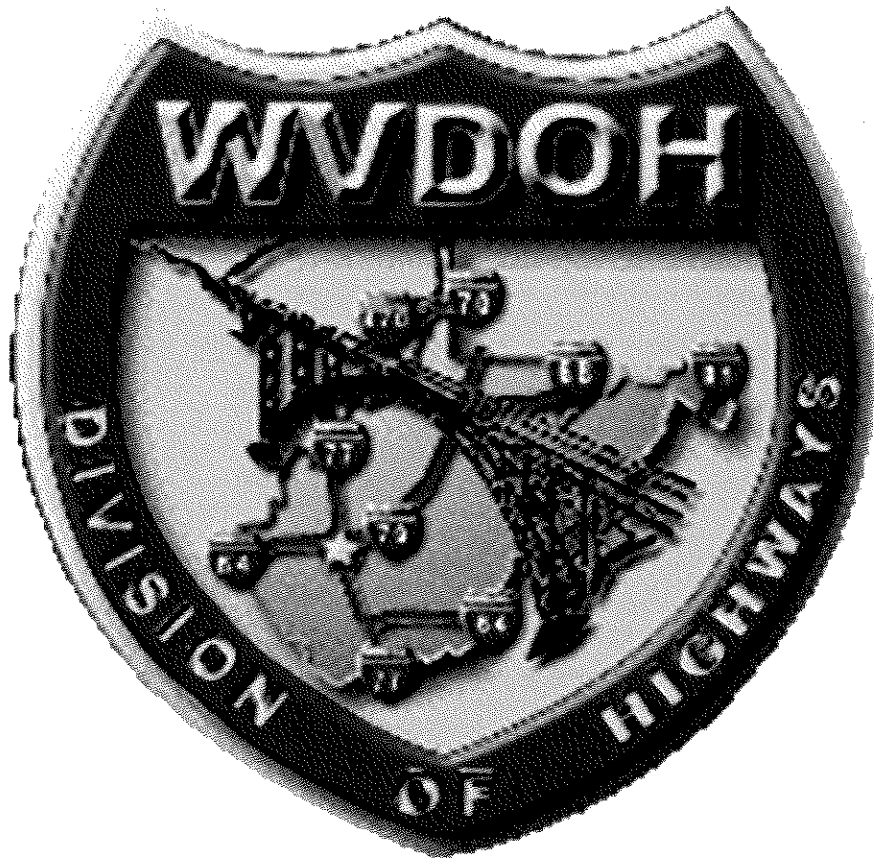


COMPACTION INSPECTOR WORK-SHOP PROBLEMS



WORKSHOP NUMBER ONE

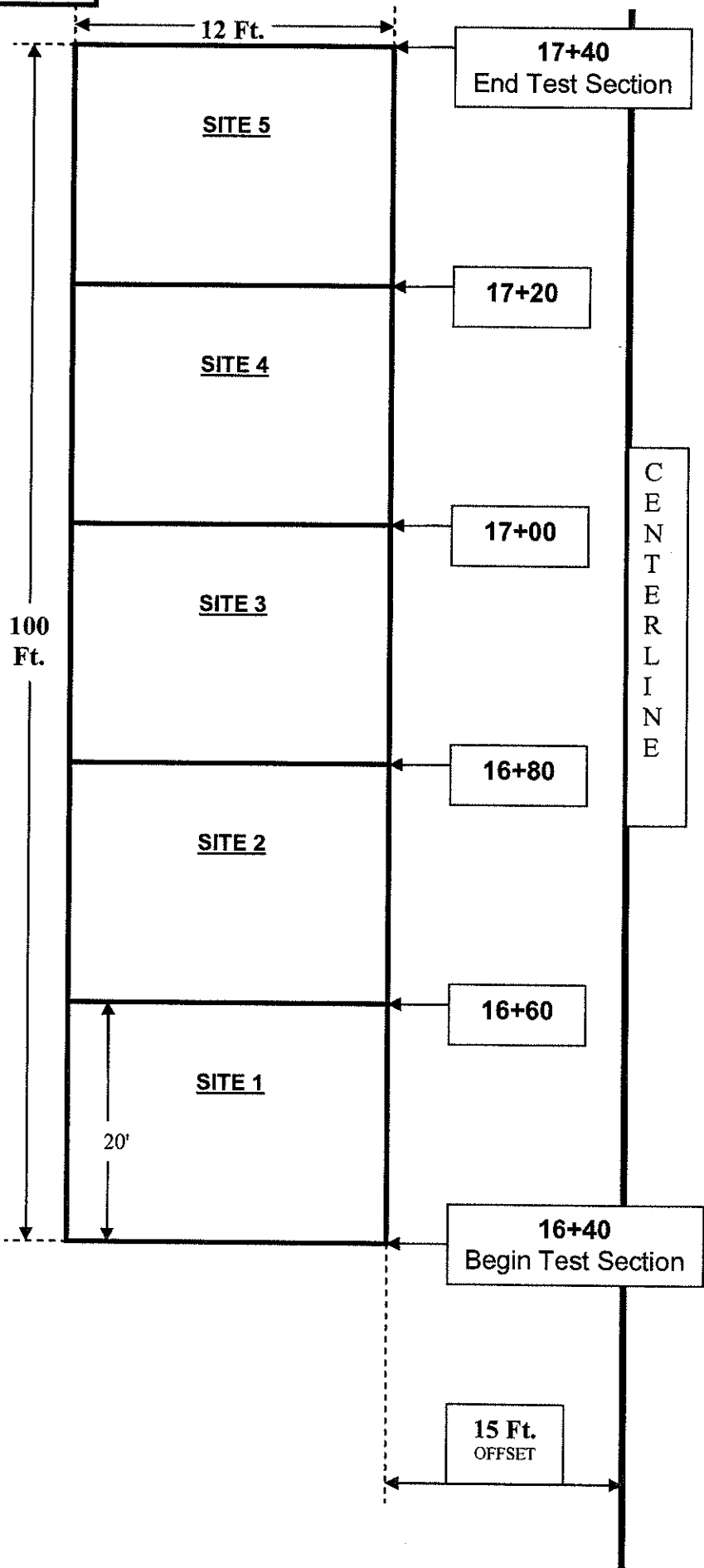
Random Numbers
&
Roller Pass Test Section

**Roller Pass Test Section
Item 307-1**

EXAMPLE # 1

RANDOM NUMBERS

1).	.065	.627
2).	.200	.055
3).	.217	.882
4).	.237	.146
5).	.815	.570



West Virginia Division of Highways
Materials Control Soil and Testing Division



Lab Number 8110912
 Auth. Number SM8888C
 Project Number S 310-8-19.22
 District Number 9
 Item Number 307-1
 Date Today's

EXAMPLE #2

FORM T-313
 MP 700.00.24
 REV. 08-08

Source of Material: Lewisburg			Length of Test Section: 100'		
Roller Type: Vibratory			Width of Test Section: 12'		
Roller Weight	Static: 9.0 Ton	Working: 15.0 Ton	Gauge Number 28225		
Lift Thickness Compacted: 6"			Manufacturer's Standards		
Depth Below Grade: 0					
Depth of Gauge Source: 6"			Density: 2865 Moisture: 678		
Observed			Standard Counts		
Yes	X	No	Density: 2857 Moisture: 670		

Test Site Number	1	2	3	4	5
Station Number	16+41	16+64	16+84	17+05	17+36
Offset	23' LT CL	16' LT CL	26' LT CL	17' LT CL	22' LT CL

A	Number of Passes	12	
	Test Site	DA	Dry Density
	1		127
	2		128
DB	Average		

B	Number of Passes	14	
	Test Site	DA	Dry Density
	1		133
	2		135
DB	Average		

C	Number of Passes	16	
	Test Site	DA	Dry Density
	1		135
	2		136
DB	Average		

D	Number of Passes	18	
	Test Site	DA	Dry Density
	1		136
	2		137
DB	Average		

$$DB = \sum DA / 2$$

$$DC = \sum DA / 5$$

Maximum Density Determination		
Test Site	DA	Dry Density
1		136
2		137
3		138
4		137
5		136
DC	Max. Density	

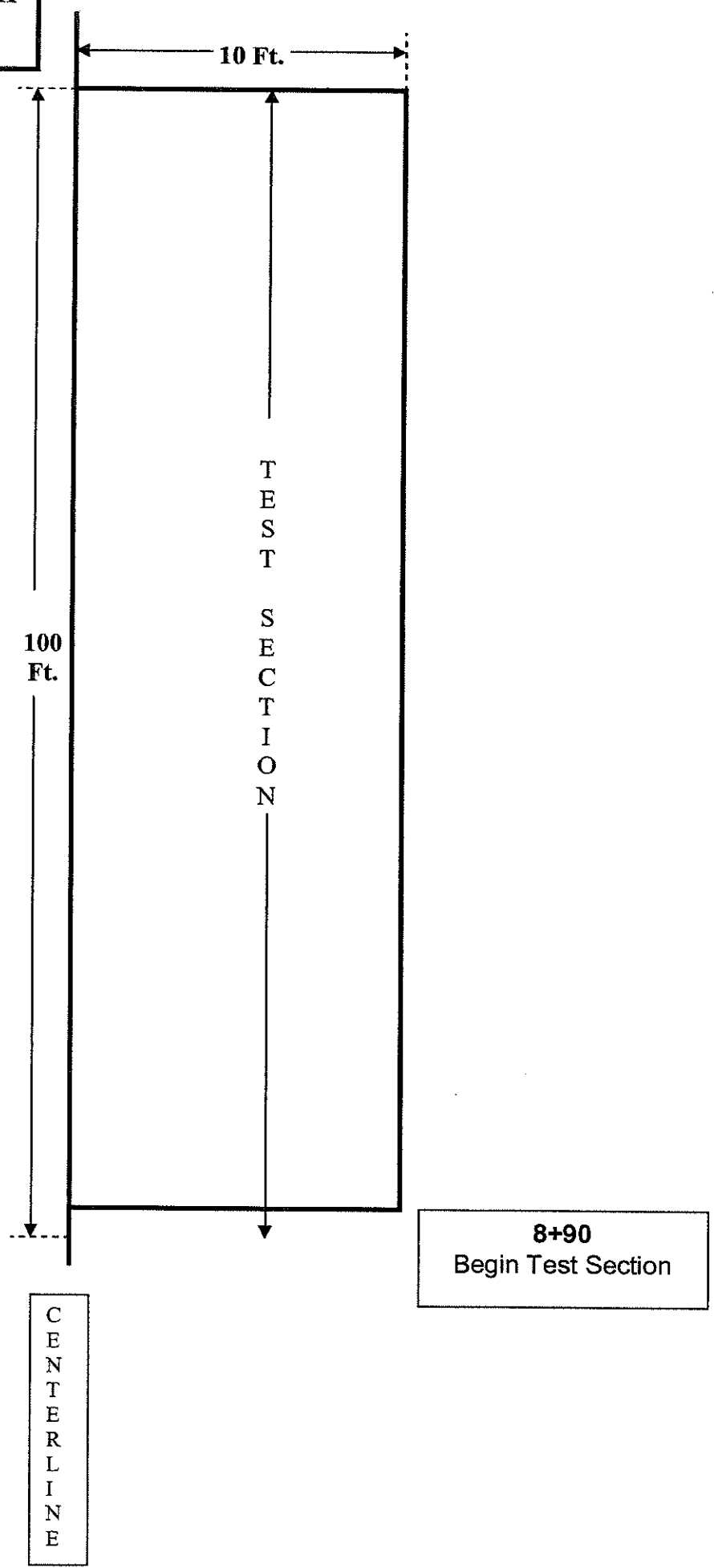
Inspector's Name: _____
 Inspector's Signature: _____
 Project's Evaluation _____
 Checked By: _____
 Date: _____

**Roller Pass Test Section
Item 307-1**

PROBLEM # 1

RANDOM NUMBERS

1).	.195	.887
2).	.902	.850
3).	.275	.023
4).	.794	.850
5).	.043	.293



PROBLEM # 2

MP 700.00.24

Item Number 307 - 1

Roller Pass Test Section T-313

Lab Number:	7112182		
Authorization Number:	FC2121C		
Project Number	RS-0162 (054)		
District Number:	4		
Item Number:	307-1		
Date	Today's		
Source of Material	Clarksburg		
Roller Type	Vibratory		
Roller Weight	Static: 10 Ton	Working:	18.5 Ton
Lift Thickness Compacted:	6"		
Depth Below Grade	0		
Depth of Gauge Source	6"		
Length of Test Section	100'		
Width of Test Section	10'		
Gauge Number	11172		
Manufacturer's Standards	Density: 2891	Moisture:	627
Standards Counts	Density: 2872	Moisture:	624

Test Site Number	1	2	3	4	5
Station Number	8+94	9+28	9+36	9+66	9+71
Offset	9' RT CL	8' RT CL	CL	8' RT CL	3' RT CL

DRY DENSITY PCF

Number of Passes		12	14	16	18	
Test Site Number	1	133	136	137	138	
Test Site Number	2	134	136	138	138	
Test Site Number	3				137	
Test Site Number	4				139	
Test Site Number	5				138	

West Virginia Division of Highways
Materials Control Soil and Testing Division



Lab Number _____
 Auth. Number _____
 Project Number _____
 District Number _____
 Item Number _____
 Date _____

PROBLEM #2
FORM T-313
 MP 700.00.24
 REV. 08-08

Source of Material:			Length of Test Section:		
Roller Type:			Width of Test Section:		
Roller Weight	Static:	Working:	Gauge Number		
Lift Thickness Compacted:			Manufacturer's Standards		
Depth Below Grade:			Density:	Moisture:	
Depth of Gauge Source:			Standard Counts		
Observed	Yes	No	Density:	Moisture:	

Test Site Number	1	2	3	4	5
Station Number					
Offset					

A	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

B	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

C	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

D	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

$$DB = \sum DA / 2$$

$$DC = \sum DA / 5$$

Maximum Density Determination		
Test Site	DA	Dry Density
1		
2		
3		
4		
5		
DC	Max. Density	

Inspector's Name: _____
 Inspector's Signature: _____
 Project's Evaluation _____
 Checked By: _____
 Date: _____

ANSWERS

Workshop Number One

Roller Pass Test Section Item 307-1

EXAMPLE # 1 ANSWERS

RANDOM NUMBERS

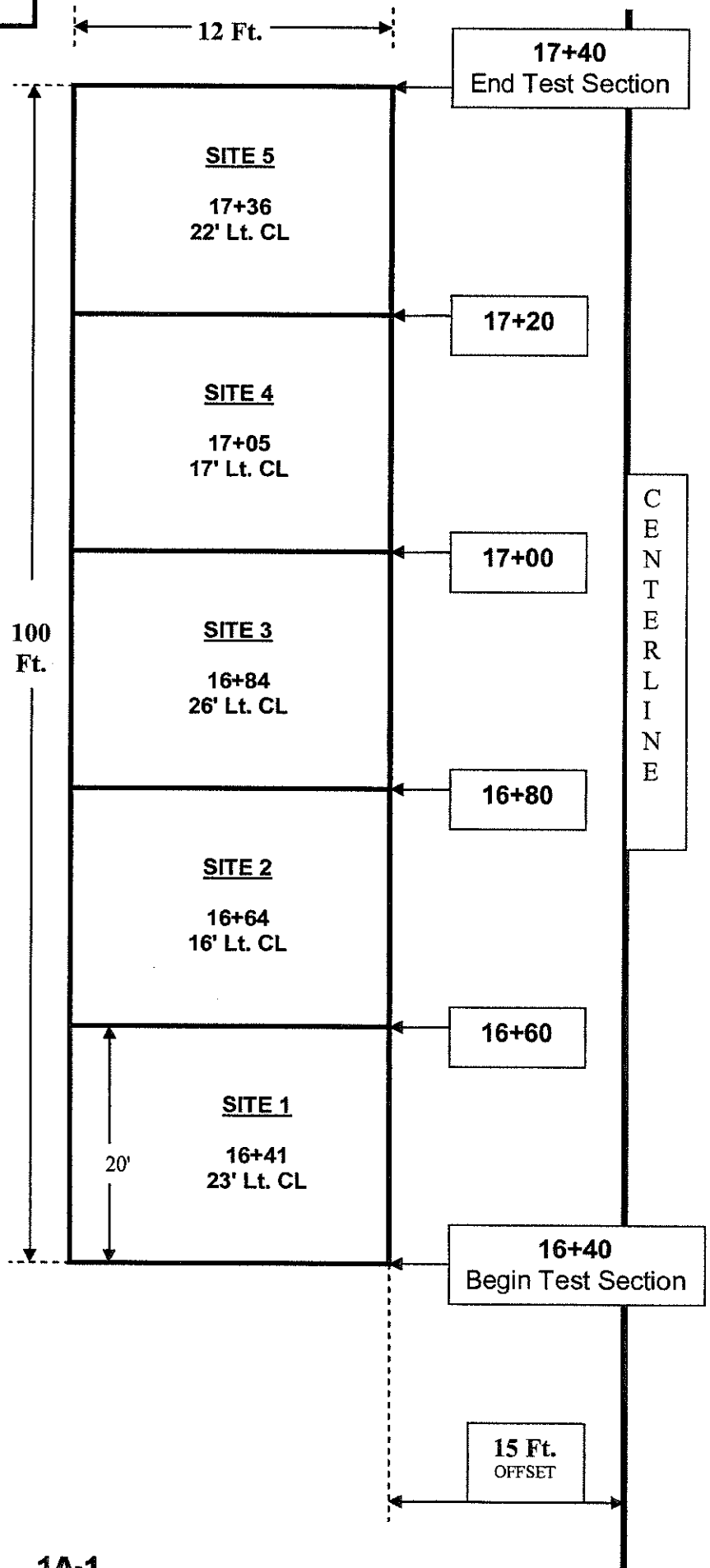
- | | | |
|-----|------|------|
| 1). | .065 | .627 |
| 2). | .200 | .055 |
| 3). | .217 | .882 |
| 4). | .237 | .146 |
| 5). | .815 | .570 |

