



THE ROBERT B. BALTER COMPANY®
Geotechnical and Geo-environmental Engineers

Taxiway B Hold Apron
Ronald Reagan Washington
National Airport

BORING LOCATION PLAN

Scale: As Shown

Date: January 2018

Project No. 16879-0

Plate 3



The Robert B. Balter Company
 Geotechnical and Environmental Engineers
 Materials and Construction Inspection and Testing
 Telephone No. (410) 363-1555
 www.balterco.com

BORING LOG

BORING B-25

PAGE 1 OF 2

CLIENT CH2M PROJECT NAME Taxiway B Hold Apron Reconstruction
 PROJECT LOCATION DCA PROJECT NUMBER 16879-0: VA

RIG Dietrich D-50 Truck METHOD Hollow Stem Auger SAMPLER: 2-in OD SS HAMMER: 140# FALL: 30" AUTO? Yes

DATE STARTED 3/15/18 COMPLETED 3/15/18

WATER LEVELS

DRILLER Dennis Strawderman HELPER John Rogers

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)
3/15/18		0 ∇		9.7	7.2	0.8

REVIEWED BY Kristopher Crist SITE DELAYS _____

LOCATION As Staked BULK SAMPLES 0.5-2'

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/EL (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS			REMARKS
												PL	LL	PI	
				8.0				SURFACE EL = 8.0 ft							
	S1	1-4-12	16	6.5				Bituminous Concrete (P-401)		11	41	14	20	6	
	S2	8-17-13-12	30	7.5		SM		Moist, Medium Dense, Brown Silty SAND (FILL)		10					
5	S3	5-5-11-8	16	4.0		CL		Moist, Stiff, Gray Sandy CLAY with Gravel (FILL)		12					
	S4	5-6-5-5	11	4.0		CL		Moist, Stiff, Gray Sandy CLAY with Gravel (FILL)		48					
	T1	18 / 24		7.5		ML	∇	Slightly Wet, Stiff, Gray SILT	1.10	46	98	28	39	11	
10				0.5		ML		Slightly Wet, Stiff, Gray SILT							
				9.5				Wet, Loose, Gray Silty SAND							
				-1.5				Wet, Loose, Gray Silty SAND							
15	S5	2-1-5	6			SM		Wet, Loose, Gray Silty SAND							(1)
20	S6	WOH-1-1	2	19.6				Wet, Soft, Gray to Dark Gray Elastic SILT	0.20						
				-11.6				Wet, Soft, Gray to Dark Gray Elastic SILT							
25	S7	1-2-1	3					Wet, Soft, Gray to Dark Gray Elastic SILT							
						MH		Wet, Soft, Gray to Dark Gray Elastic SILT							
30	S8	1-1-1	2					organics (ie, wood fragments) at 29'	0.30	71	87	39	58	19	
								organics (ie, wood fragments) at 29'							
35	S9	WOH-	2					organics (ie, wood fragments) at 29'	0.30						

REMARKS: (1) Drill spoils placed into sealed 55-gallon drums. Boring backfilled with bentonite at completion. Pavement patched with concrete.



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BORING LOG

BORING B-25
 PAGE 2 OF 2

CLIENT CH2M PROJECT NAME Taxiway B Hold Apron Reconstruction
 PROJECT LOCATION DCA PROJECT NUMBER 16879-0: VA

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/EL (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	-#200	ATTERBERGS			REMARKS
												PL	LL	PI	
		1-1		35.5 -27.5				Terminated at 35.5 feet							

REMARKS: (1)Drill spoils placed into sealed 55-gallon drums. Boring backfilled with bentonite at completion. Pavement patched with concrete.

NEW GEOTECH BH LOG 16879-0 DCA TAXIWAY B HOLD APRON.GPJ ROBERT B BALTER.GDT 4/18/18



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SUMMARY OF LABORATORY RESULTS

PAGE 1 OF 1

CLIENT CH2M

PROJECT NAME Taxiway B Hold Apron Reconstruction

PROJECT LOCATION DCA

PROJECT NUMBER 16879-0: VA DATE TESTED _____

Borehole	Depth	Sample Number	Liquid Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	AASHTO Classification	ASTM Classification	Water Content (%)	Max Dry Density (pcf)	Optimum Moisture (%)	CBR Value
B-25	0.0' - 5.5'	BULK	20	6	19	41	A-4	SC-SM	11.0	130.0	8.5	
B-25	2.0' - 4.0'	S-2							9.8			
B-25	4.0' - 6.0'	S-3							12.0			
B-25	6.0' - 8.0'	S-4							48.5			
B-25	8.0' - 10.0'	T-1	39	11	2	98	A-6	ML	45.9			
B-25	29.0' - 30.5'	S-8	58	19	4.75	87	A-7-5	MH	71.3			

