

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
			Cat 1	Cat 1	Cat 2			
			Hazard Mitigation	Permanent Remedy	Baseline Condition Repair			
1) ROADWAY						<i>Unless stated otherwise, measurements shall be conducted using procedures, techniques, and measuring equipment consistent with TxDOT's Pavement Management Information System Rater's Manual.</i>		
1.1	Obstructions and debris	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
1.2	Pavement	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	a) Ruts – Mainlanes, shoulders & ramps Physical measurement and visual inspection.	1.2.1	Wheel path length with ruts greater than the reference condition in the BECR
						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
						b) Ride quality 10-ft straightedge used to measure discontinuities	1.2.3	Individual discontinuities greater than the reference condition in the BECR
						d) Failures Instances of failures exceeding the failure criteria set forth in the TxDOT PMIS Rater's Manual, including potholes, base failures, punchouts and jointed concrete pavement failures	1.2.4	Occurrence of any failure exceeding the reference condition in the BECR
						e) Edge drop-offs 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
						f) 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	1.2.6	Not used
1.2	Pavement	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.
1.3	Crossovers and other paved areas	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	a) Potholes	1.3.1	Number of potholes exceeding the reference condition in the BECR
						b) Base failures	1.3.2	Number of base failures exceeding the reference condition in the BECR
1.4	Joints in concrete	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
						Visual inspection	1.4.2	Joint width exceeding the reference condition in the BECR
2) DRAINAGE								
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	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.
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	28 days	Visual inspection	2.2.1	Number of devices functioning correctly with means of operation displayed

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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	NA	Visual inspection of water on surface	2.3.1	Number of instances of hazardous water build-up
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.
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
3) STRUCTURES								
3.1	Structures having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or springlines of arches or extreme ends of openings or multiple boxes	Substructures and superstructures 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"> • graffiti • undesirable vegetation • debris and excessive bird droppings • blocked drains, weep pipes manholes and chambers • blocked drainage holes in structural components • defects in joint sealants • defects in pedestrian protection measure • scour damage • corrosion of rebar • paint system failures • impact damage 	24 hrs	28 days	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
							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

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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"> dirt debris and vegetation defects in drainage systems loose nuts and bolts defects in gaskets <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"> loose nuts or bolts blockages of hollow section drain holes graffiti vegetation accident damage <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.</p> <p>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
							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
							3.3	Non-bridge class culverts
3.3.2	Not used							
3.3.3	Not used							
3.4	Gantries and high masts	<p>Except as otherwise recorded as the reference condition on a structure-specific basis in the BECR:</p> <p>Sign signal gantries, high masts are structurally sound and free of:</p> <ul style="list-style-type: none"> 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
							3.4.2	Number of gantries and high masts with defects in surface protection

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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)
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
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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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
4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS								
4.1	Pavement markings	Pavement markings are: <ul style="list-style-type: none"> • 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
						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
								Not used
						b) Profile Markings		
Visual inspection	4.1.3	Profile marking condition at least equal to the reference condition in the BECR						

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4.2	Raised reflective markers	Raised reflective pavement markers are: <ul style="list-style-type: none"> • 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)
							4.2.2	Not Used
							4.2.3	Not Used
4.3	Delineators & Markers	Object markers, mail box markers and delineators are: <ul style="list-style-type: none"> • clean and visible • of the correct color and type • legible and reflective • straight and vertical 	24 hrs	28 days	28 days	Visual inspection	4.3.1	Delineators and markers condition at least equal to the reference condition in the BECR
5) GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS								
5.1	Guardrails and safety barriers	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
							5.1.2	Not used
							5.1.3	Guardrail correct height and offset at least equal to the reference condition in the BECR
							5.1.4	Not used
5.2	Impact attenuators	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
6) TRAFFIC SIGNS								
6.1	Gantry-mounted overhead signs	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
7) TRAFFIC SIGNALS (NOT PART OF MAINTAINED ELEMENTS)								
8) LIGHTING								
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
9) FENCES, WALLS AND SOUND ABATEMENT								
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

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10) ROADSIDE MANAGEMENT								
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) Urban areas 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.
						b) Rural areas 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.
						c) Encroachment Visual inspection of instances of encroachment of vegetation	10.1.3	Number of occurrences of vegetation encroachment
						d) Sight lines Visual inspection	10.1.4	Number of instances of impairment of sight lines or sight distance to signs
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.
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
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
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
11) REST AREAS AND PICNIC AREAS (Not Used)								

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			Hazard Mitigation	Permanent Remedy	Baseline Condition Repair			
12) EARTHWORKS, EMBANKMENTS AND CUTTINGS								
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
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
13) ITS EQUIPMENT								
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
13.2	Dynamic Message Sign Equipment	Dynamic Message Signs are free from faults such as: i) Any signal displaying a message which is deemed to be a safety hazard. 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
13.3	CCTV Equipment	CCTV Systems are free from serious faults that significantly limit the availability of the operators to monitor the area network, such as: i) Failure of CCTV Systems to provide control offices with access and control of CCTV images. ii) Failure of a CCTV camera or its video transmission system. iii) Failure of a Pan / Tilt unit or its control system. 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

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13.4	Vehicle Detection Equipment	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
		i) Inoperable loops.				Traffic Detector Loops:	13.4.2	Traffic Detector Loop circuit's inductance to be > 50 and < 1,000 micro henries.
		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.
14) TOLLING Facilities and Buildings (Not Used)								
15) AMENITY								
16) SNOW AND ICE CONTROL								
16.1	Travel lanes	Maintain travel way free from snow and ice	2 hrs	N/A	N/A	Maximum 1hr response time to complete manning and loading of spreading vehicles.	16.1.1	Inspection records showing compliance with requirements for snow and ice control in each Performance Section
						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
						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
16.2	Weather Forecasting	Weather forecast information is obtained and assessed and appropriate precautionary treatment is carried out to prevent ice forming on the travel way.	2 hrs	N/A	N/A	Operations plan details the process and procedures in place and followed.	16.2.1	Inspection records showing compliance with requirements for weather forecasting in each Performance Section
16.3	Operational Plans	Operate snow and ice clearance plans to maintain traffic flows during and after snowfall and restore the travel way to a clear condition as soon as possible.	2 hrs	N/A	N/A	Operations plan details the process and procedures in place and followed.	16.3.1	Inspection records showing compliance with snow and ice clearance plans in each Performance Section
17) INCIDENT RESPONSE								
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
						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
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
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
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

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18) CUSTOMER RESPONSE								
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.
						All work resulting from customer requests is scheduled within 48 hours of customer contact.	18.1.2	Demonstrated by O&M Records
						Follow-up contact with the customer within 72 hours of initial inquiry.	18.1.3	Demonstrated by O&M Records
						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
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.
19) SWEEPING AND CLEANING								
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.
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.

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 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 th is achieved for each Measurement Record.

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