

**Texas Department of Transportation**

**BOOK 2 – TECHNICAL PROVISIONS**

**FOR**

**US 181 HARBOR BRIDGE PROJECT**

**DESIGN-BUILD PROJECT**

**ATTACHMENT 19-1**

**BASELINE PERFORMANCE AND**

**MEASUREMENT TABLE NEW HARBOR BRIDGE**

**ATTACHMENT 19-1: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR NEW HARBOR BRIDGE**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
<b>1) ROADWAY</b>						<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.</i>			
1.1	<b>Obstructions and debris</b>	Roadway and clear zone free from obstructions and debris	2 hrs	NA	NA	Visual Inspection	1.1.1	Number of obstructions and debris	Nil
1.2	<b>Pavement</b>	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	<b>a) 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. <b>b) Ride quality</b>  <b>c) 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  <b>d) Edge drop-offs</b> Physical measurement of edge drop-off level compared to adjacent surface	1.2.1	Percentage of wheel path length with ruts greater than ¼" in depth in each Performance Section	
							1.2.2	• Mainlanes, shoulders and ramps - 3%	Nil
							1.2.3	Depth of rut at any location greater than ½"	Nil
								NOT USED	
							1.2.4	Individual discontinuities greater than 1/4"	Nil
							1.2.5	Occurrence of any failure	Nil
1.2.6	Number of instances of edge drop-off greater than 2"	Nil							
1.2	<b>Pavement</b>	Road users warned of potential skidding hazards	24 hrs	28 days	6 months	<b>e) Skid resistance</b> ASTM E 274 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	1.2.7	• Performance Sections with skid numbers for 0.5-mile section of mainlanes, shoulders and ramps exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	100%
							1.2.8	• Performance Sections with skid numbers for 0.5-mile section of frontage roads exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	100%
							1.2.9	• When the skid number is below 25 and/or when a site is categorized by TxDOT in accordance with the Wet Weather Accident Reduction Program, as a Wet Weather Accident Site, Developer shall perform a site investigation and perform required corrective action.	100%
							1.2.10	Instances where road users are warned of a potential skidding hazard where corrective action is required following the categorization as a Wet Weather Accident Reduction Site.	100%
1.3	<b>Crossovers and other paved areas</b>	Crossovers and other paved areas are free of Defects	24 hrs	28 days	6 months	<b>a) Potholes</b>  <b>b) Base failures</b>	1.3.1	Number of potholes of low severity or higher	Nil
							1.3.2	NOT USED	Nil
1.4	<b>Joints in concrete</b>	Joints in concrete paving are sealed and watertight	24 hrs	28 days	6 months	Visual inspection of joints	1.4.1	Length of unsealed joints greater than ¼"	Nil
		Longitudinal joint separation is controlled				Measurement of joint width and level difference of two sides of joints	1.4.2	Joint width more than 1" or faulting more than ¼"	Nil
1.5	<b>Curbs</b>	Curbs are in good alignment and free of Defects	24 hrs	28 days	6 months	Visual inspection	1.5.1	Continuous curb lengths where more than 10% of the length has defects such as cracks and chips	Nil
						Physical measurement	1.5.2	Continuous curb lengths where more than 5% of the length has a separation exceeding 0.25" between curb face and adjacent roadway surface	Nil
						Survey and 10' straight edge	1.5.3	Continuous curb lengths where more than 5% of the length has either the top or face of curbs exceeding 0.5" from intended design alignment	Nil

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1.6	Maintenance/Access Roads	Maintenance / access roads are free of Defects	24 hrs	28 days	6 months	Crown: Flat A shape or super-elevation with 4% cross slopes maintained to minimize ponding	1.6.1	Cross slope less than 3% or more than 6%	Nil
						Shoulder: Maintain slope away from the travel way and shoulder flush with travel way	1.6.2	Shoulder cross slope less than travel way cross slope; shoulder lower or higher than travel way	Nil
						Ditch: Maintain size and shape of ditch for proper drainage	1.6.3	Sides of ditches slumping or eroding, or obstructed by debris	Nil
						Ruts/potholes: Depth as measured using an automated device in compliance with TxDOT standards	1.6.4	Depth of ruts or potholes at any location greater than 1"	Nil
						Subgrade: Identify and repair any subgrade failures	1.6.5	Locations where subgrade failure is evident	Nil
<b>2) DRAINAGE</b>									
2.1	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.	2.1.1	Length of pipe or channel in feet with less than 90% of cross sectional clear area, calculated as the arithmetic mean of the clear cross-sectional areas of individual 10 feet lengths of pipes and channels in each Performance Section.	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 on Emergency.	24 hrs	28 days	6 months	Visual inspection	2.2.1	Number of 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.	2.3.1	Number of instances of hazardous water build-up.	Nil
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	2.4.1	Performance Sections with surface water discharge systems performing their proper function and discharging in compliance with the relevant legislation and permits.	100%
2.5	Protected Species	Named species and habitats are protected.	24 hrs	28 days	6 months	Visual inspection	2.5.1	Performance Sections with named species and habitats with protection of these named species and habitats.	100%
<b>3) STRUCTURES</b>									
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"> <li>• undesirable vegetation</li> <li>• debris and excessive bird droppings</li> <li>• blocked drains, weep pipes manholes and chambers</li> <li>• blocked drainage holes in structural components</li> </ul> <ul style="list-style-type: none"> <li>• defects in joint sealants</li> <li>• defects in pedestrian protection measure</li> <li>• scour damage</li> <li>• corrosion of rebar</li> <li>• paint system failures</li> <li>• impact damage</li> </ul>	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.		<i>Records as required in the TxDOT Bridge Inspection Manual</i>	
						As above	3.1.1	Occurrence of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below seven for any deck, superstructure or substructure	Nil
						As above	3.1.2	Performance Sections with structure components with condition states of one, in accordance with the TxDOT Field Inspection Manual	100%

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3.2	Structure components	i) Expansion joints are free of: <ul style="list-style-type: none"> <li>dirt debris and vegetation</li> <li>defects in drainage systems</li> <li>loose nuts and bolts</li> <li>defects in gaskets</li> </ul> ii) The deck drainage system is free of all debris and operates as intended.  iii) Parapets are free of: <ul style="list-style-type: none"> <li>loose nuts or bolts</li> <li>blockages of hollow section drain holes</li> <li>vegetation</li> <li>accident damage</li> </ul> iv) Bearings and bearing shelves are clean. Bearings allow for translation and rotation as designed. No presence of water exists on bearings and bearing seats. v) Sliding and roller surfaces are clean and greased to ensure satisfactory performance. Additional advice contained in bearing manufacturers' instructions is followed. 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	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.	3.2.1	Occurrence of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below seven for any deck, superstructure or substructure	Nil
						Visual inspection of Elements listed in (i) through (vii) of the general performance requirement column.	3.2.2	Instances of condition of any element not meeting general performance requirement as determined in accordance with Good Industry Practice.	Nil
3.3	Integral wearing surface	Integral wearing surface is in a structurally sound condition in which cracking and concrete cover to reinforcement is controlled to ensure durability	24 hrs	28 days	6 months	Concrete cover measured at [10ft] intervals	3.3.1	Occurrence of any instance where integral wearing surface thickness is less than [50%] of design value	Nil
						Cracks measured at [3 ft] intervals on the surface of the deck prior to 3 hours after sunrise at concrete age greater than 28 days	3.3.2	Instances of cracks wider than [0.025] inches	Nil
						De-lamination or spalling	3.3.3	Instances of de-lamination or spalling	Nil
3.4	Stay Cables	Stay cable system operates as intended including damping system (if any) and acoustic monitoring system.	24 hrs	28 days	NA	Visual and hands-on inspection	3.4.1	Instances of damage or deterioration of the corrosion protection system including coatings, protective pipes and anchorage units	Nil
							3.4.2	Instances of damaged or broken strand / wire	Nil
							3.4.3	Instances of stay cable damping system not operating as intended including failure to provide the minimum design level of damping	Nil
							3.4.4	Instances of stay cable acoustic monitoring system not operating as intended including failure to transmit measured information.	Nil
3.5	Inspection and access equipment	Inspection and access equipment is properly maintained including: <ul style="list-style-type: none"> <li>Under-deck inspection systems such as maintenance travelers</li> <li>Fixed access and inspection platforms</li> <li>Access stairways and lift systems</li> </ul>	24 hrs	28 days	6 months	Visual and hands-on inspection	3.5.1	Instances of loose assemblies or nuts and bolts not fully tightened	Nil
							3.5.2	Instances of defects in surface protection such as failures of coating systems to bare metal or loss of galvanizing	Nil
							3.5.3	Instances of failures to conform with relevant standards for fixed and mobile inspection facilities, hoists and lifts	Nil
							3.5.4	Instances where maintenance traveler fails to operate smoothly under power or braking, has uneven or inconsistent movement of any driven component or exhibits binding or swaying, in each case in a manner that exceeds normal operational parameters.	Nil

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3.6	Ship impact protection system	The ship impact protection system (if any) including any fenders and exposed foundations shall be maintained such that it is able to perform its intended function	24 hrs	28 days	6 months	Visual inspection	3.6.1	Instances of marine boring (timber systems)	Nil	
							3.6.2	Instances of corrosion that would reduce the system resistance to below its intended design state	Nil	
							3.6.3	Instances of damage from vessel impact that would reduce the system resistance to below its intended design state or would cause a material reduction in the remaining service life	Nil	
3.7	Corrosion protection systems	Corrosion protection systems are intact and operating in line with design intent including: • Paint systems for steel • Concrete surface protection systems • Sacrificial protection systems Zinc metalizing	24 hrs	28 days	6 months	Visual inspection	3.7.1	Instances of failure of coating system down to bare metal or instances of repair / removal of overcoat that damages underlying metallized coating.	Nil	
							3.7.2	Loss of galvanizing	Nil	
							3.7.3	Damaged, blistered, cracked, delaminated or peeling material including any painted surface for which a color is specified that has changed color by more than 10 Delta-E CIE LAB units.	Nil	
							3.7.4	Noncompliance with manufacturer's recommendations for the maintenance and re-application of coatings	Nil	
3.8	Lightning Protection Systems	Lightning protection systems are intact and operating in line with design intent.	24 hrs	7 days	NA	Inspection and assessment in accordance with the requirements of Underwriters Laboratories, Inc. (UL) 96 and Lightning Protection Institute (LPI) 175.	3.8.1	Noncompliance with specified standards.	Nil	
							3.8.2	Instances of lightning protection system not operating as intended.	Nil	
3.11	Load Ratings	All structures maintain the design load capacity.	24 hrs	7 days	NA	Load rating calculations in accordance with the Manual for Bridge Evaluation and the TxDOT Bridge Inspection Manual and per the Technical Provisions	3.11.1	Number of structures with load restrictions for Texas legal loads (including legally permitted vehicles) in each Performance Section	Nil	
3.12	Access Points	All hatches and points of access have fully operational and lockable entryways.	24 hrs	28 days	6 months	Visual Inspection	3.12.1	Number with defects in locks or entryways	Nil	
3.14	Structural Surfaces	Vertical Surfaces free of graffiti, markings by vandalism.	24 hrs	28 days	6 months	Visual Inspection	3.14.1	Number of areas where graffiti is present	Nil	
<b>4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS</b>										
4.1	Pavement markings	Pavement markings are: • 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  Portable retroreflector, which uses 30 meter geometry, meeting the requirements described in ASTM E 1710  Physical measurement	4.1.1	Percentage of total length of pavement marking in each Performance Section meeting the minimum retroreflectivity 175 med/sqm/lx for white	100%	
							4.1.2	Percentage of total length of pavement marking in each Performance Section meeting the minimum retroreflectivity 125 med/sqm/lx for white	100%	
							4.1.3	Length of pavement marking in each Performance Section with more than 5% loss of area of material at any point	Nil	
							4.1.4	Length of pavement marking in each Performance Section with spread more than 10% of specified dimensions.	Nil	
							b) Profile Markings			
							4.1.5	Percentage of total length of pavement marking in each Performance Section performing its intended function and compliant with relevant regulations	100%	

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4.2	Raised Reflective Markings	Raised reflective pavement markers are: • clean and clearly visible • of the correct color and type • reflective or retroreflective in accordance with TxDOT standards • 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	4.2.1	Number of markers associated with road markings that are ineffective in any 10 consecutive markers. (Ineffective includes missing, damaged, settled or sunk)	Nil
							4.2.2	A minimum of four markers are visible at 80' spacing when viewed under low beam headlights.	100%
							4.2.3	Uniformity (replacement raised reflective pavement markers have equivalent physical and performance characteristics to adjacent markers).	100%
4.3	Delineators and Markers	Object markers, mail box markers and delineators are: • clean and visible • of the correct color and type • legible and reflective • straight and vertical	24 hrs	28 days	6 months	Visual inspection	4.3.1	Number of object markers or delineators in each Performance Section that is defective or missing	Nil
<b>5) GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS</b>									
5.1	Guardrails and Safety Barriers	All guardrails, safety barriers, concrete barriers, etc. are maintained free of Defects, , and undesirable vegetation. 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.	24 hrs	28 days	6 months	Visual inspection	5.1.1	Performance Sections with all guard rails and safety barriers appropriately placed and correction installed	100%
							5.1.2	Performance Sections with all guard rails and safety barriers free from defects	100%
							5.1.3	Performance Sections with all guard rails and safety barriers at correct heights	100%
							5.1.4	Performance Sections with all guard rails and safety barriers at correct distances from roadway obstacles	100%
5.2	Impact Attenuators	All impact attenuators are appropriately placed and correctly installed	24 hrs	28 days	6 months	Visual inspection	5.2.1	Performance Sections will all impact attenuators appropriately placed and correctly installed.	100%
<b>6) TRAFFIC SIGNS</b>									
6.1	General - All Gantry-Mounted overhead 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) Visibility distances meet the stated requirements  iv) Obsolete and redundant signs are removed or replaced as appropriate  v) Sign information is of the correct size, location, type and wording to meet its intended purpose and any statutory requirements vi) All structures and elements of the signing system are kept clean and free from debris and have clear access provided. vii) All replacement and repair materials and equipment are in accordance with the requirements of the TMUTCD  viii) Dynamic message signs are in an operational condition	24 hrs	28 days	6 months	a) Retroreflectivity Determination of Coefficient of retro-reflectivity	6.1.1	Number of signs with actual reflectivity below the requirements of TxDOT's TMUTCD in each Performance Section	Nil
						b) Face damage Visual inspection	6.1.2	Number of signs in each Performance Section with face damage greater than 5% of area	Nil
						c) Placement Visual inspection	6.1.3	All signs in each Performance Section are placed in accordance with TxDOT's Sign Crew Field Book including not twisted or leaning	100%
						d) Obsolete signs Visual inspection	6.1.4	Number of obsolete signs in each Performance Section	100%
						e) Sign Information Visual inspection	6.1.5	All sign information in each Performance Section is of the correct size, location, type and wording to meet its intended purpose	100%
						f) Dynamic Message Signs Visual inspection	6.1.6	Dynamic message signs are fully functioning	100%

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6.2	Gantries	Sign and signal mounting structures (including gantries) are structurally sound and free of:  • defects in surface protection systems  • loose nuts and bolts • graffiti	24 hrs	28 days	6 months	Visual inspection	6.2.1	Number with defects in surface protection system	Nil
							6.2.1	Number with loose nuts and bolts	Nil
							6.2.3	Number with graffiti	Nil
<b>7) TRAFFIC SIGNALS (NOT PART OF MAINTAINED ELEMENTS)</b>									
<b>8) LIGHTING</b>									
8.1	Roadway Lighting	i) All lighting is free from defects and provides acceptable uniform lighting quality ii) Lanterns are clean and correctly positioned iii) Lighting units are free from any damage or vandalism iv) Columns are upright, correctly founded, visually acceptable and structurally sound	24 hrs	28 days	6 months	a) Mainlane lights operable Night time inspection or automated logs	8.1.1	Performance Sections with less than 90% of lights functioning correctly at all times	Nil
						b) Mainlane lights out of action Night time inspection or automated logs			
8.2	Sign Lighting	Sign lighting is fully operational	24 hrs	28 days	6 months	Night time inspection or automated logs	8.2.1	Number of instances of more than one bulb per sign not working in each Performance Section	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	28 days	Testing to meet NEC regulations, visual inspection	8.3.1	Inspection records showing safe installation and maintenance in each Performance Section	Nil
8.4	Access Panels	All access panels in place at all times.	24 hrs	7 days	28 days	Visual Inspection	8.4.1	Number of instances of missing or damaged access panels in each Performance Section	Nil
8.5	High Mast Lighting	NOT USED				NOT USED			
8.6	Navigational Lighting	Navigational lighting is fully operational	24 hrs	7 days	28 days	Night time inspection or automated logs	8.5.1	Number of instances of more than one bulb per sign not working in each Performance Section	Nil
8.7	Architectural Lighting	All architectural lighting is functioning in accordance with the original design requirements and specifications			28 days	Night time inspection or automated logs	8.6.1	Instances of architectural lighting with more than 10% of lamps not functioning	Nil
8.8	Bridge Inspection Lighting	All bridge inspection lighting is functioning in accordance with original design requirements and specifications	24 hrs	7 days	28 days	Night time inspection or automated logs	8.7.1	Instances of bridge inspection lighting where failures could adversely impact safety or security of inspections or access	Nil
<b>9) FENCES, WALLS AND SOUND ABATEMENT (NOT USED)</b>									
<b>10) ROADSIDE MANAGEMENT (NOT USED)</b>									
<b>11) REST AREAS AND PICNIC AREAS (NOT USED)</b>									
<b>12) EARTHWORKS, EMBANKMENTS AND CUTTINGS (NOT USED)</b>									
<b>13) ITS EQUIPMENT</b>									
13.1	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 replaced. vi) Backup power supply system is available at all times	24 hrs	14 days	28 days	Visual Inspection	13.1.1	Inspection records showing compliance with requirements for maintenance of ITS equipment in each Performance Section.	100%

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13.2	<b>Dynamic Message Sign Equipment</b>	Dynamic Message Signs are free from faults such as: i) Any signal displaying a 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 hrs	24 hrs	14 days	Defect measurement dependent on equipment	13.2.1	Inspection records showing compliance with requirements for Dynamic Message Signs in each Performance Section	100%	
13.3	<b>CCTV Equipment</b>	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. iv) Moisture ingress onto CCTV camera lens. v) Faults that result in significant degradation of CCTV images.	2 hrs	24 hrs	14 days	Defect measurement dependent on equipment	13.3.1	Inspection records showing compliance with requirements for CCTV equipment in each Performance Section	100%	
13.4	<b>Vehicle Detection Equipment</b>	All equipment free of defects and operational problems such as: i) Inoperable loops. ii) Malfunctioning camera controllers.	2 hrs	24 hrs	28 days	Defect measurement dependent on equipment	13.4.1	Inspection records showing compliance with requirements for vehicle detection equipment in each Performance Section	100%	
							13.4.2	Traffic Detector Loop circuit's inductance to be > 50 and < 1,000 micro henries.	100%	
							13.4.3	Insulation resistance to be > 50 meg ohms.	100%	
<b>14) TOLLING FACILITIES AND BUILDINGS (NOT USED)</b>										
<b>15) AMENITY (NOT USED)</b>										
<b>16) SNOW AND ICE CONTROL</b>										
16.1	<b>Travel lanes</b>	Maintain travel way free from snow and ice.	2 hrs	NA	NA	Maximum 1hr response time to complete manning and loading of spreading vehicles.	16.1.1	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	100%	
							16.1.2	Maximum 2hrs from departure from loading point to complete treatment and return to loading point.	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	100%
							16.1.3	Maximum 1hr response time for snow and ice clearance vehicles to depart from base.	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	100%
16.2	<b>Weather Forecasting</b>	Weather forecast information is obtained and assessed and appropriate precautionary treatment is carried out to prevent ice forming on the travel way.	2 hrs	NA	NA	Operations plan details the process and procedures in place and followed.	16.2.1	Inspection records showing compliance with requirements for weather forecasting in each Performance Section	100%	
16.3	<b>Operational Plans</b>	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	NA	NA	Operations plan details the process and procedures in place and followed.	16.3.1	Inspection records showing compliance with snow and ice clearance plans in each Performance Section	100%	
16.4	<b>Operations and Maintenance Manual</b>	Operations and maintenance instructions for the anti-icing system and items of equipment (if Used)	2 hrs	NA	NA	Operations and maintenance instructions detail the process and procedures in place and followed.	16.4.1	Inspection records showing compliance with operations and maintenance instructions in each Performance Section.	100%	
<b>17) INCIDENT RESPONSE</b>										
17.1	<b>General</b>	Monitor the Project and respond to Incidents in accordance with the Maintenance Management Plan (MMP).	1 hr	NA	NA	Response times are met for 98% of incidents measured on a 1 year rolling basis.	17.1.1	Inspection records showing compliance with the MMP and requirements regarding incident response times in each Performance Section	100%	
						No complaints from Emergency Services.	17.1.2	Inspection records showing compliance with the MMP and requirements regarding incident response times in each Performance Section	100%	