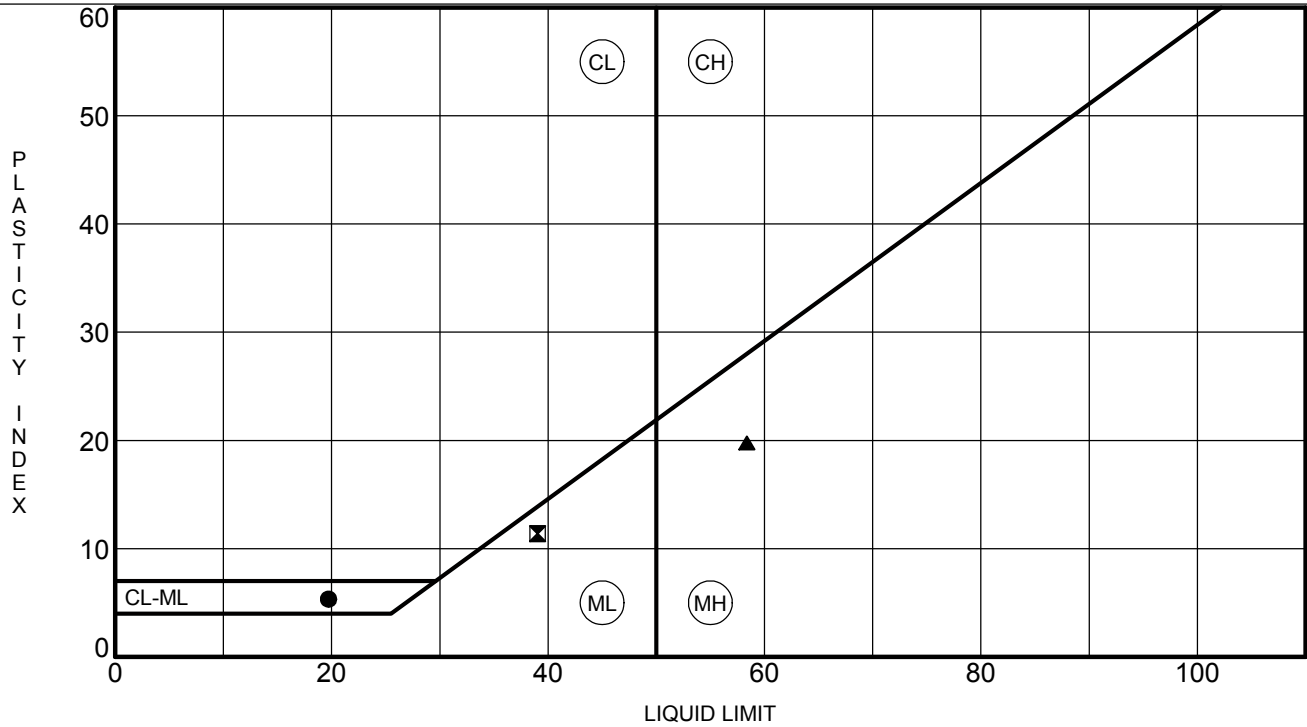


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ATTERBERG LIMITS' RESULTS

TEST METHOD ASTM D4318

CLIENT CH2M PROJECT NAME Taxiway B Hold Apron Reconstruction
 PROJECT LOCATION DCA PROJECT NUMBER 16879-0: VA DATE TESTED _____

