BRIDGE INSPECTION GUIDELINES

CHAPTER 2 - TYPES OF BRIDGE INSPECTIONS AND INSPECTION INTERVALS

2.1 INTRODUCTION

ADOT's Bridge Inspection Program follows general inspection policies and procedures published in the following manuals latest editions:

- AASHTO Manual for Bridge Evaluation (MBE)
- AASHTO Manual for Bridge Element Inspection (MBEI)
- FHWA Bridge Inspector Reference Manual (BIRM)

Bridge inspections allow the agency to maintain an inventory of structures in order to track their condition and preserve or improve the remaining life of the structures through early detection of defects and timely repairs.

Currently, there are seven types of inspections performed within ADOT's bridge inspection program:

1. Initial Inspections
2. Routine Inspections
3. Special Inspections
4. In-Depth Inspections
5. Non-Redundant Steel Tension Members Inspections
6. Damage Inspections
7. Underwater Inspections

An "NSTM In-Depth" inspection is an In-Depth inspection of a qualified structure meeting the criteria in Subsection 2.5 of these guidelines, but also has NSTMs that qualify for an NSTM inspection meeting the criteria in subsection 2.6 of these guidelines.

There are 2 other types of inspections:

1. Service Inspection: An inspection to identify major deficiencies and safety issues, performed by personnel with general knowledge of bridge maintenance or bridge inspection. This type of inspection will not be utilized by ADOT because the Department will not pursue an inspection interval greater than 48 months for routine inspections.
2. Scour Monitoring Inspections: An inspection performed during or after a triggering storm event as required by a Scour Plan of Action (POA), by personnel with qualifications required by the agency. When required by a POA after a triggering event, this type of inspection will be performed by personnel meeting the criteria shown in Subsection 2.4 of these guidelines.

Inspection procedures, documents, findings, and reports must be per the requirements presented in these guidelines.

2.2 INITIAL INSPECTIONS

The purpose of an initial Inspection is to record the bridge into the bridge inventory database. It is the first inspection of a newly constructed, replaced or rehabilitated structure. An initial inspection documents the condition of the new structure or the structural changes due to a widening or rehabilitation. Initial Inspections includes coding of the analytical determination of load carrying capacity and scour criticality.

It is preferred that an initial inspection is performed for each new structure after construction is essentially complete and before the bridge is put into service, but in some instances the initial inspection can't be performed until after the structure was opened to traffic. For those instances, the initial inspection must be performed within 3 months after it was open to traffic. If a structure was open to traffic for more than 3 months and an initial inspection has yet to occur; the Bridge Inspection Team Leader will schedule the inspection, provide the inspector the reason(s) for the late initial inspection, and request the inspector include the reason(s) within the inspection notes.

It is also recommended that load rating for structures that are due for an initial inspection be performed prior to the inspection, as that would allow the load rater to request or confirm specific measurements or other info from the inspection team. Such coordination would save a repeat trip to the bridge site.

Initial inspections serve as the baseline condition of the structure and will be used to determine deterioration of various elements during future inspections. Prior to the inspection site visit, the team leader shall record the structure's baseline information into the agency's database using the record drawings or as-built plans.

During the initial inspection site visit, the team leader shall verify the info previously collected and record any information that could not be determined from the plans. Initial measurements, quantities and condition of elements, presence of utilities or signs, thickness of overlays or other pertinent info shall also be recorded during the initial site visit.

A structure's Inspection intervals cannot exceed 24 months after the completion of an initial inspection. Inspection intervals exceeding 24 months can only be set after the following has occurred:

1. A completed initial inspection.
2. 24 months in service.
3. Completed first routine inspection.

The inspection interval shall be determined per the agency's inspection interval criteria as shown in Subsection 2.8 of these guidelines.