**ATTACHMENT 19-1: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR NEW HARBOR BRIDGE**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
17.2	<b>Hazardous Materials</b>	Monitor the Project and respond to Incidents involving Hazardous Materials in accordance with the Maintenance Management Plan (MMP).	1 hr	NA	NA	MMP details the process and procedures in place and followed.	17.2.1	Inspection records showing compliance with the MMP details regarding hazardous materials in each Performance Section	100%
17.3	<b>Structural Assessment</b>	Evaluate structural damage to structures and liaise with emergency services to ensure safe working environment while clearing the incident	1 hr	NA	NA	Inspections and surveys as required by incident	17.3.1	Inspection records showing compliance with the MMP and requirements for incidents in each Performance Section	100%
17.4	<b>Temporary and permanent remedy</b>	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	NA	Review and inspection of the incident site	17.4.1	Inspection records showing compliance with requirements for temporary and permanent remedy for incidents in each Performance Section	100%
<b>18) CUSTOMER RESPONSE</b>									
18.1	<b>Response to inquiries</b>	Timely and effective response to customer inquiries and complaints.	48 hrs	NA	NA	Contact the customer within 48 hours following initial customer inquiry.	18.1.1	Percentage of responses within specified times in each Performance Section.	100%
						All work resulting from customer requests is scheduled within 48 hours of customer contact.	18.1.2	Demonstrated by O&M Records	100%
						Follow-up contact with the customer within 72 hours of initial inquiry.	18.1.3	Demonstrated by O&M Records	100%
						All customer concerns/requests are resolved to TxDOT's satisfaction within 2 weeks of the initial inquiry.	18.1.4	Demonstrated by O&M Records	100%
18.2	<b>Customer Contact Line</b>	Telephone line manned during business hours and 24 hour availability of messaging system. Faults to telephone line or message system rectified.	24 hrs	7 days	NA	Instances of line out of action or unmanned	18.2.1	Number of operations records showing non availability of the customer contact line in each Performance Section including complaints from public.	Nil
<b>19) SWEEPING AND CLEANING</b>									
19.1	<b>Sweeping</b>	i) Keep all channels, hard shoulders, gore areas, ramps, intersections, islands and frontage roads swept clean with vacuum sweepers, 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	3 months	Buildup of dirt, ice, rock, debris, etc. on roadways and bridges not to accumulate greater than 24" wide or 1/2" deep	19.1.1	Inspection records showing compliance with requirements for sweeping in each Performance Section.	100%
19.2	<b>Litter</b>	i) Keep the right of way in a neat condition, remove litter regularly. ii) Pick up large litter items before mowing operations. Dispose of all litter and debris collected at an approved solid waste site.	24 hrs	28 days	3 months	No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed.	19.2.1	Inspection records showing compliance with requirements regarding litter pick-up in each Performance Section.	100%
<b>NOTES FOR ATTACHMENT 19-1</b>									
<p>1 Hazard Mitigation shall be an action taken by Developer to mitigate a hazard to Users or imminent risk of damage or deterioration to property or the environment such that the Category 1 Defect no longer exists.</p> <p>2 Permanent Remedy shall be an action taken by Developer to restore the condition of an Element following Hazard Mitigation of a Category 1 Defect: (a) to the standard required for new construction / Renewal Work; or (b) to a condition such that the Target is achieved for each Measurement Record.</p> <p>3 Permanent Repair shall be an action taken by Developer to restore the condition of an Element for which a Category 2 Defect has been recorded: (a) to the standard required for new construction / Renewal Work; or (b) to a condition such that the Target is achieved for each Measurement Record.</p>									

**Texas Department of Transportation**

**BOOK 2 – TECHNICAL PROVISIONS**

**FOR**

**US 181 HARBOR BRIDGE PROJECT**

**DESIGN-BUILD PROJECT**

**ATTACHMENT 19-2**

**BASELINE PERFORMANCE AND  
MEASUREMENT TABLE ROADWAY SECTION  
DURING CONSTRUCTION**

**ATTACHMENT 19-2: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION DURING CONSTRUCTION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Baseline Condition Repair				
<b>1) ROADWAY</b>						<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.</i>			
1.1	<b>Obstructions and debris</b>	Roadway and clear zone free from obstructions and debris	2 hrs	N/A	N/A	Visual Inspection	1.1.1	Number of obstructions and debris	Nil
1.2	<b>Pavement</b>	All roadways shall be safe for road users and shall maintain or exceed the applicable reference condition (on a location-specific basis) as identified in the BECR (including shoulders, bridge decks, covers, gratings, frames and boxes).	24 hrs	28 days	28 days	<b>a) Ruts – Mainlanes, shoulders &amp; ramps</b> Physical measurement and visual inspection.	1.2.1	Wheel path length with ruts greater than the reference condition in the BECR	Nil
						10ft straight edge used to measure rut depth for localized areas.	1.2.2	Depth of rut greater than the reference condition in the BECR	Nil
						<b>b) Ride quality</b> 10-ft straightedge used to measure discontinuities	1.2.3	Individual discontinuities greater than the reference condition in the BECR	Nil
						<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	1.2.4	Occurrence of any failure exceeding the reference condition in the BECR	Nil
						<b>e) Edge drop-offs</b> Physical measurement of edge drop-off level compared to adjacent surface	1.2.5	Number of instances of edge drop-off greater than the reference condition in the BECR	Nil
						<b>f) Skid resistance</b> ASTM E 274 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	1.2.6	Not used	
1.2	<b>Pavement</b>	Road users warned of potential skidding hazards	24hrs	7 days	N/A		1.2.7	Instances where road users are warned of a potential skidding hazard where remedial action is identified.	100%
1.3	<b>Crossovers and other paved areas</b>	Crossovers and other paved areas are free of defects exceeding the reference condition (on a location-specific basis) as identified in the BECR.	24 hrs	28 days	28 days	<b>a) Potholes</b>	1.3.1	Number of potholes exceeding the reference condition in the BECR	Nil
						<b>b) Base failures</b>	1.3.2	Number of base failures exceeding the reference condition in the BECR	Nil
1.4	<b>Joints in concrete</b>	Joints in concrete paving meet or exceed the reference condition (on a location-specific basis) as identified in the BECR  Longitudinal joint separation meets or exceeds the reference condition (on a location-specific basis) as identified in the BECR.	24 hrs	28 days	28 days	Visual inspection of joints	1.4.1	Length of unsealed joints exceeding the reference condition in the BECR	Nil
						Visual inspection	1.4.2	Joint width exceeding the reference condition in the BECR	Nil
<b>2) DRAINAGE</b>									
2.1	<b>Pipes and Channels</b>	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	28 days	Visual inspection	2.1.1	Length of pipe or channel subject to accumulation of debris, silt or other blockage exceeding the reference condition in the BECR.	Nil

**ATTACHMENT 19-2: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION DURING CONSTRUCTION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Baseline Condition Repair				
2.2	<b>Drainage treatment devices</b>	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 on Emergency.	24 hrs	28 days	28 days	Visual inspection	2.2.1	Number of devices functioning correctly with means of operation displayed	100%
2.3	<b>Travel Way</b>	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	NA	Visual inspection of water on surface	2.3.1	Number of instances of hazardous water build-up	Nil
2.4	<b>Discharge systems</b>	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	2.4.1	Performance Sections with surface water discharge systems performing their proper function and discharging in compliance with the relevant legislation and permits.	100%
2.5	<b>Protected Species</b>	Named species and habitats are protected.	24 hrs	28 days	6 months	Visual inspection	2.5.1	Performance Sections with named species and habitats with protection of these named species and habitats	100%
<b>3) STRUCTURES</b>									
3.1	<b>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</b>	Substructures and superstructures shall maintain or exceed the applicable reference condition (on a location-specific basis) as identified in the BECR including: <ul style="list-style-type: none"> <li>• graffiti</li> <li>• undesirable vegetation</li> <li>• debris and excessive bird droppings</li> <li>• blocked drains, weep pipes manholes and chambers</li> <li>• blocked drainage holes in structural components</li> <li>• defects in joint sealants</li> <li>• defects in pedestrian protection measure</li> <li>• scour damage</li> <li>• corrosion of rebar</li> <li>• paint system failures</li> <li>• impact damage</li> </ul>	24 hrs	28 days	28 days	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	
							3.1.1	Presence of any defect not recorded in the applicable reference condition (on a location-specific basis) as identified in the BECR	Nil
							3.1.2	All condition states to be at least equal to the condition states recorded on a structure-specific basis in the BECR for all structure components	100%

**ATTACHMENT 19-2: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION DURING CONSTRUCTION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET		
			Cat 1	Cat 1	Cat 2						
			Hazard Mitigation	Permanent Remedy	Baseline Condition Repair						
3.2	Structure components	<p>Except as otherwise recorded as the reference condition on a structure-specific basis in the BECR:</p> <p>i) Expansion joints are free of:</p> <ul style="list-style-type: none"> <li>• dirt debris and vegetation</li> <li>• defects in drainage systems</li> <li>• loose nuts and bolts</li> <li>• defects in gaskets</li> </ul> <p>ii) The deck drainage system is free of debris all and operates as intended.</p> <p>iii) Parapets are free of:</p> <ul style="list-style-type: none"> <li>• loose nuts or bolts</li> <li>• blockages of hollow section drain holes</li> <li>• graffiti</li> <li>• vegetation</li> <li>• accident damage</li> </ul> <p>iv) Bearings and bearing shelves are clean.</p> <p>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.</p> <p>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.</p>	24 hrs	28 days	28 days	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				
									3.2.1	Presence of any defect not recorded in the applicable reference condition (on a location-specific basis) as identified in the BECR	Nil
									3.2.2	All condition states to be at least equal to the condition states recorded on a structure-specific basis in the BECR for all structure components	100%
3.3	Non-bridge class culverts	<p>Except as otherwise recorded as the reference condition on a structure-specific basis in the BECR:</p> <p>Non-bridge-class culverts are free of:</p> <ul style="list-style-type: none"> <li>• vegetation and debris and silt</li> <li>• defects in sealant to movement joints</li> <li>• scour damage</li> </ul>	24 hrs	28 days	28 days	Visual inspection		3.3.1	Presence of any defect not recorded in the applicable reference condition (on a location-specific basis) as identified in the BECR	Nil	
								3.3.2	Not used	Nil	
								3.3.3	Not used	Nil	

**ATTACHMENT 19-2: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION DURING CONSTRUCTION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Baseline Condition Repair				
3.4	Gantries and high masts	Except as otherwise recorded as the reference condition on a structure-specific basis in the BECR: Sign signal gantries, high masts are structurally sound and free of: • loose nuts and bolts • defects in surface protection systems • graffiti	24 hrs	28 days	6 months	Visual inspection	3.4.1	Number of gantries and high masts with loose assemblies	Nil
							3.4.2	Number of gantries and high masts with defects in surface protection	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 Load restriction requirements as per the TxDOT Bridge Inspection Manual	3.5.1	Number of structures with load restrictions for Texas legal loads (including legally permitted vehicles)	Nil
3.6	Access points	All hatches and points of access have fully operational and lockable entryways.	24 hrs	28 days	6 months	Visual Inspection	3.6.1	Number with defects in locks or entryways	Nil
3.7	Mechanically Stabilized Earth and Retaining Walls	Except as otherwise recorded as the reference condition on a structure-specific basis in the BECR: Mechanically Stabilized Earth and Retaining Walls free of: • blocked weep holes • undesirable vegetation • defects in joint sealants • defects in pedestrian protection • scour damage • corrosion of reinforcing bars • paint system failure • concrete spalling • impact damage Parapets free of: • loose nuts and bolts • blockage of drain holes • undesirable vegetation • impact damage • concrete spalling • graffiti	24 hrs	28 days	28 days	Inspection and assessment in accordance with the requirements of federal Nations Bridge Inspection Standards (NBIS) of the Code of Federal Regulations, 23 Highways - Part 650, the TxDOT Bridge Inspection Manual and the Federal Highway Administration's Bridge Inspector's Reference Manual.	3.7.1	Records as required in the TxDOT Bridge Inspection Manual	100%
<b>4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS</b>									
4.1	Pavement markings	Pavement markings are: • clean and visible during the day and at night • placed to meet the TMUTCD and TxDOT's Pavement Marking Standard Sheets	24 hrs	28 days	28 days	a) Markings - General			
						Visual inspection (to include a record of visibility of markings under low beam headlights)	4.1.1	Occurrence of any marking visibility condition on a location-specific basis less than the reference condition in the BECR	Nil

**ATTACHMENT 19-2: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION DURING CONSTRUCTION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Baseline Condition Repair				
						Physical measurement	4.1.2	Length of pavement marking where the loss of pavement marking material exceeds the reference condition for loss of pavement marking material recorded on a location-specific basis in the BECR	Nil
						b) Profile Markings		Not used	
						Visual inspection	4.1.3	Profile marking condition at least equal to the reference condition in the BECR	100%
<b>4.2</b>	<b>Raised reflective markers</b>	Raised reflective pavement markers are: <ul style="list-style-type: none"> <li>• clean and clearly visible</li> <li>• of the correct color and type</li> <li>• reflective or retroreflective in accordance with TxDOT Standards</li> <li>• correctly located, aligned and at the correct level</li> <li>• are firmly fixed</li> <li>• are in a condition that will ensure that they remain at the correct level.</li> </ul>	24 hrs	28 days	6 months	Visual inspection	4.2.1	Number of markers associated with road markings that are ineffective in any 10 consecutive markers. (Ineffective includes missing, damaged, settled or sunk)	Nil
							4.2.2	Not Used	
							4.2.3	Not Used	
<b>4.3</b>	<b>Delineators &amp; Markers</b>	Object markers, mail box markers and delineators are: <ul style="list-style-type: none"> <li>• clean and visible</li> <li>• of the correct color and type</li> <li>• legible and reflective</li> <li>• straight and vertical</li> </ul>	24 hrs	28 days	28 days	Visual inspection	4.3.1	Delineators and markers condition at least equal to the reference condition in the BECR	100%
<b>5) GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS</b>									
<b>5.1</b>	<b>Guardrails and safety barriers</b>	All guardrails, safety barriers, concrete barriers, etc. are maintained free of defects, graffiti, and undesirable vegetation. 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.	24 hrs	28 days	28 days	Visual inspection	5.1.1	Guardrail condition at least equal to the reference condition in the BECR	100%
							5.1.2	Not used	100%
							5.1.3	Guardrail correct height and offset at least equal to the reference condition in the BECR	100%
							5.1.4	Not used	100%
<b>5.2</b>	<b>Impact attenuators</b>	All impact attenuators are appropriately placed and correctly installed	24 hrs	7 days	6 months	Visual inspection	5.2.1	Impact Attenuator condition at least equal to the reference condition in the BECR	100%
<b>6) TRAFFIC SIGNS</b>									
<b>6.1</b>	<b>Gantry-mounted overhead signs</b>	Signs are clean, correctly located, clearly visible, legible, reflective, at the correct height and free from structural and electrical defects	24 hrs	28 days	28 days	Visual inspection	6.1.1	Condition of gantry-mounted signs at least equal to the reference condition in the BECR	100%
<b>7) TRAFFIC SIGNALS (NOT PART OF MAINTAINED ELEMENTS)</b>									

**ATTACHMENT 19-2: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION DURING CONSTRUCTION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Baseline Condition Repair				
<b>8) LIGHTING</b>									
8.1	Roadway Lighting	i) All lighting is free from defects and provides acceptable uniform lighting quality ii) Lanterns are clean and correctly positioned iii) Lighting units are free from any damage or vandalism iv) Columns are upright, correctly founded, visually acceptable and structurally sound	24 hrs	28 days	28 days	Visual inspection	6.1.1	Condition of roadway lighting at least equal to the reference condition in the BECR	100%
<b>9) FENCES, WALLS AND SOUND ABATEMENT</b>									
9.1	Construction	Integrity and structural condition of fences is maintained	24 hrs	28 days	6 months	Structural assessment if visual inspection warrants	9.1.1	Inspection records for fences and walls showing compliance with fence and wall requirements	100%
<b>10) ROADSIDE MANAGEMENT</b>									
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. ii) Spot mowing at intersections, ramps or other areas maintains visibility of appurtenances and sight distance. iii) Grass or vegetation does not encroach into or on paved shoulders, main lanes, sidewalks, islands, riprap, traffic barrier or curbs. iv) A full width mowing cycle is completed after the first frost	24 hrs	7 days	28 days	a) <b>Urban areas</b> Physical measurement of height of grass and weeds	10.1.1	Individual measurement to have 95% of grass and weeds between 5" and 18" in height.	100%
b) <b>Rural areas</b> Physical measurement of height of grass and weeds	10.1.2	Individual measurement to have 95% of height of grass and weeds between 5" and 30" in height.				100%			
c) <b>Encroachment</b> Visual inspection of instances of encroachment of vegetation	10.1.3	Number of occurrences of vegetation encroachment				Nil			
d) <b>Sight lines</b> Visual inspection	10.1.4	Number of instances of impairment of sight lines or sight distance to signs				Nil			
10.2	Landscaped Areas	i) All landscaped areas are maintained to their originally constructed condition. Landscaped areas are as designated in the plans. 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 MMP. iii) The height of grass and weeds is kept between 2" and 8". Mowing begins before vegetation reaches 8 in.	24 hrs	7 days	28 days	Visual inspection	10.2.1	Inspection records showing compliance with requirements for landscaping.	100%
10.3	Fire Hazards	Fire hazards are controlled	24 hrs	7 days	28 days	Visual inspection	10.3.1	Number of instances of dry brush or vegetation forming fire hazard	Nil

**ATTACHMENT 19-2: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION DURING CONSTRUCTION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Baseline Condition 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. 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.	24 hrs	7 days	28 days	Visual inspection	10.4.1	Inspection records showing compliance with requirements for trees, brush and ornamentals	100%
10.5	Wetlands	Wetlands are managed in accordance with the permit requirements.	24 hrs	7 days	28 days	Visual inspection, assessment of permit issuers	10.5.1	Number of instances of permit requirements not met	Nil
<b>11) REST AREAS AND PICNIC AREAS (Not Used)</b>									
<b>12) EARTHWORKS, EMBANKMENTS AND CUTTINGS</b>									
12.1	Slope Failure	All structural or natural failures of the embankment and cut slopes of the Project are repaired	24 hrs	28 days	6 months	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	12.1.1	Number of recorded instances of slope failure	Nil
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	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	12.2.1	Inspection records showing compliance with requirements for slopes	100%
<b>13) ITS EQUIPMENT</b>									
13.1	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 replaced. vi) Backup power supply system is available at all times	24 hrs	14 days	1 month	Visual Inspection	13.1.1	Inspection records showing compliance with requirements for maintenance of ITS equipment	100%

**ATTACHMENT 19-2: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION DURING CONSTRUCTION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Baseline Condition Repair				
13.2	<b>Dynamic Message Sign Equipment</b>	Dynamic Message Signs are free from faults such as: i) Any signal displaying a 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 hrs	24 hrs	14 days	Defect measurement dependent on equipment	13.2.1	Inspection records showing compliance with requirements for Dynamic Message Signs	100%
13.3	<b>CCTV Equipment</b>	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. iv) Moisture ingress onto CCTV camera lens. v) Faults that result in significant degradation of CCTV images.	2 hrs	24 hrs	14 days	Defect measurement dependent on equipment	13.3.1	Inspection records showing compliance with requirements for CCTV equipment	100%
13.4	<b>Vehicle Detection Equipment</b>	All equipment free of defects and operational problems such as:	2 hrs	24 hrs	1 month	Defect measurement dependent on equipment	13.4.1	Inspection records showing compliance with requirements for vehicle detection equipment in each Performance Section	100%
		i) Inoperable loops.				Traffic Detector Loops:	13.4.2	Traffic Detector Loop circuit's inductance to be > 50 and < 1,000 micro henries.	100%
		ii) Malfunctioning camera controllers.				Loop circuit's inductance to be > 50 and < 1,000 micro henries.	13.4.3	Insulation resistance to be > 50 meg ohms.	100%
<b>14) TOLLING Facilities and Buildings (Not Used)</b>									
<b>15) AMENITY</b>									
<b>16) SNOW AND ICE CONTROL</b>									
16.1	<b>Travel lanes</b>	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.	16.1.1	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	100%
						Maximum 2hrs from departure from loading point to complete treatment and return to loading point.	16.1.2	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	100%
						Maximum 1hr response time for snow and ice clearance vehicles to depart from base.	16.1.3	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	100%
16.2	<b>Weather Forecasting</b>	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.	16.2.1	Inspection records showing compliance with requirements for weather forecasting in each Performance Section	100%
16.3	<b>Operational Plans</b>	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.	16.3.1	Inspection records showing compliance with snow and ice clearance plans in each Performance Section	100%

**ATTACHMENT 19-2: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION DURING CONSTRUCTION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Baseline Condition Repair				
<b>17) INCIDENT RESPONSE</b>									
17.1	General	Monitor the Project and respond to Incidents in accordance with the Maintenance Management Plan (MMP).	1 hr	N/A	N/A	Maintenance Specifications are met for 98% of incidents measured on a 1 year rolling basis.	17.1.1	Inspection records showing compliance with the MMP and requirements regarding incident response times in each Performance Section	100%
						No complaints from Emergency Services.	17.1.2	Inspection records showing compliance with the MMP and requirements regarding incident response times in each Performance Section	100%
17.2	Hazardous Materials	Monitor the Project and respond to Incidents involving Hazardous Materials in accordance with the Maintenance Management Plan (MMP).	1 hr	N/A	N/A	MMP details the process and procedures in place and followed.	17.2.1	Inspection records showing compliance with the MMP details regarding hazardous materials in each Performance Section	100%
17.3	Structural assessment	Evaluate structural damage to structures and liaise with emergency services to ensure safe working environment while clearing the incident	1 hr	N/A	N/A	Inspections and surveys as required by incident	17.3.1	Inspection records showing compliance with the MMP and requirements for incidents in each Performance Section	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	17.4.1	Inspection records showing compliance with requirements for temporary and permanent remedy for incidents in each Performance Section	100%
<b>18) CUSTOMER RESPONSE</b>									
18.1	Response to inquiries	Timely and effective response to customer inquiries and complaints.	48 hrs	NA	NA	Contact the customer within 48 hours following initial customer inquiry.	18.1.1	Percentage of responses within specified times in each Performance Section.	100%
						All work resulting from customer requests is scheduled within 48 hours of customer contact.	18.1.2	Demonstrated by O&M Records	100%
						Follow-up contact with the customer within 72 hours of initial inquiry.	18.1.3	Demonstrated by O&M Records	100%
						All customer concerns/requests are resolved to TxDOT's satisfaction within 2 weeks of the initial inquiry.	18.1.4	Demonstrated by O&M Records	100%
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	7 days	NA	Instances of line out of action or unmanned	18.2.1	Number of operations records showing non availability of the customer contact line in each Performance Section including complaints from public.	Nil
<b>19) SWEEPING AND CLEANING</b>									
19.1	Sweeping	i) Keep all channels, hard shoulders, gore areas, ramps, intersections, islands and frontage roads swept clean with vacuum sweepers, 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	3 months	Buildup of dirt, ice, rock, debris, etc. on roadways and bridges not to accumulate greater than 24" wide or 1/2" deep	19.1.1	Inspection records showing compliance with requirements for sweeping in each Performance Section.	100%
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. Dispose of all litter and debris collected at an approved solid waste site.	24 hrs	28 days	3 months	No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed.	19.2.1	Inspection records showing compliance with requirements regarding litter pick-up in each Performance Section.	100%

**ATTACHMENT 19-2: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION DURING CONSTRUCTION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Baseline Condition Repair				

**NOTES FOR ATTACHMENT 19-1**

- 1 Hazard Mitigation shall be an action taken by Developer to mitigate a hazard to Users or imminent risk of damage or deterioration to property or the environment such that the Category 1 Defect no longer exists.
- 2 Permanent Remedy shall be an action taken by Developer to restore the condition of an Element following Hazard Mitigation of a Category 1 Defect: (a) to the standard required for new construction / Renewal Work; or (b) to a condition such that the Target is achieved for each Measurement Record.
- 3 Baseline Condition Repair shall be an action taken by Developer to restore the condition of an Element for which a Category 2 Defect has been recorded: (a) to the standard required for new construction / Renewal Work; or (b) to a condition such that the Target is achieved for each Measurement Record.