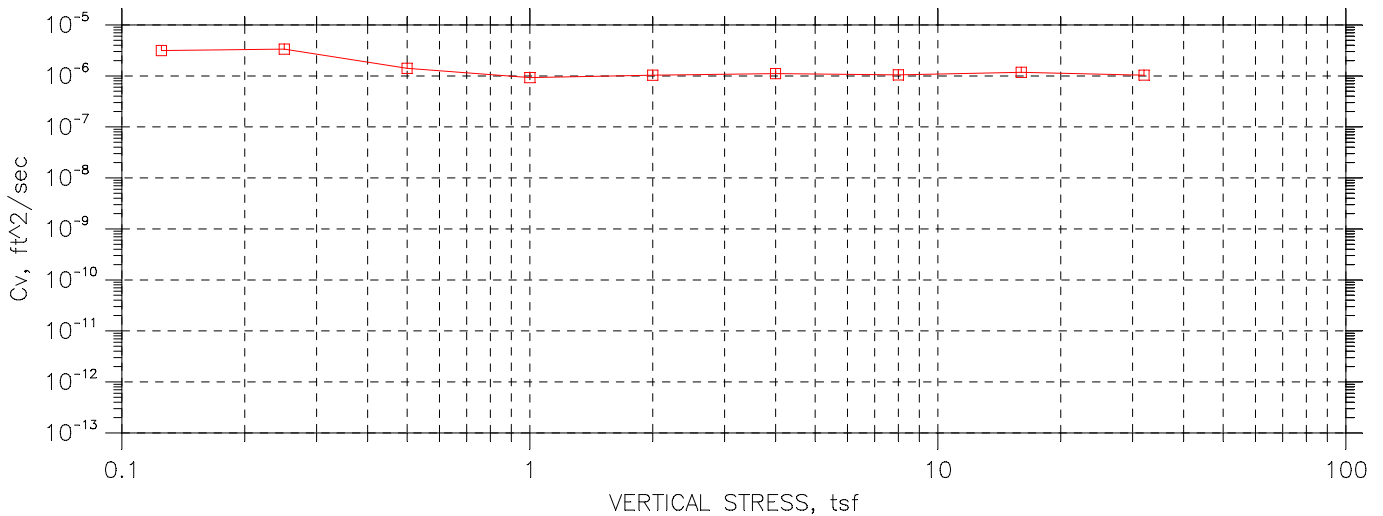
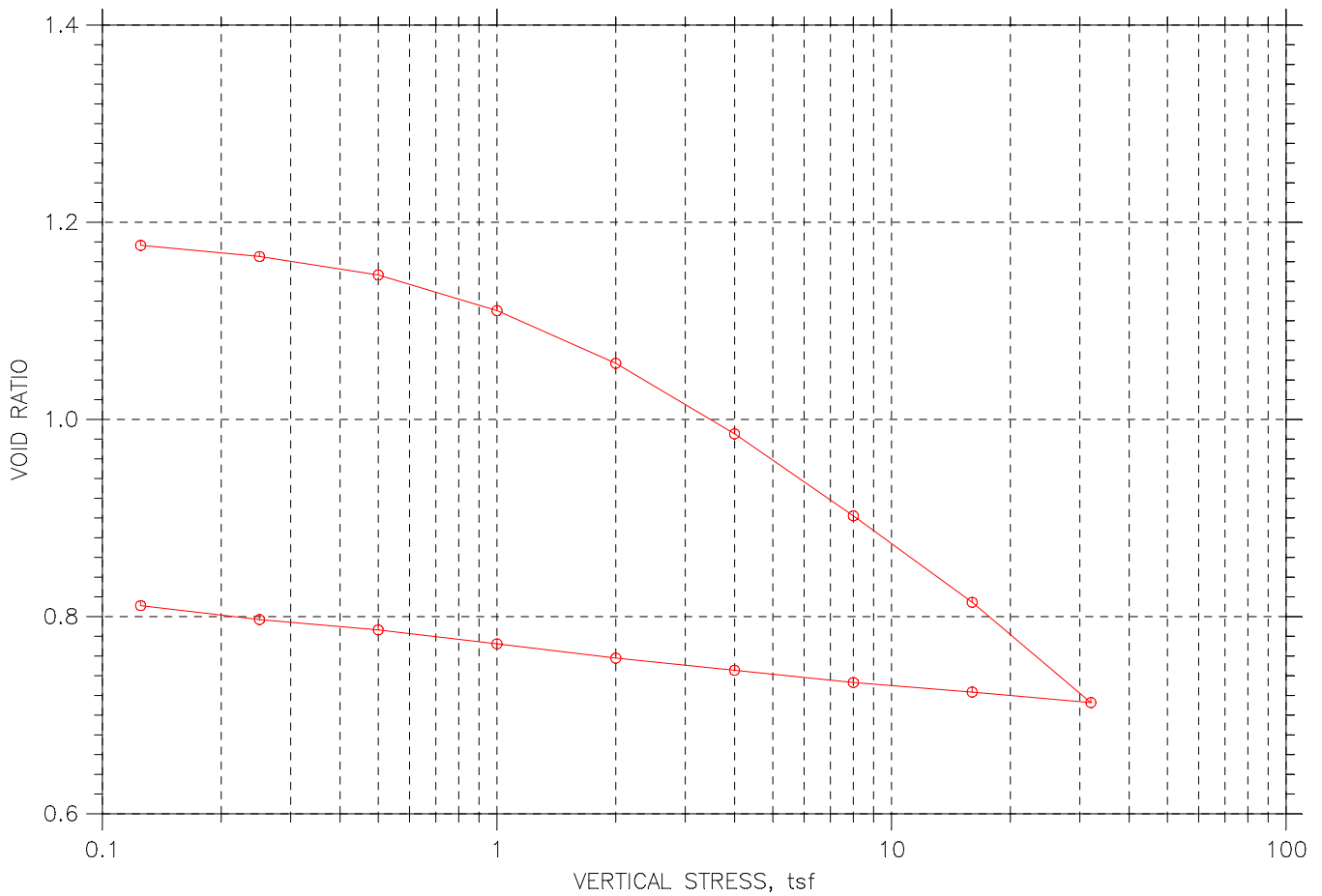



Specimen Identification	LL	PL	PI	Fines	Classification
● B-25, BULK @ 0.0' - 5.5',	20	14	6	41	Dark Yellowish Brown SILTY, CLAYEY SAND(SC-SM) {A-4, GI=0}
⊠ B-25, T-1 @ 8.0' - 10.0',	39	28	11	98	Brown SILT(ML) {A-6, GI=13}
▲ B-25, S-8 @ 29.0' - 30.5',	58	39	19	87	Very Dark Gray ELASTIC SILT(MH) {A-7-5, GI=22}

