Testing Engineers & Consultants, Inc.

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(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

soil borings soil evaluation foundation investigation instrumentation

SOIL BORING LOG

BORING NO.: 1 **JOB NO.:** 48364 **PROJECT NAME:** Great Lakes National Cemetary
CLIENT: URS Group, Inc. Belford Road West of Fagan Road
Type of Rig: All-Terrain Vehicle **Location:** Holly Township, Michigan
Drilling Method: Solid Stem Augers **Drilled By:** I. Mickle
Ground Surface Elevation: 929 **Started:** June 7, 2007 **Completed:** June 7, 2007

DEPTH IN FEET	SAMPLE TYPE	N	STRATA CHANGE	SOIL CLASSIFICATION	W	d	qu
				Moist Dark Brown Clayey TOPSOIL (4")			
2.5	LS	3 5 7		Firm Moist Brown CLAY With Some Silt, Trace Of Gravel & Dark Gray Layer	15.9	122	4780
5	LS	3 5 7	4.5	Stiff Moist Brown Oxidized CLAY With Some Silt & Trace Of Gravel	15.3	130	7420
7.5	LS	6 10 15			11.8	142	8570
10	LS	9 10 15			10.4	137	11370
12.5							
15	LS	8 12 18			11.9	137	12110
17.5			17	Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel			
20	LS	4 7 11			13.8	133	4530
22.5			22	Medium Compact Wet Gray Fine To Medium SAND			
25	LS	8 9 11	25		9.9	134	
				End of Boring			

"N" - Standard Penetration Resistance
SS - 2" O.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf

WATER ENCOUNTERED 27'0"
AT COMPLETION 18'6"
Boring No. 1

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soil borings soil evaluation foundation investigation instrumentation

SOIL BORING LOG

BORING NO.: 2 **JOB NO.:** 48364 **PROJECT NAME:** Great Lakes National Cemetary
CLIENT: URS Group, Inc. Belford Road West of Fagan Road
Type of Rig: All-Terrain Vehicle **Location:** Holly Township, Michigan
Drilling Method: Solid Stem Augers **Drilled By:** I. Mickle
Ground Surface Elevation: 927 **Started:** June 7, 2007 **Completed:** June 7, 2007

DEPTH IN FEET	SAMPLE TYPE	N	STRATA CHANGE	SOIL CLASSIFICATION	W	d	qu
				Moist Dark Brown Clayey TOPSOIL (4")			
2.5	LS	3 5 4	3	Firm Moist Brown CLAY With Some Silt & Trace Of Gravel	13.3	102	
5	LS	4 6 7	5.5	Medium Compact Moist Brown Clayey SAND With Trace Of Gravel & Clay Layers	12.7	118	
7.5	LS	5 9 12		Stiff Moist Brown Oxidized CLAY With Some Silt & Trace Of Gravel	17.5	126	9890
10	LS	5 10 15			11.4	139	9150
12.5							
15	LS	6 9 12			11.6	136	8320
17.5			17	Firm Moist Gray CLAY With Some Silt & Trace Of Gravel			
20	LS	5 6 9			13.8	130	3540
22.5			22	Medium Compact Wet Gray Fine SAND With Occasional Clay Layer			
25	LS	4 7 9	25		12.8	127	
				End of Boring			

"N" - Standard Penetration Resistance
SS - 2" O.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf

WATER ENCOUNTERED 22'0"
AT COMPLETION 20'0"
Boring No. 2

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soil borings soil evaluation foundation investigation instrumentation

SOIL BORING LOG

BORING NO.: 3 **JOB NO.:** 48364 **PROJECT NAME:** Great Lakes National Cemetary
CLIENT: URS Group, Inc. Belford Road West of Fagan Road
Type of Rig: All-Terrain Vehicle **Location:** Holly Township, Michigan
Drilling Method: Solid Stem Augers **Drilled By:** I. Mickle
Ground Surface Elevation: 929 **Started:** June 7, 2007 **Completed:** June 7, 2007

DEPTH IN FEET	SAMPLE TYPE	N	STRATA CHANGE	SOIL CLASSIFICATION	W	d	qu
				Moist Dark Brown Clayey TOPSOIL (2")			
2.5	LS	9 10 8	3	Stiff Moist Brown Clay With Some Silt & Trace Of Gravel-FILL	12.3	105	
5	LS	2 3 4	5.5	Plastic Moist Brown Clay With Some Silt & Trace Of Gravel-FILL	15.1	102	
7.5	LS	9 9 9		Stiff Moist Brown CLAY With Some Silt, Trace Of Sand & Gravel	12.0	137	5110
10	LS	6 9 15			10.9	145	8080
12.5							
15	LS	6 9 13			13.5	143	8980
17.5			17	Firm Moist Gray CLAY With Some Silt, Trace Of Sand, Gravel & Very Moist Seams			
20	LS	4 6 7	22		15.4	137	2720
22.5				Stiff Moist Gray CLAY With Some Silt, Trace Of Sand, Gravel & Very Moist Sand Seams			
25	LS	4 7 10	25		12.5	139	4200
				End of Boring			

