



Minnesota Department Of Transportation
TEST REPORT ON SAMPLE OF SUBSOIL

MAY 03 2007

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Office of Materials
1400 Gervais Avenue
Maplewood, MN 55109

Sample ID: CO-SS07-0042
Project No.: SAP 27-614-11
Source:
Submitted By:
Proj. Eng.: H. HANSON
Point Number:
Tests Required: G,PI,P,R-V
Sample Taken From: RV 1 HOLE 1

Depth:
Field ID: 74-SME-1
Field Classification:
Date Sampled: 4/18/2007
Date Received: 4/26/2007
Report Approved: 05/02/2007 13:45

Sieves

Sieve Size	Percent Passing
2" (50 mm)	100.0
1" (25.0 mm)	100.0
3/4" (19.0 mm)	99.4
3/8" (9.5 mm)	93.6
#4 (4.75 mm)	87.7
#10 (2.00 mm)	82.6
#20 (850 um)	78.7
#40 (425 um)	63.3
#60 (250 um)	38.1
#100 (150 um)	18.7
#200 (75 um)	11.6

Other Soil Tests

Test	Result
Plasticity Index	NP
Clay (%)	1.8
Silt (%)	9.8
Mn/DOT Class (Entire Sample)	LFS
Mn/DOT Class (Minus 10)	LS
AASHTO Group	A-2-4
Group Index	0
Optimum Moisture (% dry wt)	10.0
Max Density (lb/cubic ft)	121.0

Test Procedures: AASHTO T87, T88, T89, T90, T99 Method "C"(M), T100, T190 (M), T-265 M = Mn/DOT Modified

Comments: LESS THAN 15% PASSING #200 SIEVE, NO R-VALUE TEST RAN

35 38 29 16

Charge Out: 1037, 1038, 1041, 1042

Copies To:

H. HANSON - HENNEPIN COUNTY

Paul Paterson

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**Hennepin County
Testing Lab**



Minnesota Department Of Transportation
TEST REPORT ON SAMPLE OF SUBSOIL

Office of Materials
 1400 Gervais Avenue
 Maplewood, MN 55109

MAY 07 2007

19 18
 23
 37
 40

Sample ID: CO-SS07-0044
 Project No.: SAP 27-614-11
 Source:
 Submitted By:
 Proj. Eng.: H. HANSON
 Point Number:
 Tests Required: G,PI,P,R-V
 Sample Taken From: RV 3 HOLE 20

Depth:
 Field ID: 76-SME-3
 Field Classification:
 Date Sampled: 4/19/2007
 Date Received: 4/26/2007
 Report Approved: 05/04/2007 14:22

Sieves

Sieve Size	Percent Passing
2" (50 mm)	100.0
1" (25.0 mm)	100.0
3/4" (19.0 mm)	98.9
3/8" (9.5 mm)	94.2
#4 (4.75 mm)	91.0
#10 (2.00 mm)	86.3
#20 (850 um)	78.5
#40 (425 um)	54.2
#60 (250 um)	31.9
#100 (150 um)	23.6
#200 (75 um)	19.7

Other Soil Tests

Test	Result
Plasticity Index	NP
Clay (%)	5.2
Silt (%)	14.5
Sand and Gravel (%)	80.3
Mn/DOT Class (Entire Sample)	LS
Mn/DOT Class (Minus 10)	SL
AASHTO Group	A-2-4
Group Index	0
Optimum Moisture (% dry wt)	10.7
Max Density (lb/cubic ft)	122.1
R-Value (at 240 psi)	54.2

Test Procedures: AASHTO T87, T88, T89, T90, T99 Method "C"(M), T100, T190 (M), T-265 M = Mn/DOT Modified

Comments:

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37, 40, 23, 18
 Charge Out: 1037, 1038, 1041, 1042, 1056
 19

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**Hennepin County
 Testing LAB**