ATTERBERG ASTM AASHTO 16879-0 DCA TAXIWAY B HOLD APRON.GPJ MTA REDLINE.GDT 3/27/18

CONSOLIDATION TEST DATA

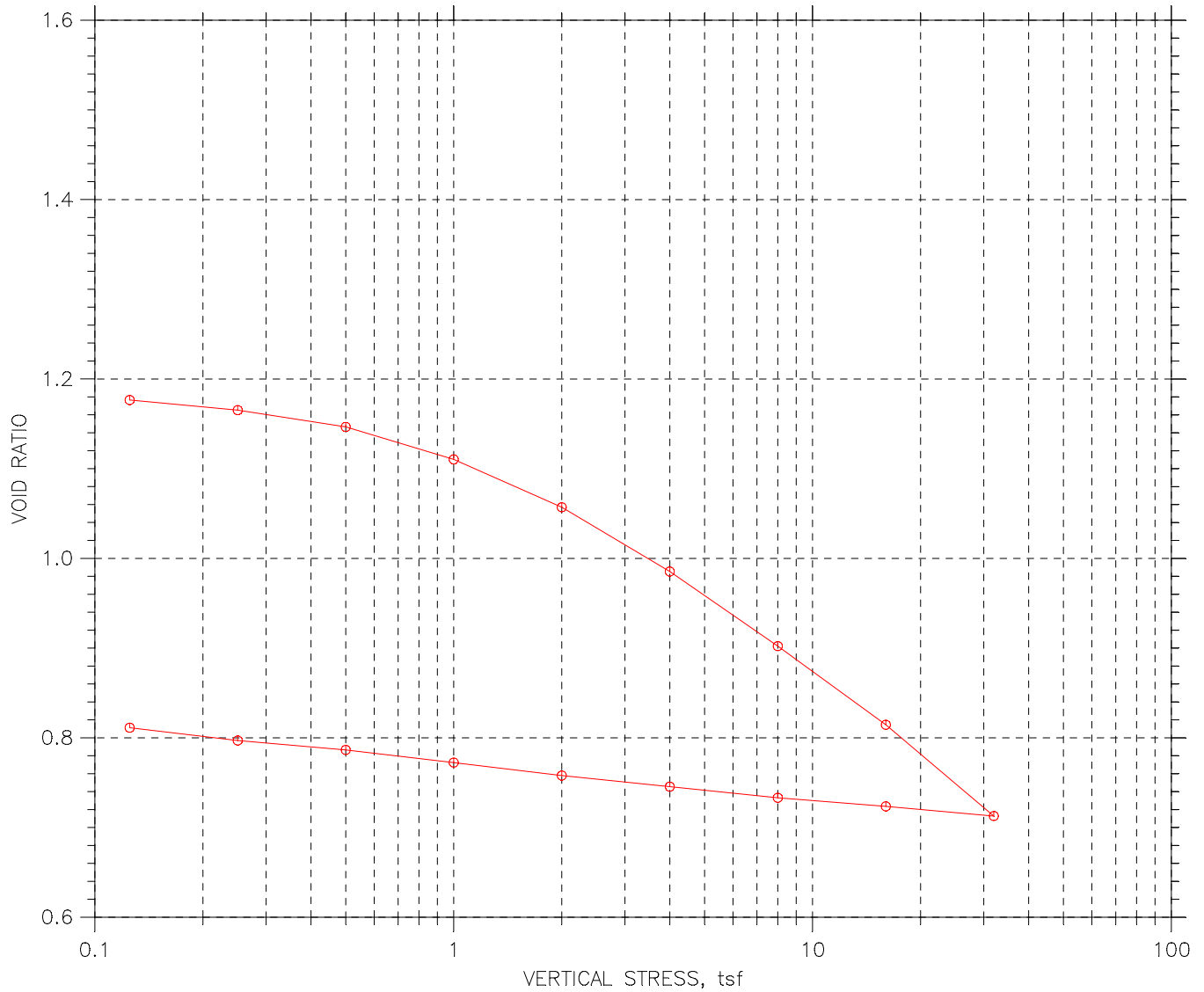
SUMMARY REPORT




	Project: DCA Glycol Tank	Location:	Project No.: 16879-0
	Boring No.: B-25	Tested By: J. Taylor	Checked By: A Bartolome
	Sample No.: T-1	Test Date: 03/22/2018	Depth: 8.0'-10.0'
	Test No.: 1	Sample Type: Undisturbed	Elevation:
	Description: Brown SILT (ML)		
	Remarks: ASTM D2435. Location: B-25 / T-1 (8.0' - 10.0') 32 TSF w/NO Unload/Reload		

CONSOLIDATION TEST DATA

SUMMARY REPORT



				Before Test	After Test
Overburden Pressure: 0.56 tsf		Water Content, %		40.26	29.05
Preconsolidation Pressure: 6.7 tsf		Dry Unit Weight, pcf		79.49	96.17
Compression Index: 0.46		Saturation, %		94.30	99.91
Diameter: 2.496 in	Height: 1.023 in	Void Ratio		1.19	0.81
LL: 39	PL: 28	PI: 11	GS: 2.79		

	Project: DCA Glycol Tank	Location:	Project No.: 16879-0	
	Boring No.: B-25	Tested By: J. Taylor	Checked By: A Bartolome	
	Sample No.: T-1	Test Date: 03/22/2018	Depth: 8.0'-10.0'	
	Test No.: 1	Sample Type: Undisturbed	Elevation:	
	Description: Brown SILT (ML)			
	Remarks: ASTM D2435. Location: B-25 / T-1 (8.0' - 10.0') 32 TSF w/NO Unload/Reload			

CONSOLIDATION TEST DATA

Project: DCA Glycol Tank
 Boring No.: B-25
 Sample No.: T-1
 Test No.: 1

Location:
 Tested By: J. Taylor
 Test Date: 03/22/2018
 Sample Type: Undisturbed

Project No.: 16879-0
 Checked By: A Bartolome
 Depth: 8.0'-10.0'
 Elevation:

Soil Description: Brown SILT (ML)

Remarks: ASTM D2435. Location: B-25 / T-1 (8.0' - 10.0') 32 TSF w/NO Unload/Reload

Estimated Specific Gravity: 2.79
 Initial Void Ratio: 1.19
 Final Void Ratio: 0.81

