

# **DESIGN-BUILD AGREEMENT**

## **SH 71 TOLL LANES PROJECT**

### **EXHIBIT 20**

## **WARRANTY PERFORMANCE AND MEASUREMENT TABLE BASELINE**

### Warranty Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	WARRANTY TERM	TXDOT INSPECTION AND MEASUREMENT METHOD	PERFORMANCE REQUIREMENT
<b>1) ROADWAY</b>					
				<b>Unless stated otherwise, measurements shall be conducted using procedures, techniques, and measuring equipment consistent with TxDOT's <i>Pavement Management Information System Rater's Manual</i>.</b>	
	1.2	Pavement	5 years, except for mill and overlay sections having a 2-year performance Warranty Term per Note 1	<p><b>b) Ruts – Mainlanes, shoulders &amp; ramps</b> Depth as measured using an automated device in compliance with TxDOT Standards. 10ft straight edge used to measure rut depth for localized areas.</p> <p><b>c) Ride quality</b> Measurement of International Roughness Index (IRI) according to TxDOT standard Tex-1001-S, Operating Inertial Profilers and Evaluating Pavement Profiles 3-ft straightedge used to measure discontinuities</p> <p><b>d) Failures</b> 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</p> <p><b>f) Skid resistance</b> ASTM E274/E274M-11 Standard Test Method for Skid Resistance Testing of Paved Surfaces at 50 MPH using a full scale smooth tire meeting the requirements of ASTM E524-08 .</p>	<p>No wheel path length with ruts greater than ¼" in depth</p> <p>No length with depth of rut at any location greater than 0.5"</p> <ul style="list-style-type: none"> <li>• Mainlanes, ramps – no results greater than 95" per mile</li> <li>• Frontage roads – no results greater than 120" per mile</li> </ul> <p>No individual discontinuities greater than 0.75"</p> <p>No occurrence of failure</p> <ul style="list-style-type: none"> <li>• All half-mile sections are to meet a minimum average Skid Number of 30.</li> <li>• All half-mile sections are to meet a minimum average Skid Number of 30.</li> <li>• Comply with the requirements of the Wet Weather Accident Reduction Program.</li> </ul>
	1.3	Crossovers and other paved areas	2 years	<p><b>a) Potholes</b></p> <p><b>b) Base failures</b></p>	<p>No potholes of low severity or higher</p> <p>No base failures of low severity or higher</p>
	1.4	Joints in concrete	5 years	<p>Visual inspection of joints</p> <p>Measurement of joint width and level difference of two sides of joints</p>	<p>No length with unsealed joints greater than ¼"</p> <p>No joint width more than 1" or faulting more than ¼"</p>

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	1.5	Curbs	2 years	Visual inspection	Less than 1" deflection out of alignment over 10'
<b>2) DRAINAGE</b>					
	2.2	Drainage treatment devices	2 years	Visual inspection	Devices functioning correctly with means of operation displayed
	2.3	Travel Way	2 years	Visual inspection of water on surface	The travel way is free from water to the extent that such water would represent a hazard by virtue of its position and depth.
	2.4	Discharge systems	2 years	Visual inspection and records	Surface water discharge systems perform their proper function and discharge to groundwater and waterways complies with the relevant permits and other legal requirements.
<b>3) STRUCTURES</b>					
	3.1	Structures having an opening measured along the centre of the roadway of more than 20 feet between undercopings of abutments or springlines of arches or extreme ends of openings or multiple boxes	5 years	Inspection and assessment in accordance with the requirements of federal National Bridge Inspection Standards (NBIS) of the Code of Federal Regulations, 23 Highways – Part 650, the TxDOT Bridge inspection Manual, and the Federal Administration's Bridge Inspector's Reference Manual	No occurrences of condition rating below seven for any deck, superstructure, substructure or components as required in the TxDOT Bridge Inspection Manual.
	3.3	Non-bridge class culverts	5 years	Visual inspection	Non-bridge-class culverts are free of: <ul style="list-style-type: none"> <li>• defects in sealant to movement joints</li> <li>• scour damage</li> </ul>
	3.4	Gantries and high masts	5 years	Visual inspection	Sign signal gantries, high masts are structurally sound and free of defects in surface protection systems
	3.5	Load ratings	5 years	Load rating calculations in accordance with the Manual for Bridge Evaluation and the TxDOT Bridge Inspection Manual.  Load restriction requirements as per the TxDOT Bridge Inspection Manual	All structures maintain the design load capacity.
<b>4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS</b>					
	4.1	Pavement markings	2 years	a) Markings General - Physical measurement  Profile Markings - Visual inspection	No Length with no more than 5% loss of area of material at any point  Length performing its intended function and compliant with relevant regulations