Length

- | | |
|---|---------------------------------------------|
| 1 | .065 X 20 = 1
16+40 + 1 = 16+41 |
| 2 | .200 X 20 = 4
16+60 + 4 = 16+64 |
| 3 | .217 X 20 = 4
16+80 + 4 = 16+84 |
| 4 | .237 X 20 = 5
17+00 + 5 = 17+05 |
| 5 | .815 X 20 = 16
17+20 + 16 = 17+36 |

Width

- | | |
|---|-----------------------------------------------|
| 1 | .627 X 12 = 8
8 + 15 = 23' Lt. CL |
| 2 | .055 X 12 = 1
1 + 15 = 16' Lt. CL |
| 3 | .882 X 12 = 11
11 + 15 = 26' Lt. CL |
| 4 | .146 X 12 = 2
2 + 15 = 17' Lt. CL |
| 5 | .570 X 12 = 7
7 + 15 = 22' Lt. CL |



West Virginia Division of Highways
Materials Control Soil and Testing Division



Lab Number 8110912
 Auth. Number SM8888C
 Project Number S 310-8-19.22
 District Number 9
 Item Number 307-1
 Date Today's

EXAMPLE #2 ANSWERS
FORM T-313
 MP 700.00.24
 REV. 08-08

Source of Material: Lewisburg			Length of Test Section: 100'	
Roller Type: Vibratory			Width of Test Section: 12'	
Roller Weight	Static: 9.0 Ton	Working: 15.0 Ton	Gauge Number 28225	
Lift Thickness Compacted: 6"			Manufacturer's Standards	
Depth Below Grade: 0			Density: 2865	Moisture: 678
Depth of Gauge Source: 6"			Standard Counts	
Observed	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Density: 2857	Moisture: 670

Test Site Number	1	2	3	4	5
Station Number	16+41	16+64	16+84	17+05	17+36
Offset	23' LT CL	16' LT CL	26' LT CL	17' LT CL	22' LT CL

A	Number of Passes	12	
	Test Site	DA	Dry Density
	1		127
	2		128
DB	Average		128

B	Number of Passes	14	
	Test Site	DA	Dry Density
	1		133
	2		135
DB	Average		134

C	Number of Passes	16	
	Test Site	DA	Dry Density
	1		135
	2		136
DB	Average		136

D	Number of Passes	18	
	Test Site	DA	Dry Density
	1		136
	2		137
DB	Average		137

$$DB = \sum DA / 2$$

$$DC = \sum DA / 5$$

Maximum Density Determination		
Test Site	DA	Dry Density
1		136
2		137
3		138
4		137
5		136
DC	Max. Density	137

Inspector's Name: _____
 Inspector's Signature: _____
 Project's Evaluation _____
 Checked By: _____
 Date: _____

**Roller Pass Test Section
Item 307-1**

**PROBLEM # 1
ANSWERS**

RANDOM NUMBERS

- 1). .195 .887
- 2). .902 .850
- 3). .275 .023
- 4). .794 .850
- 5). .043 .293

Length

1 .195 X 20 = 4
8+90 + 4 = **8+94**

2 .902 X 20 = 18
9+10 + 18 = **9+28**

3 .275 X 20 = 6
9+30 + 6 = **9+36**

4 .794 X 20 = 16
9+50 + 16 = **9+66**

5 .043 X 20 = 1
9+70 + 1 = **9+71**

Width

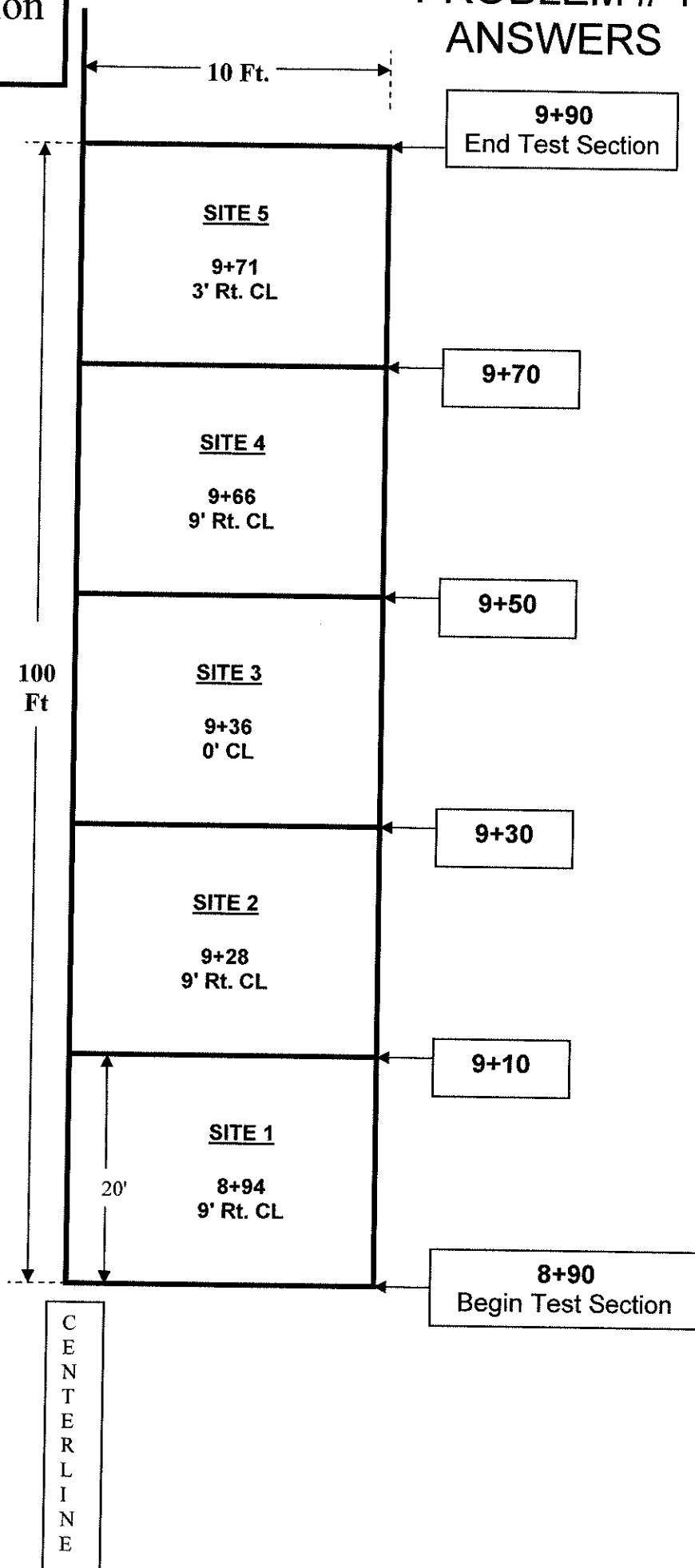
1 .887 X 10 = **9' Rt. CL**

2 .850 X 10 = **9' Rt. CL**

3 .023 X 10 = **0' CL**

4 .850 X 10 = **9' Rt. CL**

5 .293 X 10 = **3' Rt. CL**



West Virginia Division of Highways
Materials Control Soil and Testing Division



Lab Number 7112182
 Auth. Number FC2121C
 Project Number RS-0162 (054)
 District Number 4
 Item Number 307-1
 Date Today's

PROBLEM #2 ANSWERS
FORM T-313
 MP 700.00.24
 REV. 08-08

Source of Material: Clarksburg			Length of Test Section: 100'	
Roller Type: Vibratory			Width of Test Section: 10'	
Roller Weight	Static: 10 Ton	Working: 18.5 Ton	Gauge Number 11172	
Lift Thickness Compacted: 6"			Manufacturer's Standards	
Depth Below Grade: 0			Density: 2891	Moisture: 627
Depth of Gauge Source: 6"			Standard Counts	
Observed	Yes	No X	Density: 2872	Moisture: 624

Test Site Number	1	2	3	4	5
Station Number	8+94	9+28	9+36	9+66	9+71
Offset	9' RT CL	8' RT CL	CL	8' RT CL	3' RT CL

A	Number of Passes	12	
	Test Site	DA	Dry Density
	1		133
	2		134
DB	Average		134

B	Number of Passes	14	
	Test Site	DA	Dry Density
	1		136
	2		136
DB	Average		136

C	Number of Passes	16	
	Test Site	DA	Dry Density
	1		137
	2		138
DB	Average		138

D	Number of Passes	18	
	Test Site	DA	Dry Density
	1		138
	2		138
DB	Average		138

$$DB = \sum DA / 2$$

$$DC = \sum DA / 5$$

Maximum Density Determination		
Test Site	DA	Dry Density
1		138
2		138
3		137
4		139
5		138
DC	Max. Density	138

Inspector's Name: _____
 Inspector's Signature: _____
 Project's Evaluation _____
 Checked By: _____
 Date: _____

WORKSHOP NUMBER TWO

Quality Assurance
Of
Aggregates

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER	8110913
AUTH. NUMBER	SM8888C
PROJECT NUMBER	S 310-8-19.22
DISTRICT	9
ITEM NUMBER	307-1

EXAMPLE#1
FORM T-317
MP 700.00.24
REV. 08-08

GAUGE #	28225	DATE	Today's			
MANUFACTURER'S DENSITY STANDARD	2865	LOT NUMBER	B-1			
		BEGINNING STATION	17+40			
MANUFACTURER'S MOISTURE STANDARD	678	ENDING STATION	34+40			
		OFFSET	10' LT CL			
		DEPTH BELOW GRADE	0			
		DEPTH OF GAUGE SOURCE	6"			
		LIFT THICKNESS COMPACTED	6"			
DC FROM TEST SECTION		DENSITY STANDARD	2858			
		MOISTURE STANDARD	672			
$DF = \frac{DE (100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$		DC	MAXIMUM DENSITY	137		
			REFERENCE LAB NUMBER	8110912		
TEST NUMBER 1	DE	DRY DENSITY	135			
	DF	% RELATIVE DENSITY				
TEST NUMBER 2	DE	DRY DENSITY	134			
	DF	% RELATIVE DENSITY				
TEST NUMBER 3	DE	DRY DENSITY	132			
	DF	% RELATIVE DENSITY				
TEST NUMBER 4	DE	DRY DENSITY	131			
	DF	% RELATIVE DENSITY				
TEST NUMBER 5	DE	DRY DENSITY	136			
	DF	% RELATIVE DENSITY				
LOT EVALUATION	\bar{X}	AVERAGE DF				
	T	TARGET				
	QL	QUALITY INDEX				
	DG	% WITHIN TOLERANCE				
	DH	MIN. FOR 100% PAY				
	DI	PASS / FAIL				

INSPECTOR'S NAME: _____
 INSPECTOR'S SIGNATURE: _____
 PROJECT'S EVALUATION _____
 CHECKED BY: _____ DATE: _____

PROBLEM # 1

MP 700.00.24

Item Number 307 - 1

Lot by Lot T-317

Lab Number:	7112183			
Authorization Number:	FC2121C			
Project Number	RS-0162(054)			
District Number:	4			
Item Number:	307-1			
Gauge Number	11172			
Manufacturer's Standards	Density	2891	Moisture	627

Date	Today's				
Lot Number	B-1				
Beginning Station	1+85				
Ending Station	20+85				
Offset	LT CL				
Depth Below Grade	0				
Depth of Gauge Source	6"				
Lift Thickness	6"				
Density Standards	2884				
Moisture Standards	625				
Maximum Denisty	138				
Reference Lab Number	7112182				

DRY DENSITY PCF

Test Site Number	1	134				
Test Site Number	2	133				
Test Site Number	3	132				
Test Site Number	4	135				
Test Site Number	5	137				

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____
 AUTH. NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 ITEM NUMBER _____

PROBLEM #1
FORM T-317
 MP 700.00.24
 REV. 08-08

GAUGE #	DATE					
MANUFACTURER'S DENSITY STANDARD	LOT NUMBER					
	BEGINNING STATION					
MANUFACTURER'S MOISTURE STANDARD	ENDING STATION					
	OFFSET					
	DEPTH BELOW GRADE					
	DEPTH OF GAUGE SOURCE					
	LIFT THICKNESS COMPACTED					
DC FROM TEST SECTION	DENSITY STANDARD					
	MOISTURE STANDARD					
$DF = \frac{DE (100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$	DC	MAXIMUM DENSITY				
		REFERENCE LAB NUMBER				
TEST NUMBER 1	DE	DRY DENSITY				
	DF	% RELATIVE DENSITY				
TEST NUMBER 2	DE	DRY DENSITY				
	DF	% RELATIVE DENSITY				
TEST NUMBER 3	DE	DRY DENSITY				
	DF	% RELATIVE DENSITY				
TEST NUMBER 4	DE	DRY DENSITY				
	DF	% RELATIVE DENSITY				
TEST NUMBER 5	DE	DRY DENSITY				
	DF	% RELATIVE DENSITY				
LOT EVALUATION	\bar{X}	AVERAGE DF				
	T	TARGET				
	QL	QUALITY INDEX				
	DG	% WITHIN TOLERANCE				
	DH	MIN. FOR 100% PAY				
	DI	PASS / FAIL				

INSPECTOR'S NAME: _____
 INSPECTOR'S SIGNATURE: _____
 PROJECT'S EVALUATION _____
 CHECKED BY: _____ DATE: _____

ANSWERS

Workshop Number Two

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER 8110913
 AUTH. NUMBER SM8888C
 PROJECT NUMBER S 310-8-19.22
 DISTRICT 9
 ITEM NUMBER 307-1

EXAMPLE#1 ANSWERS
FORM T-317
 MP 700.00.24
 REV. 08-08

GAUGE #	28225	DATE	Today's				
MANUFACTURER'S DENSITY STANDARD	2865	LOT NUMBER	B-1				
		BEGINNING STATION	17+40				
MANUFACTURER'S MOISTURE STANDARD	678	ENDING STATION	34+40				
		OFFSET	10' LT CL				
		DEPTH BELOW GRADE	0				
		DEPTH OF GAUGE SOURCE	6"				
		LIFT THICKNESS COMPACTED	6"				
DC FROM TEST SECTION		DENSITY STANDARD	2858				
		MOISTURE STANDARD	672				
$DF = \frac{DE (100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$		DC	MAXIMUM DENSITY	137			
			REFERENCE LAB NUMBER	8110912			
TEST NUMBER 1	DE	DRY DENSITY	135				
	DF	% RELATIVE DENSITY	99				
TEST NUMBER 2	DE	DRY DENSITY	134				
	DF	% RELATIVE DENSITY	98				
TEST NUMBER 3	DE	DRY DENSITY	132				
	DF	% RELATIVE DENSITY	96				
TEST NUMBER 4	DE	DRY DENSITY	131				
	DF	% RELATIVE DENSITY	96				
TEST NUMBER 5	DE	DRY DENSITY	136				
	DF	% RELATIVE DENSITY	99				
LOT EVALUATION	\bar{X}	AVERAGE DF	97.6				
	T	TARGET	95				
	QL	QUALITY INDEX	0.87				
	DG	% WITHIN TOLERANCE	99				
	DH	MIN. FOR 100% PAY	80				
	DI	PASS / FAIL	Pass				

INSPECTOR'S NAME: _____
 INSPECTOR'S SIGNATURE: _____
 PROJECT'S EVALUATION _____
 CHECKED BY: _____ DATE: _____
2A-1

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER 7112183
 AUTH. NUMBER FC2121C
 PROJECT NUMBER RS-0162-(054)
 DISTRICT 4
 ITEM NUMBER 307-1