Liquid Limit: 39
 Plastic Limit: 28
 Plasticity Index: 11

Initial Height: 1.02 in
 Specimen Diameter: 2.50 in

Container ID	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
	19	RING	RING	RING
Wt. Container + Wet Soil, gm	81.1	256.38	244.67	244.67
Wt. Container + Dry Soil, gm	59.91	214.33	214.33	214.33
Wt. Container, gm	10.3	109.88	109.88	109.88
Wt. Dry Soil, gm	49.61	104.45	104.45	104.45
Water Content, %	42.71	40.26	29.05	29.05
Void Ratio	---	1.19	0.81	---
Degree of Saturation, %	---	94.30	99.91	---
Dry Unit Weight, pcf	---	79.494	96.166	---

CONSOLIDATION TEST DATA

Project: DCA Glycol Tank
 Boring No.: B-25
 Sample No.: T-1
 Test No.: 1

Location:
 Tested By: J. Taylor
 Test Date: 03/22/2018
 Sample Type: Undisturbed

Project No.: 16879-0
 Checked By: A Bartolome
 Depth: 8.0'-10.0'
 Elevation:

Soil Description: Brown SILT (ML)

Remarks: ASTM D2435. Location: B-25 / T-1 (8.0' - 10.0') 32 TSF w/NO Unload/Reload

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting		Coefficient of Consolidation		
					Sq.Rt. min	Log min	Sq.Rt. ft ² /sec	Log ft ² /sec	Ave. ft ² /sec
1	0.125	0.006783	1.177	0.66	1.9	0.0	3.15e-006	0.00e+000	3.15e-006
2	0.25	0.01205	1.165	1.18	1.8	0.0	3.35e-006	0.00e+000	3.35e-006
3	0.5	0.02079	1.147	2.03	4.1	0.0	1.41e-006	0.00e+000	1.41e-006
4	1	0.03767	1.110	3.68	6.1	0.0	9.26e-007	0.00e+000	9.26e-007
5	2	0.06261	1.057	6.12	5.2	0.0	1.03e-006	0.00e+000	1.03e-006
6	4	0.09606	0.985	9.39	4.6	0.0	1.11e-006	0.00e+000	1.11e-006
7	8	0.1349	0.902	13.18	4.5	0.0	1.05e-006	0.00e+000	1.05e-006
8	16	0.1758	0.814	17.19	3.6	0.0	1.18e-006	0.00e+000	1.18e-006
9	32	0.2233	0.713	21.83	3.7	0.0	1.04e-006	0.00e+000	1.04e-006
10	16	0.2183	0.723	21.34	0.9	0.0	3.98e-006	0.00e+000	3.98e-006
11	8	0.2138	0.733	20.90	3.5	0.0	1.08e-006	0.00e+000	1.08e-006
12	4	0.208	0.746	20.33	5.6	0.0	6.75e-007	0.00e+000	6.75e-007
13	2	0.2022	0.758	19.77	8.4	0.0	4.52e-007	0.00e+000	4.52e-007
14	1	0.1955	0.772	19.11	12.6	0.0	3.07e-007	0.00e+000	3.07e-007
15	0.5	0.1889	0.786	18.46	10.6	0.0	3.73e-007	0.00e+000	3.73e-007
16	0.25	0.184	0.797	17.99	5.9	0.0	6.83e-007	0.00e+000	6.83e-007
17	0.125	0.1774	0.811	17.34	14.5	0.0	2.79e-007	0.00e+000	2.79e-007



