

**STATE OF OKLAHOMA
DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL SPECIFICATIONS FOR ROADWAY DESIGN**

June 29, 2011

APPENDIX 5. - STANDARD FORMS FOR REPORTING GEOTECHNICAL INFORMATION

In order to insure uniformity in the information submitted to ODOT, certain standard report formats will be required as follows:

1. Pedological & Geological Soils Test Data
2. Resilient Modulus Test Data
3. Resilient Modulus of Subgrade Soil (AASHTO T 307-99)
4. Shoulder Soils Survey
5. Pavement Core Data and In-place Soils
6. Pavement Core logs
7. Soil Series Characteristics
8. FWD Report for Flexible Pavement
9. FWD Report for PC Concrete Pavement

While these forms may be re-created in an electronic format and the general parameters adjusted as necessary, the content and specific presentation of the information must not be modified.

In addition to these standard report Formats, ODOT will require the utilization of the following unique software package gINT® in the development and compilation boring log information.

Project No. STP-123C (123), 12345(04)
 Location US 69 from Choteau to SH 20

County Mayes County

EXAMPLE Resilient Modulus Test Data

Laboratory No.	6783		6789		6792	
Sample No.	1	2	1	2	1	2
Station	105+05		113+85		127+90	
Location	35 ft lt. CL		20 ft rt CL		18 ft rt CL	
Depth (inches)	12 – 60					
Soil Series	Dennis "B"		Parsons "B"		Bates "B"	
Sieve Size	Percent Passing		Percent Passing		Percent Passing	
1" / 25.0 mm	100		100		100	
No. 4 / 4.75 mm	100		100		100	
No. 10 / 2.0 mm	100		100		100	
No. 40 / 0.425 mm	99		99		99	
No. 200 / 0.075 mm	95.0		85.2		84.6	
Liquid Limit	71		36		56	
Plasticity Index	49		20		40	
Standard Density , PCF	93.0		99.2		102.6	
Optimum Moisture, %	24.6		17.7		21.8	
AASHTO Class	A-7-6(52)		A-6 (16)		A-7-6(35)	
Molded Density, PCF	90.1	88.2	97.2	94.9	100	97.4
Molded Moisture Content, %	24.2	26.9	17.1	19.2	21.4	23.5
Est. Compaction Factor – Shrink /	9.6 % Swell		6.2% Swell		1.6 % Swell	
Resilient Modulus, PSI	See enclosed data and graphs		See enclosed data and graphs		See enclosed data and graphs	

Project No. STP-123C (123), 12345(04)

Location US 69 from Choteau to SH 20

County Mayes County

EXAMPLE Resilient Modulus of Subgrade Soils (AASHTO T-307) Data

Soil Series Parsons 'B'

AASHTO Class A-6 (16)

Sample No. 1A

Std. Density, pcf 99.2

Opt. Moisture, % 17.7

Material Type Type 2

Molded Density, pcf 97.2

Molded Moisture, % 17.5

Test Date June 11, 2011

Colum #	1	2	3	4	5	6	7	8	9	10	11	12	13
Parameter	Chamber Confining Pressure	Nominal Maximum Axial Stress	Actual Applied Max. Axial Load	Actual Applied Cyclic Load	Actual Applied Contact Load	Actual Applied Max. Axial Stress	Actual Applied Cyclic Stress	Actual Applied Contact Stress	Recov. Def. LVDT # 1 Reading	Recov. Def. LVDT # 2 Reading	Average Recov. Def. LVDT 1 & 2	Resilient Strain	Resilient Modulus
Designation	S3	Scyclic	Pmax	Pcyclic	Pcontact	Smax	Scyclic	Scontact	H1	H2	Havg	er	Mr
Unit	psi	psi	lbs	lbs	lbs	psi	psi	psi	in	in	in	in/in	psi
Precision	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequence 1	6	2	29.011	24.235	4.775	2.310	1.930	0.380	0.00092	0.00189	0.00141	0.00015	13016
Sequence 2	6	4	54.237	46.928	7.310	4.318	3.736	0.582	0.00273	0.00360	0.00316	0.00033	11222
Sequence 3	6	6	78.831	68.990	9.841	6.276	5.493	0.783	0.00506	0.00588	0.00547	0.00058	9539
Sequence 4	6	8	103.541	91.221	12.320	8.244	7.263	0.981	0.00770	0.00843	0.00807	0.00085	8555
Sequence 5	6	10	128.324	113.514	14.810	10.217	9.038	1.179	0.01027	0.01088	0.01057	0.00111	8121
Sequence 6	4	2	26.721	23.791	2.930	2.127	1.894	0.233	0.00129	0.00228	0.00178	0.00019	10098
Sequence 7	4	4	51.121	45.681	5.440	4.070	3.637	0.433	0.00360	0.00456	0.00408	0.00043	8471
Sequence 8	4	6	75.529	67.571	7.957	6.013	5.380	0.634	0.00635	0.00725	0.00680	0.00072	7515
Sequence 9	4	8	100.921	90.457	10.464	8.035	7.202	0.833	0.00920	0.00996	0.00958	0.00101	7143
Sequence 10	4	10	125.497	112.578	12.919	9.992	8.963	1.029	0.01198	0.01273	0.01236	0.00130	6891
Sequence 11	2	2	24.475	22.792	1.683	1.949	1.815	0.134	0.00174	0.00276	0.00225	0.00024	7667
Sequence 12	2	4	47.585	43.381	4.204	3.789	3.454	0.335	0.00468	0.00566	0.00517	0.00054	6344
Sequence 13	2	6	71.775	65.072	6.704	5.715	5.181	0.534	0.00816	0.00905	0.00861	0.00091	5717
Sequence 14	2	8	97.198	88.043	9.155	7.739	7.010	0.729	0.01143	0.01225	0.01184	0.00125	5626
Sequence 15	2	10	121.138	109.461	11.676	9.645	8.715	0.930	0.01444	0.01502	0.01473	0.00155	5620

