN.dwg DATE: JUN 19, 2008 TIME: 11:09 AM



BERM AWAY FROM DOWN PIPE



BERM AT DOWN PIPE

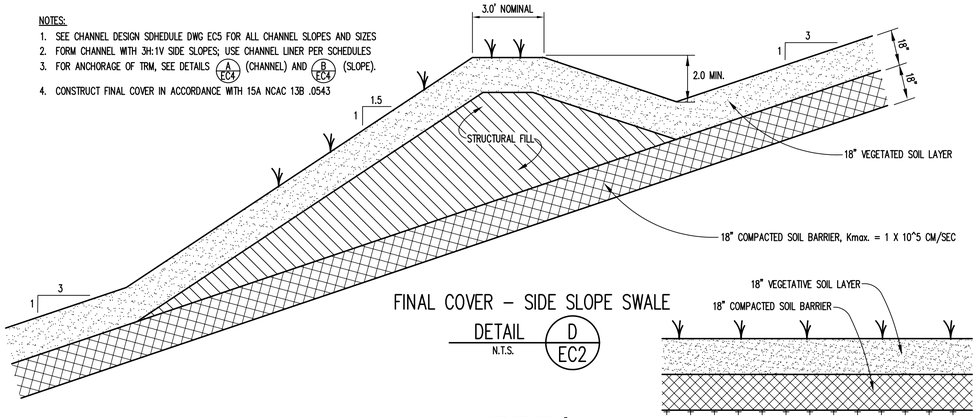
CAP DIVERSION BERM

DETAIL A / EC2

N.T.S.

NOTES:
1. GRADE INSIDE TOE OF BERM TOWARD DOWN CHUTE OR DOWN PIPE AT 0.5% MIN. SLOPE.
2. FOR ANCHORAGE OF EROSION CONTROL BLANKET, SEE DETAIL C / EC4.
3. TAPER BERM HEIGHT FROM TYPICAL 1.5' HEIGHT TO 3' HEIGHT AT DOWNPIPE INLET.

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

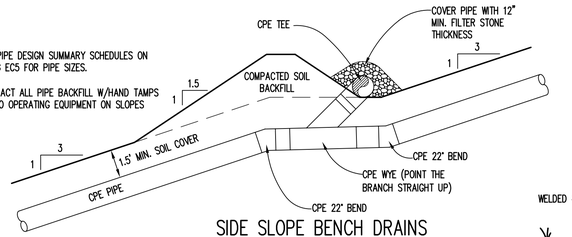


FINAL COVER – SIDE SLOPE SWALE

DETAIL D / EC2

N.T.S.

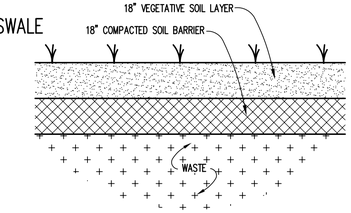
NOTE:
1. SEE PIPE DESIGN SUMMARY SCHEDULES ON DRAWING EC5 FOR PIPE SIZES.
2. COMPACT ALL PIPE BACKFILL W/HAND TAMPS PRIOR TO OPERATING EQUIPMENT ON SLOPES



SIDE SLOPE BENCH DRAINS

DETAIL C / EC2

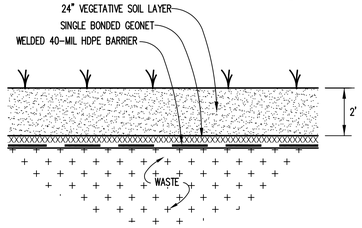
N.T.S.



FINAL COVER SOIL DETAIL

DETAIL H / EC2

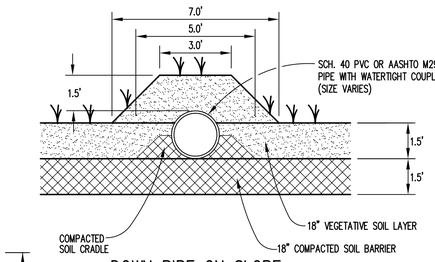
N.T.S.



ALTERNATE
FINAL COVER SOIL DETAIL

DETAIL J / EC2

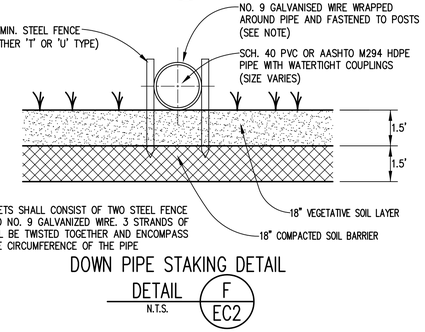
N.T.S.



DOWN PIPE ON SLOPE

DETAIL E / EC2

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 / EC2

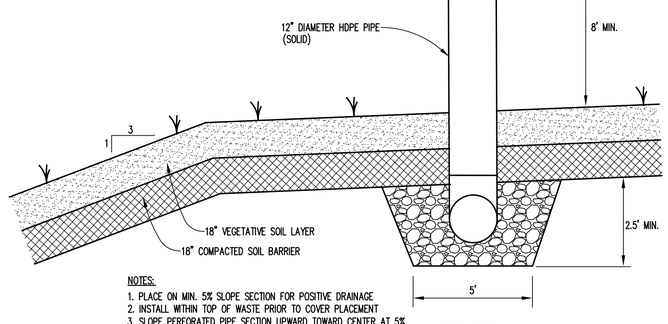
N.T.S.