PROBLEM#1 ANSWERS
FORM T-317
 MP 700.00.24
 REV. 08-08

GAUGE #	11172	DATE	Today's				
MANUFACTURER'S DENSITY STANDARD	2891	LOT NUMBER	B-1				
		BEGINNING STATION	1+85				
MANUFACTURER'S MOISTURE STANDARD	627	ENDING STATION	20+85				
		OFFSET	LT CL				
		DEPTH BELOW GRADE	0				
		DEPTH OF GAUGE SOURCE	6"				
		LIFT THICKNESS COMPACTED	6"				
DC FROM TEST SECTION		DENSITY STANDARD	2884				
		MOISTURE STANDARD	625				
$DF = \frac{DE (100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$		DC	MAXIMUM DENSITY	138			
			REFERENCE LAB NUMBER	7112182			
TEST NUMBER 1	DE	DRY DENSITY	134				
	DF	% RELATIVE DENSITY	97				
TEST NUMBER 2	DE	DRY DENSITY	133				
	DF	% RELATIVE DENSITY	96				
TEST NUMBER 3	DE	DRY DENSITY	132				
	DF	% RELATIVE DENSITY	96				
TEST NUMBER 4	DE	DRY DENSITY	135				
	DF	% RELATIVE DENSITY	98				
TEST NUMBER 5	DE	DRY DENSITY	137				
	DF	% RELATIVE DENSITY	99				
LOT EVALUATION	\bar{X}	AVERAGE DF	97.2				
	T	TARGET	95				
	QL	QUALITY INDEX	0.73				
	DG	% WITHIN TOLERANCE	99				
	DH	MIN. FOR 100% PAY	80				
	DI	PASS / FAIL	Pass				

INSPECTOR'S NAME: _____
 INSPECTOR'S SIGNATURE: _____
 PROJECT'S EVALUATION _____
 CHECKED BY: _____ DATE: _____

WORKSHOP NUMBER THREE

Quality Assurance
Of
Soils

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER 9112762
 AUTHORIZATION NUMBER FC3838H
 PROJECT NUMBER S 317 - 2 - 41.55
 DISTRICT 4
 LOT NUMBER F25
 ITEM NUMBER 207 - 1

EXAMPLE
FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY	2912	STATION NUMBER	ft.	14+65	15+32	17+18	18+92	20+42	
MOISTURE	662	OFFSET	ft.	8'LT CL	12'RT CL	38'RT CL	29'LT CL	10'LT CL	
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.	18'	18'	18'	18'	18'	
DENSITY	2901	LIFT THICKNESS	in.	6"	6"	6"	6"	6"	
MOISTURE	655	DEPTH OF SOURCE	in.	6"	6"	6"	6"	6"	
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	125	123	124	120	118
		MA	MOISTURE	lb/ft ³	10	11	12	16	16
		DB	DRY DENSITY -3/4	lb/ft ³					
		MB	MOISTURE	%					
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	5035			4916	
CC = CA - CB		CB	PAN	grams	415			415	
CF = CD - CE		CC	EXCAVATED MAT.	grams					
CG = CF (100) CC		CD	PLUS 3/4 MAT. + PAN	grams	829			1125	
PC = PA - PB		CE	PAN	grams	465			465	
PD = PC (0.066)		CF	PLUS 3/4 MAT.	grams					
PE = PD (100) 100 + MB		CG	PLUS 3/4 MAT.	%					
		CH	SPECIFIC GRAVITY		2.5			2.5	
				RERUN	RERUN	RERUN	RERUN	RERUN	
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3941			4014	4032
		PB	MOLD	grams	2009			2009	2009
		PC	WEIGHT OF SOIL	grams					
		PD	WET DENSITY	lb/ft ³					
		PE	DRY DENSITY	lb/ft ³					
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams				598	
SE = SD - SB		SB	PAN	grams				245	
SF = SC - SE		SC	WET WEIGHT	grams					
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams				560	
		SE	DRY WEIGHT	grams					
DE = DB (100) DC		SF	MOISTURE	grams					
		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%					
		OB	PLUS / MINUS TOLER.						
		OC	PASS / FAIL						
QL = $\frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³					
		DE	RELATIVE DENSITY	%					
LOT EVALUATION		\bar{X}	AVERAGE DE	%		INSPECTOR'S NAME:			
		T	TARGET	%		INSPECTOR'S SIGNATURE:			
		QL	QUALITY INDEX			PROJECT'S EVALUATION			
		DF	WITHIN TOLERANCE	%		CHECKED BY:			
		DG	MIN. FOR 100% PAY	%		DATE:			
		DH	PASS / FAIL	YES	NO				

PROBLEM # 1

MP 207.07.20

T - 316

Lab Number:	5111297			
Authorization Number:	FC3636K			
Project Number	S326-17 - 3.65			
District Number:	4			
Lot Number:	P - 218			
Item Number:	604 (36)			
Gauge Number	57420			
Manufacturer's Standards	Density	3165	Moisture	621

Test Number	1	2	3	4	5
Date	Today's	Today's	Today's	Today's	Today's
Station Number	206+18	206+18	206+18	206+18	206+18
Offset	37' RT CL	39' RT CL	31' RT CL	25' RT CL	42' RT CL
Density Standard	3152	3152	3152	3152	3152
Moisture Standard	620	620	620	620	620
Depth Below Grade	14'	13'	12'	10'	9'
Lift Thickness	4"	4"	4"	4"	4"
Depth of Gauge Source	4"	4"	4"	4"	4"
Total Dry Density <i>PCF</i>	114	111	112	115	116
Moisture <i>PCF</i>	15	18	18	14	16
Excavated Material + Pan	5057				
Pan	525				
+3/4" Material + Pan	829				
Pan	545				
Specific Gravity	2.5				
Wt. of Soil + Mold (g)	3945				
Wt. Mold (g)	2000				
Wt. of Soil + Mold <i>RERUN</i>					
Wt. Mold <i>RERUN</i>					
Wet Wt. + Pan					
Pan					
Dry Wt. + Pan					

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

PROBLEM #1
FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER	ft.						
MOISTURE		OFFSET	ft.						
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.						
DENSITY		LIFT THICKNESS	in.						
MOISTURE		DEPTH OF SOURCE	in.						
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³					
		MA	MOISTURE	lb/ft ³					
		DB	DRY DENSITY -3/4	lb/ft ³					
		MB	MOISTURE	%					
$MB = \frac{MA(100)}{DB}$		PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams				
CC = CA - CB			CB	PAN	grams				
CF = CD - CE			CC	EXCAVATED MAT.	grams				
$CG = \frac{CF(100)}{CC}$			CD	PLUS 3/4 MAT. + PAN	grams				
PC = PA - PB			CE	PAN	grams				
PD = PC (0.066)			CF	PLUS 3/4 MAT.	grams				
$PE = \frac{PD(100)}{100 + MB}$			CG	PLUS 3/4 MAT.	%				
			CH	SPECIFIC GRAVITY					
					RERUN	RERUN	RERUN	RERUN	RERUN
RERUN PROCTOR $PE (RERUN) = \frac{PD(100)}{100 + SG}$	ONE POINT PROCTOR		PA	WEIGHT SOIL & MOLD	grams				
		PB	MOLD	grams					
		PC	WEIGHT OF SOIL	grams					
		PD	WET DENSITY	lb/ft ³					
		PE	DRY DENSITY	lb/ft ³					
SC = SA - SB SE = SD - SB SF = SC - SE $SG = \frac{SF(100)}{SE}$ DE = DB (100) DC	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams					
		SB	PAN	grams					
		SC	WET WEIGHT	grams					
		SD	DRY WEIGHT + PAN	grams					
		SE	DRY WEIGHT	grams					
		SF	MOISTURE	grams					
		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%					
		OB	PLUS / MINUS TOLER.						
		OC	PASS / FAIL						
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³					
		DE	RELATIVE DENSITY	%					
LOT EVALUATION	X	T	AVERAGE DE	%	INSPECTOR'S NAME:				
		QL	TARGET	%					
	DF DG DH	QL	QUALITY INDEX		INSPECTOR'S SIGNATURE:				
		DF	WITHIN TOLERANCE	%					
		DG	MIN. FOR 100% PAY	%					
		DH	PASS / FAIL	YES					NO
				PROJECT'S EVALUATION					
				CHECKED BY:					
				DATE:					

PROBLEM # 2

MP 207.07.20

T - 316

Lab Number:	61181932			
Authorization Number:	FM2002C			
Project Number	S344-41-9.82			
District Number:	10			
Lot Number:	F - 32			
Item Number:	207 - 1			
Gauge Number	11162			
Manufacturer's Standards	Density	2914	Moisture	667

Test Number	1	2	3	4	5
Date	Today's	Today's	Today's	Today's	Today's
Station Number	87+14	88+21	89+33	90+62	92+03
Offset	18' RT CL	29' LT CL	4' LT CL	16' RT CL	23' RT CL
Density Standard	2896				
Moisture Standard	664				
Depth Below Grade	82'				
Lift Thickness	6"				
Depth of Gauge Source	6"				
Total Dry Density <i>PCF</i>	114	112	122	119	120
Moisture <i>PCF</i>	18	16	14	13	12
Excavated Material + Pan	4921		4936		
Pan	450		450		
+3/4" Material + Pan	896		1094		
Pan	421		421		
Specific Gravity	2.5		2.7		
Wt. of Soil + Mold (<i>g</i>)	3941		4059		
Wt. Mold (<i>g</i>)	2000		2000		
Wt. of Soil + Mold <i>RERUN</i>	3923				
Wt. Mold <i>RERUN</i>	2000				
Wet Wt. + Pan	2146				
Pan	1827				
Dry Wt. + Pan	2112				

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

PROBLEM #2
FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER	ft.						
MOISTURE		OFFSET	ft.						
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE		ft.					
DENSITY		LIFT THICKNESS		in.					
MOISTURE		DEPTH OF SOURCE		in.					
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³					
		MA	MOISTURE	lb/ft ³					
		DB	DRY DENSITY -3/4	lb/ft ³					
		MB	MOISTURE	%					
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams					
CC = CA - CB		CB	PAN	grams					
CF = CD - CE		CC	EXCAVATED MAT.	grams					
CG = CF (100) CC		CD	PLUS 3/4 MAT. + PAN	grams					
PC = PA - PB		CE	PAN	grams					
PD = PC (0.066)		CF	PLUS 3/4 MAT.	grams					
PE = PD (100) 100 + MB		CG	PLUS 3/4 MAT.	%					
		CH	SPECIFIC GRAVITY						
				RERUN	RERUN	RERUN	RERUN	RERUN	
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams					
		PB	MOLD	grams					
		PC	WEIGHT OF SOIL	grams					
		PD	WET DENSITY	lb/ft ³					
		PE	DRY DENSITY	lb/ft ³					
SC = SA - SB SE = SD - SB SF = SC - SE SG = SF (100) SE DE = DB (100) DC	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams					
		SB	PAN	grams					
		SC	WET WEIGHT	grams					
		SD	DRY WEIGHT + PAN	grams					
		SE	DRY WEIGHT	grams					
		SF	MOISTURE	grams					
		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%					
		OB	PLUS / MINUS TOLER.						
		OC	PASS / FAIL						
QL = $\frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³					
		DE	RELATIVE DENSITY	%					
LOT EVALUATION		\bar{X}	AVERAGE DE	%		INSPECTOR'S NAME:			
		T	TARGET	%		INSPECTOR'S SIGNATURE:			
		QL	QUALITY INDEX			PROJECT'S EVALUATION			
		DF	WITHIN TOLERANCE	%		CHECKED BY:			
		DG	MIN. FOR 100% PAY	%		DATE:			
		DH	PASS / FAIL	YES	NO				

ANSWERS

Workshop Number Three

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER 9112762
 AUTHORIZATION NUMBER FC3838H
 PROJECT NUMBER S 317 - 2 - 41.55
 DISTRICT 4
 LOT NUMBER F25
 ITEM NUMBER 207 - 1

EXAMPLE
FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		26895		TEST NUMBER		1	2	3	4	5
MANUFACTURER'S STANDARDS		DATE								
DENSITY	2912	STATION NUMBER	ft.	14+65	15+32	17+18	18+92	20+42		
MOISTURE	662	OFFSET	ft.	8'LT CL	12'RT CL	38'RT CL	29'LT CL	10'LT CL		
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE		ft.	18'	18'	18'	18'	18'	
DENSITY	2901	LIFT THICKNESS		in.	6"	6"	6"	6"	6"	
MOISTURE	655	DEPTH OF SOURCE		in.	6"	6"	6"	6"	6"	
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	125	123	124	120	118	
		MA	MOISTURE	lb/ft ³	10	11	12	16	16	
		DB	DRY DENSITY -3/4	lb/ft ³	124	122	123	117	115	
		MB	MOISTURE	%	8	9	10	14	14	
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	5035			4916		
CC = CA - CB		CB	PAN	grams	415			415		
CF = CD - CE		CC	EXCAVATED MAT.	grams	4620			4501		
CG = CF (100) CC		CD	PLUS 3/4 MAT. + PAN	grams	829			1125		
PC = PA - PB		CE	PAN	grams	465			465		
PD = PC (0.066)		CF	PLUS 3/4 MAT.	grams	364			660		
PE = PD (100) 100 + MB		CG	PLUS 3/4 MAT.	%	8			15		
		CH	SPECIFIC GRAVITY		2.5			2.5		
					RERUN	RERUN	RERUN	RERUN	RERUN	
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3941			4014	4032	
		PB	MOLD	grams	2009			2009	2009	
		PC	WEIGHT OF SOIL	grams	1932			2005	2023	
		PD	WET DENSITY	lb/ft ³	128			132	134	
		PE	DRY DENSITY	lb/ft ³	119			116	120	
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams				598		
SE = SD - SB		SB	PAN	grams				245		
SF = SC - SE		SC	WET WEIGHT	grams				353		
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams				560		
		SE	DRY WEIGHT	grams				315		
DE = DB (100) DC		SF	MOISTURE	grams				38		
		SG	MOISTURE	%				12		
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%	12	12	12	12	12	
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4	
		OC	PASS / FAIL		Pass	Pass	Pass	Pass	Pass	
QL = $\frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³	123	123	123	120	120	
		DE	RELATIVE DENSITY	%	101	99	100	98	96	
LOT EVALUATION		\bar{X}	AVERAGE DE	%	98.8	INSPECTOR'S NAME:				
		T	TARGET	%	95	INSPECTOR'S SIGNATURE:				
		QL	QUALITY INDEX		0.76	PROJECT'S EVALUATION				
		DF	WITHIN TOLERANCE	%	99	CHECKED BY:				
		DG	MIN. FOR 100% PAY	%	80	DATE:				
		DH	PASS / FAIL		YES	NO				

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER 5111297
 AUTHORIZATION NUMBER FC3636K
 PROJECT NUMBER S 326 - 17 - 3.65
 DISTRICT 4
 LOT NUMBER P - 218
 ITEM NUMBER 604 (36)

PROBLEM #1 ANSWERS
 FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		57420		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE				Today's	Today's	Today's	Today's	Today's	
DENSITY	3165	STATION NUMBER		ft.		206+18	206+18	206+18	206+18	206+18	
MOISTURE	621	OFFSET		ft.		37'RT CL	39'RT CL	31'RT CL	25'RT CL	42'RT CL	
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE		ft.		14	13	12	10	9	
DENSITY	3152	LIFT THICKNESS		in.		4	4	4	4	4	
MOISTURE	620	DEPTH OF SOURCE		in.		4	4	4	4	4	
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³		114	111	112	115	116	
		MA	MOISTURE	lb/ft ³		15	18	18	14	16	
		DB	DRY DENSITY -3/4	lb/ft ³		113	109	110	114	115	
		MB	MOISTURE	%		13	17	16	12	14	
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams		5057					
		CB	PAN	grams		525					
		CC	EXCAVATED MAT.	grams		4532					
		CD	PLUS 3/4 MAT. + PAN	grams		829					
		CE	PAN	grams		545					
		CF	PLUS 3/4 MAT.	grams		284					
		CG	PLUS 3/4 MAT.	%		6					
		CH	SPECIFIC GRAVITY			2.5					
CC = CA - CB		RERUN		RERUN		RERUN		RERUN		RERUN	
CF = CD - CE		RERUN		RERUN		RERUN		RERUN		RERUN	
CG = CF (100) CC		RERUN		RERUN		RERUN		RERUN		RERUN	
PC = PA - PB		RERUN		RERUN		RERUN		RERUN		RERUN	
PD = PC (0.066)		RERUN		RERUN		RERUN		RERUN		RERUN	
PE = PD (100) 100 + MB		RERUN		RERUN		RERUN		RERUN		RERUN	
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams		3945					
		PB	MOLD	grams		2000					
		PC	WEIGHT OF SOIL	grams		1945					
		PD	WET DENSITY	lb/ft ³		128					
		PE	DRY DENSITY	lb/ft ³		113					
SC = SA - SB SE = SD - SB SF = SC - SE SG = SF (100) SE DE = DB (100) DC	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams							
		SB	PAN	grams							
		SC	WET WEIGHT	grams							
		SD	DRY WEIGHT + PAN	grams							
		SE	DRY WEIGHT	grams							
		SF	MOISTURE	grams							
		SG	MOISTURE	%							
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%		14	14	14	14	14	
		OB	PLUS / MINUS TOLER.			+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4	
		OC	PASS / FAIL			PASS	PASS	PASS	PASS	PASS	
QL = $\frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³		114	114	114	114	114	
		DE	RELATIVE DENSITY	%		99	96	96	100	101	
LOT EVALUATION		\bar{X}	AVERAGE DE	%		98.4	INSPECTOR'S NAME:				
		T	TARGET	%		95					
		QL	QUALITY INDEX			0.68	INSPECTOR'S SIGNATURE:				
		DF	WITHIN TOLERANCE	%		100					
		DG	MIN. FOR 100% PAY	%		80	PROJECT'S EVALUATION				
		DH	PASS / FAIL			YES					CHECKED BY:
					NO	DATE:					