* Reported results are based on the average of the last 5 cycles of each load sequence

**Detailed report (Hard Copy), as recommended by AASHTO T 307-99, is available at ODOT (Materials Division, Soils and Foundations Branch)

*** Peaks and valleys were recorded per load cycle

Resilient Modulus of Subgrade Soil (AASHTO T 307-99)
(Summary Sheet 2)

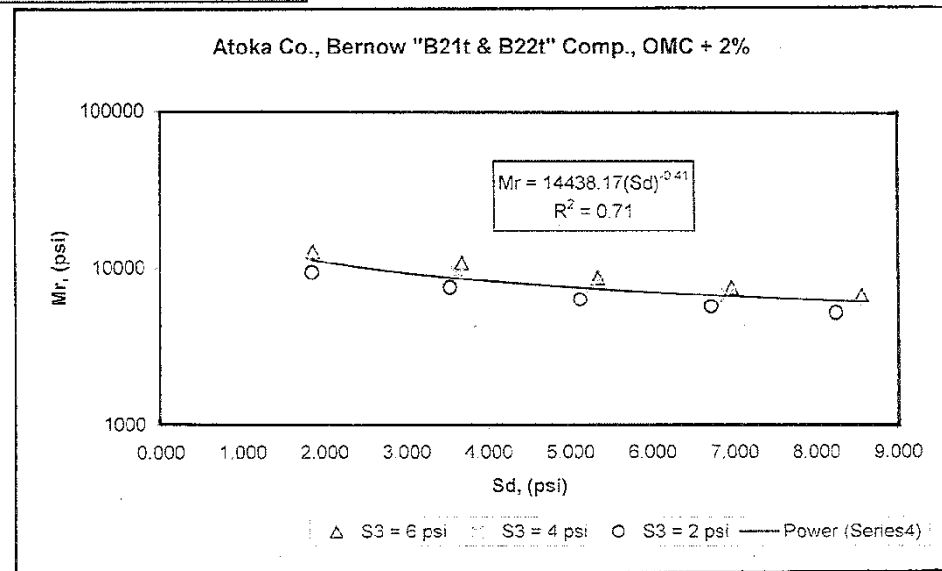
1. Sample Number 4138-2
 2. Material Type Type 2
 3. Test Date 2/7/2007

Desired S3 (psi)	Desired Sd (psi)	Actual Sd (psi)	Actual Mr (psi)	Log (Sd) (psi)	Log (S3) (psi)	Log (Mr) (psi)	Calculated ¹ Mr (psi)
6	1.8	1.863	12676	0.27	0.78	4.10	11203
6	3.6	3.678	10704	0.57	0.78	4.03	8489
6	5.4	5.337	8579	0.73	0.78	3.93	7294
6	7.2	6.966	7422	0.84	0.78	3.87	6543
6	9	8.557	6611	0.93	0.78	3.82	6016
4	1.8	1.865	11003	0.27	0.60	4.04	11199
4	3.6	3.632	9225	0.56	0.60	3.96	8533
4	5.4	5.294	7736	0.72	0.60	3.89	7318
4	7.2	6.920	6717	0.84	0.60	3.83	6560
4	9	8.499	6012	0.93	0.60	3.78	6033
2	1.8	1.850	9302	0.27	0.30	3.97	11236
2	3.6	3.530	7466	0.55	0.30	3.87	8632
2	5.4	5.119	6219	0.71	0.30	3.79	7418
2	7.2	6.715	5564	0.83	0.30	3.75	6641
2	9	8.242	5069	0.92	0.30	3.70	6109

¹: Model # 1

Model #1: $Mr = K1 \times Sd^{K2}$

S3 (psi)	K1	K2	R ²
6	17405	-0.43	0.96
4	14645	-0.40	0.97
2	12162	-0.41	0.99
All	14438	-0.41	0.71



EXAMPLE TYPE OF SURVEY

Surveyed by: _____

 Date Surveyed: _____

**Shoulder / In Place Soils Survey
 "Same As Approach"**

Sheet _____ of _____
 Project _____
 County _____ Location _____

Field No.	Soil Group	Station	Description	Depth (in)	L.L.	P.I.	Percent Passing					OSI	M.C. %	Soluble Sulfates (mg/kg)	
							3 in.	¾ in	#4	#10	#40				#200
		160+00, 17' Lt													
1A	A-6(11)		Lean Clay	0 - 6	30	13	100	100	100	100	99.4	90.0	15	24.4	255
1B	A-6(16)		Lean Clay	6 - 30	33	19	100	100	100	100	100	92.2	12	24.1	134
1C	A-6(18)		Lean Clay	30 - 36	38	26	100	100	100	100	100	91.5	21	21.8	437
Mr-1A	A-6(18)		Composite- Lean Clay	0 - 36	37	26	100	100	100	100	100	92.1	20	24.0	289
		165+00, 16'Rt													
2A			Similar as 1A												
2B			Similar as 1B												
2C			Similar as 1C												
		170+00, 16' Lt													
3A	A-2-4(0)		Silty Sand	0 - 6	NP	NP	100	91	83	76	64	26.0	0	12.7	260
3B	A-4(0)		Silty Sand	6 - 16	NP	NP	100	100	95	88	86	82.9	0	14.5	357
3C			Similar as 1C	16 - 36											
		175+00, 15' Rt													
4A	A-4(0)		Silty Sand	0 - 6	NP	NP	100	100	91	89	86	81.2	0	14.9	138
4B	A-4(0)		Silty Sand	6 - 18	NP	NP	100	100	100	100	92	83.2	0	15.1	175
4C	A-4(0)		Silty Sand	18 - 36	NP	NP	100	100	100	95	88	82.7	0	16.5	211
Mr-2A	A-4(0)		Composite- Silty Sand	0 - 36	NP	NP	100	100	98	95	90	82.1	0		185
		180+00, 16' Lt													
5A			Similar as 4A	0 - 6											
5B			Similar as 4A	6 - 12											
5C	A-6(16)		Lean Clay with Sand	0 - 6	36	20	100	100	100	100	97.8	83.5	15	25.9	244
5D	A-6(20)		Lean Clay	6 - 27	30	15	100	100	100	100	100	92.7	12	20.9	311

EXAMPLE ASPHALT CORE LOG



CORE LOG

PROJECT NO. STPY-123C(123)
 JOB PIECE NO. 12345(04)
 LOCATION SH-123
 COUNTY OKLAHOMA
 DATE JUNE 11, 2011
 CONTROL SECTION
 CORE 1
 STATION 325+50, 10' RT
 LANE DIRECTION NB
 CHAINAGE
 GPS

CORE LAYER DATA (FROM TOP TO BOTTOM):

Sample No	Layer Type	Layer Thickness (in.)	Layer Characteristics*
1	Asphaltic Concrete	1 3/4	Type B, separation at 1 3/4 inches
	Asphaltic Concrete	2	Type B
	Asphaltic Concrete	1 1/2	Type B
	Asphaltic Concrete	1 1/2	Type B
	Asphaltic Concrete	2 1/2	Type A

CORE DATA

Surface Material Type: A.C. P.C.C. Continuously Reinforced Concrete

Stripping or Separation in Asphalt: Stripping Separation N/A

Honeycomb or "D" Cracking in PCC: Honeycomb "D" Cracking N/A

Stabilized Subgrade Beneath Pavement or Sub-base? Yes No Unknown

Total Core Thickness 9 1/4

2 Asphaltic Sand and Gravel, black (5YR 2.5/1)

3 Clayey Gravel, reddish-brown (5YR 4/4)

* Asphalt type based on visual observation only

EXAMPLE CONCRETE CORE LOG



CORE LOG

PROJECT NO. STPY 123C(123)
 JOB PIECE NO. 12345(04)
 LOCATION SH-123
 COUNTY OKLAHOMA
 DATE JUNE 11, 2011
 CONTROL SECTION
 CORE 15
 STATION 657+72, 10' FT
 LANE DIRECTION SB
 CHAINAGE
 GPS