Minnesota Department Of Transportation

SubSoil Sample Worksheet

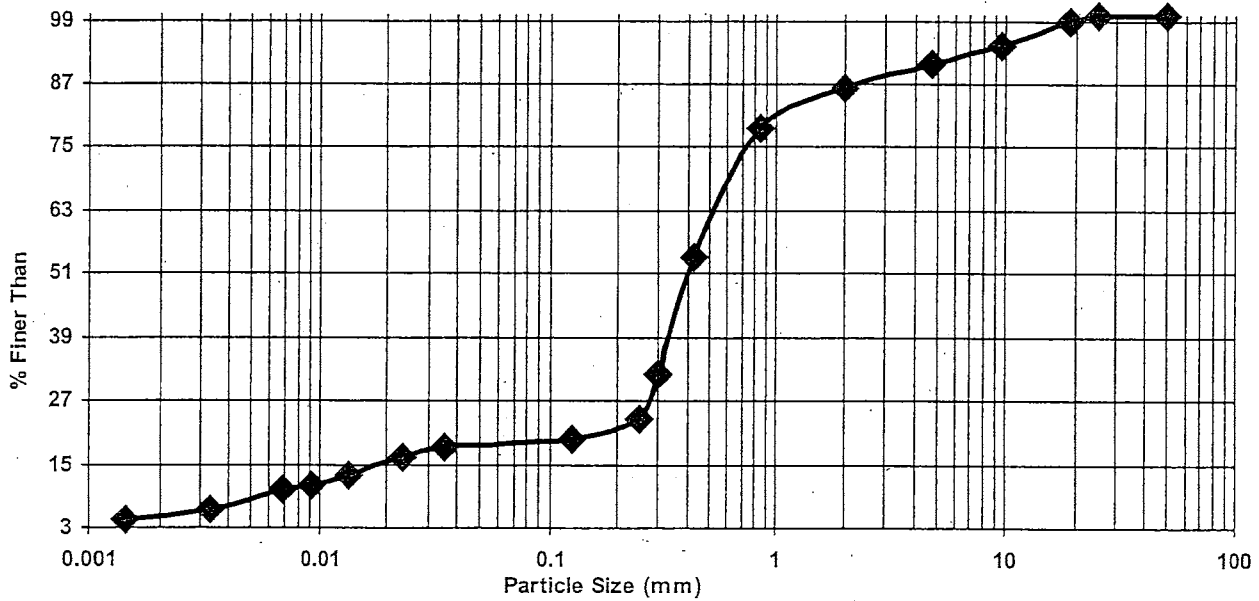
Sample ID: CO-SS07-0044
 Project No.: SAP 27-614-11
 Date Sampled: 4/19/2007

Submitted By:
 Source:
 Date Received: 4/26/2007

Hydrometer Analysis					Liquid Limit			Particle Size		
Time	Temp	Read	Size (mm)	% Finer	Type	Weight 1	Weight 2	%	Particle	Size (mm)
2 min	70.0	17.0	0.03584	18.1	Liquid Limit	0.0%		80.3	Sand and Gravel	
5 min	70.0	16.0	0.02344	16.4				14.5	Silt	.075-.002
15 min	70.0	14.0	0.01368	13.0				5.2	Clay	<.002
30 min	70.0	13.0	0.00917	11.2						
60 min	70.0	12.5	0.00681	10.4						
250 mi	71.0	10.0	0.00334	6.4						
24 hr	68.0	9.5	0.00142	4.4						

Hygroscopic Moisture		Plastic Limit		
Content Type	Weight	Type	Weight 1	Weight 2
Air Dry + Can	32.88	Plastic Limit	0.0%	
Oven Dry + Can	32.87	Plasticity Ind	0.0	
Can	14.40			
Corr. Factor	0.999%			