**Texas Department of Transportation**

**BOOK 2 – TECHNICAL PROVISIONS**

**FOR**

**US 181 HARBOR BRIDGE PROJECT**

**DESIGN-BUILD PROJECT**

**ATTACHMENT 19-3**

**BASELINE PERFORMANCE AND  
MEASUREMENT TABLE ROADWAY SECTION  
AFTER SUBSTANTIAL COMPLETION**

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
<b>1) ROADWAY</b>						<p><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.</i></p> <p><i>Renewal Work and new construction are subject to construction quality IRI standards (75 inches per mile for rigid pavements, 65 inches per mile for flexible pavements- refer to Technical Provisions Section 8.3.2)</i></p>			
1.1	Obstructions and debris	Roadway and clear zone free from obstructions and debris	2 hrs	NA	NA	Visual Inspection	1.1.1	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	<p><b>a) Ruts – Mainlanes, shoulders &amp; ramps</b> Depth as measured using an automated device in compliance with TxDOT Standards.</p> <p>10ft straight edge used to measure rut depth for localized areas.</p> <p><b>b) Ride quality</b> Measurement of International Roughness Index (IRI) according to TxDOT standard Tex-1001-S, Operating Inertial Profilers and Evaluating Pavement Profiles</p> <p>** To allow for measurement bias, an adjustment of -10 (minus ten) is made to IRI measurements for concrete pavements before assessing threshold compliance.</p> <p>10-ft straightedge used to measure discontinuities</p> <p><b>c) 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>d) Edge drop-offs</b> Physical measurement of edge drop-off level compared to adjacent surface</p>	1.1.1	Percentage of wheel path length with ruts greater than ¼" in depth in each Performance Section	
							1.2.1	• Mainlanes, shoulders and ramps - 3%	Nil
							1.2.2	• Frontage roads - 10%	Nil
							1.2.3	Depth of rut at any location greater than ½"	Nil
							1.2.4	For 80% of all Performance Sections measured, IRI throughout 98% of each Performance Section is less than or equal to: • Mainlanes, ramps -95" per mile**	100%
							1.2.5	• Frontage roads - 120" per mile**	100%
							1.2.6	IRI throughout 98% of each Performance Section is less than or equal to: • Mainlanes, ramps - 120" per mile**	100%
							1.2.7	• Frontage roads - 150" per mile**	100%
							1.2.8	Mainlanes, ramps, 0.1 mile average - 150" per mile**	100%
							1.2.9	Frontage roads, 0.1 mile average - 180" per mile**	100%
							1.2.10	IRI measured throughout 98% of each lane containing a bridge deck in any Performance Section, 0.1 mile average - 200" per mile**	100%
							1.2.11	Individual discontinuities greater than 1/4"	Nil
							1.2.12	Occurrence of any failure	Nil
1.2.13	Number of instances of edge drop-off greater than 2"	Nil							

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
1.2	Pavement	Road users warned of potential skidding hazards	24 hrs	28 days	6 months	e) Skid resistance ASTM E 274 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	1.2.14	• Performance Sections with skid numbers for 0.5-mile section of mainlines, shoulders and ramps exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	100%
							1.2.15	• Performance Sections with skid numbers for 0.5-mile section of frontage roads exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	100%
							1.2.16	• When the skid number is below 25 and/or when a site is categorized by TxDOT in accordance with the Wet Weather Accident Reduction Program, as a Wet Weather Accident Site, Developer shall perform a site investigation and perform required corrective action.	100%
							1.2.17	Instances where road users are warned of a potential skidding hazard where corrective action is required following the categorization as a Wet Weather Accident Reduction Site.	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	1.3.1	Number of potholes of low severity or higher	Nil
						b) Base failures	1.3.2	Number of base failures of low severity or higher	Nil
1.4	Joints in concrete	Joints in concrete paving are sealed and watertight Longitudinal joint separation is controlled	24 hrs	28 days	6 months	Visual inspection of joints	1.4.1	Length of unsealed joints greater than ¼"	Nil
						Measurement of joint width and level difference of two sides of joints	1.4.2	Joint width more than 1" or faulting more than ¼"	Nil
1.5	Curbs	Curbs are in good alignment and free of Defects	24 hrs	28 days	6 months	Visual inspection	1.5.1	Continuous curb lengths where more than 10% of the length has defects such as cracks and chips	Nil
						Physical measurement	1.5.2	Continuous curb lengths where more than 5% of the length has a separation exceeding 0.25" between curb face and adjacent roadway surface	Nil
						Survey and 10' straight edge	1.5.3	Continuous curb lengths where more than 5% of the length has either the top or face of curbs exceeding 0.5" from intended design alignment	Nil
1.6	Maintenance/Access Roads	Maintenance / access roads are free of Defects	24 hrs	28 days	6 months	Crown: Flat A shape or super-elevation with 4% cross slopes maintained to minimize ponding	1.6.1	Cross slope less than 3% or more than 6%	Nil
						Shoulder: Maintain slope away from the travel way and shoulder flush with travel way	1.6.2	Shoulder cross slope less than travel way cross slope; shoulder lower or higher than travel way	Nil
						Ditch: Maintain size and shape of ditch for proper drainage	1.6.3	Sides of ditches slumping or eroding, or obstructed by debris	Nil
						Ruts/potholes: Depth as measured using an automated device in compliance with TxDOT standards	1.6.4	Depth of ruts or potholes at any location greater than 1"	Nil
						Subgrade: Identify and repair any subgrade failures	1.6.5	Locations where subgrade failure is evident	Nil

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
<b>2) DRAINAGE</b>									
2.1	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.	2.1.1	Length of pipe or channel in feet with less than 90% of cross sectional clear area, calculated as the arithmetic mean of the clear cross-sectional areas of individual 10 feet lengths of pipes and channels in each Performance Section.	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 on Emergency.	24 hrs	28 days	6 months	Visual inspection	2.2.1	Number of 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.	2.3.1	Number of instances of hazardous water build-up.	Nil
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	2.4.1	Performance Sections with surface water discharge systems performing their proper function and discharging in compliance with the relevant legislation and permits.	100%
2.5	Protected Species	Named species and habitats are protected.	24 hrs	28 days	6 months	Visual inspection	2.5.1	Performance Sections with named species and habitats with protection of these named species and habitats.	100%
<b>3) STRUCTURES</b>									
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"> <li>• undesirable vegetation</li> <li>• debris and excessive bird droppings</li> <li>• blocked drains, weep pipes manholes and chambers</li> <li>• blocked drainage holes in structural components</li> <li>• defects in joint sealants</li> <li>• defects in pedestrian protection measure</li> <li>• scour damage</li> <li>• corrosion of rebar</li> <li>• paint system failures</li> <li>• impact damage</li> </ul>	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.		<i>Records as required in the TxDOT Bridge Inspection Manual</i>	
						As above	3.1.1	Occurrence of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below seven for any deck, superstructure or substructure	Nil
						As above	3.1.2	Performance Sections with structure components with condition states of one, in accordance with the TxDOT Field Inspection Manual	100%

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
3.2	Structure components	i) Expansion joints are free of: <ul style="list-style-type: none"> <li>dirt debris and vegetation</li> <li>defects in drainage systems</li> <li>loose nuts and bolts</li> <li>defects in gaskets</li> </ul> ii) The deck drainage system is free of all debris and operates as intended. iii) Parapets are free of: <ul style="list-style-type: none"> <li>loose nuts or bolts</li> <li>blockages of hollow section drain holes</li> <li>vegetation</li> <li>accident damage</li> </ul> iv) Bearings and bearing shelves are clean. Bearings allow for translation and rotation as designed. No presence of water exists on bearings and bearing seats. v) Sliding and roller surfaces are clean and greased to ensure satisfactory performance. Additional advice contained in bearing manufacturers' instructions is followed. 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	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.	3.2.1	Occurrence of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below <b>seven (7)</b> for any deck, superstructure or substructure	Nil
						Visual inspection of Elements listed in (i) through (vii) of the general performance requirement column.	3.2.2	Instances of condition of any element not meeting general performance requirement as determined in accordance with Good Industry Practice.	Nil
3.9	Non-bridge class culverts	Non-bridge-class culverts are free of: <ul style="list-style-type: none"> <li>vegetation and debris and silt</li> <li>defects in sealant to movement joints</li> <li>scour damage</li> </ul>	24 hrs	28 days	NA	Visual inspection	3.9.1	Number of non-bridge class culverts with vegetation, debris and silt in each Performance Section	Nil
							3.9.2	Number of non-bridge class culverts with defects in sealant and movement joints in each Performance Section	Nil
							3.9.3	Number of non-bridge class culverts with scour damage in each Performance Section	Nil
3.10	Gantries and High-masts	Overhead sign bridges, high masts are structurally sound and free of: <ul style="list-style-type: none"> <li>loose nuts and bolts</li> <li>defects in surface protection systems</li> </ul>	24 hrs	28 days	NA	Visual and up close inspection	3.10.1	Number of gantries and high masts with loose assemblies in each Performance Section	Nil
							3.10.2	Number of gantries and high masts with defects in surface protection in each Performance Section	Nil
3.11	Load Ratings	All structures maintain the design load capacity.	24 hrs	7 days	NA	Load rating calculations in accordance with the Manual for Bridge Evaluation and the TxDOT Bridge Inspection Manual and per the Technical Provisions	3.11.1	Number of structures with load restrictions for Texas legal loads (including legally permitted vehicles) in each Performance Section	Nil
3.12	Access Points	All hatches and points of access have fully operational and lockable entryways.	24 hrs	28 days	6 months	Visual Inspection	3.12.1	Number with defects in locks or entryways	Nil

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
3.13	<b>Mechanically Stabilized Earth and Retaining Walls</b>	Mechanically Stabilized Earth and Retaining Walls free of: <ul style="list-style-type: none"> <li>blocked weep holes</li> <li>undesirable vegetation</li> <li>defects in joint sealants</li> <li>defects in pedestrian protection</li> <li>scour damage</li> <li>corrosion of reinforcing bars</li> <li>paint system failure</li> <li>concrete spalling</li> <li>impact damage</li> </ul> Parapets free of: <ul style="list-style-type: none"> <li>loose nuts and bolts</li> <li>blockage of drain holes</li> <li>undesirable vegetation</li> <li>impact damage</li> <li>concrete spalling</li> </ul>	24 hrs	28 days	6 months	Inspection and assessment in accordance with the requirements of federal Nations Bridge Inspection Standards (NBIS) of the Code of Federal Regulations, 23 Highways - Part 650, the TxDOT Bridge Inspection Manual and the Federal Highway Administration's Bridge Inspector's Reference Manual.	3.13.1	Records as required in the TxDOT Bridge Inspection Manual	100%
						Visual Inspection	3.13.2	Number of parapet areas with loose nuts & bolts, blockage, undesirable vegetation, impact damage or concrete spalling in the Performance Section.	Nil
3.14	<b>Structural Surfaces</b>	Vertical Surfaces free of graffiti, markings by vandalism.	24 hrs	28 days	6 months	Visual Inspection	3.14.1	Number of areas where graffiti is present	Nil
<b>4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS</b>									
4.1	<b>Pavement markings</b>	Pavement markings are: <ul style="list-style-type: none"> <li>clean and visible during the day and at night</li> <li>whole and complete and of the correct color, type, width and length</li> <li>placed to meet the TMUTCD and TxDOT's Pavement Marking Standard Sheets</li> </ul>	24 hrs	28 days	6 months	<b>a) Markings - General</b>			
						Portable retroreflector, which uses 30 meter geometry, meeting the requirements described in ASTM E 1710	4.1.1	Percentage of total length of pavement marking in each Performance Section meeting the minimum retroreflectivity 175 med/sqm/lx for white	100%
							4.1.2	Percentage of total length of pavement marking in each Performance Section meeting the minimum retroreflectivity 125 med/sqm/lx for white	100%
						Physical measurement	4.1.3	Length of pavement marking in each Performance Section with more than 5% loss of area of material at any point	Nil
							4.1.4	Length of pavement marking in each Performance Section with spread more than 10% of specified dimensions.	Nil
						<b>b) Profile Markings</b>			
	Visual inspection	4.1.5	Percentage of total length of pavement marking in each Performance Section performing its intended function and compliant with relevant regulations	100%					
4.2	<b>Raised Reflective Markings</b>	Raised reflective pavement markers are: <ul style="list-style-type: none"> <li>clean and clearly visible</li> <li>of the correct color and type</li> <li>reflective or retroreflective in accordance with TxDOT standards</li> <li>correctly located, aligned and at the correct level</li> <li>are firmly fixed</li> <li>are in a condition that will ensure that they remain at the correct level.</li> </ul>	24 hrs	28 days	6 months	Visual inspection			
							4.2.1	Number of markers associated with road markings that are ineffective in any 10 consecutive markers. (Ineffective includes missing, damaged, settled or sunk)	Nil
							4.2.2	A minimum of four markers are visible at 80' spacing when viewed under low beam headlights.	100%
		4.2.3	Uniformity (replacement raised reflective pavement markers have equivalent physical and performance characteristics to adjacent markers).	100%					

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
4.3	<b>Delineators and Markers</b>	Object markers, mail box markers and delineators are: • clean and visible • of the correct color and type • legible and reflective • straight and vertical	24 hrs	28 days	6 months	Visual inspection	4.3.1	Number of object markers or delineators in each Performance Section that is defective or missing	Nil
<b>5) GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS</b>									
5.1	<b>Guardrails and Safety Barriers</b>	All guardrails, safety barriers, concrete barriers, etc. are maintained free of Defects, , and undesirable vegetation. 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.	24 hrs	28 days	6 months	Visual inspection	5.1.1	Performance Sections with all guard rails and safety barriers appropriately placed and correction installed	100%
							5.1.2	Performance Sections with all guard rails and safety barriers free from defects	100%
							5.1.3	Performance Sections with all guard rails and safety barriers at correct heights	100%
							5.1.4	Performance Sections with all guard rails and safety barriers at correct distances from roadway obstacles	100%
5.2	<b>Impact Attenuators</b>	All impact attenuators are appropriately placed and correctly installed	24 hrs	28 days	6 months	Visual inspection	5.2.1	Performance Sections will all impact attenuators appropriately placed and correctly installed.	100%
<b>6) TRAFFIC SIGNS</b>									
6.1	<b>General - All Gantry-Mounted overhead signs</b>	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) Visibility distances meet the stated requirements  iv) Obsolete and redundant signs are removed or replaced as appropriate  v) Sign information is of the correct size, location, type and wording to meet its intended purpose and any statutory requirements vi) All structures and elements of the signing system are kept clean and free from debris and have clear access provided. vii) All replacement and repair materials and equipment are in accordance with the requirements of the TMUTCD  viii) Dynamic message signs are in an operational condition	24 hrs	28 days	6 months	<b>a) Retroreflectivity</b> Determination of Coefficient of retro-reflectivity	6.1.1	Number of signs with actual reflectivity below the requirements of TxDOT's TMUTCD in each Performance Section	Nil
						<b>b) Face damage</b> Visual inspection	6.1.2	Number of signs in each Performance Section with face damage greater than 5% of area	Nil
						<b>c) Placement</b> Visual inspection	6.1.3	All signs in each Performance Section are placed in accordance with TxDOT's Sign Crew Field Book including not twisted or leaning	100%
						<b>d) Obsolete signs</b> Visual inspection	6.1.4	Number of obsolete signs in each Performance Section	100%
						<b>e) Sign Information</b> Visual inspection	6.1.5	All sign information in each Performance Section is of the correct size, location, type and wording to meet its intended purpose	100%
						<b>f) Dynamic Message Signs</b> Visual inspection			

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
6.2	Gantries	Sign and signal mounting structures (including gantries) are structurally sound and free of:  • defects in surface protection systems  • loose nuts and bolts  • graffiti	24 hrs	28 days	6 months	Visual inspection	6.2.1	Number with defects in surface protection system	Nil
							6.2.1	Number with loose nuts and bolts	Nil
							6.2.3	Number with graffiti	Nil
<b>7) TRAFFIC SIGNALS (NOT PART OF MAINTAINED ELEMENTS)</b>									
<b>8) LIGHTING</b>									
8.1	Roadway Lighting	i) All lighting is free from defects and provides acceptable uniform lighting quality ii) Lanterns are clean and correctly positioned iii) Lighting units are free from any damage or vandalism iv) Columns are upright, correctly founded, visually acceptable and structurally sound	24 hrs	28 days	6 months	a) Mainlane lights operable Night time inspection or automated logs	8.1.1	Performance Sections with less than 90% of lights functioning correctly at all times	Nil
						b) Mainlane lights out of action Night time inspection or automated logs			
8.2	Sign Lighting	Sign lighting is fully operational	24 hrs	28 days	6 months	Night time inspection or automated logs	8.2.1	Number of instances of more than one bulb per sign not working in each Performance Section	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	28 days	Testing to meet NEC regulations, visual inspection	8.3.1	Inspection records showing safe installation and maintenance in each Performance Section	Nil
8.4	Access Panels	All access panels in place at all times.	24 hrs	7 days	28 days	Visual Inspection	8.4.1	Number of instances of missing or damaged access panels in each Performance Section	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	24 hrs	28 days	6 months	Night-time inspections or automated logs	8.5.1	Instances of two or more lamps not working per high mast pole	Nil

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
<b>9) FENCES, WALLS AND SOUND ABATEMENT</b>									
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	9.1.1	Inspection records for fences and walls showing compliance with fence and wall requirements in each Performance Section	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	9.2.2	Inspection records for fences and walls showing compliance with fence and wall requirements in each Performance Section	100%
9.3	Operation	Fences, Walls, and Sound Abatement elements free of: <ul style="list-style-type: none"> <li>• blocked weep holes</li> <li>• undesirable vegetation</li> <li>• defects in joint sealants</li> <li>• defects in pedestrian protection</li> <li>• scour damage</li> <li>• corrosion of reinforcing bars</li> <li>• paint system failure</li> <li>• concrete spalling</li> <li>• impact damage</li> <li>• graffiti</li> </ul>	24 hrs	28 days	6 months	Structural assessment if visual inspection warrants	9.3.1	Inspection records for fences and walls showing compliance with fence and wall requirements in each Performance Section	100%
<b>10) ROADSIDE MANAGEMENT</b>									
10.1	Vegetated Areas - Except landscaped areas - General	Vegetation is maintained so that: <ul style="list-style-type: none"> <li>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.</li> <li>ii) Spot mowing at intersections, ramps or other areas maintains visibility of appurtenances and sight distance.</li> <li>iii) Grass or vegetation does not encroach into or on paved shoulders, main lanes, sidewalks, islands, riprap, traffic barrier or curbs.</li> <li>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.</li> <li>v) A full width mowing cycle is completed after the first frost.</li> </ul>	24 hrs	7 days	28 days	a) <b>Urban areas</b> Physical measurement of height of grass and weeds	10.1.1	Individual measurement areas in each Performance Section to have 95% of grass and weeds between 5" and 18" in height.	100%
						b) <b>Encroachment</b> Visual inspection of instances of encroachment of vegetation	10.1.2	Number of occurrences of vegetation encroachment in each Performance Section	Nil
						c) <b>Wildflowers</b> Visual Inspection with audit of process.	10.1.3	Adherence to vegetation management manuals	100%
						d) <b>Sight lines</b> Visual inspection	10.1.4	Number of instances of impairment of sight lines or sight distance to signs in each Performance Section	Nil
10.2	Landscaped Areas	<ul style="list-style-type: none"> <li>i) All landscaped areas are maintained to their originally constructed condition. Landscaped areas are as designated in the plans.</li> <li>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 MMP.</li> <li>iii) The height of grass and weeds is kept between 2" and 8". Mowing begins before vegetation reaches 8 in.</li> <li>iv) Damaged or dead vegetation is replaced.</li> <li>v) Areas under approach structures are kept free of weeds and undesirable vegetation, and under-bridge gravel or rip-rap is maintained in its originally constructed condition.</li> </ul>	24 hrs	7 days	28 days	Visual inspection	10.2.1	Inspection records showing compliance with requirements for landscaping in each Performance Section.	100%

