

Texas Department of Transportation
TECHNICAL PROVISIONS
FOR
TXDOT SH 288 TOLL LANES PROJECT IN HARRIS COUNTY

ATTACHMENT 19-1
PERFORMANCE AND MEASUREMENT TABLE BASELINE

April 7, 2014

| Performance and Measurement Table Baseline | | | | | | | | | | | | |
|--|-----|-------------------------|---|---------------------|------------------|------------------|---|--|--|---|---|----------------|
| ELEMENT CATEGORY | REF | ELEMENT | PERFORMANCE REQUIREMENT | RESPONSE TO DEFECTS | | | INSPECTION AND MEASUREMENT METHOD (AFTER SERVICE COMMENCEMENT)* | MEASUREMENT RECORD (AFTER SERVICE COMMENCEMENT)* | TARGET | INSPECTION AND MEASUREMENT METHOD (FROM OPERATING COMMENCEMENT DATE TO SERVICE COMMENCEMENT) | MEASUREMENT RECORD (FROM OPERATING COMMENCEMENT DATE TO SERVICE COMMENCEMENT) | TARGET |
| | | | | Cat 1 | Cat 1 | Cat 2 | | | | | | |
| | | | | Hazard Mitigation | Permanent Remedy | Permanent Repair | | | | | | |
| 1) ROADWAY | | | | | | | | | | | | |
| | | | | | | | <i>Unless stated otherwise, measurements shall be conducted using procedures, techniques, and measuring equipment consistent with TxDOT's Pavement Management Information System Rater's Manual. Unless otherwise stated, pavement performance measurement records relate to 0.5-mile sections as described in the Pavement Management Information System Rater's Manual.</i> | | | <i>Unless stated otherwise, measurements shall be conducted using procedures, techniques, and measuring equipment consistent with TxDOT's Pavement Management Information System Rater's Manual. Unless otherwise stated, pavement performance measurement records relate to 0.5-mile sections as described in the Pavement Management Information System Rater's Manual.</i> | | |
| | 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 | Visual Inspection | Number of obstructions and debris | Nil |
| | 1.2 | Pavement | All roadways have a smooth and quiet surface course (including bridge decks, covers, gratings, frames and boxes) with adequate skid resistance and free from Defects. | 24 hrs | 28 days | 6 months | a) Pavement Condition Score Measurements and inspections necessary to derive Pavement Condition Score | Pavement Condition Score for 80% of Auditable Sections exceeding: • Mainlanes and ramps - 90 • Frontage roads - 80 Pavement Condition Score for 80% of Auditable Sections exceeding: • Mainlanes and ramps - 80 • Frontage roads - 70 | 100% 100% 100% 100% | Pavement Condition Score will not be measured for this phase. | | N/A N/A |
| | | | | | | | b) Ruts – Mainlanes, shoulders & ramps Depth as measured using an automated device in compliance with TxDOT Standards. | Percentage of wheel path length with ruts greater than ¼" in depth in each Auditable Section • Mainlanes, shoulders and ramps - 3% • Frontage roads - 10% | Nil Nil | Visual inspection at travel speed | | N/A N/A |
| | | | | | | | 10ft straight edge used to measure rut depth for localized areas. | Depth of rut at any location greater than 0.5" | Nil | 10ft straight edge used to measure rut depth for localized areas. | Depth of rut at any location greater than 0.5" | Nil |
| | | | | | | | c) Ride quality Measurement of International Roughness Index (IRI) according to TxDOT standard Tex-1001-S, Operating Inertial Profilers and Evaluating Pavement Profiles | For 80% of all Auditable Sections Measured, IRI throughout 98% of each Auditable Section is less than or equal to: • Mainlanes, ramps - 95" per mile** • Frontage roads - 120" per mile** | 100% 100% | Ride quality will not be measured during this phase. | | N/A N/A |