2.3 ROUTINE INSPECTIONS

Routine Inspections provide documentation of the existing physical and functional conditions of the structures. All changes to NBI items that have occurred since last inspection are also to be documented and updated. The purpose of routine inspection is to comply with NBIS and to satisfy ADOT Bridge Inspection Guidelines. The inspections are also served to determine the need for improvement, maintenance, and establishing or revising a weight or height restriction on the bridge, to ensure that the structure continues to satisfy present service and safety requirements and to identify and list concerns of future conditions. Visual inspection is the key to start of any inspection. In particular, it may apply to underside of the deck, superstructure and substructure units. Load capacity analysis is re-evaluated only if changes in structural conditions or pertinent site conditions have occurred since the previous analysis. There are three types of structures with respect to routine inspections to consider:

1. Typical Structures (full ground access - year round)
2. Bridges with Ground Access by Special Equipment
3. Bridges with Limiting Access Factors

2.3.1. Typical Structures

Routine Inspection of typical structures with year-round ground access such as bridges over roadways, dry washes, drainage channels, intermittent or shallow streams, rivers, or canals with access from walkways under the structure is done on foot. For a bridge with substructure units in the water, after visual evaluation of all elements, it is necessary to evaluate physical condition of the bridge's elements that may not be visible. This evaluation may include sounding of structural surfaces with a hammer to detect delamination under the surfaces or use of probing or sounding rods to detect any hidden scour at bottom of the substructure units. When the abutments are hidden behind bank protection, the probing should be applied to the toe of the bank protection.

2.3.2. Bridges with Partial Ground Access

When ground access to the underside of a bridge deck is not possible without additional equipment such as waders or canoes, other inspection methods have to be considered for scheduling and conducting such routine inspections. Irrigation and municipal water canal are examples of bridges that would require advanced scheduling and additional inspection planning and preparation.

Majority of the canals in Arizona are used for irrigation purposes. When the use of canal water is mainly for irrigation, the water flows full in the canal during growing season and is then reduced to low flow or dry conditions in the non-growing season. Low flow or dry conditions allows for inspection of bridges over these irrigation canals with or without waders. The inspector should apply probing techniques to detect any scour at toe of the abutments or bank protection units. When the channel bottom adjacent to the substructure elements is soft or slippery, extra care must be taken in wading the water regardless of the water depth.

The canals conveying municipal water (e.g., Central Arizona Project) usually flow full year-round except for a short time during periodic dry-ups (typically once every seven years) for maintenance purposes. Since the routine inspection interval for a bridge is once every 24 months, the inspection date almost always coincides with water being present at full depth in the canal which necessitates utilization of a boat in order to be able to access and inspect the underside of bridge decks or bridge superstructures over municipal water canals. The inspector can apply visual and physical probing techniques from a boat to detect any defects including scour at toe of the abutments, piers, or bank protection units.

2.3.3. Bridges Over Canals with Limiting Factors

Limiting factors to consider are high depth, high velocity, low freeboard, and high turbidity that make the routine inspection under such canal bridges difficult or unsafe even with waders or a boat. As a result, canals with limiting factors will be scheduled for a routine inspection every 24 months and an underwater inspection every 60 months. The routine inspection will be for the portions of the bridge that are accessible by foot. The underwater inspection will be performed on the portions of the substructure and the surrounding channel that cannot be inspected visually. See Subsection 2.8 for additional details and requirements regarding underwater inspections.

2.4 SPECIAL INSPECTIONS

Special inspections will be performed by a lead inspector that is either a qualified Team Leader, a Professional Engineer with a minimum of 5 years' experience in bridge design and construction, or specialized bridge inspectors such as divers, climbers, or riggers. Special inspections will also be used to monitor localized deficiencies in lieu of a reduced routine inspection interval

The lead inspector will only inspect the eligible component(s) with suspected deficiencies, or monitor special details or unusual characteristics of a bridge that do not have defects. The lead inspector shall utilize any necessary inspection methods such as visual, physical, Non-Destructive Evaluations (NDE), or other methods needed to inspect the defect or the special details and characteristics. If the special inspection requires a technician to perform an NDE, the team leader is required to be present for the entire duration of the non-destructive evaluations. The required qualification of the team members will be identified in the "Special Inspection Procedures" on a per bridge basis.