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
10.3	Fire Hazards	Fire hazards are controlled	24 hrs	7 days	28 days	Visual inspection	10.3.1	Number of instances of dry brush or vegetation forming fire hazard in each Performance Section.	Nil
10.4	Trees, Bushes 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. 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.	24 hrs	7 days	28 days	Visual inspection	10.4.1	Inspection records showing compliance with requirements for trees, brush and ornamentals in each Performance Section.	100%
10.5	Wetlands	Wetlands are managed in accordance with the permit requirements.	24 hrs	7 days	28 days	Visual inspection, assessment of permit issuers	10.5.1	Number of instances of permit requirements not met in each Performance Section	Nil
<b>11) REST AREAS AND PICNIC AREAS (Not Used)</b>									
<b>12) EARTHWORKS, EMBANKMENTS AND CUTTINGS</b>									
12.1	Slope Failure	All structural or natural failures of the embankment and cut slopes of the Project are repaired	24 hrs	28 days	6 months	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	12.1.1	Number of recorded instances of slope failure in each Performance Section	Nil
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	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	12.2.1	Inspection records showing compliance with requirements for slopes in each Performance Section.	100%

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
<b>13) ITS EQUIPMENT</b>									
13.1	<b>ITS Equipment - Maintenance</b>	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 replaced. vi) Backup power supply system is available at all times	24 hrs	14 days	28 days	Visual Inspection	13.1.1	Inspection records showing compliance with requirements for maintenance of ITS equipment in each Performance Section.	100%
13.2	<b>Dynamic Message Sign Equipment</b>	Dynamic Message Signs are free from faults such as: i) Any signal displaying a 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 hrs	24 hrs	14 days	Defect measurement dependent on equipment	13.2.1	Inspection records showing compliance with requirements for Dynamic Message Signs in each Performance Section	100%
13.3	<b>CCTV Equipment</b>	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. iv) Moisture ingress onto CCTV camera lens. v) Faults that result in significant degradation of CCTV images.	2 hrs	24 hrs	14 days	Defect measurement dependent on equipment	13.3.1	Inspection records showing compliance with requirements for CCTV equipment in each Performance Section	100%
13.4	<b>Vehicle Detection Equipment</b>	All equipment free of defects and operational problems such as: i) Inoperable loops. ii) Malfunctioning camera controllers.	2 hrs	24 hrs	28 days	Defect measurement dependent on equipment	13.4.1	Inspection records showing compliance with requirements for vehicle detection equipment in each Performance Section	100%
							13.4.2	Traffic Detector Loop circuit's inductance to be > 50 and < 1,000 micro henries.	100%
							13.4.3	Insulation resistance to be > 50 meg ohms.	100%

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
<b>14) TOLLING FACILITIES AND BUILDINGS (NOT USED)</b>									
<b>15) AMENITY (NOT USED)</b>									
<b>16) SNOW AND ICE CONTROL</b>									
16.1	Travel lanes	Maintain travel way free from snow and ice.	2 hrs	NA	NA	Maximum 1hr response time to complete manning and loading of spreading vehicles.	16.1.1	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	100%
						Maximum 2hrs from departure from loading point to complete treatment and return to loading point.	16.1.2	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	100%
						Maximum 1hr response time for snow and ice clearance vehicles to depart from base.	16.1.3	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	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	NA	NA	Operations plan details the process and procedures in place and followed.	16.2.1	Inspection records showing compliance with requirements for weather forecasting in each Performance Section	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	NA	NA	Operations plan details the process and procedures in place and followed.	16.3.1	Inspection records showing compliance with snow and ice clearance plans in each Performance Section	100%
16.4	Operations and Maintenance Manual	Operations and maintenance instructions for the anti-icing system and items of equipment (if Used)	2 hrs	NA	NA	Operations and maintenance instructions detail the process and procedures in place and followed.	16.4.1	Inspection records showing compliance with operations and maintenance instructions in each Performance Section.	100%
<b>17) INCIDENT RESPONSE</b>									
17.1	General	Monitor the Project and respond to Incidents in accordance with the Maintenance Management Plan (MMP).	1 hr	NA	NA	Response times are met for 98% of incidents measured on a 1 year rolling basis.	17.1.1	Inspection records showing compliance with the MMP and requirements regarding incident response times in each Performance Section	100%
						No complaints from Emergency Services.	17.1.2	Inspection records showing compliance with the MMP and requirements regarding incident response times in each Performance Section	100%
17.2	Hazardous Materials	Monitor the Project and respond to Incidents involving Hazardous Materials in accordance with the Maintenance Management Plan (MMP).	1 hr	NA	NA	MMP details the process and procedures in place and followed.	17.2.1	Inspection records showing compliance with the MMP details regarding hazardous materials in each Performance Section	100%
17.3	Structural Assessment	Evaluate structural damage to structures and liaise with emergency services to ensure safe working environment while clearing the incident	1 hr	NA	NA	Inspections and surveys as required by incident	17.3.1	Inspection records showing compliance with the MMP and requirements for incidents in each Performance Section	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	NA	Review and inspection of the incident site	17.4.1	Inspection records showing compliance with requirements for temporary and permanent remedy for incidents in each Performance Section	100%

**ATTACHMENT 19-3: PERFORMANCE AND MEASUREMENT TABLE BASELINE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	PERFORMANCE REQUIREMENT	DEFECT REMEDY PERIOD			INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	TARGET
			Cat 1	Cat 1	Cat 2				
			Hazard Mitigation	Permanent Remedy	Permanent Repair				
<b>18) CUSTOMER RESPONSE</b>									
18.1	Response to inquiries	Timely and effective response to customer inquiries and complaints.	48 hrs	NA	NA	Contact the customer within 48 hours following initial customer inquiry.	18.1.1	Percentage of responses within specified times in each Performance Section.	100%
						All work resulting from customer requests is scheduled within 48 hours of customer contact.	18.1.2	Demonstrated by O&M Records	100%
						Follow-up contact with the customer within 72 hours of initial inquiry.	18.1.3	Demonstrated by O&M Records	100%
						All customer concerns/requests are resolved to TxDOT's satisfaction within 2 weeks of the initial inquiry.	18.1.4	Demonstrated by O&M Records	100%
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	7 days	NA	Instances of line out of action or unmanned	18.2.1	Number of operations records showing non availability of the customer contact line in each Performance Section including complaints from public.	Nil
<b>19) SWEEPING AND CLEANING</b>									
19.1	Sweeping	i) Keep all channels, hard shoulders, gore areas, ramps, intersections, islands and frontage roads swept clean with vacuum sweepers, 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	3 months	Buildup of dirt, ice, rock, debris, etc. on roadways and bridges not to accumulate greater than 24" wide or 1/2" deep	19.1.1	Inspection records showing compliance with requirements for sweeping in each Performance Section.	100%
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. Dispose of all litter and debris collected at an approved solid waste site.	24 hrs	28 days	3 months	No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed.	19.2.1	Inspection records showing compliance with requirements regarding litter pick-up in each Performance Section.	100%

**NOTES FOR ATTACHMENT 19-3**

- 1 Hazard Mitigation shall be an action taken by Developer to mitigate a hazard to Users or imminent risk of damage or deterioration to property or the environment such that the Category 1 Defect no longer exists.
- 2 Permanent Remedy shall be an action taken by Developer to restore the condition of an Element following Hazard Mitigation of a Category 1 Defect: (a) to the standard required for new construction / Renewal Work; or (b) to a condition such that the Target is achieved for each Measurement Record.
- 3 Permanent Repair shall be an action taken by Developer to restore the condition of an Element for which a Category 2 Defect has been recorded: (a) to the standard required for new construction / Renewal Work; or (b) to a condition such that the Target is achieved for each Measurement Record.

**Texas Department of Transportation**  
**BOOK 2 – TECHNICAL PROVISIONS**  
**FOR**  
**US 181 HARBOR BRIDGE PROJECT**  
**DESIGN-BUILD PROJECT**

**ATTACHMENT 19-4**  
**OPERATIONS AND MAINTENANCE LIMITS**

**PRELIMINARY**  
SUBJECT TO CHANGE

	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 1)	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 2)	O&M LIMITS AFTER SUBSTANTIAL COMPLETION
	x		x
	x		
		x	

--- EXISTING ROW  
- - - PROPOSED ROW



MATCHLINE I-37 STA 89+50

MATCHLINE C-C  
SEE SHEET 15 OF 15

ATTACHMENT 19-4  
O&M LIMITS  
SCALE: 1" = 200'  
SHEET 1 OF 15

Scale: 1:200  
Plotted on: 10/23/2014

Model Name: PLN031

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**PRELIMINARY**  
SUBJECT TO CHANGE

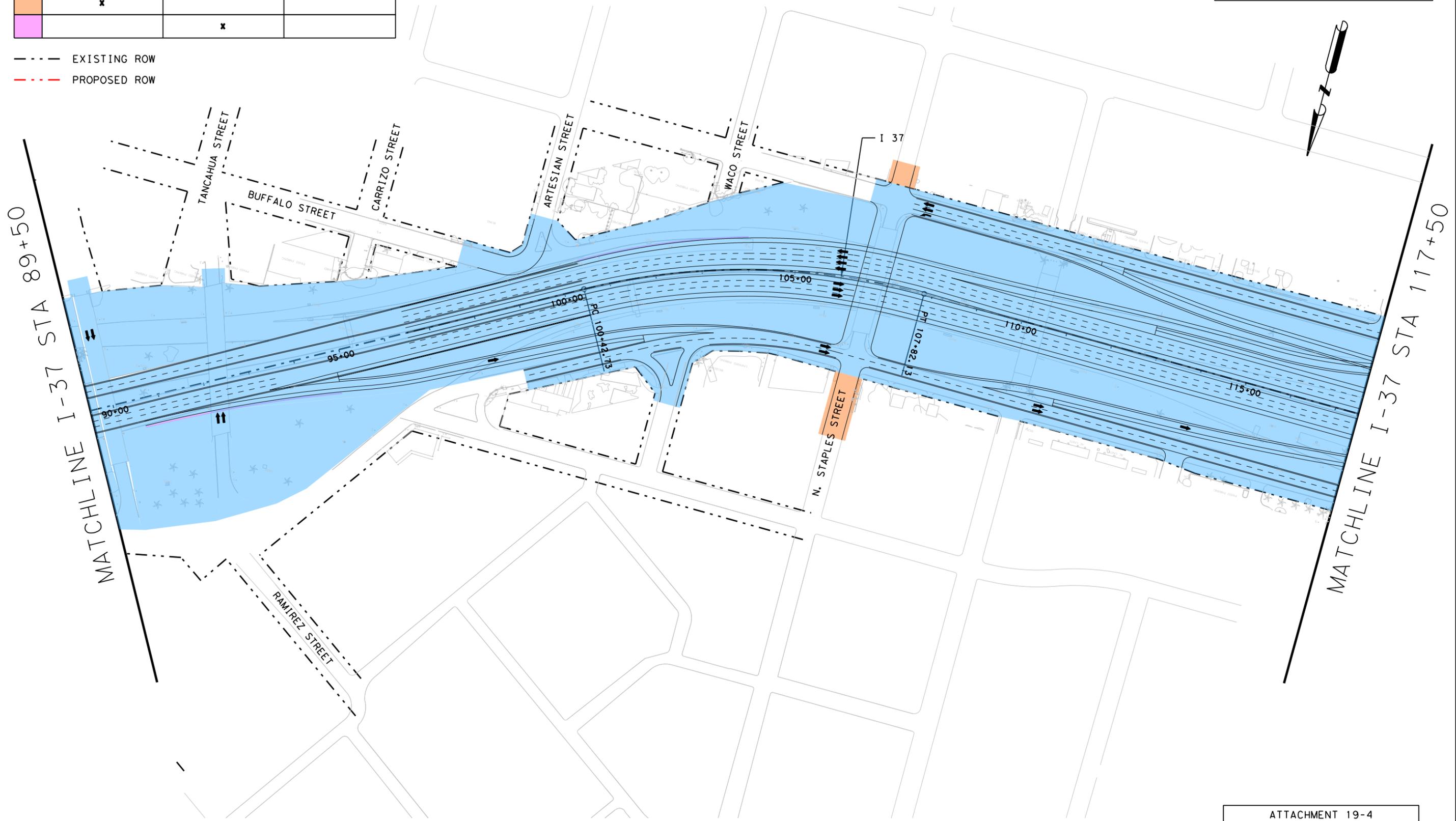
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Orange	x		
Pink		x	

--- EXISTING ROW  
- - - PROPOSED ROW

Scale: 1:200  
Plotted on: 10/23/2014

Model Name: PLN032

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ATTACHMENT 19-4  
O&M LIMITS  
SCALE: 1" = 200'

MATCHLINE US-181/SH-286 STA 1169+90.6

SEE SHEET 12 OF 15

	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 1)	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 2)	O&M LIMITS AFTER SUBSTANTIAL COMPLETION
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	x		
		x	

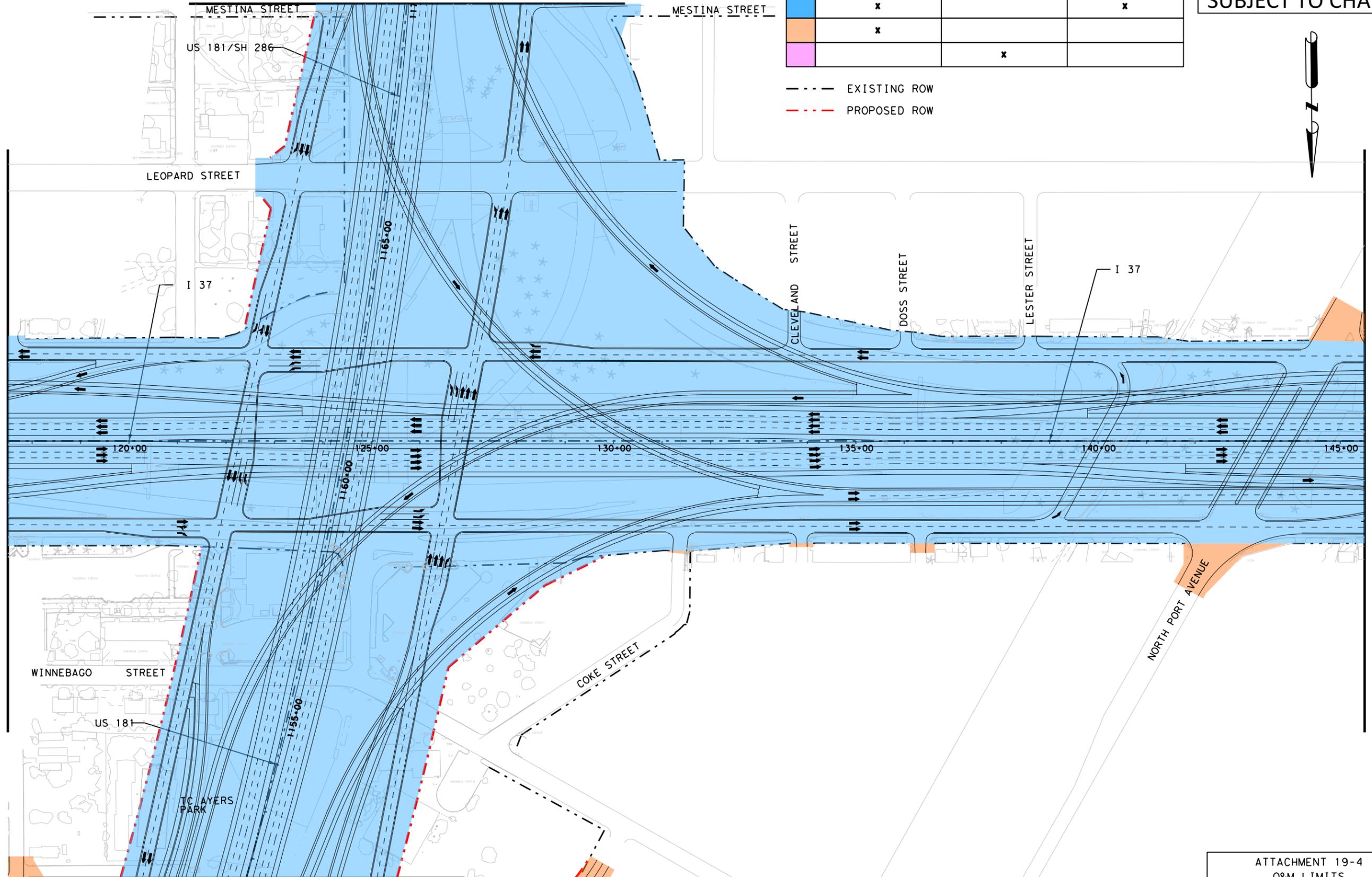
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--- EXISTING ROW  
- - - PROPOSED ROW



MATCHLINE I-37 STA 117+50

MATCHLINE I-37 STA 145+50



MATCHLINE US-181 STA 1151+58.1

SEE SHEET 11 OF 15

ATTACHMENT 19-4  
O&M LIMITS  
SCALE: 1" = 200'

SHEET 3 OF 15

Scale: 1:200  
Plotted on: 10/23/2014

Model Name: PLN033

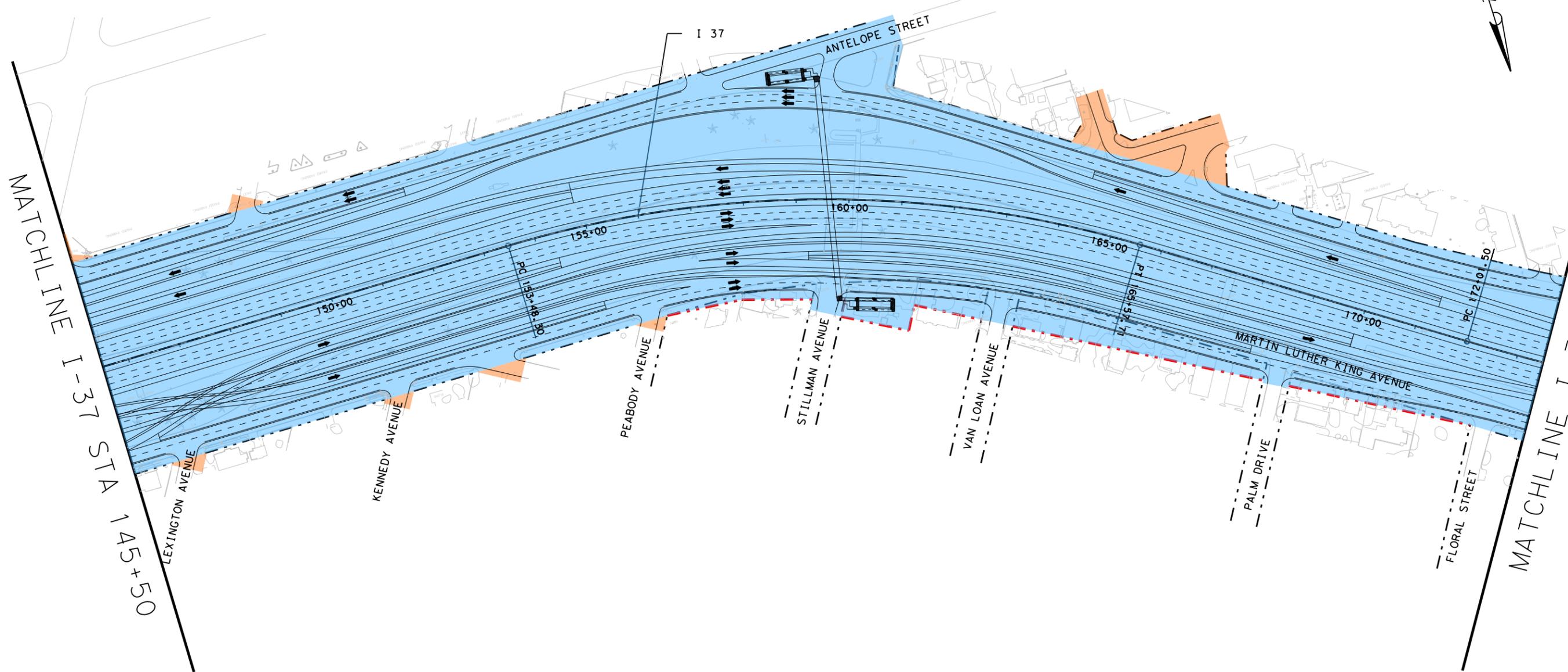
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**PRELIMINARY**  
SUBJECT TO CHANGE



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Blue	x		x
Orange	x		
Pink		x	

--- EXISTING ROW  
- - - PROPOSED ROW



Scale: 1"=200  
Plotted on: 10/23/2014

Model Name: PLN034

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Design File Name: US181HB-E-RD-PLN00.dgn

ATTACHMENT 19-4  
O&M LIMITS  
SCALE: 1" = 200'