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| | 1.2 Cont. | | | | | | ** To allow for measurement bias, an adjustment of -10 (minus ten) is made to IRI measurements for concrete pavements before assessing threshold compliance. | IRI measured throughout 98% of Auditable Section of less than or equal to: • Mainlanes, ramps - 120" per mile** • Frontage roads - 150" per mile** | 100% 100% | | • Frontage roads - 150" per mile** | N/A N/A |
| | | | | | | (Renewal Work and new construction subject to construction quality standards) | Mainlanes, ramps, 0.1 mile average - 150" per mile** | 100% | (Renewal Work and new construction subject to construction quality standards) | Mainlanes, ramps, 0.1 mile average - 150" per mile** | N/A | |
| | | | | | | | Frontage roads, 0.1 mile average - 180" per mile** | 100% | | Frontage roads, 0.1 mile average - 180" per mile** | N/A | |
| | | | | | | | IRI measured throughout 98% of each lane containing a bridge deck in any Auditable Section, 0.1 mile average - 200" per mile** | 100% | | IRI measured throughout 98% of each lane containing a bridge deck in any Auditable Section, 0.1 mile average - 200" per mile** | N/A | |
| | | | | | | 10-ft straightedge used to measure discontinuities | Individual discontinuities greater than 1/4" | Nil | 10-ft straightedge used to measure discontinuities | Individual discontinuities greater than 1/4" | Nil | |
| | | | | | | d) 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 | Occurance of any failure | Nil | d) 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 | |
| | | | | | | e) Edge drop-offs Physical measurement of edge drop-off level compared to adjacent surface | Instances of edge drop-off greater than 2" | Nil | e) Edge drop-offs Visual inspection of edge drop-off level compared to adjacent surface | Instances of edge drop-off greater than 2" | Nil | |
| | | | | | | f) Skid resistance 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 E 524 | • Mainlanes, shoulders, and ramps - Number of sections investigated as to potential risk of skidding accident and appropriate remedial action taken where average Skid Number for 0.5-mile section of mainlanes, shoulders and ramps is below 25. | Nil | f) Skid resistance 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 E 524 . | • Mainlanes, shoulders and ramps – Number of sections investigated as to potential risk of skidding accident and appropriate remedial action taken where average Skid Number for 0.5-mile section of mainlanes, shoulders and ramps is below 25. | Nil | |
| | | | | | | | • Frontage roads - Number of sections investigated as to potential risk of skidding accident and appropriate remedial action taken where average Skid Number for 0.5-mile section of frontage roads is below 25.. | Nil | | • Frontage roads –Number of sections investigated as to potential risk of skidding accident and appropriate remedial action taken where average Skid Number for 0.5-mile section of frontage roads is below 25. | Nil | |

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| | 1.2 Cont. | | | | | | | 100% | | • When the Skid Number is below 25 and/or when required by the Wet Weather Accident Reduction Program, areas categorized as high risk, the Concessionaire shall perform a site investigation and perform required corrective action. | 100% | |
| | | | Road users warned of potential skidding hazards | 24hrs | 7days | N/A | Skid resistance (as above) | Instances where road users warned of potential skidding hazard where remedial action is identified. | 100% | Skid resistance (as above) | Instances where road users warned of potential skidding hazard where remedial action is identified. | 100% |
| | 1.3 | Crossovers and other paved areas | Crossovers and other paved areas are free of Defects | 24 hrs | 28 days | 6 months | a) Potholes | Potholes of low severity or higher | Nil | a) Potholes | Potholes of low severity or higher | Nil |
| | | | | | | | b) Base failures | Base failures of low severity or higher | Nil | b) Base failures | Base failures of low severity or higher | 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 ¼" | Nil | Visual inspection of joints | Length unsealed joints greater than ¼" | 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 ¼" | Nil | Measurement of joint width and level difference of two sides of joints | Joint width more than 1" or faulting more than ¼" | Nil |
| | 1.5 | Curbs | Curbs are free of defects | 24 hrs | 28 days | 6 months | Visual inspection | Length out of alignment | Nil | Visual inspection | Length out of alignment | Nil |
| * - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice. | | | | | | | | | | | | |
| 2) DRAINAGE | | | | | | | | | | | | |
| | 2.1 | Culverts, Pipes and Channels | Each element of the drainage system is maintained in its proper function by cleaning, clearing and/or emptying as appropriate from the point at which water drains from the travel way to the outfall or drainage way. | 24 hrs | 28 days | 6 months | Visual inspection supplemented by CCTV where required to inspect buried pipe work | Length with less than 90% of cross-sectional area clear (feet) | Nil | Visual inspection following heavy rain | -Identify areas of water back up | Nil |
| | 2.2 | Drainage treatment devices | Drainage treatment and balancing systems, flow and spillage control devices function correctly and their location and means of operation is recorded adequately to permit their correct operation in Emergency. | 24 hrs | 28 days | 6 months | Visual inspection | Devices functioning correctly with means of operation displayed | 100% | Visual inspection | Devices functioning correctly with means of operation displayed | 100% |
| | 2.3 | 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 | Visual inspection of water on surface | Instances of hazardous water build-up | Nil |