CORE LAYER DATA (FROM TOP TO BOTTOM):

Sample No	Layer Type	Layer Thickness (in.)	Layer Characteristics*
1	Portland Cement Concrete	9 5/8	Separation at 9 5/8"
	Asphaltic Concrete	6 1/8	Type C

CORE DATA

Surface Material Type: A.C. P.C.C. Continuously Reinforced Concrete

Stripping or Separation in Asphalt: Stripping Separation N/A

Honeycomb or "D" Cracking in PCC: Honeycomb "D" Cracking N/A

Stabilized Subgrade Beneath Pavement or Sub-base? Yes No Unknown

Total Core Thickness 15 3/4

2 Stabilized subgrade - Silty clayey sand, yellowish-brown (10YR 4/4) 7 1/2

3 Lean clay, brown (7.5YR 4/4) —

* Asphalt type based on visual observation only

Project No. STP-123C(123), 12345(04)

Location US 69 From Choteau to SH 20

County Mayes

Table 1 Typical Characteristics of Soil Series

Soil Series	Lineal Extent (ft)	Slope Variability %	Parent Material	Depth to Bedrock (in)	Drainage	Permeability	Shrink-Swell Potential	Comments
Bates	1550	1 - 5	Sandstone	30 - 34	Well	Moderate	Low to moderate	- moderate corrosion risk to concrete - low strength
Dennis	4320	1 - 3	Shale	60	Mod. Well	Slow	Moderate to high	- high corrosion risk to uncoated steel - moderate corrosion risk to concrete - low strength - perched water table 2-3 ft Dec.- April
Okemah	980	0 - 1	Shale	60	Mod. Well	Slow	High	- high corrosion risk to uncoated steel - moderate corrosion risk to concrete - low strength - perched water table 2-3 ft Dec.- April
Parsons	1340	0 - 1	Shale	60	Poor	Very slow	High	- high corrosion risk to uncoated steel - moderate corrosion risk to concrete - low strength - perched water table 2-3 ft Dec.- April
Verdigris	130	Nearly level	Alluvium	> 72	Moderately Well	Moderate	Moderate	- subject to flooding

EXAMPLE FWD REPORT FOR FLEXIBLE PAVEMENT

Project No. STPY-150B(042)

U.S. Highway 177 From Carter/Murray County Line Extending North 5 Miles

Murray County, Oklahoma

Station (ft)	Direction	Asphalt Thickness (in)	Base Thickness (in)	Asphalt Temp. (F)	Asphalt Elastic Modulus (ksi)	Asphalt Elastic Modulus @ 68 F (ksi)	Equivalent Pavement Modulus (ksi)	Subgrade Resilient Modulus (ksi)	Design Subgrade Resilient Modulus (ksi)
10020	NB	8.3	12.0	52	455	295	56	23.6	7.9
10258	NB	8.3	12.0	52	455	296	72	17.7	5.9
10511	NB	8.3	12.0	52	227	148	83	31.3	10.4
10763	NB	8.3	12.0	52	227	149	112	25.9	8.6
11002	NB	8.3	12.0	52	181	119	49	23.2	7.7
11253	NB	8.3	12.0	53	181	120	48	24.7	8.2
11508	NB	6.0	8.0	52	268	176	69	13.8	4.6
11753	NB	9.3	12.0	53	268	176	104	19.2	6.4
12012	NB	9.3	12.0	52	255	167	105	14.7	4.9
12250	NB	9.3	12.0	53	255	168	141	13.4	4.5
12509	NB	9.3	12.0	53	320	213	125	17.8	5.9
12755	NB	9.3	12.0	53	637	425	221	25.8	8.6
13006	NB	9.3	12.0	53	315	210	363	53.6	17.9
13263	NB	8.3	6.0	53	315	210	145	24.2	8.1
13497	NB	8.3	6.0	53	315	209	94	27.2	9.1
13763	NB	8.3	6.0	53	150	99	72	28.7	9.6
13999	NB	8.3	6.0	53	150	99	168	33.5	11.2
14252	NB	8.3	6.0	53	477	314	56	19.6	6.5
14499	NB	12.0	6.0	53	477	315	59	13.3	4.4
14760	NB	12.0	6.0	53	202	133	275	19.4	6.5
15013	NB	8.8	6.0	53	202	135	84	13.0	4.3
15280	NB	8.8	6.0	53	202	136	54	26.6	8.9
15511	NB	8.8	6.0	53	470	316	185	26.9	9.0
15756	NB	8.8	6.0	53	470	316	67	24.6	8.2
16002	NB	8.0	6.0	53	470	316	142	19.8	6.6
16256	NB	8.0	6.0	53	470	313	157	17.8	5.9
16500	NB	8.0	6.0	53	506	337	158	23.2	7.7
16751	NB	8.0	6.0	53	224	149	118	15.5	5.2
16999	NB	9.8	6.0	53	224	149	68	15.6	5.2
17253	NB	9.8	6.0	53	460	304	150	14.4	4.8
17508	NB	9.8	6.0	53	460	307	157	12.8	4.3
17759	NB	9.8	6.0	53	154	102	184	13.7	4.6
18014	NB	9.8	6.0	53	154	103	192	25.5	8.5
18256	NB	8.0	6.0	53	565	378	205	21.5	7.2
18498	NB	8.0	6.0	53	565	377	192	23.2	7.7
18760	NB	8.0	6.0	53	290	193	124	23.8	7.9
18997	NB	8.0	6.0	53	290	192	140	19.5	6.5
19246	NB	7.3	6.0	53	290	194	107	19.2	6.4
19492	NB	7.3	6.0	53	290	194	82	18.2	6.1
19752	NB	7.3	6.0	53	172	115	79	21.2	7.1
			No. of Tests	40					
				Average	326	217	127	22	7.2
				Std Dev	137	92	67	7	2.5