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GRAIN SIZE DISTRIBUTION

TEST METHOD ASTM D422

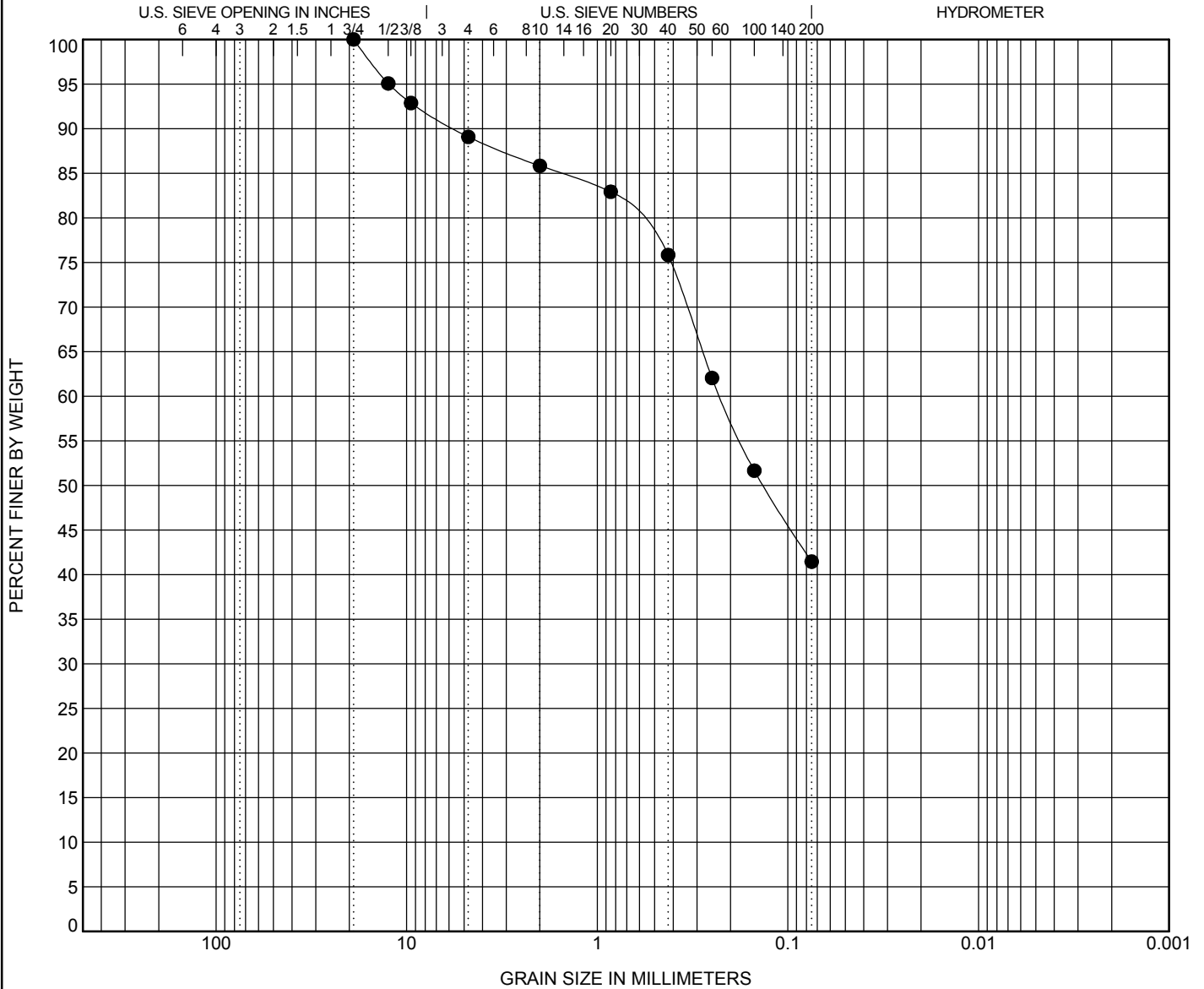
CLIENT CH2M

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PROJECT LOCATION DCA

PROJECT NUMBER 16879-0: VA

DATE TESTED _____



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					LL	PL	PI	Cc	Cu
● B-25, BULK	Dark Yellowish Brown SILTY, CLAYEY SAND(SC-SM) {A-4, GI=0}					20	14	6		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-25, BULK	19	0.226			10.9	47.6	41.5	

COPY OF GRAIN SIZE ASTM AND AASHTO 16879-0 DCA TAXIWAY B HOLD APRON.GPJ MTA REDLINE.GDT 3/27/18



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GRAIN SIZE DISTRIBUTION

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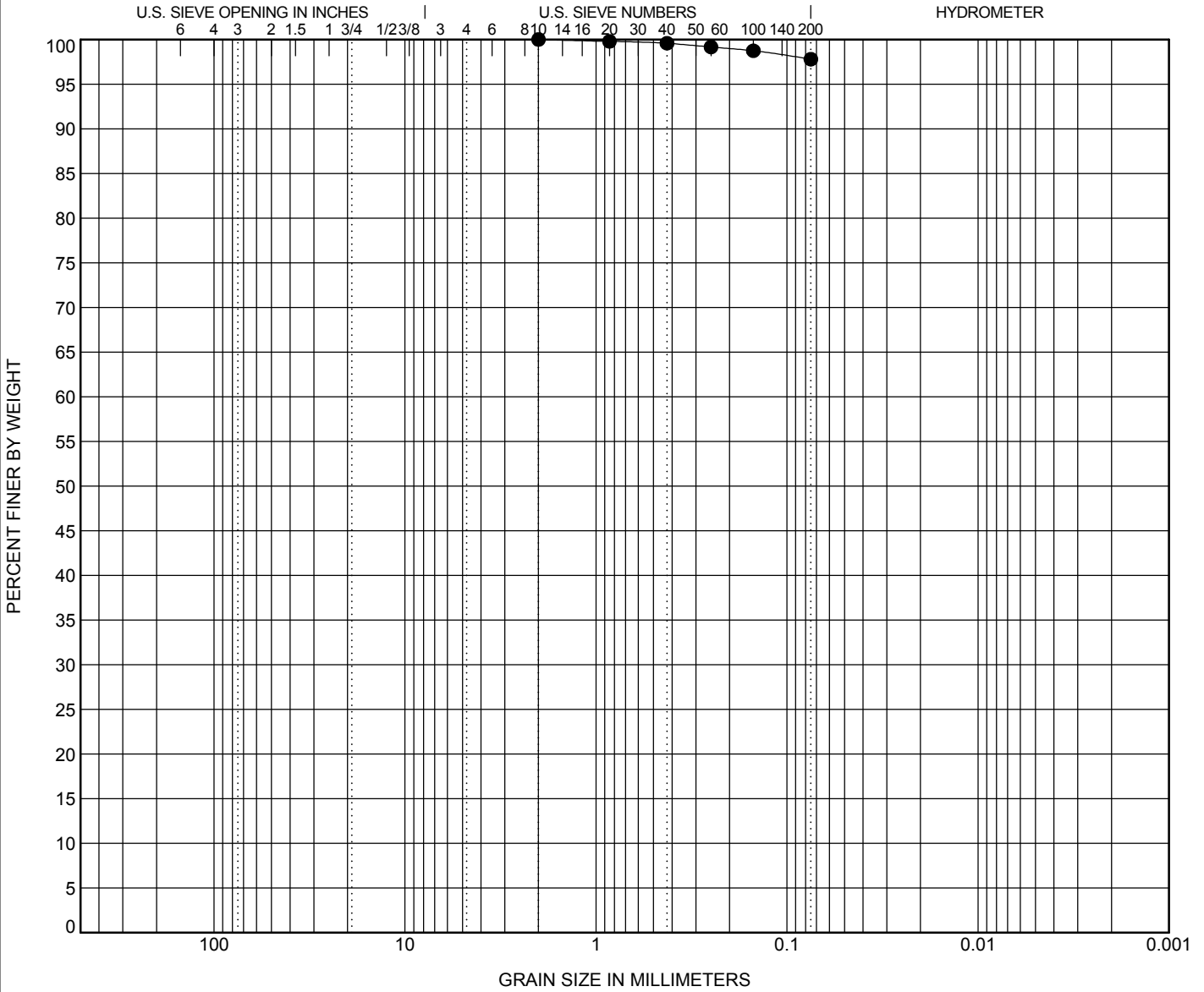
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PROJECT NAME Taxiway B Hold Apron Reconstruction

