Project 0-6658: Task 4 - Data Collection Plans

LIST OF LAB TESTS (MIN 3 REPLICATE SAMPLES PER TEST PER MATERIAL/LAYER)

#	Material		Tests	Test Specification	Replicates Per Layer/Material	WHO WILL RUN?	Analysis- Output Data & Parameters to Report (Raw Data Files will also be Provided to TxDOT)	Reporting Format (ACCESS??)	M-E Model Where Required (Otherwise indicate RPE- Routine Performance Evaluation)
1	Asphalt-binders	a.	PG grading (interpolated exact grade)	M 320/Item 300/MP 19	≥ 3	TTI/UTEP	PG grade		TxACOL, MEPDG
		b.	Specific gravity	T 228	≥ 3	TTI/UTEP			
		c.	Viscosity & elastic recovery	T 316/D 6084 method A	≥ 3	TTI/UTEP			
		d.	DSR tests (complex modulus & phase angle at multiple temperatures)	T 315	≥ 3	TTI/UTEP	Temperature, modulus (G*), phase angle (δ), COV	Table (and Graph	TxACOL, MEPDG
		e.	Thermal conductivity		≥ 3	TTI/UTEP			
		f.	BBR (multiple temperatures)	T 313/R 28	≥ 3	TTI/UTEP	Temperature, stifness (S), slope (m), COV	Table (and Graph	
		g.	RTFO-DSR multiple temperatures)	T 315/T 240	≥ 3	TTI/UTEP			
		h.	PAV-DSR (multiple temperatures)	T 315/R 28	≥ 3	TTI/UTEP			
		i.	RTFO-MSCR (multiple temperatures)	TP 70	≥ 3	TTI/UTEP			
		j.	Reference temperature, etc.		≥ 3	TTI/UTEP			
2	Aggregates		SAC class, Gradations, etc (raw materials)		≥ 3	TXDOT	SAC class, %age passing, grading type (coarse, fine, etc)	Table (and Graph	
3	HMA (including WMA/recycled materials where applicable)	a.	HMA mix type	Tex-204-F(Mix design worksheet)	≥ 3	TXDOT	Type A, B, C, D, F, etc	List	
		b.	Volumetrics - AC content, effective AC, VMA, in-situ density, Rice (SG), design lab density, etc	TXDOT QC/QA	≥ 3	TXDOT	AC content, VMA, density, Rice (SG), COV, etc	Table	
		c.	Extractions – AC content, gradations, etc	Tex-210-F, Tex-200-F	≥ 3	TTI/UTEP	AC content, %age passing, COV	Table (& Graph)	
		d.	Vmeter – design modulus???	"UTEP" procedure	≥ 3	TTI/UTEP	Modulus value, temperature, COV	Table	
		e.	Hamburg (rutting potential & moisture susceptibility)	Tex-242-F	≥ 3 sets??	TTI/UTEP	PG binder grade, rut depth, load passes, COV	Table (& Graph)	RPE
		f.	Dynamic modulus (modulus measurements)	AASHTO TP 62-03	≥ 3	TTI/UTEP	Modulus value, temperatures, COV	Table (& Graph)	MEPDG
		g.	Repeated loading permanent deformation (visco-elastic and rutting properties [*alpha* and *mu* values])	VESYS Test Protocol: Report 0-5798	≥ 3	TTI/UTEP	Load, temperature, cycles, permanent strains, alpha, mu values, COV	Table (& Graph)	TxACOL
		h.	Overlay (cracking potential & fracture properties [*A* and *n* values]),	modified Tex-248-F	≥ 3	TTI/UTEP/TXDOT	Peak load, cycles, fracture parameters, COV		Tex M-E (alt?)
		i.	*Indirect-tension (IDT) &* ~~*Semi-circular bending (SCB)*~~ ~~– surrogate crack tests for crack resistance and fracture properties.~~	Tex-226-F(IDT)	≥ 3	TTI/UTEP	Avg. strength, COV	Table	MEPDG, Tex M-E
		j.	Thermal coefficient	AASHTO TP60	≥ 3		Avg. value, COV	Table	TxACOL, MEPDG
		j.	~~Permeability tests (PFC mixes cores from wheel paths and between wheel paths), etc~~	~~Tex-246-F~~	≥ 3				
4	Base/subbase materials (unbound)	a.	Grade, classification (AASHTO & USC), Poisson's ratio, & gradation analysis	TXDOT QC	≥ 3	TXDOT			MEPDG
		b.	Atterberg limits (PI, LL), proctors, density (MDD, SG), & moisture (OMC)	TXDOT QC	≥ 3	TXDOT			MEPDG
		c.	Unconfined compression strength tests (UCS) May need some nominal level of confinement	TBD - PENDING REVIEW OF FUJIE'S, EMMANUEL'S, JOE'S, MARK'S CONCURRENCE ON DIRECTION OF MECHANISTIC PROGRAM	≥ 3	TTI/UTEP			
		d.	Triaxial & resilient modulus tests (k1, k2, k3, etc)		≥ 3	TTI/UTEP			
		e.	Repeated load permanent deformation tests (*alpha* and *mu* values)		≥ 3	TTI/UTEP			Tex M-E
		f.	CBR, ~~R-value~~, DCP, etc We have no experience with 'R-value'		≥ 3	TTI/UTEP			
		g.	Soil suction, etc.		≥ 3	TTI/UTEP			
5	Base/subbase materials – treated (bound)	a.	Unconfined compressive strength tests (UCS)	TBD - PENDING REVIEW OF FUJIE'S, EMMANUEL'S, JOE'S, MARK'S CONCURRENCE ON DIRECTION OF MECHANISTIC PROGRAM	≥ 3	TTI/UTEP			
		b.	Resilient modulus tests		≥ 3	TTI/UTEP			
		c.	Repeated load permanent deformation tests (asphalt bound materials)		≥ 3	TTI/UTEP			Tex M-E
		d.	Resilient modulus (or modulus of rupture) - cement stabilized bases		≥ 3	TTI/UTEP			
		e.	%age lime and cement stabilization		≥ 3	TXDOT			
		f.	Sulfates, organic tests, etc	TXDOT QC	≥ 3	TXDOT			
6	Subgrade (coarse or fine grained)	a.	Grade, classification (AASHTO & UCS), Poisson' ratio, & gradation analysis	TXDOT QC	≥ 3	TXDOT			
		b.	Atterberg limits (PI, LL), PI, proctors, density (MDD, SG), & moisture (OMC)	TXDOT QC	≥ 3	TXDOT			
		c.	Unconfined compressive strength	TBD - PENDING REVIEW OF FUJIE'S, EMMANUEL'S, JOE'S, MARK'S CONCURRENCE ON DIRECTION OF MECHANISTIC PROGRAM	≥ 3	TTI/UTEP			
		d.	Triaxial & resilient modulus tests (k1, k2, k3, etc)		≥ 3	TTI/UTEP			
		e.	Repeated load permanent deformation tests (alpha & mu values)		≥ 3	TTI/UTEP			Tex M-E
		f.	Shear strength test		≥ 3	TTI/UTEP	Cohesion, friction angle, TTC, COV		
		h.	Soil suction, etc.		≥ 3	TTI/UTEP	Soil-water characteristic curve		

Legend:

Items in Red - Not currently required by any M-E model; just conducted for routine material property characterzation or performance prediction.

Itemd in Blue - Additions/cancellations by or response to TxDOT comment.

Note:

For the material items listed above, the following information will also be collected:

- Highway name
- Date open to traffic
- Latitude and longitudinal location (both start and end points)
- Lane direction
- Layer ID