**PRELIMINARY**  
SUBJECT TO CHANGE



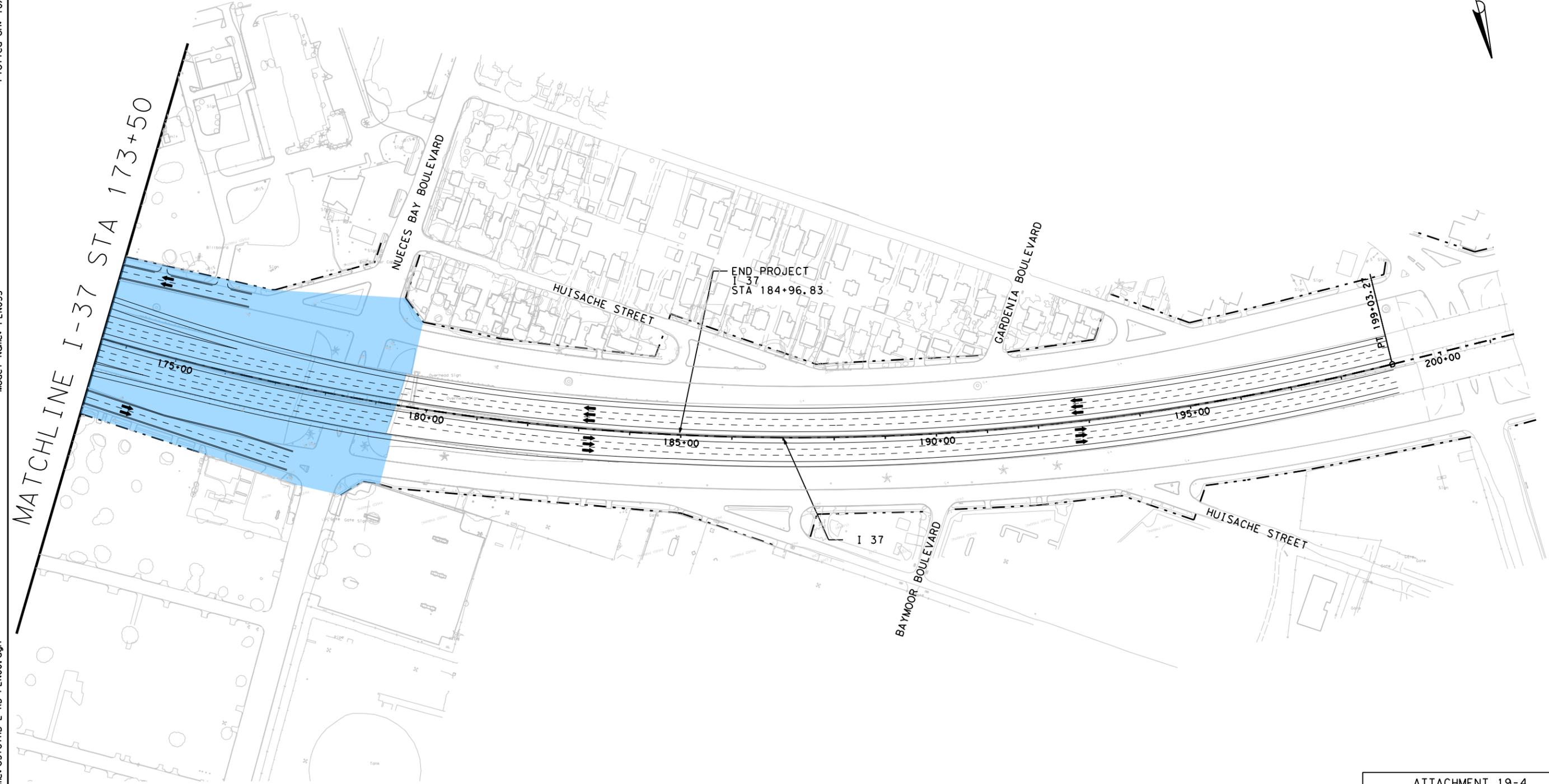
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	x		
		x	

--- EXISTING ROW  
- - - PROPOSED ROW

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Plotted on: 10/23/2014

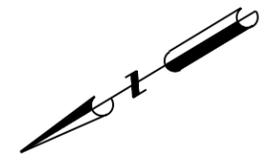
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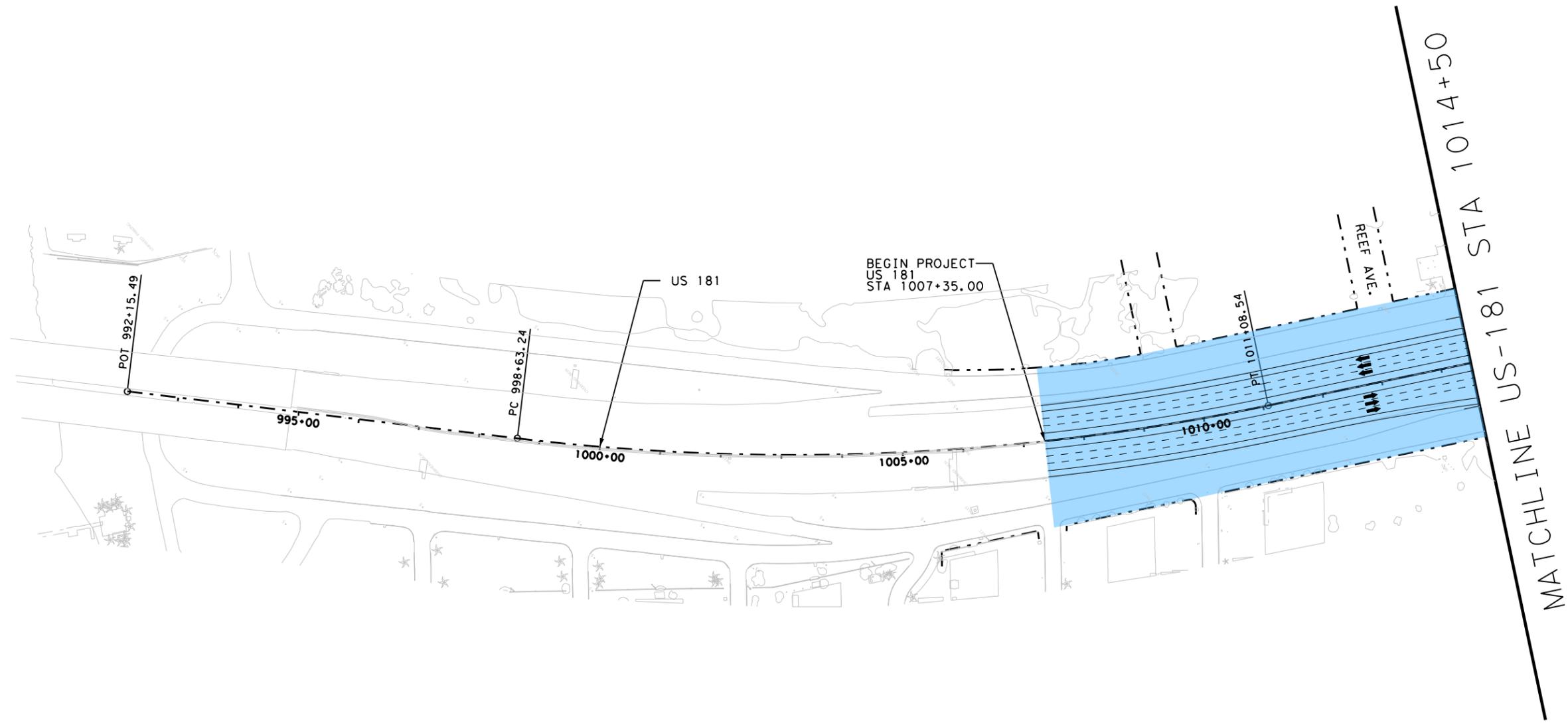
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O&M LIMITS  
SCALE: 1" = 200'

**PRELIMINARY**  
SUBJECT TO CHANGE



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	x		x
	x		
		x	

--- EXISTING ROW  
- - - PROPOSED ROW



ATTACHMENT 19-4  
O&M LIMITS  
SCALE: 1" = 200'

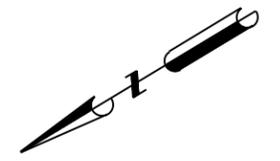
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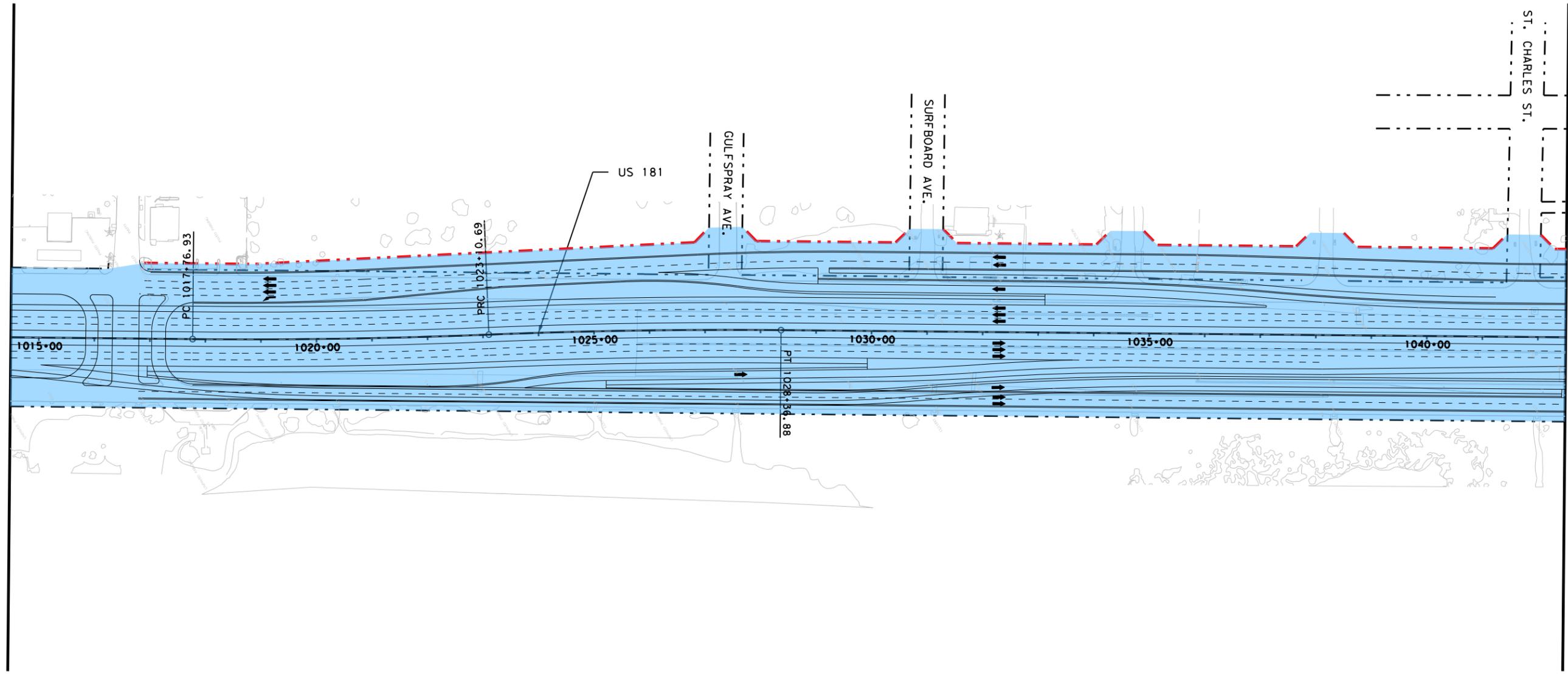
**PRELIMINARY**  
 SUBJECT TO CHANGE



--- EXISTING ROW  
 - - - PROPOSED ROW

MATCHLINE US-181 STA 1014+50

MATCHLINE US-181 STA 1042+50



ATTACHMENT 19-4  
 O&M LIMITS  
 SCALE: 1" = 200'

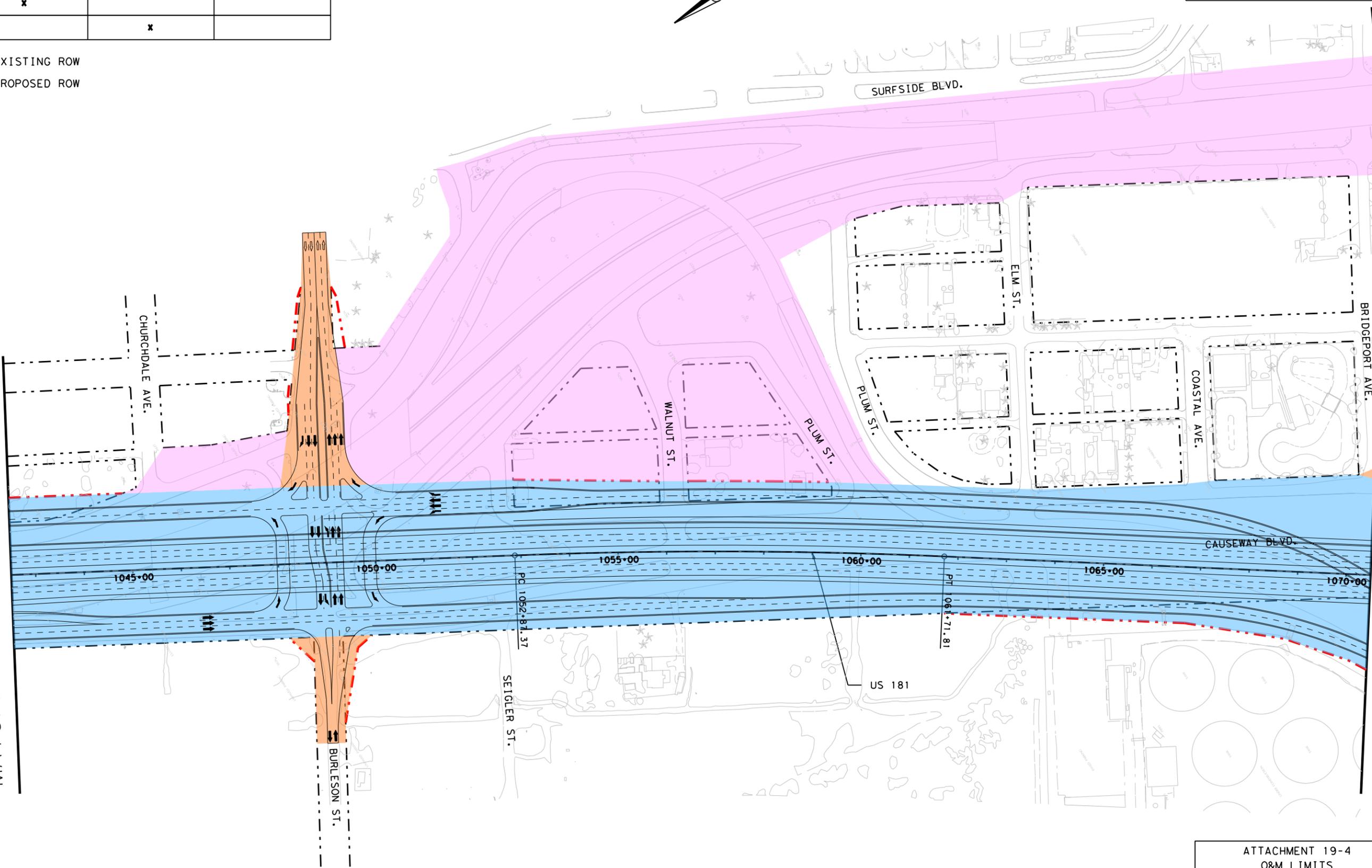
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	x		
		x	

--- EXISTING ROW  
 - - - PROPOSED ROW

**PRELIMINARY**  
 SUBJECT TO CHANGE

MATCHLINE US-181 STA 1042+50

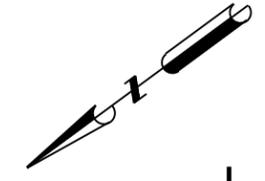
MATCHLINE US-181 STA 1070+50



MATCHLINE A-A  
 SEE SHEET 14 OF 15

ATTACHMENT 19-4  
 O&M LIMITS  
 SCALE: 1" = 200'  
 SHEET 8 OF 15

**PRELIMINARY**  
SUBJECT TO CHANGE



	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 1)	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 2)	O&M LIMITS AFTER SUBSTANTIAL COMPLETION
Blue	x		x
Orange	x		
Pink		x	

--- EXISTING ROW  
- - - PROPOSED ROW

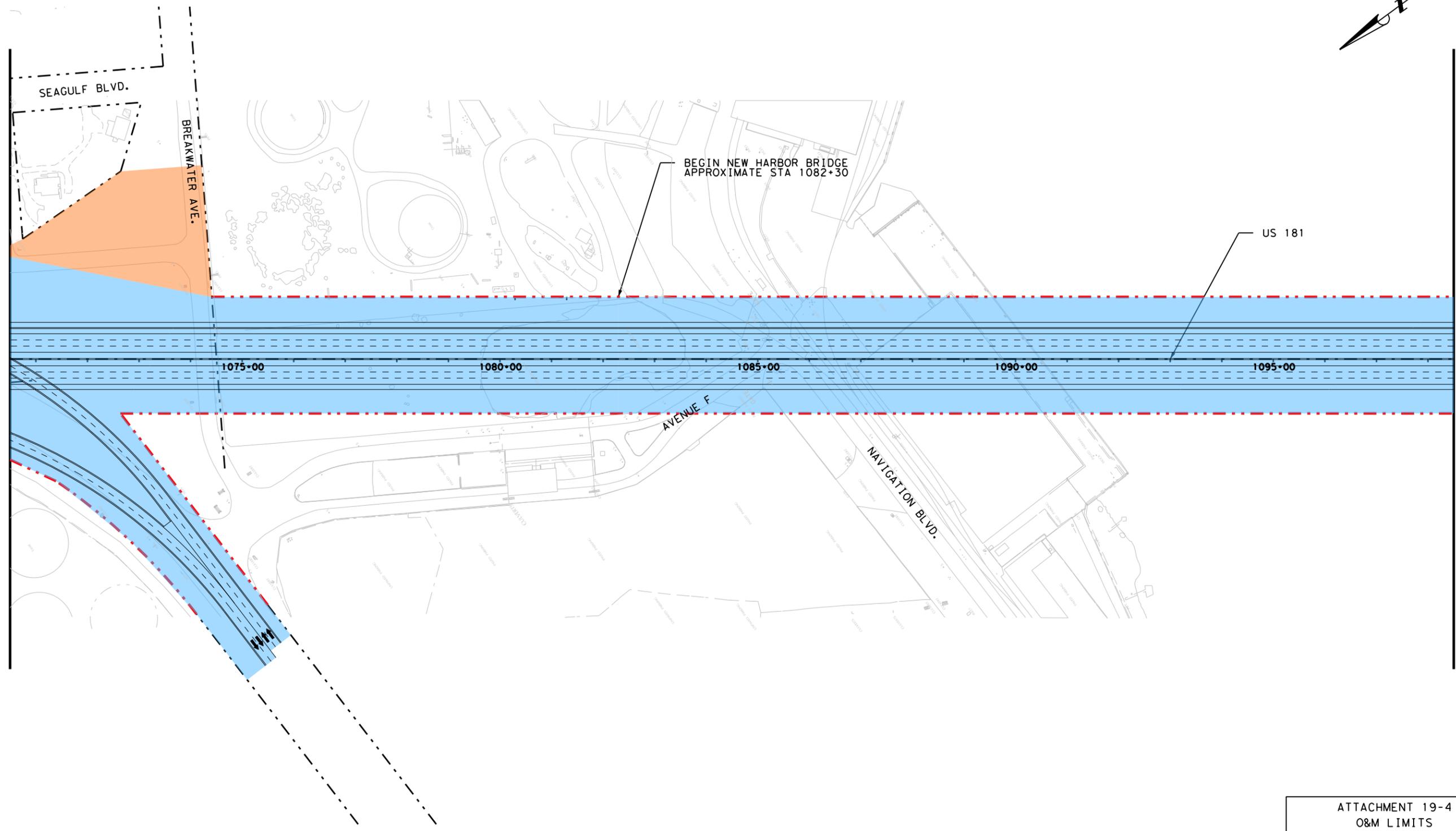
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MATCHLINE US-181 STA 1070+50

MATCHLINE US-181 STA 1098+50



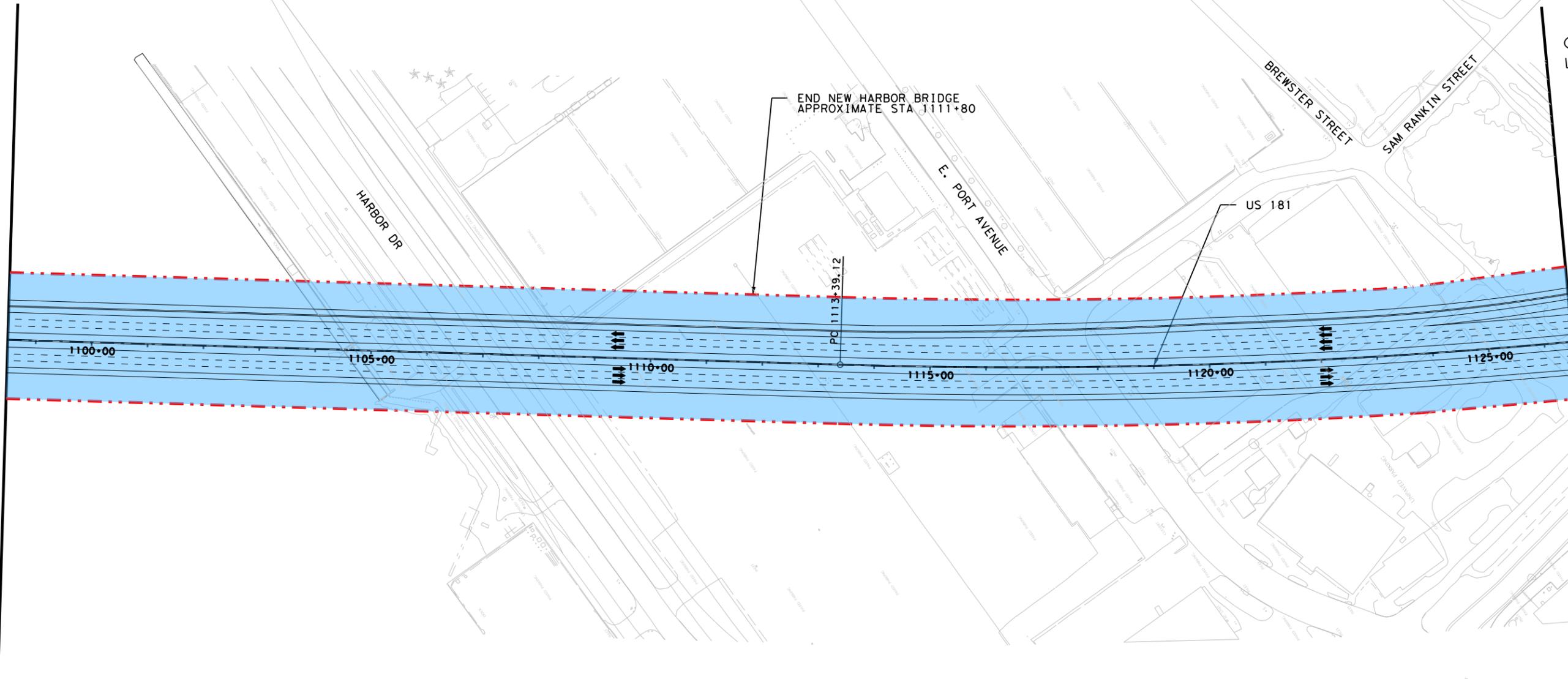
ATTACHMENT 19-4  
O&M LIMITS  
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MATCHLINE US-181 STA 1098+50

