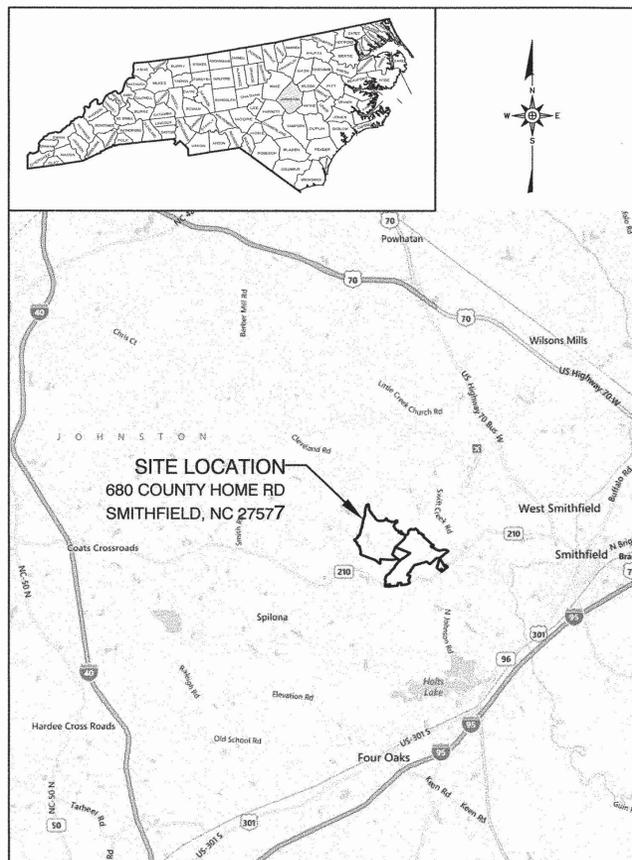


JOHNSTON COUNTY, NORTH CAROLINA  
DEPARTMENT OF SOLID WASTE SERVICES

# JOHNSTON COUNTY C&D LANDFILL AREA 2 PERMIT DRAWINGS

OCTOBER 2005  
REVISED: FEBRUARY 2015

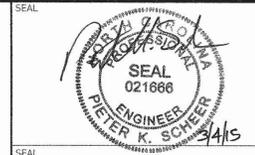


SITE LOCATION MAP  
NOT TO SCALE

RIVER BASIN: NEUSE

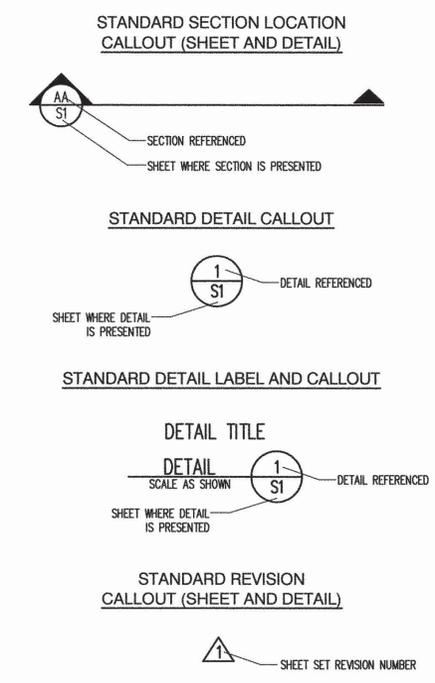
SHEET NO.	DRAWING NO.	DRAWING TITLE	REVISION NO.
1	-	TITLE-COVER SHEET	3
2	S1	EXISTING SITE CONDITIONS	2
3	S2	SITE DEVELOPMENT PLAN - BASE GRADES	2
4	S3	SITE DEVELOPMENT PLAN - FINAL COVER GRADES	2
5	S4	AREA 2 SUBGRADE GRADING AND DRAINAGE PLAN	3
6	S5	AREA 2 COMPOSITE LINER GRADING AND LEACHATE COLLECTION SYSTEM	3
7	S6	AREA 2 PROTECTIVE COVER GRADING PLAN	3
8	S7	LEACHATE FORCEMAIN PLAN & PROFILE	2
9	L1	LINER AND BERM DETAILS (SHEET 1 OF 2)	
10	L2	LINER & BERM DETAILS (SHEET 2 OF 2)	
11	LM1	LEACHATE MANAGEMENT SYSTEM DETAILS (SHEET 1 OF 3)	
12	LM2	LEACHATE MANAGEMENT SYSTEM DETAILS (SHEET 2 OF 3)	
13	LM3	LEACHATE MANAGEMENT SYSTEM DETAILS (SHEET 3 OF 3)	
14	R1	ROADWAY DETAILS	
15	EC1	EROSION & SEDIMENTATION CONTROL DETAILS (SHEET 1 OF 2)	
16	EC2	EROSION & SEDIMENTATION CONTROL DETAILS (SHEET 2 OF 2)	
17	FC1	AREA 2 FINAL COVER GRADING AND DRAINAGE PLAN	2
18	FC2	FINAL COVER DETAILS (SHEET 1 OF 2)	
19	FC3	FINAL COVER DETAILS (SHEET 2 OF 2)	
20	LFG1	LANDFILL GAS MANAGEMENT DETAILS	
21	X1	AREA 2 - ENGINEERING CROSS SECTION (1 OF 2)	2
22	X2	AREA 2 - ENGINEERING CROSS SECTION (2 OF 2)	2
23	P1	C&D LANDFILL PHASING PLAN	2
24	P2	MSW LANDFILL PHASING PLAN (SHEET 1 OF 2)	2
25	P3	MSW LANDFILL PHASING PLAN (SHEET 2 OF 2)	2
26	M1	MISCELLANEOUS DETAILS	3

APPROVED DOCUMENT  
Division of Waste Management  
Solid Waste Section  
Approved May 27, 2015  
By D. Wilson  
Facility ID 5103-CDLF  
Doc ID 24159 (permit)  
Doc ID 24160 (applic)  
Doc ID 24161 (drawings)



REV.	DATE	DESCRIPTION
1	3/06	REVISED AREA 2 BASE GRADES
2	11/14	REVISED PER DWM COMMENTS
3	2/15	REVISED PER DWM COMMENTS

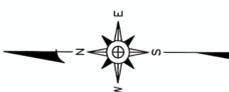
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NC LIC. NO. C-0828 (ENGINEERING)

## SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

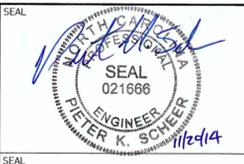


PARCEL REFERENCES	
PARCEL	COUNTY REFERENCE
1	D.B. 775, PG. 410 (PERMIT); TRACT 6 LAND BOOK E, PG. 305
2	D.B. 952, PG. 374 (PERMIT); TRACT 6 LAND BOOK E, PG. 305
3	D.B. 763, PG. 525; D.B. 952, PG. 374 (PERMIT)
4	D.B. 1228, PG. 652 - SECOND TRACT; LAND BOOK E, PG. 305
5	D.B. 1228, PG. 652 - FIRST TRACT; LAND BOOK E, PG. 305
6	D.B. 1215, PG. 747
7	NO DEED REFERENCE
8	NO DEED REFERENCE
9	D.B. E-3, PG. 1
10	D.B. 2109, PG 599; D.B. 58, PG. 449-450

NOTE:  
PROPERTY INFORMATION FROM RECOMBINATION MAP FOR  
"COUNTY OF JOHNSTON" JOHNSTON COUNTY LANDLIFT  
PREPARED BY JERRY BALL LAND SURVEYING, PC.

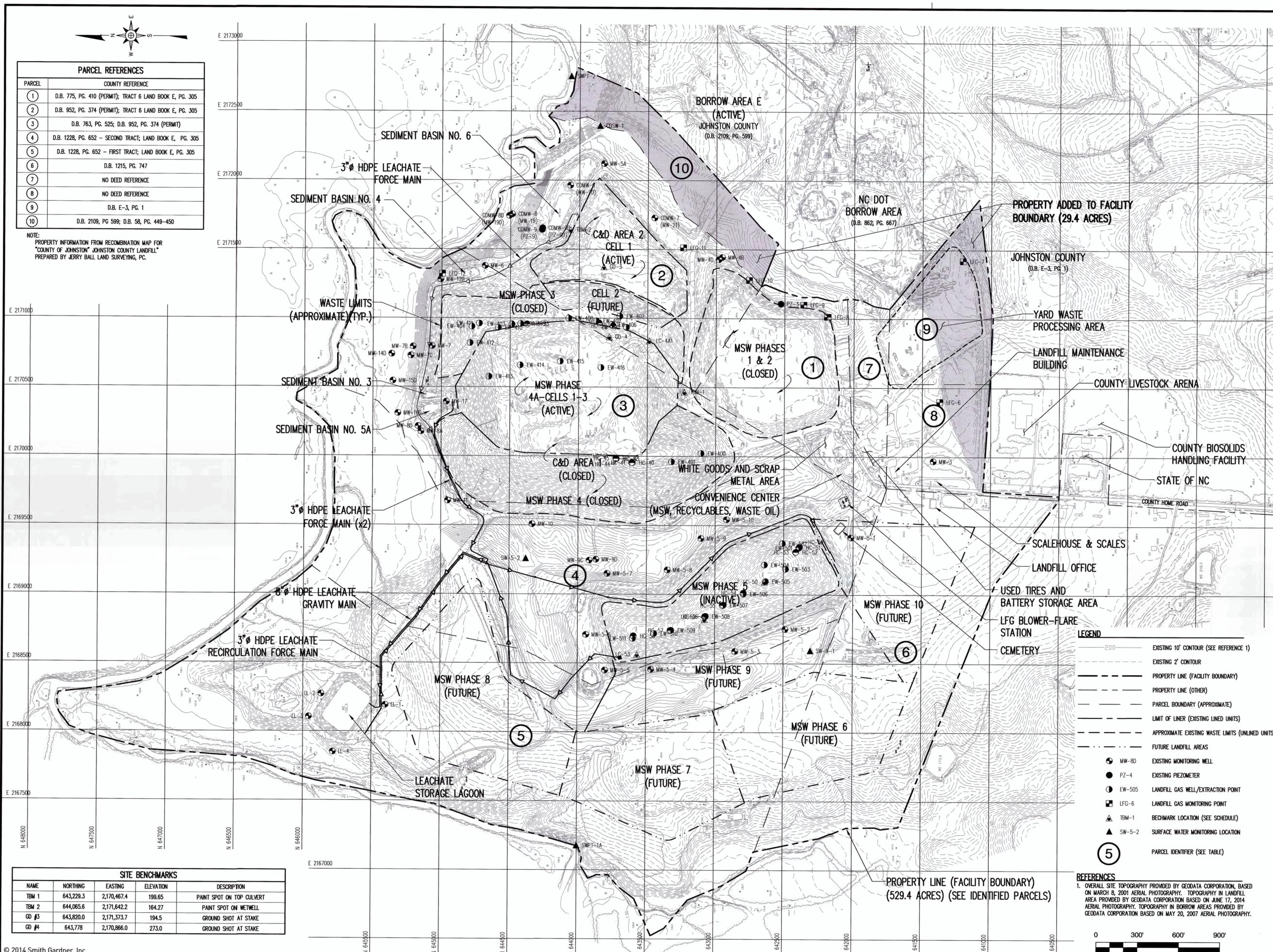
PREPARED FOR:  
**JOHNSTON COUNTY  
NORTH CAROLINA  
DEPARTMENT OF  
SOLID WASTE SERVICES**

PREPARED BY:  
NC LIC. NO. C-0828 (ENGINEERING)  
**SMITH+  
GARDNER**  
ENGINEERS  
14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



REV.	DATE	DESCRIPTION
1	12/4/13	NEW PROPERTY SURVEY
2	11/1/14	REVISED PER DWM COMMENTS

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**LEGEND**

- 200 --- EXISTING 10' CONTOUR (SEE REFERENCE 1)
- EXISTING 2' CONTOUR
- PROPERTY LINE (FACILITY BOUNDARY)
- PROPERTY LINE (OTHER)
- PARCEL BOUNDARY (APPROXIMATE)
- LIMIT OF LINER (EXISTING LINED UNITS)
- APPROXIMATE EXISTING WASTE LIMITS (UNLINED UNITS)
- FUTURE LANDFILL AREAS
- MW-80 EXISTING MONITORING WELL
- PZ-4 EXISTING PIEZOMETER
- EW-505 LANDFILL GAS WELL/EXTRACTION POINT
- LFG-6 LANDFILL GAS MONITORING POINT
- ▲ TBM-1 BENCHMARK LOCATION (SEE SCHEDULE)
- ▲ SW-5-2 SURFACE WATER MONITORING LOCATION
- ⑤ PARCEL IDENTIFIER (SEE TABLE)

**REFERENCES**  
1. OVERALL SITE TOPOGRAPHY PROVIDED BY GEODATA CORPORATION, BASED ON MARCH 8, 2001 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN LANDFILL AREA PROVIDED BY GEODATA CORPORATION BASED ON JUNE 17, 2014 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN BORROW AREAS PROVIDED BY GEODATA CORPORATION BASED ON MAY 20, 2007 AERIAL PHOTOGRAPHY.

**SITE BENCHMARKS**

NAME	NORTHING	EASTING	ELEVATION	DESCRIPTION
TBM 1	643,229.3	2,170,467.4	199.65	PAINT SPOT ON TOP CULVERT
TBM 2	644,065.6	2,171,642.2	164.27	PAINT SPOT ON METWELL
GD #3	643,820.0	2,171,373.7	194.5	GROUND SHOT AT STAKE
GD #4	643,778	2,170,866.0	273.0	GROUND SHOT AT STAKE

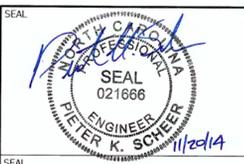
PROPERTY LINE (FACILITY BOUNDARY)  
(529.4 ACRES) (SEE IDENTIFIED PARCELS)



PROJECT TITLE:  
**JOHNSTON COUNTY LANDFILL FACILITY**

DRAWING TITLE:  
**EXISTING SITE CONDITIONS**

DESIGNED: P.K.S.	PROJECT NO: JOHN 13-4
DRAWN: T.R.S.	SCALE: AS SHOWN
APPROVED:	DATE: OCT. 2014
FILENAME: JOHN-D0356A	DRAWING NUMBER: <b>S1</b>
SHEET NUMBER: <b>2</b>	



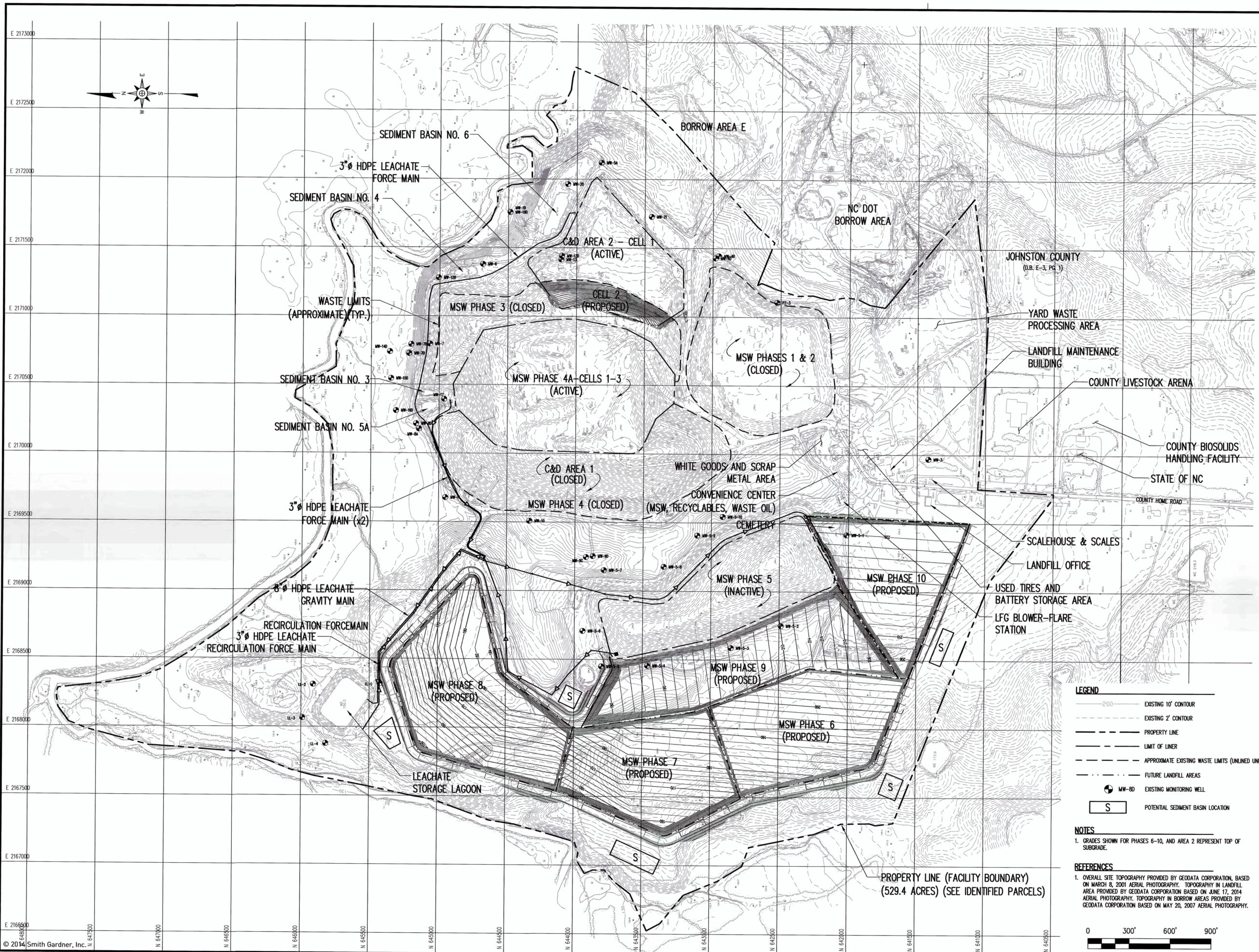
REV.	DATE	DESCRIPTION
1	3/06	REVISED AREA 2 BASE GRADES
2	11/14	REVISED PER DWM COMMENTS

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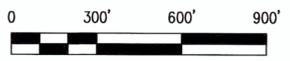
PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
 AREA 2  
 PERMIT DRAWINGS**

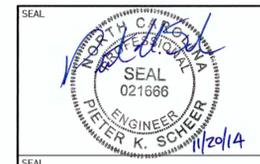
DRAWING TITLE:  
**SITE DEVELOPMENT PLAN  
 BASE GRADES  
 (MSW AND C&D UNITS)**

DESIGNED: P.K.S.	PROJECT NO: JOHN-13-4
DRAWN: T.R.S.	SCALE: AS SHOWN
APPROVED: P.K.S.	DATE: NOV 2014
FILENAME: JOHN-D0366B	
SHEET NUMBER: 3	DRAWING NUMBER: S2



- LEGEND**
- 200' — EXISTING 10' CONTOUR
  - 2' — EXISTING 2' CONTOUR
  - — PROPERTY LINE
  - — LIMIT OF LINER
  - - - - - APPROXIMATE EXISTING WASTE LIMITS (UNLINED UNITS)
  - - - - - FUTURE LANDFILL AREAS
  - MW-80 EXISTING MONITORING WELL
  - S POTENTIAL SEDIMENT BASIN LOCATION
- NOTES**
- GRADES SHOWN FOR PHASES 6-10, AND AREA 2 REPRESENT TOP OF SUBGRADE.
- REFERENCES**
- OVERALL SITE TOPOGRAPHY PROVIDED BY GEODATA CORPORATION, BASED ON MARCH 8, 2001 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN LANDFILL AREA PROVIDED BY GEODATA CORPORATION BASED ON JUNE 17, 2014 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN BORROW AREAS PROVIDED BY GEODATA CORPORATION BASED ON MAY 20, 2007 AERIAL PHOTOGRAPHY.





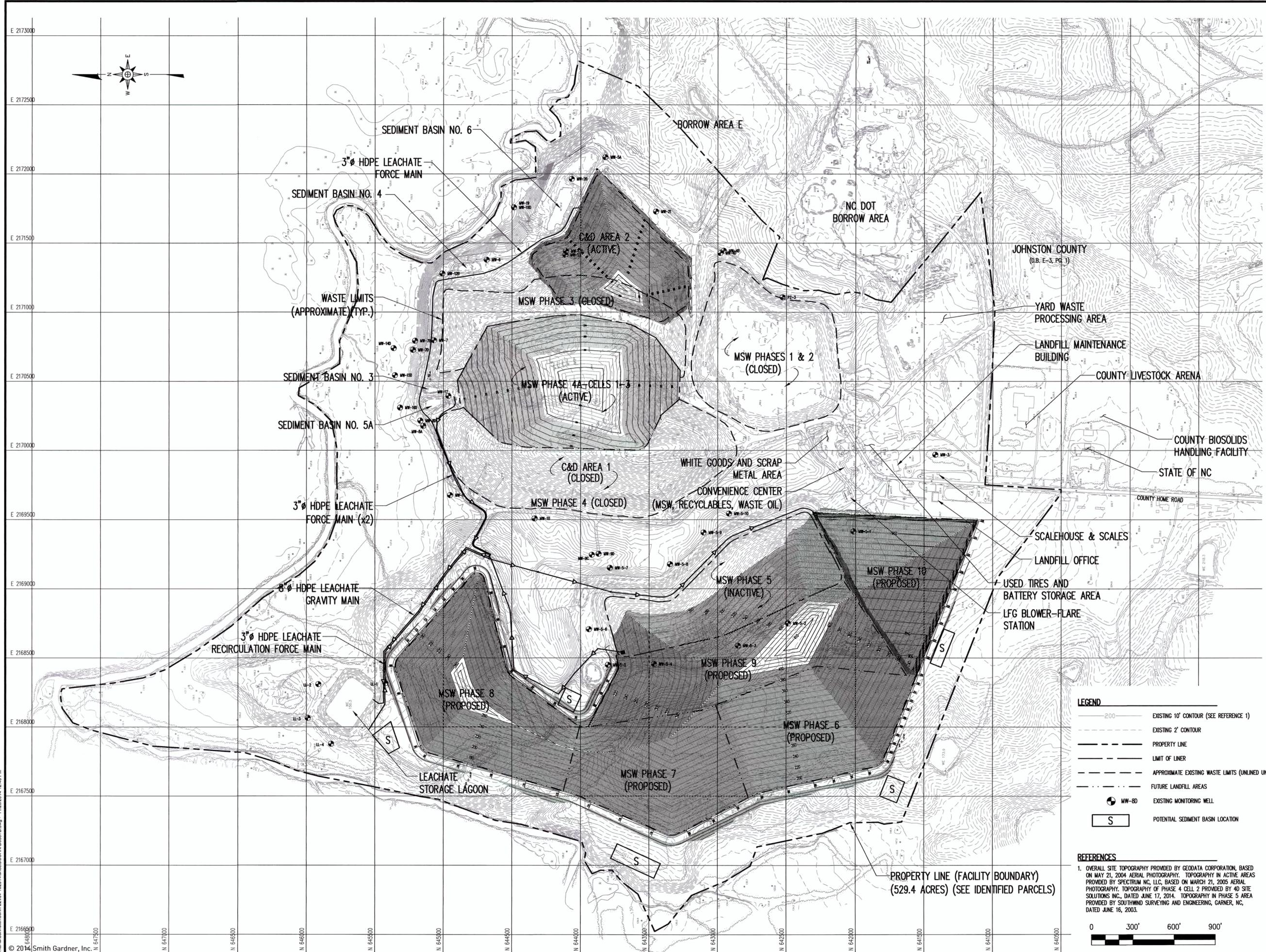
REV.	DATE	DESCRIPTION
2	11/14	REVISED PER DWM COMMENTS

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PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL**  
**AREA 2**  
**PERMIT DRAWINGS**

DRAWING TITLE:  
**SITE DEVELOPMENT PLAN**  
**FINAL COVER GRADES**  
**(MSW AND C&D UNITS)**

DESIGNED: P.K.S.	PROJECT NO: JOHN-13-4
DRAWN: T.R.S.	SCALE: AS SHOWN
APPROVED: <i>PKS</i>	DATE: NOV 2014
FILENAME: JOHN-D0367B	
SHEET NUMBER: 4	DRAWING NUMBER: S3

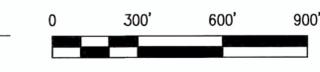


**LEGEND**

	EXISTING 10' CONTOUR (SEE REFERENCE 1)
	EXISTING 2' CONTOUR
	PROPERTY LINE
	LIMIT OF LINER
	APPROXIMATE EXISTING WASTE LIMITS (UNLINED UNITS)
	FUTURE LANDFILL AREAS
	MW-80 EXISTING MONITORING WELL
	POTENTIAL SEDIMENT BASIN LOCATION

**REFERENCES**

1. OVERALL SITE TOPOGRAPHY PROVIDED BY GEODATA CORPORATION, BASED ON MAY 21, 2004 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN ACTIVE AREAS PROVIDED BY SPECTRUM NO. 11.C, BASED ON MARCH 21, 2005 AERIAL PHOTOGRAPHY. TOPOGRAPHY OF PHASE 4 CELL 2 PROVIDED BY 4D SITE SOLUTIONS INC., DATED JUNE 17, 2014. TOPOGRAPHY IN PHASE 5 AREA PROVIDED BY SOUTHWIND SURVEYING AND ENGINEERING, GARNER, NC, DATED JUNE 16, 2003.