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| | 2.4 | Discharge systems | Surface water discharge systems perform their proper function and discharge to groundwater and waterways complies with the relevant legislation and permits. | 24 hrs | 28 days | 6 months | Visual inspection and records | Non-compliances with legislation | Nil | Visual inspection and records | Non-compliances with legislation | Nil |
| | 2.5 | Protected Species | Named species and habitats are protected. | 24 hrs | 28 days | 6 months | Visual inspection | Compliance with the requirement | 100% | Visual inspection | Compliance with the requirement | 100% |
| 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 arches or extreme ends of openings or multiple boxes | Substructures and superstructures are free of: <ul style="list-style-type: none"> • graffiti • undesirable vegetation • debris and bird droppings • blocked drains, weep pipes manholes and chambers • blocked drainage holes in structural components • defects in joint sealants • defects in pedestrian protection measure • scour damage • corrosion of rebar • paint system failures • impact damage | 24 hrs | 28 days | 6 months | 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. | Records as required in the TxDOT Bridge Inspection Manual Occurrence of condition rating below six (6) for any deck, super structure or substructure All condition states to be one (1) for all structure components | Nil 100% | 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. | Records as required in the TxDOT Bridge Inspection Manual Occurrence of condition rating below six (6) for any deck, super structure or substructure All condition states to be one (1) for all structure components | Nil 100% |
| * - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice. | | | | | | | | | | | | |
| | 3.2 | Structure components | i) Expansion joints are free of: <ul style="list-style-type: none"> • dirt debris and vegetation • defects in drainage systems • loose nuts and bolts • defects in gaskets ii) The deck drainage system is free of all and operates as intended. | 24 hrs | 28 days | 6 months | 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. | Records as required in the TxDOT Bridge Inspection Manual Occurrences of condition rating below six(6) for any deck, superstructure or substructure All condition states to be one (1) for all structure components | Nil 100% | 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. | Records as required in the TxDOT Bridge Inspection Manual Occurrences of condition rating below six (6) for any deck, superstructure or substructure All condition states to be one (1) for all structure components | Nil 100% |

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| | | | iii) Parapets are free of: <ul style="list-style-type: none"> • loose nuts or bolts • blockages of hollow section drain holes • graffiti • vegetation • accident damage | | | | | | | | | |
| | 3.2 Cont | | iv) Bearings and bearing shelves are clean. v) Sliding and roller surfaces are clean and greased to ensure satisfactory performance. Additional advice contained in bearing manufacturers' instructions in the Structure Maintenance Manual is followed. 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. | | | | | | | | | |
| | 3.3 | Non-bridge class culverts | Non-bridge-class culverts are free of: <ul style="list-style-type: none"> • vegetation and debris and silt • defects in sealant to movement joints • scour damage | 24 hrs | 28 days | 6 months | Visual inspection | Number with vegetation, debris and silt Number with defects in sealant and movement joints Number with scour damage | Nil Nil Nil | Visual inspection | Number with vegetation, debris and silt Number with defects in sealant and movement joints Number with scour damage | Nil Nil Nil |
| | 3.4 | Gantries and high masts | Sign signal gantries, high masts are structurally sound and free of: <ul style="list-style-type: none"> • loose nuts and bolts • defects in surface protection systems • graffiti | 24 hrs | 28 days | 6 months | Visual inspection | Number with loose assemblies Number with defects in surface protection Number with graffiti | Nil Nil Nil | Visual inspection | Number with loose assemblies Number with defects in surface protection Number with graffiti | Nil Nil Nil |
| | 3.5 | Load ratings | All structures maintain the design load capacity. | 24 hrs | 28 days | 6 months | Load rating calculations in accordance with the Manual for Bridge Evaluation and the TxDOT Bridge Inspection Manual. | Number of load restrictions for Texas legal loads (including legally permitted vehicles) | Nil | | Number of load restrictions for Texas legal loads (including legally permitted vehicles) | Nil |

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| | | | | | | | Load restriction requirements as per the TxDOT Bridge Inspection Manual | | | | | |
| 4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS | | | | | | | | | | | | |
| * - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice. | | | | | | | | | | | | |
| | 4.1 | Pavement markings | Pavement markings are: <ul style="list-style-type: none"> • clean and visible during the day and at night • whole and complete and of the correct color, type, width and length • placed to meet the TMUTCD and TxDOT's Pavement Marking Standard Sheets | 24 hrs | 28 days | 6 months | a) Markings - General General Portable retroreflectometer, which uses 30 meter geometry meeting the requirements described in ASTM E 1710 Physical measurement b) Profile Markings Visual inspection | Length meeting the minimum retroreflectivity 175 med/sqm/lx for white Length meeting the minimum retroreflectivity 125 med/sqm/lx for white Length with more than 5% loss of area of material at any point Length with spread more than 10% of specified dimensions. Length performing its intended function and compliant with relevant regulations | 100% 100% Nil Nil 100% | a) Markings - General Visual inspection at 300 ft with low beams as per earlier TxDOT practice. Visual inspection b) Profile Markings Visual inspection | Length found defective. Length with more than 5% loss of area of material at any point Length with spread more than 10% of specified dimensions. Length performing its intended function and compliant with relevant regulations | 100% 100% Nil Nil 100% |
| | 4.2 | Raised reflective markers | Raised reflective pavement markers, object markers and delineators are: <ul style="list-style-type: none"> • 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. | 24 hrs | 28 days | 6 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 low beam headlights] Uniformity (replacement rpms having equivalent physical and performance characteristics to adjacent markers). | Nil 100% | 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 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: <ul style="list-style-type: none"> • clean and visible • of the correct color and type • legible and reflective • Straight and Vertical | 24 hrs | 28 days | 6 months | Visual inspection | Number of object markers or delineators defective or missing | Nil | Visual inspection | Number of object markers or delineators defective or missing | Nil |
| 5) GUARDRAILS, SAFETY BARRIERS AND 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% | Visual inspection | Length of road restraint systems correctly installed | 100% |