Percent Finer

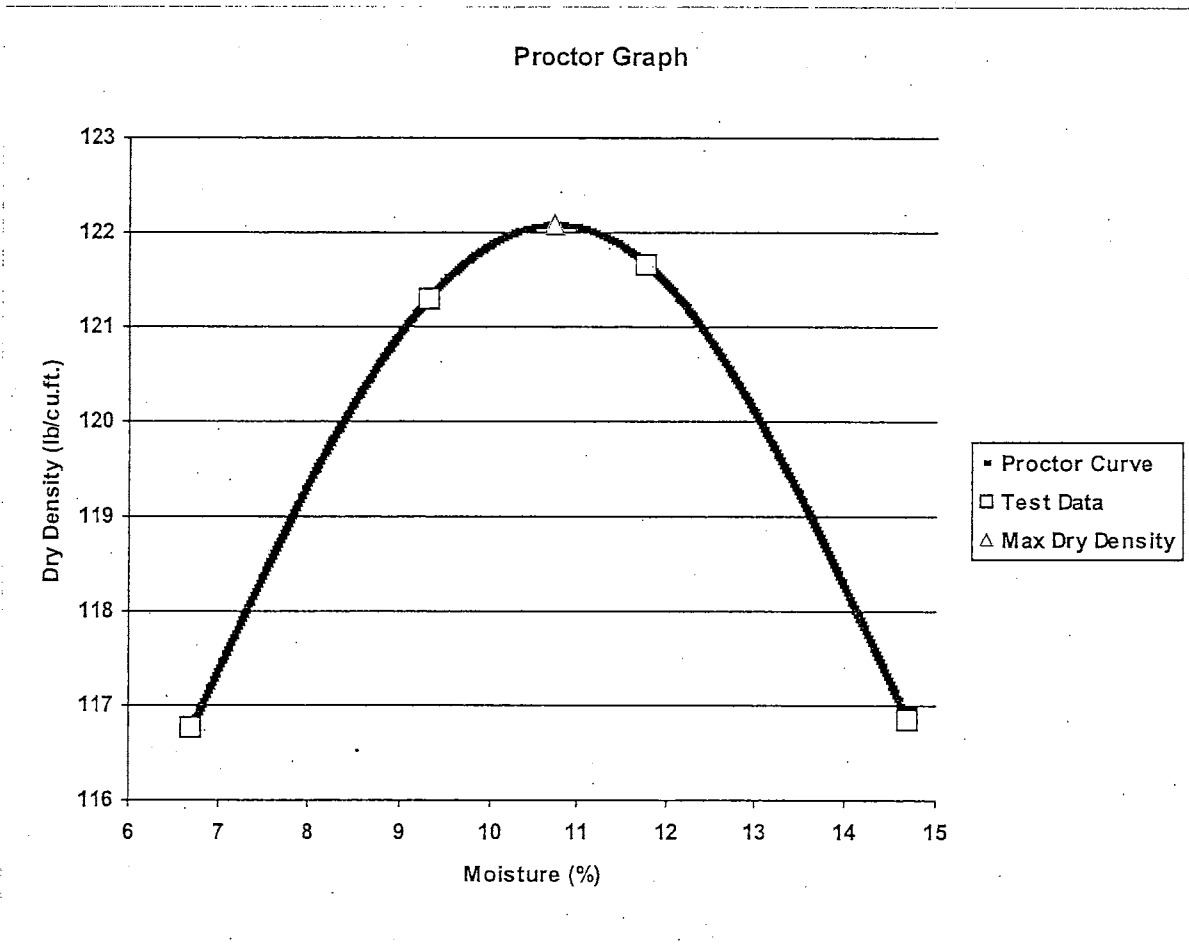


State of Minnesota Department of Transportation

MOISTURE-DENSITY RELATIONSHIP

Sample ID: CO-SS07-0044 Proj Eng : H. HANSON Submitted By:
 Sample From : RV 3 HOLE 20 Project No.: 27-614-11 Report Approved : 05/02/2007 07:31

Test Number:	1	2	3	4	5	6	7	8
Wet Soil Mold:	6146.40	6267.30	6318.20	6288.80				
Mold:	4262.70	4262.70	4262.70	4262.70				
Wet Soil Pan:	945.30	870.00	903.20	983.90				
Dry Soil Pan:	908.30	826.10	846.00	903.10				
Pan:	356.40	354.80	359.30	353.10				
%Moisture-Dry:	6.70	9.31	11.75	14.69				
Dry Density:	116.77	121.30	121.66	116.85				
Maximum Density:	122.1 lb/cu.ft.							
Optimum Moisture:	10.7 %							



Test Procedures: AASHTO T-99 Method "C" (M)