A "Special Inspection Procedure" will be created for special inspections and must identify the access and inspection equipment that will be used during the inspection. The "Special Inspection Procedure" must be developed prior to the inspection using the template provided by ADOT's Bridge Group. Every special inspection will require a "Special Inspection Procedure" to be developed, unless the special inspection is to monitor a localized deficiency that a procedure has already been developed and the condition hasn't changed. In such cases, the previously developed "Special Inspection Procedure" can be reused and will only require an update. Multiple "Special Inspection Procedure" might be available for one structure, with each defect, special detail, or unusual characteristic having its own procedure developed. The "Special Inspection Procedure" will be uploaded to BrM's multimedia section, under the "BRIDGE" tab.

All special inspections must also include a "Special Inspection Supplemental Report". The supplemental report shall be completed during or after an inspection is completed, and must be submitted for review along with the inspection report as part of the QC/QA submittal. After approval, the supplemental report shall be uploaded to BrM's multimedia section, under the "BRIDGE" tab.

After the completion of a special inspection, the Team Leader will use all the data collected in the field, including any NDE results to create a new inspection report in BrM with the type of inspection identified as a "Special" inspection. The special inspection" will be identified as such in the database, in order to not affect or change the inspection interval established during a routine, underwater, NSTM, an in-depth or an initial inspection, unless the special inspection Team Leader has lowered the NBI condition rating of the deck, superstructure, substructure, channel, or culvert, and a new inspection interval has been set.

The Program Manager or the Bridge Inspection Section Leader will request a Special Inspections as follows:

1. When condition ratings are coded 3 or less due to deterioration of a component(s) with localized deficiencies, ADOT will determine if a special inspection limited to those deficiencies will be performed at an interval of 12 months or less. The special inspections must be performed by the qualified team leader listed in the procedure. The special inspection of those deficiencies may be used in lieu of a reduced interval routine inspection.
2. After a damage inspection has been performed and a change in the condition rating is warranted for the damaged areas of the bridge, ADOT will schedule a special inspection to document the changes to the affected component's condition rating and to the affected

element's condition state. Such special inspection requiring a condition ratings change must be performed by a qualified team leader listed in the procedure.

3. When there's a need to monitor a particular known or suspected deficiency such as fatigue or shear cracking, soffit map cracking with efflorescence, pot holes in a recently paved overlay, or special details or unusual characteristics of a bridge that does not necessarily have visual defects but requires non-destructive evaluations.