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| | 5.1 Cont. | | They are appropriately placed and correctly installed at the correct height and distance from roadway or obstacles. Installation and repairs shall be carried out in accordance with the requirements of NCHRP 350 standards. | | | | Length free from defects Length at correct height Length at correct distance from roadway and obstacle | 100% 100% 100% | | Length free from defects Length at correct height Length at correct distance from roadway and obstacle | 100% 100% 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% | Visual inspection | Number correctly placed and installed | 100% |
| 6) TRAFFIC SIGNS | | | | | | | | | | | | |
| | 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 ii) Identification markers are provided, correctly located, visible, clean and legible iii) Sign mounting posts are vertical, structurally sound and rust free iv) All break-away sign mounts are clear of silt or other debris that could impede break-away features and shall have correct stub heights v) Obsolete and redundant signs are removed or 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 | 24 hrs | 28 days | 6 months | a) Retroreflectivity Coefficient of retro-reflectivity b) Face damage Visual inspection c) Placement Visual inspection d) Obsolete signs Visual inspection e) Sign Information Visual inspection | Number of signs with reflectivity below the requirements of TxDOT's TMUTCD Number of signs with face damage greater than 5% of area Signs are placed in accordance with TxDOT's Sign Crew Field Book including not twisted or leaning Number of obsolete signs Sign information is of the correct size, location, type and wording to meet its intended purpose | Nil Nil 100% Nil 100% | Visual inspection at 300 ft with low beams as per earlier TxDOT practice b) Face damage Visual inspection No action No action e) Sign Information Visual inspection | Number of signs found non-reflective. Number of signs with face damage greater than 5% of area Signs are not twisted or leaning Number of obsolete signs Sign information is of the correct size, location, type and wording to meet its intended purpose | Nil Nil 100% Nil 100% |
| | | | 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 requirements of the TMUTCD x) Dynamic message signs are in an operational condition | | | | f) Dynamic Message Signs Visual | Dynamic message signs are | 100% | f) Dynamic Message Signs Visual inspection | Dynamic message signs are fully functioning | 100% |

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| | | | | | | | inspection | fully functioning | | | | |

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|--|-----|---------------------------------|---|------|--------|----------|-------------------|---|-----|-------------------|---|-----|
| | 6.2 | General - Safety critical signs | Requirements as 6.1, Plus: "Stop," "Yield," "Do Not Enter," "One Way" and "Wrong Way" signs are clean legible and undamaged. | 2hrs | 1 week | 6 months | Visual inspection | Number of damaged Safety critical signs | Nil | Visual inspection | Number of damaged Safety critical signs | Nil |
|--|-----|---------------------------------|---|------|--------|----------|-------------------|---|-----|-------------------|---|-----|

7) TRAFFIC SIGNALS

| | | | | | | | | | | | | |
|--|-----|---|--|--------|---------|----------|---|--|------------------------------|---|--|------------------------------|
| | 7.1 | General | i) Traffic Signals and their associated equipment are: • clean and visible • correctly aligned and operational • free from damage caused by accident or vandalism • correctly aligned and operational 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 | 2hrs | 24 hrs | 6 months | a) General condition Visual inspection b) Damage Visual inspection c) Signal timing Timed measurements d) Contingency plans Records Review | Signals are clean and visible Signals are undamaged Installations have correct signal timings Full contingency plans are in place | 100% 100% 100% 100% | a) General condition Visual inspection b) Damage Visual inspection c) Signal timing Timed measurements d) Contingency plans Records Review | Signals are clean and visible Signals are undamaged Installations have correct signal timings Full contingency plans are in place | 100% 100% 100% 100% |
| | 7.2 | Soundness | Traffic Signals are structurally and electrically sound | 24 hrs | 28 days | 6 months | a) Structural soundness Visual inspection b) Electrical soundness Testing to meet NEC regulations | Inspection records showing safe installation and maintenance | 100% | a) Structural soundness Visual inspection b) Electrical soundness Testing to meet NEC regulations | Inspection records showing safe installation and maintenance | 100% |
| | 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% | 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% | Visual inspection | Inspection records showing compliance | 100% |

* - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice.