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

DOWN PIPE

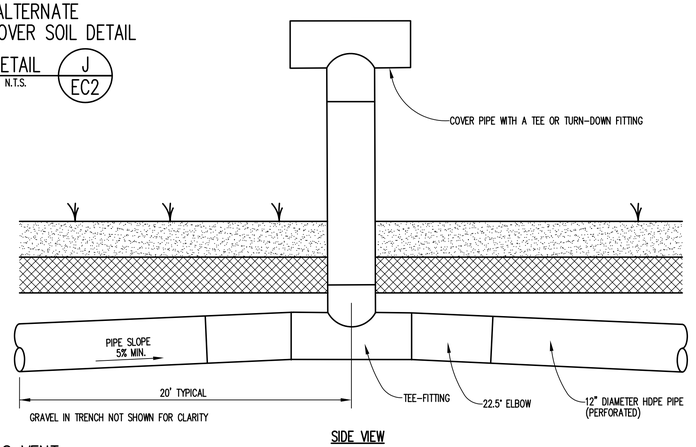
DETAIL B / EC2

N.T.S.



NOTES:
1. PLACE ON MIN. 5% SLOPE SECTION FOR POSITIVE DRAINAGE
2. INSTALL WITHIN TOP OF WASTE PRIOR TO COVER PLACEMENT
3. SLOPE PERFORATED PIPE SECTION UPWARD TOWARD CENTER AT 5%
4. BACKFILL TRENCH WITH NO. 57 WASHED STONE
5. COMPACT OVERLYING SOILS TO PROJECT SPECIFICATIONS
6. TYPICALLY INSPALL AT THREE VENTS PER ACRE

END VIEW



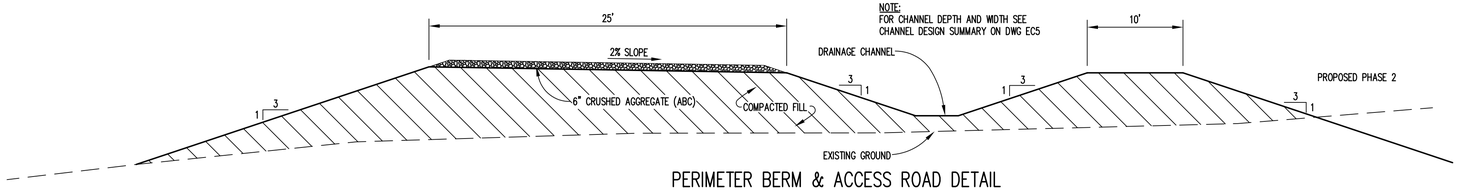
GRAVEL IN TRENCH NOT SHOWN FOR CLARITY

SIDE VIEW

LANDFILL GAS VENT

DETAIL K / EC2

N.T.S.



NOTE:
FOR CHANNEL DEPTH AND WIDTH SEE CHANNEL DESIGN SUMMARY ON DWG EC5

PERIMETER BERM & ACCESS ROAD DETAIL

DETAIL I / EC2

N.T.S.

DATE	NO.	REVISION

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SEAL

SEAL

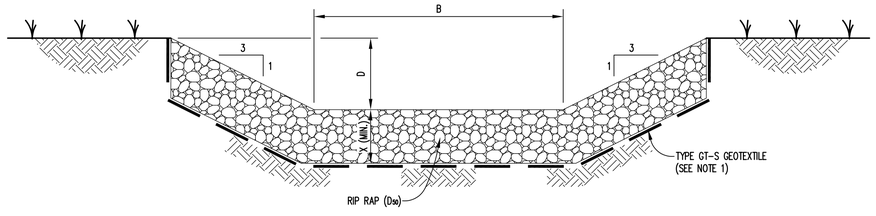
NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER DAVID GARRETT 9-22-2008

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODIFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

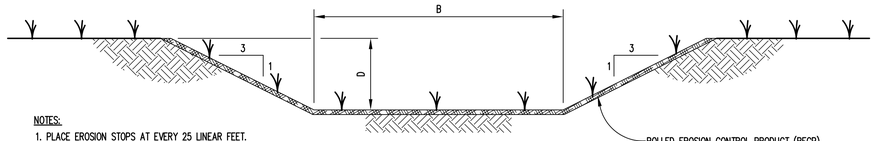
DRAWING TITLE:
SEDIMENTATION & EROSION CONTROL DETAILS
SHEET 1 OF 3

DESIGNED BY:	DRAWN BY:
G.D.G.	A.W.H.
CHECKED BY:	PROJECT NO.:
G.D.G.	WCA-2
SCALE:	DATE:
AS SHOWN	JUNE 2008
FILE NAME	
S&EC DETAILS SHT 1 OF 3	
SHEET NO.	DRAWING NO.
17	EC2

E:\V&B\-CAD\DGARRETT\WCA-2\SHEETS\PH2 CDLF PERMIT\dwgs dg\S&EC DETAILS SHT 1 OF 3.dwg DATE: JUN 19, 2008 TIME: 11:04 AM



RIP RAP LINED CHANNELS

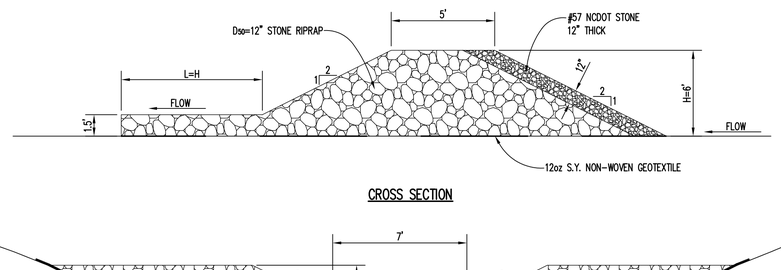


NOTES:
1. PLACE EROSION STOPS AT EVERY 25 LINEAR FEET. FOR EROSION STOPS SEE DETAIL (C / EC2)
2. FOR ANCHORAGE OF RECP, SEE DETAIL (C / EC4)

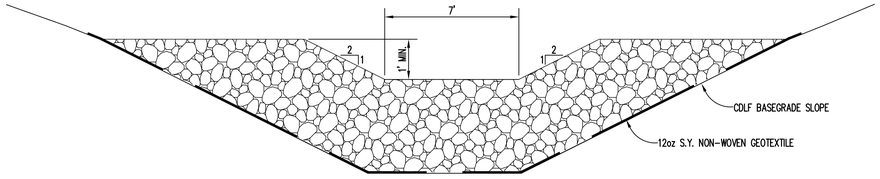
RECP LINED CHANNELS

DRAINAGE CHANNEL DETAILS

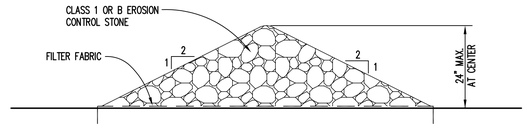
DETAIL A / EC3
N.T.S.