M = Mn/DOT Modified

State of Minnesota Department of Transportation

R-Value Worksheet

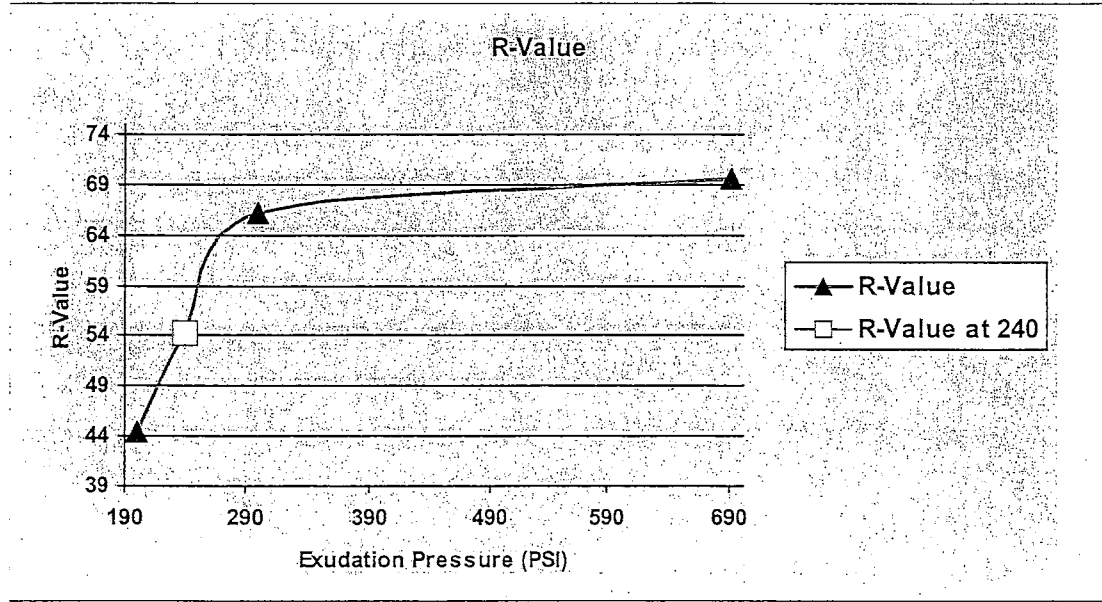
Sample ID: CO-SS07-0044 Soils Lab No.: RV Initials: RV Date:
 % Passing 3/8": 94.2 % Passing #4: 91.0 Mn/DOT Class: LS AASHTO Group: A-2-4
 Opt. Moisture: 10.7 Max Density: 122.1 Est Orig Moisture: 2 Report Approved: 05/04/2007 14:21
 Mold No: 1 2 3 4 Mold No: 1 2 3 4

Batching Data				
Water Added (Init):	74	92	102	111
Water Added (Final):	37	46	51	55
Initial Moisture (%):	5	7	7	8
Moisture Added (%):	8.0	10.0	11.0	12.0
Total Moisture (%):	9.0	11.0	12.0	13.0
Orig. Wt. of Batch:	1400			
Corr. Wt. of Batch:	1386			
Dry Spec. Wt.:	1007			
Wet Spec. Wt.:	1097	1118	1128	1138

Stabilometer Test				
Exudation Pressure:	692	300	200	
Wt. of Briq. + Mold:	3146.2	3243.1	3180.3	
Wt. of Mold:	2050.4	2129.6	2055.9	2065.4
Height of Briquette:	2.58	2.55	2.52	
Dial Reading (.0001):	15.00	0.00	0.00	
Expansion Pressure:	0.4	0.0	0.0	
Stabil - 1000lb:	18	20	32	
Stabil - 2000lb:	36	40	68	
Turns Displacement:	4.08	4.03	4.31	

Moisture Data				
Wet Weight:	597.6	599.4	608.9	
Dry Weight:	566.7	562.5	568.7	
Pan Tare Wt.:	183.1	186.2	195.6	184.5

Calculated Information				
Moisture Loss:	30.9	36.9	40.2	
Dry Soil Wt.:	383.6	376.3	373.1	
Moisture at Compact:	8.1	9.8	10.8	
Wet Wt. of Briq.:	1096	1114	1124	
R-Value (Corr):	69.6	66.2	44.5	
R-Value at 240 psi:	54.2			





Minnesota Department Of Transportation
TEST REPORT ON SAMPLE OF SUBSOIL

MAY 03 2007

Office of Materials
 1400 Gervais Avenue
 Maplewood, MN 55109

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Sample ID: CO-SS07-0043 -
 Project No.: SAP 27-614-11
 Source:
 Submitted By:
 Proj. Eng.: H. HANSON
 Point Number:
 Tests Required: G,PI,P,R-V
 Sample Taken From: RV 2 HOLE 10

Depth:
 Field ID: 75-SME-2
 Field Classification:
 Date Sampled: 4/18/2007
 Date Received: 4/26/2007
 Report Approved: 05/02/2007 13:45

Sieves

Sieve Size	Percent Passing
2" (50 mm)	100.0
1" (25.0 mm)	100.0
3/4" (19.0 mm)	99.8
3/8" (9.5 mm)	97.3
#4 (4.75 mm)	93.0
#10 (2.00 mm)	87.8
#20 (850 um)	80.2
#40 (425 um)	60.9
#60 (250 um)	28.5
#100 (150 um)	13.9
#200 (75 um)	10.6