8) LIGHTING

| | | | | | | | | | | | | |
|--|-----|----------------------------|--|--------|---------|----------|--|---|------------|--|---|------------|
| | 8.1 | Roadway Lighting – General | i) All lighting is free from defects and provides acceptable uniform lighting quality ii) Lanterns are clean and correctly positioned | 24 hrs | 28 days | 6 months | a) Mainlane lights operable Night time inspection or automated logs b) Mainlane lights out of action Night time inspection or automated | Number of sections with less than 90% of lights functioning correctly at all times Instances of more than two consecutive lights out of action | Nil Nil | a) Mainlane lights operable Night time inspection or automated logs b) Mainlane lights out of action Night time inspection or automated | Number of sections with less than 90% of lights functioning correctly at all times Instances of more than two consecutive lights out of action | Nil Nil |
|--|-----|----------------------------|--|--------|---------|----------|--|---|------------|--|---|------------|

| Performance and Measurement Table Baseline | | | | | | | | | | | | |
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| ELEMENT CATEGORY | REF | ELEMENT | PERFORMANCE REQUIREMENT | RESPONSE TO DEFECTS | | | INSPECTION AND MEASUREMENT METHOD (AFTER SERVICE COMMENCEMENT)* | MEASUREMENT RECORD (AFTER SERVICE COMMENCEMENT)* | TARGET | INSPECTION AND MEASUREMENT METHOD (FROM OPERATING COMMENCEMENT DATE TO SERVICE COMMENCEMENT) | MEASUREMENT RECORD (FROM OPERATING COMMENCEMENT DATE TO SERVICE COMMENCEMENT) | TARGET |
| | | | | Cat 1 | Cat 1 | Cat 2 | | | | | | |
| | | | | Hazard Mitigation | Permanent Remedy | Permanent Repair | | | | | | |
| | | | iii) Lighting units are free from accidental damage or vandalism | | | | logs | | logs | | | |
| | 8.1 Cont. | | iv) Columns are upright, correctly founded, visually acceptable and structurally sound | | | | | | | | | |
| | 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 | Night time inspection or automated logs | Instances of more than one bulb per sign not working Nil | |
| | 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% | 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 | Visual Inspection | Instances of missing access panels Nil | |
| | 8.5 | High Mast Lighting | i) All high mast luminaries functioning on each pole ii) All obstruction lights are present and working (if required) iii) Compartment door is secure with all bolts in place iv) All winch and safety equipment is correctly functioning and maintained without rusting or corrosion (for structural requirements refer to Element Category 3) | 24 hrs | 48 hrs | 1 month | Yearly inspection and night time inspections or automated logs | Instances of two or more lamps not working per high mast pole Identification of other defects | Nil Nil | Yearly inspection and night time inspections or automated logs | Instances of two or more lamps not working per high mast pole Identification of other defects Nil Nil | |
| 9) FENCES, WALLS AND SOUND ABATEMENT | | | | | | | | | | | | |
| | 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% | Visual Inspection | Inspection records showing compliance 100% | |
| | 9.2 | Construction | Integrity and structural condition of the fence is maintained | 24 hrs | 28 days | 6 months | Structural assessment if visual inspection warrants | Inspection records showing compliance | 100% | Structural assessment if visual inspection warrants | Inspection records showing compliance 100% | |
| 10) ROADSIDE MANAGEMENT | | | | | | | | | | | | |
| * - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice. | | | | | | | | | | | | |
| | 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 | a) Urban 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 18 in | 100% | a) Urban areas Visual inspection 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% | |