PROPERTY LINE (FACILITY BOUNDARY)  
 (529.4 ACRES) (SEE IDENTIFIED PARCELS)



REV.	DATE	DESCRIPTION
2	11/14	REVISED PER DWM COMMENTS
3	2/15	REVISED PER DWM COMMENTS

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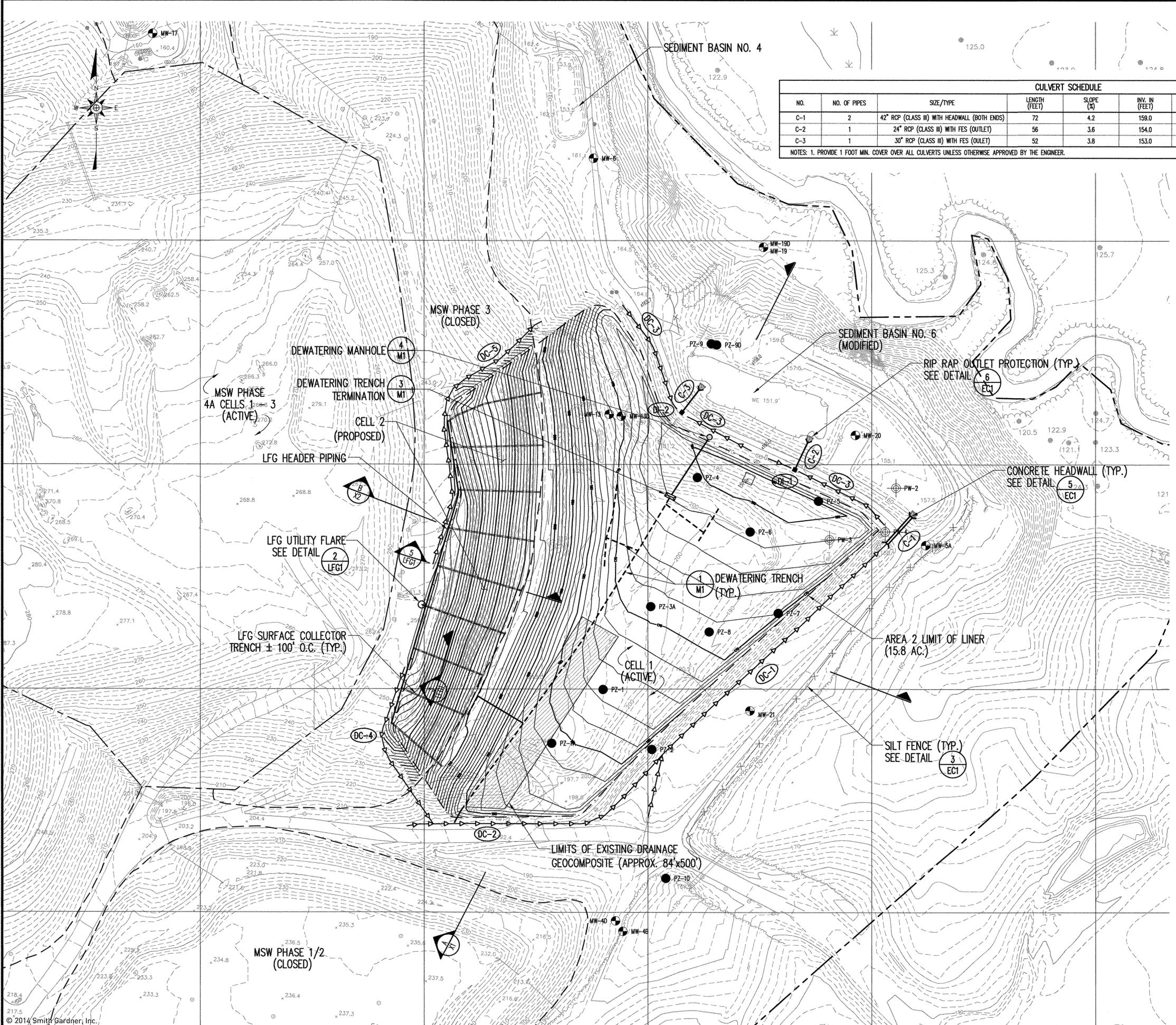
PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
AREA 2  
PERMIT DRAWINGS**

DRAWING TITLE:  
**AREA 2  
SUBGRADE GRADING  
AND DRAINAGE PLAN**

DESIGNED:	P.K.S.	PROJECT NO.:	JOHN-13-4
DRAWN:	T.R.S.	SCALE:	AS SHOWN
APPROVED:	PKS	DATE:	FEB 2015
FILENAME:	JOHN-D0382C	DRAWING NUMBER:	

CULVERT SCHEDULE							
NO.	NO. OF PIPES	SIZE/TYPE	LENGTH (FEET)	SLOPE (%)	INV. IN (FEET)	INV. OUT (FEET)	REMARKS
C-1	2	42" RCP (CLASS III) WITH HEADWALL (BOTH ENDS)	72	4.2	159.0	156.0	---
C-2	1	24" RCP (CLASS III) WITH FES (OUTLET)	56	3.6	154.0	152.0	INLET IN DI-1
C-3	1	30" RCP (CLASS III) WITH FES (OUTLET)	52	3.8	153.0	151.0	INLET IN DI-2

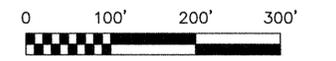
NOTES: 1. PROVIDE 1 FOOT MIN. COVER OVER ALL CULVERTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

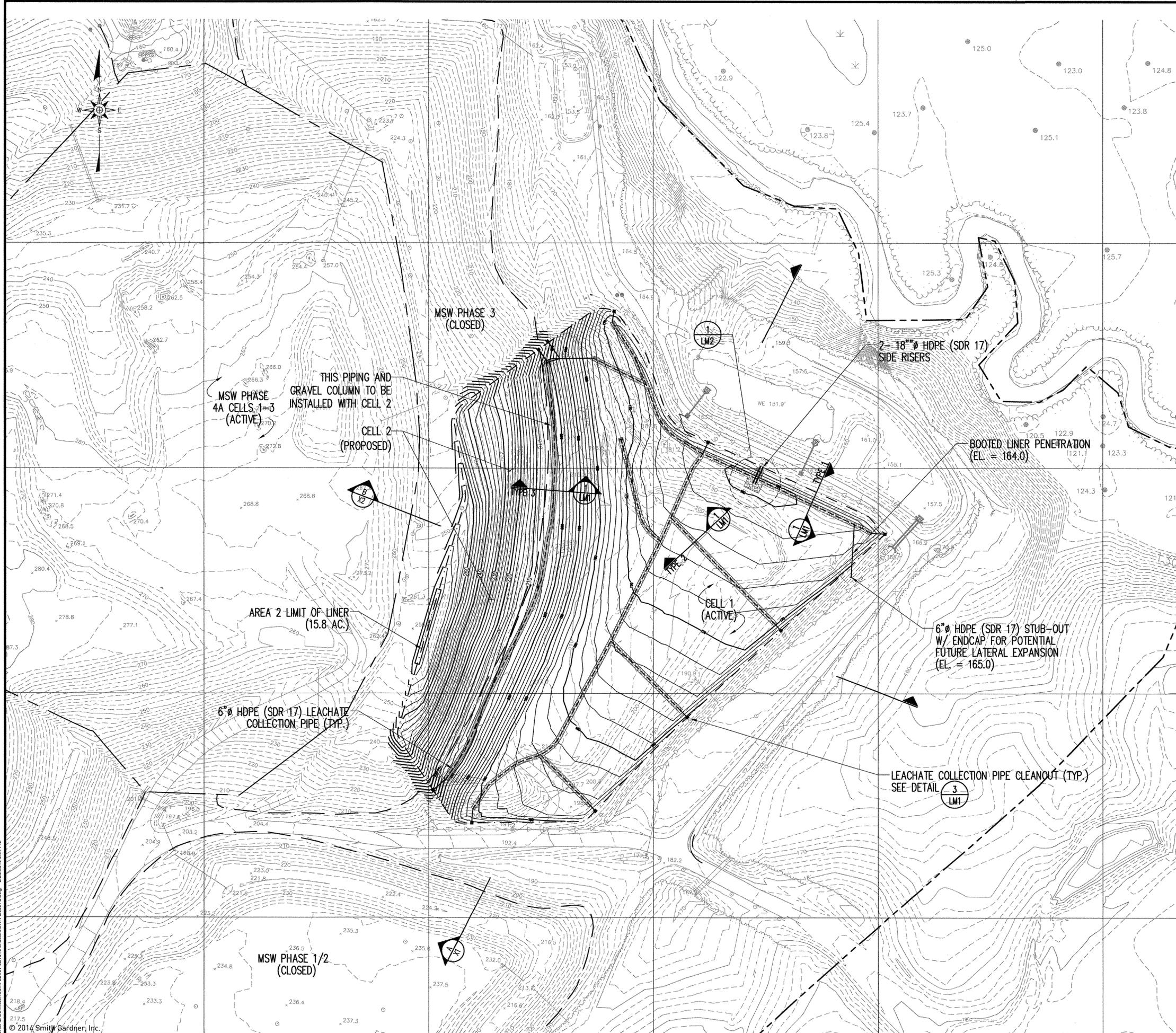


- LEGEND**
- 200 — EXISTING 10' CONTOUR
  - 150 — EXISTING 2' CONTOUR
  - 150 — PROPOSED 10' CONTOUR
  - 150 — PROPOSED 2' CONTOUR
  - — — — — PROPERTY LINE
  - — — — — AREA 2 LIMIT OF LINER
  - — — — — APPROXIMATE EXISTING WASTE LIMITS (UNLINED UNITS)
  - MW-8D EXISTING MONITORING WELL
  - ⊕ PW-2 EXISTING PIEZOMETER
  - PZ-4 EXISTING PIEZOMETER
  - — — — — LFG SURFACE COLLECTOR TRENCH/ PERFORATED PIPING
  - — — — — SOLID PIPING
  - LFG UTILITY FLARE
  - x — x — SILT FENCE
  - > — > — DRAINAGE CHANNEL
  - C-1 CULVERT NUMBER
  - DI-1 DROP INLET NUMBER

- NOTES**
- CONTOURS SHOWN ON PIGGY BACK AREAS MAY VARY SOMEWHAT DUE TO SETTLEMENT OF UNDERLYING WASTE.
  - GRADES SHOWN FOR AREA 2 REPRESENT TOP OF SUBGRADE.

- REFERENCES**
- OVERALL SITE TOPOGRAPHY PROVIDED BY GEODATA CORPORATION, BASED ON MARCH 8, 2001 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN LANDFILL AREA PROVIDED BY GEODATA CORPORATION BASED ON JUNE 17, 2014 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN BORROW AREAS PROVIDED BY GEODATA CORPORATION BASED ON MAY 20, 2007 AERIAL PHOTOGRAPHY. CELL 1 SUBGRADE BASED ON ASBUILT INFORMATION PROVIDED BY BATEMAN CIVIL SURVEY COMPANY, PC, DATED MAY 21, 2007.

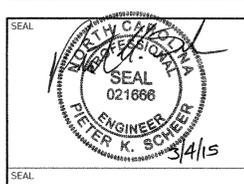




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PREPARED FOR:  
**JOHNSTON COUNTY  
 NORTH CAROLINA  
 DEPARTMENT OF  
 SOLID WASTE SERVICES**

PREPARED BY:  
 NC LIC. NO. C-0828 (ENGINEERING)  
**SMITH+  
 GARDNER**  
 ENGINEERS  
 14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



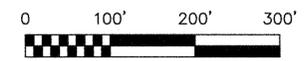
REV.	DATE	DESCRIPTION
2	11/14	REVISED PER DWM COMMENTS
3	2/15	REVISED PER DWM COMMENTS

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- LEGEND**
- 200 — EXISTING 10' CONTOUR
  - 150 --- EXISTING 2' CONTOUR
  - 150 — PROPOSED 10' CONTOUR
  - --- PROPOSED 2' CONTOUR
  - — — — — PROPERTY LINE
  - - - - - AREA 2 LIMIT OF LINER
  - ==== PERFORATED PIPING/ GRAVEL COLUMNS
  - — — — — SOLID PIPING
  - CLEANOUT

- NOTES**
- CONTOURS SHOWN ON PEGGY BACK AREAS MAY VARY SOMEWHAT DUE TO SETTLEMENT OF UNDERLYING WASTE.
  - GRADES SHOWN FOR AREA 2 REPRESENT TOP OF COMPACTED SOIL LINER (OR STRUCTURAL FILL).
  - REFER TO DETAILS FOR PROPER TIE IN OF LINER SYSTEM AND PROTECTIVE COVER AROUND THE PERIMETER OF AREA 2.

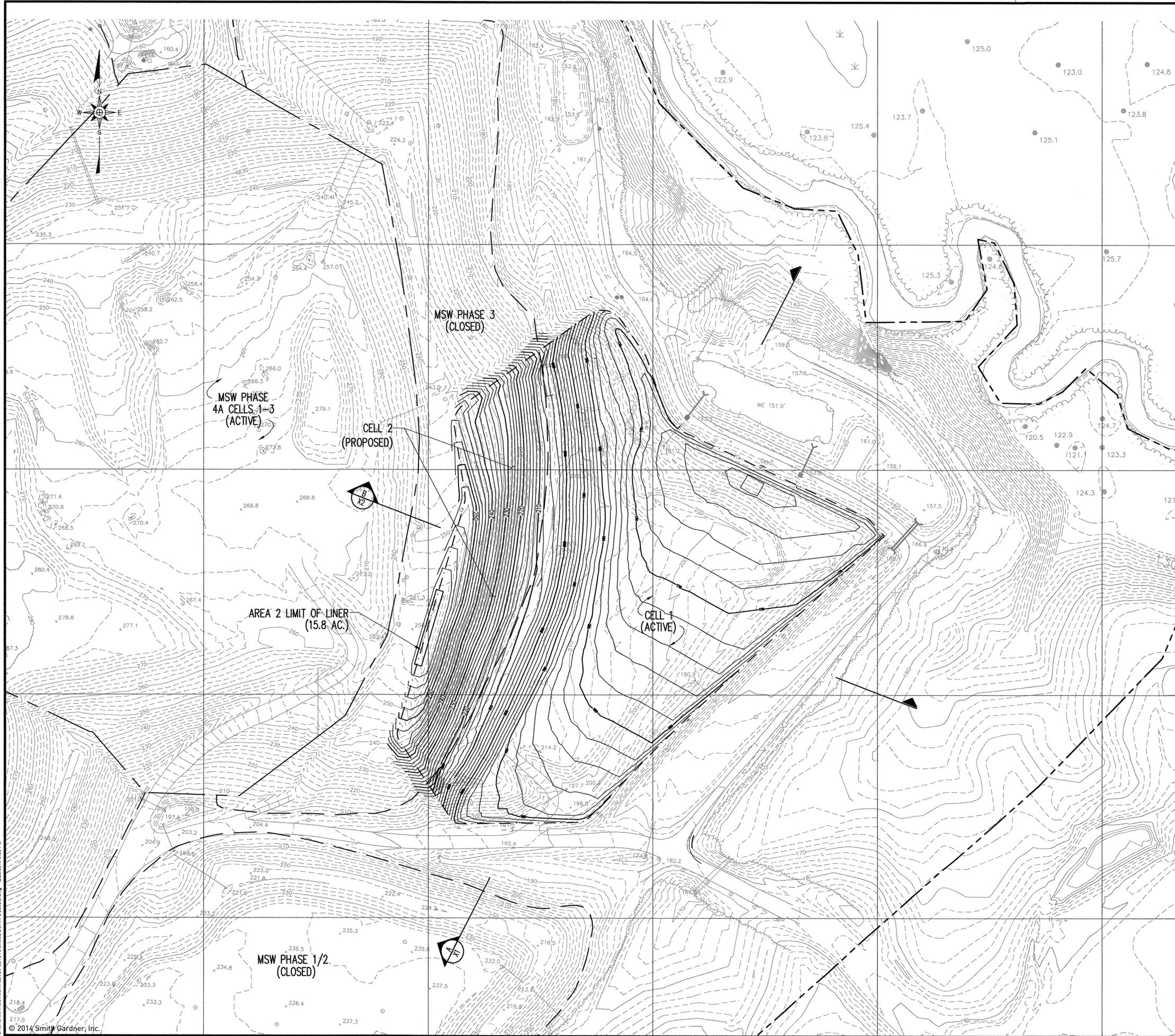
- REFERENCES**
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PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
 AREA 2  
 PERMIT DRAWINGS**

DRAWING TITLE:  
**AREA 2  
 COMPOSITE LINER GRADING  
 AND LEACHATE COLLECTION PLAN**

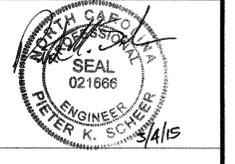
DESIGNED: P.K.S.	PROJECT NO: JOHN-13-4
DRAWN: T.R.S.	SCALE: AS SHOWN
APPROVED: PKS	DATE: FEB 2015
FILENAME: JOHN-D0397C	DRAWING NUMBER:
<b>6</b>	<b>S5</b>



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PREPARED FOR:  
**JOHNSTON COUNTY  
 NORTH CAROLINA  
 DEPARTMENT OF  
 SOLID WASTE SERVICES**

PREPARED BY:  
 NC LIC. NO. C-0828 (ENGINEERING)  
**SMITH+  
 GARDNER**  
 ENGINEERS  
 14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



REV.	DATE	DESCRIPTION
1	3/06	REVISED AREA 2 BASE GRADES
2	11/14	REVISED PER DWM COMMENTS
3	2/15	REVISED PER DWM COMMENTS

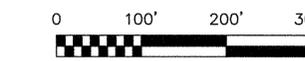
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**LEGEND**

—200—	EXISTING 10' CONTOUR
- - - - -	EXISTING 2' CONTOUR
—150—	PROPOSED 10' CONTOUR
- - - - -	PROPOSED 2' CONTOUR
— — — — —	PROPERTY LINE
- - - - -	AREA 2 LIMIT OF LINER

- NOTES**
1. CONTOURS SHOWN ON PIGGY BACK AREAS MAY VARY SOMEWHAT DUE TO SETTLEMENT OF UNDERLYING WASTE.
  2. GRADES SHOWN FOR AREA 2 REPRESENT TOP OF PROTECTIVE COVER.
  3. REFER TO DETAILS FOR PROPER TIE IN OF LINER SYSTEM AND PROTECTIVE COVER AROUND THE PERIMETER OF AREA 2.

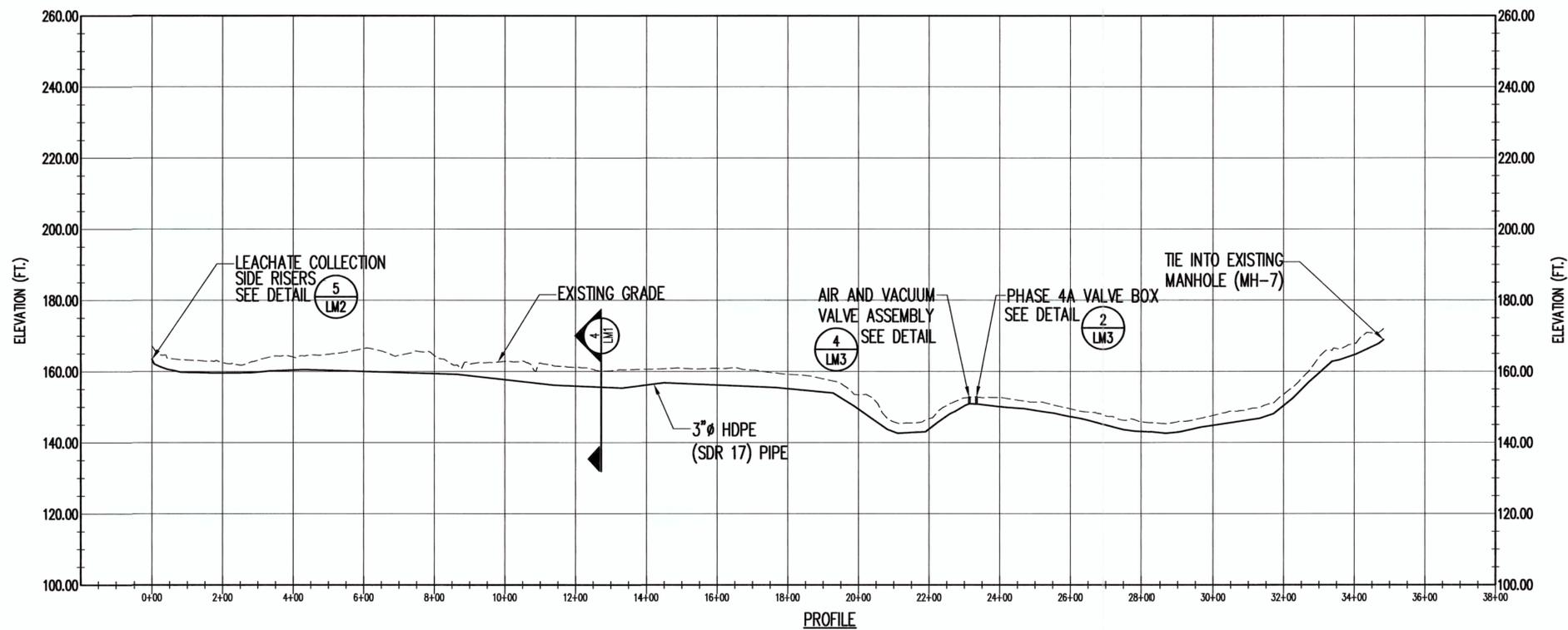
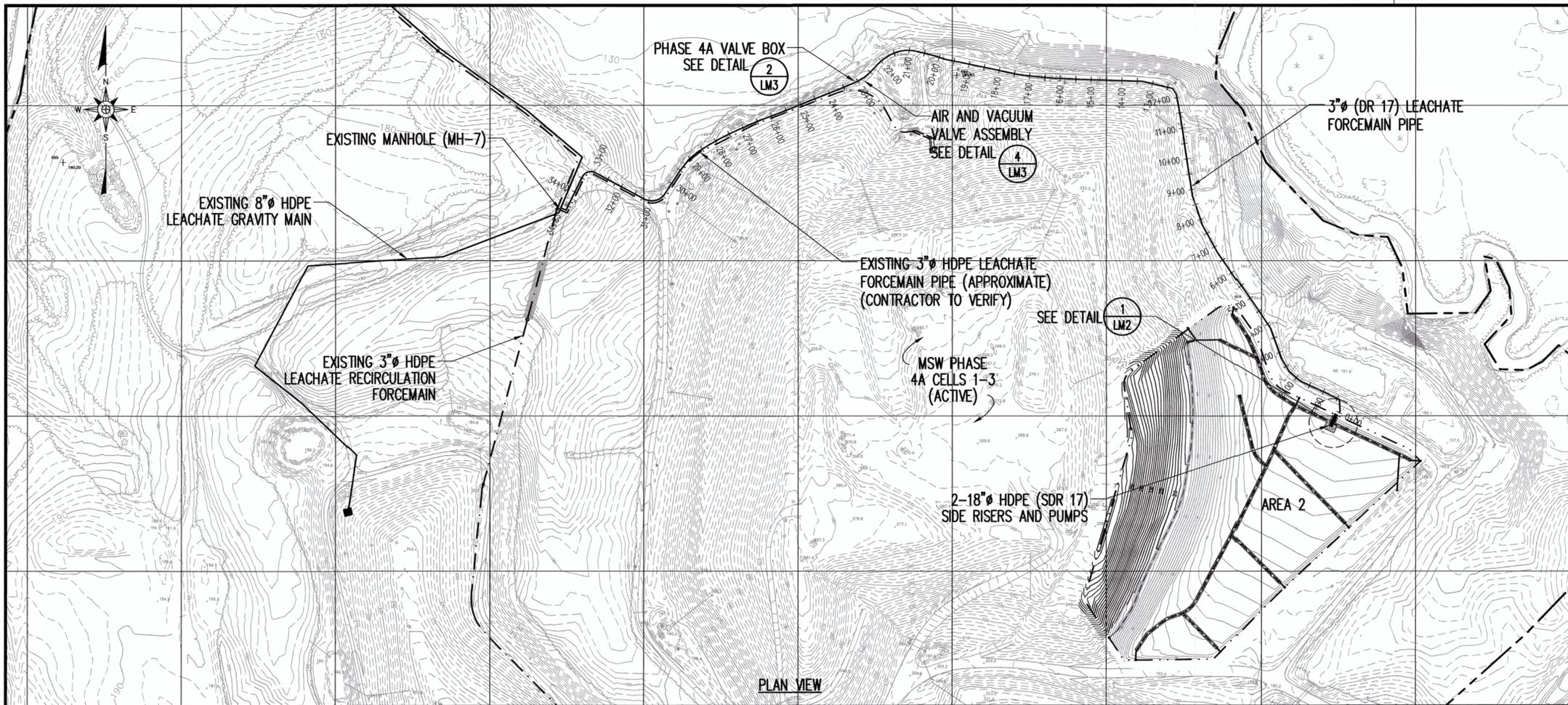
- REFERENCES**
1. OVERALL SITE TOPOGRAPHY PROVIDED BY GEODATA CORPORATION, BASED ON MARCH 8, 2001 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN LANDFILL AREA PROVIDED BY GEODATA CORPORATION BASED ON JUNE 17, 2014 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN BORROW AREAS PROVIDED BY GEODATA CORPORATION BASED ON MAY 20, 2007 AERIAL PHOTOGRAPHY. CELL 1 PROTECTIVE COVER GRADES BASED ON ASBUILT INFORMATION PROVIDED BY BATEMAN CIVIL SURVEY COMPANY, PC, DATED MAY 21, 2007.



PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
 AREA 2  
 PERMIT DRAWINGS**

DRAWING TITLE:  
**AREA 2  
 PROTECTIVE COVER  
 GRADING PLAN**

DESIGNED: P.K.S.	PROJECT NO: JOHN-13-4
DRAWN: T.R.S.	SCALE: AS SHOWN
APPROVED: PKS	DATE: FEB 2015
FILE NAME: JOHN-D0399C	DRAWING NUMBER:
<b>7</b>	<b>S6</b>



**LEGEND**

- 200' --- EXISTING 10' CONTOUR (SEE REFERENCE 1)
- EXISTING 2' CONTOUR
- PROPERTY LINE
- PROPOSED LEACHATE FORCEMAIN
- EXISTING LEACHATE GRAVITY MAIN
- EXISTING LEACHATE FORCEMAIN

**NOTES**

- CONTOURS SHOWN ON PIGGY BACK AREAS MAY VARY SOMEWHAT DUE TO SETTLEMENT OF UNDERLYING WASTE.
- GRADES SHOWN FOR AREA 2 REPRESENT TOP OF LINER.

**REFERENCES**

- OVERALL SITE TOPOGRAPHY PROVIDED BY GEODATA CORPORATION, BASED ON MARCH 8, 2001 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN LANDFILL AREA PROVIDED BY GEODATA CORPORATION BASED ON JUNE 17, 2014 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN BORROW AREAS PROVIDED BY GEODATA CORPORATION BASED ON MAY 20, 2007 AERIAL PHOTOGRAPHY.

0 200' 400' 600'

PREPARED FOR:

**JOHNSTON COUNTY  
NORTH CAROLINA  
DEPARTMENT OF  
SOLID WASTE SERVICES**

PREPARED BY:

NC LIC. NO. C-0828 (ENGINEERING)

**SMITH+  
GARDNER  
ENGINEERS**

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

SEAL

SEAL

REV.	DATE	DESCRIPTION
1	3/06	REVISED AREA 2 BASE GRADES
2	11/14	REVISED PER DWM COMMENTS

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PROJECT TITLE:

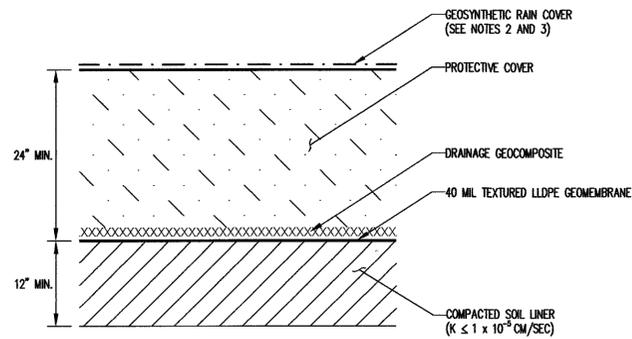
**JOHNSTON COUNTY CSG LANDFILL  
AREA 2  
PERMIT DRAWINGS**

DRAWING TITLE:

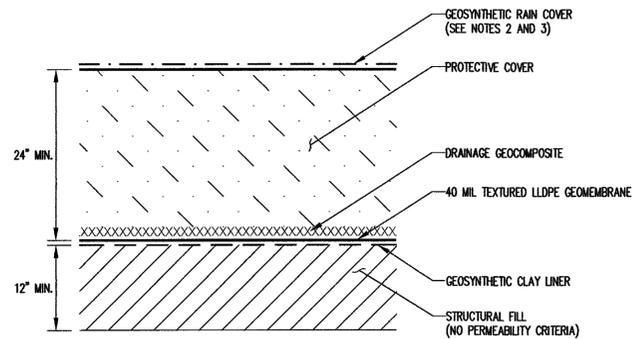
**LEACHATE FORCEMAIN  
PLAN AND PROFILE**

DESIGNED: P.K.S.	PROJECT NO: JOHN-13-4
DRAWN: T.R.S.	SCALE: AS SHOWN
APPROVED: PK	DATE: NOV 2014
FILENAME: JOHN-D0390B	DRAWING NUMBER:
SHEET NUMBER: 8	SHEET NUMBER: S7

G:\CAD\Johnson\John-22\rev 112014\leach\JOHN-D0390B.dwg - 11/18/2014 3:24 PM



**TYPE 1**  
(SEE NOTE 1)

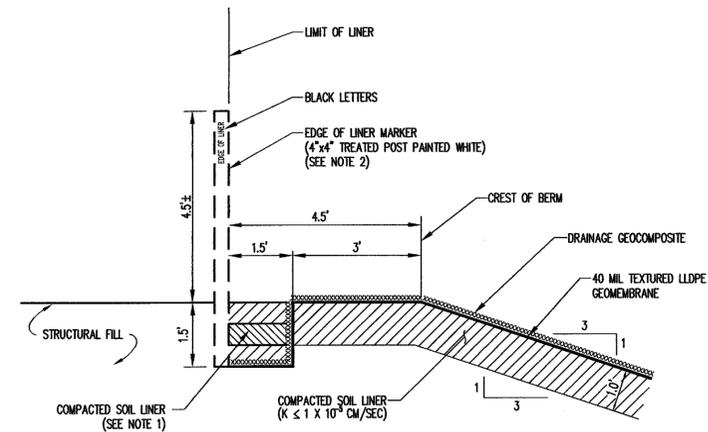


**TYPE 2**

- NOTES:**
1. THE TYPE 1 LINER SYSTEM IS ASSUMED IN THE PROJECT DETAILS.
  2. THE GEOSYNTHETIC RAIN COVER IS TO BE INSTALLED AT THE OWNERS OPTION.
  3. **OPERATIONS:**  
PRIOR TO THE PLACEMENT OF WASTE, THE OWNER SHALL REMOVE ALL GEOSYNTHETIC RAIN COVER FROM THE AREA TO BE USED.

**TYPICAL LINER AND LEACHATE COLLECTION SYSTEM CROSS SECTIONS**

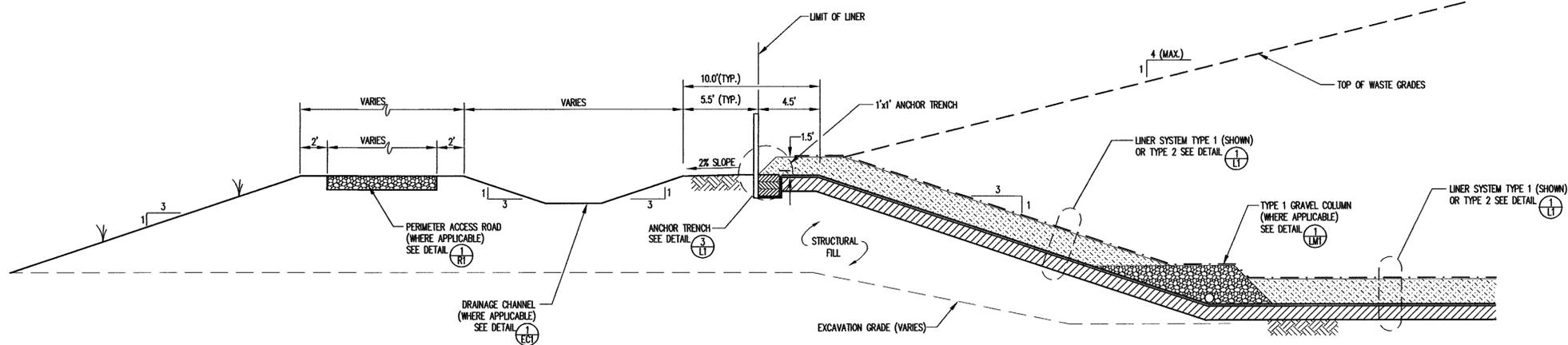
**DETAIL 1**  
SCALE: 1" = 1' (L1)



- NOTES:**
1. BACKFILL ANCHOR TRENCH IN 6"-DEEP LIFTS.
  2. PLACE EDGE OF LINER MARKERS EVERY 100' ON-CENTER AND AT BREAK POINTS.
  3. SOME LAYERS NOT SHOW FOR CLARITY.

**ANCHOR TRENCH**

**DETAIL 3**  
SCALE: 1" = 2' (L1)



**PERIMETER BERM CROSS-SECTION (TYP.)**

**DETAIL 2**  
SCALE: 1" = 5' (L1)

NO.	DATE	REVISION

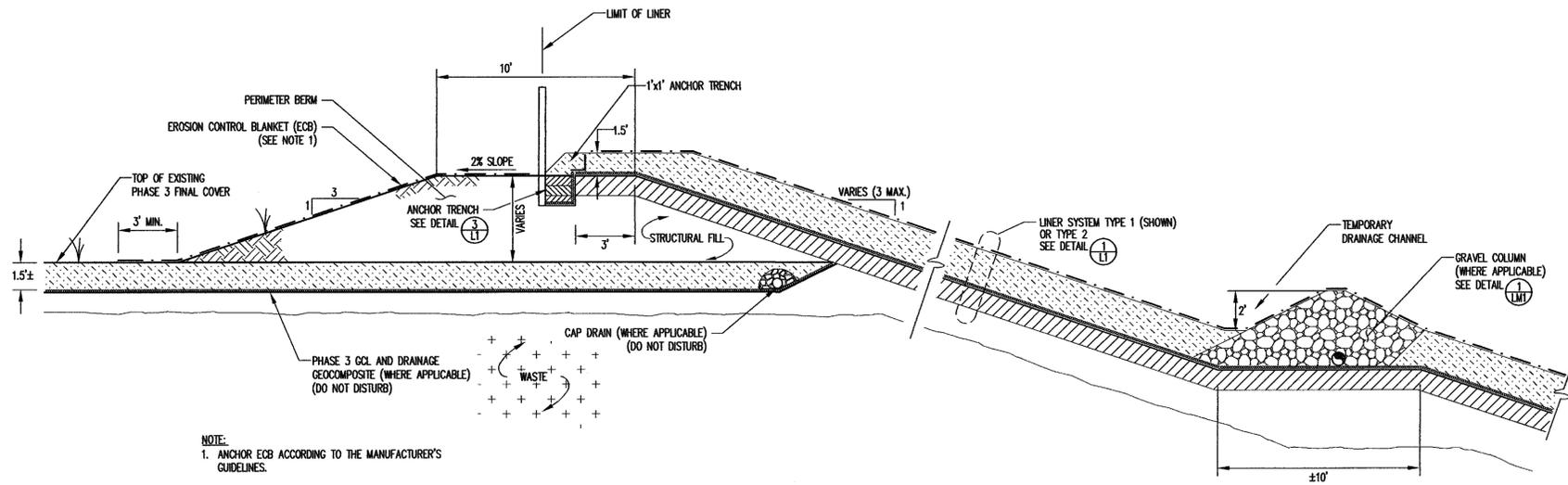
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Engineering and Geological Services  
14 N. Boylan Ave.  
Raleigh, N.C. 27603  
www.gnra.com  
ph: 919-828-0577  
fax: 919-828-3899



PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
AREA 2  
PERMIT DRAWINGS**

DRAWING TITLE:  
**LINER AND BERM DETAILS  
(SHEET 1 OF 2)**

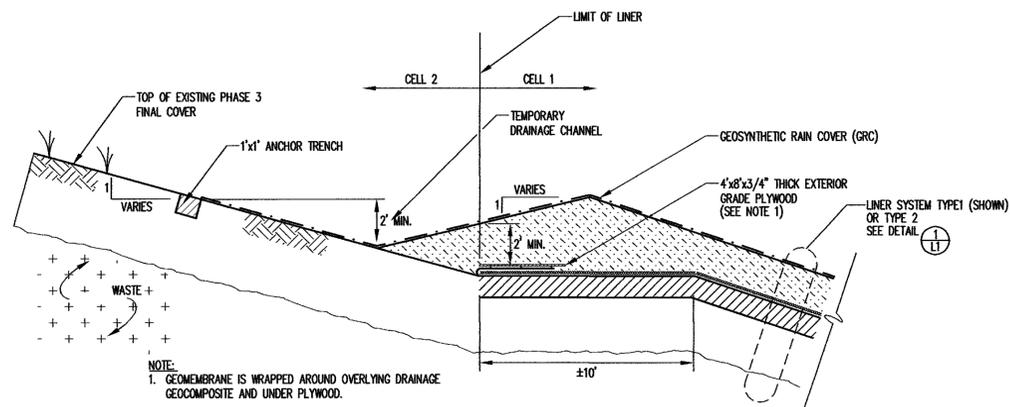
DESIGNED BY: P.K.S.	DRAWN BY: J.A.L.
CHECKED BY: JOHN-22	PROJECT NO.:
SCALE: AS SHOWN	DATE: OCT. 2005
FILE NAME: JOHN-00355	
SHEET NO. <b>9</b>	DRAWING NO. <b>L1</b>



NOTE:  
1. ANCHOR ECB ACCORDING TO THE MANUFACTURER'S GUIDELINES.

TYPICAL CROSS SECTION ALONG SLOPE

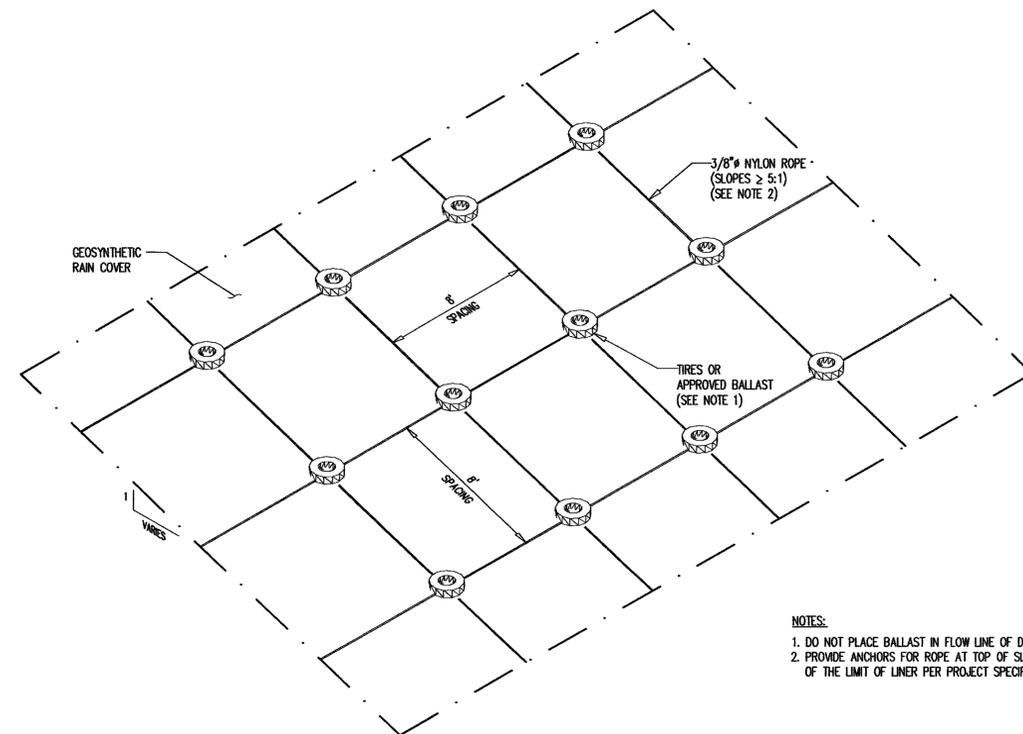
DETAIL 1  
SCALE: 1" = 4'



NOTE:  
1. GEOMEMBRANE IS WRAPPED AROUND OVERLYING DRAINAGE GEOCOMPOSITE AND UNDER PLYWOOD.

CELL 1/ CELL 2 LINER TERMINATION

DETAIL 3  
SCALE: 1" = 4'



NOTES:  
1. DO NOT PLACE BALLAST IN FLOW LINE OF DRAINAGE CHANNEL.  
2. PROVIDE ANCHORS FOR ROPE AT TOP OF SLOPE AND OUTSIDE OF THE LIMIT OF LINER PER PROJECT SPECIFICATIONS.

ANCHORAGE OF GEOSYNTHETIC RAIN COVER

DETAIL 2  
NOT TO SCALE

NO.	DATE	REVISION

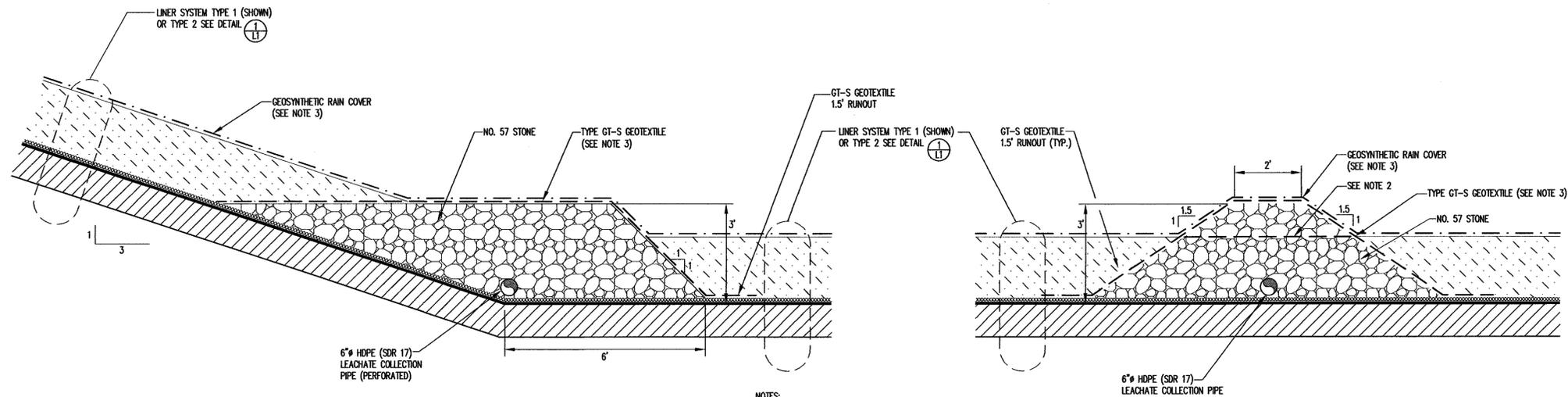
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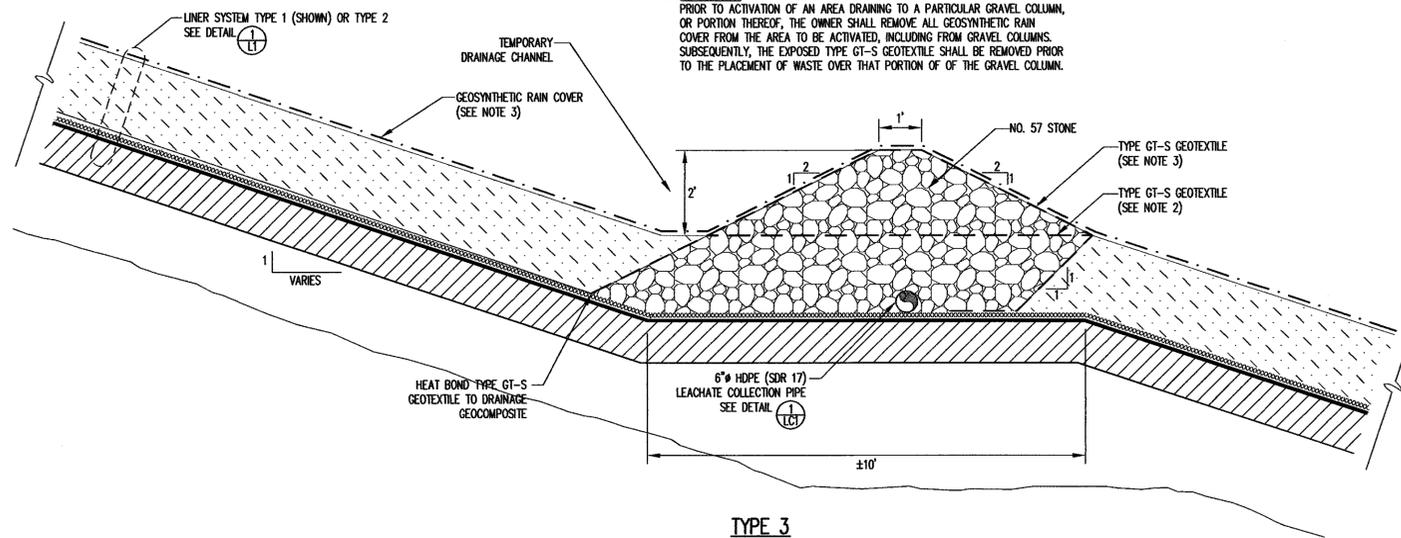
JOHNSTON COUNTY C&D LANDFILL  
AREA 2  
PERMIT DRAWINGS

LINER AND BERM DETAILS  
(SHEET 2 OF 2)

DESIGNED BY: P.K.S.	DRAWN BY: J.A.L.
CHECKED BY:	PROJECT NO.: JOHN-22
SCALE: AS SHOWN	DATE: OCT. 2005
FILE NAME: JOHN-D0057	DRAWING NO.:
SHEET NO. 10	DRAWING NO. L2

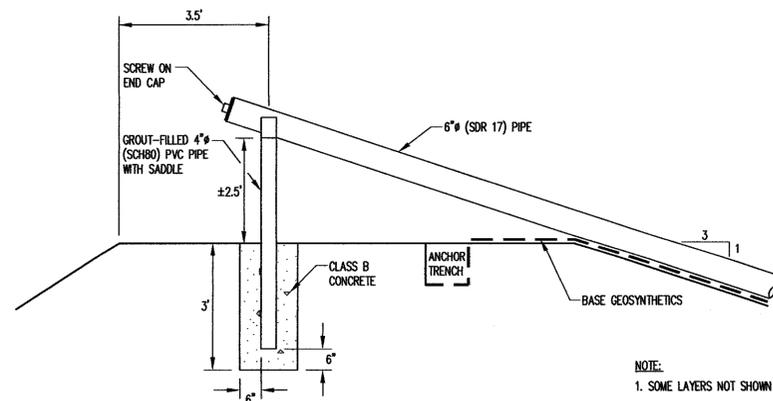


- NOTES:
- SEE DETAIL (L2) FOR PIPE PERFORATIONS.
  - AT THE LOW END OF TYPE 2 AND TYPE 3 GRAVEL COLUMNS, LEAVE 5 TO 10 FEET FLUSH WITH THE TOP OF PROTECTIVE COVER TO ALLOW STORM WATER TO FLOW TO THE LOW END OF THE CELL.
  - OPERATIONS:  
PRIOR TO ACTIVATION OF AN AREA DRAINING TO A PARTICULAR GRAVEL COLUMN, OR PORTION THEREOF, THE OWNER SHALL REMOVE ALL GEOSYNTHETIC RAIN COVER FROM THE AREA TO BE ACTIVATED, INCLUDING FROM GRAVEL COLUMNS. SUBSEQUENTLY, THE EXPOSED TYPE GT-S GEOTEXTILE SHALL BE REMOVED PRIOR TO THE PLACEMENT OF WASTE OVER THAT PORTION OF THE GRAVEL COLUMN.



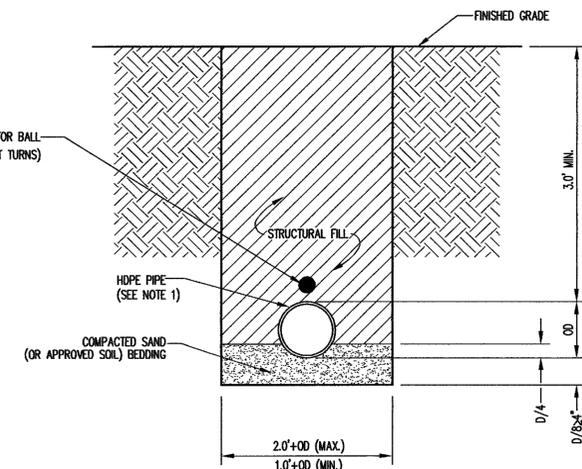
GRAVEL COLUMN CROSS SECTIONS

DETAIL 1 LM1  
SCALE: 1" = 2'



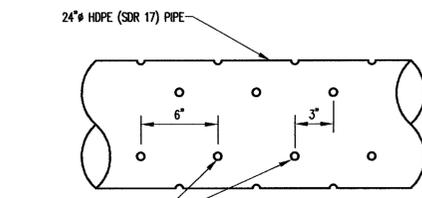
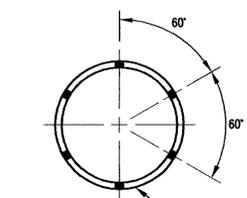
LEACHATE COLLECTION CLEANOUT

DETAIL 3 LM1  
SCALE: 1" = 2'



HDPE PIPE BEDDING

DETAIL 4 LM1  
SCALE: 1" = 1.0'



SEE NOTE 1

ALL HOLES ARE 1/2" AT 6" MIN. O.C. (STAGGER ADJACENT ROWS 3" O.C.)

SIDE RISERS

NOTE:  
1. ORIENT PIPE AS SHOWN.