PROJECT LOCATION DCA

PROJECT NUMBER 16879-0: VA

DATE TESTED _____



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					LL	PL	PI	Cc	Cu
● B-25, T-1	Brown SILT(ML) {A-6, GI=13}					39	28	11		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-25, T-1	2				0.0	2.2	97.8	

COPY OF GRAIN SIZE ASTM AND AASHTO 16879-0 DCA TAXIWAY B HOLD APRON.GPJ MTA REDLINE.GDT 3/27/18



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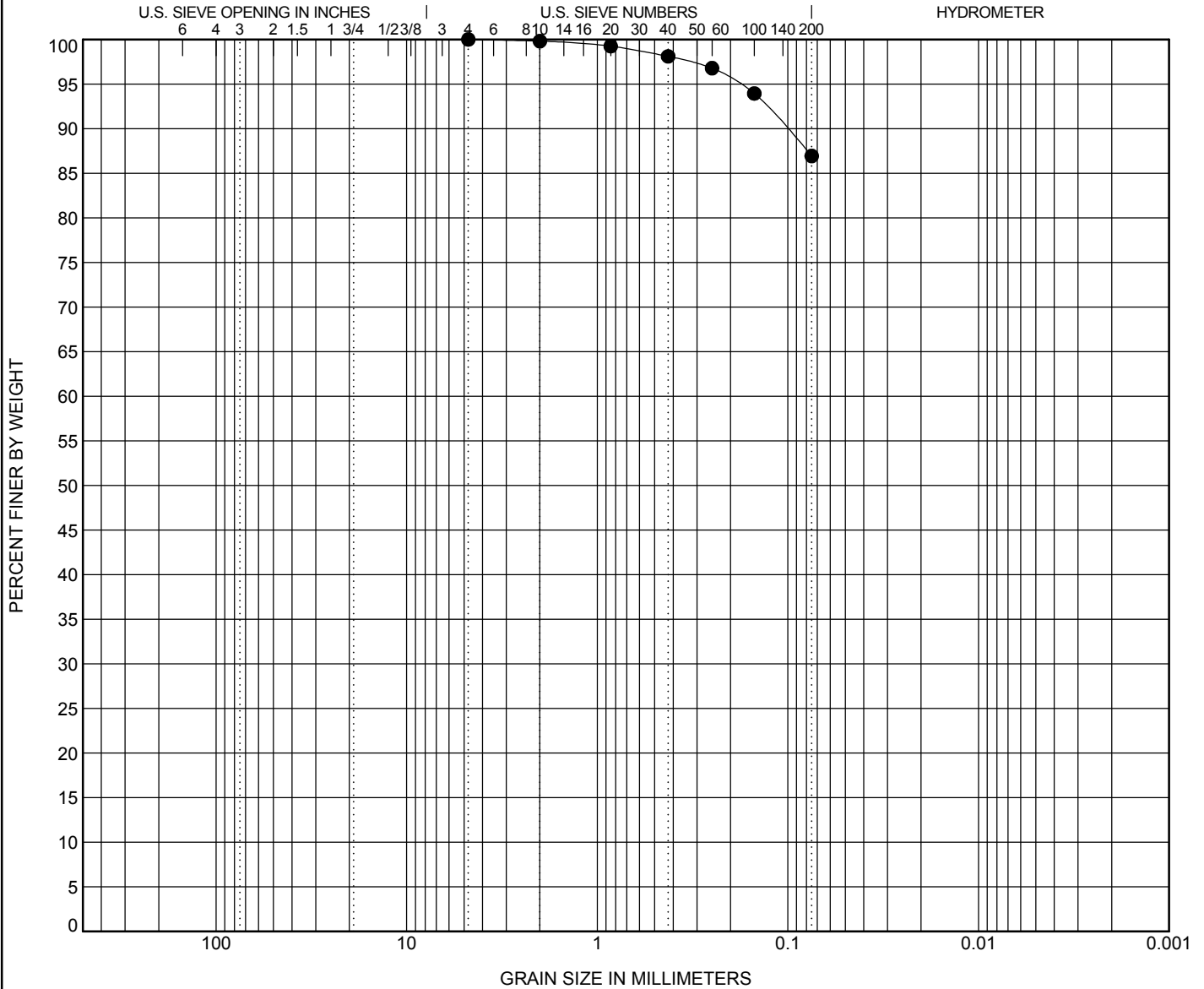
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	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					LL	PL	PI	Cc	Cu
● B-25, S-8	Very Dark Gray ELASTIC SILT(MH) {A-7-5, GI=22}					58	39	19		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-25, S-8	4.75				0.0	13.1	86.9	