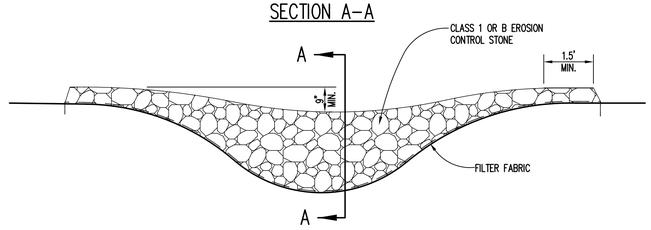
CROSS SECTION



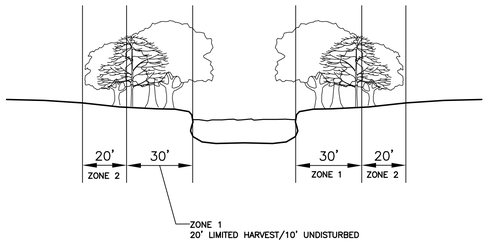
ROCK DAM
DETAIL B / EC3
N.T.S.



SECTION A-A



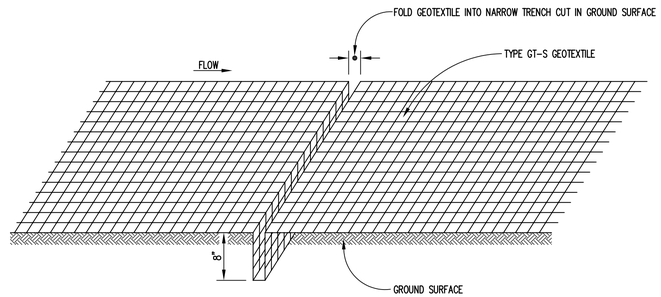
CHECK DAM
DETAIL C / EC3
N.T.S.



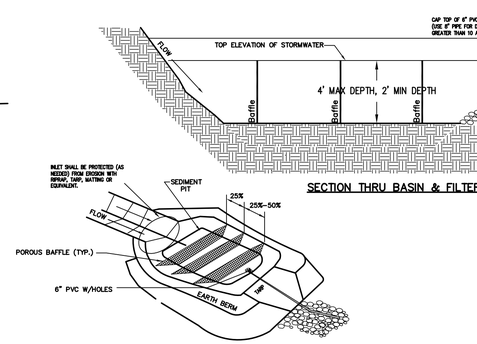
– A LIMITED AMOUNT OF HARVESTING IS ALLOWED IN THE OUTER 20 FEET OF ZONE 1. THE FIRST 10' OF ZONE 1 MUST REMAIN ESSENTIALLY UNDISTRUBED.

– ZONE 2 IS AN ADDITIONAL 20' ON EITHER SIDE OF THE STREAM. ZONE 2 MUST HAVE A DENSE PLANT COVER. FOR BOTH ZONES, THE LANDOWNER OR CARETAKER IS REQUIRED TO KEEP THE LAND UNDISTURBED AND REFRAIN FROM USING FERTILIZER. NEW DEVELOPMENT IS NOT ALLOWED IN EITHER ZONE.

TYPICAL RIPARIAN BUFFERED STREAM
DETAIL E / EC3
N.T.S.

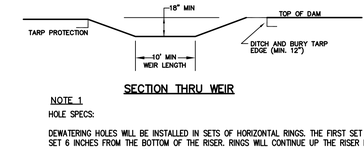


EROSION STOP DETAIL
DETAIL G / EC2
N.T.S.



PERSPECTIVE VIEW

SECTION THRU BASIN & FILTER



SECTION THRU WEIR

GENERAL NOTES

1. DRAW DOWN RISER & BARREL SHALL BE 6" SCH. 40 PVC WITH CLEAN-OUT CAP AND 3/4" HOLES. SEE NOTE 1 FOR NUMBER AND SPACING OF HOLES.

2. THE TARP USED TO PROTECT THE WEIR SHALL BE THE WIDTH SPECIFIED. THE LENGTH OF THE TARP SHALL BE ACCORDING TO AVAILABLE SUPPLY. IF MULTIPLE TARPS ARE TO BE USED, THEN TARPS SHALL BE OVERLAPPED AT LEAST 12". THE UPSTREAM 12" TARP SHALL OVERLAP THE DOWNSTREAM TARP. THE TARP SHALL BE 50 MIL. HEAVY DUTY SILVER TARPAULINS OR EQUIVALENT FOR U.V. RESISTANCE.