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	4.2	Raised reflective markers	2 years	Visual inspection	Markings are functioning as intended
<b>5) GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS</b>					
	5.1	Guard rails and safety barriers	2 years	Visual inspection	All guardrails, safety barriers, concrete barriers, etc. are free of construction defects and remain at correct height.
	5.2	Impact attenuators	2 years	Visual inspection	All impact attenuators remain as installed.
<b>6) TRAFFIC SIGNS</b>					
	6.1	General – All Signs	2 years	<b>a) Retroreflectivity</b> Coefficient of retro reflectivity <b>b) Face damage</b> Visual inspection <b>c) Placement</b> Visual inspection	No signs with reflectivity below the requirements of TxDOT’s TMUTCD and free from structural and electrical defects No signs with face damage greater than 5% of area, unless caused by a third party Sign mounting posts are structurally sound and rust free
<b>7) TRAFFIC SIGNALS</b>					
	7.2	Soundness	2 years	<b>a) Structural soundness</b> Visual inspection <b>b) Electrical soundness</b>	Traffic Signals, Pedestrian Elements and Vehicle Detectors are structurally and electrically sound Inspection records showing compliance
<b>8) LIGHTING</b>					
	8.1	Roadway Lighting – General	2 years		Columns are upright, correctly founded, visually acceptable and structurally sound
	8.3	Electrical Supply	2 years	Testing to meet NEC regulations, visual inspection	Electricity supply, feeder pillars, cabinets, switches and fittings are electrically, mechanically and structurally sound and functioning
	8.5	High Mast Lighting	2 years		All winch and safety equipment is correctly functioning. (for structural requirements refer to Element Category 3)
<b>9) FENCES, WALLS AND SOUND ABATEMENT</b>					
	9.2	Construction	5 years	Structural assessment if visual inspection warrants	Integrity and structural condition of the fence is maintained
<b>12) EARTHWORKS, EMBANKMENTS AND CUTTINGS</b>					
	12.1	Slope Failure	5 years	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	All structural failures of the embankment and cut slopes of the Facility are repaired
<b>13) ITS EQUIPMENT</b>					
	13.5	Vehicle Detection Equipment	2 years	Defect measurement dependent on equipment	All equipment free of defects and operational problems such as; <ul style="list-style-type: none"> <li>• Inoperable loops.</li> </ul>

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				Traffic Detector Loops: Loop circuit's inductance to be > 50 and < 1,000 micro henries. Insulation resistance to be > 50 meg ohms.	<ul style="list-style-type: none"> <li>Malfunctioning camera controllers.</li> </ul>
<b>14) PLANT MATERIALS</b>					
	14.1	Trees, Shrubs, and Other Plant Materials	1 year	Visual inspection of trees, shrubs, and other plant materials	All trees, shrubs, and other plant materials shall be in healthy condition. <ul style="list-style-type: none"> <li>Remove dead plants within ten (10) Business Days of discovery.</li> <li>Replace such plants during the next planting season.</li> </ul>

Note 1: Where indicated, mill and overlay sections specified in Technical Provisions Section 1.2.1 shall meet performance requirements for a period of 2 years from Final Acceptance (rather than for the 5-year Warranty Term generally applicable to the element category).