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Date: Friday, September 18, 1998 1:08 PM
Subject: EN-1 Performance on US 290 / US 281 Ramp

Steve,

Please see the attachments. For Rampu290 documents, the layer moduli are given. The modulus for the hot mix (E1) was fixed at 350 ksi, because it is too thin to back-calculate. E2 is the stabilized base material. Typically, the modulus would be in the range of 75 - 150 ksi for this environment. Note that the performance is relative to the support given by the subgrade; where the subgrade is shallower, the support is better and the modulus of the base is better. This would be true for unstabilized base as well.

TTI MODULUS ANALYSIS SYSTEM (SUMMARY REPORT)

(Version 5.1)

District: 14
 County: 16
 Highway/Road: us0290

w5=w6=w7=0, DTB = 120

	Thickness (in)	MODULI RANGE (psi)		Poisson Ratio Values
		Minimum	Maximum	
Pavement:	2.00	349,965	350,035	H1: $\delta = 0.35$
Base:	12.00	100,000	700,000	H2: $\delta = 0.35$
Subbase:	0.00	0	0	H3: $\delta = 0.35$
Subgrade:	120.00		15,000	H4: $\delta = 0.40$

Station	Load (lbs)	Measured Deflection (mils):								Calculated Moduli values (ksi):				Absolute Dpth to	
		R1	R2	R3	R4	R5	R6	R7	SURF (E1)	BASE (E2)	SUBB (E3)	SUBG (E4)	ERR/Sens	Bedrock	
160.000	9,601	4.04	2.36	1.50	1.12	0.90	0.70	0.58	350.	637.1	0.0	49.3	4.43	36.00	
170.000	9,620	3.97	2.31	1.43	1.04	0.81	0.68	0.58	350.	599.1	0.0	52.6	3.51	24.00	
181.000	9,557	3.89	2.24	1.33	0.98	0.77	0.65	0.54	350.	561.9	0.0	56.0	4.15	24.00	
191.000	9,601	3.93	2.25	1.39	1.01	0.76	0.52	0.47	350.	589.9	0.0	54.2	3.61	24.00	
200.000	9,601	3.97	2.30	1.43	1.03	0.76	0.58	0.47	350.	592.8	0.0	52.8	3.24	24.00	
212.000	9,585	4.06	2.34	1.40	1.02	0.75	0.65	0.57	350.	535.6	0.0	53.6	3.80	24.00	
221.000	9,609	5.26	2.67	1.48	1.06	0.81	0.67	0.57	350.	318.4	0.0	53.5	4.54	24.00	
231.000	9,565	6.20	2.58	1.47	1.06	0.83	0.70	0.58	350.	232.6	0.0	55.1	7.57	24.00	
240.000	9,581	4.26	2.50	1.53	1.13	0.81	0.66	0.59	350.	546.1	0.0	48.5	3.94	36.00	
259.000	9,664	4.55	2.59	1.51	1.05	0.82	0.66	0.59	350.	438.6	0.0	51.7	3.25	24.00	
281.000	9,597	4.80	2.58	1.52	1.02	0.74	0.55	0.44	350.	382.4	0.0	52.8	2.38	24.00	
300.000	9,557	4.79	2.60	1.51	0.97	0.71	0.53	0.43	350.	363.5	0.0	54.2	1.93	24.00	
320.000	9,549	5.76	2.79	1.46	0.98	0.72	0.54	0.44	350.	243.6	0.0	55.4	3.83	24.00	
341.000	9,632	6.13	3.01	1.53	1.02	0.73	0.55	0.46	350.	223.0	0.0	53.0	4.36	24.00	
360.000	9,589	6.49	2.96	1.49	1.02	0.72	0.48	0.40	350.	197.9	0.0	53.6	4.61	24.00	
381.000	9,565	5.72	2.91	1.57	1.09	0.83	0.67	0.56	350.	271.3	0.0	50.7	4.18	36.00	
401.000	9,624	4.99	2.78	1.68	1.26	1.00	0.83	0.69	350.	429.6	0.0	44.3	4.97	36.00	
422.000	9,593	4.93	2.86	1.83	1.37	1.04	0.87	0.74	350.	494.0	0.0	40.3	4.75	36.00	
950.000	9,509	9.06	4.15	1.85	1.23	0.91	0.72	0.61	350.	121.0	0.0	40.3	5.81	36.00 *	
970.000	9,664	5.68	2.76	1.59	1.14	0.90	0.70	0.59	350.	296.9	0.0	50.4	5.35	36.00	
990.000	9,700	4.26	2.19	1.32	1.05	0.69	0.65	0.53	350.	515.8	0.0	56.8	7.81	24.00	
1010.000	9,708	4.54	2.37	1.50	1.13	0.89	0.74	0.61	350.	498.3	0.0	50.6	6.52	36.00	
1031.000	9,664	5.61	2.91	1.70	1.23	0.94	0.77	0.68	350.	325.7	0.0	46.1	4.79	36.00	
1053.000	9,692	6.00	3.12	1.81	1.30	1.00	0.81	0.68	350.	297.6	0.0	43.6	4.50	36.00	
1071.000	9,724	5.60	2.89	1.68	1.25	0.97	0.78	0.72	350.	333.1	0.0	46.4	5.65	36.00	
1091.000	9,700	4.26	2.50	1.61	1.16	0.98	0.80	0.72	350.	596.1	0.0	47.2	3.43	36.00	

Mean:	5.11	2.67	1.54	1.10	0.84	0.67	0.57	350.	409.3	0.0	50.5	4.50	28.36
Std. Dev:	1.15	0.40	0.14	0.11	0.10	0.10	0.10	0.	150.2	0.0	4.7	1.38	5.57
Var Coeff (%):	22.48	15.08	9.24	9.88	12.44	15.41	16.96	0.	36.7	0.0	9.2	30.59	19.64