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER 61181932
 AUTHORIZATION NUMBER FM2002C
 PROJECT NUMBER S 344 - 41 - 9.82
 DISTRICT 10
 LOT NUMBER F - 32
 ITEM NUMBER 207 - 1

PROBLEM #2 ANSWERS
 FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		11162		TEST NUMBER		1	2	3	4	5
MANUFACTURER'S STANDARDS		DATE		Today's		Today's	Today's	Today's	Today's	Today's
DENSITY	2914	STATION NUMBER	ft.	87+14	88+21	89+33	90+62	92+03		
MOISTURE	667	OFFSET	ft.	18'RT CL	21'LT CL	4'LT CL	16'RT CL	23'RT CL		
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE		ft.	82'	82'	82'	82'	82'	82'
DENSITY	2896	LIFT THICKNESS		in.	6"	6"	6"	6"	6"	6"
MOISTURE	664	DEPTH OF SOURCE		in.	6"	6"	6"	6"	6"	6"
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	114	112	122	119	120	
		MA	MOISTURE	lb/ft ³	18	16	14	13	12	
		DB	DRY DENSITY -3/4	lb/ft ³	111	109	117	114	115	
		MB	MOISTURE	%	16	15	12	11	10	
PLUS 3/4 MATERIAL DETERMINATION	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	4921		4936			
		CB	PAN	grams	450		450			
		CC	EXCAVATED MAT.	grams	4471		4486			
		CD	PLUS 3/4 MAT. + PAN	grams	896		1094			
		CE	PAN	grams	421		421			
		CF	PLUS 3/4 MAT.	grams	475		673			
		CG	PLUS 3/4 MAT.	%	11		15			
		CH	SPECIFIC GRAVITY		2.5		2.7			
RERUN		RERUN		RERUN		RERUN		RERUN		
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3941	3923		4059		
		PB	MOLD	grams	2000	2000		2000		
		PC	WEIGHT OF SOIL	grams	1941	1923		2059		
		PD	WET DENSITY	lb/ft ³	128	127		136		
		PE	DRY DENSITY	lb/ft ³	110	113		121		
SC = SA - SB SE = SD - SB SF = SC - SE SG = SF (100) SE DE = DB (100) DC	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams	2146					
		SB	PAN	grams	1827					
		SC	WET WEIGHT	grams	319					
		SD	DRY WEIGHT + PAN	grams	2112					
		SE	DRY WEIGHT	grams	285					
		SF	MOISTURE	grams	34					
		SG	MOISTURE	%	12					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%	14	14	12	12	12	
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4	
		OC	PASS / FAIL		PASS	PASS	PASS	PASS	PASS	
QL = $\frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³	114	114	121	121	121	
		DE	RELATIVE DENSITY	%	97	96	97	94	95	
LOT EVALUATION	LOT EVALUATION	X	AVERAGE DE	%	95.8	INSPECTOR'S NAME:				
		T	TARGET	%	95	INSPECTOR'S SIGNATURE:				
		QL	QUALITY INDEX		0.27	PROJECT'S EVALUATION				
		DF	WITHIN TOLERANCE	%	73	CHECKED BY:				
		DG	MIN. FOR 100% PAY	%	80	DATE:				
DH	PASS / FAIL	YES	NO							

BLANK FORMS

T-313

West Virginia Division of Highways
Hot-Mix Asphalt Compaction Form

Proj./Auth. Number: <u>S 316-45-1.97</u> District Number: <u>5</u> Item Number: <u>401 - 1</u> Design Number: <u>17462</u> Spec. Range: <u>92% - 96%</u> Date: _____	Acceptance Tests <input checked="" type="checkbox"/> Quality Control Tests <input type="checkbox"/>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------

Lab Number	12345	12346	12347		
Lot Number	A - 26	A - 27	A - 28		
Gauge Number	11409	11409	11409		
Manufacturer Standard Count	3042	3042	3042		
Density Standard Count	3007	3007	3007		
Beginning Station Number	16+57	26+57	36+57		
Ending Station Number	26+57	36+57	46+57		
Offset	12'LT CL	12'LT CL	12'LT CL		
Lift Thickness Compacted	2"	2"	2"		
Target Density A	153.8	153.8	153.8		

Acceptance Test	Wet Density		B	140.4	140.9	139.8		
	Relative Density		C	91	92	91		
Quality Control	1	Wet Density		B	141.7		142.4	
		Relative Density		C				
	2	Wet Density		B	142.2		140.7	
		Relative Density		C				
Or Additional Acceptance Tests	3	Wet Density		B	141.9		141.4	
		Relative Density		C				
	4	Wet Density		B	142.2		142.9	
		Relative Density		C				
5	Wet Density		B	141.9		140.8		
	Relative Density		C					
Evaluation of Additional Acceptance Tests	Avg. Wet Density		D	142.0		141.6		
	Relative Density		E	92		92		
	Pass / Fail				PASS	PASS	PASS	
$C = \frac{B \times 100}{A}$	$E = \frac{D \times 100}{A}$	Mat Temperature			260°F	253°F	266°F	
					233°F		228°F	

Technician's Name (Print): _____
 Technician's Signature: _____
 Checked By: _____ Date: _____
 Remarks: _____

West Virginia Division of Highways
Materials Control Soil and Testing Division



Lab Number _____
Auth. Number _____
Project Number _____
District Number _____
Item Number _____
Date _____

FORM T-313
MP 700.00.24
REV. 08-08

Source of Material:			Length of Test Section:		
Roller Type:			Width of Test Section:		
Roller Weight	Static:	Working:	Gauge Number		
Lift Thickness Compacted:		Manufacturer's Standards			
Depth Below Grade:					
Depth of Gauge Source:		Density:			
Observed		Yes	No	Moisture:	
			Standard Counts		
			Density:		
			Moisture:		

Test Site Number	1	2	3	4	5
Station Number					
Offset					

A	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

B	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

C	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

D	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

$DB = \sum DA / 2$
 $DC = \sum DA / 5$

Maximum Density Determination		
Test Site	DA	Dry Density
1		
2		
3		
4		
5		
DC	Max. Density	

Inspector's Name: _____
Inspector's Signature: _____
Project's Evaluation
Checked By: _____
Date: _____

West Virginia Division of Highways
Materials Control Soil and Testing Division



Lab Number _____
 Auth. Number _____
 Project Number _____
 District Number _____
 Item Number _____
 Date _____

FORM T-313
 MP 700.00.24
 REV. 08-08

Source of Material:			Length of Test Section:	
Roller Type:			Width of Test Section:	
Roller Weight	Static:	Working:	Gauge Number	
Lift Thickness Compacted:			Manufacturer's Standards	
Depth Below Grade:			Density:	Moisture:
Depth of Gauge Source:			Standard Counts	
Observed	Yes	No	Density:	Moisture:

Test Site Number	1	2	3	4	5
Station Number					
Offset					

A	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

B	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

C	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

D	Number of Passes		
	Test Site	DA	Dry Density
	1		
	2		
DB	Average		

$$DB = \sum DA / 2$$

$$DC = \sum DA / 5$$

Maximum Density Determination		
Test Site	DA	Dry Density
1		
2		
3		
4		
5		
DC	Max. Density	

Inspector's Name: _____
 Inspector's Signature: _____
 Project's Evaluation
 Checked By: _____
 Date: _____

BLANK FORMS

T-317

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____
 AUTH. NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 ITEM NUMBER _____

FORM T-317
 MP 700.00.24
 REV. 08-08

GAUGE #	DATE						
MANUFACTURER'S DENSITY STANDARD	LOT NUMBER						
	BEGINNING STATION						
MANUFACTURER'S MOISTURE STANDARD	ENDING STATION						
	OFFSET						
	DEPTH BELOW GRADE						
	DEPTH OF GAUGE SOURCE						
	LIFT THICKNESS COMPACTED						
DC FROM TEST SECTION	DENSITY STANDARD						
	MOISTURE STANDARD						
$DF = \frac{DE (100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$		DC	MAXIMUM DENSITY				
			REFERENCE LAB NUMBER				
TEST NUMBER 1	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 2	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 3	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 4	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 5	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
LOT EVALUATION	\bar{X}	AVERAGE DF					
	T	TARGET					
	QL	QUALITY INDEX					
	DG	% WITHIN TOLERANCE					
	DH	MIN. FOR 100% PAY					
	DI	PASS / FAIL					

INSPECTOR'S NAME: _____
 INSPECTOR'S SIGNATURE: _____
 PROJECT'S EVALUATION _____
 CHECKED BY: _____ DATE: _____

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____
 AUTH. NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 ITEM NUMBER _____

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GAUGE #	DATE						
MANUFACTURER'S DENSITY STANDARD	LOT NUMBER						
	BEGINNING STATION						
	ENDING STATION						
MANUFACTURER'S MOISTURE STANDARD	OFFSET						
	DEPTH BELOW GRADE						
	DEPTH OF GAUGE SOURCE						
	LIFT THICKNESS COMPACTED						
DC FROM TEST SECTION	DENSITY STANDARD						
	MOISTURE STANDARD						
$DF = \frac{DE (100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$	DC	MAXIMUM DENSITY					
		REFERENCE LAB NUMBER					
TEST NUMBER 1	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 2	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 3	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 4	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 5	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
LOT EVALUATION	\bar{X}	AVERAGE DF					
	T	TARGET					
	QL	QUALITY INDEX					
	DG	% WITHIN TOLERANCE					
	DH	MIN. FOR 100% PAY					
	DI	PASS / FAIL					

INSPECTOR'S NAME: _____
 INSPECTOR'S SIGNATURE: _____
 PROJECT'S EVALUATION _____
 CHECKED BY: _____ DATE: _____

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____
 AUTH. NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 ITEM NUMBER _____

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GAUGE #	DATE						
MANUFACTURER'S DENSITY STANDARD	LOT NUMBER						
	BEGINNING STATION						
	ENDING STATION						
MANUFACTURER'S MOISTURE STANDARD	OFFSET						
	DEPTH BELOW GRADE						
	DEPTH OF GAUGE SOURCE						
	LIFT THICKNESS COMPACTED						
DC FROM TEST SECTION	DENSITY STANDARD						
	MOISTURE STANDARD						
$DF = \frac{DE (100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$		DC	MAXIMUM DENSITY				
		REFERENCE LAB NUMBER					
TEST NUMBER 1	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 2	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 3	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 4	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
TEST NUMBER 5	DE	DRY DENSITY					
	DF	% RELATIVE DENSITY					
LOT EVALUATION	\bar{X}	AVERAGE DF					
	T	TARGET					
	QL	QUALITY INDEX					
	DG	% WITHIN TOLERANCE					
	DH	MIN. FOR 100% PAY					
	DI	PASS / FAIL					

INSPECTOR'S NAME: _____
 INSPECTOR'S SIGNATURE: _____
 PROJECT'S EVALUATION _____
 CHECKED BY: _____ DATE: _____

BLANK FORMS

T-316

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

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GAUGE NUMBER		TEST NUMBER		1	2	3	4	5
MANUFACTURER'S STANDARDS		DATE						
DENSITY		STATION NUMBER	ft.					
MOISTURE		OFFSET	ft.					
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.					
DENSITY		LIFT THICKNESS	in.					
MOISTURE		DEPTH OF SOURCE	in.					
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³				
		MA	MOISTURE	lb/ft ³				
		DB	DRY DENSITY -3/4	lb/ft ³				
		MB	MOISTURE	%				
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams				
CC = CA - CB		CB	PAN	grams				
CF = CD - CE		CC	EXCAVATED MAT.	grams				
CG = CF (100) CC		CD	PLUS 3/4 MAT. + PAN	grams				
PC = PA - PB		CE	PAN	grams				
PD = PC (0.066)		CF	PLUS 3/4 MAT.	grams				
PE = PD (100) 100 + MB		CG	PLUS 3/4 MAT.	%				
		CH	SPECIFIC GRAVITY					
				RERUN	RERUN	RERUN	RERUN	RERUN
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams				
		PB	MOLD	grams				
		PC	WEIGHT OF SOIL	grams				
		PD	WET DENSITY	lb/ft ³				
		PE	DRY DENSITY	lb/ft ³				
SC = SA - SB SE = SD - SB SF = SC - SE SG = SF (100) SE DE = DB (100) DC	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams				
		SB	PAN	grams				
		SC	WET WEIGHT	grams				
		SD	DRY WEIGHT + PAN	grams				
		SE	DRY WEIGHT	grams				
		SF	MOISTURE	grams				
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%				
		OB	PLUS / MINUS TOLER.					
		OC	PASS / FAIL					
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³				
		DE	RELATIVE DENSITY	%				
LOT EVALUATION	LOT EVALUATION	\bar{X}	AVERAGE DE	%	INSPECTOR'S NAME:			
		T	TARGET	%				
		QL	QUALITY INDEX		PROJECT'S EVALUATION			
		DF	WITHIN TOLERANCE	%				
		DG	MIN. FOR 100% PAY	%	DATE:			
		DH	PASS / FAIL	YES				

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

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GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER	ft.						
MOISTURE		OFFSET	ft.						
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.						
DENSITY		LIFT THICKNESS	in.						
MOISTURE		DEPTH OF SOURCE	in.						
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³					
		MA	MOISTURE	lb/ft ³					
		DB	DRY DENSITY -3/4	lb/ft ³					
		MB	MOISTURE	%					
MB = MA (100) DB		PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams				
CC = CA - CB			CB	PAN	grams				
CF = CD - CE			CC	EXCAVATED MAT.	grams				
CG = CF (100) CC			CD	PLUS 3/4 MAT. + PAN	grams				
PC = PA - PB			CE	PAN	grams				
PD = PC (0.066)			CF	PLUS 3/4 MAT.	grams				
PE = PD (100) 100 + MB			CG	PLUS 3/4 MAT.	%				
			CH	SPECIFIC GRAVITY					
					RERUN	RERUN	RERUN	RERUN	RERUN
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR		PA	WEIGHT SOIL & MOLD	grams				
		PB	MOLD	grams					
		PC	WEIGHT OF SOIL	grams					
		PD	WET DENSITY	lb/ft ³					
		PE	DRY DENSITY	lb/ft ³					
SC = SA - SB SE = SD - SB SF = SC - SE SG = SF (100) SE DE = DB (100) DC	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams					
		SB	PAN	grams					
		SC	WET WEIGHT	grams					
		SD	DRY WEIGHT + PAN	grams					
		SE	DRY WEIGHT	grams					
		SF	MOISTURE	grams					
		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%					
		OB	PLUS / MINUS TOLER.						
		OC	PASS / FAIL						
QL = $\frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³					
		DE	RELATIVE DENSITY	%					
LOT EVALUATION	LOT EVALUATION	X	AVERAGE DE	%	INSPECTOR'S NAME:				
		T	TARGET	%					
		QL	QUALITY INDEX		INSPECTOR'S SIGNATURE:				
		DF	WITHIN TOLERANCE	%					
		DG	MIN. FOR 100% PAY	%	PROJECT'S EVALUATION				
		DH	PASS / FAIL	YES NO					
			CHECKED BY:						
			DATE:						