Example: FWD Report For Asphalt Pavement

Proj. No. SSP-114B(185)SS, J.P. No. 24112(04)

12,000 lb test load

Location: SH-39, East of Lexington

County : Cleveland

Station (ft)	Lane	Asphalt Thickness (in.)	Asphalt Temp. (°F)	Asphalt	Equivalent Pavement Modulus (ksi)	Subgrade Resilient Modulus (ksi)	Design Subgrade Resilient Modulus (ksi)
				Elastic Modulus at 77°F (ksi)			
81500	EB	14.2	73	463	463	19.6	6.5
82000	EB	14.2	74	97	97	14.6	4.9
82500	EB	14.2	74	126	126	15.7	5.2
83000	EB	14.2	74	164	164	16.4	5.5
83500	EB	14.2	74	102	102	36.6	12.2
84000	EB	14.2	74	270	270	21.7	7.2
84500	EB	14.2	74	250	250	18.9	6.3
85000	EB	9.5	73	184	184	22.1	7.4
85500	EB	9.5	74	100	100	23.2	7.7
86000	EB	9.5	74	67	67	16.0	5.3
86500	EB	9.5	74	132	132	10.5	3.5
87000	EB	9.5	74	294	294	16.2	5.4
87500	EB	9.5	75	64	64	10.4	3.5
88000	EB	9.5	74	93	93	13.4	4.5
88500	EB	13.0	73	56	56	7.3	2.4
89000	EB	13.0	73	54	54	8.3	2.8
89500	EB	13.0	73	49	49	7.4	2.5
90000	EB	13.0	73	112	112	16.8	5.6
90500	EB	13.0	74	76	76	15.5	5.2
91000	EB	13.0	73	69	69	18.6	6.2
91500	EB	13.0	74	123	123	17.9	6.0
92000	EB	10.5	74	113	113	17.9	6.0
92500	EB	10.5	75	85	85	15.9	5.3
93000	EB	10.5	74	72	72	15.8	5.3
93500	EB	10.5	75	213	213	12.7	4.2
94000	EB	10.5	75	118	118	13.8	4.6
94500	EB	10.5	75	102	102	12.0	4.0
95000	EB	10.5	74	60	60	18.4	6.1
95500	EB	10.5	74	108	108	17.9	6.0
96000	EB	10.5	76	92	92	17.8	5.9
96500	EB	10.5	74	115	115	17.1	5.7
97000	EB	10.5	76	122	122	15.7	5.2
97500	EB	10.5	76	167	167	10.7	3.6
98000	EB	10.5	76	219	219	13.4	4.5
98500	EB	10.5	76	169	169	9.8	3.3
99000	EB	10.5	76	178	178	13.4	4.5
99500	EB	10.5	76	181	181	15.6	5.2
100000	EB	10.5	75	102	102	15.4	5.1
100500	EB	10.5	76	250	250	13.5	4.5
101000	EB	10.5	76	126	126	15.5	5.2
101300	EB	10.5	75	84	84	9.5	3.2
			No. Tests:	41			
			Average:	137	137.057	15.583	5.194
			Std Dev.:	81	81.432	5.073	1.790
			85%:	69	69.263	10.500	3.500

