

MOISTURE DENSITY TEST DATA

Client: City and County of Berthoud

Project: Berthoud County Landfill Expansion

Project Number: 93X4123.4

Location: B-3

Depth: 0-5'

Sample Number: S-1

Description: Light brown sandy gravel - some +3 material

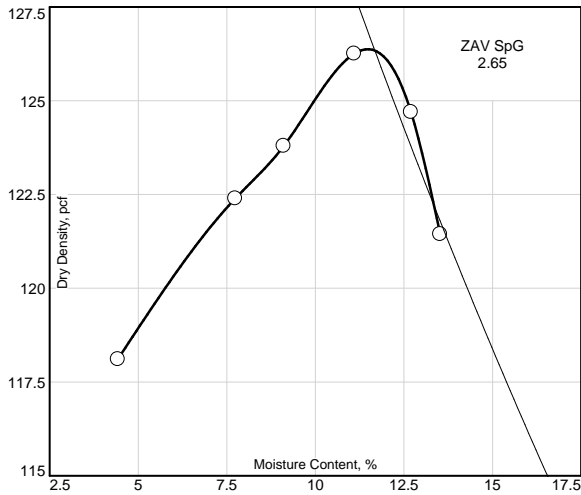
AASHTO: A-4(0)

Test Data and Results For Curve C-15

Test Specification:

Type of Test: AASHTO T 180-01 Method B Modified

Mold Dia: 6.00 **Hammer Wt.:** 10 lb. **Drop:** 18 in. **Layers:** five **Blows per Layer:** 56



Point No.	1	2	3	4	5	6
Wt. M+S	17.5	18.1	18.3	18.7	18.8	18.6
Wt. M	8.2	8.2	8.2	8.2	8.2	8.2
Wt. W+T	652.20	776.60	900.80	635.80	827.40	842.90
Wt. D+T	628.40	726.60	832.90	582.50	746.60	755.10
Tare	90.30	80.50	87.30	102.20	110.30	105.80
Moist.	4.4	7.7	9.1	11.1	12.7	13.5
Dry Den.	118.1	122.4	123.8	126.3	124.7	121.4

Rock Corrected Results:

Max. Dry Den.= 133 pcf Opt. Moist.= 10%

Uncorrected Results:

Max. Dry Den.= 126 pcf Opt. Moist.= 11%

Rock Correction Data:

Correction Method: AASHTO T 224-01

Percentage of Oversize Material (%> #4): 81 **Bulk Specific Gravity of Oversize Material:** 2.7

Oversize Material Moisture Content: 4

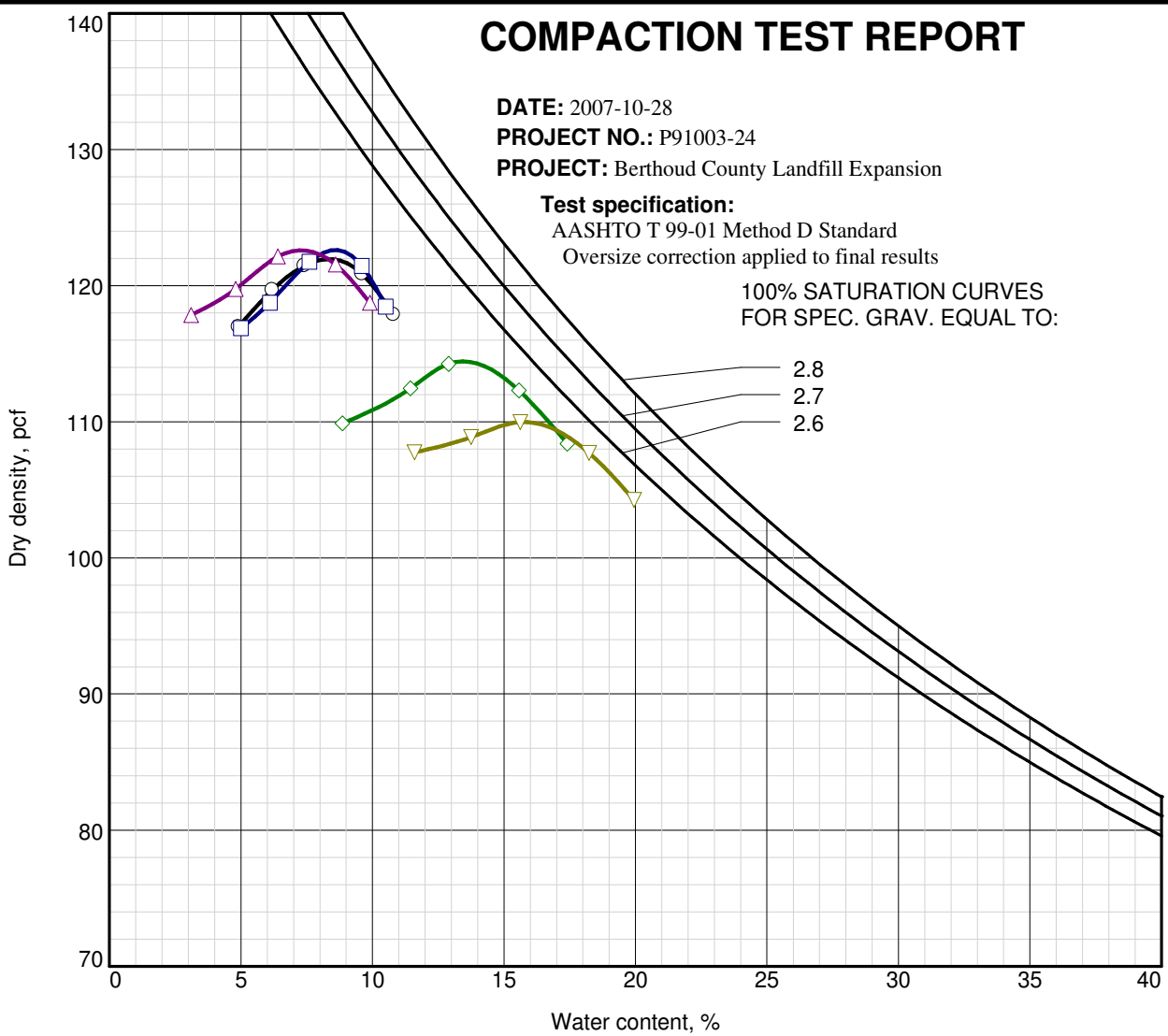
Note: the rock correction was applied to the calculated max. density and opt. moisture values.