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	x		
		x	

**PRELIMINARY**  
 SUBJECT TO CHANGE

--- EXISTING ROW  
 - - - PROPOSED ROW



MATCHLINE US-181 STA 1126+50

ATTACHMENT 19-4  
 O&M LIMITS  
 SCALE: 1" = 200'

**PRELIMINARY**  
SUBJECT TO CHANGE

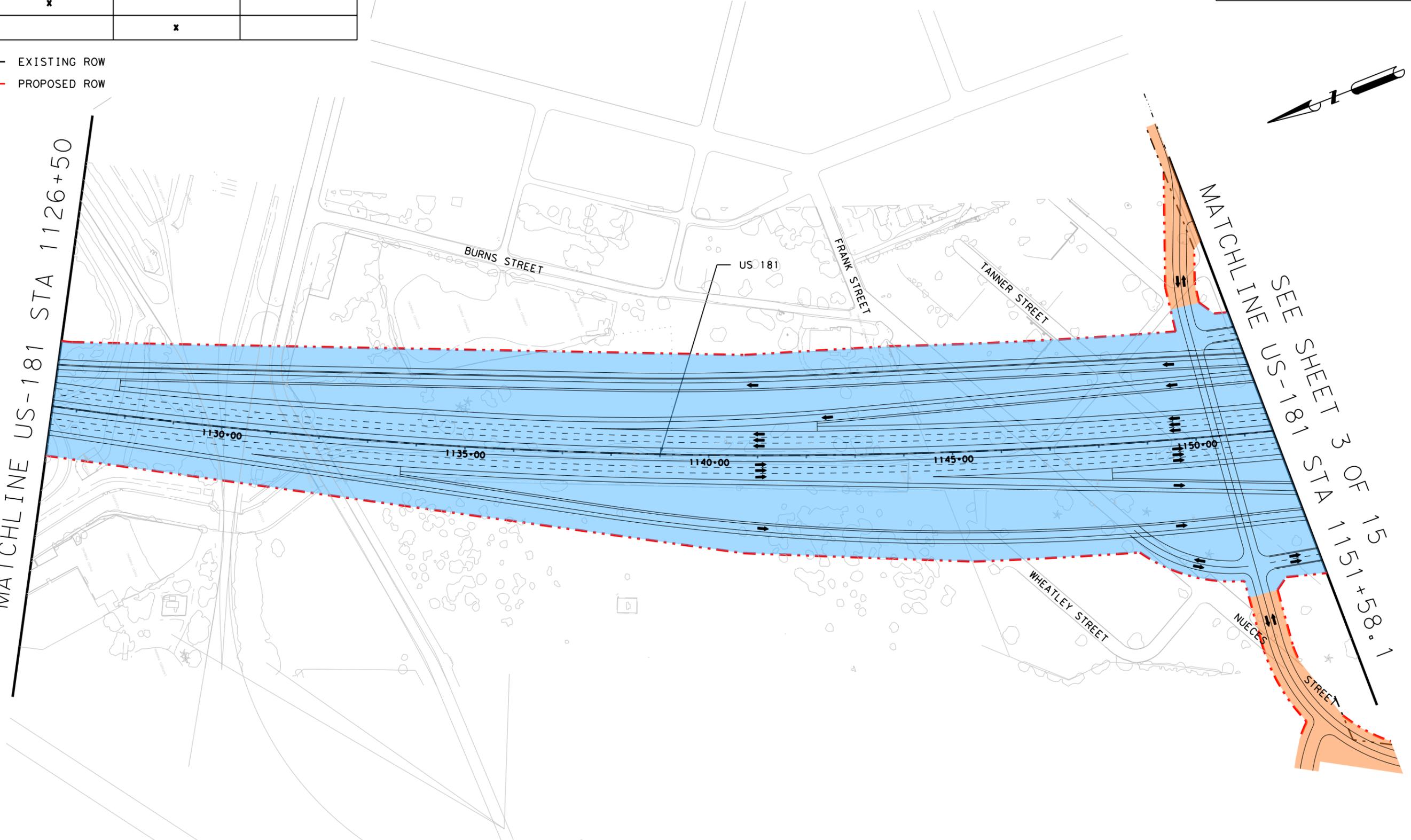
	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 1)	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 2)	O&M LIMITS AFTER SUBSTANTIAL COMPLETION
Blue	x		x
Orange	x		
Pink		x	

--- EXISTING ROW  
- - - PROPOSED ROW



MATCHLINE US-181 STA 1126+50

MATCHLINE SEE SHEET 3 OF 15 US-181 STA 1151+58.1



Scale: 1:200  
Plotted on: 10/23/2014

Model Name: PLN041

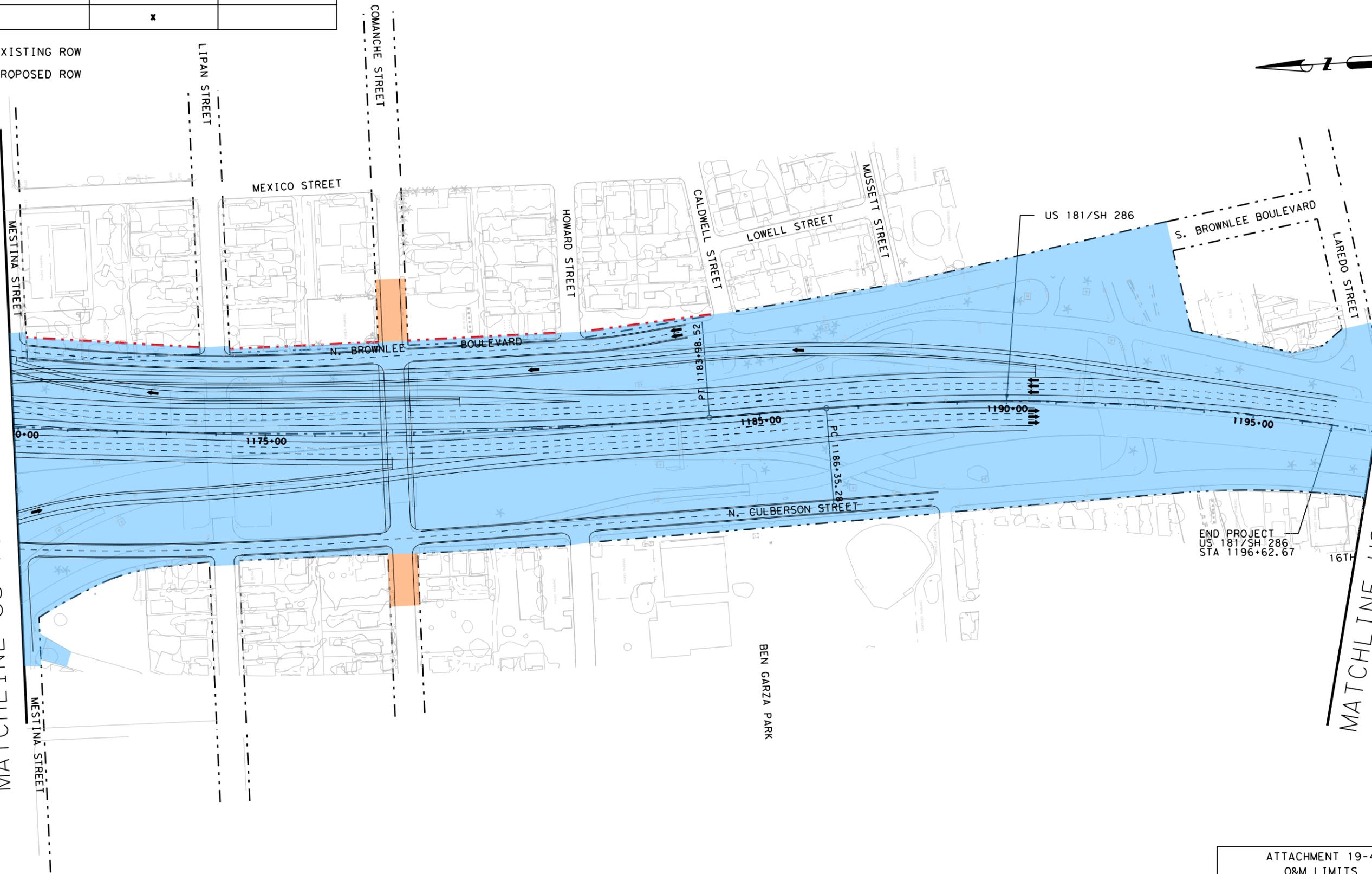
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Design File Name: US181HB-E-RD-PLN00.dgn

ATTACHMENT 19-4  
O&M LIMITS  
SCALE: 1" = 200'

SEE SHEET 3 OF 15  
 MATCHLINE US-181/SH-286 STA 1169+90.6

	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 1)	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 2)	O&M LIMITS AFTER SUBSTANTIAL COMPLETION
	x		x
	x		
		x	

**PRELIMINARY**  
 SUBJECT TO CHANGE



MATCHLINE US-181/SH-286 STA 1197+50

END PROJECT  
 US 181/SH 286  
 STA 1196+62.67

ATTACHMENT 19-4  
 O&M LIMITS  
 SCALE: 1" = 200'  
 SHEET 12 OF 15

MATCHLINE US-181/SH-286 STA 1197+50

	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 1)	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 2)	O&M LIMITS AFTER SUBSTANTIAL COMPLETION
	x		x
	x		
		x	

--- EXISTING ROW  
 - - - PROPOSED ROW

**PRELIMINARY**  
 SUBJECT TO CHANGE



ATTACHMENT 19-4  
 O&M LIMITS

SCALE: 1" = 200'

**PRELIMINARY**  
SUBJECT TO CHANGE

	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 1)	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 2)	O&M LIMITS AFTER SUBSTANTIAL COMPLETION
	x		x
	x		
		x	

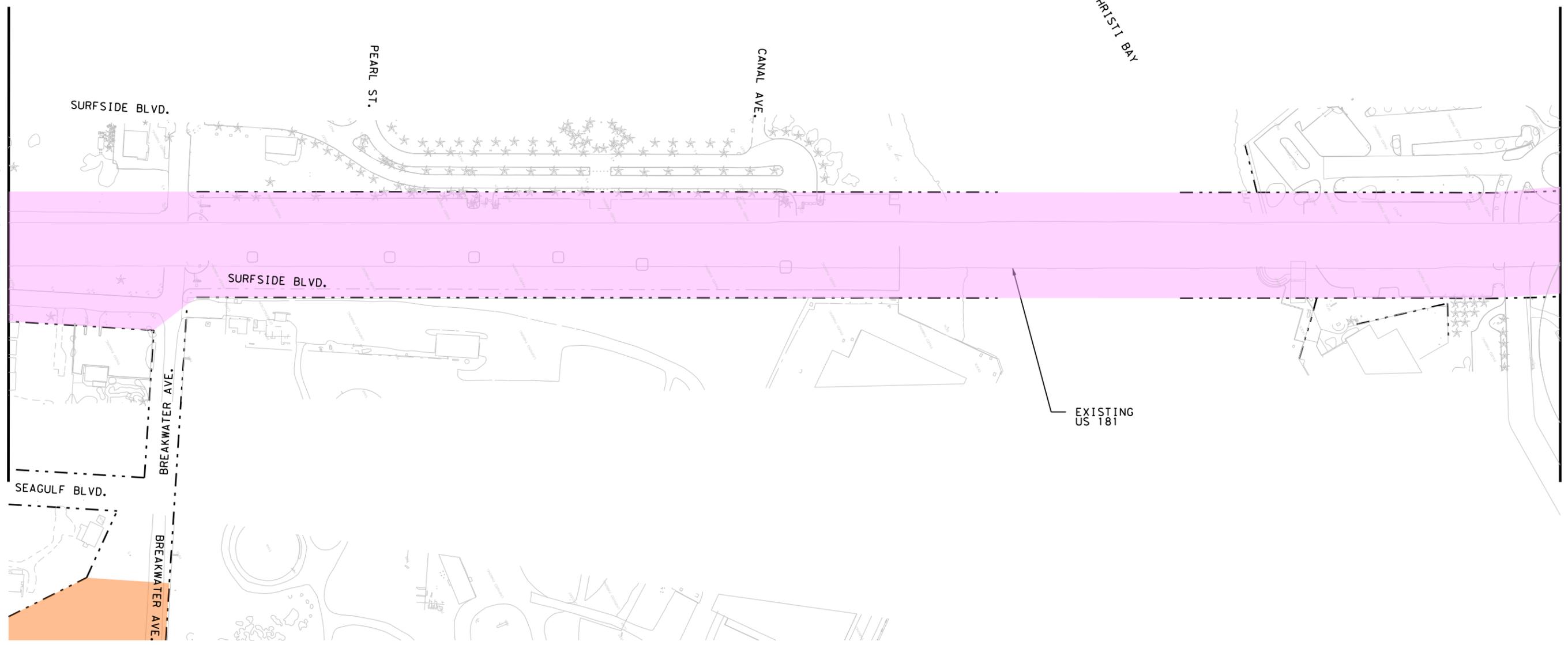
--- EXISTING ROW  
- - - PROPOSED ROW

Scale: 1"=200'  
Plotted on: 10/23/2014

Model Name: PLN044

MATCHLINE A-A  
SEE SHEET 8 OF 15

MATCHLINE B-B



BAYFRONT  
SCIENCE  
PARK

CORPUS CHRISTI BAY

EXISTING  
US 181

Pen Tab let Texas Two Step pentable rco. tbi  
Design File name: US181HB-E-RD-PLN00.dgn

ATTACHMENT 19-4  
O&M LIMITS  
SCALE: 1" = 200'

SHEET 14 OF 15

Scale: 1:200  
Plotted on: 10/23/2014

Model Name: PLN045

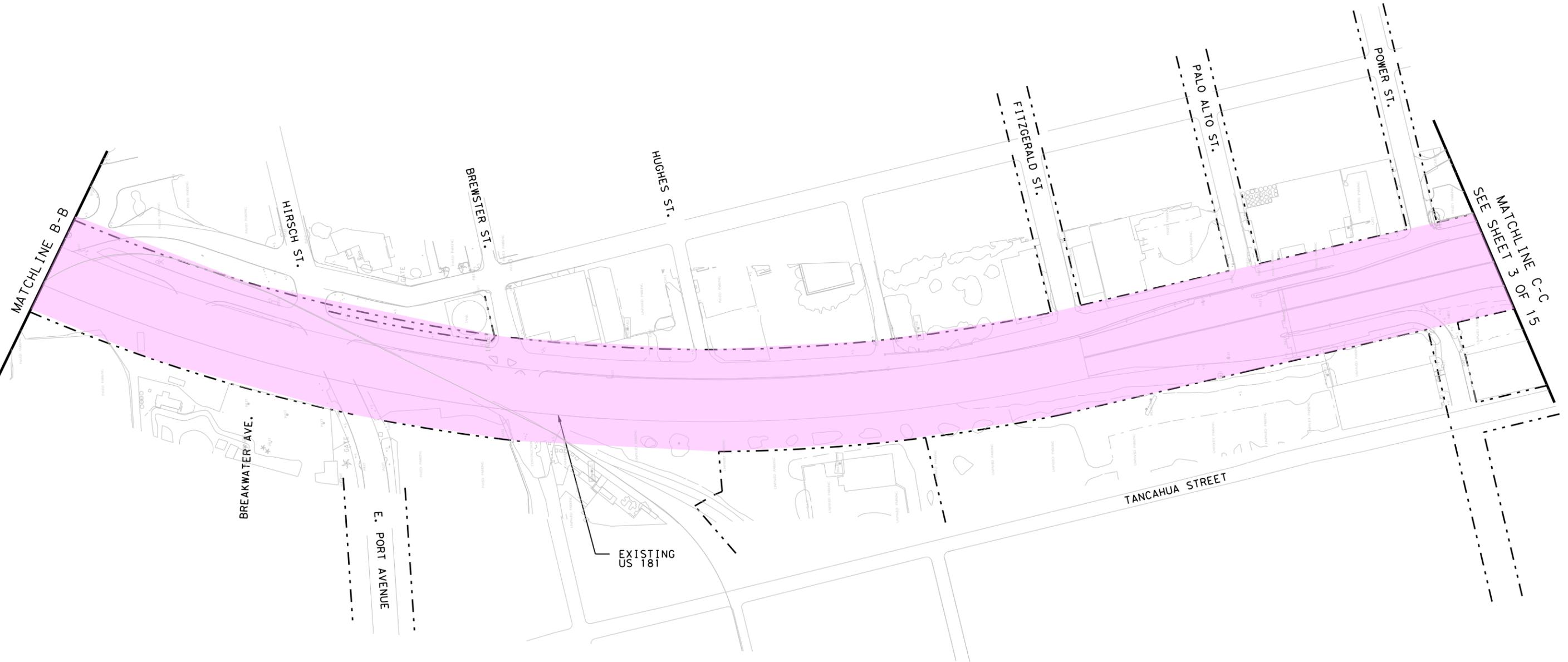
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	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 1)	O&M LIMITS FOR O&M DURING CONSTRUCTION (PHASE 2)	O&M LIMITS AFTER SUBSTANTIAL COMPLETION
Blue	x		x
Orange	x		
Pink		x	



**PRELIMINARY**  
SUBJECT TO CHANGE

--- EXISTING ROW  
- - - PROPOSED ROW



ATTACHMENT 19-4  
O&M LIMITS  
SCALE: 1" = 200'  
SHEET 15 OF 15

**Texas Department of Transportation**

**BOOK 2 – TECHNICAL PROVISIONS**

**FOR**

**US 181 HARBOR BRIDGE PROJECT**

**DESIGN-BUILD PROJECT**

**ATTACHMENT 19-5**

**ASSET CONDITION SCORE CALCULATION**

**METHOD NEW HARBOR BRIDGE**

**ATTACHMENT 19-5: ASSET CONDITION SCORE CALCULATION NEW HARBOR BRIDGE**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>1</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
<b>1) ROADWAY</b>									<b>3.6</b>
1.1	Obstructions and debris	Visual Inspection	1.1.1	Number of obstructions and debris	25	2.3%	3	0.07	
1.2	Pavement	a) Ruts – Mainlanes, shoulders & ramps Depth as measured using an automated device in compliance with TxDOT Standards.  10ft straight edge used to measure rut depth for localized areas.		<i>Percentage of wheel path length with ruts greater than ¼" in depth in each Performance Section</i>					
			1.2.1	• Mainlanes, shoulders and ramps - 3%	10	0.9%	4	0.04	
		1.2.3	Depth of rut at any location greater than ½"	10	0.9%	4	0.04		
		b) Ride quality	NOT USED						
		c) 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	1.2.4	Individual discontinuities greater than 1/4"	10	0.9%	4	0.04	
		d) Edge drop-offs Physical measurement of edge drop-off level compared to adjacent surface	1.2.12	Occurrence of any failure	5	0.5%	5	0.02	
			1.2.13	Number of instances of edge drop-off greater than 2"	5	0.5%	5	0.02	
1.2	Pavement	e) Skid resistance ASTM E 274 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	1.2.14	• Performance Sections with skid numbers for 0.5-mile section of mainlines, shoulders and ramps exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	10	0.9%	5	0.05	
			1.2.15	• Performance Sections with skid numbers for 0.5-mile section of frontage roads exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	10	0.9%	5	0.05	
			1.2.16	• When the skid number is below 25 and/or when required by the Wet Weather Accident Reduction Program, areas categorized as high risk, Developer shall perform a site investigation and perform required corrective action.	10	0.9%	2	0.02	
			1.2.17	Instances where road users are warned of a potential skidding hazard where remedial action is identified.	10	0.9%	2	0.02	
1.3	Crossovers and other paved areas	a) Potholes	1.3.1	Number of potholes of low severity or higher	5	0.5%	4	0.02	
		b) Base failures	1.3.2	NOT USED	0	0.0%	0	0.00	
1.4	Joints in concrete	Visual inspection of joints	1.4.1	Length of unsealed joints greater than ¼"	10	0.9%	3	0.03	
		Measurement of joint width and level difference of two sides of joints	1.4.2	Joint width more than 1" or faulting more than ¼"	10	0.9%	3	0.03	
1.5	Curbs	Visual inspection	1.5.1	Continuous curb lengths where more than 10% of the length has defects such as cracks and chips	5	0.5%	3	0.01	
		Physical measurement	1.5.2	Continuous curb lengths where more than 5% of the length has a separation exceeding 0.25" between curb face and adjacent roadway surface	5	0.5%	3	0.01	
		Survey and 10' straight edge	1.5.3	Continuous curb lengths where more than 5% of the length has either the top or face of curbs exceeding 0.5" from intended design alignment	5	0.5%	3	0.01	