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

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GAUGE NUMBER		TEST NUMBER		1	2	3	4	5
MANUFACTURER'S STANDARDS		DATE						
DENSITY		STATION NUMBER	ft.					
MOISTURE		OFFSET	ft.					
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.					
DENSITY		LIFT THICKNESS	in.					
MOISTURE		DEPTH OF SOURCE	in.					
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³				
		MA	MOISTURE	lb/ft ³				
		DB	DRY DENSITY -3/4	lb/ft ³				
		MB	MOISTURE	%				
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams				
CC = CA - CB		CB	PAN	grams				
CF = CD - CE		CC	EXCAVATED MAT.	grams				
CG = CF (100) CC		CD	PLUS 3/4 MAT. + PAN	grams				
PC = PA - PB		CE	PAN	grams				
PD = PC (0.066)		CF	PLUS 3/4 MAT.	grams				
PE = PD (100) 100 + MB		CG	PLUS 3/4 MAT.	%				
		CH	SPECIFIC GRAVITY					
				RERUN	RERUN	RERUN	RERUN	RERUN
RERUN PROCTOR PE (RERUN) = $\frac{PD (100)}{100 + SG}$	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams				
		PB	MOLD	grams				
		PC	WEIGHT OF SOIL	grams				
		PD	WET DENSITY	lb/ft ³				
		PE	DRY DENSITY	lb/ft ³				
SC = SA - SB SE = SD - SB SF = SC - SE SG = SF (100) SE DE = DB (100) DC	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams				
		SB	PAN	grams				
		SC	WET WEIGHT	grams				
		SD	DRY WEIGHT + PAN	grams				
		SE	DRY WEIGHT	grams				
		SF	MOISTURE	grams				
		SG	MOISTURE	%				
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%				
		OB	PLUS / MINUS TOLER.					
		OC	PASS / FAIL					
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³				
		DE	RELATIVE DENSITY	%				
LOT EVALUATION	X	AVERAGE DE	%		INSPECTOR'S NAME:			
	T	TARGET	%					
	QL	QUALITY INDEX			INSPECTOR'S SIGNATURE:			
	DF	WITHIN TOLERANCE	%					
	DG	MIN. FOR 100% PAY	%		PROJECT'S EVALUATION			
	DH	PASS / FAIL	YES	NO				
				CHECKED BY:				
				DATE:				

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

FORM T-316
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GAUGE NUMBER		TEST NUMBER		1	2	3	4	5
MANUFACTURER'S STANDARDS		DATE						
DENSITY		STATION NUMBER	ft.					
MOISTURE		OFFSET	ft.					
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.					
DENSITY		LIFT THICKNESS	in.					
MOISTURE		DEPTH OF SOURCE	in.					
DB FROM TABLES $MB = \frac{MA(100)}{DB}$ $CC = CA - CB$ $CF = CD - CE$ $CG = \frac{CF(100)}{CC}$ $PC = PA - PB$ $PD = PC(0.066)$ $PE = \frac{PD(100)}{100 + MB}$	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³				
		MA	MOISTURE	lb/ft ³				
		DB	DRY DENSITY -3/4	lb/ft ³				
		MB	MOISTURE	%				
PLUS 3/4 MATERIAL DETERMINATION $SC = SA - SB$ $SE = SD - SB$ $SF = SC - SE$ $SG = \frac{SF(100)}{SE}$ $DE = \frac{DB(100)}{DC}$	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams				
		CB	PAN	grams				
		CC	EXCAVATED MAT.	grams				
		CD	PLUS 3/4 MAT. + PAN	grams				
		CE	PAN	grams				
		CF	PLUS 3/4 MAT.	grams				
		CG	PLUS 3/4 MAT.	%				
		CH	SPECIFIC GRAVITY					
				RERUN	RERUN	RERUN	RERUN	RERUN
RERUN PROCTOR $PE (RERUN) = \frac{PD(100)}{100 + SG}$	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams				
		PB	MOLD	grams				
		PC	WEIGHT OF SOIL	grams				
		PD	WET DENSITY	lb/ft ³				
		PE	DRY DENSITY	lb/ft ³				
$\bar{X} = \frac{\sum DE}{5}$ $QL = \frac{\bar{X} - T}{R}$	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams				
		SB	PAN	grams				
		SC	WET WEIGHT	grams				
		SD	DRY WEIGHT + PAN	grams				
		SE	DRY WEIGHT	grams				
		SF	MOISTURE	grams				
		SG	MOISTURE	%				
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%				
		OB	PLUS / MINUS TOLER.					
		OC	PASS / FAIL					
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY	lb/ft ³				
		DE	RELATIVE DENSITY	%				
LOT EVALUATION	X	AVERAGE DE	%	INSPECTOR'S NAME: INSPECTOR'S SIGNATURE:				
	T	TARGET	%					
	QL	QUALITY INDEX		PROJECT'S EVALUATION				
	DF	WITHIN TOLERANCE	%					
	DG	MIN. FOR 100% PAY	%	CHECKED BY:				
	DH	PASS / FAIL	YES	NO	DATE:			

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

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GAUGE NUMBER		TEST NUMBER		1	2	3	4	5
MANUFACTURER'S STANDARDS		DATE						
DENSITY		STATION NUMBER	ft.					
MOISTURE		OFFSET	ft.					
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE		ft.				
DENSITY		LIFT THICKNESS		in.				
MOISTURE		DEPTH OF SOURCE		in.				
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³				
		MA	MOISTURE	lb/ft ³				
		DB	DRY DENSITY -3/4	lb/ft ³				
MB = MA (100) DB		MB	MOISTURE	%				
CC = CA - CB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams				
CF = CD - CE		CB	PAN	grams				
CG = CF (100) CC		CC	EXCAVATED MAT.	grams				
PC = PA - PB		CD	PLUS 3/4 MAT. + PAN	grams				
PD = PC (0.066)		CE	PAN	grams				
PE = PD (100) 100 + MB		CF	PLUS 3/4 MAT.	grams				
		CG	PLUS 3/4 MAT.	%				
		CH	SPECIFIC GRAVITY					
				RERUN	RERUN	RERUN	RERUN	RERUN
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams				
		PB	MOLD	grams				
		PC	WEIGHT OF SOIL	grams				
		PD	WET DENSITY	lb/ft ³				
		PE	DRY DENSITY	lb/ft ³				
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams				
SE = SD - SB		SB	PAN	grams				
SF = SC - SE		SC	WET WEIGHT	grams				
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams				
DE = DB (100) DC		SE	DRY WEIGHT	grams				
		SF	MOISTURE	grams				
		SG	MOISTURE	%				
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%				
		OB	PLUS / MINUS TOLER.					
		OC	PASS / FAIL					
QL = $\frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY	lb/ft ³				
		DE	RELATIVE DENSITY	%				
LOT EVALUATION		\bar{X}	AVERAGE DE	%	INSPECTOR'S NAME:			
		T	TARGET	%	INSPECTOR'S SIGNATURE:			
		QL	QUALITY INDEX		PROJECT'S EVALUATION			
		DF	WITHIN TOLERANCE	%	CHECKED BY:			
		DG	MIN. FOR 100% PAY	%	DATE:			
		DH	PASS / FAIL	YES	NO			

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION

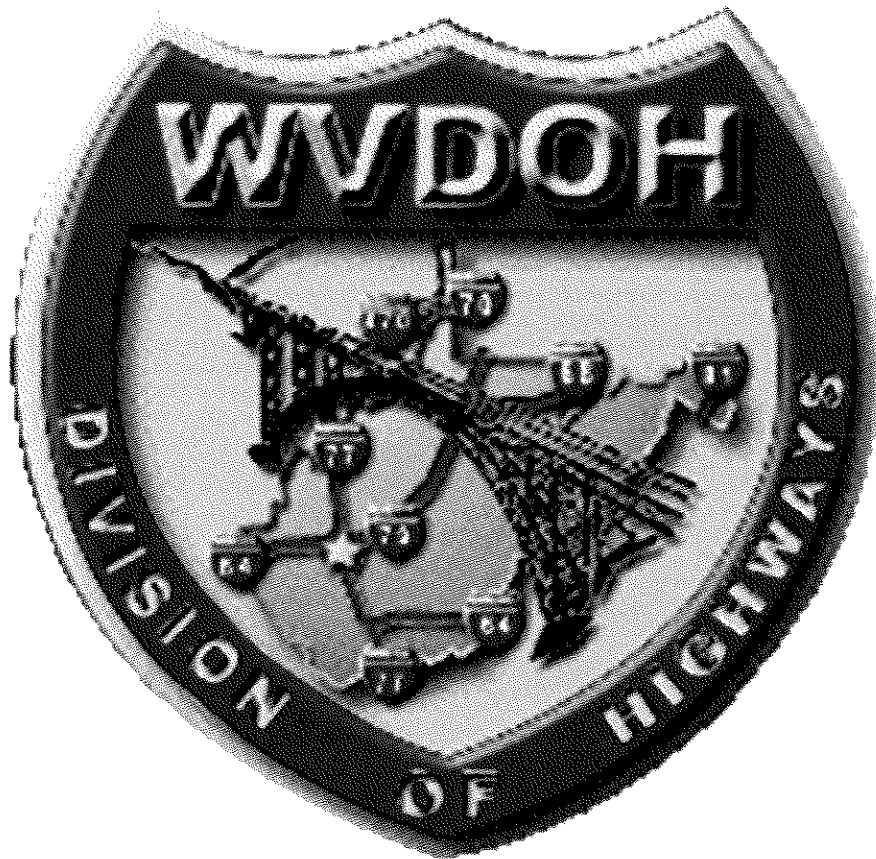


LAB NUMBER _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

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GAUGE NUMBER		TEST NUMBER		1	2	3	4	5
MANUFACTURER'S STANDARDS		DATE						
DENSITY		STATION NUMBER	ft.					
MOISTURE		OFFSET	ft.					
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.					
DENSITY		LIFT THICKNESS	in.					
MOISTURE		DEPTH OF SOURCE	in.					
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³				
		MA	MOISTURE	lb/ft ³				
		DB	DRY DENSITY -3/4	lb/ft ³				
		MB	MOISTURE	%				
MB = MA (100) DB		PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams			
CC = CA - CB			CB	PAN	grams			
CF = CD - CE			CC	EXCAVATED MAT.	grams			
CG = CF (100) CC			CD	PLUS 3/4 MAT. + PAN	grams			
PC = PA - PB			CE	PAN	grams			
PD = PC (0.066)			CF	PLUS 3/4 MAT.	grams			
PE = PD (100)			CG	PLUS 3/4 MAT.	%			
100 + MB			CH	SPECIFIC GRAVITY				
				RERUN	RERUN	RERUN	RERUN	RERUN
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams				
		PB	MOLD	grams				
		PC	WEIGHT OF SOIL	grams				
		PD	WET DENSITY	lb/ft ³				
		PE	DRY DENSITY	lb/ft ³				
SC = SA - SB SE = SD - SB SF = SC - SE SG = SF (100) SE DE = DB (100) DC	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams				
		SB	PAN	grams				
		SC	WET WEIGHT	grams				
		SD	DRY WEIGHT + PAN	grams				
		SE	DRY WEIGHT	grams				
		SF	MOISTURE	grams				
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%				
		OB	PLUS / MINUS TOLER.					
		OC	PASS / FAIL					
QL = $\frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY	lb/ft ³				
		DE	RELATIVE DENSITY	%				
LOT EVALUATION		X	AVERAGE DE	%	INSPECTOR'S NAME:			
		T	TARGET	%				
	QL	QUALITY INDEX		PROJECT'S EVALUATION				
	DF	WITHIN TOLERANCE	%					CHECKED BY:
	DG	MIN. FOR 100% PAY	%	DATE:				
	DH	PASS / FAIL	YES					NO

**COMPACTION INSPECTOR
PRACTICE
PROBLEMS**



WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER **B**
 AUTHORIZATION NUMBER
 PROJECT NUMBER
 DISTRICT
 LOT NUMBER
 ITEM NUMBER

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GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER	ft.						
MOISTURE		OFFSET	ft.						
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.						
DENSITY		LIFT THICKNESS	in.						
MOISTURE		DEPTH OF SOURCE	in.						
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	111	109	108	110	109
		MA	MOISTURE	lb/ft ³	14	15	17	14	17
		DB	DRY DENSITY -3/4	lb/ft ³					
MB = MA (100) DB		MB	MOISTURE	%					
CC = CA - CB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	5541				
CF = CD - CE		CB	PAN	grams	502				
CG = CF (100) CC		CC	EXCAVATED MAT.	grams					
PC = PA - PB		CD	PLUS 3/4 MAT. + PAN	grams	759				
PD = PC (0.066)		CE	PAN	grams	502				
PE = PD (100) 100 + MB		CF	PLUS 3/4 MAT.	grams					
		CG	PLUS 3/4 MAT.	%					
		CH	SPECIFIC GRAVITY		2.5	2.5	2.5	2.5	2.5
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3822				
		PB	MOLD	grams	1995				
		PC	WEIGHT OF SOIL	grams					
		PD	WET DENSITY	lb/ft ³					
		PE	DRY DENSITY	lb/ft ³					
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams					
SE = SD - SB		SB	PAN	grams					
SF = SC - SE		SC	WET WEIGHT	grams					
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams					
DE = DB (100) DC		SE	DRY WEIGHT	grams					
		SF	MOISTURE	grams					
		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%					
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4
		OC	PASS / FAIL						
QL = $\frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY	lb/ft ³					
		DE	RELATIVE DENSITY	%					
	LOT EVALUATION	X	AVERAGE DE	%		INSPECTOR'S NAME:			
T		TARGET	%	95	INSPECTOR'S SIGNATURE:				
QL		QUALITY INDEX			PROJECT'S EVALUATION				
DF		WITHIN TOLERANCE	%		CHECKED BY:				
DG		MIN. FOR 100% PAY	%	80	DATE:				
DH		PASS / FAIL							

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____ C _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER	ft.						
MOISTURE		OFFSET	ft.						
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.						
DENSITY		LIFT THICKNESS	in.						
MOISTURE		DEPTH OF SOURCE	in.						
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	108	109	108	110	111
		MA	MOISTURE	lb/ft ³	20	19	20	18	20
		DB	DRY DENSITY -3/4	lb/ft ³					
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	MB	MOISTURE	%					
CC = CA - CB		CA	EXC. MATERIAL + PAN	grams	4862				
CF = CD - CE		CB	PAN	grams	298				
CG = CF (100) CC		CC	EXCAVATED MAT.	grams					
PC = PA - PB		CD	PLUS 3/4 MAT. + PAN	grams	2045				
PD = PC (0.066)		CE	PAN	grams	298				
PE = PD (100) 100 + MB		CF	PLUS 3/4 MAT.	grams					
		CG	PLUS 3/4 MAT.	%					
	CH	SPECIFIC GRAVITY		2.4	2.4	2.4	2.4	2.4	
				RERUN	RERUN	RERUN	RERUN	RERUN	
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3799				
		PB	MOLD	grams	2022				
		PC	WEIGHT OF SOIL	grams					
		PD	WET DENSITY	lb/ft ³					
		PE	DRY DENSITY	lb/ft ³					
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams					
SE = SD - SB		SB	PAN	grams					
SF = SC - SE		SC	WET WEIGHT	grams					
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams					
DE = DB (100) DC		SE	DRY WEIGHT	grams					
		SF	MOISTURE	grams					
		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%					
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	
		OC	PASS / FAIL						
QL = $\frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³					
		DE	RELATIVE DENSITY	%					
	LOT EVALUATION	X	AVERAGE DE	%		INSPECTOR'S NAME:			
		T	TARGET	%	95	INSPECTOR'S SIGNATURE:			
		QL	QUALITY INDEX			PROJECT'S EVALUATION			
		DF	WITHIN TOLERANCE	%		CHECKED BY:			
		DG	MIN. FOR 100% PAY	%	80	DATE:			
		DH	PASS / FAIL						