COMPACTION TEST REPORT

DATE: 2007-10-28
PROJECT NO.: P91003-24
PROJECT: Berthoud County Landfill Expansion

Test specification:
 AASHTO T 99-01 Method D Standard
 Oversize correction applied to final results

100% SATURATION CURVES
 FOR SPEC. GRAV. EQUAL TO:



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No.	LOCATION AND DESCRIPTION			REMARKS
○ C-281	Sample Source: Boring B-2	Depth: 0-5'	Sample No.: S-1	T-112=0.0% SE=89 Soundness=3.8%
□ C-294	Sample Source: Boring B-2	Depth: 5-10'	Sample No.: S-2	T-96=27% T-104=2.8%
△ C-301	Sample Source: Boring B-2	Depth: 10-15'	Sample No.: S-3	T-96=23 Soundness=2.8% T-112=0.0
◇ C-314	Sample Source: TP-2	Depth: 0-2.5	Sample No.: S-1	T-96=23 Soundness=2.8% T-112=0.0
▽ C-321	Sample Source: Boring B-4	Depth: 5-10'	Sample No.: S-2	SE=82 T-112=2.945

No.	USCS	LL	PI	NAT. MOIST.	OVERSIZE	%< No.200	MAX. DRY DEN.	OPT. MOIST.
○ C-281	CL	52	32	34	%>3/4 in.=12.4	4.9 %	126.3	8.3 %
□ C-294	CL	40	25	5.7	%>3/4 in.=90.0	15 %	162.5	8.6 %
△ C-301	CL	NV	NP	N/A	%>3/4 in.=88.0	14 %	161.3	7.3 %
◇ C-314	CL	34	20	29				
▽ C-321	CL	41	16	28	%>3/4 in.=95.0	12 %	164.2	15.8 %