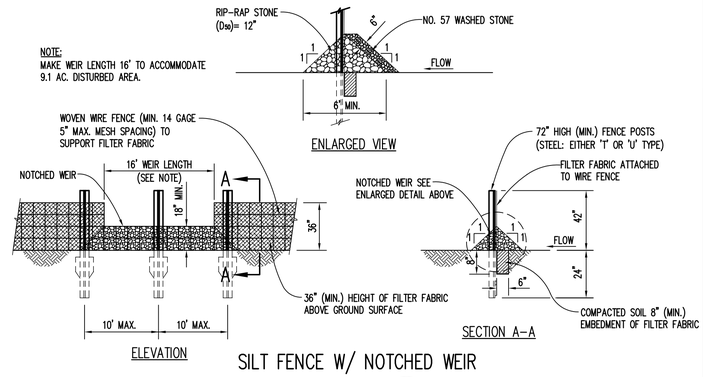
3. MAINTENANCE: SEDIMENT TO BE REMOVED AND PROPERLY DISPOSED OF WHEN BASIN IS HALF FULL. GRAVEL FILTER AROUND RISER SHOULD BE REPLACED AS NEEDED TO ENSURE DEWATERING.

NOTE 1
HOLE SPECS:

DEWATERING HOLES WILL BE INSTALLED IN SETS OF HORIZONTAL RINGS. THE FIRST SET OF HOLES WILL BE SET 6 INCHES FROM THE BOTTOM OF THE RISER. RINGS WILL CONTINUE UP THE RISER IN INTERVALS OF 3 INCHES. HOLES WILL BE 3/4 INCH IN DIAMETER AND WILL BE SPACED EQUALLY AROUND THE RISER. THE NUMBER OF HOLES PER RING WILL EQUAL TO THE DRAINAGE AREA.

EXAMPLE
A BASIN DRAINING 2.0 ACRES SHOULD HAVE 2 HOLES PER RING EVERY 3 INCHES ON THE RISER PIPE. THE FIRST RING (2 HOLES) WILL BE SET 6 INCHES FROM THE BOTTOM OF THE RISER.

NOTE: ROUND DRAINAGE AREA TO THE NEAREST WHOLE NUMBER TO DETERMINE NUMBER OF HOLES.

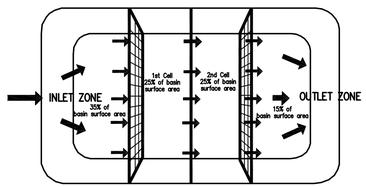


ENLARGED VIEW

SILT FENCE W/ NOTCHED WEIR
DETAIL D / EC3
N.T.S.

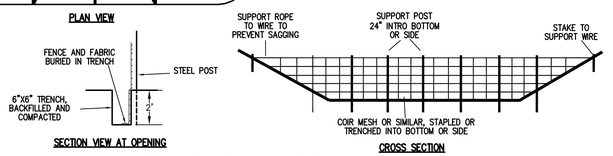
CUSTOM BASIN DETAIL (WAKE CO.)

DETAIL F / EC3
N.T.S.



PLAN VIEW

NOTES:
1. BAFFLE MATERIAL SHOULD BE SECURED AT THE BOTTOM AND SIDES USING STAPLES OR BY TRENCHING AS FOR SILT FENCE.
2. MOST OF THE SEDIMENT WILL ACCUMULATE IN THE 1ST BAY, WHICH SHOULD BE READILY ACCESSIBLE FOR MAINTENANCE.
3. PROVIDE 3 BAFFLES (USE TWO IF LESS THAN 20 FEET IN LENGTH). PROVIDE 5 BAFFLES FOR DRAINAGE AREAS GREATER THAN 10 ACRES.
4. BAFFLE SHALL BE 700 G/M2 COIR EROSION BLANKET.
5. TOPS OF BAFFLES SHOULD BE 2 INCHES LOWER THAN THE TOP OF THE BERMS
6. INSPECT BAFFLES FOR REPAIR ONCE A WEEK AND AFTER EACH RAINFALL



SECTION VIEW AT OPENING

CROSS SECTION

STANDARD BAFFLES DETAIL
DETAIL G / EC3
N.T.S.

DATE	NO.	REVISION

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SEAL

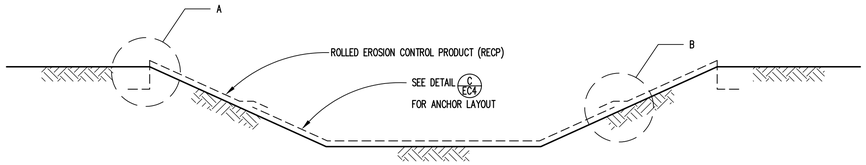
SEAL
NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 019844 DAVID GARRETT 6-22-2008

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

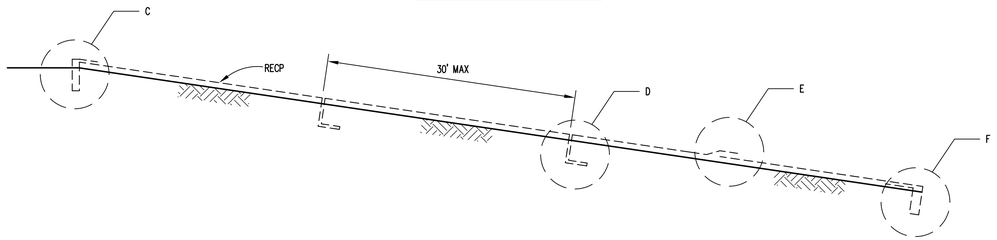
DRAWING TITLE:
SEDIMENTATION & EROSION CONTROL DETAILS
SHEET 2 OF 3

DESIGNED BY:	DRAWN BY:
G.D.G.	A.W.H.
CHECKED BY:	PROJECT NO.:
G.D.G.	WCA-2
SCALE:	DATE:
AS SHOWN	JUNE 2008
FILE NAME	
S&EC DETAILS SHT 2 OF 3	
SHEET NO.	DRAWING NO.
18	EC3