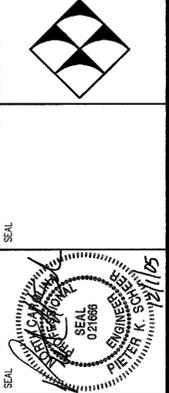
LEACHATE COLLECTION PIPING

HDPE PIPE PERFORATIONS

DETAIL 2 LM1  
NOT TO SCALE

NOTES:  
1. FOR THRUST BLOCKING OF PRESSURE PIPE, SEE DETAIL (L3)

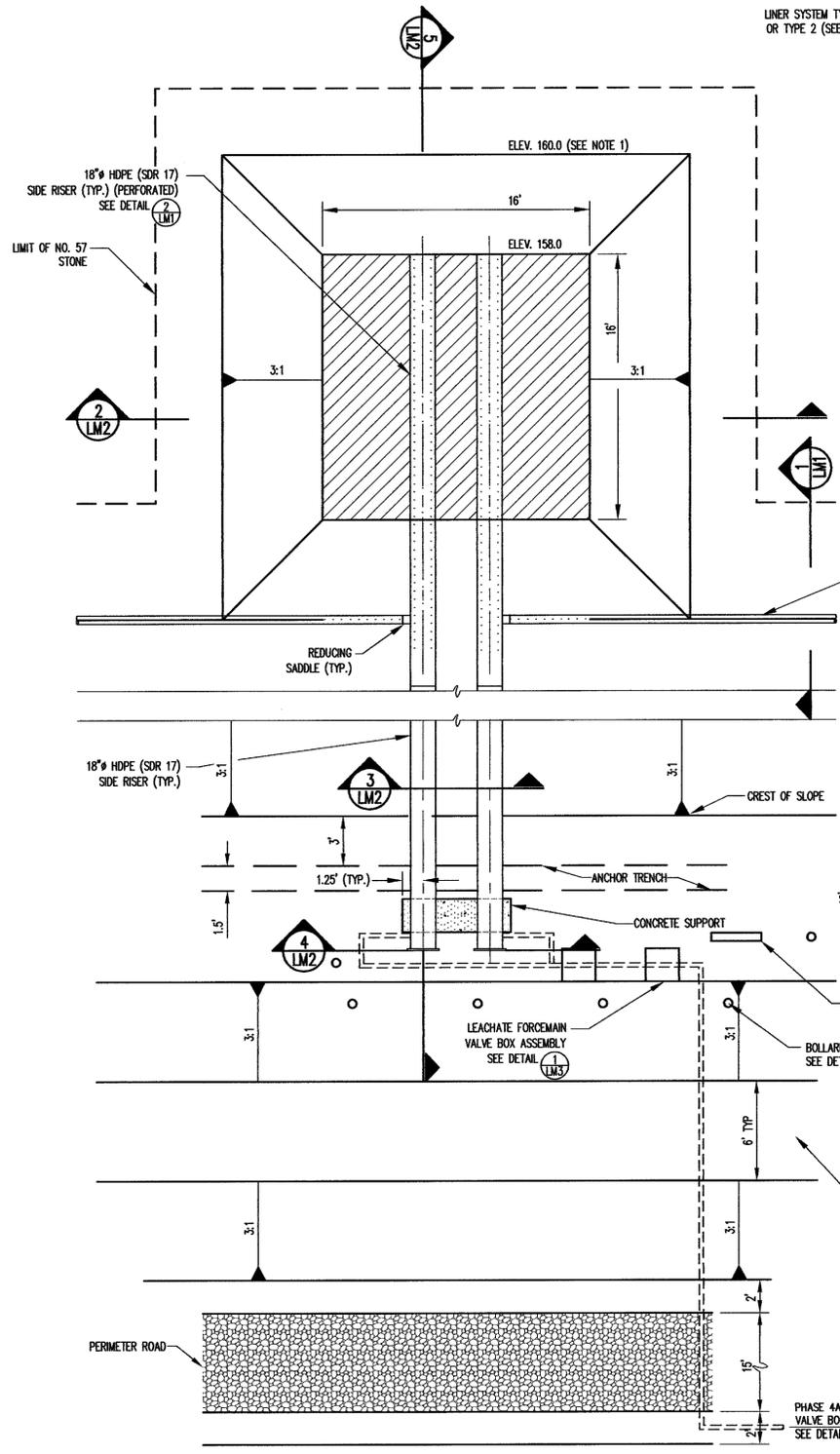
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JOHNSTON COUNTY C&D LANDFILL  
AREA 2  
PERMIT DRAWINGS

LEACHATE MANAGEMENT SYSTEM DETAILS  
(SHEET 1 OF 3)

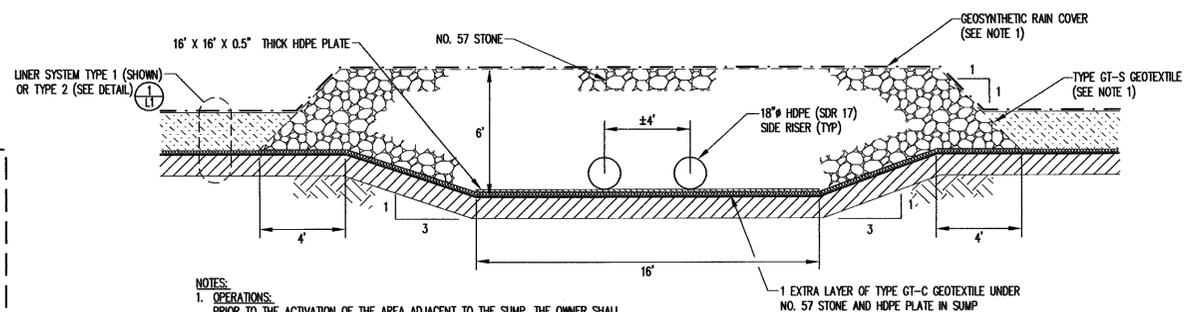
DESIGNED BY: P.K.S.	DRAWN BY: J.A.L.
CHECKED BY:	PROJECT NO.: JOHN-22
SCALE: AS SHOWN	DATE: OCT. 2005
FILE NAME: JOHN-D0372	
SHEET NO. 11	DRAWING NO. LM1



TYPICAL LEACHATE SUMP/ CLEANOUT - PLAN VIEW

DETAIL SCALE: 1" = 5' **1** LM2

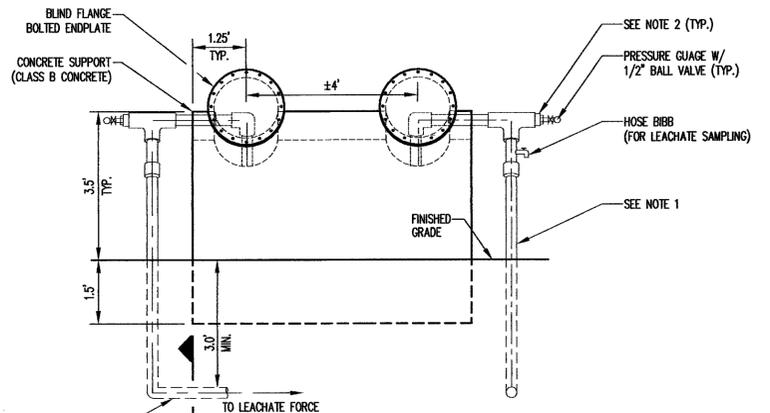
- NOTES:  
 1. ELEVATIONS SHOWN REPRESENT TOP OF COMPACTED SOIL LINER (OR STRUCTURAL FILL).  
 2. PUMP CONTROLS TO BE PLACED AS DIRECTED BY OWNER.



LEACHATE SUMP - TYPICAL CROSS SECTION

DETAIL SCALE: 1" = 4' **2** LM2

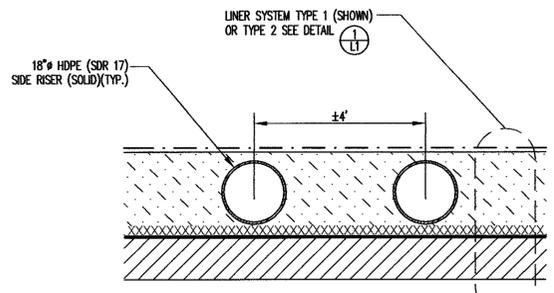
- NOTES:  
 1. OPERATIONS:  
 PRIOR TO THE ACTIVATION OF THE AREA ADJACENT TO THE SUMP, THE OWNER SHALL REMOVE ALL GEOSYNTHETIC RAIN COVER FROM THE AREA TO BE ACTIVATED, INCLUDING FROM THE GRAVEL LAYER OVERLYING THE SUMP. SUBSEQUENTLY, THE EXPOSED TYPE GT-S GEOTEXTILE SHALL BE REMOVED PRIOR TO THE PLACEMENT OF WASTE OVER THE SUMP.



SIDE RISER - FRONT VIEW

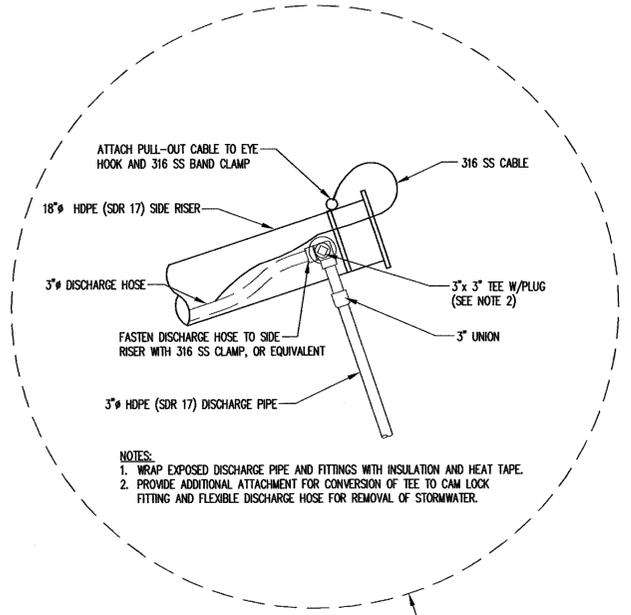
DETAIL SCALE: 1" = 2' **4** LM2

- NOTES:  
 1. WRAP EXPOSED DISCHARGE PIPE AND FITTINGS WITH INSULATION AND HEAT TAPE.  
 2. PROVIDE ADDITIONAL ATTACHMENT FOR CONVERSION OF TEE TO CAM LOCK FITTING AND FLEXIBLE DISCHARGE HOSE FOR REMOVAL OF STORMWATER.

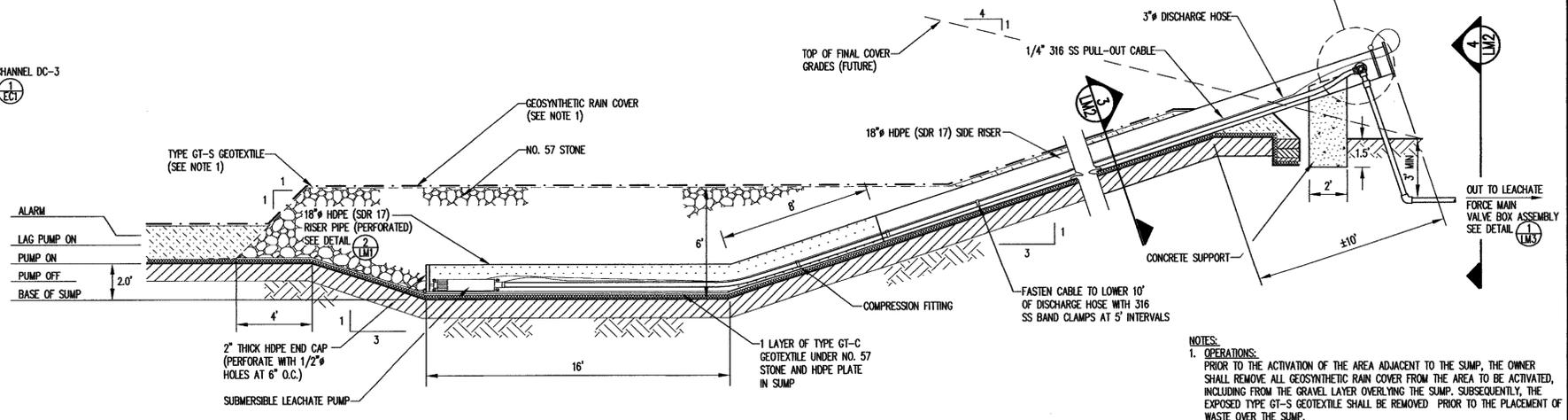


LEACHATE SUMP - TYPICAL CROSS SECTION OF SIDE RISER PIPES ON SLOPE

DETAIL SCALE: 1" = 2' **3** LM2



- NOTES:  
 1. WRAP EXPOSED DISCHARGE PIPE AND FITTINGS WITH INSULATION AND HEAT TAPE.  
 2. PROVIDE ADDITIONAL ATTACHMENT FOR CONVERSION OF TEE TO CAM LOCK FITTING AND FLEXIBLE DISCHARGE HOSE FOR REMOVAL OF STORMWATER.



LEACHATE SUMP - SECTION THROUGH LEACHATE COLLECTION SIDE RISER

DETAIL SCALE: 1" = 4' **5** LM2

- NOTES:  
 1. OPERATIONS:  
 PRIOR TO THE ACTIVATION OF THE AREA ADJACENT TO THE SUMP, THE OWNER SHALL REMOVE ALL GEOSYNTHETIC RAIN COVER FROM THE AREA TO BE ACTIVATED, INCLUDING FROM THE GRAVEL LAYER OVERLYING THE SUMP. SUBSEQUENTLY, THE EXPOSED TYPE GT-S GEOTEXTILE SHALL BE REMOVED PRIOR TO THE PLACEMENT OF WASTE OVER THE SUMP.

NO.	DATE	REVISION
1	3/06	REVISED SUMP ELEVATIONS, MODIFIED DETAILS 1-5/LM2

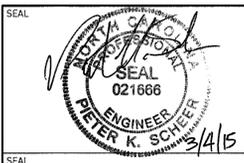
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JOHNSTON COUNTY C&D LANDFILL  
 AREA 2  
 PERMIT DRAWINGS

LEACHATE MANAGEMENT  
 SYSTEM DETAILS  
 (SHEET 2 OF 3)

DESIGNED BY: P.K.S.	DRAWN BY: J.A.L.
CHECKED BY:	PROJECT NO.: JOHN-22
SCALE: AS SHOWN	DATE: OCT. 2005
FILE NAME: JOHN-00371A	
SHEET NO. 12	DRAWING NO. LM2



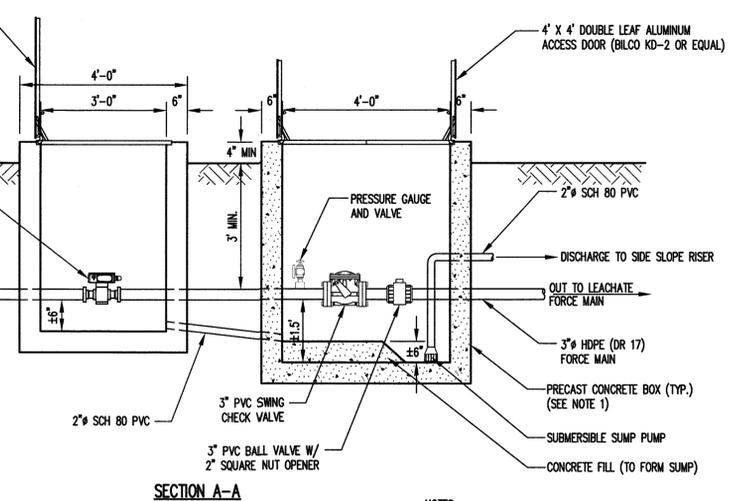
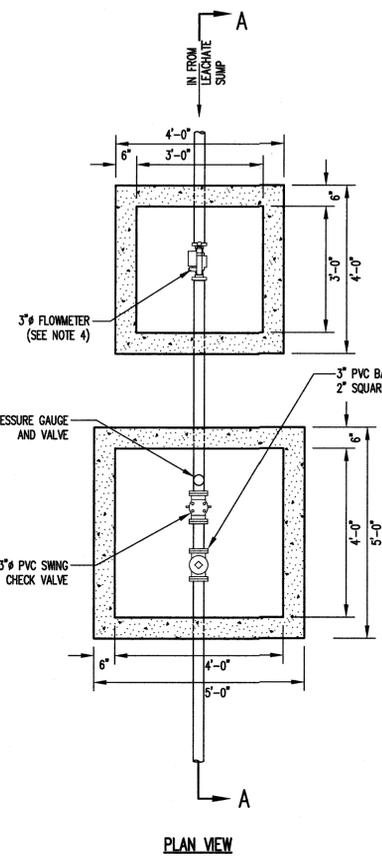
REV.	DATE	DESCRIPTION
3	2/15	REVISED PER DWM COMMENTS

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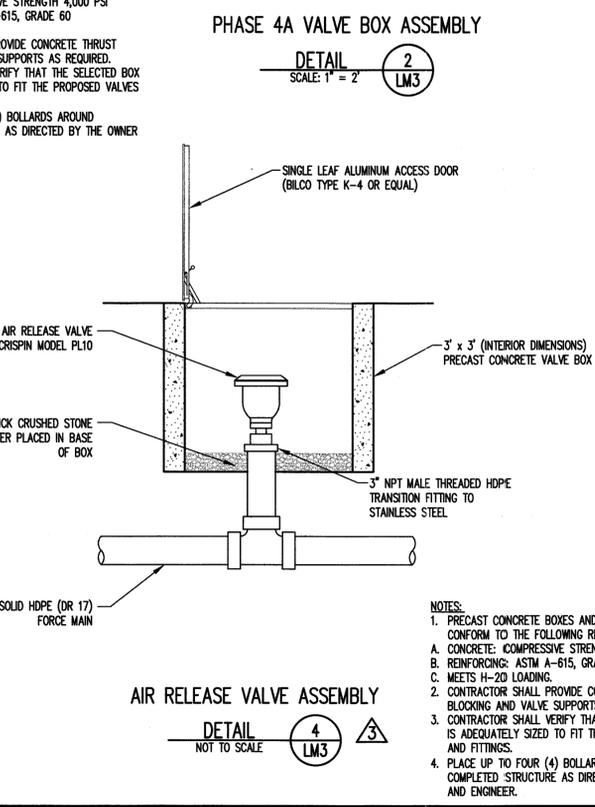
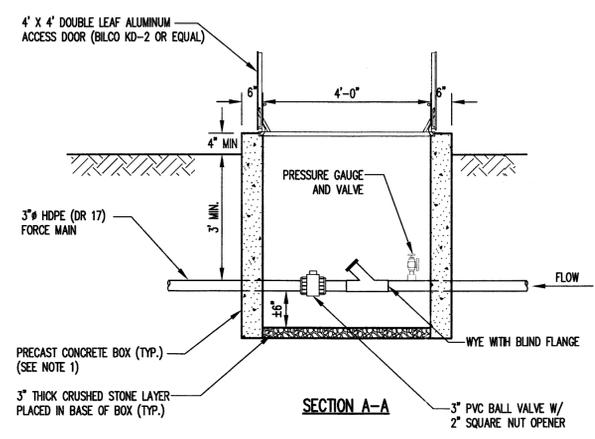
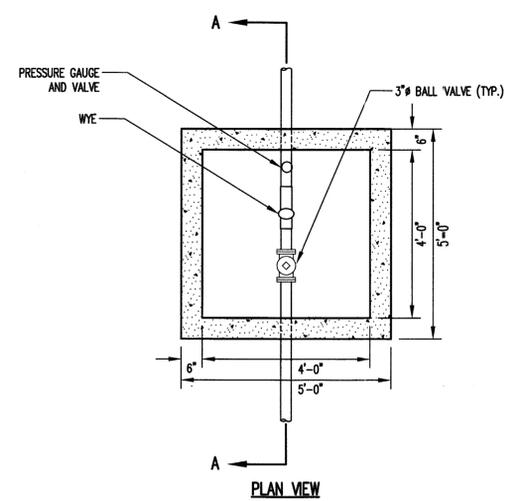
PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
AREA 2  
PERMIT DRAWINGS**

DRAWING TITLE:  
**LEACHATE MANAGEMENT  
SYSTEM DETAILS  
(SHEET 3 OF 3)**

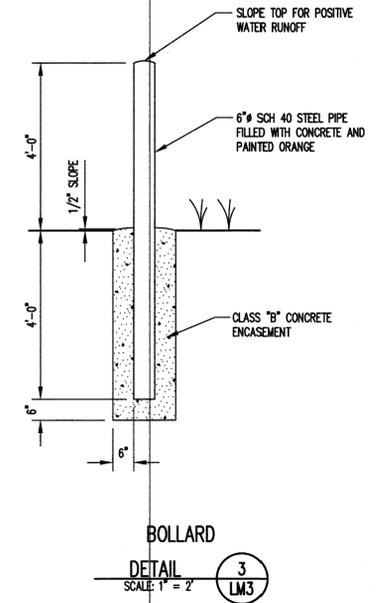
DESIGNED: P.K.S.	PROJECT NO: JOHN-13-4
DRAWN: T.R.S.	SCALE: AS SHOWN
APPROVED: PKS	DATE: FEB 2015
FILENAME: JOHN-D0361A	DRAWING NUMBER:
SHEET NUMBER: 13	LM3



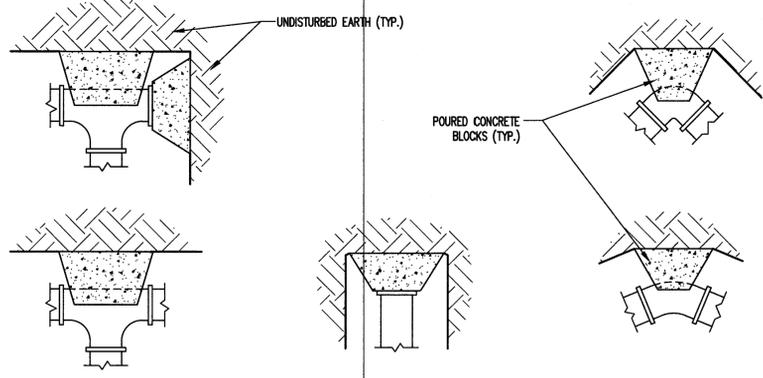
**LEACHATE FORCE MAIN VALVE BOX ASSEMBLY**  
DETAIL 1  
SCALE: 1" = 2'  
LM3



**AIR RELEASE VALVE ASSEMBLY**  
DETAIL 4  
NOT TO SCALE  
LM3



**BOLLARD**  
DETAIL 3  
SCALE: 1" = 2'  
LM3

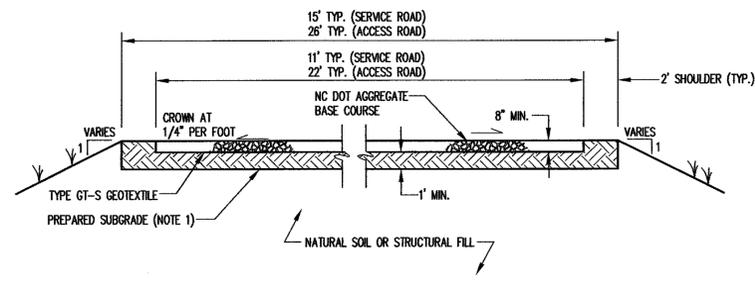


**THRUST BLOCKS**  
DETAIL 5  
NOT TO SCALE  
LM3

- NOTES:**
1. PRECAST CONCRETE BOXES AND COVERS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:  
A. CONCRETE: COMPRESSIVE STRENGTH 4,000 PSI  
B. REINFORCING: ASTM A-615, GRADE 60  
C. MEETS H-20 LOADING.
  2. CONTRACTOR SHALL PROVIDE CONCRETE THRUST BLOCKING AND VALVE SUPPORTS AS REQUIRED.
  3. CONTRACTOR SHALL VERIFY THAT THE SELECTED BOX IS ADEQUATELY SIZED TO FIT THE PROPOSED VALVES AND FITTINGS.
  4. PLACE UP TO FOUR (4) BOLLARDS AROUND COMPLETED STRUCTURE AS DIRECTED BY THE OWNER AND ENGINEER.

- NOTES:**
1. PRECAST CONCRETE BOXES AND COVERS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:  
A. CONCRETE: COMPRESSIVE STRENGTH 4,000 PSI  
B. REINFORCING: ASTM A-615, GRADE 60  
C. MEETS H-20 LOADING.
  2. CONTRACTOR SHALL PROVIDE CONCRETE THRUST BLOCKING AND VALVE SUPPORTS AS REQUIRED.
  3. CONTRACTOR SHALL VERIFY THAT THE SELECTED BOX IS ADEQUATELY SIZED TO FIT THE PROPOSED VALVES AND FITTINGS.
  4. FLOWMETER SHALL BE INSTALLED IN PIPE WITH MINIMUM OF 5 PIPE DIAMETERS UNOBSTRUCTED PIPE DOWNSTREAM OF METER AND 10 PIPE DIAMETERS UPSTREAM OF METER.

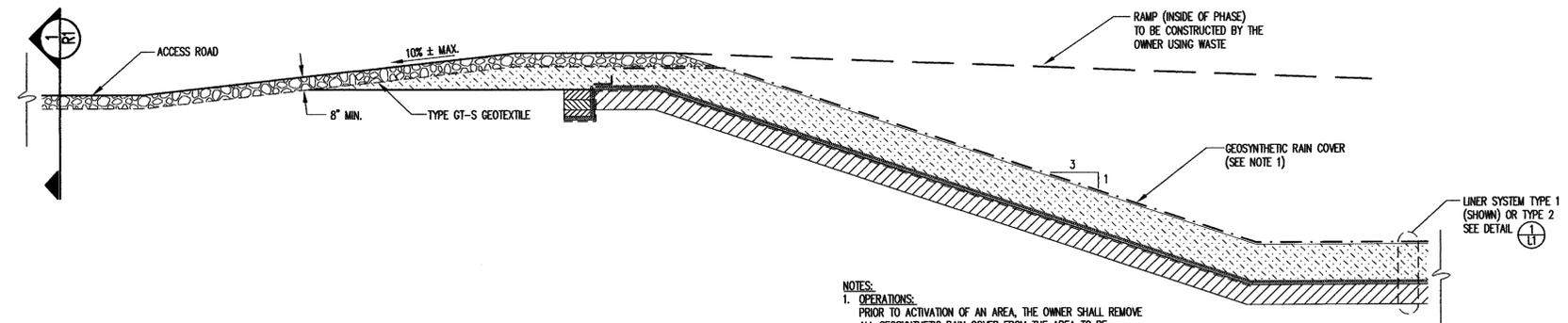
- NOTES:**
1. PRECAST CONCRETE BOXES AND COVERS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:  
A. CONCRETE: COMPRESSIVE STRENGTH 4,000 PSI  
B. REINFORCING: ASTM A-615, GRADE 60  
C. MEETS H-20 LOADING.
  2. CONTRACTOR SHALL PROVIDE CONCRETE THRUST BLOCKING AND VALVE SUPPORTS AS REQUIRED.
  3. CONTRACTOR SHALL VERIFY THAT THE SELECTED BOX IS ADEQUATELY SIZED TO FIT THE PROPOSED VALVES AND FITTINGS.
  4. PLACE UP TO FOUR (4) BOLLARDS AROUND COMPLETED STRUCTURE AS DIRECTED BY THE OWNER AND ENGINEER.



NOTE:  
 1. IN FILL AREAS, PREPARED SUBGRADE IS EQUIVALENT TO STRUCTURAL FILL. FOR CUT AREAS, REMOVE AND REPLACE WITH STRUCTURAL FILL (SEE PROJECT SPECIFICATIONS).

TYPICAL ROADWAY CROSS SECTION

DETAIL 1  
 SCALE: 1" = 5'



NOTES:  
 1. OPERATIONS:  
 PRIOR TO ACTIVATION OF AN AREA, THE OWNER SHALL REMOVE ALL GEOSYNTHETIC RAIN COVER FROM THE AREA TO BE ACTIVATED.

ACCESS RAMP

DETAIL 2  
 SCALE: 1" = 4'

NO.	DATE	REVISION

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 Engineering and Geological Services  
 14 N. Boylan Ave.  
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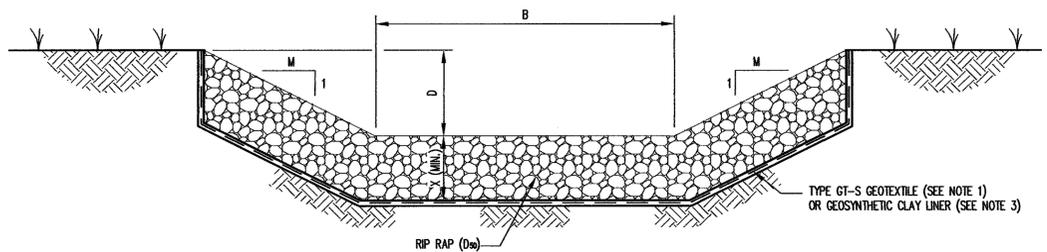


PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
 AREA 2  
 PERMIT DRAWINGS**

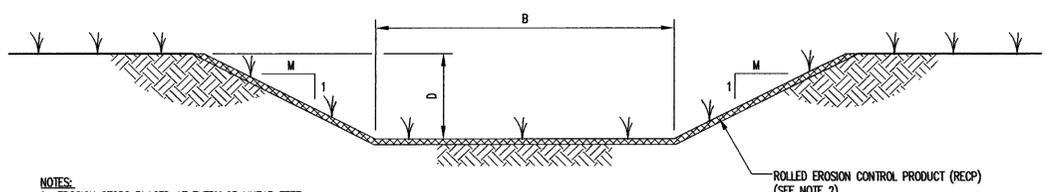
DESIGNED BY: P.K.S.	DRAWN BY: J.A.L.
CHECKED BY:	PROJECT NO.: JOHN-22
SCALE: AS SHOWN	DATE: OCT. 2005
FILE NAME: JOHN-D0387	
SHEET NO. <b>14</b>	DRAWING NO. <b>R1</b>

DRAINAGE CHANNEL SCHEDULE						
DRAINAGE CHANNEL	LINING	B (FEET)	D (FEET)	M	D <sub>50</sub> (INCHES)	X (FEET)
DC-1	RIP RAP	8.0	2.0	3	9	1.5
DC-2	RIP RAP	6.0	2.0	3	6	1.0
DC-3	TRM*	6.0	2.0	3	---	---
DC-4A	TRM*	4.0	1.5	3	---	---
DC-4B	RIP RAP	4.0	1.5	3	9	1.5
DC-5A	TRM*	4.0	1.5	3	---	---
DC-5B	RIP RAP	6.0	1.5	3	12	2.0

\*TRM = TURF REINFORCEMENT MATTING



RIP RAP LINED CHANNELS

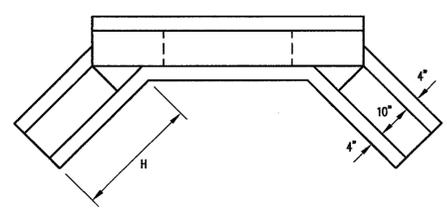


RECP LINED CHANNELS

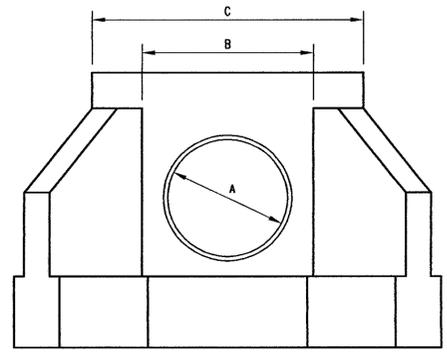
- NOTES:
- EROSION STOPS PLACED AT EVERY 25 LINEAR FEET. FOR EROSION STOPS SEE DETAIL 2 (EC1).
  - FOR ANCHORAGE OF RECP, SEE DETAIL 1 (EC2).
  - USE GCL WHERE CHANNEL OVERLIES EXISTING WASTE. WHERE EXCAVATION INTO UNDERLYING WASTE IS REQUIRED, OVEREXCAVATE ONE FOOT AND BACKFILL WITH STRUCTURAL FILL.

DRAINAGE CHANNEL DETAILS

DETAIL 1 (EC1) NOT TO SCALE



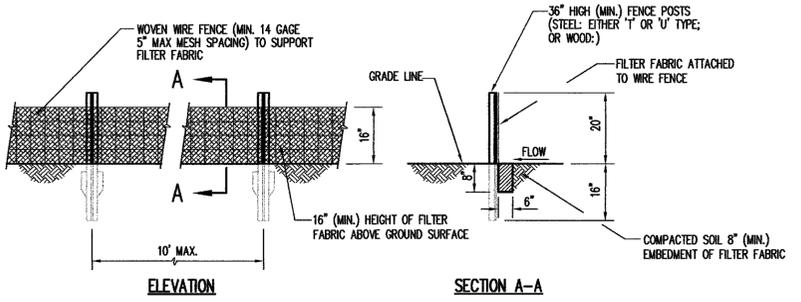
CONCRETE HEADWALL SCHEDULE							
A	B	C	D	E	F	G	H
12"	1'-8"	4'-0"	2'-6"	1'-8"	1'-2"	1'-3"	1'-7"
15"	2'-0"	4'-4"	2'-10"	2'-0"	1'-3"	1'-3"	1'-7"
18"	2'-4"	4'-8"	3'-2"	2'-4"	1'-4"	1'-3"	1'-7"
24"	2'-10"	5'-2"	3'-8"	2'-10"	1'-5"	1'-4"	2'-1"
30"	3'-6"	5'-10"	4'-4"	3'-6"	1'-9"	1'-6"	2'-5"
36"	4'-0"	6'-4"	4'-10"	4'-0"	2'-0"	1'-8"	2'-11"
42"	4'-6"	6'-10"	5'-4"	4'-6"	2'-3"	2'-0"	3'-6"
48"	5'-2"	7'-6"	6'-0"	5'-2"	2'-6"	2'-0"	4'-0"
54"	5'-9"	8'-1"	6'-7"	5'-9"	2'-9"	2'-0"	4'-6"
60"	6'-4"	8'-8"	7'-2"	6'-4"	3'-0"	2'-2"	5'-0"



CONCRETE HEADWALL

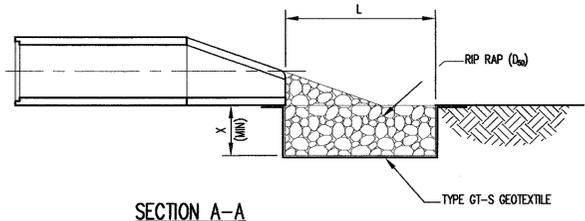
DETAIL 5 (EC1) SCALE: 1" = 2'

- NOTES:
- PRECAST CONSTRUCTION SHALL MEET THE REQUIREMENTS OF THE NC D.O.T. AND ASTM C-478.
  - REINFORCING STEEL SHALL BE A MINIMUM OF #4 @ 6 O.C.E.W.
  - FOR TWIN PIPES, DOUBLE DIMENSIONS "B" AND "C".

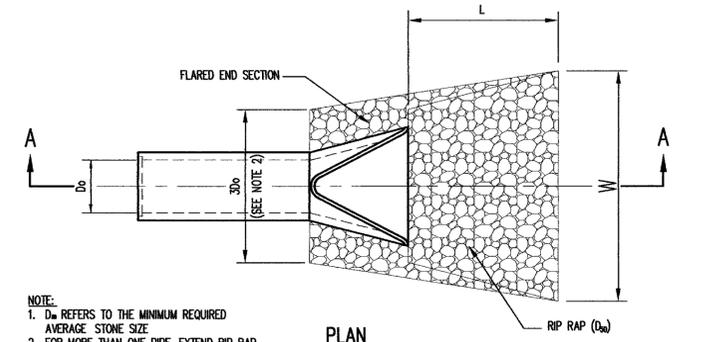


SILT FENCE

DETAIL 3 (EC1) NOT TO SCALE



SECTION A-A

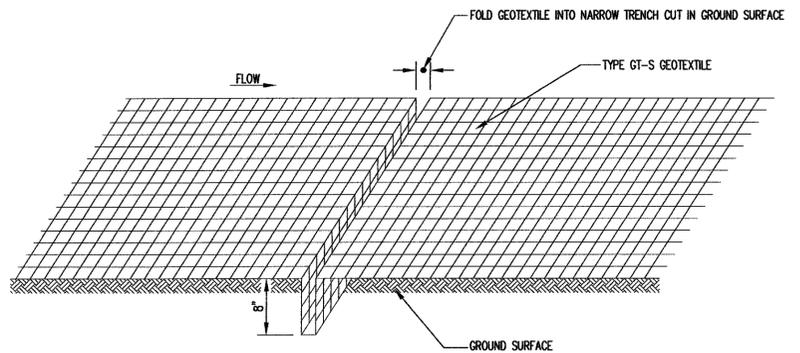


PLAN

RIP RAP OUTLET PROTECTION (OUTLET TO FLAT AREA)

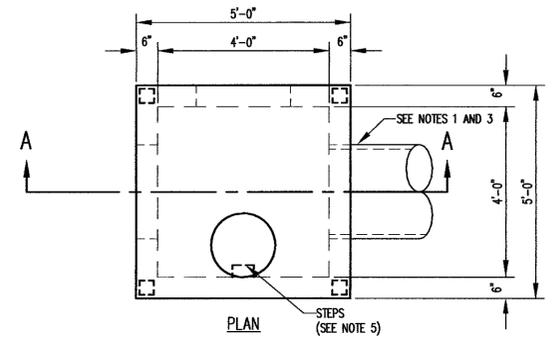
DETAIL 6 (EC1) NOT TO SCALE

RIP RAP OUTLET PROTECTION SCHEDULE					
PIPE	D <sub>50</sub> (INCHES)	L (FEET)	W (FEET)	D <sub>50</sub> (INCHES)	X (FEET)
C-1	42 (2 PIPES)	30	37	12	1.5
C-2	24	12	14	6	1.0
C-3	30	16	19	6	1.0

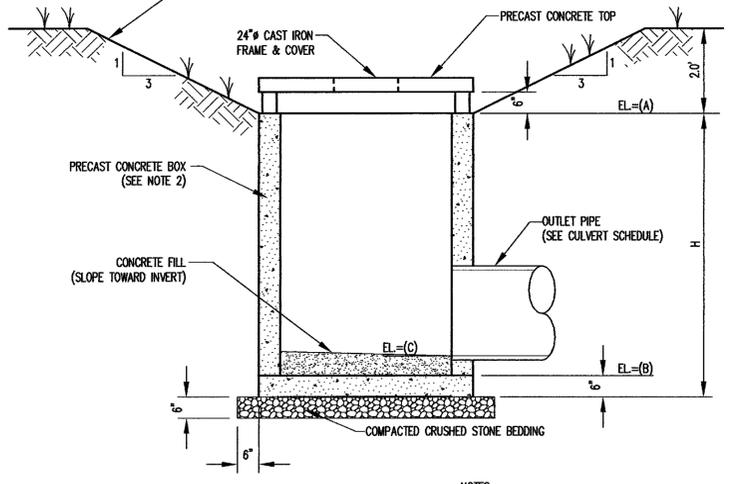


EROSION STOP DETAIL

DETAIL 2 (EC1) NOT TO SCALE



PLAN



SECTION A-A

DROP INLET SCHEDULE				
DROP INLET	A	B	C	H
DI-1	161.8'	153.5'	154.0'	8.8'
DI-2	158.8'	152.5'	153.0'	7.8'

DROP INLET

DETAIL 4 (EC1) NOT TO SCALE

- NOTES:
- PROVIDE WATERTIGHT JOINTS ON ALL PIPING.
  - PRECAST CONCRETE BOXES SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:  
A. CONCRETE: COMPRESSIVE STRENGTH 4000 PSI  
B. REINFORCING: ASTM A-615, GRADE 60 C. MEETS H-20 LOADING.
  - PIPES MAY BE ORIENTED DIFFERENTLY WITH RESPECT TO THE CHANNEL THAN DISPLAYED HERE. SEE DRAWING EC1 FOR PROPER ORIENTATION.
  - THE CONTRACTOR SHALL PROVIDE ADEQUATE PROTECTION FROM SEDIMENTATION FOR ALL DROP INLETS USING GRAVEL AND WIRE MESH FILTERS OR OTHER METHOD AS APPROVED BY THE ENGINEER.
  - PROVIDE STEPS FOR DROP INLETS WITH H>4.5'. STEPS SHALL HAVE A 16" SPACING THE FULL HEIGHT OF THE DROP INLET. START FIRST STEP 6" BELOW TOP.

NO.	DATE	REVISION
1	3/06	MODIFIED DETAILS 4/EC1 & 6/EC1

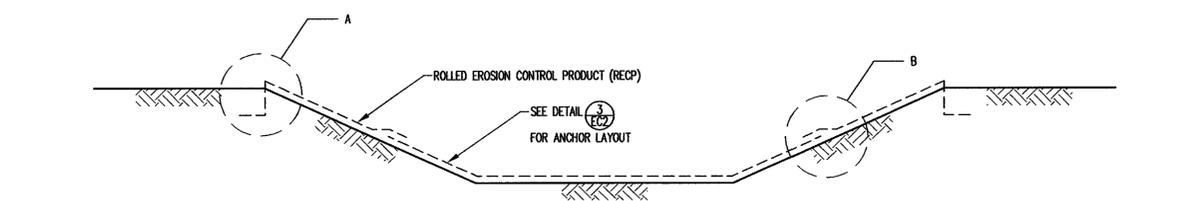
G. N. RICHARDSON & ASSOCIATES, INC.  
Engineering and Geological Services  
14 N. Boylan Ave.  
Raleigh, N.C. 27603  
www.gnra.com  
ph: 919-828-0877  
fax: 919-828-3899



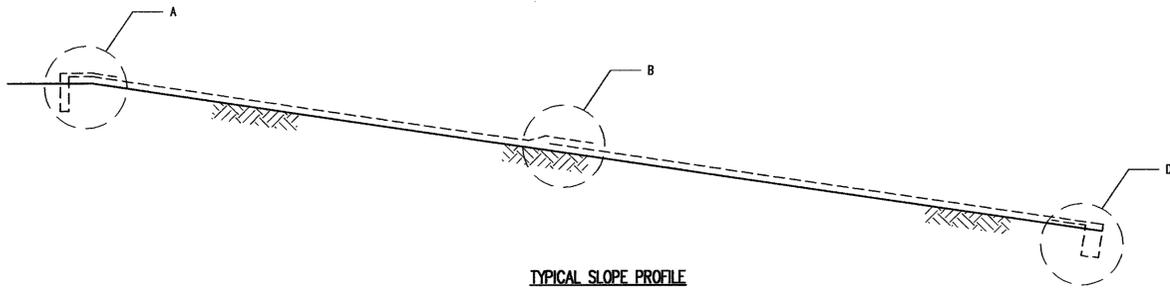
JOHNSTON COUNTY C&D LANDFILL  
AREA 2  
PERMIT DRAWINGS

EROSION AND SEDIMENTATION  
CONTROL DETAILS  
(SHEET 1 OF 2)

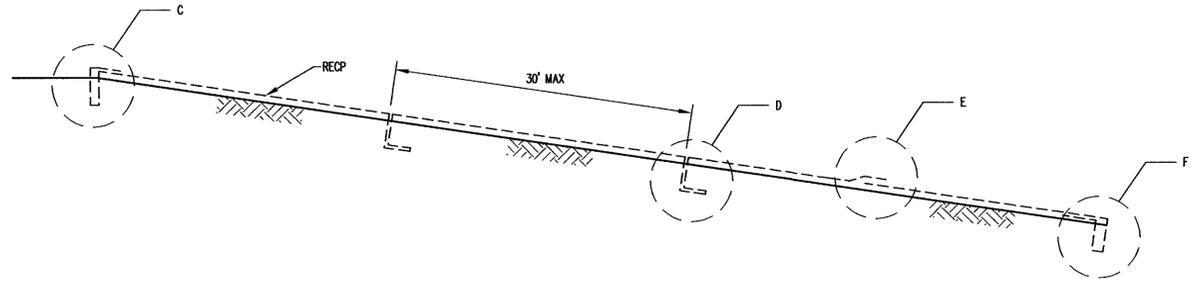
DESIGNED BY: P.K.S.	DRAWN BY: J.A.L.
CHECKED BY:	PROJECT NO.: JOHN-22
SCALE: AS SHOWN	DATE: OCT. 2005
FILE NAME: JOHN-0036A	SHEET NO.: 15
DRAWING NO.: EC1	



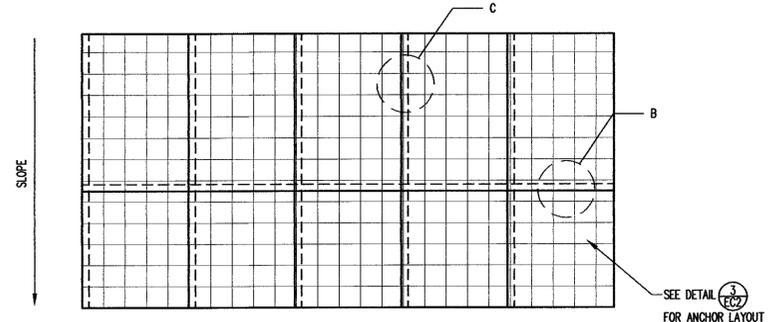
TYPICAL CHANNEL CROSS SECTION



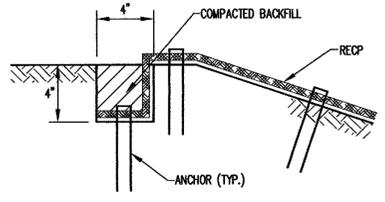
TYPICAL SLOPE PROFILE



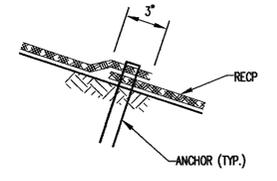
TYPICAL CHANNEL PROFILE



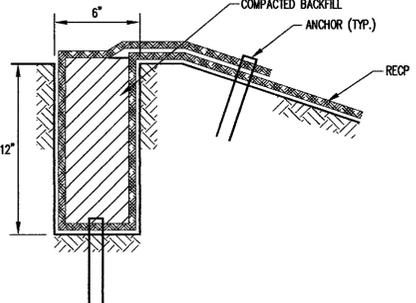
TYPICAL SLOPE PLAN VIEW



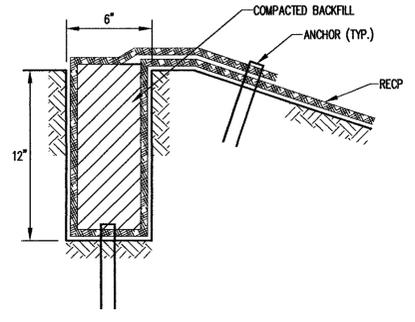
A. LONGITUDINAL ANCHOR TRENCH



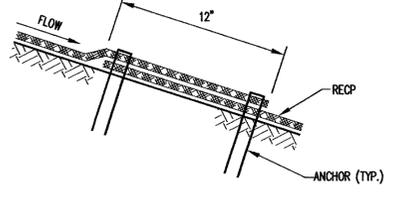
B. OVERLAP AT ADJACENT EDGES



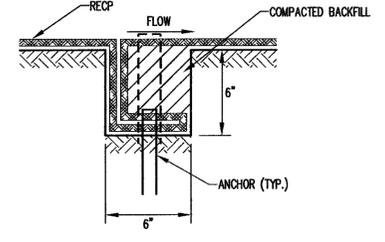
C. UPSTREAM TERMINAL ANCHOR TRENCH



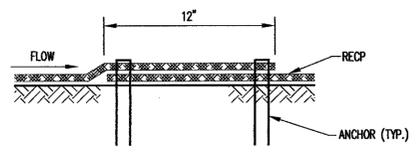
A. UPSLOPE TERMINAL ANCHOR TRENCH



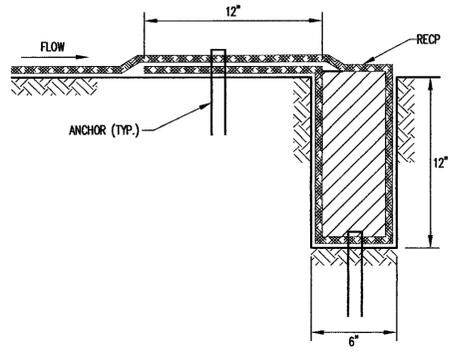
B. OVERLAP AT ROLL ENDS



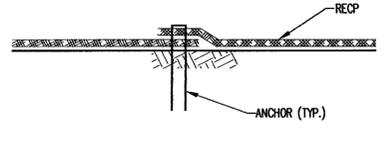
D. INTERMITTENT CHECK SLOT



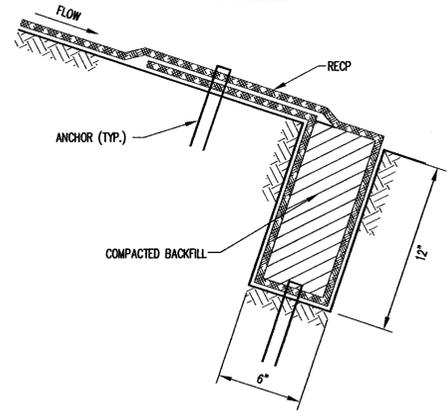
E. OVERLAP AT ROLL ENDS



F. DOWNSTREAM TERMINAL ANCHOR TRENCH



C. OVERLAP AT ADJACENT EDGES



D. DOWNSLOPE TERMINAL ANCHOR TRENCH

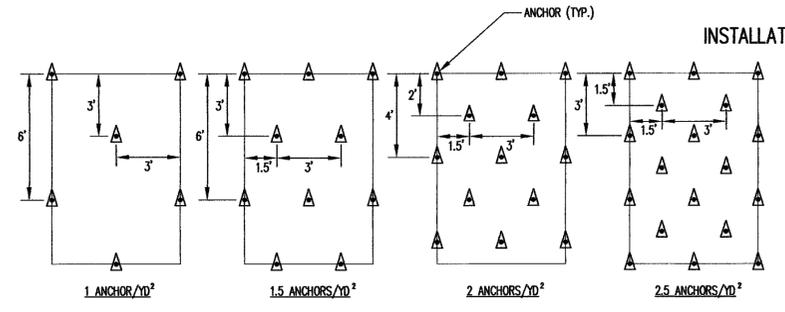
NOTES:  
1. PLACE ANCHORS AT ANCHOR TRENCHES, OVERLAPS, AND CHECK SLOTS ON 1 FOOT CENTERS.  
IF APPLICABLE, STAGGER ANCHOR SPACING BETWEEN MULTIPLE ROWS OF ANCHORS.

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 1 EC2 NOT TO SCALE

LOCATION	REQUIRED ANCHOR SPACING (ANCHORS/YD <sup>2</sup> )
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



ANCHOR LAYOUT

DETAIL 3 EC2 NOT TO SCALE

INSTALLATION OF ROLLED EROSION CONTROL PRODUCTS (SLOPES)

DETAIL 2 EC2 NOT TO SCALE

G. N. RICHARDSON & ASSOCIATES, INC.  
Engineering and Geological Services  
14 N. Boylan Ave.  
Raleigh, N.C. 27603  
www.gnra.com  
ph: 919-828-0577  
fax: 919-828-3899



PROJECT TITLE:  
JOHNSTON COUNTY C&D LANDFILL  
AREA 2  
PERMIT DRAWINGS

EROSION AND SEDIMENTATION  
CONTROL DETAILS  
(SHEET 2 OF 2)

DESIGNED BY: P.K.S.  
CHECKED BY: JOHN-22  
SCALE: AS SHOWN  
FILE NAME: JOHN-00363  
SHEET NO.: 16  
DRAWING NO.: EC2



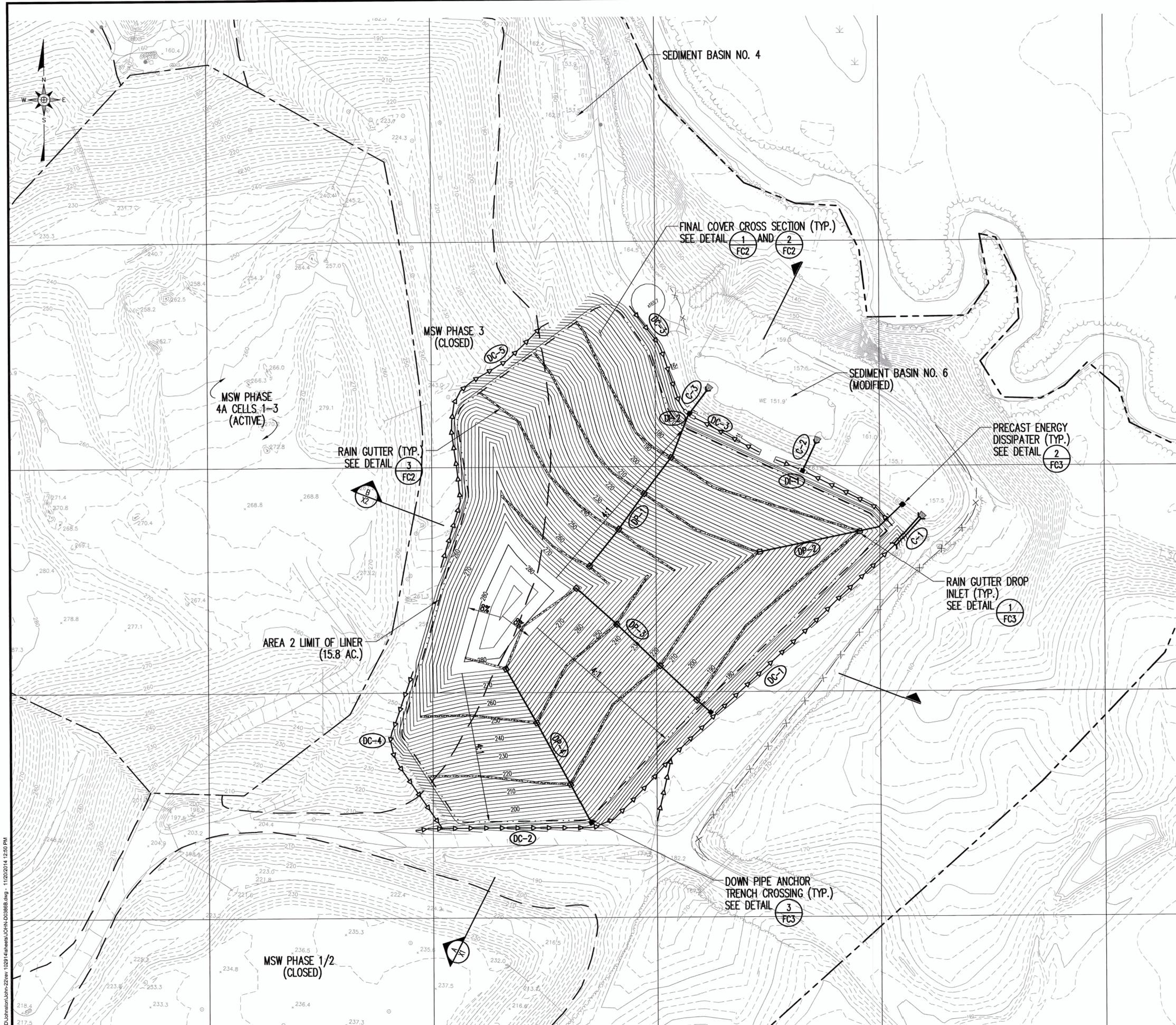
REV.	DATE	DESCRIPTION
1	3/06	REVISED AREA 2 BASE GRADES
2	11/14	REVISED PER DWM COMMENTS

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PROJECT TITLE:  
**JOHNSTON COUNTY CSG LANDFILL  
AREA 2  
PERMIT DRAWINGS**

DRAWING TITLE:  
**FINAL COVER GRADING  
AND DRAINAGE PLANS**

DESIGNED: P.K.S.	PROJECT NO: JOHN-13-4
DRAWN: T.R.S.	SCALE: AS SHOWN
APPROVED: P.K.S.	DATE: NOV 2014
FILE NAME: JOHN-D0386B	
SHEET NUMBER: 17	DRAWING NUMBER: FC1

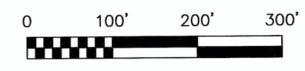


PIPING SCHEDULE	
RAIN GUTTERS	
PIPE DIAMETER (INCHES)	MAX. DRAINAGE AREA (AC.)
6	0.32
8	0.67
10	1.18
12	1.89
DOWN PIPE DROP INLETS	
PIPE DIAMETER (INCHES)	MAX. DRAINAGE AREA (AC.)
8	0.52
10	0.80
12	1.14
14	1.37
16	1.80
18	2.27
DOWN PIPES	
PIPE DIAMETER (INCHES)	MAX. DRAINAGE AREA (AC.)
8	0.77
10	1.36
12	2.18
14	2.76
16	3.99
18	5.42

LEGEND	
-150-	EXISTING 10' CONTOUR (SEE REFERENCE 1)
- - -	EXISTING 2' CONTOUR
- - - - -	APPROXIMATE PROPERTY LINE
-150-	PROPOSED 10' CONTOUR
- - -	PROPOSED 2' CONTOUR
DP-3	DOWN PIPE
DC-1	DRAINAGE CHANNEL
C-1	CULVERT NUMBER
DI-1	DROP INLET NUMBER
□	DOWN PIPE DROP INLET
■	PRECAST ENERGY DISSIPATER
- - - - -	RAIN GUTTER

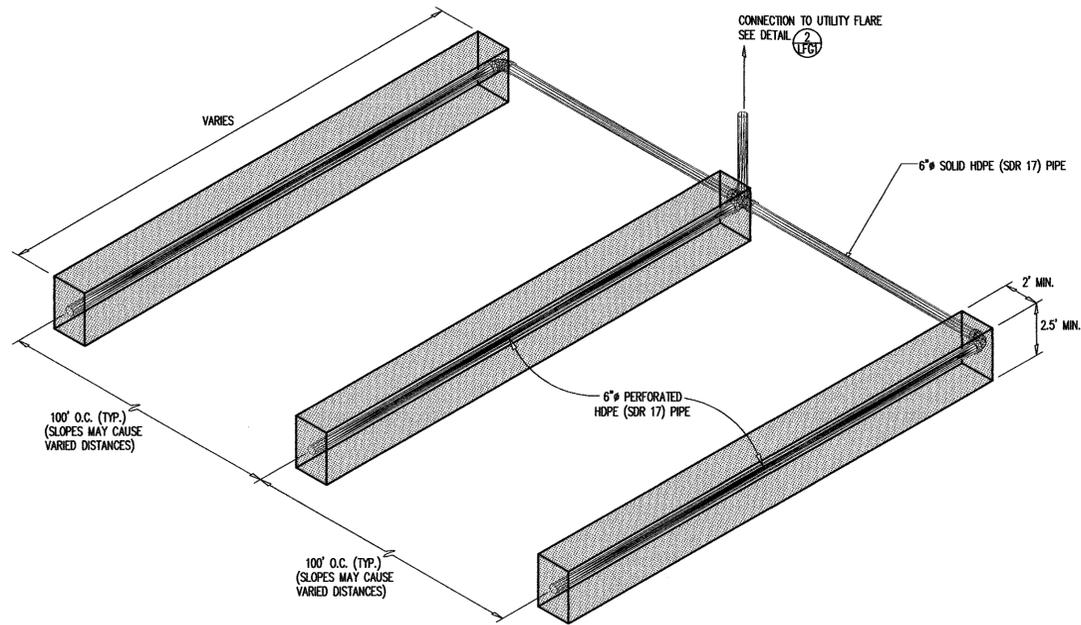
**NOTES**  
1. GRADES SHOWN REPRESENT APPROXIMATE TOP OF FINAL COVER GRADES.  
2. THE RAIN GUTTERS AND DOWN PIPES SHOWN ARE CONCEPTUAL LOCATIONS ONLY. THE DESIGN OF THESE DEVICES IS TO BE EVALUATED PRIOR TO THE PLACEMENT OF FINAL COVER.

**REFERENCES**  
1. OVERALL SITE TOPOGRAPHY PROVIDED BY GEODATA CORPORATION, BASED ON MAY 21, 2004 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN ACTIVE AREAS PROVIDED BY SPECTRUM NC, LLC, BASED ON MARCH 21, 2005 AERIAL PHOTOGRAPHY. TOPOGRAPHY OF PHASE 4 CELL 2 PROVIDED BY 4D SITE SOLUTIONS INC., DATED JUNE 17, 2014. TOPOGRAPHY IN PHASE 5 AREA PROVIDED BY SOUTHWIND SURVEYING AND ENGINEERING, GARNER, NC, DATED JUNE 16, 2003.



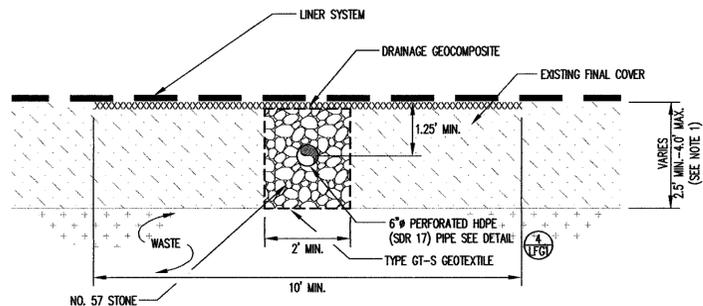






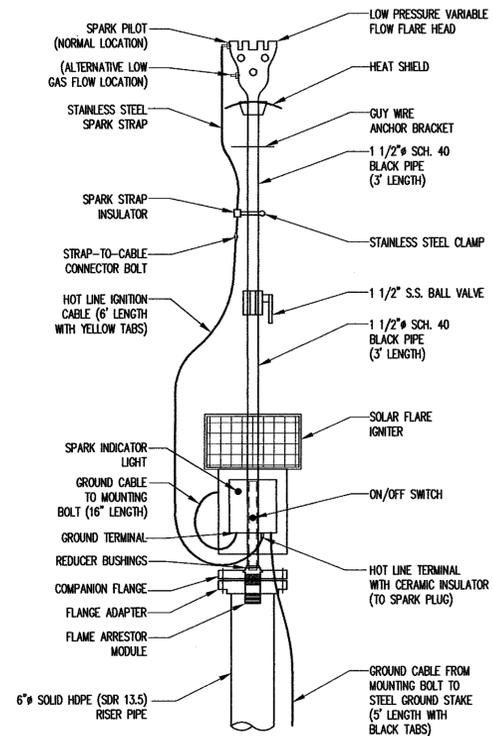
**GAS COLLECTION NETWORK**

DETAIL 1  
NOT TO SCALE LFG1



**LFG SURFACE COLLECTOR TRENCH CROSS SECTION**

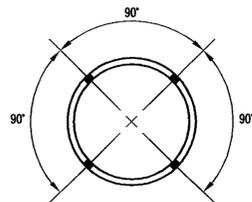
DETAIL 3  
SCALE: 1" = 2' LFG1



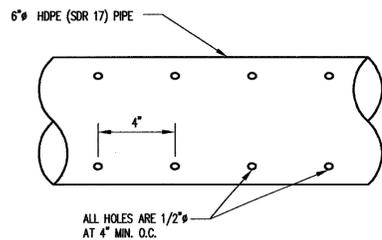
**LFG UTILITY FLARE**

DETAIL 2  
SCALE: 1" = 1' LFG1

NOTE:  
1. USE LANDFILL TECHNOLOGIES, INC. CF-5 SOLAR FLARE OR OTHER APPROVED EQUAL.

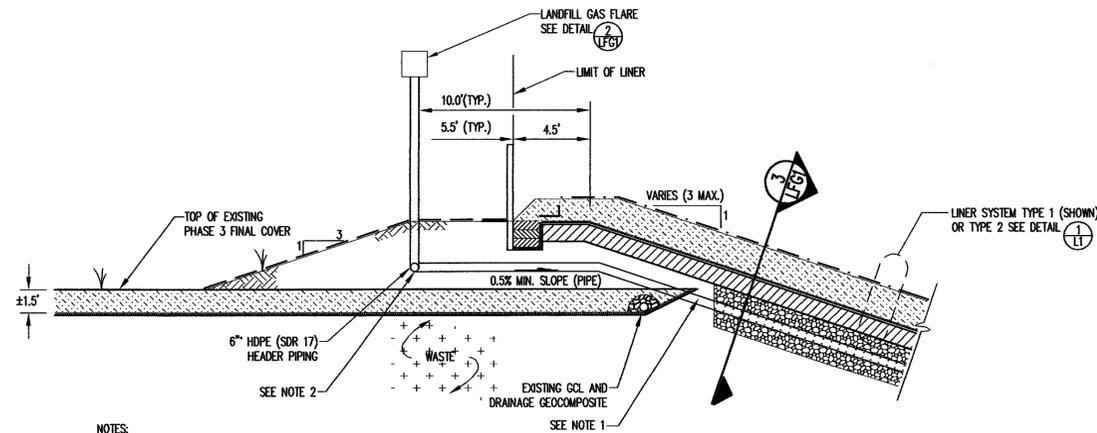


**LANDFILL GAS PIPING**



**HDPE PIPE PERFORATIONS**

DETAIL 4  
NOT TO SCALE LFG1



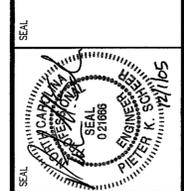
**LFG PIPING CROSS SECTION**

DETAIL 5  
SCALE: 1" = 5' LFG1

NOTES:  
1. CAREFULLY EXCAVATE TRENCH AT EDGE OF EXISTING GCL AND DRAINAGE GEOCOMPOSITE TO MINIMIZE DAMAGE TO THESE MATERIALS.  
2. PROVIDE CONCRETE FOR SUPPORT OF PIPING UNDER LANDFILL GAS FLARES AS REQUIRED.

REVISION  
DATE NO.

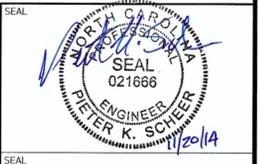
**G. N. RICHARDSON & ASSOCIATES, INC.**  
Engineering and Geological Services  
14 N. Boylan Ave. Raleigh, N.C. 27603  
www.gnra.com  
ph: 919-828-0577  
fax: 919-828-3899



PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
AREA 2  
PERMIT DRAWINGS**

DRAWING TITLE:  
**LANDFILL GAS MANAGEMENT  
DETAILS**

DESIGNED BY: P.K.S.	DRAWN BY: J.A.L.
CHECKED BY:	PROJECT NO.: JOHN-22
SCALE: AS SHOWN	DATE: OCT. 2005
FILE NAME: JOHN-00359	
SHEET NO. 20	DRAWING NO. LFG1



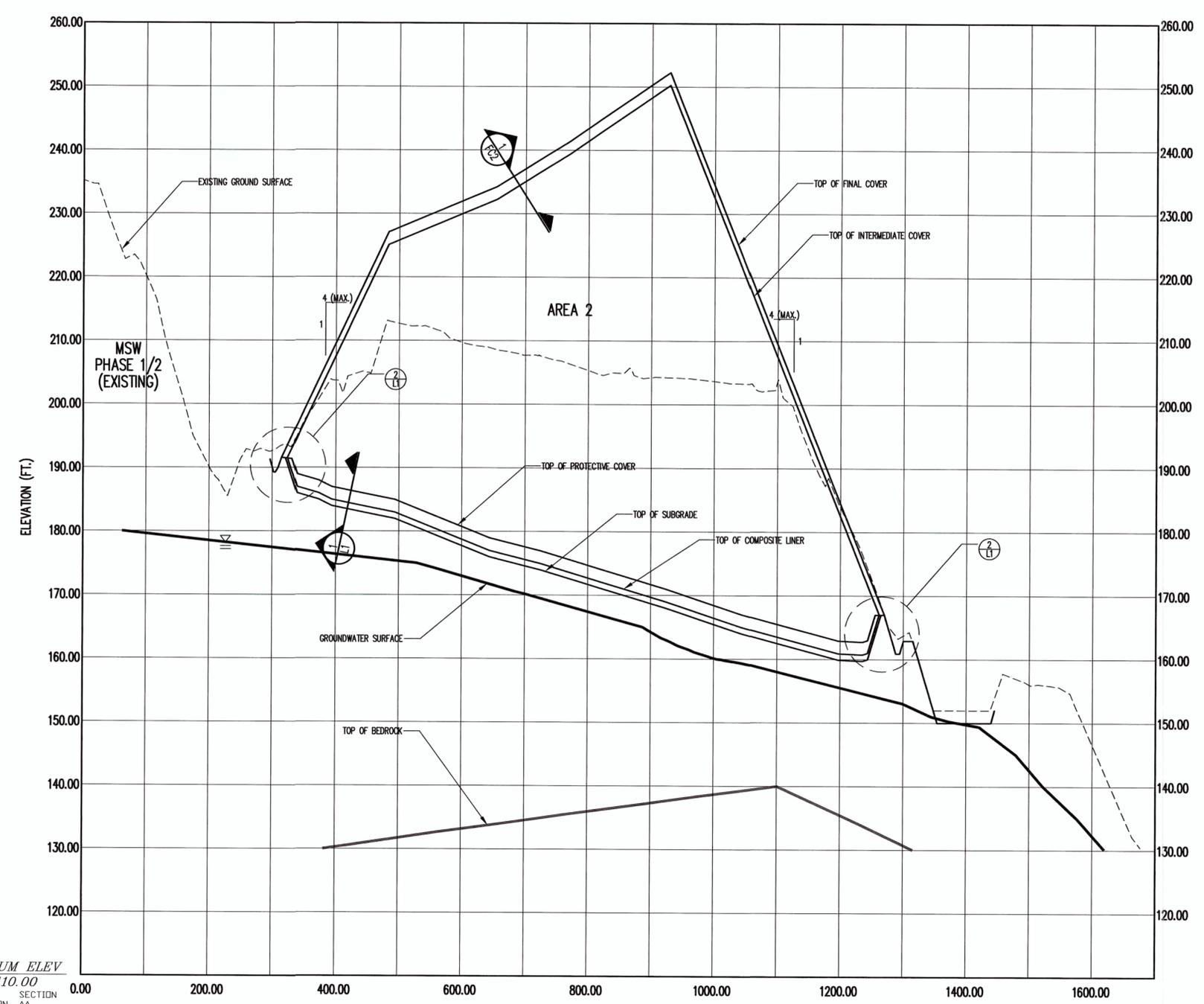
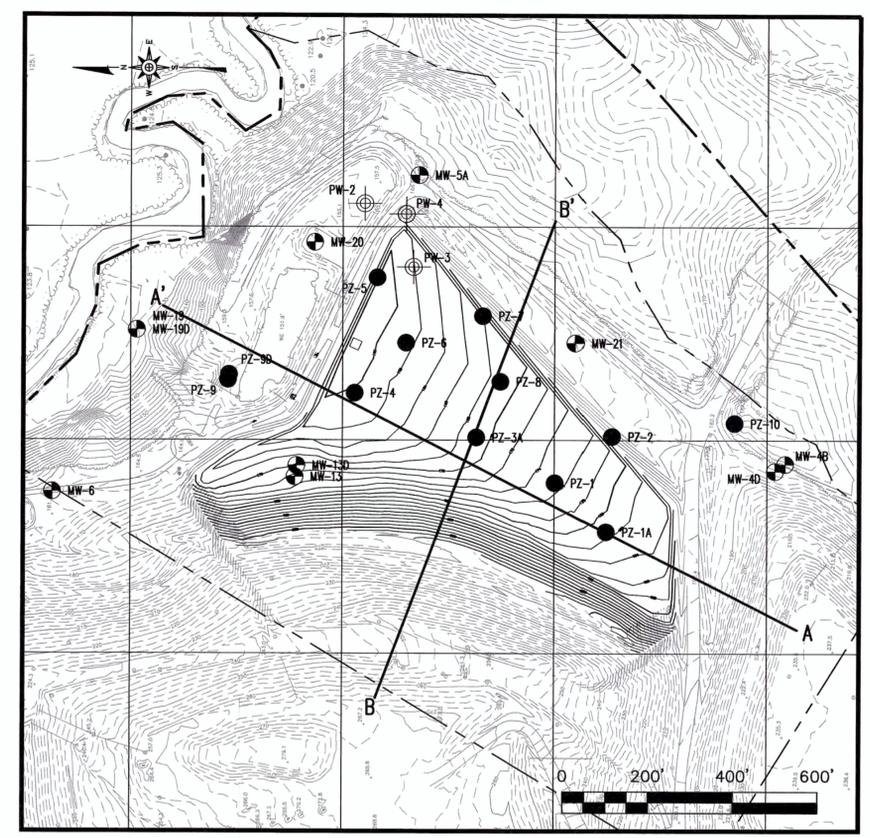
REV.	DATE	DESCRIPTION
1	3/06	REVISED AREA 2 BASE GRADES
2	11/14	REVISED PER DWM COMMENTS

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PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
AREA 2  
PERMIT DRAWINGS**

DRAWING TITLE:  
**AREA 2  
ENGINEERING CROSS SECTIONS  
(SHEET 1 OF 2)**

DESIGNED: P.K.S.	PROJECT NO: JOHN-13-4
DRAWN: T.R.S.	SCALE: AS SHOWN
APPROVED: PKS	DATE: NOV 2014
FILENAME: JOHN-D0394B	DRAWING NUMBER:
SHEET NUMBER: <b>21</b>	DRAWING NUMBER: <b>X1</b>



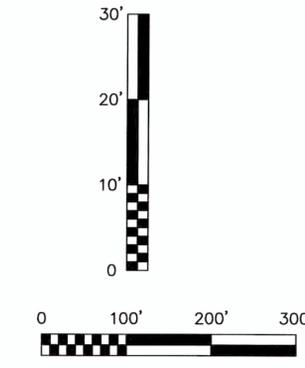
DATUM ELEV  
110.00  
GROUP SECTION  
SECTION AA