**ATTACHMENT 19-5: ASSET CONDITION SCORE CALCULATION NEW HARBOR BRIDGE**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>1</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
1.6	<b>Maintenance/Access Roads</b>	Crown: Flat A shape or super-elevation with 4% cross slopes maintained to minimize ponding	1.6.1	Cross slope less than 3% or more than 6%	2	0.2%	4	0.01	
		Shoulder: Maintain slope away from the travel way and shoulder flush with travel way	1.6.2	Shoulder cross slope less than travel way cross slope; shoulder lower or higher than travel way	2	0.2%	4	0.01	
		Ditch: Maintain size and shape of ditch for proper drainage	1.6.3	Sides of ditches slumping or eroding, or obstructed by debris	2	0.2%	5	0.01	
		Ruts/potholes: Depth as measured using an automated device in compliance with TxDOT standards	1.6.4	Depth of ruts or potholes at any location greater than 1"	2	0.2%	5	0.01	
		Subgrade: Identify and repair any subgrade failures	1.6.5	Locations where subgrade failure is evident	2	0.2%	5	0.01	
<b>2) DRAINAGE</b>									<b>3.1</b>
2.1	<b>Pipes and Channels</b>	Visual inspection supplemented by CCTV where required to inspect buried pipe work.	2.1.1	Length of pipe or channel in feet with less than 90% of cross sectional clear area, calculated as the arithmetic mean of the clear cross-sectional areas of individual 10 feet lengths of pipes and channels in each Performance Section.	5	0.5%	5	0.02	
2.2	<b>Drainage treatment devices</b>	Visual inspection	2.2.1	Number of devices functioning correctly with means of operation displayed.	5	0.5%	2	0.01	
2.3	<b>Travel Way</b>	Visual inspection of water on surface.	2.3.1	Number of instances of hazardous water build-up.	20	1.8%	2	0.04	
2.4	<b>Discharge systems</b>	Visual inspection and records	2.4.1	Performance Sections with surface water discharge systems performing their proper function and discharging in compliance with the relevant legislation and permits.	10	0.9%	3	0.03	
2.5	<b>Protected Species</b>	Visual inspection	2.5.1	Performance Sections with named species and habitats with protection of these named species and habitats.	20	1.8%	4	0.07	
<b>3) STRUCTURES</b>									<b>3.9</b>
3.1	<b>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</b>	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.		<i>Records as required in the TxDOT Bridge Inspection Manual</i>					
		As above	3.1.1	Occurrence of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below <b>seven</b> for any deck, superstructure or substructure	50	4.6%	5	0.23	
		As above	3.1.2	Performance Sections with structure components with condition states of one, in accordance with the TxDOT Field Inspection Manual	50	4.6%	5	0.23	

**ATTACHMENT 19-5: ASSET CONDITION SCORE CALCULATION NEW HARBOR BRIDGE**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>1</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
3.2	Structure components	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.  Visual inspection of Elements listed in (i) through (vii) of the general performance requirement column in the Performance and Measurement Table.	3.2.1	Occurrence of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below <b>seven</b> for any deck, superstructure or substructure	50	4.6%	3	0.14	
			3.2.2	Instances of condition of any element not meeting general performance requirement as determined in accordance with Good Industry Practice.	50	4.6%	4	0.18	
3.3	Integral wearing surface	Concrete cover measured at [10ft] intervals  Cracks measured at [3 ft] intervals on the surface of the deck prior to 3 hours after sunrise at concrete age greater than 28 days  De-lamination or spalling	3.3.1	Occurrence of any instance where integral wearing surface thickness is less than [50%] of design value	25	2.3%	4	0.09	
			3.3.2	Instances of cracks wider than [0.025] inches	25	2.3%	2	0.05	
			3.3.3	Instances of de-lamination or spalling	10	0.9%	2	0.02	
3.4	Stay Cables	Visual and hands-on inspection	3.4.1	Instances of damage or deterioration of the corrosion protection system including coatings, protective pipes and anchorage units	20	1.8%	3	0.06	
			3.4.2	Instances of damaged or broken strand / wire	50	4.6%	5	0.23	
			3.4.3	Instances of stay cable damping system not operating as intended including failure to provide the minimum design level of damping	20	1.8%	5	0.09	
			3.4.4	Instances of stay cable acoustic monitoring system not operating as intended including failure to transmit measured information.	20	1.8%	5	0.09	
3.5	Inspection and access equipment	Visual and hands-on inspection	3.5.1	Instances of loose assemblies or nuts and bolts not fully tightened	10	0.9%	2	0.02	
			3.5.2	Instances of defects in surface protection such as failures of coating systems to bare metal or loss of galvanizing	10	0.9%	1	0.01	
			3.5.3	Instances of failures to conform with relevant standards for fixed and mobile inspection facilities, hoists and lifts	10	0.9%	2	0.02	
			3.5.4	Instances where maintenance traveler fails to operate smoothly under power or braking, has uneven or inconsistent movement of any driven component or exhibits binding or swaying, in each case in a manner that exceeds normal operational parameters.	10	0.9%	3	0.03	
3.6	Ship impact protection system	Visual inspection	3.6.1	Instances of marine boring (timber systems)	10	0.9%	5	0.05	
			3.6.2	Instances of corrosion that would reduce the system resistance to below its intended design state	10	0.9%	5	0.05	
			3.6.3	Instances of damage from vessel impact that would reduce the system resistance to below its intended design state or would cause a material reduction in the remaining service life	10	0.9%	4	0.04	

**ATTACHMENT 19-5: ASSET CONDITION SCORE CALCULATION NEW HARBOR BRIDGE**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>1</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>		
3.7	<b>Corrosion protection systems</b>	Visual inspection	3.7.1	Instances of failure of coating system down to bare metal	15	1.4%	3	0.04			
			3.7.2	Loss of galvanizing	10	0.9%	2	0.02			
			3.7.3	Damaged or peeling material	10	0.9%	3	0.03			
			3.7.4	Noncompliance with manufacturer's recommendations for the maintenance and re-application of coatings	10	0.9%	4	0.04			
3.8	<b>Lightning Protection Systems</b>	Inspection and assessment in accordance with the requirements of Underwriters Laboratories, Inc. (UL) 96 and Lightning Protection Institute (LPI) 175.	3.8.1	Noncompliance with specified standards.	5	0.5%	5	0.02			
			3.8.2	Instances of lightning protection system not operating as intended.	5	0.5%	5	0.02			
3.11	<b>Load Ratings</b>	Load rating calculations in accordance with the Manual for Bridge Evaluation and the TxDOT Bridge Inspection Manual and per the Technical Provisions	3.11.1	Number of structures with load restrictions for Texas legal loads (including legally permitted vehicles) in each Performance Section	10	0.9%	5	0.05			
3.12	<b>Access Points</b>	Visual Inspection	3.12.1	Number with defects in locks or entryways	5	0.5%	3	0.01			
3.14	<b>Structural Surfaces</b>	Visual Inspection	3.14.1	Number of areas where graffiti is present	5	0.5%	3	0.01			
<b>4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS</b>									<b>3.9</b>		
4.1	<b>Pavement markings</b>	<b>a) Markings - General</b>	Portable retroreflectometer, which uses 30 meter geometry, meeting the requirements described in ASTM E 1710	4.1.1	Percentage of total length of pavement marking in each Performance Section meeting the minimum retroreflectivity 175 med/sqm/lx for white	5	0.5%	3	0.01		
				4.1.2	Percentage of total length of pavement marking in each Performance Section meeting the minimum retroreflectivity 125 med/sqm/lx for white	5	0.5%	4	0.02		
			Physical measurement	4.1.3	Length of pavement marking in each Performance Section with more than 5% loss of area of material at any point	5	0.5%	4	0.02		
				4.1.4	Length of pavement marking in each Performance Section with spread more than 10% of specified dimensions.	5	0.5%	4	0.02		
			Visual inspection	<b>b) Profile Markings</b>							
				4.1.5	Percentage of total length of pavement marking in each Performance Section performing its intended function and compliant with relevant regulations	5	0.5%	3	0.01		
4.2	<b>Raised Reflective Markings</b>	Visual inspection	4.2.1	Number of markers associated with road markings that are ineffective in any 10 consecutive markers. (Ineffective includes missing, damaged, settled or sunk)	2	0.2%	5	0.01			
			4.2.2	A minimum of four markers are visible at 80' spacing when viewed under low beam headlights.	2	0.2%	5	0.01			
			4.2.3	Uniformity (replacement raised reflective pavement markers have equivalent physical and performance characteristics to adjacent markers).	2	0.2%	5	0.01			
4.3	<b>Delineators and Markers</b>	Visual inspection	4.3.1	Number of object markers or delineators in each Performance Section that is defective or missing	2	0.2%	4	0.01			

**ATTACHMENT 19-5: ASSET CONDITION SCORE CALCULATION NEW HARBOR BRIDGE**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>1</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>	
<b>5) GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS</b>									<b>3.8</b>	
5.1	Guardrails and Safety Barriers	Visual inspection	5.1.1	Performance Sections with all guard rails and safety barriers appropriately placed and correction installed	20	1.8%	3	0.06		
			5.1.2	Performance Sections with all guard rails and safety barriers free from defects	20	1.8%	5	0.09		
			5.1.3	Performance Sections with all guard rails and safety barriers at correct heights	5	0.5%	5	0.02		
			5.1.4	Performance Sections with all guard rails and safety barriers at correct distances from roadway obstacles	5	0.5%	3	0.01		
5.2	Impact Attenuators	Visual inspection	5.2.1	Performance Sections will all impact attenuators appropriately placed and correctly installed.	5	0.5%	2	0.01		
<b>6) TRAFFIC SIGNS</b>									<b>3.9</b>	
6.1	General - All Signs	a) <b>Retroreflectivity</b> Determination of Coefficient of retro-reflectivity	6.1.1	Number of signs with actual reflectivity below the requirements of TxDOT's TMUTCD in each Performance Section	20	1.8%	3	0.06		
			b) <b>Face damage</b> Visual inspection	6.1.2	Number of signs in each Performance Section with face damage greater than 5% of area	10	0.9%	4		0.04
			c) <b>Placement</b> Visual inspection	6.1.3	All signs in each Performance Section are placed in accordance with TxDOT's Sign Crew Field Book including not twisted or leaning	5	0.5%	4		0.02
			d) <b>Obsolete signs</b> Visual inspection	6.1.4	Number of obsolete signs in each Performance Section	5	0.5%	5		0.02
			e) <b>Sign Information</b> Visual inspection	6.1.5	All sign information in each Performance Section is of the correct size, location, type and wording to meet its intended purpose	5	0.5%	5		0.02
			f) <b>Dynamic Message Signs</b> Visual inspection	6.1.6	Dynamic message signs are fully functioning	5	0.5%	3		0.01
6.2	Gantries	Visual inspection	6.2.1	Number with defects in surface protection system	10	0.9%	5	0.05		
			6.2.1	Number with loose nuts and bolts	10	0.9%	4	0.04		
			6.2.3	Number with graffiti	10	0.9%	4	0.04		
<b>7) TRAFFIC SIGNALS (NOT PART OF MAINTAINED ELEMENTS)</b>										

**ATTACHMENT 19-5: ASSET CONDITION SCORE CALCULATION NEW HARBOR BRIDGE**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>1</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
<b>8) LIGHTING</b>									
8.1	Roadway Lighting	a) Mainlane lights operable Night time inspection or automated logs	8.1.1	Performance Sections with less than 90% of lights functioning correctly at all times	25	2.3%	4	0.09	4.3
		b) Mainlane lights out of action Night time inspection or automated logs	8.1.2	Instances of more than two consecutive lights out of action	25	2.3%	5	0.12	
8.2	Sign Lighting	Night time inspection or automated logs	8.2.1	Number of instances of more than one bulb per sign not working in each Performance Section	10	0.9%	5	0.05	
8.3	Electrical Supply	Testing to meet NEC regulations, visual inspection	8.3.1	Inspection records showing safe installation and maintenance in each Performance Section	10	0.9%	4	0.04	
8.4	Access Panels	Visual Inspection	8.4.1	Number of instances of missing or damaged access panels in each Performance Section	5	0.5%	4	0.02	
8.5	High Mast Lighting			NOT USED					
8.6	Navigational Lighting	Night time inspection or automated logs	8.5.1	Number of instances of more than one bulb per sign not working in each Performance Section	15	1.4%	4	0.06	
8.7	Architectural Lighting	Night time inspection or automated logs	8.6.1	Instances of architectural lighting with more than 10% of lamps not functioning	25	2.3%	4	0.09	
8.8	Bridge Inspection Lighting	Night time inspection or automated logs	8.7.1	Instances of bridge inspection lighting where failures could adversely impact safety or security of inspections or access	10	0.9%	4	0.04	
<b>9) FENCES, WALLS AND SOUND ABATEMENT</b>									
9.1	Design and Location	Visual Inspection		NOT USED					
9.2	Construction	Structural assessment if visual inspection warrants		NOT USED					
9.3	Operation	Structural assessment if visual inspection warrants		NOT USED					
<b>10) ROADSIDE MANAGEMENT (NOT USED)</b>									
<b>11) REST AREAS AND PICNIC AREAS (NOT USED)</b>									
<b>12) EARTHWORKS, EMBANKMENTS AND CUTTINGS (NOT USED)</b>									
<b>13) ITS EQUIPMENT</b>									
13.1	ITS Equipment - Maintenance	Visual Inspection	13.1.1	Inspection records showing compliance with requirements for maintenance of ITS equipment in each Performance Section.	5	0.5%	4	0.02	4.3
13.2	Dynamic Message Sign Equipment	Defect measurement dependent on equipment	13.2.1	Inspection records showing compliance with requirements for Dynamic Message Signs in each Performance Section	5	0.5%	4	0.02	
13.3	CCTV Equipment	Defect measurement dependent on equipment	13.3.1	Inspection records showing compliance with requirements for CCTV equipment in each Performance Section	5	0.5%	4	0.02	
13.4	Vehicle Detection Equipment	Defect measurement dependent on equipment	13.4.1	Inspection records showing compliance with requirements for vehicle detection equipment in each Performance Section	5	0.5%	4	0.02	
			13.4.2	Traffic Detector Loop circuit's inductance to be > 50 and < 1,000 micro henries.	5	0.5%	5	0.02	
			13.4.3	Insulation resistance to be > 50 meg ohms.	5	0.5%	5	0.02	
<b>14) TOLLING FACILITIES AND BUILDINGS (NOT USED)</b>									
<b>15) AMENITY (NOT USED)</b>									

**ATTACHMENT 19-5: ASSET CONDITION SCORE CALCULATION NEW HARBOR BRIDGE**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>1</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
<b>16) SNOW AND ICE CONTROL (NOT PART OF ASSET CONDITION SCORE)</b>									
16.1	Travel lanes	Maximum 1hr response time to complete manning and loading of spreading vehicles.	16.1.1	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	0	0.0%			
		Maximum 2hrs from departure from loading point to complete treatment and return to loading point.	16.1.2	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	0	0.0%			
		Maximum 1hr response time for snow and ice clearance vehicles to depart from base.	16.1.3	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	0	0.0%			
16.2	Weather Forecasting	Operations plan details the process and procedures in place and followed.	16.2.1	Inspection records showing compliance with requirements for weather forecasting in each Performance Section	0	0.0%			
16.3	Operational Plans	Operations plan details the process and procedures in place and followed.	16.3.1	Inspection records showing compliance with snow and ice clearance plans in each Performance Section	0	0.0%			
16.4	Operations and Maintenance Manual	Operations and maintenance instructions detail the process and procedures in place and followed.	16.4.1	Inspection records showing compliance with operations and maintenance instructions in each Performance Section.	0	0.0%			
<b>17) INCIDENT RESPONSE (NOT PART OF ASSET CONDITION SCORE)</b>									
17.1	General	Response times are met for 98% of incidents measured on a 1 year rolling basis.	17.1.1	Inspection records showing compliance with the MMP and requirements regarding incident response times in each Performance Section	0	0.0%			
		No complaints from Emergency Services.	17.1.2	Inspection records showing compliance with the MMP and requirements regarding incident response times in each Performance Section	0	0.0%			
17.2	Hazardous Materials	MMP details the process and procedures in place and followed.	17.2.1	Inspection records showing compliance with the MMP details regarding hazardous materials in each Performance Section	0	0.0%			
17.3	Structural Assessment	Inspections and surveys as required by incident	17.3.1	Inspection records showing compliance with the MMP and requirements for incidents in each Performance Section	0	0.0%			
17.4	Temporary and permanent remedy	Review and inspection of the incident site	17.4.1	Inspection records showing compliance with requirements for temporary and permanent remedy for incidents in each Performance Section	0	0.0%			
<b>18) CUSTOMER RESPONSE (NOT PART OF ASSET CONDITION SCORE)</b>									
18.1	Response to inquiries	Contact the customer within 48 hours following initial customer inquiry.	18.1.1	Percentage of responses within specified times in each Performance Section.	0	0.0%			
		All work resulting from customer requests is scheduled within 48 hours of customer contact.	18.1.2	Demonstrated by O&M Records	0	0.0%			
		Follow-up contact with the customer within 72 hours of initial inquiry.	18.1.3	Demonstrated by O&M Records	0	0.0%			
		All customer concerns/requests are resolved to TxDOT's satisfaction within 2 weeks of the initial inquiry.	18.1.4	Demonstrated by O&M Records	0	0.0%			
18.2	Customer Contact Line	Instances of line out of action or unmanned	18.2.1	Number of operations records showing non availability of the customer contact line in each Performance Section including complaints from public.	0	0.0%			

**ATTACHMENT 19-5: ASSET CONDITION SCORE CALCULATION NEW HARBOR BRIDGE**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASURE- MENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>1</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
<b>19) SWEEPING AND CLEANING</b>									<b>4.5</b>
19.1	Sweeping	Buildup of dirt, ice, rock, debris, etc. on roadways and bridges not to accumulate greater than 24" wide or 1/2" deep	19.1.1	Inspection records showing compliance with requirements for sweeping in each Performance Section.	15	1.4%	4	0.06	
19.2	Litter	No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed.	19.2.1	Inspection records showing compliance with requirements regarding litter pick-up in each Performance Section.	15	1.4%	5	0.07	
						<b>100.0%</b>			
<b>AGGREGATED ASSET CONDITION SCORE FOR NEW HARBOR BRIDGE AFTER SUBSTANTIAL COMPLETION <sub>6</sub></b>								<b>3.89</b>	

**NOTES FOR ASSET CONDITION SCORE CALCULATION**

- 1 Weighting is the assigned weighting for each Measurement Record on a scale of 1-50 for purpose of Asset Condition Score
- 2 Weighting Factor is the Weighting expressed as a percentage for each Measurement Record and totaling 100%
- 3 Example Raw Asset Condition Score = Asset Condition Score for each Measurement Record across all inspected Performance Sections
- 4 Weighted Score = Raw Asset Condition Score x Weighting Factor
- 5 Element Category Asset Condition Score = Sum of Weighted Score / Sum of Weighting Factors for each Element Category
- 6 Aggregated Asset Condition Score = Sum of Weighted Scores for each Measurement Record for all Element Categories

92	Number of non-zero Weightings
1083	Total of Weightings
11.77	Average Weighting

**Texas Department of Transportation**  
**BOOK 2 – TECHNICAL PROVISIONS**  
**FOR**  
**US 181 HARBOR BRIDGE PROJECT**  
**DESIGN-BUILD PROJECT**

**ATTACHMENT 19-6**  
**ASSET CONDITION SCORE CALCULATION**  
**METHOD ROADWAY SECTION AFTER**  
**SUBSTANTIAL COMPLETION**

**ATTACHMENT 19-6: ASSET CONDITION SCORE CALCULATION METHOD ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>2</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>	
<b>1) ROADWAY</b>										
1.1	Obstructions and debris	Visual Inspection	1.1.1	Number of obstructions and debris	50	3.8%	3	0.11	3.2	
1.2	Pavement	a) Ruts – Mainlanes, shoulders & ramps Depth as measured using an automated device in compliance with TxDOT Standards.		<i>Percentage of wheel path length with ruts greater than ¼" in depth in each Performance Section</i>						
			1.2.1	• Mainlanes, shoulders and ramps - 3%	15	1.1%	4	0.05		
			1.2.2	• Frontage roads - 10%	10	0.8%	4	0.03		
			10ft straight edge used to measure rut depth for localized areas.	1.2.3	Depth of rut at any location greater than ½"	10	0.8%	4	0.03	
			b) Ride quality Measurement of International Roughness Index (IRI) according to TxDOT standard Tex-1001-S, Operating Inertial Profilers and Evaluating Pavement Profiles		<i>For 80% of all Performance Sections measured, IRI throughout 98% of each Performance Section is less than or equal to:</i>					
				1.2.4	• Mainlanes, ramps - 95" per mile**	10	0.8%	3	0.02	
			** To allow for measurement bias, an adjustment of -10 (minus ten) is made to IRI measurements for concrete pavements before assessing threshold compliance.	1.2.5	• Frontage roads - 120" per mile**	10	0.8%	3	0.02	
					<i>IRI throughout 98% of each Performance Section is less than or equal to:</i>					
				1.2.6	• Mainlanes, ramps - 120" per mile**	10	0.8%	4	0.03	
				1.2.7	• Frontage roads - 150" per mile**	10	0.8%	4	0.03	
				1.2.8	Mainlanes, ramps, 0.1 mile average - 150" per mile**	10	0.8%	4	0.03	
				1.2.9	Frontage roads, 0.1 mile average - 180" per mile**	10	0.8%	4	0.03	
			10-ft straightedge used to measure discontinuities	1.2.10	IRI measured throughout 98% of each lane containing a bridge deck in any Performance Section, 0.1 mile average - 200" per mile**	10	0.8%	4	0.03	
	c) 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	1.2.11	Individual discontinuities greater than 1/4"	20	1.5%	3	0.05			
	d) Edge drop-offs Physical measurement of edge drop-off level compared to adjacent surface	1.2.12	Occurrence of any failure	20	1.5%	5	0.08			
		1.2.13	Number of instances of edge drop-off greater than 2"	20	1.5%	2	0.03			