Other Soil Tests

Test	Result
Plasticity Index	NP
Clay (%)	0.5
Silt (%)	10.2
Mn/DOT Class (Entire Sample)	LFS
Mn/DOT Class (Minus 10)	LS
AASHTO Group	A-2-4
Group Index	0
Optimum Moisture (% dry wt)	10.0
Max Density (lb/cubic ft)	117.0

Test Procedures: AASHTO T87, T88, T89, T90, T99 Method "C"(M), T100, T190 (M), T-265 M = Mn/DOT Modified

Comments: LESS THAN 15% PASSING #200 SIEVE, NO R-VALUE TEST RAN

36 39 15 17

Charge Out: 1037, 1038, 1041, 1042

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MAY 21 2007

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Testing Lab**

Minnesota Department Of Transportation SubSoil Sample Worksheet

Sample ID: CO-SS07-0043
 Project No.: SAP 27-614-11
 Date Sampled: 4/18/2007

Submitted By:
 Source:
 Date Received: 4/26/2007

Hydrometer Analysis

Time	Temp	Read	Size (mm)	% Finer
2 min	70.0	11.0	0.03712	7.9
5 min	70.0	10.0	0.02427	6.2
15 min	70.0	9.0	0.01408	4.4
30 min	70.0	9.0	0.00939	4.4
60 min	70.0	8.0	0.00699	2.6
250 mi	71.0	7.0	0.00340	1.3
24 hr	70.0	6.5	0.00143	0.0

Liquid Limit

Type	Weight 1	Weight 2
Liquid Limit	0.0%	

Particle Size

%	Particle	Size (mm)
89.4	Total Sand	
10.2	Silt	.075-.002
0.5	Clay	<.002

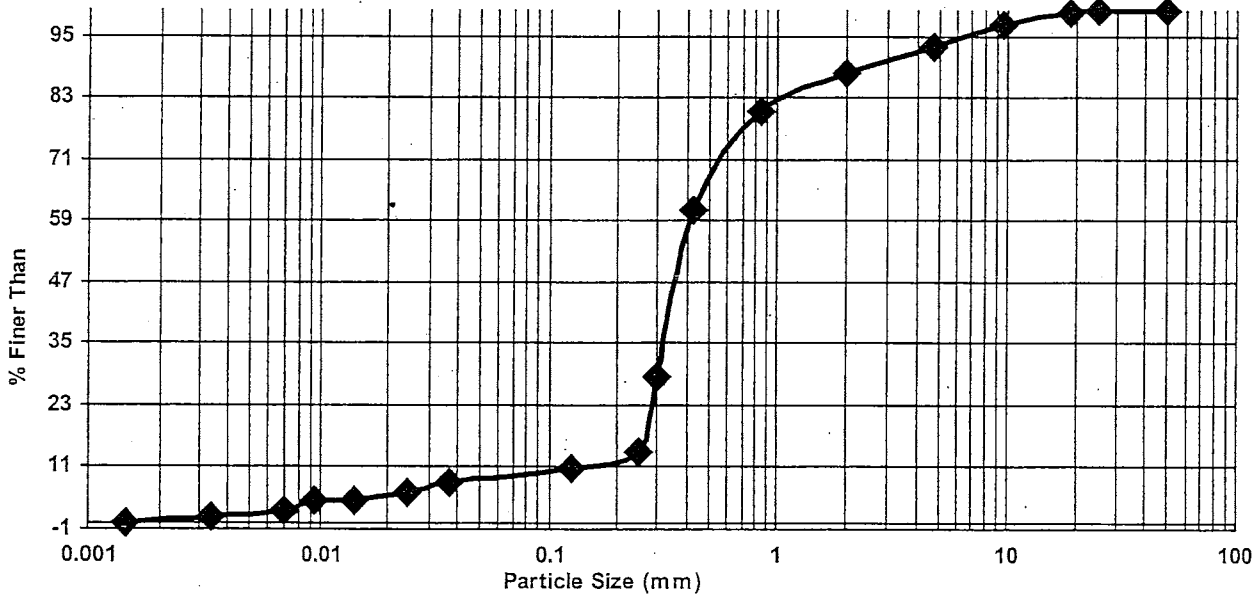
Hygroscopic Moisture

Content Type	Weight
Air Dry + Can	34.74
Oven Dry + Can	34.73
Can	14.54
Corr. Factor	1.000%