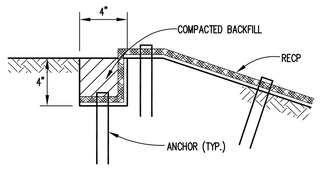
E:\WBH-CAD\CAD\GARRETT\WCA-2\SHEETS\PH2 CDLF PERMIT\dwgs dg\S&EC DETAILS SHT 2 OF 3.dwg DATE: JUN 19, 2008 TIME: 11:05 AM



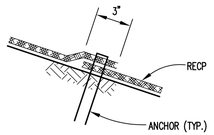
TYPICAL CHANNEL CROSS SECTION



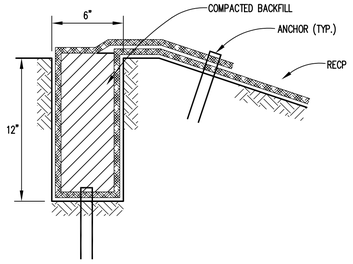
TYPICAL CHANNEL PROFILE



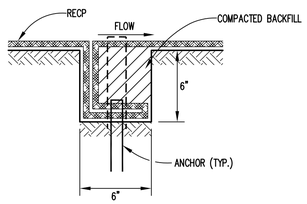
A. LONGITUDINAL ANCHOR TRENCH



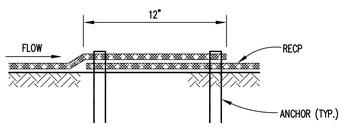
B. OVERLAP AT ADJACENT EDGES



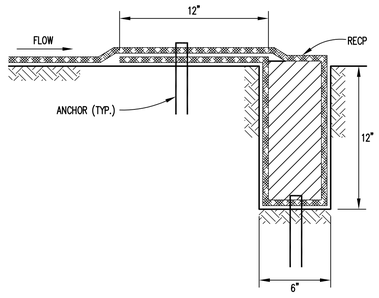
C. UPSTREAM TERMINAL ANCHOR TRENCH



D. INTERMITTENT CHECK SLOT



E. OVERLAP AT ROLL ENDS



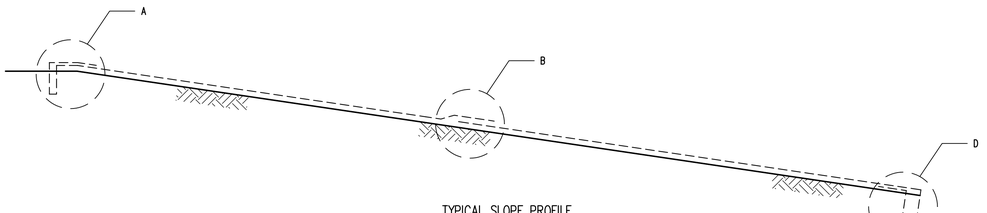
F. DOWNSTRAM TERMINAL ANCHOR TRENCH

NOTES:

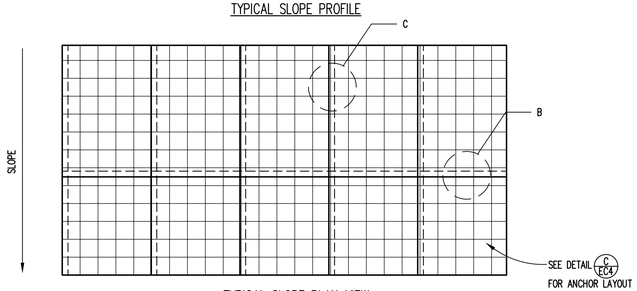
1. PLACE ANCHORS AT ANCHOR TRENCHES, OVERLAPS, AND CHECK SLOTS ON 1 FOOT CENTERS. IF APPLICABLE, STAGGER ANCHOR SPACING BETWEEN MULTIPLE ROWS OF ANCHORS.

INSTALLATION OF ROLLED EROSION CONTROL PRODUCTS (CHANNELS)

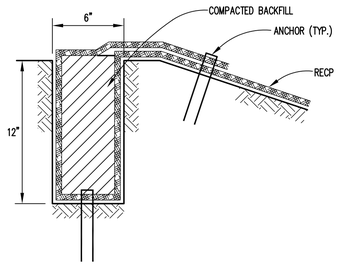
DETAIL A / EC4 — N.T.S.



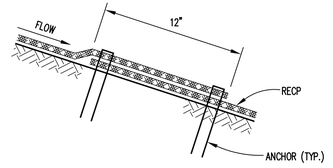
TYPICAL SLOPE PROFILE



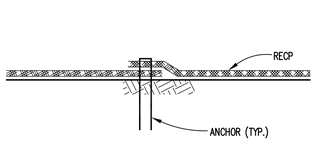
TYPICAL SLOPE PLAN VIEW



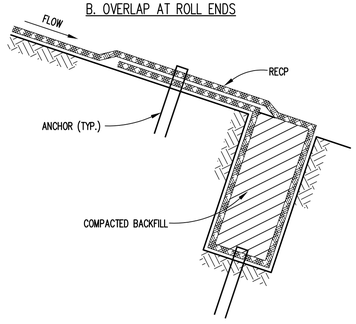
A. UPSLOPE TERMINAL ANCHOR TRENCH



B. OVERLAP AT ROLL ENDS



C. OVERLAP AT ADJACENT EDGES



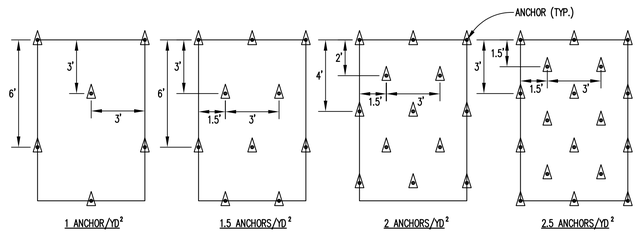
D. DOWNSLOPE TERMINAL ANCHOR TRENCH

NOTES:

1. PLACE ANCHORS AT ANCHOR TRENCHES, OVERLAPS, AND CHECK SLOTS ON 1 FOOT CENTERS. IF APPLICABLE, STAGGER ANCHOR SPACING BETWEEN MULTIPLE ROWS OF ANCHORS.

INSTALLATION OF ROLLED EROSION CONTROL PRODUCTS (SLOPES)

DETAIL B / EC4 — N.T.S.



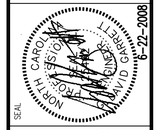
ANCHOR LAYOUT DETAIL C / EC4 — N.T.S.

ANCHOR SPACING SCHEDULE	
LOCATION	REQUIRED ANCHOR SPACING (ANCHORS/YD²)
ALL CHANNELS	2.5
1.5H:1V SLOPES	2.0
2H:1V SLOPES	2.0
2.5H:1V SLOPES	1.5
3H:1V SLOPES	1.5
3.5H:1V SLOPES	1.0
4H:1V SLOPES	1.0

REVISION		
NO.	DATE	

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

SEAL



PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODIFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

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

DESIGNED BY:	DRAWN BY:
G.D.G.	A.W.H.
CHECKED BY:	PROJECT NO.:
G.D.G.	WCA-2
SCALE:	DATE:
AS SHOWN	JUNE 2008
FILE NAME	
S&EC DETAILS SHT 3 OF 3	
SHEET NO.	DRAWING NO.
19	EC4

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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, Q25	Normal Depth, Q25	Velocity at Q25	Max. Shear Stress at Q25	Bottom Width, B	Minimum Depth, D	Top Width, W	Side Slope, m	Lining Type
	acres	feet	feet	%		cfs	feet	fps	psf	feet	feet	feet		
1	0.14	8	468	1.7%	0.033	1	0.22	1.7	0.2	2	1	8	3H:1V	Grass w/ straw net, check dams**
2	0.55	14	410	3.4%	0.033	2	0.28	2.6	0.6	2	1	8	3H:1V	Grass w/ straw net, check dams**
3	0.59	6.5	355	1.8%	0.033	2	0.31	2.2	0.3	2	1	8	3H:1V	Grass w/ straw net, check dams**
4	0.90	20.5	655	3.1%	0.033	3	0.33	3.0	0.6	2	1	8	3H:1V	Grass w/ straw net, check dams**
5	0.14	8	380	2.1%	0.033	1	0.21	1.8	0.3	2	1	8	3H:1V	Grass w/ straw net, check dams**
6	1.73	18	686	2.6%	0.033	6	0.50	3.4	0.8	2	1	8	3H:1V	Grass w/ straw net, check dams**
7	1.51	10	513	1.9%	0.033	5	0.49	2.9	0.6	2	1	8	3H:1V	Grass w/ straw net, check dams**
8	1.44	8	588	1.4%	0.033	5	0.53	2.6	0.5	2	1	8	3H:1V	Grass w/ straw net, check dams**
9	2.10	12	735	1.6%	0.033	7	0.61	3.0	0.6	2	1	8	3H:1V	Grass w/ straw net, check dams**
10	1.76	22	992	3.2%	0.033	6	0.47	3.7	0.9	2	1	8	3H:1V	Grass w/ straw net, check dams**
11	2.01	22	823	2.7%	0.033	7	0.53	3.7	0.9	2	1	8	3H:1V	Grass w/ straw net, check dams**
12	1.54	10	607	1.6%	0.033	5	0.45	3.3	0.8	2	1	8	3H:1V	Grass w/ straw net, check dams**
13	2.35	14	800	1.8%	0.033	8	0.57	3.8	1.0	2	1	8	3H:1V	Grass w/ straw net, check dams**
14	3.00	13	986	1.3%	0.033	10	0.55	3.9	0.9	3	1	9	3H:1V	Grass w/ straw net, check dams**
15	2.89	31	931	3.3%	0.033	10	0.55	3.9	0.9	3	1	9	3H:1V	Grass w/ straw net, check dams**
16	2.51	20	939	2.1%	0.033	9	0.60	3.9	1.0	2	1	8	3H:1V	Grass w/ straw net, check dams**
17	1.90	12	710	1.7%	0.033	7	0.53	3.7	0.9	2	1	8	3H:1V	Grass w/ straw net, check dams**
18	1.85	10	633	1.6%	0.033	7	0.61	3.0	0.6	2	1	8	3H:1V	Grass w/ straw net, check dams**
19	0.61	2	175	1.1%	0.033	2	0.35	1.9	0.2	2	1	8	3H:1V	Grass w/ straw net, check dams**
20	0.34	2	175	1.1%	0.033	2	0.35	1.9	0.2	2	1	8	3H:1V	Grass w/ straw net, check dams**
21	0.67	5	280	1.8%	0.033	3	0.38	2.5	0.4	2	1	8	3H:1V	Grass w/ straw net, check dams**
22	0.95	5	340	1.5%	0.033	4	0.47	2.5	0.4	2	1	8	3H:1V	Grass w/ straw net, check dams**
23	2.00	11	568	1.9%	0.033	7	0.58	3.2	0.7	2	1	8	3H:1V	Grass w/ straw net, check dams**
24	3.61	36	1189	3.0%	0.025	12	0.59	5.4	1.1	2	1	8	3H:1V	Vegetated TRM w/ check dams**
25	2.17	18	945	1.9%	0.033	11	0.63	3.6	0.7	3	1	9	3H:1V	Grass w/ straw net, check dams**
26	11.48	20	770	2.6%	0.025	44	1.02	7.1	1.7	3	2	15	3H:1V	Vegetated TRM w/ check dams**
27	20.71	12	655	1.8%	0.025	76	1.44	7.2	1.6	3	2	15	3H:1V	Vegetated TRM w/ check dams**
28	23.72	2	170	1.2%	0.025	87	1.68	6.4	1.3	3	2	15	3H:1V	Vegetated TRM w/ check dams**
29	34.74	4	264	1.5%	0.025	125	1.88	7.7	1.8	3	2	15	3H:1V	Vegetated TRM w/ check dams**
30	19.16	5	768	0.7%	0.025	73	1.75	5.1	0.8	3	2	15	3H:1V	Vegetated TRM w/ check dams**
31	14.09	11	575	1.9%	0.025	54	1.21	6.7	1.4	3	2	15	3H:1V	Vegetated TRM w/ check dams**
32	3.20	34	1941	2.5%	0.025	16	0.62	5.3	1.0	3	1	9	3H:1V	Vegetated TRM w/ check dams**
33	2.05	61	1895	3.2%	0.033	7	0.62	3.9	1.2	1	1	7	3H:1V	Grass w/ straw net, check dams**
34	0.67	36	962	3.7%	0.033	3	0.4	3.4	0.9	1	1	7	3H:1V	Grass w/ straw net, check dams**
DB1	0.65	1	306	1.0%	0.033	2	0.45	1.9	0.3	1	1	7	3H:1V	Grass w/ straw net, check dams**
DB2	0.07	1	126	1.0%	0.033	1	0.33	1.5	0.2	1	1	7	3H:1V	Grass w/ straw net, check dams**
DB3	0.11	1	0.01	1.0%	0.033	1	0.33	1.5	0.2	1	1	7	3H:1V	Grass w/ straw net, check dams**
DB4	0.56	2	234	1.0%	0.033	2	0.45	1.9	0.3	1	1	7	3H:1V	Grass w/ straw net, check dams**
DB5	0.40	1	134	1.0%	0.033	2	0.45	1.9	0.3	1	1	7	3H:1V	Grass w/ straw net, check dams**
DB6	0.61	5	468	1.0%	0.033	3	0.55	2.1	0.3	1	1	7	3H:1V	Grass w/ straw net, check dams**
DB7	0.87	5	471	1.0%	0.033	3	0.55	2.1	0.3	1	1	7	3H:1V	Grass w/ straw net, check dams**
DB8	0.35	1	121	1.0%	0.033	1	0.33	1.5	0.2	1	1	7	3H:1V	Grass w/ straw net, check dams**