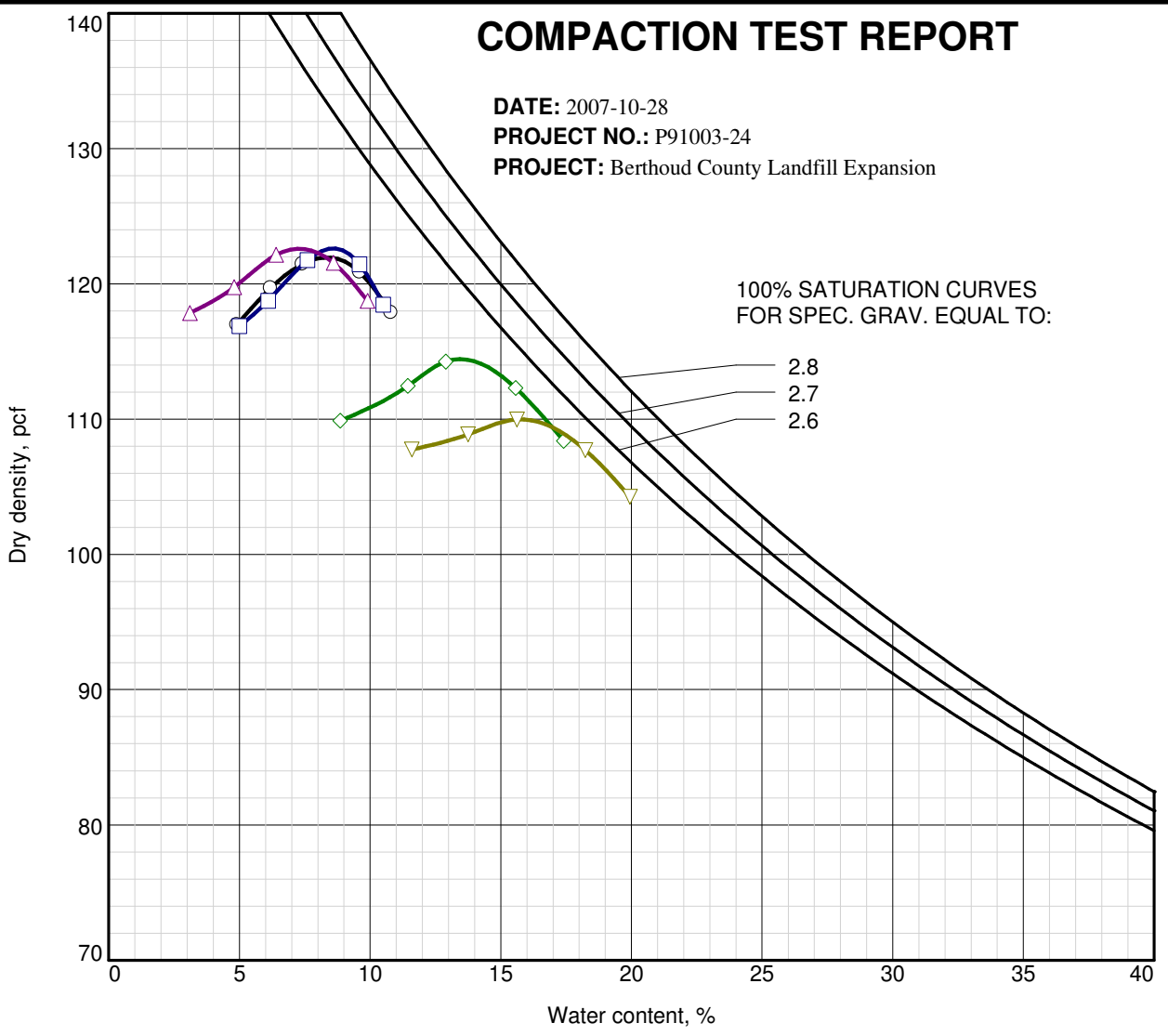
Figure F-22

ALV Engineers

Tested By: ○ ALV □ ALV △ ALV ◇ ALV ▽ ERK Checked By: ERK

COMPACTION TEST REPORT

DATE: 2007-10-28
 PROJECT NO.: P91003-24
 PROJECT: Berthoud County Landfill Expansion



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No.	LOCATION AND DESCRIPTION			TEST SPECIFICATION
○ C-281	Sample Source: Boring B-2	Depth: 0-5'	Sample No.: S-1	AASHTO T 99-01 Method D Standard
□ C-294	Sample Source: Boring B-2	Depth: 5-10'	Sample No.: S-2	AASHTO T 99-01 Method D Standard
△ C-301	Sample Source: Boring B-2	Depth: 10-15'	Sample No.: S-3	AASHTO T 99-01 Method D Standard
◇ C-314	Sample Source: TP-2	Depth: 0-2.5'	Sample No.: S-1	AASHTO T 99-01 Method D Standard
▽ C-321	Sample Source: Boring B-4	Depth: 5-10'	Sample No.: S-2	AASHTO T 99-01 Method D Standard