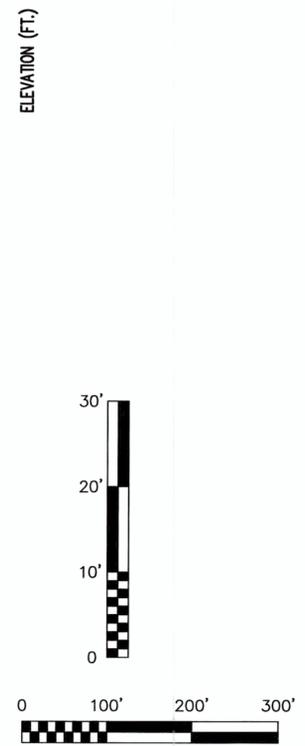
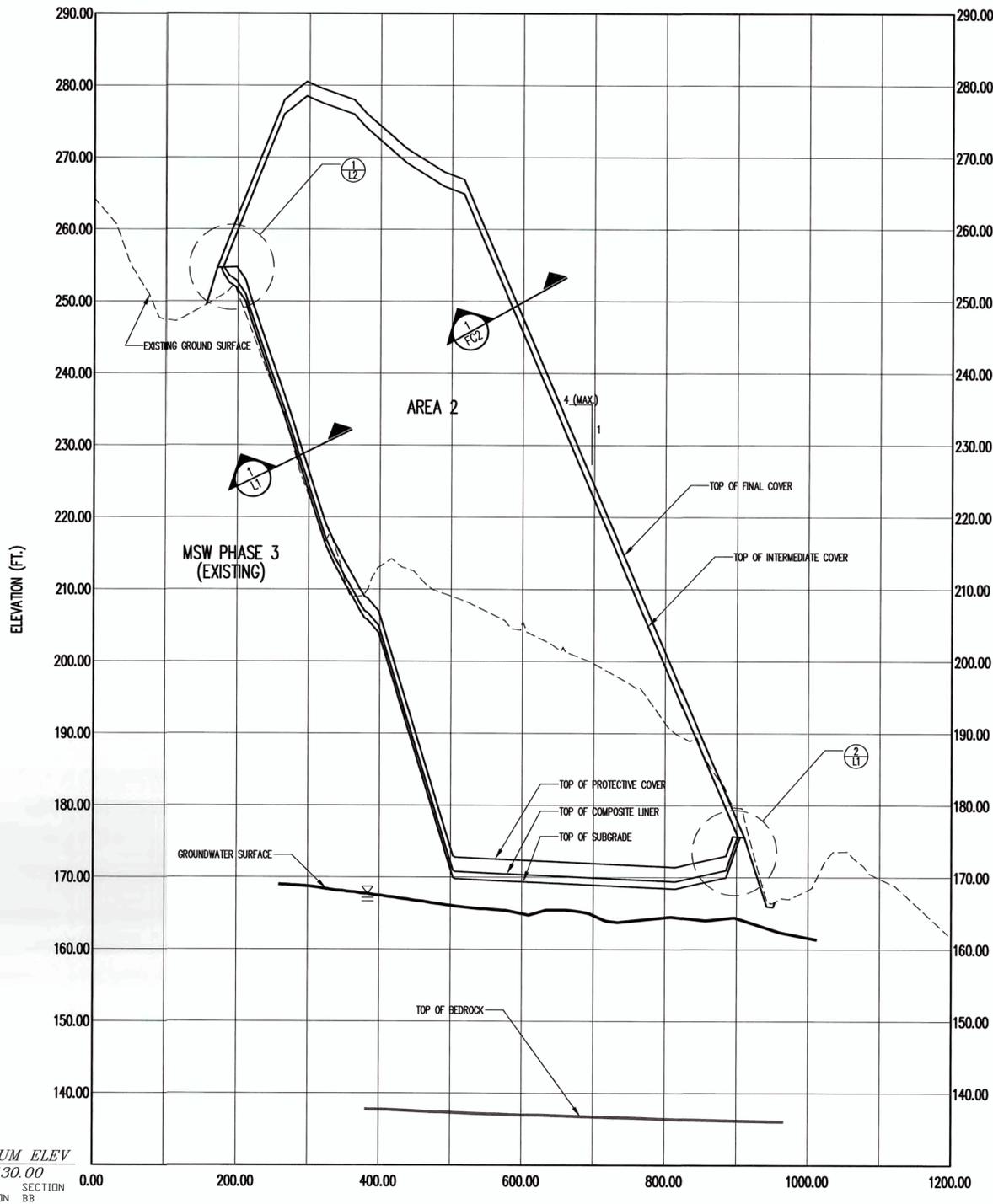
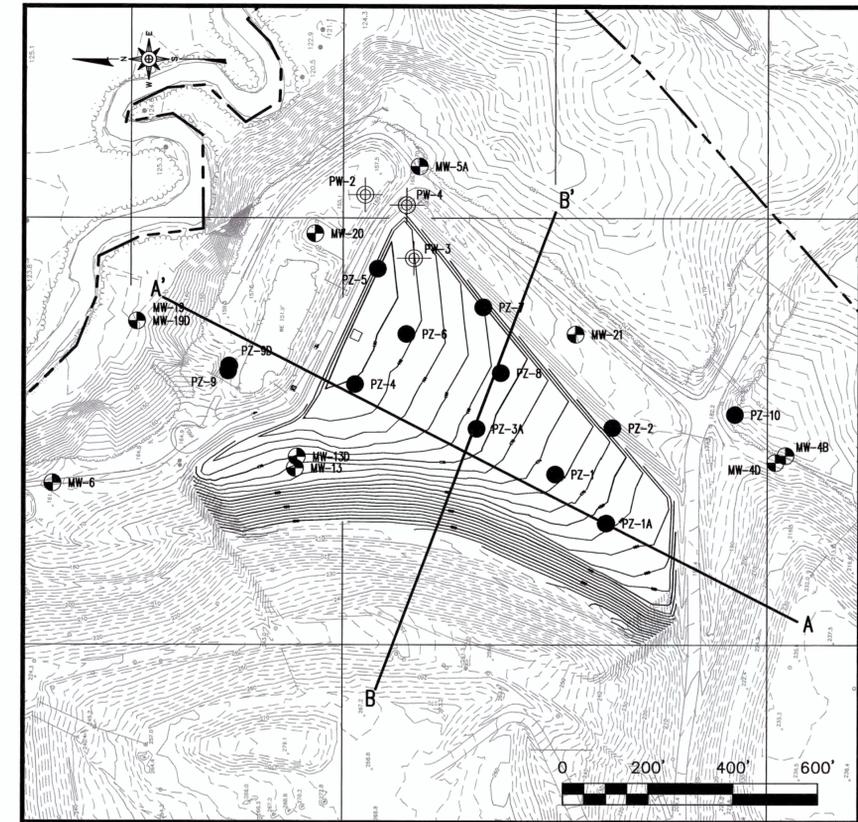
SECTION  
AS SHOWN  
**A  
X1**  
\*VERTICAL EXAGGERATION = 10x

- LEGEND**
- 200 — EXISTING 10' CONTOUR
  - - - - - EXISTING 2' CONTOUR
  - 150 — PROPOSED 10' CONTOUR
  - - - - - PROPOSED 2' CONTOUR
  - — — — — PROPERTY LINE
  - - - - - AREA 2 LIMIT OF LINER
  - MW-8D EXISTING MONITORING WELL
  - ⊙ PW-2 EXISTING PIEZOMETER
  - PZ-4 EXISTING PIEZOMETER

- NOTES**
- CONTOURS SHOWN ON PIGGY BACK AREAS MAY VARY SOMEWHAT DUE TO SETTLEMENT OF UNDERLYING WASTE.
  - GRADES SHOWN FOR AREA 2 REPRESENT TOP OF SUBGRADE.

- REFERENCES**
- OVERALL SITE TOPOGRAPHY PROVIDED BY GEODATA CORPORATION, BASED ON MARCH 8, 2001 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN LANDFILL AREA PROVIDED BY GEODATA CORPORATION BASED ON JUNE 17, 2014 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN BORROW AREAS PROVIDED BY GEODATA CORPORATION BASED ON MAY 20, 2007 AERIAL PHOTOGRAPHY. CELL 1 SUBGRADE BASED ON ASBUILT INFORMATION PROVIDED BY BATEMAN CIVIL SURVEY COMPANY, PC, DATED MAY 21, 2007.





**LEGEND**

— 200 —	EXISTING 10' CONTOUR
- - - - -	EXISTING 2' CONTOUR
— 150 —	PROPOSED 10' CONTOUR
- - - - -	PROPOSED 2' CONTOUR
— — — — —	PROPERTY LINE
- - - - -	AREA 2 LIMIT OF LINER
●	MW-8D EXISTING MONITORING WELL
⊕	PW-2 EXISTING PIEZOMETER
●	PZ-4 EXISTING PIEZOMETER

- NOTES**
1. CONTOURS SHOWN ON PIGGY BACK AREAS MAY VARY SOMEWHAT DUE TO SETTLEMENT OF UNDERLYING WASTE.
  2. GRADES SHOWN FOR AREA 2 REPRESENT TOP OF SUBGRADE.

**REFERENCES**

1. OVERALL SITE TOPOGRAPHY PROVIDED BY GEODATA CORPORATION, BASED ON MARCH 6, 2001 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN LANDFILL AREA PROVIDED BY GEODATA CORPORATION BASED ON JUNE 17, 2014 AERIAL PHOTOGRAPHY. TOPOGRAPHY IN BORROW AREAS PROVIDED BY GEODATA CORPORATION BASED ON MAY 20, 2007 AERIAL PHOTOGRAPHY. CELL 1 SUBGRADE BASED ON ASBUILT INFORMATION PROVIDED BY BATEMAN CIVIL SURVEY COMPANY, PC, DATED MAY 21, 2007.

REV.	DATE	DESCRIPTION
1	3/06	REVISED AREA 2 BASE GRADES
2	11/14	REVISED PER DWM COMMENTS

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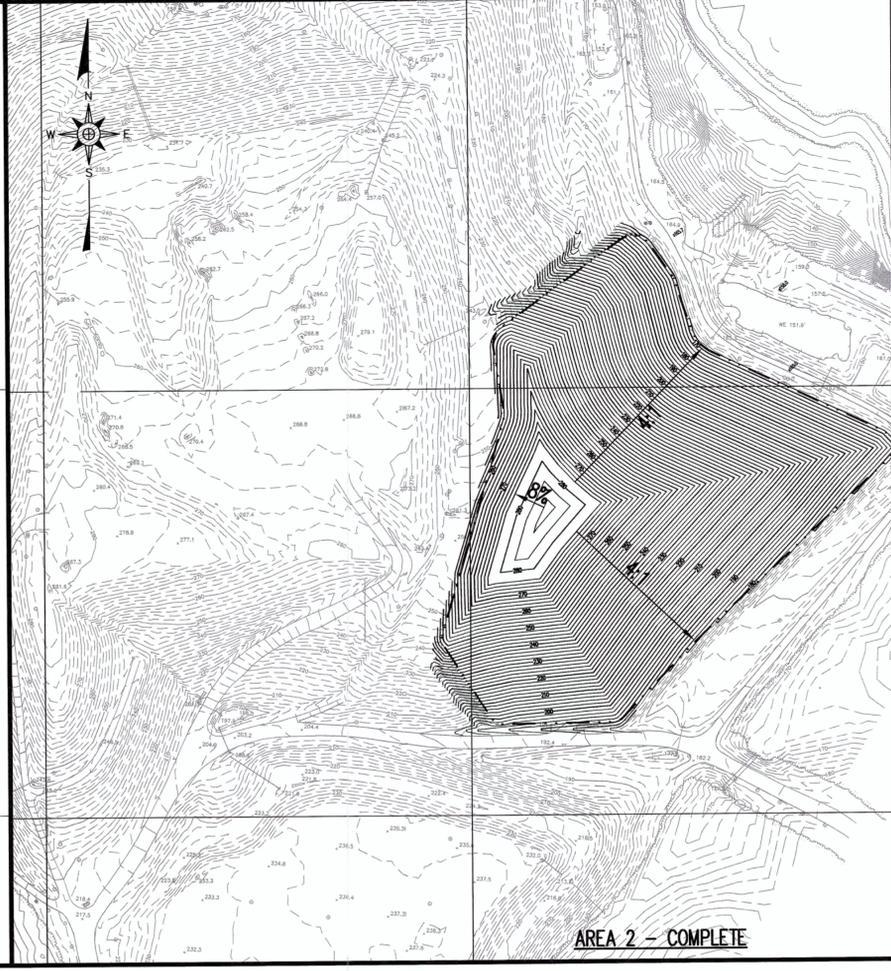
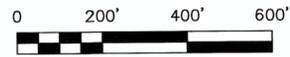
PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
AREA 2  
PERMIT DRAWINGS**

DRAWING TITLE:  
**AREA 2  
ENGINEERING CROSS SECTIONS  
(SHEET 2 OF 2)**

DESIGNED: P.K.S.	PROJECT NO. JOHN-13-4
DRAWN: T.R.S.	SCALE: AS SHOWN
APPROVED: PKS	DATE: NOV 2014
FILENAME: JOHN-D0395B	DRAWING NUMBER: 
SHEET NUMBER: <b>22</b>	DRAWING NUMBER: <b>X2</b>



AREA 2 - CELL 2



AREA 2 - COMPLETE



PREPARED FOR:  
**JOHNSTON COUNTY  
 NORTH CAROLINA  
 DEPARTMENT OF  
 SOLID WASTE SERVICES**

PREPARED BY:  
 NC LIC. NO. C-0828 (ENGINEERING)  
**SMITH+  
 GARDNER**  
 ENGINEERS  
 14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



REV.	DATE	DESCRIPTION
1	12/4/13	NEW PROPERTY SURVEY
2	11/14	REVISED PER DWM COMMENTS

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PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
 AREA 2  
 PERMIT DRAWINGS**

DRAWING TITLE:  
**C&D LANDFILL  
 PHASING PLAN**

DESIGNED: P.K.S.	PROJECT NO: JOHN-13-4
DRAWN: T.R.S.	SCALE: AS SHOWN
APPROVED: <i>PKS</i>	DATE: NOV 2014
FILENAME: JOHN-D0396B	
SHEET NUMBER: <b>23</b>	DRAWING NUMBER: <b>P1</b>



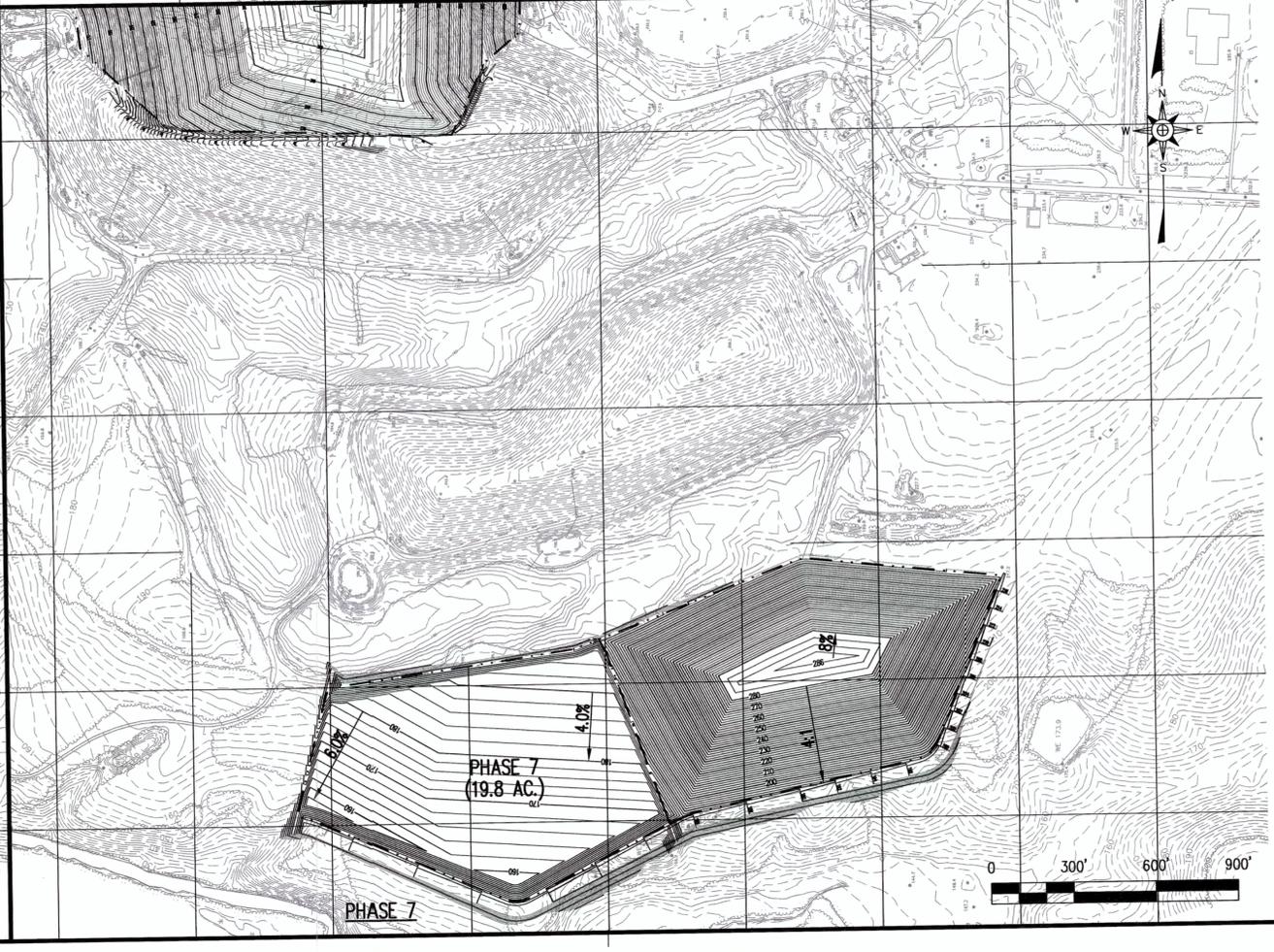
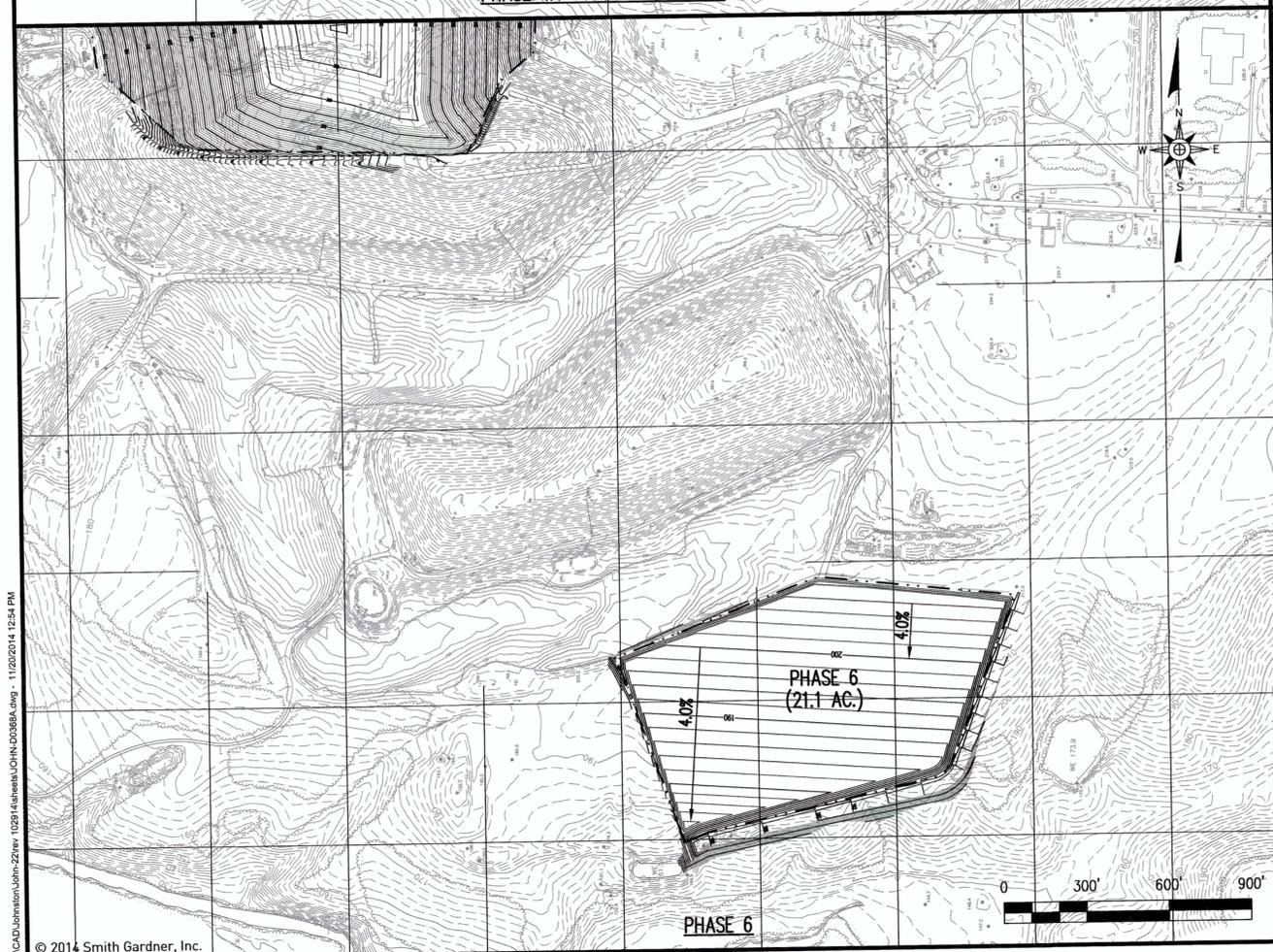
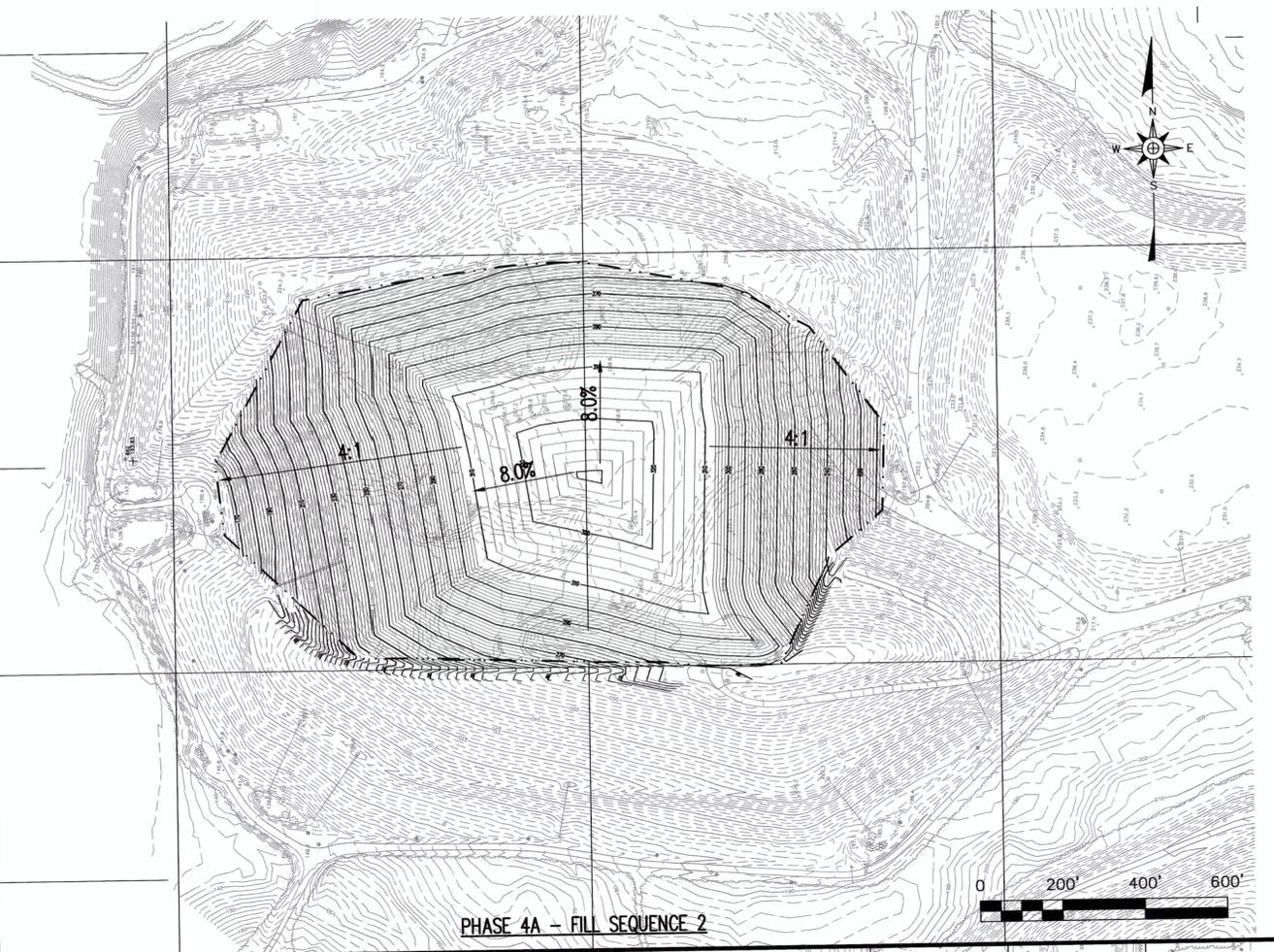
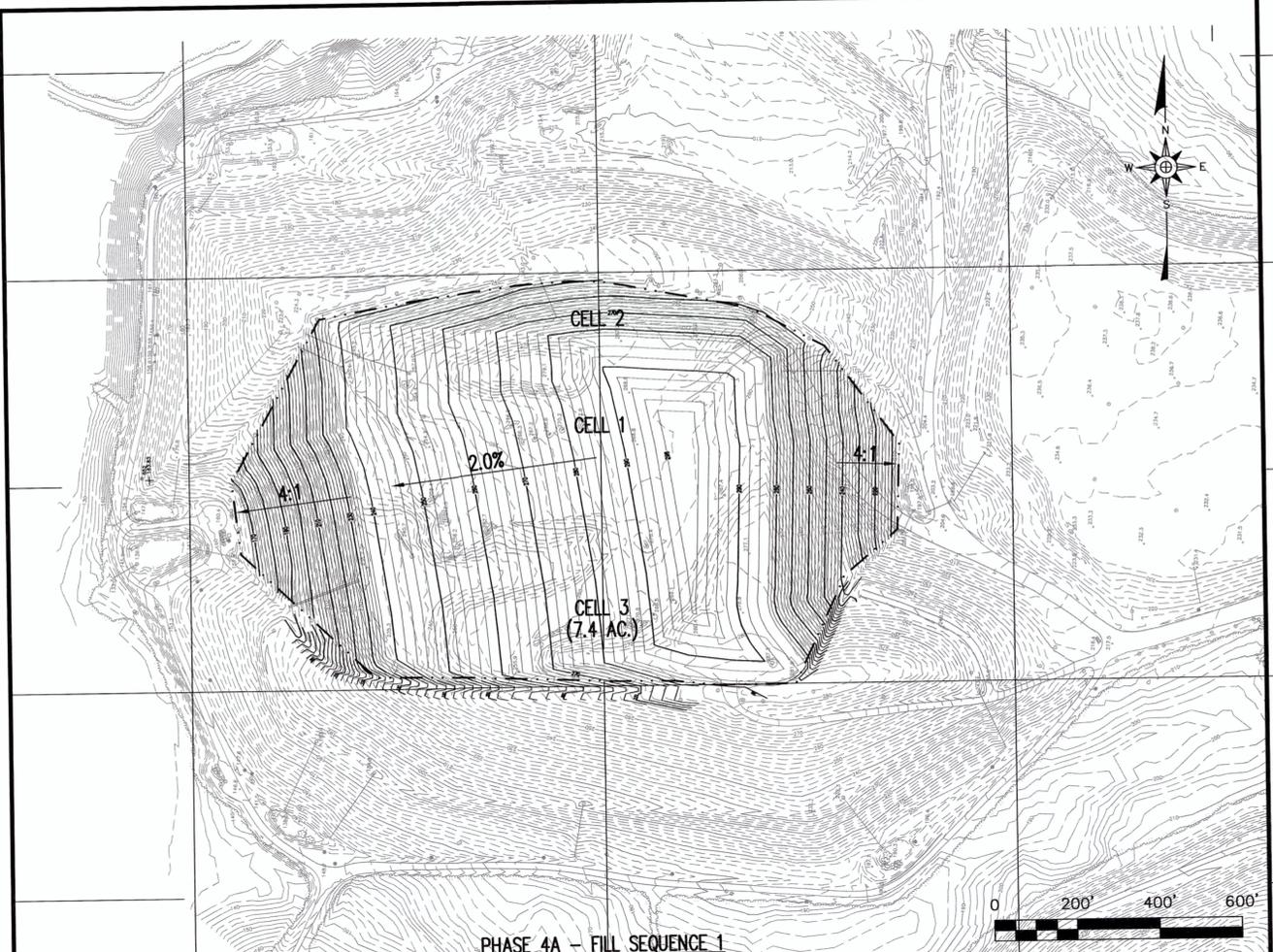
REV.	DATE	DESCRIPTION
1	12/4/13	NEW PROPERTY SURVEY
2	11/14	REVISED PER DWM COMMENTS