"N" - Standard Penetration Resistance
SS - 2" O.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf

WATER ENCOUNTERED None
AT COMPLETION None
Boring No. 3

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soil borings soil evaluation foundation investigation instrumentation

SOIL BORING LOG

BORING NO.: 4 **JOB NO.:** 48364 **PROJECT NAME:** Great Lakes National Cemetary
CLIENT: URS Group, Inc. Belford Road West of Fagan Road
Type of Rig: All-Terrain Vehicle **Location:** Holly Township, Michigan
Drilling Method: Solid Stem Augers **Drilled By:** I. Mickle
Ground Surface Elevation: 927 **Started:** June 7, 2007 **Completed:** June 7, 2007

DEPTH IN FEET	SAMPLE TYPE	N	STRATA CHANGE	SOIL CLASSIFICATION	W	d	qu
				Moist Dark Brown Clayey TOPSOIL (3")			
2.5	LS	5 5 6		Firm Moist Brown Clay With Some Silt, Trace Of Gravel & Dark Gray Layer-FILL	11.6	105	
5	LS	2 4 7	5.5		15.6	106	
7.5	LS	4 5 6		Firm Moist Brown Oxidized CLAY With Some Silt & Trace Of Gravel	11.9	132	4780
10	LS	4 6 11	9	Stiff Moist Brown Oxidized CLAY With Some Silt & Trace Of Gravel	11.3	140	10880
12.5							
15	LS	5 11 14			12.3	133	11120
17.5			17	Firm Moist Gray CLAY With Some Silt, Trace Of Gravel & Sand Seams			
20	LS	4 5 8	22		13.9	139	4040
22.5				Firm Moist Gray CLAY With Some Silt, Sand & Trace Of Gravel			
25	LS	3 5 6	25		12.8	139	2230
				End of Boring			

"N" - Standard Penetration Resistance
SS - 2" O.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf

WATER ENCOUNTERED None
AT COMPLETION None
Boring No. 4

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soil borings soil evaluation foundation investigation instrumentation

SOIL BORING LOG

BORING NO.: 5 **JOB NO.:** 48364 **PROJECT NAME:** Great Lakes National Cemetary
CLIENT: URS Group, Inc. Belford Road West of Fagan Road
Type of Rig: All-Terrain Vehicle **Location:** Holly Township, Michigan
Drilling Method: Solid Stem Augers **Drilled By:** I. Mickle
Ground Surface Elevation: 929 **Started:** June 8, 2007 **Completed:** June 8, 2007

DEPTH IN FEET	SAMPLE TYPE	N	STRATA CHANGE	SOIL CLASSIFICATION	W	d	qu
				Crushed STONE (6")			
2.5	LS	13 12 10	2.5	Medium Compact Moist Brown SAND With Some Gravel & Silt	5.5	120	
5	LS	8 11 17		Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	10.9	144	11370
7.5	LS	4 12 18	8		11.7	139	10550
10	LS	4 10 16		Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel	12.3	137	14830
12.5							
15	LS	3 6 10	15		10.0	143	6020
17.5				End of Boring			
20							
22.5							
25							

"N" - Standard Penetration Resistance
SS - 2" O.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf

WATER ENCOUNTERED None
AT COMPLETION None
Boring No. 5

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soil borings soil evaluation foundation investigation instrumentation

SOIL BORING LOG

BORING NO.: 6 **JOB NO.:** 48364 **PROJECT NAME:** Great Lakes National Cemetary
CLIENT: URS Group, Inc. Belford Road West of Fagan Road
Type of Rig: All-Terrain Vehicle **Location:** Holly Township, Michigan
Drilling Method: Solid Stem Augers **Drilled By:** I. Mickle
Ground Surface Elevation: 920 **Started:** June 7, 2007 **Completed:** June 7, 2007

DEPTH IN FEET	SAMPLE TYPE	N	STRATA CHANGE	SOIL CLASSIFICATION	W	d	qu
				Crushed STONE (8")			
2.5	LS	9 16 36	3	Dense Moist Dark Brown Gravelly Silty Sand-Possible Fill	8.1	117	
5	LS	5 7 10	6.5	Medium Compact Moist Dark Brown Clayey SAND With Trace Of Gravel-Poassible Fill	12.3	123	6590
7.5	LS	4 7 11	8	Medium Compact Moist Dark Brown Clayey SAND With Trace Of Gravel & Organics	13.7	109	2880
10	LS	2 3 3	11	Loose Moist Dark Brown Clayey SAND With Trace Of Gravel	24.7	116	
12.5			12.5	Loose Wet Brown Clayey SAND With Trace Of Gravel			
15	LS	5 8 13	15	Stiff Moist Brown CLAY With Some Silt, Trace Of Sand & Gravel	13.6	142	8650
17.5				End of Boring			
20							
22.5							
25							

"N" - Standard Penetration Resistance
SS - 2" O.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf

WATER ENCOUNTERED 11'0"
AT COMPLETION 11'0"
Boring No. 6

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soil borings soil evaluation foundation investigation instrumentation

SOIL BORING LOG

BORING NO.: 7 **JOB NO.:** 48364 **PROJECT NAME:** Great Lakes National Cemetary
CLIENT: URS Group, Inc. Belford Road West of Fagan Road
Type of Rig: All-Terrain Vehicle **Location:** Holly Township, Michigan
Drilling Method: Solid Stem Augers **Drilled By:** I. Mickle
Ground Surface Elevation: 917 **Started:** June 8, 2007 **Completed:** June 8, 2007

DEPTH IN FEET	SAMPLE TYPE	N	STRATA CHANGE	SOIL CLASSIFICATION	W	d	qu
				Moist Dark Brown Clayey TOPSOIL (7")			
2.5	LS	7 5 6	2	Medium Compact Moist Dark Brown Clayey SAND With Trace Of Gravel	9.6	109	
5	LS	5 9 12		Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	12.2	136	10790
7.5	LS	3 8 12		A.B. Note Soil Boring inform. incorrect per R.R. - See SAD-004	10.9	141	5110
10	LS	4 10 15			12.4	137	8240
12.5			12				
15	LS	3 6 8	15	Firm Moist Gray CLAY With Some Silt & Trace Of Gravel	13.7	138	5110
17.5				End of Boring			
20							
22.5							
25							

"N" - Standard Penetration Resistance
SS - 2" O.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf

WATER ENCOUNTERED None
AT COMPLETION None
Boring No. 7

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soil borings soil evaluation foundation investigation instrumentation

SOIL BORING LOG

BORING NO.: 8 **JOB NO.:** 48364 **PROJECT NAME:** Great Lakes National Cemetary
CLIENT: URS Group, Inc. Belford Road West of Fagan Road
Type of Rig: All-Terrain Vehicle **Location:** Holly Township, Michigan
Drilling Method: Solid Stem Augers **Drilled By:** I. Mickle
Ground Surface Elevation: 912 **Started:** June 8, 2007 **Completed:** June 8, 2007

DEPTH IN FEET	SAMPLE TYPE	N	STRATA CHANGE	SOIL CLASSIFICATION	W	d	qu
			1.2	Moist Dark Brown Clayey TOPSOIL			
2.5	LS	3 6 9	3	Firm Moist Brown Oxidized CLAY With Some Silt & Trace Of Gravel	20.5	124	7330
5	LS	9 11 14		Stiff Moist Brown Oxidized CLAY With Some Silt & Trace Of Gravel	13.8	142	4530
7.5	LS	9 8 9			10.5	142	3380
10	LS	7 8 9	11		12.9	135	3540
12.5				Firm Moist Gray CLAY With Some Silt, Trace Of Sand & Gravel			
15	LS	3 5 7			14.0	126	2800
17.5			17	Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel			
20	LS	6 9 14			13.7	125	5850
22.5							
25	LS	5 7 10	25		13.7	135	4530
				End of Boring			

"N" - Standard Penetration Resistance
SS - 2" O.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf

WATER ENCOUNTERED None
AT COMPLETION None
Boring No. 8

RECORD DRAWINGS	07/08/2011
Revisions:	Date

AS-BUILT NOTE:

THE INFORMATION REPRESENTED ON THIS PLAN/DETAIL SHEET IS FROM CONTRACTOR'S, RESIDENT ENGINEER'S AS-BUILT PROVIDED INFORMATION ALONG WITH COMPLIED INFORMATION FROM A/E SITE VISIT REPORTS, PHOTOGRAPHS AND INFORMATION AND IS IS NOT DEEMED TO BE ACCURATE NOR COMPLETE BUT AN ASSUMED CONSTRUCTED CONDITION AT THE SITE. SEE CONTRACTOR PROVIDED AS-BUILT DRAWINGS FOR ADDITIONAL INFORMATION.

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Drawing Title: **SOIL BORING DATA -1**

Approved: David C. Starkie, Acting NCA Team Leader

Contracted By: Kevin W. Dix, NCA Project Manager

Project Title: **GREAT LAKES NATIONAL CEMETERY PHASE 1B EXPANSION**

Location: HOLLY, MICHIGAN

Date: FEB. 29, 2008 | Checked: CD | Drawn: JJH

Project Number: 923CM2003

Building Number:

Drawing Number: **B-303**

Dwg. 10 of 173

Office of Construction and Facilities Management

Department of Veterans Affairs

RECORD DRAWINGS

VA FORM 08-6231, OCT 1978