Plastic Limit

Type	Weight 1	Weight 2
Plastic Limit	0.0%	
Plasticity Ind	0.0	

Percent Finer

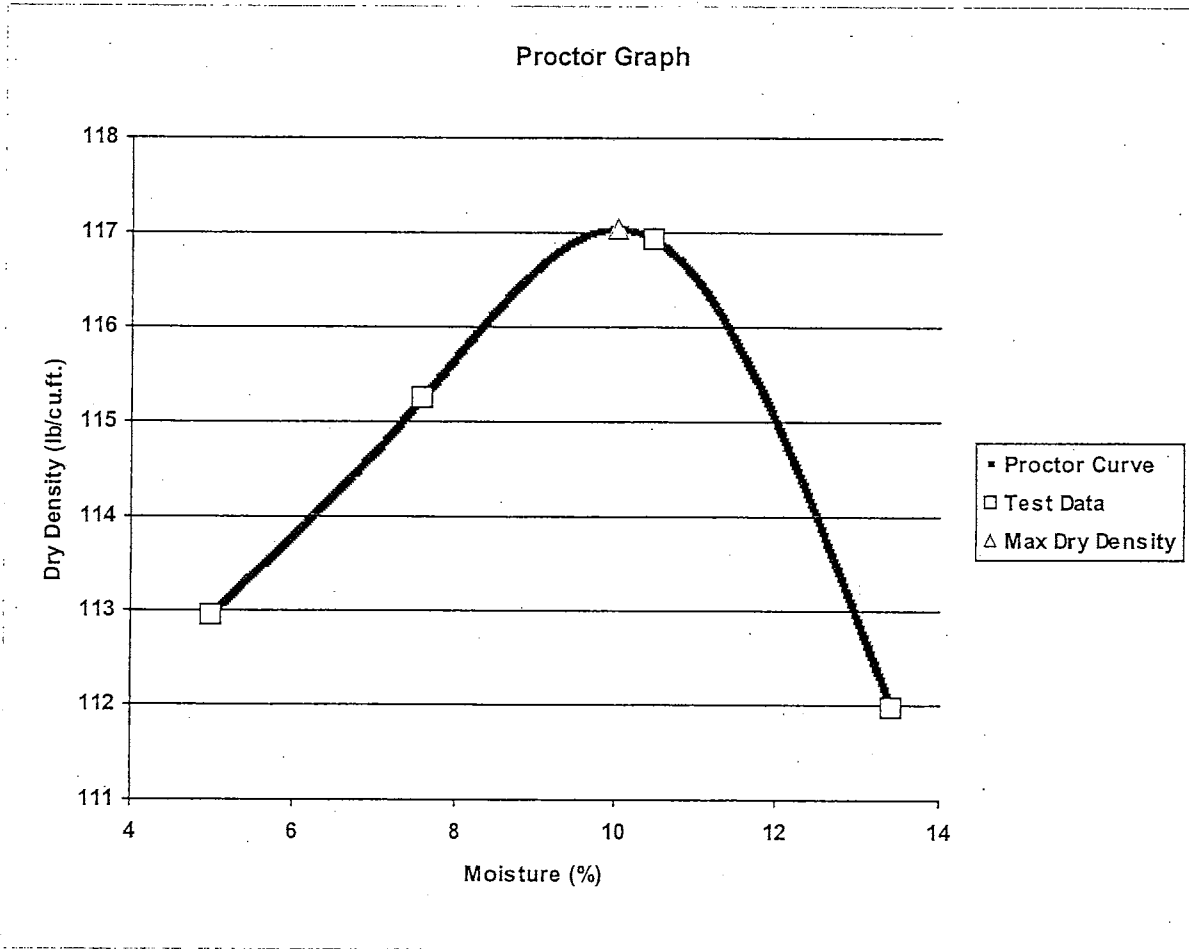


State of Minnesota Department of Transportation

MOISTURE-DENSITY RELATIONSHIP

Sample ID: CO-SS07-0043 Proj Eng : H. HANSON Submitted By:
 Sample From : RV 2 HOLE 10 Project No.: 27-614-11 Report Approved : 05/02/2007 07:29

Test Number:	1	2	3	4	5	6	7	8
Wet Soil Mold:	6055.70	6137.30	6215.10	6182.30				
Mold:	4262.70	4262.70	4262.70	4262.70				
Wet Soil Pan:	953.30	941.80	914.10	949.40				
Dry Soil Pan:	925.10	900.50	862.70	879.50				
Pan:	359.90	356.60	370.70	358.40				
%Moisture-Dry:	4.99	7.59	10.45	13.41				
Dry Density:	112.96	115.25	116.93	111.96				
Maximum Density:	117.0 lb/cu.ft.							
Optimum Moisture:	10.0 %							