| Performance and Measurement Table Baseline | | | | | | | | | | | | |
|--|------------|------------------|---|---------------------|------------------|------------------|--|---|---|--|---|---|
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| | | | | Cat 1 | Cat 1 | Cat 2 | | | | | | |
| | | | | Hazard Mitigation | Permanent Remedy | Permanent Repair | | | | | | |
| | | | | | | | | | | | | |
| | 10.1 Cont. | | <p>ii) Spot mowing at intersections, ramps or other areas maintains visibility of appurtenances and sight distance.</p> <p>iii) Grass or vegetation does not encroach into or on paved shoulders, main lanes, sidewalks, islands, riprap, traffic barrier or curbs.</p> <p>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.</p> <p>v) A full width mowing cycle is completed after the first frost.</p> | | | | <p>b) Rural areas Physical measurement of height of grass and weeds</p> <p>c) Encroachment Visual inspection of instances of encroachment of vegetation</p> <p>d) Wildflowers Visual Inspection with audit of process.</p> <p>e) Sight lines Visual inspection</p> | <p>Individual measurement areas to have 95% of height of grass and weeds between 5 in. and 30 in</p> <p>Occurrences of vegetation encroachment in each auditable section</p> <p>Adherence to vegetation management manuals</p> <p>Instances of impairment of sight lines or sight distance to signs</p> | <p>100%</p> <p>Nil</p> <p>100%</p> <p>Nil</p> | <p>b) Rural areas Physical measurement of height of grass and weeds</p> <p>c) Encroachment Visual inspection of instances of encroachment of vegetation</p> <p>d) Wildflowers Visual Inspection with audit of process.</p> <p>e) Sight lines Visual inspection</p> | <p>Individual measurement areas to have 95% of height of grass and weeds between 5 in. and 30 in</p> <p>Occurrences of vegetation encroachment in each auditable section</p> <p>Adherence to vegetation management manuals</p> <p>Instances of impairment of sight lines or sight distance to signs</p> | <p>100%</p> <p>Nil</p> <p>100%</p> <p>Nil</p> |
| | 10.2 | Landscaped Areas | <p>i) All landscaped areas are maintained to their originally constructed condition. Landscaped areas are as designated in the plans.</p> | 24 hrs | 7 days | 28 days | Visual inspection | Inspection records showing compliance | 100% | Visual inspection | Inspection records showing compliance | 100% |
| | | | <p>ii) Mowing, litter pickup, irrigation system maintenance and operation, plant maintenance, pruning, insect, disease and pest control, fertilization, mulching, bed maintenance, watering is undertaken as per FMP.</p> <p>iii) The height of grass and weeds is kept between 2" and 8". Mowing begins before vegetation reaches 8 in</p> <p>iv) Damaged or dead vegetation is replaced.</p> | | | | | | | | | |
| | 10.3 | Fire Hazards | Fire hazards are controlled | 24 hrs | 7 days | 28 days | Visual inspection | Instances of dry brush or vegetation forming fire hazard | Nil | Visual inspection | Instances of dry brush or vegetation forming fire hazard | Nil |

| Performance and Measurement Table Baseline | | | | | | | | | | | | |
|--|------------|------------------------------|---|---------------------|------------------|------------------|---|--|--------|--|---|--------|
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| | | | | Cat 1 | Cat 1 | Cat 2 | | | | | | |
| | | | | Hazard Mitigation | Permanent Remedy | Permanent Repair | | | | | | |
| | 10.4 | Trees, brush and ornamentals | i) Trees, brush and ornamentals on the right of way, except in established no mow areas, are trimmed in accordance with TxDOT standards. | 24 hrs | 7 days | 28 days | Visual inspection | Inspection records showing compliance | 100% | Visual inspection | Inspection records showing compliance | 100% |
| | 10.4 Cont. | | ii) Trees, brush and ornamentals are trimmed to insure they do not interfere with vehicles or sight distance, or inhibit the visibility of signs. iii) Dead trees, brush, ornamentals and branches are removed. Potentially dangerous trees or limbs are removed. iv) All undesirable trees and vegetation are removed. Diseased trees or limbs are treated or removed by licensed contractors. | | | | | | | | | |
| | 10.5 | Wetlands | Wetlands are managed in accordance with the permit requirements | 24 hrs | 7 days | 28 days | Visual inspection, assessment of permit issuers | Instances of permit requirements not met | Nil | Visual inspection, assessment of permit issuers | Instances of permit requirements not met | Nil |

11) REST AREAS AND PICNIC AREAS

* - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice.

| | | | | | | | | | | | | |
|--|------|-----------------------------|--|--------|---------|----------|---------------------------------------|---|------|-----|--|------|
| | 11.1 | Rest areas and picnic areas | i) Picnic areas are clean and neat in appearance. | 24 hrs | 28 days | 6 months | Inspection records showing compliance | Instances where 90% of measured area shall have grass and weeds height between 2 in. and 8 in. | 100% | N/A | Instances where 90% of measured area shall have grass and weeds height between 2 in. and 8 in. | 100% |
| | | | ii) Trash barrels are painted and attached to their supports to prevent stealing. | | | | | Mowing shall begin before vegetation reaches 8 in. | 100% | | Mowing shall begin before vegetation reaches 8 in. | 100% |
| | | | iii) Site free of any visible litter, all litter properly disposed. Litter removed from the picnic area grounds and barrels before being allowed to accumulate outside of the barrels. | | | | | Number of bare ground areas larger than 5 square feet | Nil | | Number of bare ground areas larger than 5 square feet | Nil |
| | | | iv) All vehicles used in transporting litter are equipped to prevent the accumulated litter from being strewn along the roadway. | | | | | Number of prohibited, invasive or noxious weeds present. | Nil | | Number of prohibited, invasive or noxious weeds present. | Nil |
| | | | v) Vegetation damaged due to improper or careless mowing and trimming operations or any other reason is replaced. | | | | | Occurrences of encroachment of vegetation or debris for more than two (2) inches onto any curb or sidewalk located throughout each rest area. | Nil | N/A | | |