Notes: *values represent 100-year design flow for sediment basin discharge
**silt check dams to be constructed of d50 = 12" rip-rap with 12 inches of No. 57 filter stone on upstream face, place on 50-foot centers

PIPE DESIGN SCHEDULE

Pipe No.	Diam. inches	Type	Length feet	Slope ft./ft.	Q25 cfs	Inlet Structure Invert Elev.*	Type	Outlet Structure Invert Elev.*	Type	Rip-Rap Apron: Length, ft.	Pipe End Width, ft.	Ditch End Width, ft.
DPIPE #1	18	PVC/PE	514	0.290	25	401.00	Projecting tee	252.00	Projecting end	20	4.5	21.5
DPIPE #2	18	PVC/PE	646	0.260	21	401.00	Projecting tee	232.00	Projecting end	18	4.5	19.5
DPIPE #3	18	PVC/PE	876	0.200	40	401.00	Projecting tee	179.00	Projecting end	24	4.5	25.5
DPIPE #4	18	PVC/PE	566	0.292	30	401.00	Projecting tee	235.00	Projecting end	22	4.5	23.5
DPIPE #5	12	PVC/PE	62	0.310	10	245.00	Projecting tee	225.00	Projecting end	14	3	15
DPIPE #6	12	PVC/PE	107	0.240	9	245.00	Projecting tee	219.00	Projecting end	14	3	15

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.) EXCEPT CPIPE 3

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

**Merge the pipe outlet apron for the stormwater basin with the emergency overflow weir apron

THE RISER STRUCTURE FOR THE STORM WATER POND IS SUBJECT TO SAME MATERIAL AND PROTECTION REQUIREMENTS AS THE CATCH BASINS (SEE ABOVE); IN ADDITION, A CONCRETE ANTI-FLOATATION BLOCK IS REQUIRED (SEE DETAILS)

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

CUSTOM BASIN SCHEDULE

These take the place of temporary sediment traps per Wake County requirements

Design Storm Event	Q25	25-Year, 5-Minute Storm
Peak Runoff Intensity, I, in/hr	8.12	NOAA Atlas 14
Design Runoff Coefficient, C	0.35	Cleared, unimproved area (for traps only)

Basin No.		**CB-1**
Disturbed Area, acres		3.60
* Required Volume (1800 ft^3 / ac), cf		6,480
Peak Runoff Flow, Qp, cfs		10.2
* Required Area (0.01 *Qp), sq. ft. with 2:1 length to width ratio		4456
Min. Basin Dimensions: (measured at bottom)	Length, ft	60
	Width, ft	30
	** Effective Depth, ft	4
Required Filter Weir Length, ft		10
Required Filter Weir Crest Width, ft		5
Resulting Dimensions: (measured at top)	Length, ft	84
	Width, ft	34
Resulting Storage Volume, cf		9360
Resulting Surface Area, sf		4536

Use 4-inch diameter PVC pipe drain (see details) with 4 drilled half-inch diameter holes placed in rings spaced 3 inches vertically

The design is OK if the resulting volume and area are larger than the required quantities

* Design criteria per NC Sedimentation and Erosion Control Design Manual guidelines - the basins are purposefully shallow and have large surface areas

** Vertical distance from top or weir to bottom of excavation, considered here to be the minimum desired depth of the sediment trap

The perimeter berm should be level and the height should be at least 1.5 feet higher than the top of the weir

Use 3H:1V side slopes inside and outside basin for berm and weir, vegetate slopes as soon as practical - within 20 days per NC S&EC Rules and Guidelines

Compact all soil per Technical Specifications, if provided, or as directed by the Engineer

Cover weir with UV-resistant silver tarp, per Wake County specifications

Direct discharge away from water bodies and/or riparian buffer zones

Construct diversion ditches toward basin, as shown on plans, and stabilize with rip-rap or vegetation as directed by the Engineer

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)

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) and Tall Fescue	70 lbs/acre 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% ANALYS
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 WAKE COUNTY DEPRTMENT OF ENVIRONMENTAL SERVICES, STORM WATER UNIT. TEL. 919–XXX–XXXX 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 AND/OR THE NCDENR 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 – ROTATE 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.

NO.	DATE	REVISION

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SEAL

SEAL

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODFICATIONS (#92–31)
WAKE COUNTY, NORTH CAROLINA

DRAWING TITLE:
SEDIMENTATION & EROSION CONTROL SCHEDULES & NARRATIVE TEXT

DESIGNED BY:	DRAWN BY:
G.D.G.	A.W.H.
CHECKED BY:	PROJECT NO.:
G.D.G.	WCA–2
SCALE:	DATE:
AS SHOWN	JUNE 2008
FILE NAME	
S&EC SCHEDULES & NARRATIVE	
SHEET NO.	DRAWING NO.
20	EC5

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DATE	NO.	REVISION
1-30-10	2	CHANGE BARHOLE PUNCH LOCATIONS TO LFG MONITORING WELLS
9-17-09	1	IDENTIFY DEEP MONITORING WELLS PER REGULATORY REVIEW

EXISTING SW-2
EXISTING MW-3
EXISTING MW-2
EXISTING SW-3
BH-1
BH-2
BH-3
BH-4
EXISTING MW-4
UNNAMED TRIBUTARY
90' CP&L R/W
FACILITY BOUNDARY
200' BUFFER
EXISTING 3-36" CMP PIPES
UNNAMED TRIBUTARY
EXIST. SED. BASIN
WASTE LIMITS
LFG-5
FUTURE MW-9s, MW-9d
EXIST. RISER & OUTLET PIPES
PROPOSED PHASE 2B
PHASE 1 FINAL GRADES SHOWN FOR REFERENCE
EXISTING MW-5
FACILITY BOUNDARY
EXIST. POND
LFG-6
SCALES
SCALE HOUSE
LFG-7
OLD HOUSE SHOWN FOR REFERENCE
FUTURE MW-8
LFG-8
PROPOSED PHASE 2A
FUTURE MW-6As, MW-6Ad
EXISTING ACCESS RD.
LFG-9
200' BUFFER
FUTURE MW-7As, MW-7Ad
RIPARIAN BUFFER LINES
MAX SEASONAL HIGH GROUND WATER CONTOURS SHOWN FOR REFERENCE
LFG-10
EXISTING SW-1 (BACKGROUND)
UNNAMED TRIBUTARY
BROWNFIELD RD. SR2553 (60' PUBLIC R/W)
EXISTING MW-1 (BACKGROUND)
PROPERTY LINE
PROPERTY LINE

N715,000 N714,500 N714,000 N713,500 N713,000 N712,500 N712,000
E2,145,000 E2,145,500 E2,146,000 E2,146,500 E2,147,000 E2,147,500 E2,148,000 E2,148,500 E2,149,000 E2,149,500

REFERENCE NOTES:

1. EXISTING TOPOGRAPHIC MAPPING OF THE IMMEDIATE C&D LANDFILL AREA PROVIDED BY AMI ENGINEERING, INC. COMPILED FROM AERIAL PHOTOGRAPHY TAKEN BY WESTERN AIR MAP DATED FEBRUARY 20, 2008.

2. EXISTING TOPOGRAPHIC MAPPING OF AREA SURROUNDING THE C&D LANDFILL PROVIDED BY SPATIAL DATA CONSULTANTS, INC., OF HIGH POINT, NORTH CAROLINA FROM AERIAL PHOTOGRAPHY DATED MARCH 27, 2001.

3. FACILITY PROPERTY LINE FROM A MAP ENTITLED "MATERIAL RECOVERY, LLC. & MARGARET TALTON" PREPARED BY TRC TRIANGLE, DATED 7-16-2003, RECORDED IN BOOK OF MAPS BOOK 2003, PAGE 1508, WAKE COUNTY REGISTER OF DEEDS.

LEGEND

- EXIST. INDEX CONTOURS
- EXIST. INTERMEDIATE CONTOURS
- EXIST. STREAM
- FACILITY BOUNDARY
- EXISTING MONITORING WELL
- EXISTING PIEZOMETER WELL
- B-6 TEST BORING
- TEST PIT
- EXISTING TEST WELL
- BH-4 METHANE MONITORING BARHOLE TEST LOCATION
- LFG-5 LANDFILL GAS MONITORING WELL

0 150' 300' 450'
1" = 150'

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SEAL

PROJECT TITLE:
WCA WASTE CORPORATION, INC.
BROWNFIELD RD. C&D LANDFILL
PH2 PERMIT MODIFICATIONS (#92-31)
WAKE COUNTY, NORTH CAROLINA

DRAWING TITLE:
GROUNDWATER AND METHANE MONITORING PLAN
PHASE 2 AMENDMENTS

DESIGNED BY: G.D.G.	DRAWN BY: A.W.H.
CHECKED BY: G.D.G.	PROJECT NO.: WCA-2
SCALE: AS SHOWN	DATE: JUNE 2008
FILE NAME: GROUNDWATER MONITORING PLAN	
SHEET NO. 21	DRAWING NO. MP1

E:\W&H-CAD\DGARRETT\WCA-2\SHEETS\PH2 C&LF PERMIT\dwgs dg\GROUNDWATER MONITORING PLAN.dwg DATE: JUN 19, 2008 TIME: 10:46 AM