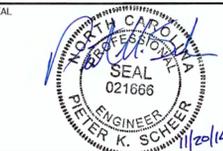
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PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
 AREA 2  
 PERMIT DRAWINGS**

DRAWING TITLE:  
**MSW LANDFILL  
 PHASING PLAN  
 (SHEET 1 OF 2)**

DESIGNED:	P.K.S.	PROJECT NO.	JOHN-13-4
DRAWN:	T.R.S.	SCALE:	AS SHOWN
APPROVED:	<i>PKS</i>	DATE:	NOV 2014
FILENAME:	JOHN-D0368A	SHEET NUMBER:	24
		DRAWING NUMBER:	P2





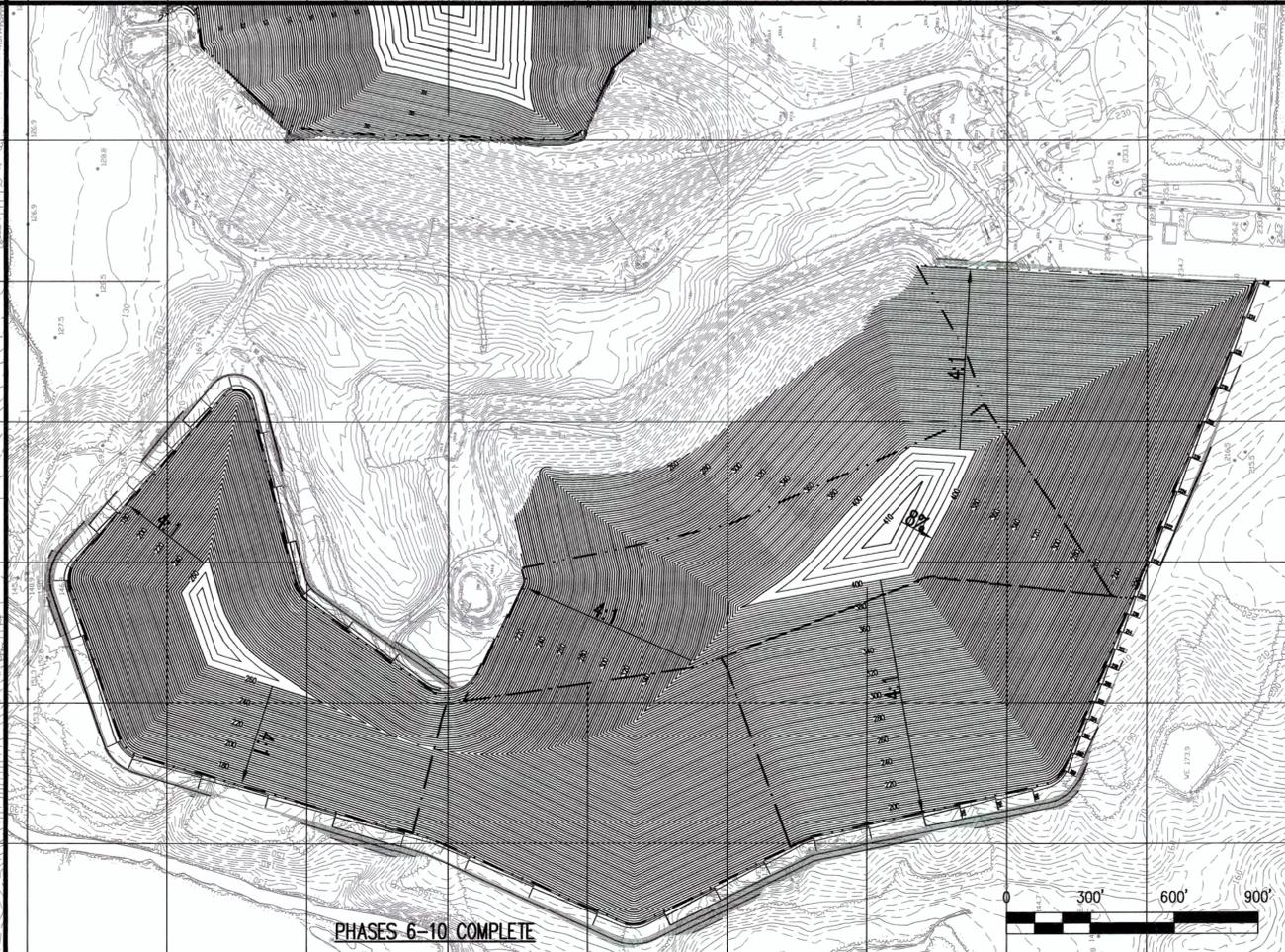
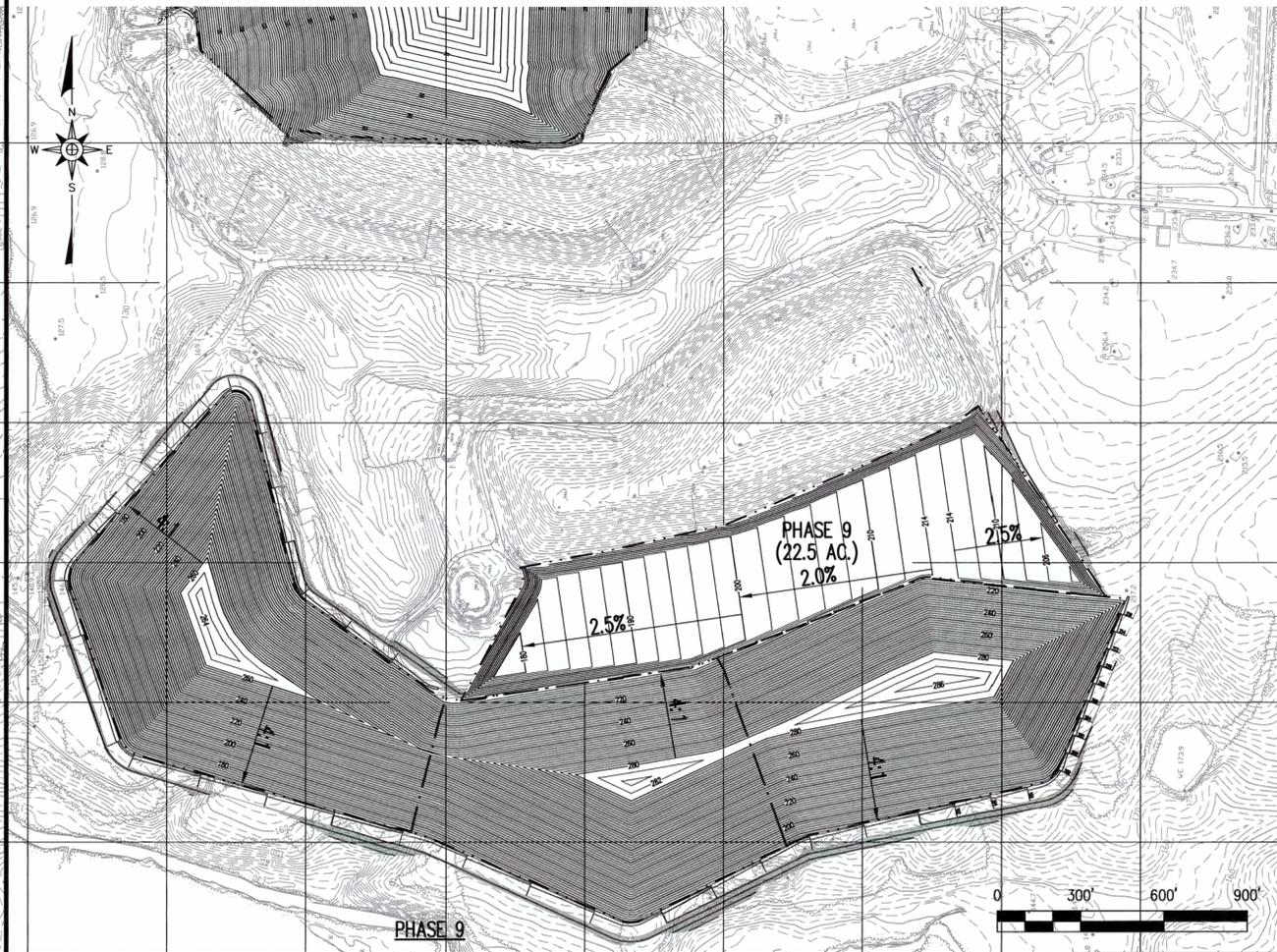
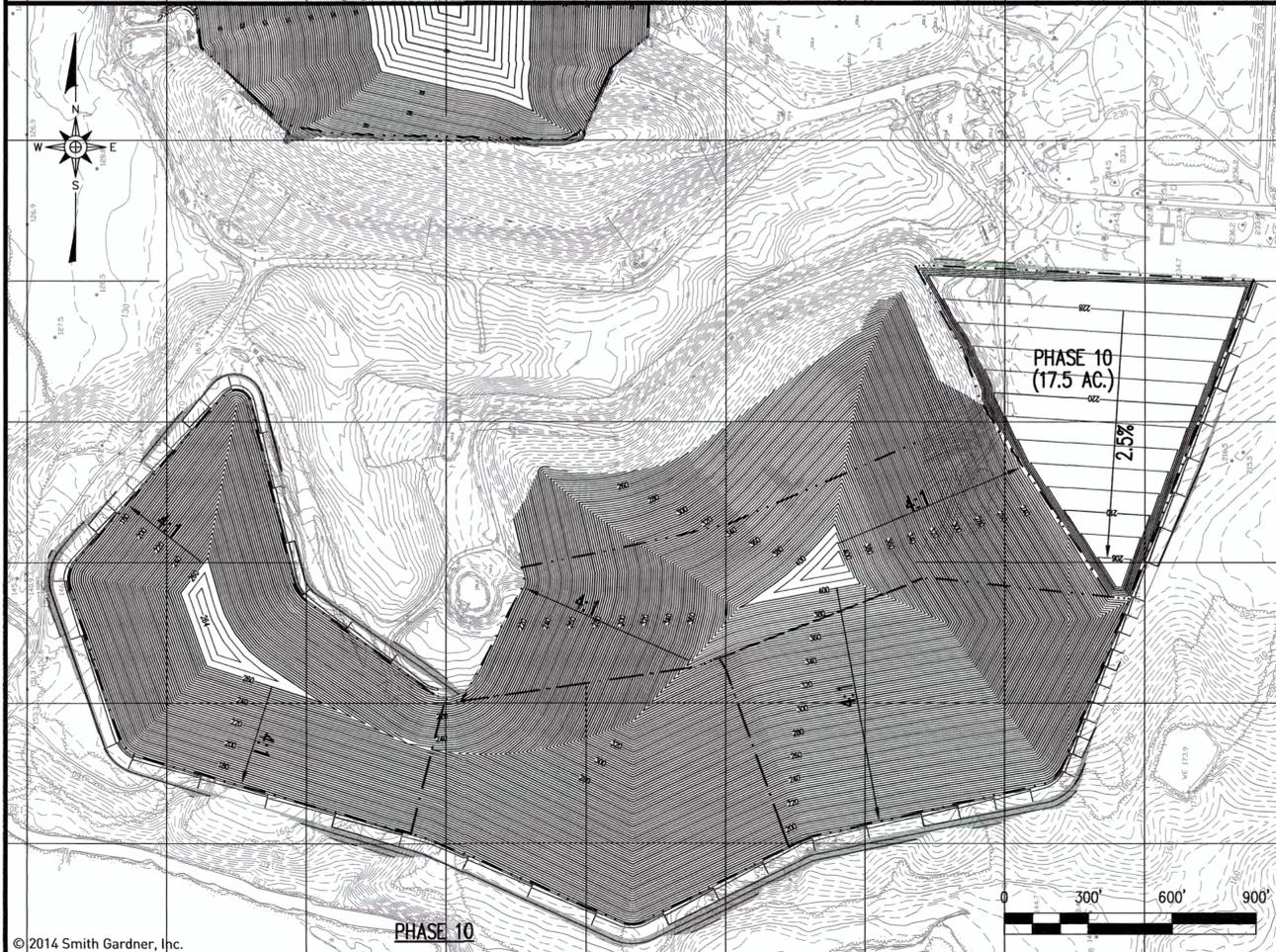
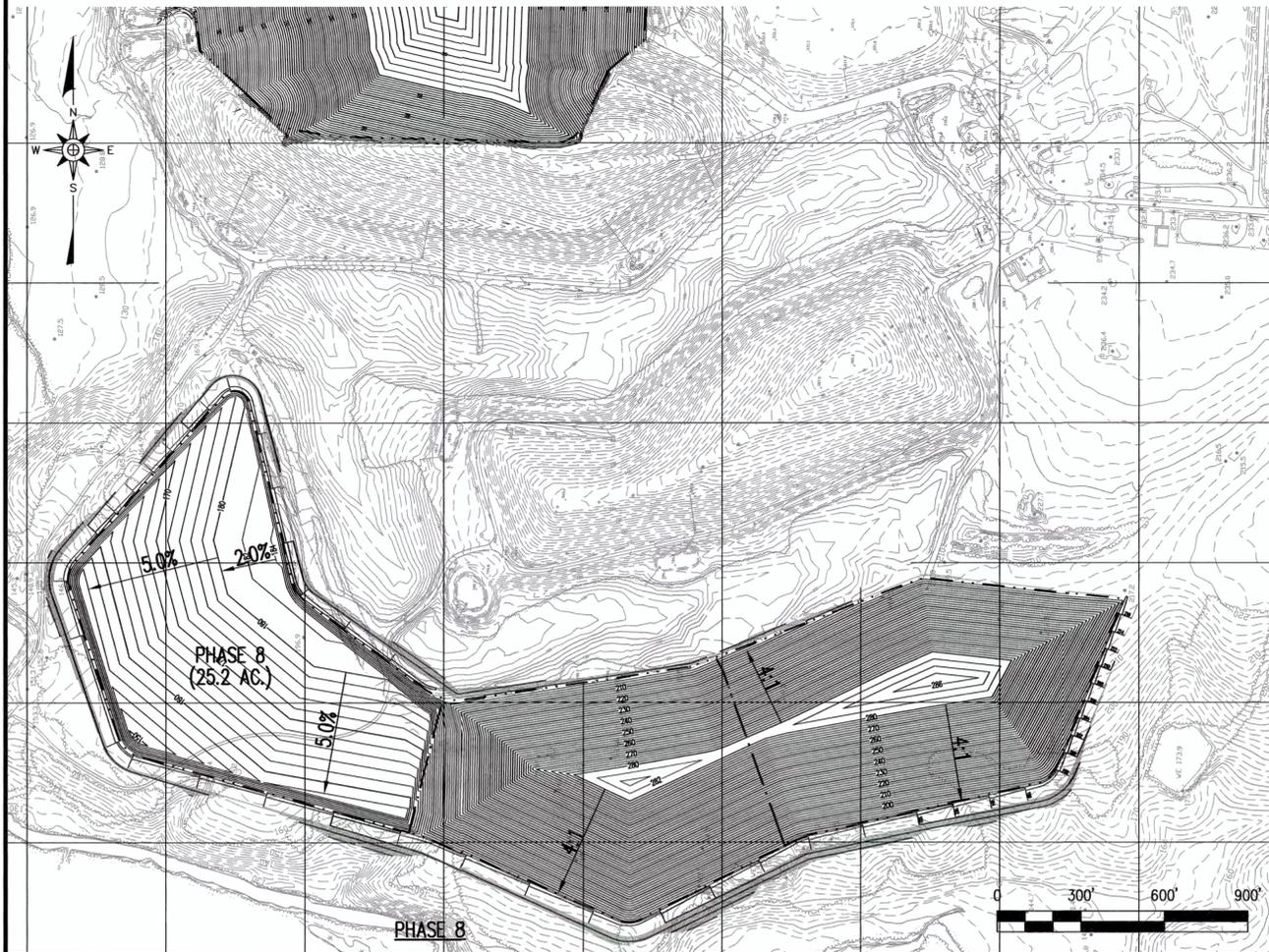
REV.	DATE	DESCRIPTION
1	12/4/13	NEW PROPERTY SURVEY
2	11/14	REVISED PER DWM COMMENTS

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PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
 AREA 2  
 PERMIT DRAWINGS**

DRAWING TITLE:  
**MSW LANDFILL  
 PHASING PLAN  
 (SHEET 2 OF 2)**

DESIGNED:	P.K.S.	PROJECT NO.:	JOHN-13-4
DRAWN:	T.R.S.	SCALE:	AS SHOWN
APPROVED:	<i>PKS</i>	DATE:	NOV 2014
FILENAME:	JOHN-D0369A	SHEET NUMBER:	25
DRAWING NUMBER:			P3



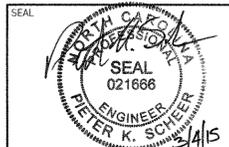
PREPARED FOR:

JOHNSTON COUNTY  
NORTH CAROLINA  
DEPARTMENT OF  
SOLID WASTE SERVICES

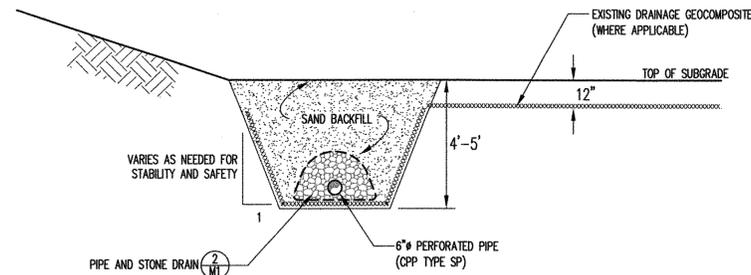
PREPARED BY:  
NC LIC. NO. C-0828 (ENGINEERING)

**SMITH+  
GARDNER**  
ENGINEERS

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

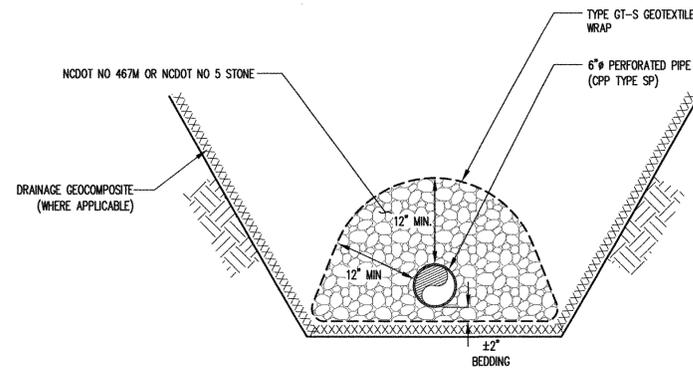


SEAL



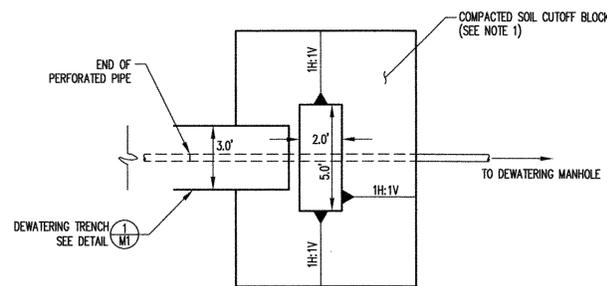
DEWATERING TRENCH

DETAIL 1  
NOT TO SCALE M1

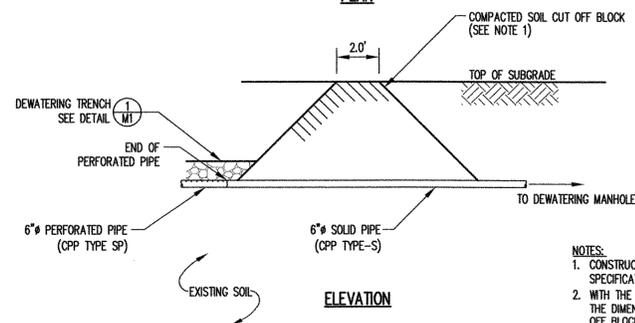


PIPE AND STONE DRAIN

DETAIL 2  
NOT TO SCALE M1



PLAN

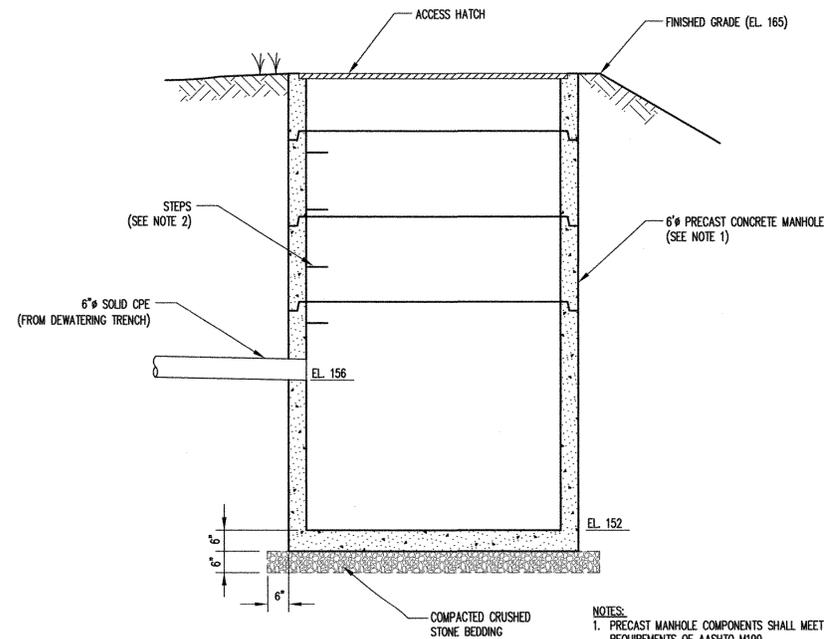


ELEVATION

DEWATERING TRENCH TERMINATION

DETAIL 3  
NOT TO SCALE M1

- NOTES:
1. CONSTRUCT SOIL CUT OFF BLOCK TO MEET THE SPECIFICATIONS OF THE COMPACTED SOIL LINER.
  2. WITH THE DESIGN ENGINEER'S PRIOR APPROVAL, THE DIMENSIONS AND SLOPES OF THE CLAY CUT OFF BLOCK MAY BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS.



DEWATERING MANHOLE

DETAIL 4  
NOT TO SCALE M1

- NOTES:
1. PRECAST MANHOLE COMPONENTS SHALL MEET REQUIREMENTS OF AASHTO M199.
  2. RISERS AND GRADE RINGS SHALL BE ASSEMBLED SO ALL STEPS WILL HAVE A 16" SPACING THE FULL HEIGHT OF MANHOLE. START FIRST STEP 6" BELOW TOP.
  3. MANHOLE IS OUTFITTED WITH PUMP AND SCH 80 PVC FORCE MAIN TO AREA 2 SIDE RISER. IN THE FUTURE, THE COUNTY MAY MODIFY THE PUMP AND FORCE MAIN TO PUMP DIRECTLY INTO THE AREA 2 LEACHATE FORCE MAIN.

REV.	DATE	DESCRIPTION
3	2/15	REVISED PER DWM COMMENTS

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PROJECT TITLE:  
**JOHNSTON COUNTY C&D LANDFILL  
AREA 2  
PERMIT DRAWINGS**

DRAWING TITLE:  
**MISCELLANEOUS DETAILS**

DESIGNED:	PROJECT NO.
P.K.S.	JOHN-13-4
DRAWN:	SCALE:
T.R.S.	AS SHOWN
APPROVED:	DATE:
P.K.S.	FEB 2015
FILENAME:	JOHN-D0694
SHEET NUMBER:	DRAWING NUMBER:
26	M1