**ATTACHMENT 19-6: ASSET CONDITION SCORE CALCULATION METHOD ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>2</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
1.2	Pavement	e) Skid resistance ASTM E 274 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	1.2.14	• Performance Sections with skid numbers for 0.5-mile section of mainlines, shoulders and ramps exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	15	1.1%	3	0.03	
			1.2.15	• Performance Sections with skid numbers for 0.5-mile section of frontage roads exceeding 30 and for which investigations as to potential risk of skidding accidents and appropriate remedial actions have been taken.	10	0.8%	5	0.04	
			1.2.16	• When the skid number is below 25 and/or when a site is categorized by TxDOT in accordance with the Wet Weather Accident Reduction Program, as a Wet Weather Accident Site, Developer shall perform a site investigation and perform required corrective action.	15	1.1%	3	0.03	
			1.2.17	Instances where road users are warned of a potential skidding hazard where corrective action is required following the categorization as a Wet Weather Accident Reduction Site.	15	1.1%	1	0.01	
1.3	Crossovers and other paved areas	a) Potholes	1.3.1	Number of potholes of low severity or higher	50	3.8%	3	0.11	
		b) Base failures	1.3.2	Number of base failures of low severity or higher	50	3.8%	3	0.11	
1.4	Joints in concrete	Visual inspection of joints	1.4.1	Length of unsealed joints greater than ¼"	5	0.4%	2	0.01	
		Measurement of joint width and level difference of two sides of joints	1.4.2	Joint width more than 1" or faulting more than ¼"	10	0.8%	3	0.02	
1.5	Curbs	Visual inspection	1.5.1	Continuous curb lengths where more than 10% of the length has defects such as cracks and chips	5	0.4%	2	0.01	
		Physical measurement	1.5.2	Continuous curb lengths where more than 5% of the length has a separation exceeding 0.25" between curb face and adjacent roadway surface	5	0.4%	2	0.01	
		Survey and 10' straight edge	1.5.3	Continuous curb lengths where more than 5% of the length has either the top or face of curbs exceeding 0.5" from intended design alignment	5	0.4%	2	0.01	
1.6	Maintenance/Access Roads	Crown: Flat A shape or super-elevation with 4% cross slopes maintained to minimize ponding	1.6.1	Cross slope less than 3% or more than 6%	2	0.2%	4	0.01	
		Shoulder: Maintain slope away from the travel way and shoulder flush with travel way	1.6.2	Shoulder cross slope less than travel way cross slope; shoulder lower or higher than travel way	2	0.2%	3	0.00	
		Ditch: Maintain size and shape of ditch for proper drainage	1.6.3	Sides of ditches slumping or eroding, or obstructed by debris	2	0.2%	3	0.00	
		Ruts/potholes: Depth as measured using an automated device in compliance with TxDOT standards	1.6.4	Depth of ruts or potholes at any location greater than 1"	2	0.2%	3	0.00	
		Subgrade: Identify and repair any subgrade failures	1.6.5	Locations where subgrade failure is evident	2	0.2%	3	0.00	

**ATTACHMENT 19-6: ASSET CONDITION SCORE CALCULATION METHOD ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASURE- MENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>2</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
<b>2) DRAINAGE</b>									<b>2.8</b>
2.1	Pipes and Channels	Visual inspection supplemented by CCTV where required to inspect buried pipe work.	2.1.1	Length of pipe or channel in feet with less than 90% of cross sectional clear area, calculated as the arithmetic mean of the clear cross-sectional areas of individual 10 feet lengths of pipes and channels in each Performance Section.	10	0.8%	2	0.02	
2.2	Drainage treatment devices	Visual inspection	2.2.1	Number of devices functioning correctly with means of operation displayed.	10	0.8%	3	0.02	
2.3	Travel Way	Visual inspection of water on surface.	2.3.1	Number of instances of hazardous water build-up.	10	0.8%	4	0.03	
2.4	Discharge systems	Visual inspection and records	2.4.1	Performance Sections with surface water discharge systems performing their proper function and discharging in compliance with the relevant legislation and permits.	10	0.8%	3	0.02	
2.5	Protected Species	Visual inspection	2.5.1	Performance Sections with named species and habitats with protection of these named species and habitats.	10	0.8%	2	0.02	
<b>3) STRUCTURES</b>									<b>3.1</b>
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	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.		<i>Records as required in the TxDOT Bridge Inspection Manual</i>					
		As above	3.1.1	Occurrence of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below seven for any deck, superstructure or substructure	50	3.8%	2	0.08	
		As above	3.1.2	Performance Sections with structure components with condition states of one, in accordance with the TxDOT Field Inspection Manual	50	3.8%	2	0.08	
3.2	Structure components	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.	3.2.1	Occurrence of condition rating, in accordance with the TxDOT Bridge Inspection Manual, below <b>seven (7)</b> for any deck, superstructure or substructure	50	3.8%	3	0.11	
		Visual inspection of Elements listed in (i) through (vii) of the general performance requirement column in the Performance and Measurement Table.	3.2.2	Instances of condition of any element not meeting general performance requirement as determined in accordance with Good Industry Practice.	50	3.8%	3	0.11	

**ATTACHMENT 19-6: ASSET CONDITION SCORE CALCULATION METHOD ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>2</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
3.9	Non-bridge class culverts	Visual inspection	3.9.1	Number of non-bridge class culverts with vegetation, debris and silt in each Performance Section	10	0.8%	4	0.03	
			3.9.2	Number of non-bridge class culverts with defects in sealant and movement joints in each Performance Section	10	0.8%	4	0.03	
			3.9.3	Number of non-bridge class culverts with scour damage in each Performance Section	10	0.8%	4	0.03	
3.10	Gantries and High-masts	Visual and up close inspection	3.10.1	Number of gantries and high masts with loose assemblies in each Performance Section	10	0.8%	4	0.03	
			3.10.2	Number of gantries and high masts with defects in surface protection in each Performance Section	10	0.8%	4	0.03	
3.11	Load Ratings	Load rating calculations in accordance with the Manual for Bridge Evaluation and the TxDOT Bridge Inspection Manual and per the Technical Provisions	3.11.1	Number of structures with load restrictions for Texas legal loads (including legally permitted vehicles) in each Performance Section	20	1.5%	5	0.08	
3.12	Access Points	Visual Inspection	3.12.1	Number with defects in locks or entryways	5	0.4%	3	0.01	
3.13	Mechanically Stabilized Earth and Retaining Walls	Inspection and assessment in accordance with the requirements of federal Nations Bridge Inspection Standards (NBIS) of the Code of Federal Regulations, 23 Highways - Part 650, the TxDOT Bridge Inspection Manual and the Federal Highway Administration's Bridge Inspector's Reference Manual.	3.13.1	Records as required in the TxDOT Bridge Inspection Manual	10	0.8%	5	0.04	
		Visual Inspection	3.13.2	Number of parapet areas with loose nuts & bolts, blockage, undesirable vegetation, impact damage or concrete spalling in the Performance Section.	10	0.8%	4	0.03	
3.14	Structural Surfaces	Visual Inspection	3.14.1	Number of areas where graffiti is present	10	0.8%	4	0.03	
<b>4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS</b>									<b>3.8</b>
4.1	Pavement markings	<b>a) Markings - General</b>							
		Portable retroreflectometer, which uses 30 meter geometry, meeting the requirements described in ASTM E 1710	4.1.1	Percentage of total length of pavement marking in each Performance Section meeting the minimum retroreflectivity 175 med/sqm/lx for white	15	1.1%	3	0.03	
			4.1.2	Percentage of total length of pavement marking in each Performance Section meeting the minimum retroreflectivity 125 med/sqm/lx for white	15	1.1%	3	0.03	
		Physical measurement	4.1.3	Length of pavement marking in each Performance Section with more than 5% loss of area of material at any point	15	1.1%	3	0.03	
			4.1.4	Length of pavement marking in each Performance Section with spread more than 10% of specified dimensions.	15	1.1%	4	0.05	
		<b>b) Profile Markings</b>							
Visual inspection	4.1.5	Percentage of total length of pavement marking in each Performance Section performing its intended function and compliant with relevant regulations	5	0.4%	3	0.01			

**ATTACHMENT 19-6: ASSET CONDITION SCORE CALCULATION METHOD ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>2</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
4.2	Raised Reflective Markings	Visual inspection	4.2.1	Number of markers associated with road markings that are ineffective in any 10 consecutive markers. (Ineffective includes missing, damaged, settled or sunk)	10	0.8%	5	0.04	
			4.2.2	A minimum of four markers are visible at 80' spacing when viewed under low beam headlights.	10	0.8%	5	0.04	
			4.2.3	Uniformity (replacement raised reflective pavement markers have equivalent physical and performance characteristics to adjacent markers).	10	0.8%	5	0.04	
4.3	Delineators and Markers	Visual inspection	4.3.1	Number of object markers or delineators in each Performance Section that is defective or missing	10	0.8%	4	0.03	
<b>5) GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS</b>									<b>3.0</b>
5.1	Guardrails and Safety Barriers	Visual inspection	5.1.1	Performance Sections with all guard rails and safety barriers appropriately placed and correction installed	25	1.9%	3	0.06	
			5.1.2	Performance Sections with all guard rails and safety barriers free from defects	20	1.5%	3	0.05	
			5.1.3	Performance Sections with all guard rails and safety barriers at correct heights	20	1.5%	2	0.03	
			5.1.4	Performance Sections with all guard rails and safety barriers at correct distances from roadway obstacles	20	1.5%	4	0.06	
5.2	Impact Attenuators	Visual inspection	5.2.1	Performance Sections will all impact attenuators appropriately placed and correctly installed.	20	1.5%	3	0.05	
<b>6) TRAFFIC SIGNS</b>									<b>3.3</b>
6.1	General - All Gantry-Mounted overhead signs	a) Retroreflectivity	Determination of Coefficient of retro-reflectivity	6.1.1	Number of signs with actual reflectivity below the requirements of TxDOT's TMUTCD in each Performance Section	20	1.5%	3	0.05
		b) Face damage	Visual inspection	6.1.2	Number of signs in each Performance Section with face damage greater than 5% of area	10	0.8%	4	0.03
		c) Placement	Visual inspection	6.1.3	All signs in each Performance Section are placed in accordance with TxDOT's Sign Crew Field Book including not twisted or leaning	5	0.4%	4	0.02
		d) Obsolete signs	Visual inspection	6.1.4	Number of obsolete signs in each Performance Section	5	0.4%	3	0.01
		e) Sign Information	Visual inspection	6.1.5	All sign information in each Performance Section is of the correct size, location, type and wording to meet its intended purpose	5	0.4%	3	0.01
		f) Dynamic Message Signs	Visual inspection	6.1.6	All dynamic message signs in each Performance Section are fully functioning	10	0.8%	3	0.02
<b>7) TRAFFIC SIGNALS (NOT USED)</b>									

**ATTACHMENT 19-6: ASSET CONDITION SCORE CALCULATION METHOD ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>2</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
<b>8) LIGHTING</b>									<b>3.7</b>
8.1	Roadway and aesthetic Lighting – General	a) Mainline lights operable Night time inspection or automated logs	8.1.1	Performance Sections with less than 90% of lights functioning correctly at all times	25	1.9%	3	0.06	
		b) Mainline lights out of action Night time inspection or automated logs	8.1.2	Instances of more than two consecutive lights out of action	25	1.9%	4	0.08	
8.2	Sign Lighting	Night time inspection or automated logs	8.2.1	Number of instances of more than one bulb per sign not working in each Performance Section	10	0.8%	4	0.03	
8.3	Electrical Supply	Testing to meet NEC regulations, visual inspection	8.3.1	Inspection records showing safe installation and maintenance in each Performance Section	10	0.8%	5	0.04	
8.4	Access Panels	Visual Inspection	8.4.1	Number of instances of missing or damaged access panels in each Performance Section	5	0.4%	5	0.02	
8.5	High Mast Lighting	Yearly inspection and night time inspections or automated logs	8.5.1	Instances of two or more lamps not working per high mast pole	15	1.1%	3	0.03	
			8.5.2	Any other defects per the "general Performance Requirements" column	10	0.8%	3	0.02	
<b>9) FENCES, WALLS AND SOUND ABATEMENT</b>									<b>4.0</b>
9.1	Design and Location								
9.2	Construction					0.0%			
9.3	Operation	Structural assessment if visual inspection warrants	9.3.1	Inspection records for fences and walls showing compliance with fence and wall requirements in each Performance Section	20	1.5%	4	0.06	
<b>10) ROADSIDE MANAGEMENT</b>									<b>4.0</b>
10.1	Vegetated Areas - Except landscaped areas - General	a) Urban areas Physical measurement of height of grass and weeds	10.1.1	Individual measurement areas in each Performance Section to have 95% of grass and weeds between 5" and 18" in height.	10	0.8%	3	0.02	
		b) Encroachment Visual inspection of instances of encroachment of vegetation	10.1.2	Number of occurrences of vegetation encroachment in each Performance Section	10	0.8%	5	0.04	
		c) Wildflowers Visual Inspection with audit of process.	10.1.3	Adherence to vegetation management manuals	10	0.8%	3	0.02	
		d) Sight lines Visual inspection	10.1.4	Number of instances of impairment of sight lines or sight distance to signs in each Performance Section	10	0.8%	4	0.03	
10.2	Landscaped Areas	Visual inspection	10.2.1	Inspection records showing compliance with requirements for landscaping in each Performance Section.	10	0.8%	4	0.03	
10.3	Fire Hazards	Visual inspection	10.3.1	Number of instances of dry brush or vegetation forming fire hazard in each Performance Section.	10	0.8%	5	0.04	
10.4	Trees, Bushes and Ornamentals	Visual inspection	10.4.1	Inspection records showing compliance with requirements for trees, brush and ornamentals in each Performance Section.	10	0.8%	5	0.04	
10.5	Wetlands	Visual inspection, assessment of permit issuers	10.5.1	Number of instances of permit requirements not met in each Performance Section	10	0.8%	3	0.02	

**ATTACHMENT 19-6: ASSET CONDITION SCORE CALCULATION METHOD ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASUREMENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>2</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
<b>11) REST AREAS AND PICNIC AREAS (NOT USED)</b>									
<b>12) EARTHWORKS, EMBANKMENTS AND CUTTINGS</b>									
									<b>5.0</b>
12.1	Slope Failure	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	12.1.1	Number of recorded instances of slope failure in each Performance Section	12	0.9%	5	0.05	
12.2	Slopes - General	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	12.2.1	Inspection records showing compliance with requirements for slopes in each Performance Section.	12	0.9%	5	0.05	
<b>13) ITS EQUIPMENT</b>									
									<b>3.7</b>
13.1	ITS Equipment - Maintenance	Visual Inspection	13.1.1	Inspection records showing compliance with requirements for maintenance of ITS equipment in each Performance Section.	5	0.4%	4	0.02	
13.2	Dynamic Message Sign Equipment	Defect measurement dependent on equipment	13.2.1	Inspection records showing compliance with requirements for Dynamic Message Signs in each Performance Section	5	0.4%	3	0.01	
13.3	CCTV Equipment	Defect measurement dependent on equipment	13.3.1	Inspection records showing compliance with requirements for CCTV equipment in each Performance Section	5	0.4%	4	0.02	
13.4	Vehicle Detection Equipment	Defect measurement dependent on equipment	13.4.1	Inspection records showing compliance with requirements for vehicle detection equipment in each Performance Section	5	0.4%	5	0.02	
			13.4.2	Traffic Detector Loop circuit's inductance to be > 50 and < 1,000 micro henries.	5	0.4%	3	0.01	
			13.4.3	Insulation resistance to be > 50 meg ohms.	5	0.4%	3	0.01	
<b>14) TOLLING FACILITIES AND BUILDINGS (NOT USED)</b>									
<b>15) AMENITY (NOT USED)</b>									
<b>16) SNOW AND ICE CONTROL (NOT PART OF ASSET CONDITION SCORE)</b>									
16.1	Travel lanes	Maximum 1hr response time to complete manning and loading of spreading vehicles.	16.1.1	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	0	0.0%			
		Maximum 2hrs from departure from loading point to complete treatment and return to loading point.	16.1.2	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	0	0.0%			
		Maximum 1hr response time for snow and ice clearance vehicles to depart from base.	16.1.3	Inspection records showing compliance with requirements for snow and ice control in each Performance Section	0	0.0%			
16.2	Weather Forecasting	Operations plan details the process and procedures in place and followed.	16.2.1	Inspection records showing compliance with requirements for weather forecasting in each Performance Section	0	0.0%			
16.3	Operational Plans	Operations plan details the process and procedures in place and followed.	16.3.1	Inspection records showing compliance with snow and ice clearance plans in each Performance Section	0	0.0%			
16.4	Operations and Maintenance Manual	Operations and maintenance instructions detail the process and procedures in place and followed.	16.4.1	Inspection records showing compliance with operations and maintenance instructions in each Performance Section.	0	0.0%			

**ATTACHMENT 19-6: ASSET CONDITION SCORE CALCULATION METHOD ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION**

ELEMENT CATEGORY	ELEMENT	INSPECTION AND MEASUREMENT METHOD	MEASURE-MENT REF	MEASUREMENT RECORD	WEIGHTING (1 TO 50) <sub>1</sub>	WEIGHTING FACTOR <sub>2</sub>	EXAMPLE RAW ASSET CONDITION SCORE <sub>3</sub>	WEIGHTED SCORE <sub>4</sub>	ELEMENT CATEGORY ASSET CONDITION SCORE <sub>5</sub>
<b>17) INCIDENT RESPONSE (NOT PART OF ASSET CONDITION SCORE)</b>									
17.1	General	Response times are met for 98% of incidents measured on a 1 year rolling basis.	17.1.1	Inspection records showing compliance with the MMP and requirements regarding incident response times in each Performance Section	0	0.0%			
		No complaints from Emergency Services.	17.1.2	Inspection records showing compliance with the MMP and requirements regarding incident response times in each Performance Section	0	0.0%			
17.2	Hazardous Materials	MMP details the process and procedures in place and followed.	17.2.1	Inspection records showing compliance with the MMP details regarding hazardous materials in each Performance Section	0	0.0%			
17.3	Structural Assessment	Inspections and surveys as required by incident	17.3.1	Inspection records showing compliance with the MMP and requirements for incidents in each Performance Section	0	0.0%			
17.4	Temporary and permanent remedy	Review and inspection of the incident site	17.4.1	Inspection records showing compliance with requirements for temporary and permanent remedy for incidents in each Performance Section	0	0.0%			
<b>18) CUSTOMER RESPONSE (NOT PART OF ASSET CONDITION SCORE)</b>									
18.1	Response to inquiries	Contact the customer within 48 hours following initial customer inquiry.	18.1.1	Percentage of responses within specified times in each Performance Section.	0	0.0%			
		All work resulting from customer requests is scheduled within 48 hours of customer contact.	18.1.2	Demonstrated by O&M Records	0	0.0%			
		Follow-up contact with the customer within 72 hours of initial inquiry.	18.1.3	Demonstrated by O&M Records	0	0.0%			
		All customer concerns/requests are resolved to TxDOT's satisfaction within 2 weeks of the initial inquiry.	18.1.4	Demonstrated by O&M Records	0	0.0%			
18.2	Customer Contact Line				0	0.0%			
<b>19) SWEEPING AND CLEANING</b>									
19.1	Sweeping	Buildup of dirt, ice, rock, debris, etc. on roadways and bridges not to accumulate greater than 24" wide or 1/2" deep	19.1.1	Inspection records showing compliance with requirements for sweeping in each Performance Section.	15	1.1%	5	0.06	4.5
19.2	Litter	No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed.	19.2.1	Inspection records showing compliance with requirements regarding litter pick-up in each Performance Section.	15	1.1%	4	0.05	
						<b>100.0%</b>			
<b>AGGREGATED ASSET CONDITION SCORE FOR ROADWAY SECTION AFTER SUBSTANTIAL COMPLETION <sub>6</sub></b>								<b>3.4</b>	

**NOTES FOR ASSET CONDITION SCORE CALCULATION**

- 1 Weighting is the assigned weighting for each Measurement Record on a scale of 1-50 for purpose of Asset Condition Score
- 2 Weighting Factor is the Weighting expressed as a percentage for each Measurement Record and totaling 100%
- 3 Example Raw Asset Condition Score = Asset Condition Score for each Measurement Record across all inspected Performance Sections
- 4 Weighted Score = Raw Asset Condition Score x Weighting Factor
- 5 Element Category Asset Condition Score = Sum of Weighted Scores / Sum of Weighting Factors for each Element Category
- 6 Aggregated Asset Condition Score = Sum of Weighted Scores for each Measurement Record for all Element Categories

95	Number of non-zero Weightings
1314	Total of Weightings
13.83	Average Weighting