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____ **E** _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER	ft.						
MOISTURE		OFFSET	ft.						
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.						
DENSITY		LIFT THICKNESS	in.						
MOISTURE		DEPTH OF SOURCE	in.						
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	122	125	128	129	127
		MA	MOISTURE	lb/ft ³	11	9	10	9	11
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	DB	DRY DENSITY - 3/4	lb/ft ³					
CC = CA - CB		MB	MOISTURE	%					
CF = CD - CE		CA	EXC. MATERIAL + PAN	grams	6004				
CG = CF (100) CC		CB	PAN	grams	1009				
PC = PA - PB		CC	EXCAVATED MAT.	grams					
PD = PC (0.066) PE = PD (100) 100 + MB		CD	PLUS 3/4 MAT. + PAN	grams	1894				
		CE	PAN	grams	1009				
		CF	PLUS 3/4 MAT.	grams					
	CG	PLUS 3/4 MAT.	%						
	CH	SPECIFIC GRAVITY		2.6	2.7	2.7	2.7	2.7	2.7
				RERUN	RERUN	RERUN	RERUN	RERUN	
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3975				
		PB	MOLD	grams	1954				
		PC	WEIGHT OF SOIL	grams					
		PD	WET DENSITY	lb/ft ³					
		PE	DRY DENSITY	lb/ft ³					
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams					
SE = SD - SB		SB	PAN	grams					
SF = SC - SE		SC	WET WEIGHT	grams					
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams					
		SE	DRY WEIGHT	grams					
		SF	MOISTURE	grams					
DE = DB (100) DC		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%					
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4
		OC	PASS / FAIL						
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY	lb/ft ³					
		DE	RELATIVE DENSITY	%					
	LOT EVALUATION	\bar{X}	AVERAGE DE	%				INSPECTOR'S NAME:	
		T	TARGET	%	95	INSPECTOR'S SIGNATURE:			
		QL	QUALITY INDEX					PROJECT'S EVALUATION	
DF		WITHIN TOLERANCE	%						
DG		MIN. FOR 100% PAY	%	80	CHECKED BY:				
DH	PASS / FAIL			DATE:					

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____ **F** _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5
MANUFACTURER'S STANDARDS		DATE						
DENSITY		STATION NUMBER	ft.					
MOISTURE		OFFSET	ft.					
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.					
DENSITY		LIFT THICKNESS	in.					
MOISTURE		DEPTH OF SOURCE	in.					
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY lb/ft ³	118	120	119	117	120
		MA	MOISTURE lb/ft ³	17	14	16	15	16
		DB	DRY DENSITY -3/4 lb/ft ³					
		MB	MOISTURE %					
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN grams	4839				
CC = CA - CB		CB	PAN grams	306				
CF = CD - CE		CC	EXCAVATED MAT. grams					
CG = CF (100) CC		CD	PLUS 3/4 MAT. + PAN grams	1229				
PC = PA - PB		CE	PAN grams	306				
PD = PC (0.066)		CF	PLUS 3/4 MAT. grams					
PE = PD (100) 100 + MB		CG	PLUS 3/4 MAT. %					
		CH	SPECIFIC GRAVITY	2.4	2.4	2.4	2.4	2.4
					RERUN	RERUN	RERUN	RERUN
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD grams	3975	3958			
		PB	MOLD grams	1954	1954			
		PC	WEIGHT OF SOIL grams					
		PD	WET DENSITY lb/ft ³					
		PE	DRY DENSITY lb/ft ³					
SC = SA - SB SE = SD - SB SF = SC - SE SG = SF (100) SE DE = DB (100) DC	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN grams	1876				
		SB	PAN grams	1501				
		SC	WET WEIGHT grams					
		SD	DRY WEIGHT + PAN grams	1839				
		SE	DRY WEIGHT grams					
		SF	MOISTURE grams					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE %					
		OB	PLUS / MINUS TOLER.	+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4
		OC	PASS / FAIL					
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY lb/ft ³					
		DE	RELATIVE DENSITY %					
$QL = \frac{\bar{X} - T}{R}$	LOT EVALUATION	X	AVERAGE DE %			INSPECTOR'S NAME:		
		T	TARGET %	95	INSPECTOR'S SIGNATURE:			
		QL	QUALITY INDEX					
		DF	WITHIN TOLERANCE %		PROJECT'S EVALUATION			
		DG	MIN. FOR 100% PAY %	80	CHECKED BY:			
		DH	PASS / FAIL		DATE:			

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____ **G** _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

FORM T-316
MP 207.07.20
REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER	ft.						
MOISTURE		OFFSET	ft.						
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.						
DENSITY		LIFT THICKNESS	in.						
MOISTURE		DEPTH OF SOURCE	in.						
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	108	110	110	111	109
		MA	MOISTURE	lb/ft ³	17	16	16	17	16
		DB	DRY DENSITY - 3/4	lb/ft ³					
MB = MA (100) DB		MB	MOISTURE	%					
CC = CA - CB		PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	5245			
CF = CD - CE			CB	PAN	grams	555			
CG = CF (100) CC			CC	EXCAVATED MAT.	grams				
PC = PA - PB			CD	PLUS 3/4 MAT. + PAN	grams	605			
PD = PC (0.066)			CE	PAN	grams	555			
PE = PD (100) 100 + MB			CF	PLUS 3/4 MAT.	grams				
			CG	PLUS 3/4 MAT.	%				
		CH	SPECIFIC GRAVITY		2.4	2.4	2.4	2.4	2.4
				RERUN	RERUN	RERUN	RERUN	RERUN	
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3957	3944			
		PB	MOLD	grams	2003	2003			
		PC	WEIGHT OF SOIL	grams					
		PD	WET DENSITY	lb/ft ³					
		PE	DRY DENSITY	lb/ft ³					
SC = SA - SB SE = SD - SB SF = SC - SE SG = SF (100) SE DE = DB (100) DC	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams	1111				
		SB	PAN	grams	879				
		SC	WET WEIGHT	grams					
		SD	DRY WEIGHT + PAN	grams	1082				
		SE	DRY WEIGHT	grams					
		SF	MOISTURE	grams					
		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%					
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4
		OC	PASS / FAIL						
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³					
		DE	RELATIVE DENSITY	%					
	LOT EVALUATION	X	AVERAGE DE	%		INSPECTOR'S NAME:			
		T	TARGET	%	95	INSPECTOR'S SIGNATURE:			
		QL	QUALITY INDEX						
		DF	WITHIN TOLERANCE	%		PROJECT'S EVALUATION			
		DG	MIN. FOR 100% PAY	%	80				
		DH	PASS / FAIL			DATE:			

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER H
 AUTHORIZATION NUMBER
 PROJECT NUMBER
 DISTRICT
 LOT NUMBER
 ITEM NUMBER

FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER	ft.						
MOISTURE		OFFSET	ft.						
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.						
DENSITY		LIFT THICKNESS	in.						
MOISTURE		DEPTH OF SOURCE	in.						
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	116	116	116	116	117
		MA	MOISTURE	lb/ft ³	17	15	15	14	13
		DB	DRY DENSITY -3/4	lb/ft ³					
		MB	MOISTURE	%					
$MB = \frac{MA}{100}$ DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	4839				
CC = CA - CB		CB	PAN	grams	339				
CF = CD - CE		CC	EXCAVATED MAT.	grams					
$CG = \frac{CF}{100}$ CC		CD	PLUS 3/4 MAT. + PAN	grams	777				
PC = PA - PB		CE	PAN	grams	339				
PD = PC (0.066)		CF	PLUS 3/4 MAT.	grams					
$PE = \frac{PD}{100}$ 100 + MB		CG	PLUS 3/4 MAT.	%					
		CH	SPECIFIC GRAVITY		2.5	2.5	2.5	2.5	2.5
RERUN PROCTOR	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3999	3969			
PE (RERUN) = $\frac{PD}{100}$ 100 + SG		PB	MOLD	grams	1999	1999			
		PC	WEIGHT OF SOIL	grams					
		PD	WET DENSITY	lb/ft ³					
		PE	DRY DENSITY	lb/ft ³					
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams	1542				
SE = SD - SB		SB	PAN	grams	1200				
SF = SC - SE		SC	WET WEIGHT	grams					
$SG = \frac{SF}{100}$ SE		SD	DRY WEIGHT + PAN	grams	1511				
DE = DB (100) DC		SE	DRY WEIGHT	grams					
		SF	MOISTURE	grams					
		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%					
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	
		OC	PASS / FAIL						
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY	lb/ft ³					
		DE	RELATIVE DENSITY	%					
	LOT EVALUATION	X	AVERAGE DE	%		INSPECTOR'S NAME:			
		T	TARGET	%	95	INSPECTOR'S SIGNATURE:			
		QL	QUALITY INDEX			PROJECT'S EVALUATION			
	DF	WITHIN TOLERANCE	%		CHECKED BY: <u> </u>				
	DG	MIN. FOR 100% PAY	%	80	DATE: <u> </u>				
	DH	PASS / FAIL							

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____ 1 _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER	ft.						
MOISTURE		OFFSET	ft.						
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.						
DENSITY		LIFT THICKNESS	in.						
MOISTURE		DEPTH OF SOURCE	in.						
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	117	117	117	117	116
		MA	MOISTURE	lb/ft ³	17	15	15	14	13
		DB	DRY DENSITY -3/4	lb/ft ³					
		MB	MOISTURE	%					
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	4839				
CC = CA - CB		CB	PAN	grams	339				
CF = CD - CE		CC	EXCAVATED MAT.	grams					
CG = CF (100) CC		CD	PLUS 3/4 MAT. + PAN	grams	777				
PC = PA - PB		CE	PAN	grams	339				
PD = PC (0.066) PE = PD (100) 100 + MB		CF	PLUS 3/4 MAT.	grams					
		CG	PLUS 3/4 MAT.	%					
		CH	SPECIFIC GRAVITY		2.5				
				RERUN	RERUN	RERUN	RERUN	RERUN	
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3999	3969			
		PB	MOLD	grams	1999	1999			
		PC	WEIGHT OF SOIL	grams					
		PD	WET DENSITY	lb/ft ³					
		PE	DRY DENSITY	lb/ft ³					
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams	1542				
SE = SD - SB		SB	PAN	grams	1200				
SF = SC - SE		SC	WET WEIGHT	grams					
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams	1511				
DE = DB (100) DC		SE	DRY WEIGHT	grams					
		SF	MOISTURE	grams					
		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%					
		OB	PLUS / MINUS TOLER.						
		OC	PASS / FAIL						
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY	lb/ft ³					
		DE	RELATIVE DENSITY	%					
	LOT EVALUATION	X	AVERAGE DE	%		INSPECTOR'S NAME:			
		T	TARGET	%		INSPECTOR'S SIGNATURE:			
		QL	QUALITY INDEX			PROJECT'S EVALUATION			
	DF	WITHIN TOLERANCE	%		CHECKED BY:				
	DG	MIN. FOR 100% PAY	%		DATE:				
	DH	PASS / FAIL							

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER J
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5					
MANUFACTURER'S STANDARDS		DATE											
DENSITY		STATION NUMBER	ft.										
MOISTURE		OFFSET	ft.										
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE	ft.										
DENSITY		LIFT THICKNESS	in.										
MOISTURE		DEPTH OF SOURCE	in.										
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	105	117	116	124	111				
		MA	MOISTURE	lb/ft ³	16	15	16	12	18				
		DB	DRY DENSITY -3/4	lb/ft ³									
		MB	MOISTURE	%									
MB = MA (100) DB		PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	5003	5121		5346	5224			
CC = CA - CB			CB	PAN	grams	500	500		500	500			
CF = CD - CE			CC	EXCAVATED MAT.	grams								
CG = CF (100) CC			CD	PLUS 3/4 MAT. + PAN	grams	654	1026		742	833			
PC = PA - PB			CE	PAN	grams	500	500		500	500			
PD = PC (0.066)			CF	PLUS 3/4 MAT.	grams								
PE = PD (100) 100 + MB			CG	PLUS 3/4 MAT.	%								
			CH	SPECIFIC GRAVITY		2.4	2.6	2.6	2.7	2.5			
						RERUN	RERUN	RERUN	RERUN	RERUN			
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3901		3985			4108		3954	3931
		PB	MOLD	grams	2004		2004			2004		2004	2004
		PC	WEIGHT OF SOIL	grams									
		PD	WET DENSITY	lb/ft ³									
		PE	DRY DENSITY	lb/ft ³									
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams								1564	
SE = SD - SB		SB	PAN	grams								1209	
SF = SC - SE		SC	WET WEIGHT	grams									
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams								1524	
DE = DB (100) DC		SE	DRY WEIGHT	grams									
		SF	MOISTURE	grams									
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%									
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4			
		OC	PASS / FAIL										
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY	lb/ft ³									
		DE	RELATIVE DENSITY	%									
	LOT EVALUATION	X	AVERAGE DE	%					INSPECTOR'S NAME:				
		T	TARGET	%	95				INSPECTOR'S SIGNATURE:				
		QL	QUALITY INDEX						PROJECT'S EVALUATION				
		DF	WITHIN TOLERANCE	%				CHECKED BY:					
		DG	MIN. FOR 100% PAY	%	80			DATE:					
		DH	PASS / FAIL										

West Virginia Division of Highways
Materials Control Soil and Testing Division



Lab Number **M**
Auth. Number _____
Project Number _____
District Number _____
Item Number _____
Date _____

FORM T-313
MP 700.00.24
REV. 08-08

Source of Material:			Length of Test Section:		
Roller Type:			Width of Test Section:		
Roller Weight	Static:	Working:	Gauge Number		
Lift Thickness Compacted:			Manufacturer's Standards		
Depth Below Grade:			Density:	Moisture:	
Depth of Gauge Source:			Standard Counts		
Observed	Yes	No	Density:	Moisture:	

Test Site Number	1	2	3	4	5
Station Number					
Offset					

A	Number of Passes	12	
	Test Site	DA	Dry Density
	1		140
	2		141
DB	Average		

B	Number of Passes	14	
	Test Site	DA	Dry Density
	1		142
	2		143
DB	Average		

C	Number of Passes	16	
	Test Site	DA	Dry Density
	1		145
	2		145
DB	Average		

D	Number of Passes	18	
	Test Site	DA	Dry Density
	1		146
	2		144
DB	Average		

$DB = \sum DA / 2$
$DC = \sum DA / 5$

Inspector's Name: _____
Inspector's Signature: _____
Project's Evaluation
Checked By: _____
Date: _____

Maximum Density Determination		
Test Site	DA	Dry Density
1		
2		
3		147
4		143
5		145
DC	Max. Density	

West Virginia Division of Highways
Materials Control Soil and Testing Division



Lab Number _____ **O** _____
 Auth. Number _____
 Project Number _____
 District Number _____
 Item Number _____
 Date _____

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Source of Material:			Length of Test Section:		
Roller Type:			Width of Test Section:		
Roller Weight	Static:	Working:	Gauge Number		
Lift Thickness Compacted:			Manufacturer's Standards		
Depth Below Grade:			Density:	Moisture:	
Depth of Gauge Source:			Standard Counts		
Observed	Yes	No	Density:	Moisture:	

Test Site Number	1	2	3	4	5
Station Number					
Offset					

A	Number of Passes		
	Test Site	DA	Dry Density
	1		131
	2		133
DB	Average		

B	Number of Passes		
	Test Site	DA	Dry Density
	1		134
	2		134
DB	Average		

C	Number of Passes		
	Test Site	DA	Dry Density
	1		135
	2		137
DB	Average		

D	Number of Passes		
	Test Site	DA	Dry Density
	1		136
	2		136
DB	Average		

$DB = \sum DA / 2$
$DC = \sum DA / 5$

Maximum Density Determination		
Test Site	DA	Dry Density
1		
2		
3		138
4		139
5		132
DC	Max. Density	

Inspector's Name: _____
 Inspector's Signature: _____
 Project's Evaluation _____
 Checked By: _____
 Date: _____

**WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION**

LAB. NUMBER: _____ P _____
 AUTH. NUMBER: _____
 PROJECT NUMB _____
 DISTRICT: _____
 ITEM NUMBER: _____

FORM T-317
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GAUGE NO.	DATE	P-1	P-2	P-3	P-4	P-5		
MANUFACTURER'S	LOT NUMBER							
DENSITY STD. COUNT	BEGINNING STATION							
	ENDING STATION							
MANUFACTURER'S	OFFSET							
MOISTURE STD. COUNT	DEPTH BELOW GRADE	6	4	8	6	4		
	DEPTH OF GAUGE SOURCE	6	4	8	6	4		
	LIFT THICKNESS COMPACTED							
DC FROM TEST SECTION	DENSITY STANDARD							
	MOISTURE STANDARD							
$DF = \frac{DE(100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$		DC	MAXIMUM DENSITY	134	128	145	108	136
			REFERENCE LAB NUMBER	K	L	M	N	O
TEST NUMBER 1	DE	DRY DENSITY	127	125	139	107	138	
	DF	% RELATIVE DENSITY						
TEST NUMBER 2	DE	DRY DENSITY	131	129	144	101	137	
	DF	% RELATIVE DENSITY						
TEST NUMBER 3	DE	DRY DENSITY	134	130	141	107	139	
	DF	% RELATIVE DENSITY						
TEST NUMBER 4	DE	DRY DENSITY	131	127	138	106	139	
	DF	% RELATIVE DENSITY						
TEST NUMBER 5	DE	DRY DENSITY	139	129	139	108	141	
	DF	% RELATIVE DENSITY						
LOT EVALUATION	\bar{X}	AVERAGE DF						
	T	TARGET	95	95	95	95	95	
	QL	QUALITY INDEX						
	DG	% WITHIN TOLERANCE						
	DH	MIN. FOR 100% PAY	80	80	80	80	80	
	DI	PASS/FAIL						