No.	USCS	LL	PI	NAT. MOIST.	OVERSIZE	%< No.200	MAX. DRY DEN.	OPT. MOIST.
○ C-281	CL	52	32	34	%>3/4 in.=12.4	4.9 %	126.3	8.3 %
□ C-294	CL	40	25	5.7	%>3/4 in.=90.0	15 %	162.5	8.6 %
△ C-301	CL	NV	NP	N/A	%>3/4 in.=88.0	14 %	161.3	7.3 %
◇ C-314	CL	34	20	29				
▽ C-321	CL	41	16	28	%>3/4 in.=95.0	12 %	164.2	15.8 %

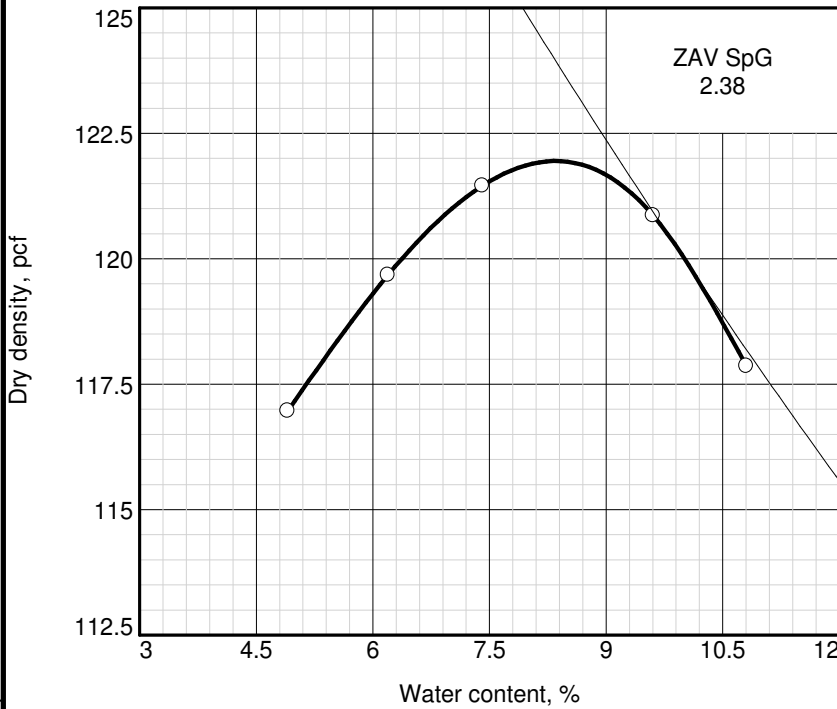
Figure F-22

ALV Engineers

Tested By: ○ ALV □ ALV △ ALV ◇ ALV ▽ ERK Checked By: ERK

COMPACTION TEST REPORT

Curve No.
C-281



Test Specification:
AASHTO T 99-01 Method D Standard
Oversize correction applied to final results

Preparation Method _____
Hammer Wt. _____ 5.5 lb.
Hammer Drop _____ 12 in.
Number of Layers _____ three
Blows per Layer _____ 56
Mold Size _____ 0.075 cu. ft.

Test Performed on Material
Passing _____ 3/4 in. **Sieve** _____
NM _____ 34 **LL** _____ 52 **PI** _____ 32
Sp.G. (ASTM D 854) _____ 2.65
%>3/4 in. _____ 12.4 **%<No.200** _____ 4.9
USCS _____ CL **AASHTO** _____ A-7-6(31)
Date Sampled _____ 4.June.2003
Date Tested _____ 5.June.2003
Tested By _____ ALV