Test Procedures: AASHTO T-99 Method "C" (M)

M = Mn/DOT Modified

Minnesota Department Of Transportation

SubSoil Sample Worksheet

Sample ID: CO-SS07-0042
 Project No.: SAP 27-614-11
 Date Sampled: 4/18/2007

Submitted By:
 Source:
 Date Received: 4/26/2007

Hydrometer Analysis

Time	Temp	Read	Size (mm)	% Finer
2 min	70.0	12.0	0.03691	9.1
5 min	70.0	11.0	0.02413	7.4
15 min	70.0	11.0	0.01392	7.4
30 min	70.0	10.5	0.00931	6.6
60 min	70.0	10.0	0.00691	5.8
250 mi	71.0	9.0	0.00336	4.5
24 hr	68.0	7.0	0.00144	0.1

Liquid Limit

Type	Weight 1	Weight 2
Liquid Limit	0.0%	

Particle Size

%	Particle	Size (mm)
88.4	Total Sand	
9.8	Silt	.075-.002
1.8	Clay	<.002

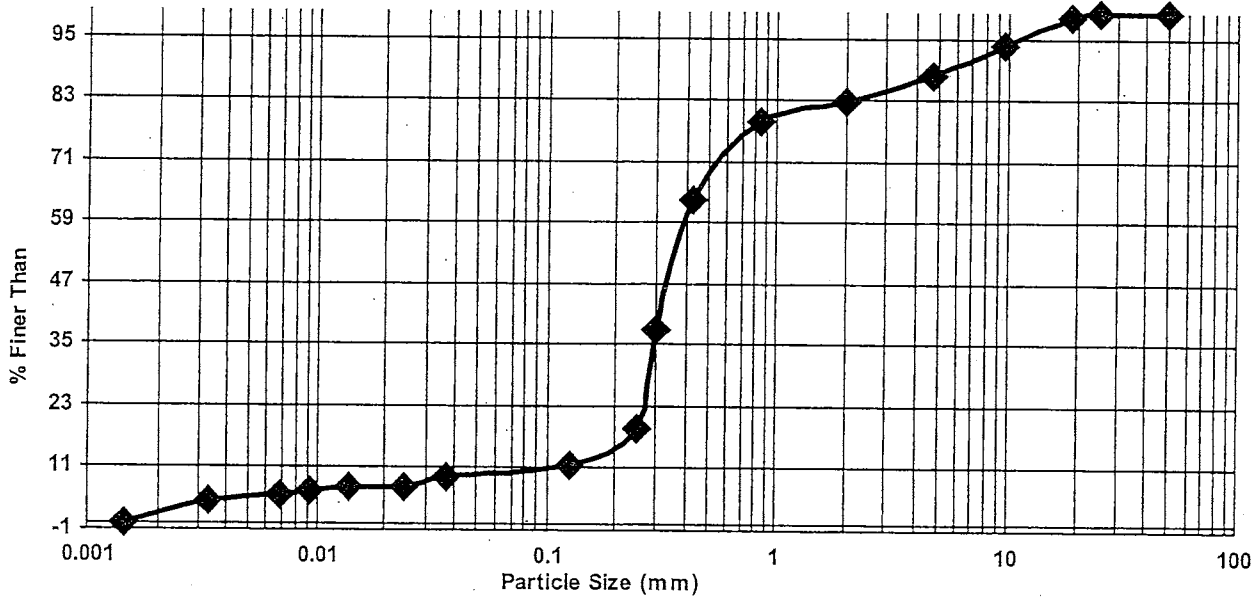
Hygroscopic Moisture

Content Type	Weight
Air Dry + Can	29.29
Oven Dry + Can	29.29
Can	14.50
Corr. Factor	1.000%