Inspector's Signature _____

Project's Evaluation _____

Checked By: _____ Date: _____

**WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION**

LAB. NUMBER: _____ Q _____
 AUTH. NUMBER: _____
 PROJECT NUMB _____
 DISTRICT: _____
 ITEM NUMBER: _____

**FORM T-317
MP 700.00.24
REV. 08-08**

GAUGE NO.		DATE						
MANUFACTURER'S		LOT NUMBER						
DENSITY STD. COUNT		BEGINNING STATION						
		ENDING STATION						
MANUFACTURER'S		OFFSET						
MOISTURE STD. COUNT		DEPTH BELOW GRADE						
		DEPTH OF GAUGE SOURCE						
		LIFT THICKNESS COMPACTED						
DC FROM TEST SECTION		DENSITY STANDARD						
		MOISTURE STANDARD						
$DF = \frac{DE(100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$		DC	MAXIMUM DENSITY	137				
			REFERENCE LAB NUMBER	123456				
TEST NUMBER 1	DE	DRY DENSITY	127					
	DF	% RELATIVE DENSITY						
TEST NUMBER 2	DE	DRY DENSITY	131					
	DF	% RELATIVE DENSITY						
TEST NUMBER 3	DE	DRY DENSITY	134					
	DF	% RELATIVE DENSITY						
TEST NUMBER 4	DE	DRY DENSITY	131					
	DF	% RELATIVE DENSITY						
TEST NUMBER 5	DE	DRY DENSITY	139					
	DF	% RELATIVE DENSITY						
LOT EVALUATION	\bar{X}	AVERAGE DF						
	T	TARGET	95					
	QL	QUALITY INDEX						
	DG	% WITHIN TOLERANCE						
	DH	MIN. FOR 100% PAY	80					
	DI	PASS/FAIL						

Inspector's Signature _____

Project's Evaluation

Checked By: _____ Date: _____

**WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION**

LAB. NUMBER: _____ R _____
 AUTH. NUMBER: _____
 PROJECT NUMB _____
 DISTRICT: _____
 ITEM NUMBER: _____

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GAUGE NO.	DATE	B-15	B-16	B-17		
MANUFACTURER'S	LOT NUMBER					
DENSITY STD. COUNT	BEGINNING STATION					
	ENDING STATION					
MANUFACTURER'S	OFFSET					
MOISTURE STD. COUNT	DEPTH BELOW GRADE	6	6	6		
	DEPTH OF GAUGE SOURCE	6	6	6		
	LIFT THICKNESS COMPACTED					
DC FROM TEST SECTION	DENSITY STANDARD					
	MOISTURE STANDARD					
$DF = \frac{DE(100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$	DC	MAXIMUM DENSITY	137	137	137	
		REFERENCE LAB NUMBER	123456	123456	123456	
TEST NUMBER 1	DE	DRY DENSITY	136	135	139	
	DF	% RELATIVE DENSITY				
TEST NUMBER 2	DE	DRY DENSITY	136	137	144	
	DF	% RELATIVE DENSITY				
TEST NUMBER 3	DE	DRY DENSITY	134	138	141	
	DF	% RELATIVE DENSITY				
TEST NUMBER 4	DE	DRY DENSITY	135	141	138	
	DF	% RELATIVE DENSITY				
TEST NUMBER 5	DE	DRY DENSITY	143	142	143	
	DF	% RELATIVE DENSITY				
LOT EVALUATION	\bar{X}	AVERAGE DF				
	T	TARGET	95	95	95	
	QL	QUALITY INDEX				
	DG	% WITHIN TOLERANCE				
	DH	MIN. FOR 100% PAY	80	80	80	
	DI	PASS/FAIL				

Inspector's Signature _____

Project's Evaluation

Checked By: _____ Date: _____

**WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION**

LAB. NUMBER: _____ S _____
 AUTH. NUMBER: _____
 PROJECT NUMB _____
 DISTRICT: _____
 ITEM NUMBER: _____

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GAUGE NO.		DATE	B-18	B-19			
MANUFACTURER'S	LOT NUMBER						
DENSITY STD. COUNT	BEGINNING STATION						
	ENDING STATION						
MANUFACTURER'S	OFFSET						
MOISTURE STD. COUNT	DEPTH BELOW GRADE	6	6				
	DEPTH OF GAUGE SOURCE	6	6				
	LIFT THICKNESS COMPACTED						
DC FROM TEST SECTION $DF = \frac{DE(100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$	DENSITY STANDARD						
	MOISTURE STANDARD						
	DC	MAXIMUM DENSITY	140	140			
		REFERENCE LAB NUMBER	123457	123457			
TEST NUMBER 1	DE	DRY DENSITY	138	144			
	DF	% RELATIVE DENSITY					
TEST NUMBER 2	DE	DRY DENSITY	141	137			
	DF	% RELATIVE DENSITY					
TEST NUMBER 3	DE	DRY DENSITY	143	137			
	DF	% RELATIVE DENSITY					
TEST NUMBER 4	DE	DRY DENSITY	137	140			
	DF	% RELATIVE DENSITY					
TEST NUMBER 5	DE	DRY DENSITY	143	142			
	DF	% RELATIVE DENSITY					
LOT EVALUATION	\bar{X}	AVERAGE DF					
	T	TARGET	95	95			
	QL	QUALITY INDEX					
	DG	% WITHIN TOLERANCE					
	DH	MIN. FOR 100% PAY	80	80			
	DI	PASS/FAIL					

Inspector's Signature _____

Project's Evaluation _____

Checked By: _____ Date: _____

**WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION**

LAB. NUMBER: _____ T
 AUTH. NUMBER: _____
 PROJECT NUMB _____
 DISTRICT: _____
 ITEM NUMBER: _____

FORM T-317
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GAUGE NO.	DATE	S-1	S-2	S-3	S-4	
MANUFACTURER'S	LOT NUMBER					
DENSITY STD. COUNT	BEGINNING STATION					
	ENDING STATION					
MANUFACTURER'S	OFFSET					
MOISTURE STD. COUNT	DEPTH BELOW GRADE	6	6	6	6	
	DEPTH OF GAUGE SOURCE	6	6	6	6	
	LIFT THICKNESS COMPACTED					
DC FROM TEST SECTION	DENSITY STANDARD					
	MOISTURE STANDARD					
$DF = \frac{DE(100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$	DC	MAXIMUM DENSITY	132	132	132	132
		REFERENCE LAB NUMBER	123455	123455	123455	123455
TEST NUMBER 1	DE	DRY DENSITY	128	125	139	127
	DF	% RELATIVE DENSITY				
TEST NUMBER 2	DE	DRY DENSITY	131	129	134	126
	DF	% RELATIVE DENSITY				
TEST NUMBER 3	DE	DRY DENSITY	134	130	131	127
	DF	% RELATIVE DENSITY				
TEST NUMBER 4	DE	DRY DENSITY	126	127	127	128
	DF	% RELATIVE DENSITY				
TEST NUMBER 5	DE	DRY DENSITY	133	129	130	126
	DF	% RELATIVE DENSITY				
LOT EVALUATION	\bar{X}	AVERAGE DF				
	T	TARGET	95	95	95	95
	QL	QUALITY INDEX				
	DG	% WITHIN TOLERANCE				
	DH	MIN. FOR 100% PAY	80	80	80	80
	DI	PASS/FAIL				

Inspector's Signature _____

Project's Evaluation _____

Checked By: _____ Date: _____

**WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION**

LAB. NUMBER: _____ U _____
 AUTH. NUMBER: _____
 PROJECT NUMB _____
 DISTRICT: _____
 ITEM NUMBER: _____

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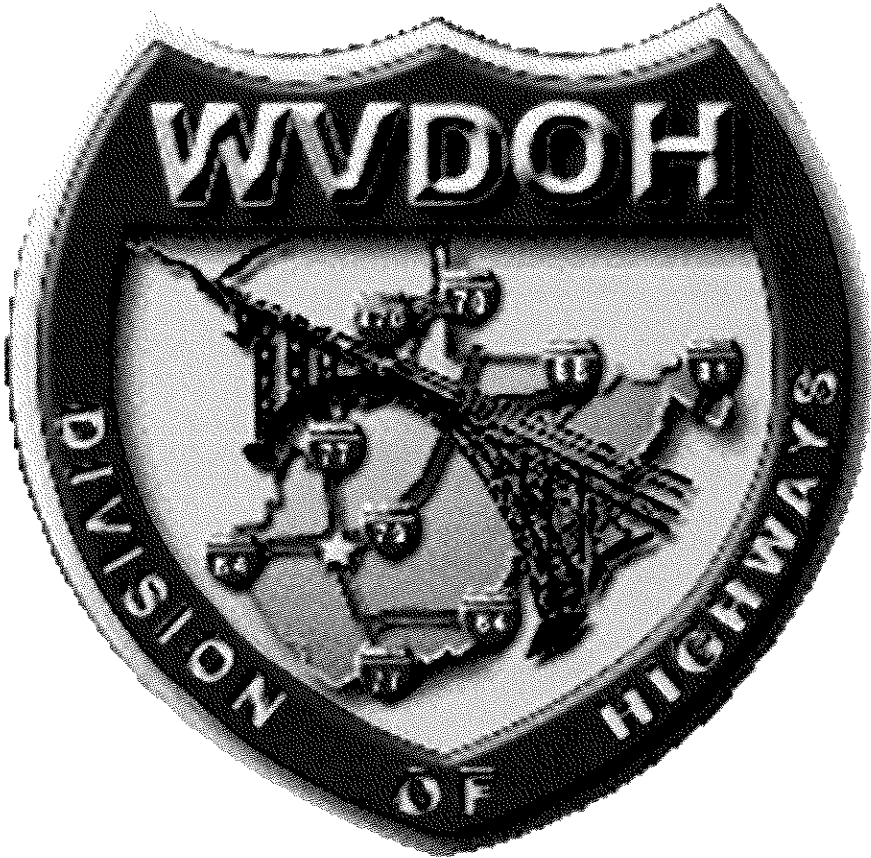
GAUGE NO.	DATE	P-96	P-97			
MANUFACTURER'S	LOT NUMBER					
DENSITY STD. COUNT	BEGINNING STATION					
	ENDING STATION					
MANUFACTURER'S	OFFSET					
MOISTURE STD. COUNT	DEPTH BELOW GRADE	4	4			
	DEPTH OF GAUGE SOURCE	4	4			
	LIFT THICKNESS COMPACTED					
DC FROM TEST SECTION	DENSITY STANDARD					
	MOISTURE STANDARD					
$DF = \frac{DE(100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$	DC	MAXIMUM DENSITY	112	118		
		REFERENCE LAB NUMBER	123465	123466		
TEST NUMBER 1	DE	DRY DENSITY	110	115		
	DF	% RELATIVE DENSITY				
TEST NUMBER 2	DE	DRY DENSITY	108	116		
	DF	% RELATIVE DENSITY				
TEST NUMBER 3	DE	DRY DENSITY	111	113		
	DF	% RELATIVE DENSITY				
TEST NUMBER 4	DE	DRY DENSITY	109	117		
	DF	% RELATIVE DENSITY				
TEST NUMBER 5	DE	DRY DENSITY	108	113		
	DF	% RELATIVE DENSITY				
LOT EVALUATION	\bar{X}	AVERAGE DF				
	T	TARGET	95	95		
	QL	QUALITY INDEX				
	DG	% WITHIN TOLERANCE				
	DH	MIN. FOR 100% PAY	80	80		
	DI	PASS/FAIL				

Inspector's Signature _____

Project's Evaluation _____

Checked By: _____ Date: _____

**COMPACTION INSPECTOR
PRACTICE
ANSWERS**



WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER A
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

FORM T-316
MP 207.07.20
REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER		ft.					
MOISTURE		OFFSET		ft.					
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE		ft.					
DENSITY		LIFT THICKNESS		in.					
MOISTURE		DEPTH OF SOURCE		in.					
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	127	125	122	126	119
		MA	MOISTURE	lb/ft ³	14	15	17	14	17
		DB	DRY DENSITY -3/4	lb/ft ³	125	122	119	124	116
MB = MA (100) DB		MB	MOISTURE	%	11	12	14	11	15
CC = CA - CB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	4952				
CF = CD - CE		CB	PAN	grams	316				
CG = CF (100) CC		CC	EXCAVATED MAT.	grams	4636				
PC = PA - PB		CD	PLUS 3/4 MAT. + PAN	grams	759				
PD = PC (0.066) PE = PD (100) 100 + MB		CE	PAN	grams	316				
		CF	PLUS 3/4 MAT.	grams	443				
		CG	PLUS 3/4 MAT.	%	10	10	10	10	10
		CH	SPECIFIC GRAVITY		2.7	2.7	2.7	2.7	2.7
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG		RERUN		RERUN	RERUN	RERUN	RERUN	RERUN	
ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	4055					
	PB	MOLD	grams	2009					
	PC	WEIGHT OF SOIL	grams	2046					
	PD	WET DENSITY	lb/ft ³	135					
	PE	DRY DENSITY	lb/ft ³	122					
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams					
SE = SD - SB		SB	PAN	grams					
SF = SC - SE		SC	WET WEIGHT	grams					
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams					
DE = DB (100) DC		SE	DRY WEIGHT	grams					
		SF	MOISTURE	grams					
		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%	12	12	12	12	12
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4
		OC	PASS / FAIL		Pass	Pass	Pass	Pass	Pass
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³	122	122	122	122	122
		DE	RELATIVE DENSITY	%	102	100	98	102	95
LOT EVALUATION	X	T	AVERAGE DE	%	99.4	INSPECTOR'S NAME:			
		T	TARGET	%	95	INSPECTOR'S SIGNATURE:			
	QL	QUALITY INDEX		0.63	PROJECT'S EVALUATION				
	DF	WITHIN TOLERANCE	%	97	CHECKED BY:				
	DG	MIN. FOR 100% PAY	%	80	DATE:				
	DH	PASS / FAIL		YES					

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER **B**
 AUTHORIZATION NUMBER
 PROJECT NUMBER
 DISTRICT
 LOT NUMBER
 ITEM NUMBER

FORM T-316
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GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER	ft.						
MOISTURE		OFFSET	ft.						
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE		ft.					
DENSITY		LIFT THICKNESS		in.					
MOISTURE		DEPTH OF SOURCE		in.					
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	111	109	108	110	109
		MA	MOISTURE	lb/ft ³	14	15	17	14	17
		DB	DRY DENSITY -3/4	lb/ft ³	110	108	106	109	108
		MB	MOISTURE	%	13	14	16	13	16
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	5541				
CC = CA - CB		CB	PAN	grams	502				
CF = CD - CE		CC	EXCAVATED MAT.	grams	5039				
CG = CF (100) CC		CD	PLUS 3/4 MAT. + PAN	grams	759				
PC = PA - PB		CE	PAN	grams	502				
PD = PC (0.066)		CF	PLUS 3/4 MAT.	grams	257				
PE = PD (100) 100 + MB		CG	PLUS 3/4 MAT.	%	5	5	5	5	5
		CH	SPECIFIC GRAVITY		2.5	2.5	2.5	2.5	2.5
						RERUN	RERUN	RERUN	RERUN
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3822				
		PB	MOLD	grams	1995				
		PC	WEIGHT OF SOIL	grams	1827				
		PD	WET DENSITY	lb/ft ³	121				
		PE	DRY DENSITY	lb/ft ³	107				
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams					
SE = SD - SB		SB	PAN	grams					
SF = SC - SE		SC	WET WEIGHT	grams					
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams					
		SE	DRY WEIGHT	grams					
DE = DB (100) DC		SF	MOISTURE	grams					
		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%	17	17	17	17	17
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4
		OC	PASS / FAIL		Pass	Pass	Pass	Pass	Pass
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY	lb/ft ³	109	109	109	109	109
		DE	RELATIVE DENSITY	%	101	99	97	100	99
	LOT EVALUATION	X	AVERAGE DE	%	99.2	INSPECTOR'S NAME:			
		T	TARGET	%	95				
		QL	QUALITY INDEX		1.05	INSPECTOR'S SIGNATURE:			
DF		WITHIN TOLERANCE	%	100					
DG		MIN. FOR 100% PAY	%	80	PROJECT'S EVALUATION				
DH	PASS / FAIL		YES	CHECKED BY:					
				DATE:					

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____ E _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