| Performance and Measurement Table Baseline | | | | | | | | | | | | |
|---|------------|------------------------------|---|---------------------|------------------|------------------|---|--|-------------|---|--|-------------|
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| | | | | Cat 1 | Cat 1 | Cat 2 | | | | | | |
| | | | | Hazard Mitigation | Permanent Remedy | Permanent Repair | | | | | | |
| | 11.1 Cont. | | vi) Weeds, grass and other undesirable growth are removed from beds of plants and shrubs as needed. Trees and shrubs are trimmed neatly. All curbs and sidewalks are edged and repaired. vii) All picnic tables are clean, free of stains and free of any defect. viii) All directional, informational, safety and any other sign is properly installed, contains accurate information and is visible from a reasonable distance. ix) All striping is intact and all parking and travel areas are clearly marked. x) All curbs are in place and intact. | | | | | Occurrences of deviation of soil or mulch above or below the top of the curb. | Nil | | Occurrences of deviation of soil or mulch above or below the top of the curb. | Nil |
| | | | | | | | | Paved surfaces maintained clean and safe with minimal obstruction. Occurrences of undermining greater than 2" | 100% Nil | | Paved surfaces maintained clean and safe with minimal obstruction. Occurrences of undermining greater than 2" | 100% Nil |
| | | | | | | | | Number of unsealed cracks > 1/2 inch. | Nil | | Number of unsealed cracks > 1/2 inch. | Nil |
| | | | | | | | | Number of lights fully functional. | 100% | | Number of lights fully functional. | 100% |
| 12) EARTHWORKS, EMBANKMENTS AND CUTTINGS | | | | | | | | | | | | |
| | 12.1 | Slope Failure | All structural or natural failures of the embankment and cut slopes of the Facility are repaired | 24 hrs | 28 days | 6 months | Visual inspection by geotechnical specialist and further tests as recommended by the specialist | Recorded instances of slope failure | Nil | Visual inspection by geotechnical specialist and further tests as recommended by the specialist | Recorded instances of slope failure | Nil |
| * - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice. | | | | | | | | | | | | |
| | 12.2 | Slopes - General | Slopes are maintained in general conformance to the original graded cross-sections, the replacement of landscaping materials, reseeding and re-vegetation 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% | | Inspection records showing compliance | 100% |
| 13) ITS and ETCS EQUIPMENT | | | | | | | | | | | | |
| | 13.1 | ETCS Equipment - Maintenance | All ITS and ETCS 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. | 24 hrs | 14 days | 1 month | Visual Inspection | Inspection records showing compliance | 100% | Visual Inspection | Inspection records showing compliance | 100% |

| Performance and Measurement Table Baseline | | | | | | | | | | | | |
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| | | | | Cat 1 | Cat 1 | Cat 2 | | | | | | |
| | | | | Hazard Mitigation | Permanent Remedy | Permanent Repair | | | | | | |
| | | | iii) Access to all communication hubs, ground boxes, cabinets and sites is clear, | | | | | | | | | |
| | 13.1 Cont. | | 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 replaced. vi) Backup power supply system is available at all times | | | | | | | | | |
| | 13.2 | VES Equipment - Maintenance | All VES equipment is kept clean, the identification numbers are visible. | 24 hrs | 14 days | 1 month | Visual Inspection | Inspection records showing compliance | 100% | Visual Inspection | Inspection records showing compliance | 100% |
| | 13.3 | Dynamic Message Sign Equipment | Dynamic Message Signs are free from faults such as: i) Any signal displaying a message which is deemed to be a safety hazard | 2 hrs | 24 hrs | 14 days | Defect measurement dependent on equipment | Inspection records showing compliance | 100% | Defect measurement dependent on equipment | Inspection records showing compliance | 100% |
| | | | 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. | | | | | | | | | |
| | 13.4 | CCTV Equipment | CCTV Systems are free from serious faults that significantly limit the availability of the operators to monitor the area network, such as: i) Failure of CCTV Systems 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. | 2 hrs | 24 hrs | 14 days | Defect measurement dependent on equipment | Inspection records showing compliance | 100% | Defect measurement dependent on equipment | Inspection records showing compliance | 100% |