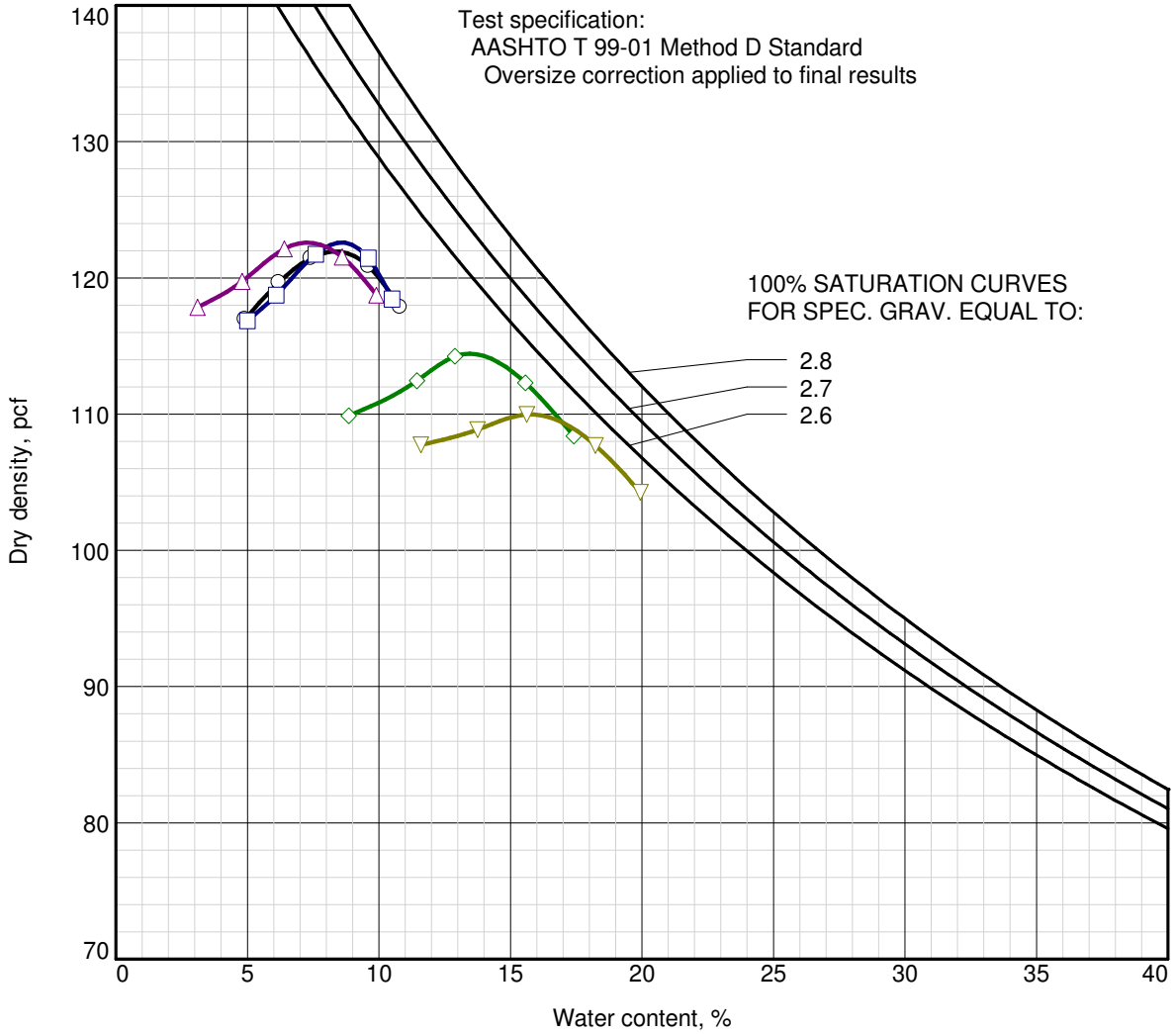
TESTING DATA

	1	2	3	4	5	6
WM + WS	9242.60	7270.90	6240.40	6189.50	6123.20	
WM	7267.60	5267.60	4267.60	4267.60	4267.60	
WW + T #1	758.90	723.50	687.20	751.00	727.30	
WD + T #1	684.90	660.10	639.80	707.20	693.30	
TARE #1	0.00	0.00	0.00	0.00	0.00	
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	10.8	9.6	7.4	6.2	4.9	
DRY DENSITY	117.9	120.9	121.5	119.7	117.0	

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ROCK CORRECTED TEST RESULTS	Material Description
Maximum dry density = 126.3 pcf	Dark Brown Sandy Lean Clay w/ Organics & Rubble
Optimum moisture = 8.3 %	
Project No. P91003-24 Client: County of Berthoud	Remarks: T-112=0.0% SE=89 Soundness=3.8%
Project: Berthoud County Landfill Expansion	
○ Sample Source: Boring B-2 Depth: 0-5' Sample No.: S-1	
ALV ENGINEERS	Checked by: ERK Title:
	Figure F-22

COMPACTION TEST REPORT



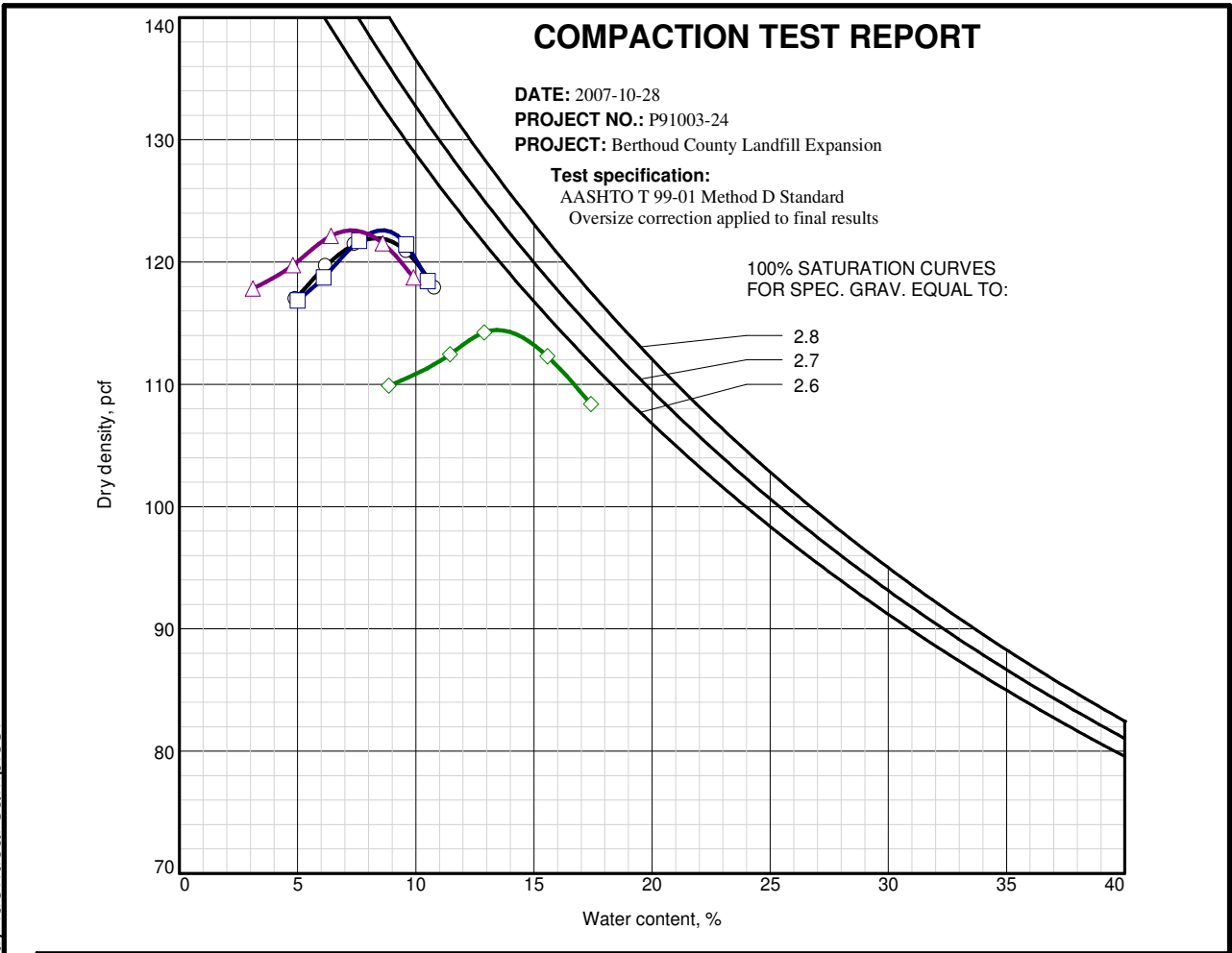
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SOIL DATA									
SOURCE	SAMPLE NO.	ELEV./ DEPTH	USCS	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	MAXIMUM DRY DENSITY pcf	OPTIMUM MOISTURE CONTENT (%)	
○	Boring B-2	S-1	0-5'	CL	34	20	52	126.3	8.3
□	Boring B-2	S-2	5-10'	CL	5.7		40	162.5	8.6
△	Boring B-2	S-3	10-15'	CL	N/A		NV	161.3	7.3
◇	TP-2	S-1	0-2.5	CL	29		34		
▽	Boring B-4	S-2	5-10'	CL	28		41	164.2	15.8

<h2 style="margin: 0;">ALV ENGINEERS</h2>	Client: County of Berthoud Project: Berthoud County Landfill Expansion Project No.: P91003-24	Figure F-22
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Tested By: ○ ALV □ ALV △ ALV ◇ ALV ▽ ERK Checked By: ERK

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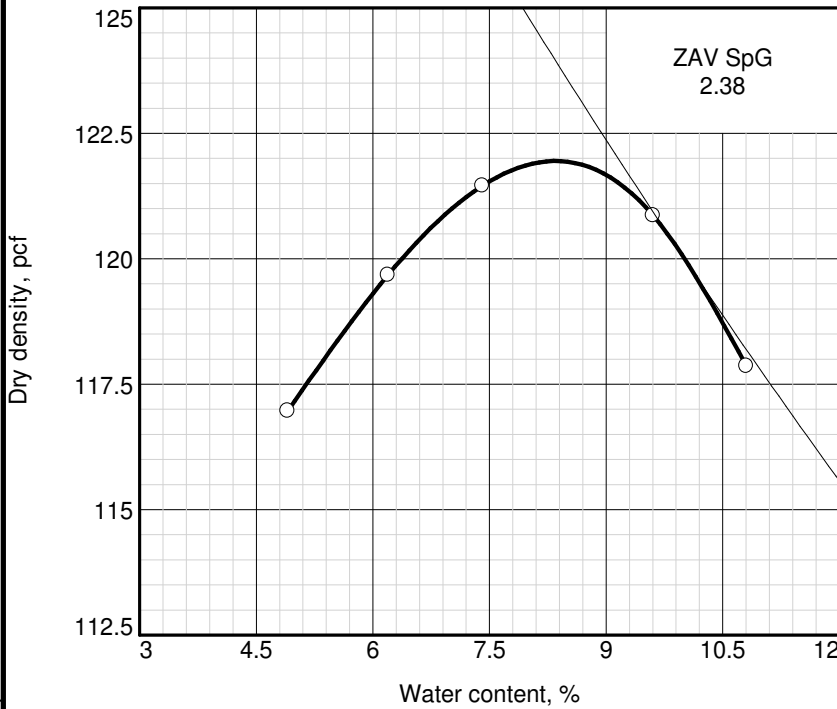


Sample No.	Elev. or Depth	Material Description	Specific Gravity	LL	PL	Oversize	% < #200
○ S-1	0-5'	Dark Brown Sandy Lean Clay w/ Organics & Rubble	2.65	52	20	%>3/4 in.=12.4	4.9
□ S-2	5-10'	Dark Gray Sandy Clay Loam Trace Gravel (Till)	2.615	40		%>3/4 in.=90.0	15
△ S-3	10-15'	Grayish Brown Sandy Loam (Alluvium)	2.615	NV		%>3/4 in.=88.0	14
◇ S-1	0-2.5'	Gray Brown Sandy Clay (Topsoil)		34			
Sample No.		S-1	S-2	S-3	S-1		
Natural water content, percent		34	5.7	N/A	29		
Optimum water content, percent		8.3	8.6	7.3			
Max dry density, pcf		126.3	162.5	161.3			
Remarks: T-112=0.0% SE=89 Soundness=3.8%			Project: Berthoud County Landfill Expansion		Project No.: P91003-24		
T-96=27% T-104=2.8%							
T-96=23 Soundness=2.8% T-112=0.0			Location:				
T-96=23 Soundness=2.8% T-112=0.0			Source: Boring B-2				
Figure		F-22		ALV ENGINEERS			

Tested By: ALV _____ **Checked By:** ERK _____

COMPACTION TEST REPORT

Curve No.
C-281



Test Specification:
AASHTO T 99-01 Method D Standard
Oversize correction applied to final results

Preparation Method _____
Hammer Wt. _____ 5.5 lb.
Hammer Drop _____ 12 in.
Number of Layers _____ three
Blows per Layer _____ 56
Mold Size _____ 0.075 cu. ft.

Test Performed on Material
Passing _____ 3/4 in. **Sieve** _____
NM _____ 34 **LL** _____ 52 **PI** _____ 32
Sp.G. (ASTM D 854) _____ 2.65
%>3/4 in. _____ 12.4 **%<No.200** _____ 4.9
USCS _____ CL **AASHTO** _____ A-7-6(31)
Date Sampled _____ 4.June.2003
Date Tested _____ 5.June.2003
Tested By _____ ALV

COMPACTION TESTING DATA

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WD + T #1	684.90	660.10	639.80	707.20	693.30	
TARE #1	0.00	0.00	0.00	0.00	0.00	
WW + T #2						
WD + T #2						
TARE #2						
MOIST.	10.8	9.6	7.4	6.2	4.9	
DRY DENS.	117.9	120.9	121.5	119.7	117.0	

SIEVE TEST RESULTS

Opening Size	% Passing	Specs.

ROCK CORRECTED TEST RESULTS

Maximum dry density = 126.3 pcf
 Optimum moisture = 8.3 %

Project No. P91003-24 **Client:** County of Berthoud
Project: Berthoud County Landfill Expansion

○ **Sample Source:** Boring B-2 **Depth:** 0-5' **Sample No.:** S-1

Material Description

Dark Brown Sandy Lean Clay w/ Organics & Rubble

Remarks:

T-112=0.0% SE=89 Soundness=3.8%

Checked by: ERK

Title:

ALV ENGINEERS

Figure F-22

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COMPACTION TEST REPORT

Curve No.: C-281

Project No.: P91003-24

Date:

Project: Berthoud County Landfill Expansion

Client: County of Berthoud

Source of Sample: Boring B-2 **Depth:** 0-5'

Sample Number: S-1

Remarks: T-112=0.0% SE=89 Soundness=3.8%

MATERIAL DESCRIPTION

Description: Dark Brown Sandy Lean Clay w/ Organics & Rubble

Classifications -

USCS: CL

AASHTO: A-7-6(31)

Nat. Moist. = 34 %

Sp.G. = 2.65

Liquid Limit = 52

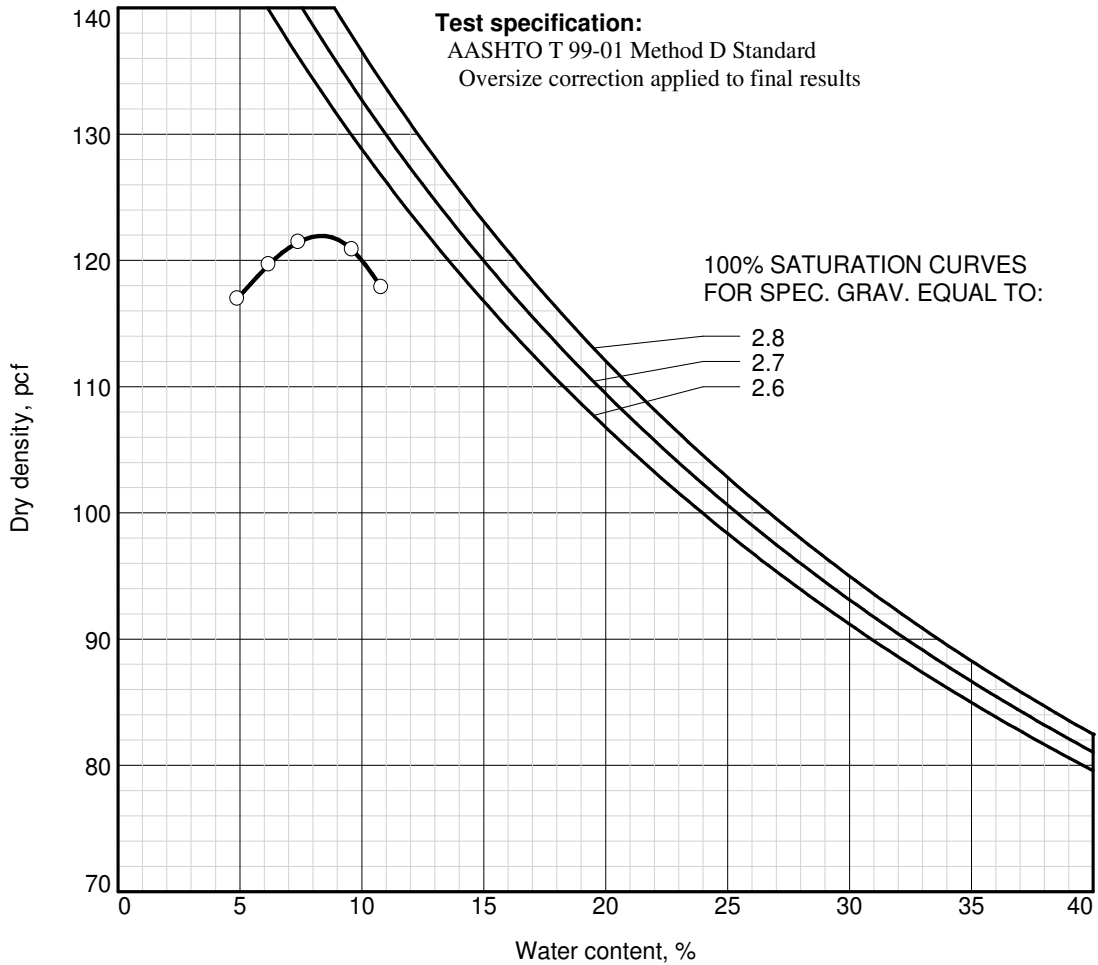
Plasticity Index = 32

% < No.200 = 4.9 %

ROCK CORRECTED TEST RESULTS

Maximum dry density = 126.3 pcf

Optimum moisture = 8.3 %



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Figure F-22

ALV Engineers

Tested By: ALV

Checked By: ERK