SIEVE ANALYSIS

(ASTM C136-96a)

Company Name: Birmingham Coal & Coke
Location: Gooden Creek # 2 Mine
Sample I.D.: PR-1
Description: Foundation

Sample Date: 3/12/13
Analyzed By: KF
Date Analyzed: 3/25/13
Requested By: Z.B.W

Weight of Oven Dry Sample (W): **1141.0 Grams**

Sieve No.	Sieve + Sample Weight	Sieve Weight	Sample Weight Retained	Percent of Total Retained	Cumulative Weight Percent	Percent Retained	Percent Finer
1"	790.0	790.0	0.0	0.0	0.0	0.0	100.0
3/4"	819.0	794.0	25.0	2.2	2.2	2.2	97.8
1/2"	824.0	776.0	48.0	4.2	6.5	6.5	93.5
4	863.0	760.0	103.0	9.1	15.6	15.6	84.4
10	783.0	722.0	61.0	5.4	21.0	21.0	79.0
40	722.0	557.0	165.0	14.6	35.5	35.5	64.5
200	1085.0	508.0	577.0	51.0	86.6	86.6	13.4
Pan	632.0	480.0	152.0	13.4	100.0	100.0	0.0
		Total Weight (W1):	1131.0				

SOIL CLASSIFICATION

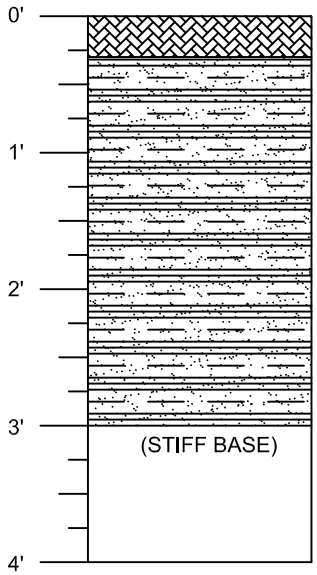
Unified System (ASTM D-2487)

Liquid Limit: 25.1
Plastic Limit: 21.6
Plasticity Index: 3.5

Soil Classification: **SM**

Coarse Grained
Silty Sand

Effective Cohesion: 1.8750 psi
Total Cohesion: 6.528 psi
Permeability: 12.30 ft/yr
Maximum Dry Density: 115.0 pcf
Optimum Moisture: 14.9 %
Effective Cohesion: 270.0 psf
Angle of Internal Friction: 33.02 degrees
Mass Unit Weight: 132.14 pcf



INTERVAL:	DESCRIPTION:
0' - 0.3'	Surface Material
0.3' - 3.0'	Silty Sand

SAMPLE TAKEN BY: KEVIN FARLEY
SAMPLE DATE: 03/12/2013

BIRMINGHAM COAL & COKE, INC
GOODEN CREEK NO. 2 MINE

DRAWN BY: Z.B.W.	DATE: 04/05/2013	DS1P 62+60 FOUNDATION INVESTIGATION
APPROVED BY: J.D.M.	DATE: 04/05/2013	
SCALE: N/A	SHEET: 1 OF 1	COLUMN VIEW

DSM
DESIGN GROUP, LLC
ENGINEERING / SURVEYING
1400 VIKING DRIVE
JASPER, ALABAMA 35501
TELEPHONE: (205) 221-6262

SIEVE ANALYSIS

(ASTM C136-96a)

Company Name: Birmingham Coal & Coke
Location: Gooden Creek # 2 Mine
Sample I.D.: PR-1
Description: Embankment

Sample Date: 3/12/13
Analyzed By: KF
Date Analyzed: 3/25/13
Requested By: Z.B.W

Weight of Oven Dry Sample (W): **1048.0 Grams**

Sieve No.	Sieve + Sample Weight	Sieve Weight	Sample Weight Retained	Percent of Total Retained	Cumulative Weight Percent	Percent Retained	Percent Finer
1"	856.0	790.0	66.0	6.3	6.3	6.3	93.7
3/4"	837.0	794.0	43.0	4.1	10.5	10.5	89.5
1/2"	862.0	776.0	86.0	8.3	18.7	18.7	81.3
4	863.0	760.0	103.0	9.9	28.6	28.6	71.4
10	849.0	722.0	127.0	12.2	40.8	40.8	59.2
40	795.0	557.0	238.0	22.8	63.6	63.6	36.4
200	735.0	508.0	227.0	21.8	85.4	85.4	14.6
Pan	632.0	480.0	152.0	14.6	100.0	100.0	0.0
		Total Weight (W1):	1042.0				