| Performance and Measurement Table Baseline | | | | | | | | | | | | |
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| | | | | Cat 1 | Cat 1 | Cat 2 | | | | | | |
| | | | | Hazard Mitigation | Permanent Remedy | Permanent Repair | | | | | | |
| | | | iv) Moisture ingress onto CCTV camera lens v) Faults that result in significant degradation of CCTV images | | | | | | | | | |
| | 13.5 | Vehicle Detection Equipment | All equipment free of defects and operational problems such as; i) Inoperable loops. ii) Malfunctioning camera controllers. iii) Side-fire Radar iv) Bluetooth probe data collection | 2 hrs | 24 hrs | 1 month | Defect measurement dependent on equipment Traffic Detector Loops: Loop circuit's inductance to be > 50 and < 1,000 micro henries. Insulation resistance to be > 50 meg ohms. | Inspection records showing compliance Instances of loops out of compliance | 100% Nil | Defect measurement dependent on equipment Traffic Detector Loops: Loop circuit's inductance to be > 50 and < 1,000 micro henries. Insulation resistance to be > 50 meg ohms. | Inspection records showing compliance Instances of loops out of compliance | 100% Nil |
| * - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice. | | | | | | | | | | | | |
| 14) TOLLING Facilities and Buildings (Not Used) | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| 15) AMENITY | | | | | | | | | | | | |
| | 15.1 | 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% | All graffiti is considered a Category 1 defect | Inspection records showing compliance | 100% |
| 16) SNOW AND ICE CONTROL | | | | | | | | | | | | |
| | 16.1 | 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% | 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% |
| | 16.2 | Weather Forecasting | Weather forecast information is obtained and assessed and appropriate precautionary treatment is carried out to prevent ice forming on the travel way | 2 hrs | N/A | N/A | Operations plan details the process and procedures in place and followed | Inspection records showing compliance | 100% | Operations plan details the process and procedures in place and followed | Inspection records showing compliance | 100% |
| | 16.3 | Operational Plans | Operate snow and ice clearance plans to maintain traffic flows during and after snowfall and restore the travel way to a clear condition as soon as possible. | 2 hrs | N/A | N/A | Operations plan details the process and procedures in place and followed | Inspection records showing compliance | 100% | Operations plan details the process and procedures in place and followed | Inspection records showing compliance | 100% |

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| | | | | Cat 1 | Cat 1 | Cat 2 | | | | | | |
| | | | | Hazard Mitigation | Permanent Remedy | Permanent Repair | | | | | | |
| 17) INCIDENT RESPONSE | | | | | | | | | | | | |
| | 17.1 | 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% | Response times met for 98% of incidents measured on a 1 year rolling basis. No complaints from Emergency Services. | Inspection records showing compliance | 100% |
| | 17.2 | Hazardous Materials | For any hazardous materials spills, comply with the requirements of Section 22. | 1 hr | N/A | N/A | FMP details the process and procedures in place and followed. | Inspection records showing compliance | 100% | FMP details the process and procedures in place and followed. | Inspection records showing compliance | 100% |
| | 17.3 | 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 | Inspection records showing compliance | 100% | Inspections and surveys as required by incident | Inspection records showing compliance | 100% |
| | 17.4 | 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% | Review and inspection of the incident site | Auditable inspection records showing compliance | 100% |
| 18) CUSTOMER RESPONSE | | | | | | | | | | | | |
| * - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice. | | | | | | | | | | | | |
| | 18.1 | Response to inquiries | Timely and effective response to customer inquiries and complaints. | 48 hrs | 28 days | N/A | Contact the customer within 48 hours following initial customer inquiry. | Number of responses within specified times | 100% | Contact the customer within 48 hours following initial customer inquiry. | Number of responses within specified times | 100% |
| | | | | | | | All work resulting from customer requests is scheduled within 48 hours of customer contact. Follow-up contact with the customer within 72 hours of initial inquiry. All customer concerns/requests are resolved to TxDOT's satisfaction within 2 weeks of the initial inquiry. | | | All work resulting from customer requests is scheduled within 48 hours of customer contact. Follow-up contact with the customer within 72 hours of initial inquiry. All customer concerns/requests are resolved to TxDOT's satisfaction within 2 weeks of the initial inquiry. | | |
| | 18.2 | Customer contact line | Telephone line manned during business hours and 24 hour availability of messaging system. Faults to telephone line or message system rectified | 24 hrs | 28 days | N/A | Instances of line out of action or unmanned | Operations records showing non availability including complaints from public. | Nil | Instances of line out of action or unmanned | Operations records showing non availability including complaints from public. | Nil |
| 19) SWEEPING AND CLEANING | | | | | | | | | | | | |
| | 19.1 | 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% | 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% |

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| | | | | Hazard Mitigation | Permanent Remedy | Permanent Repair | | | | | | |
| | | | 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. | | | | | | | | | |
| | 19.2 | Litter | i) Keep the right of way in a neat condition, remove litter regularly ii) Pick up large litter items before mowing operations. | 24 hrs | 28 days | 6 months | No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed. | Inspection records showing compliance | 100% | No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed. | Inspection records showing compliance | 100% |
| | | | Dispose of all litter and debris collected at an approved solid waste site. | | | | | | | | | |

* - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice