Texas Department of Transportation TECHNICAL PROVISIONS

SH 71 TOLL LANES

Attachment 19-1 Performance and Measurement Table Baseline Addendum 2

Table 19-1: Performance and Measurement Table

					SPONSE DEFECT		INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	
ELEMENT	REF	ELEMENT	PERFORMANCE	Cat 1	Cat 1	Cat 2			TARGET
CATEGORY	KEF	ECEVIENT	REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair			TARGET
1) ROADWAY	'			•					•
							Unless stated otherwise, measu using procedures, techniques, a consistent with TxDOT's Paver Information System Rater's Ma	and measuring equipment ment Management	
	1.1	Obstructions and debris	Roadway and clear zone free from obstructions and debris	2 hrs	N/A	N/A	Visual Inspection	Number of obstructions and debris	Nil
	1.2	Pavement	All roadways have a smooth surface course (including bridge decks, covers, gratings, frames and boxes) and free	24 hrs	28 days	6 months	a) Ruts – Mainlanes, shoulders & ramps		
			from Defects.				10ft straight edge used to measure rut depth for localized areas.	Depth of rut at any location greater than 0.5"	Nil
							b) Failures Instances of failures exceeding the failure criteria set forth in the TxDOT PMIS Rater's Manual, including potholes, base failures, punchouts and jointed concrete pavement failures	Occurrence of any failure	Nil
							c) Edge drop-offs Physical measurement of edge drop-off level compared to adjacent surface	Instances of edge drop-off greater than 2" (Number)	Nil
	1.3		Crossovers and other paved areas are free of Defects	24 hrs	28 days	6 months	a) Potholes Visual Inspection	Potholes of low severity or higher (Number)	Nil

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ELEMENT	DEE		PERFORMANCE	Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT	TARGET
CATEGORY	REF	ELEMENT	REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	TARGET
	1.3 con't.						,	Base failures of low severity or higher (Number)	Nil
	1.4	Joints in concrete	Joints in concrete paving are sealed and watertight	24 hrs	28 days	6 months	Visual inspection of joints	Length unsealed joints greater than 1/4"	Nil
			Longitudinal joint separation				Measurement of joint width and level difference of two sides of joints	Joint width more than 1" or faulting more than 1/4"	Nil
	1.5	Curbs	Curbs are free of defects	24 hrs	28 days	6 months	Visual inspection	Length out of alignment	Less than 1" deflection out of alignment over 10'
2) DRAINAGE	•			•		•			•
	2.1	Travel Way	The travel way is free from water to the extent that such water would represent a hazard by virtue of its position and depth.	24 hrs	28 days	6 months	Visual inspection of water on surface	Instances of hazardous water build-up	Nil
3) STRUCTURES					•				
	3.1	Structures having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or springlines of	Substructures and superstructures are free of:	24 hrs	28 days	6 months	Visual inspection.	Instances of defect.	Nil 100%

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CATEGORY	REF	ELEMENT	REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	TARGET
	3.1 con't.	arches or extreme ends of openings or multiple boxes	in structural components defects in joint sealants defects in pedestrian protection measure scour damage corrosion of rebar paint system failures impact damage						

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						SPONSE DEFECT				
1	ELEMENT	REF	ELEMENT	PERFORMANCE	Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT	TARGET
	CATEGORY	KET	ELEMENT	REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	TARGET
		3.2		i) Expansion joints are free of:	24 hrs	28 days	6 months	Visual inspection	Instances of defect.	Nil 100%

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ELEMENT	REF	ELEMENT	PERFORMANCE	Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT	TARGET
CATEGORY	KEI	ELEMENT	REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	
	con't.	Structure components Non-bridge class	vi) Special finishes are clean and perform to the appropriate standards. vii) All non-structural items such as hoists and electrical fixings, operate correctly, are clean and lubricated as appropriate, in accordance with the manufacturer's recommendations and certification of lifting devices is maintained.	24 hrs	28 days	6 months	Visual inspection Visual inspection	Instances of defect. Number with defects in	Nil 100%
		culverts	free of: • defects in sealant to movement joints			months		sealant and movement joints	
4) PAVEMENT MA	ARKING	SS, OBJECT MAR	KERS, BARRIER MARKERS	S AND D	ELINEA	TORS			
	4.1	Pavement markings	Pavement markings are: • clean and visible during the day and at night	24 hrs	28 days	6 months	a) Markings - Visual inspection	Length found defective.	100%
			 whole and complete and of the correct color, type, width and length placed to meet the 				Physical measurement	Length with more than 5% loss of area of material at any point	Nil
			TMUTCD and TxDOT's Pavement Marking Standard Sheets					Length with spread more than 10% of specified dimensions.	Nil
								Length performing its intended function and	100%

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ELEMENT	REF	ELEMENT	PERFORMANCE	Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT	TARGET
CATEGORY	KEF	ELEMENT	REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	TARGET
	4.1 con't							compliant with relevant regulations	
		Raised reflective markers Raised reflective markers	Raised reflective pavement markers, object markers and delineators are: • Clean and clearly visible • Of the correct color and type • Reflective or retroreflective as TxDOT standard • Correctly located, aligned and at the correct level • Are firmly fixed • Are in a condition that will ensure that they remain at the correct level.			months	Visual inspection	Number of markers associated with road markings that are ineffective in any 10 consecutive markers. (Ineffective includes missing, damaged, settled or sunk.) A minimum of four markers should be visible at 80' spacing when viewed under under low beam headlights. Uniformity (replacement rpms having equivalent physical and performance characteristics to adjacent markers).	Nil 100%
	4.3	Delineators & Markers	Object markers, mail box markers and delineators are:	24 hrs	28 days	6 months	Visual inspection	Number of object markers or delineators defective or missing	Nil

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CATEGORY			REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	
5) GUARDRAILS,	SAFET	Y BARRIERS AN	D IMPACT ATTENUATORS						
	5.1	Guard rails and safety barriers	All guardrails, safety barriers, concrete barriers, etc. are maintained free of Defects.	24 hrs	28 days	6 months	Visual inspection	Length of road restraint systems correctly installed	100%
			They are appropriately placed and correctly installed at the					Length free from defects	100%
			correct height and distance from roadway or obstacles.					Length at correct height	100%
			Installation and repairs shall be carried out in accordance with the requirements of NCHRP 350 standards.					Length at correct distance from roadway and obstacle	100%
	5.2	Impact attenuators	All impact attenuators are appropriately placed and correctly installed	24 hrs	7 days	6 months	Visual inspection	Number correctly placed and installed	100%
6) TRAFFIC SIGN	S								
	6.1	General – All Signs	i) Signs are clean, correctly located, clearly visible, legible, reflective, at the correct height and free from structural and electrical defects	24 hrs	28 days	6 months	a) Retroreflectivity Coefficient of retro reflectivity	Number of signs with reflectivity below the requirements of TxDOT's TMUTCD	Nil
			ii) Identification markers are provided, correctly located, visible, clean and legible				b) Face damage Visual inspection	Number of signs with face damage greater than 5% of area	Nil
			iii) Sign mounting posts are vertical, structurally sound and rust free				c) Placement Visual inspection	Signs are placed in accordance with TxDOT's Sign Crew Field Book including not twisted or leaning	100%

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CATEGORY	REF	ELEMENT	REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	TARGET
	6.1 con't		iv) All break-away sign mounts are clear of silt or other debris that could impede break-away				d) Obsolete signs Visual inspection	Number of obsolete signs	Nil
			features and shall have correct stub heights v) Obsolete and redundant signs are removed or				e) Sign Information Visual inspection	Sign information is of the correct size, location, type and wording to meet its intended purpose	100%
			replaced as appropriate vi) Visibility distances meet the stated requirements vii) Sign information is of the correct size, location, type and wording to meet its intended purpose and any statutory requirements viii) All structures and elements of the signing system are kept clean and free from debris and have clear access provided. ix) All replacement and repair materials and equipment are in accordance with the				f) Dynamic Message Signs Visual inspection	Dynamic message signs are fully functioning	100%
	6.2	General - Safety critical signs	i) Requirements of the TMUTCD ii) Dynamic message signs are in an operational condition	2hrs	1 week	6 months	Visual inspection	Number of damaged Safety critical signs	Nil
7) TRAFFIC SIGN	ALS	l	ı	ı	1	1	I	I.	ı

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					SPONSE DEFECT				
ELEMENT	DEE		PERFORMANCE	Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT	TA DOET
CATEGORY	REF	ELEMENT	REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	TARGET
	7.1	General	 i) Traffic Signals and their associated equipment are: • clean and visible • correctly aligned and 	2 hrs		6 months	•	Signals are clean and visible	100%
			operational free from damage caused by accident or vandalism				•	Signals are undamaged	100%
			correctly aligned and operational				c) Signal timing Timed measurements	Installations have correct signal timings	100%
			ii) Signal timing and operation is correct iii) Contingency plans are in place to rectify Category 1 defects not immediately repairable to assure alternative traffic control is provided during a period of failure					Full contingency plans are in place	100%
	7.2	Soundness	Traffic signals are structurally and electrically sound	24 hrs	28 days	6 months	a) Structural soundness Visual inspection		
								Inspection records showing safe installation and maintenance	100%

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ELEMENT	REF	ELEMENT	PERFORMANCE	Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT	TARGET
CATEGORY	KEF	ELEWENT	REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	
	7.3	Identification marking	Signals have identification markers and the telephone number for reporting faults are correctly located, clearly visible, clean and legible	N/A	28 days	6 months	Visual inspection	Inspection records showing identification markers and other information are easily readable	100%
	7.4	Pedestrian Elements and vehicle detectors	All pedestrian Elements and vehicle detectors are correctly positioned and fully functional at all times	24 hrs	28 days	6 months	Visual Inspection	Inspection records showing compliance	100%
8) LIGHTING				1	I.			L	
	8.1	Roadway lighting – General	i) All lighting is free from defects and provides acceptable uniform lighting quality ii) Lanterns are clean and	24 hrs	28 days	6 months	a) Mainlane lights operable Night time inspection or automated logs	Number of sections with less than 90% of lights functioning correctly at all times	Nil
			correctly positioned iii) Lighting units are free from accidental damage or vandalism iv) Columns are upright, correctly founded, visually acceptable and structurally sound				b) Mainlane lights out of action Night time inspection or automated logs	Instances of more than two consecutive lights out of action	Nil
	8.2	Sign lighting	Sign lighting is fully operational	24 hrs	28 days	6 months	Night time inspection or automated logs	Instances of more than one bulb per sign not working	Nil

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					SPONSI DEFECT				
ELEMENT	REF	ELEMENT	PERFORMANCE	Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT	TARGET
CATEGORY			REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	
	8.3	Electrical supply	Electricity supply, feeder pillars, cabinets, switches and fittings are electrically, mechanically and structurally sound and functioning	24 Hrs	7 Days	1 Month	Testing to meet NEC regulations, visual inspection	Inspection records showing safe installation and maintenance	100%
	8.4	Access panels	All access panels in place at all times.	24 Hrs	7 Days	1 Month	Visual inspection	Instances of missing access panels	Nil
9) FENCES, WALI	LS AND	SOUND ABATEN	MENT			I	l	l	
	9.1	Design and location	Fences and walls act as designed and serve the purpose for which they were intended	24 hrs	28 days	6 months	Visual Inspection	Inspection records showing compliance	100%
	9.2	Construction	Integrity and structural condition of the fence is maintained	24 hrs	28 days		Structural assessment if visual inspection warrants	Inspection records showing compliance	100%
10) ROADSIDE MA	ANAGE	MENT							
	10.1	Vegetated Areas – Except landscaped areas – General	Vegetation is maintained so that: i) Height of grass and weeds is kept within the limits described for urban and rural areas. Mowing begins before vegetation reaches the maximum height.	24 hrs	7 days	28 days	Physical measurement of height of grass and weeds	Individual measurement areas to have 95% of height of grass and weeds between 5 in. and 18 in	100%

Table 19-1: Performance and Measurement Table

					SPONSI DEFECT			MEASUREMENT	
ELEMENT	REF	ELEMENT	PERFORMANCE	Cat 1	Cat 1	Cat 2	INSPECTION AND		TARGE
CATEGORY	KEF	ELEMENT	REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	17111021
			ii) Spot mowing at intersections, ramps or other areas maintains visibility of appurtenances and sight distance.				b) Rural areas Physical measurement of height of grass and weeds	Individual measurement areas to have 95% of height of grass and weeds between 5 in. and 30 in	100%
			iii) Grass or vegetation does not encroach into or on paved shoulders, main lanes, sidewalks, islands, riprap, traffic barrier or curbs.				c) Encroachment Visual inspection of instances of encroachment of vegetation	Occurrences of vegetation encroachment in each auditable section	Nil
			iv) A herbicide program is undertaken in accordance with the TxDOT Herbicide Manual to control noxious weeds and to eliminate grass in pavement or concrete.				d) Wildflowers Visual Inspection with audit of process.	Adherence to vegetation management manuals	100%
			v) A full width mowing cycle is completed after the first frost.vi) Wildflowers are preserved				e) Sight lines Visual inspection	Instances of impairment of sight lines or sight distance to signs	Nil
			utilizing the guidelines in the mowing specifications						
	10.1 con't.	Vegetated Areas – Except landscaped areas – General	and TXDOT Roadside Vegetation Manual.	24 hrs	7 days	28 days			

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			PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS					
ELEMENT	REF	ELEMENT		Cat 1	Cat 1	Cat 2	INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
CATEGORY	KEI	EDEWIEN		Hazard Mitigation	Permanent Remedy	Permanent Repair			
	11.1	Slope Failure	All structural or natural failures of the embankment and cut slopes of the Facility are repaired	24 hrs	28 days	months	1 3	Recorded instances of slope failure	Nil
	11.2		Slopes are maintained in general conformance to the original graded cross-sections, the replacement of landscaping materials, reseeding and revegetation for erosion control purposes and removal and disposal of all eroded materials from the roadway and shoulders	24 hrs	28 days	6 months		Inspection records showing compliance	100%

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		ELEMENT	PERFORMANCE REQUIREMENT		SPONSE DEFECT				TARGET
ELEMENT	REF			Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT	
CATEGORY	KE			Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	
12) AMENITY									
	12.1	Graffiti	Graffiti is removed in a manner and using materials that restore the surface to a like appearance similar to adjoining surfaces	24 hrs	28 days	6 months	All graffiti is considered a Category 1 defect	Inspection records showing compliance	100%
	12.2	Animals	All dead or injured animals are removed from the ROW	2 hrs	N/A	N/A	Visual inspection	No dead or injured animals are present on ROW	100%
	12.3	Abandoned vehicles and equipment	All abandoned vehicles and equipment are removed from the ROW.	1 hr	24 hrs	N/A	Visual inspection	No abandoned vehicles or equipment present	100%
13) SNOW AND IC	CE CON	TROL			•	·			•
	13.1	Travel lanes	Maintain travel way free from snow and ice	2 hrs	N/A	N/A	Maximum 1hr response time to complete manning and loading of spreading vehicles Maximum 2hrs from departure from loading point to complete treatment and return to loading point Maximum 1hr response time for snow and ice clearance vehicles to depart from base	Inspection records showing compliance	100%
	13.2	Weather forecasting	weather forecast information is obtained and assessed and appropriate precautionary treatment is carried out to prevent ice forming on the travel way	2hrs	N/A	N/A	Operations plan details the process and procedures in place and followed	Inspection records showing compliance	100%

Table 19-1: Performance and Measurement Table

			PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS					
ELEMENT	REF	ELEMENT		Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT RECORD*	TARGET
CATEGORY	KEF	ELEWENT		Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*		
14) INCIDENT RE	SPONSI	E							
	14.1	General	Respond to Incidents in accordance with Section 22.	1 hr	N/A	N/A	Response times met for 98% of Incidents measured on a 1 year rolling basis. No complaints from Emergency Services.	Inspection records showing compliance	100%
	14.2	Hazardous Materials	For any Hazardous Materials spills, comply with the requirements of Section 22.	1 hr	N/A	N/A	MMP details the process and procedures in place and followed.	Inspection records showing compliance	100%
	14.3	Structural assessment	Evaluate structural damage to structures and liaise with Emergency Services to ensure safe working in clearing the Incident	1 hr	N/A	N/A	Inspections and surveys as required by Incident	Incident reports showing compliance	100%
	14.4	Temporary and permanent remedy	Propose and implement temporary measures or permanent repairs to Defects arising from the Incident. Ensure the structural safety of any structures affected by the Incident	24 hrs	28 days	N/A	Review and inspection of the Incident site	Auditable inspection records showing compliance	100%
15) SWEEPING AT	ND CLE	ANING			•				
	15.1	Sweeping	i) Keep all channels, hard shoulders, gore areas, ramps, intersections, islands and frontage roads swept clean.	24 hrs	28 days	6 months	Buildup of dirt, ice rock, debris, etc. on roadways and bridges not to accumulate greater than 24" wide or 1/2" deep	Inspection records showing compliance	100%

Table 19-1: Performance and Measurement Table

				RESPONSE TO DEFECTS					
ELEMENT	DEE		PERFORMANCE REQUIREMENT	Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT	TARGET
CATEGORY	REF	ELEMENT		Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	
	15.1 con't.		ii) Clear and remove debris from traffic lanes, hard shoulders, verges and central reservations. footways and cycle ways iii) Remove all sweepings without stockpiling in the right of way and dispose of at approved tip.	24 hrs	28 days	6 months			
	15.2		 i) Keep the right of way in a neat condition, remove litter regularly. ii) Pick up large litter items before mowing operations. iii) Dispose of all litter and debris collected at an approved solid waste site. 	24 hrs	28 days		No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed.	Inspection records showing compliance	100%

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					SPONSE DEFECT	S			
ELEMENT	REF	ELEMENT	PERFORMANCE	Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT	TARGET
CATEGORY	KI2T	ELEWIENI	REQUIREMENT	Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	TARGET
16) ITS EQUIPMENT	Γ								
16.	5.1	ITS Equipment - Maintenance	All ITS equipment is fully functional and housing is functioning and free of defects. i) All equipment and cabinet identification numbers are visible, sites are well drained and access is clear. ii) Steps, handrails and accesses are kept in a good condition. iii) Access to all communication hubs, ground boxes, cabinets and sites is clear, iv) All drainage is operational and all external fixtures and fittings are in a satisfactory condition. v) All communications cable markers, cable joint markers and duct markers are visible and missing markers are	24 hr	14 days	1 month	Visual Inspection	Inspection records showing compliance	100%

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ELEMENT			PERFORMANCE REQUIREMENT		SPONSE DEFECT				
	DEE			Cat 1 Cat 1 Cat 2	INSPECTION AND	MEASUREMENT	TADGET		
CATEGORY	REF	ELEMENT		Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	TARGET
			replaced. vi) Backup power supply system is available at all times						
	16.2	Dynamic Message Sign Equipment	Dynamic Message Signs are free from faults such as: i) Any signal displaying an message which is deemed to be a safety hazard ii) Failure of system to clear sign settings when appropriate. iii) 2 or more contiguous sign failures that prevent control office setting strategic diversions iv) Signs displaying an incorrect message.	2 hr	24 hrs	14 days	MMP details the process and procedures in place and followed.	Inspection records showing compliance	100%
	16.3	CCTV Equipment	CCTV Systems are free from faults that limit the availability of the operators to monitor the area network, such as: i) Failure of CCTV Systems	2 hr	24 hrs	14 days	Defect measurement dependent on equipment	Incident reports showing compliance	100%

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ELEMENT CATEGORY			PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS					
	DEE			Cat 1	Cat 1	Cat 2	INSPECTION AND	MEASUREMENT	TA DOET
	REF	F ELEMENT		Hazard Mitigation	Permanent Remedy	Permanent Repair	MEASUREMENT METHOD*	RECORD*	TARGET
			to provide control offices with access and control of CCTV images ii) Failure of a CCTV camera or its video transmission system. iii) Failure of a Pan / Tilt unit or its control system. iv) Moisture ingress onto CCTV camera lens iv) Faults that result in significant degradation of CCTV images						