Plastic Limit

Type	Weight 1	Weight 2
Plastic Limit	0.0%	
Plasticity Ind	0.0	

Percent Finer

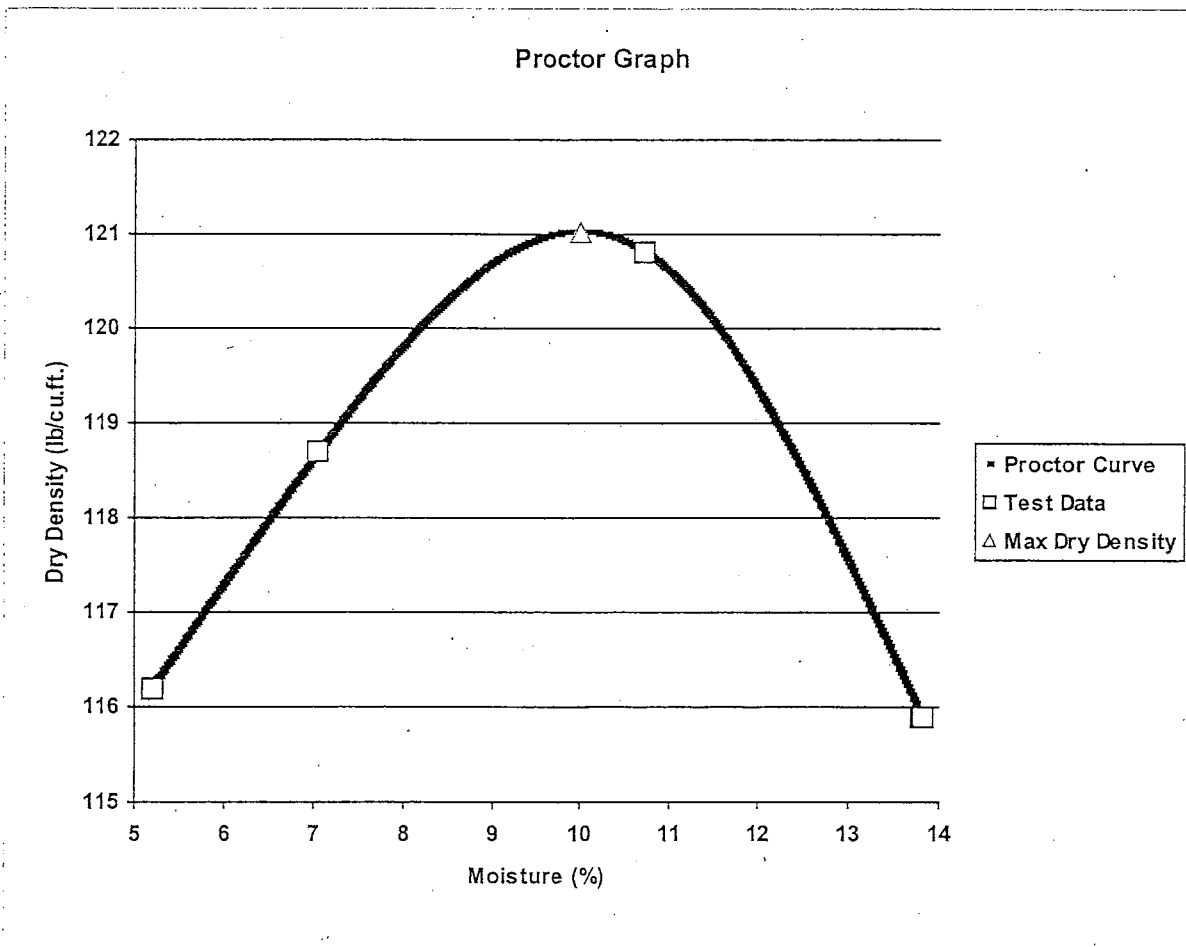


State of Minnesota Department of Transportation

MOISTURE-DENSITY RELATIONSHIP

Sample ID: CO-SS07-0042 Proj Eng : H. HANSON Submitted By:
 Sample From : RV 1 HOLE 1 Project No.: 27-614-11 Report Approved : 05/02/2007 07:28

Test Number:	1	2	3	4	5	6	7	8
Wet Soil Mold:	6110.70	6183.80	6284.70	6256.60				
Mold:	4262.70	4262.70	4262.70	4262.70				
Wet Soil Pan:	942.20	913.90	894.20	927.50				
Dry Soil Pan:	913.10	877.00	842.10	858.30				
Pan:	352.70	354.00	355.60	357.50				
%Moisture-Dry:	5.19	7.06	10.71	13.82				
Dry Density:	116.20	118.70	120.81	115.88				
Maximum Density:	121.0 lb/cu.ft.							
Optimum Moisture:	10.0 %							



Test Procedures: AASHTO T-99 Method "C" (M)

M = Mn/DOT Modified