COPY OF GRAIN SIZE ASTM AND AASHTO 16879-0 DCA TAXIWAY B HOLD APRON.GPJ MTA REDLINE.GDT 3/27/18



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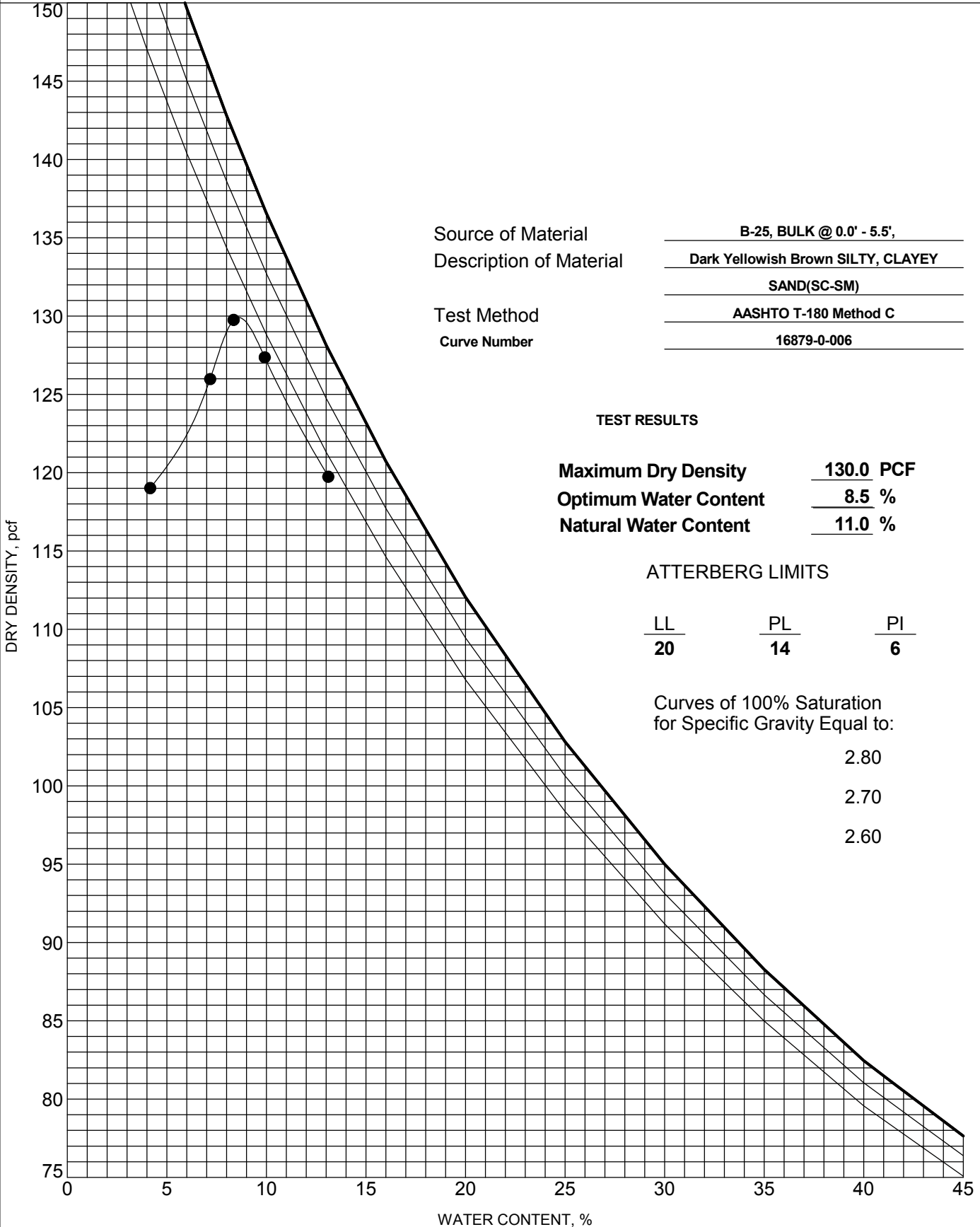
MOISTURE-DENSITY RELATIONSHIP

CLIENT CH2M

PROJECT NAME Taxiway B Hold Apron Reconstruction

PROJECT LOCATION DCA

PROJECT NUMBER 16879-0: VA DATE TESTED



Source of Material	<u>B-25, BULK @ 0.0' - 5.5',</u>
Description of Material	<u>Dark Yellowish Brown SILTY, CLAYEY</u>
	<u>SAND(SC-SM)</u>
Test Method	<u>AASHTO T-180 Method C</u>
Curve Number	<u>16879-0-006</u>

TEST RESULTS

Maximum Dry Density	<u>130.0 PCF</u>
Optimum Water Content	<u>8.5 %</u>
Natural Water Content	<u>11.0 %</u>

ATTERBERG LIMITS

<u>LL</u>	<u>PL</u>	<u>PI</u>
20	14	6

Curves of 100% Saturation
 for Specific Gravity Equal to:

2.80
 2.70
 2.60