SOIL CLASSIFICATION

Unified System (ASTM D-2487)

Liquid Limit: 25.1
Plastic Limit: 21.8
Plasticity Index: 6.4

Soil Classification: **SM-SC**

Coarse Grained
Silty, Clayey Sand

Effective Cohesion: 1.2500 psi
Total Cohesion: 1.940 psi
Permeability: 1.40 ft/yr
Maximum Dry Density: 120.0 pcf
Optimum Moisture: 13.3 %
Effective Cohesion: 180.0 psf
Angle of Internal Friction: 30.54 degrees
Mass Unit Weight: 135.96 pcf

STANDARD PROCTOR COMPACTION TEST (ASTM D-698)

Company Name: Birmingham Coal & Coke Co., Inc
Location: Gooden Crek #2
Sample I.D.: PR-1
Description: Embankment

Sample Date: 3/12/2013
Analyzed By: KF
Date Analyzed: 03/25/13
Requested By: Z.B.W.

Weight of Mold (W1): 4,260 Grams

Test No.	Wt. of Mold & Wet Soil (w2) grams	Wt. of wet Soil (w2-w1) grams	Wet Unit Wt. (w2-w1)/C lb/cu-ft	Moisture Content (w) %	Dry Unit Weight lb/cu-ft
1	6,120	1,860	123.0	5.2	117.0
2	6,223	1,963	129.8	7.1	121.2
3	6,316	2,056	136.0	10.6	123.0
4	6,265	2,005	132.6	11.5	118.9
5	6,259	1,999	132.2	14.0	115.9

Constant C = 15.12 (conversion factor)

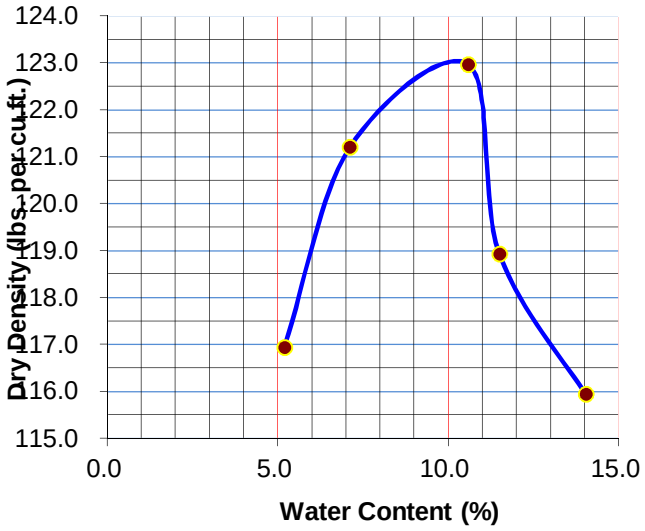
MOISTURE CONTENT DETERMINATION

Test No.	1	2	3	4	5	6	7
Can No.	1	2	3	4	5		
Wt. of Can, a, (g)	21.2	21.4	21.2	21.5	21.2		
Wt. of Can + Wet Soil, b, (g)	50.2	50.3	53.0	40.8	57.8		
Wt. of Can + Dry Soil, c, (g)	48.8	48.4	50.0	38.8	53.3		
* Moisture Content, w, (%)	5.2	7.1	10.6	11.5	14.0		

* Moisture Content, w = (b - c)/(c - a) x 100

Maximum Dry Density (Lb/Cu-Ft) 123.0
Optimum Moisture Content (%): 10.6

Birmingham Coal & Coke Co., Inc
Gooden Crek #2 , PR-1, Embankment
Moisture Density Relationship
(Proctor Method)



ASTM D-698 Method C	Water Content %	Specific Gravity	%> No. 4	%< No. 200	LL %	PL %	PI %
			71.40	85.40	28.2	21.8	6.4

Sample Description, Classification and Location	Sample No.:	PR-1 Embankment
Coarse Grained Silty Clayey Sand (SM-SC)	Optimum Moisture Content=	10.6
	Maximum Dry Density =	123.0