FORM T-316
 MP 207.07.20
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GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER		ft.					
MOISTURE		OFFSET		ft.					
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE		ft.					
DENSITY		LIFT THICKNESS		in.					
MOISTURE		DEPTH OF SOURCE		in.					
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	122	125	128	129	127
		MA	MOISTURE	lb/ft ³	11	9	10	9	11
		DB	DRY DENSITY -3/4	lb/ft ³	117	120	124	125	122
		MB	MOISTURE	%	9	8	8	7	9
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	6004				
CC = CA - CB		CB	PAN	grams	1009				
CF = CD - CE		CC	EXCAVATED MAT.	grams	4995				
CG = CF (100) CC		CD	PLUS 3/4 MAT. + PAN	grams	1894				
PC = PA - PB		CE	PAN	grams	1009				
PD = PC (0.066) PE = PD (100) 100 + MB		CF	PLUS 3/4 MAT.	grams	885				
		CG	PLUS 3/4 MAT.	%	18	18	18	18	18
		CH	SPECIFIC GRAVITY		2.6	2.7	2.7	2.7	2.7
					RERUN	RERUN	RERUN	RERUN	RERUN
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3975				
		PB	MOLD	grams	1954				
		PC	WEIGHT OF SOIL	grams	2021				
		PD	WET DENSITY	lb/ft ³	133				
		PE	DRY DENSITY	lb/ft ³	122				
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams					
SE = SD - SB		SB	PAN	grams					
SF = SC - SE		SC	WET WEIGHT	grams					
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams					
		SE	DRY WEIGHT	grams					
		SF	MOISTURE	grams					
DE = DB (100) DC		SG	MOISTURE	%					
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%	11	11	11	11	11
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4
		OC	PASS / FAIL		Pass	Pass	Pass	Pass	Pass
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL	DC	MAXIMUM DENSITY	lb/ft ³	124	124	124	124	124
		DE	RELATIVE DENSITY	%	94	97	100	101	98
	LOT EVALUATION	\bar{X}	AVERAGE DE	%	98	INSPECTOR'S NAME:			
		T	TARGET	%	95				
		QL	QUALITY INDEX		0.43	INSPECTOR'S SIGNATURE:			
		DF	WITHIN TOLERANCE	%	86				
		DG	MIN. FOR 100% PAY	%	80	PROJECT'S EVALUATION			
		DH	PASS / FAIL		YES				
					CHECKED BY:				
					DATE:				

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER _____ H _____
 AUTHORIZATION NUMBER _____
 PROJECT NUMBER _____
 DISTRICT _____
 LOT NUMBER _____
 ITEM NUMBER _____

FORM T-316
 MP 207.07.20
 REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER		ft.					
MOISTURE		OFFSET		ft.					
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE		ft.					
DENSITY		LIFT THICKNESS		in.					
MOISTURE		DEPTH OF SOURCE		in.					
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	116	116	116	116	117
		MA	MOISTURE	lb/ft ³	17	15	15	14	13
		DB	DRY DENSITY -3/4	lb/ft ³	114	114	114	114	115
		MB	MOISTURE	%	15	13	13	12	11
MB = MA (100) DB CC = CA - CB CF = CD - CE CG = CF (100) CC PC = PA - PB PD = PC (0.066) PE = PD (100) 100 + MB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	4839				
		CB	PAN	grams	339				
		CC	EXCAVATED MAT.	grams	4500				
		CD	PLUS 3/4 MAT. + PAN	grams	777				
		CE	PAN	grams	339				
		CF	PLUS 3/4 MAT.	grams	438				
		CG	PLUS 3/4 MAT.	%	10	10	10	10	10
		CH	SPECIFIC GRAVITY		2.5	2.5	2.5	2.5	2.5
				RERUN	RERUN	RERUN	RERUN	RERUN	
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG	ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3999	3969			
		PB	MOLD	grams	1999	1999			
		PC	WEIGHT OF SOIL	grams	2000	1970			
		PD	WET DENSITY	lb/ft ³	132	130			
		PE	DRY DENSITY	lb/ft ³	115	118			
SC = SA - SB SE = SD - SB SF = SC - SE SG = SF (100) SE DE = DB (100) DC	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams	1542				
		SB	PAN	grams	1200				
		SC	WET WEIGHT	grams	342				
		SD	DRY WEIGHT + PAN	grams	1511				
		SE	DRY WEIGHT	grams	311				
		SF	MOISTURE	grams	31				
		SG	MOISTURE	%	10				
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%	12	12	12	12	12
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4
		OC	PASS / FAIL		Pass	Pass	Pass	Pass	Pass
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY	lb/ft ³	120	120	120	120	120
		DE	RELATIVE DENSITY	%	95	95	95	95	96
	LOT EVALUATION	X	AVERAGE DE	%	95.2	INSPECTOR'S NAME:			
		T	TARGET	%	95				
		QL	QUALITY INDEX		0.20	INSPECTOR'S SIGNATURE:			
DF	WITHIN TOLERANCE	%	68	PROJECT'S EVALUATION					
DG	MIN. FOR 100% PAY	%	80					CHECKED BY:	
DH	PASS / FAIL		NO	DATE:					

WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION



LAB NUMBER 1
AUTHORIZATION NUMBER _____
PROJECT NUMBER _____
DISTRICT _____
LOT NUMBER _____
ITEM NUMBER _____

FORM T-316
MP 207.07.20
REV. 08-08

GAUGE NUMBER		TEST NUMBER		1	2	3	4	5	
MANUFACTURER'S STANDARDS		DATE							
DENSITY		STATION NUMBER		ft.					
MOISTURE		OFFSET		ft.					
GAUGE STANDARD COUNTS		DEPTH BELOW GRADE		ft.					
DENSITY		LIFT THICKNESS		in.					
MOISTURE		DEPTH OF SOURCE		in.					
DB FROM TABLES	Field Density Moisture	DA	TOTAL DRY DENSITY	lb/ft ³	117	117	117	117	116
		MA	MOISTURE	lb/ft ³	17	15	15	14	13
		DB	DRY DENSITY -3/4	lb/ft ³	115	115	115	115	114
		MB	MOISTURE	%	15	13	13	12	11
MB = MA (100) DB	PLUS 3/4 MATERIAL DETERMINATION	CA	EXC. MATERIAL + PAN	grams	4839				
CC = CA - CB		CB	PAN	grams	339				
CF = CD - CE		CC	EXCAVATED MAT.	grams	4500				
CG = CF (100) CC		CD	PLUS 3/4 MAT. + PAN	grams	777				
PC = PA - PB		CE	PAN	grams	339				
PD = PC (0.066) PE = PD (100) 100 + MB		CF	PLUS 3/4 MAT.	grams	438				
		CG	PLUS 3/4 MAT.	%	10	10	10	10	10
		CH	SPECIFIC GRAVITY		2.5	2.5	2.5	2.5	2.5
					RERUN	RERUN	RERUN	RERUN	RERUN
RERUN PROCTOR PE (RERUN) = PD (100) 100 + SG		ONE POINT PROCTOR	PA	WEIGHT SOIL & MOLD	grams	3999	3969		
	PB		MOLD	grams	1999	1999			
	PC		WEIGHT OF SOIL	grams	2000	1970			
	PD		WET DENSITY	lb/ft ³	132	130			
	PE		DRY DENSITY	lb/ft ³	115	118			
SC = SA - SB	STOVE DRIED MOISTURE	SA	WET WEIGHT + PAN	grams	1542				
SE = SD - SB		SB	PAN	grams	1200				
SF = SC - SE		SC	WET WEIGHT	grams	342				
SG = SF (100) SE		SD	DRY WEIGHT + PAN	grams	1511				
DE = DB (100) DC		SE	DRY WEIGHT	grams	311				
		SF	MOISTURE	grams	31				
		SG	MOISTURE	%	10				
$\bar{X} = \frac{\sum DE}{5}$	MOIST. EVAL.	OA	OPTIMUM MOISTURE	%	12	12	12	12	12
		OB	PLUS / MINUS TOLER.		+3 / -4	+3 / -4	+3 / -4	+3 / -4	+3 / -4
		OC	PASS / FAIL		Pass	Pass	Pass	Pass	Pass
$QL = \frac{\bar{X} - T}{R}$	DEN EVAL.	DC	MAXIMUM DENSITY	lb/ft ³	120	120	120	120	120
		DE	RELATIVE DENSITY	%	96	96	96	96	95
	LOT EVALUATION	X	AVERAGE DE	%	95.8	INSPECTOR'S NAME:			
		T	TARGET	%	95	INSPECTOR'S SIGNATURE:			
		QL	QUALITY INDEX		0.80	PROJECT'S EVALUATION			
	DF	WITHIN TOLERANCE	%	100	CHECKED BY:				
	DG	MIN. FOR 100% PAY	%	80	DATE:				
	DH	PASS / FAIL		YES					

**WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION**

LAB. NUMBER: _____ P _____
 AUTH. NUMBER: _____
 PROJECT NUMB _____
 DISTRICT: _____
 ITEM NUMBER: _____

FORM T-317
 MP 700.00.24
 REV. 08-08

GAUGE NO.	DATE	P-1	P-2	P-3	P-4	P-5	
MANUFACTURER'S	LOT NUMBER						
DENSITY STD. COUNT	BEGINNING STATION						
	ENDING STATION						
MANUFACTURER'S	OFFSET						
MOISTURE STD. COUNT	DEPTH BELOW GRADE	6	4	8	6	4	
	DEPTH OF GAUGE SOURCE	6	4	8	6	4	
	LIFT THICKNESS COMPACTED						
DC FROM TEST SECTION $DF = \frac{DE(100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$	DENSITY STANDARD						
	MOISTURE STANDARD						
	DC	MAXIMUM DENSITY	134	128	145	108	136
	REFERENCE LAB NUMBER	K	L	M	N	O	
TEST NUMBER 1	DE	DRY DENSITY	127	125	139	107	138
	DF	% RELATIVE DENSITY	95	98	96	99	101
TEST NUMBER 2	DE	DRY DENSITY	131	129	144	101	137
	DF	% RELATIVE DENSITY	98	101	99	94	101
TEST NUMBER 3	DE	DRY DENSITY	134	130	141	107	139
	DF	% RELATIVE DENSITY	100	102	97	99	102
TEST NUMBER 4	DE	DRY DENSITY	131	127	138	106	139
	DF	% RELATIVE DENSITY	98	99	95	98	102
TEST NUMBER 5	DE	DRY DENSITY	139	129	139	108	141
	DF	% RELATIVE DENSITY	104	101	96	100	104
LOT EVALUATION	\bar{X}	AVERAGE DF	99.0	100.2	96.6	98.0	102.0
	T	TARGET	95	95	95	95	95
	QL	QUALITY INDEX	0.44	1.30	0.40	0.50	2.33
	DG	% WITHIN TOLERANCE	86	100	83	90	100
	DH	MIN. FOR 100% PAY	80	80	80	80	80
	DI	PASS/FAIL	PASS	PASS	PASS	PASS	PASS

Inspector's Signature _____

Project's Evaluation

Checked By: _____ Date: _____

**WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION**

LAB. NUMBER: _____ R _____
 AUTH. NUMBER: _____
 PROJECT NUMB _____
 DISTRICT: _____
 ITEM NUMBER: _____

FORM T-317
 MP 700.00.24
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GAUGE NO.		DATE	B-15	B-16	B-17			
MANUFACTURER'S	LOT NUMBER							
DENSITY STD. COUNT	BEGINNING STATION							
	ENDING STATION							
MANUFACTURER'S	OFFSET							
MOISTURE STD. COUNT	DEPTH BELOW GRADE	6	6	6				
	DEPTH OF GAUGE SOURCE	6	6	6				
	LIFT THICKNESS COMPACTED							
DC FROM TEST SECTION	DENSITY STANDARD							
	MOISTURE STANDARD							
$DF = \frac{DE(100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$		DC	MAXIMUM DENSITY	137	137	137		
			REFERENCE LAB NUMBER	123456	123456	123456		
TEST NUMBER 1	DE	DRY DENSITY	136	135	139			
	DF	% RELATIVE DENSITY	99	99	101			
TEST NUMBER 2	DE	DRY DENSITY	136	137	144			
	DF	% RELATIVE DENSITY	99	100	105			
TEST NUMBER 3	DE	DRY DENSITY	134	138	141			
	DF	% RELATIVE DENSITY	98	101	103			
TEST NUMBER 4	DE	DRY DENSITY	135	141	138			
	DF	% RELATIVE DENSITY	99	103	101			
TEST NUMBER 5	DE	DRY DENSITY	143	142	143			
	DF	% RELATIVE DENSITY	104	104	104			
LOT EVALUATION	\bar{X}	AVERAGE DF	99.8	101.4	102.8			
	T	TARGET	95	95	95			
	QL	QUALITY INDEX	0.80	1.28	1.95			
	DG	% WITHIN TOLERANCE	100	100	100			
	DH	MIN. FOR 100% PAY	80	80	80			
	DI	PASS/FAIL	PASS	PASS	PASS			

Inspector's Signature _____

Project's Evaluation _____

Checked By: _____ Date: _____

**WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION**

LAB. NUMBER: _____ T _____
 AUTH. NUMBER: _____
 PROJECT NUMB _____
 DISTRICT: _____
 ITEM NUMBER: _____

FORM T-317
 MP 700.00.24
 REV. 08-08

GAUGE NO.	DATE	S-1	S-2	S-3	S-4	
MANUFACTURER'S	LOT NUMBER					
DENSITY STD. COUNT	BEGINNING STATION					
	ENDING STATION					
MANUFACTURER'S	OFFSET					
MOISTURE STD. COUNT	DEPTH BELOW GRADE	6	6	6	6	
	DEPTH OF GAUGE SOURCE	6	6	6	6	
	LIFT THICKNESS COMPACTED					
DC FROM TEST SECTION	DENSITY STANDARD					
	MOISTURE STANDARD					
$DF = \frac{DE(100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$	DC	132	132	132	132	
	MAXIMUM DENSITY	123455	123455	123455	123455	
	REFERENCE LAB NUMBER					
TEST NUMBER 1	DE	128	125	139	127	
	DF	97	95	105	96	
TEST NUMBER 2	DE	131	129	134	126	
	DF	99	98	102	95	
TEST NUMBER 3	DE	134	130	131	127	
	DF	102	98	99	96	
TEST NUMBER 4	DE	126	127	127	128	
	DF	95	96	96	97	
TEST NUMBER 5	DE	133	129	130	126	
	DF	101	98	98	95	
LOT EVALUATION	\bar{X}	98.8	97.0	100.0	95.8	
	T	95	95	95	95	
	QL	0.54	0.67	0.56	0.40	
	DG	93	100	94	83	
	DH	80	80	80	80	
	DI	PASS	PASS	PASS	PASS	

Inspector's Signature _____

Project's Evaluation _____

Checked By: _____ Date: _____

**WEST VIRGINIA DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION**

LAB. NUMBER: _____ U _____
 AUTH. NUMBER: _____
 PROJECT NUMB _____
 DISTRICT: _____
 ITEM NUMBER: _____

**FORM T-317
 MP 700.00.24
 REV. 08-08**

GAUGE NO.	DATE	P-96	P-97			
MANUFACTURER'S	LOT NUMBER					
DENSITY STD. COUNT	BEGINNING STATION					
	ENDING STATION					
MANUFACTURER'S	OFFSET					
MOISTURE STD. COUNT	DEPTH BELOW GRADE	4	4			
	DEPTH OF GAUGE SOURCE	4	4			
	LIFT THICKNESS COMPACTED					
DC FROM TEST SECTION $DF = \frac{DE(100)}{DC}$ $\bar{X} = \frac{\sum DF}{5}$ $QL = \frac{\bar{X} - T}{R}$	DENSITY STANDARD					
	MOISTURE STANDARD					
	DC	MAXIMUM DENSITY	112	118		
		REFERENCE LAB NUMBER	123465	123466		
TEST NUMBER 1	DE	DRY DENSITY	110	115		
	DF	% RELATIVE DENSITY	98	97		
TEST NUMBER 2	DE	DRY DENSITY	108	116		
	DF	% RELATIVE DENSITY	96	98		
TEST NUMBER 3	DE	DRY DENSITY	111	113		
	DF	% RELATIVE DENSITY	99	96		
TEST NUMBER 4	DE	DRY DENSITY	109	117		
	DF	% RELATIVE DENSITY	97	99		
TEST NUMBER 5	DE	DRY DENSITY	108	113		
	DF	% RELATIVE DENSITY	96	96		
LOT EVALUATION	\bar{X}	AVERAGE DF	97.2	97.2		
	T	TARGET	95	95		
	QL	QUALITY INDEX	0.73	0.73		
	DG	% WITHIN TOLERANCE	100	100		
	DH	MIN. FOR 100% PAY	80	80		
	DI	PASS/FAIL	PASS	PASS		

Inspector's Signature _____

Project's Evaluation _____

Checked By: _____ Date: _____