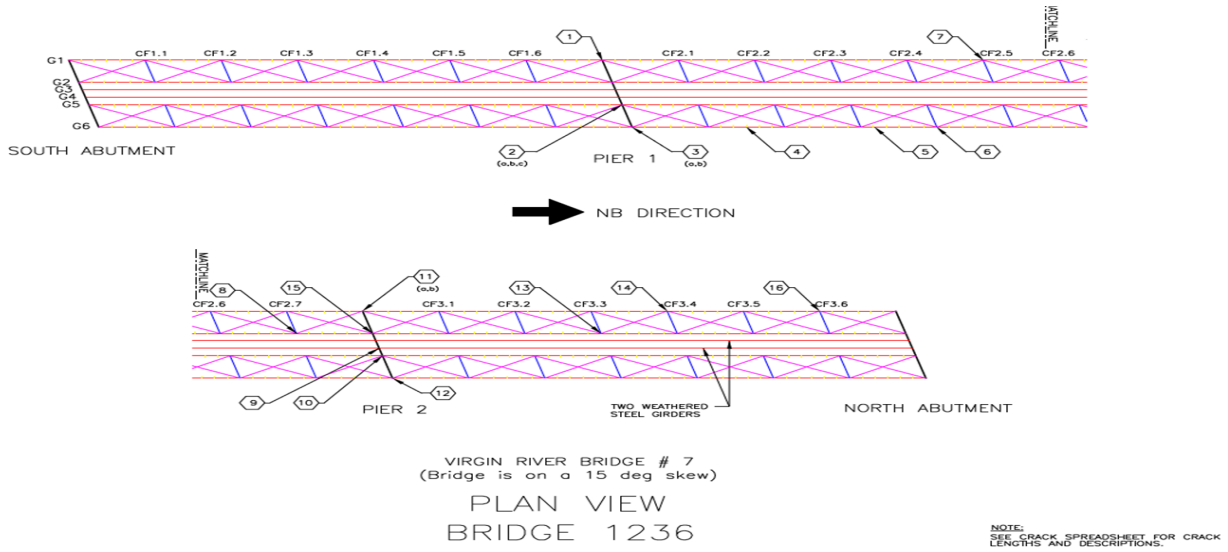
2.5 IN-DEPTH INSPECTIONS

An in-depth inspection is a close-up, detailed, and hands-on inspection of one or more bridge components located above or below water, using visual or non-destructive techniques to identify any deficiency not readily detectable using routine inspection procedures.

The purpose of in-depth inspection is to collect and document data to a sufficient detail needed to ascertain the existence of or the extent of any deficiencies, provide non-destructive field tests, other material tests or both as may be necessary.

The cracking of the main members and connection welds may be illustrated in sketches for better description and reporting.

Load capacity analysis is to be re-evaluated only if changes in structural conditions or pertinent site conditions have occurred since the previous analysis.



Example of a sketch showing crack locations in steel superstructure

In-depth inspections will be performed by a qualified Team leader and, if required, specialized bridge inspectors such as divers, climbers, or riggers. Any additional required qualifications will be identified in the "In-Depth Inspection Procedures" on a per bridge basis. The qualified inspector(s) will be using visual or nondestructive evaluation techniques as required to identify any deficiencies not readily detectable using routine inspection procedures.

Per 23 CFR 650.313(j), at least one qualified Team Leader must actively participate in the inspection at all times during each in-depth inspection. For large structures that require multiple crews or mixed day

and night inspection shifts; one Team Leader must be present with each crew and for every shift regardless of the time of day.

In-Depth inspections will be performed on all steel bridges, any bridges with steel substructure bents, caps, or columns, severely deteriorated concrete and timber bridges, and substructures below water (underwater inspection levels 1 or 2 only) based on the following criteria:

- For steel bridges, the in-depth inspection interval is:

Condition Rating	Inspection Interval
≥ 6	48 months
5 or 4	24 months
3	12 months or less

- For deteriorated concrete or timber bridges, the in-depth inspection interval is:

Condition Rating	Inspection Interval
5	48 months
4	24 months
3	12 months or less

- For any bridge where the use of access equipment provides the only means of inspection, the in-depth inspection interval will be equal to the routine inspection interval.
- Additional criteria will be established on a case-by-case basis to determine the in-depth inspection interval. For such cases, the inspection interval will be documented in the "In-Depth Inspection Procedure".

The in-depth inspection will consist of close-up detailed inspections of bridge components per the criteria noted above and as noted in the "In-Depth Inspection Procedure".

An in-depth inspection will typically be performed at the same time as a routine level inspection of the bridge. In certain situations where, due to unforeseen circumstances (Traffic control not allowed, access restrictions, malfunctioning access equipment, Railroad permit not issued or other circumstances), the routine and in-depth inspections cannot be performed on the same day, the inspection team will perform the routine level inspection (if possible), and the team will return at a later date to perform the in-depth inspection only.

Access for in-depth inspections may require the use of ladders, under bridge inspection vehicles (UBIV), climbing techniques or a combination thereof. Traffic control or right of way permits might be needed.

An "In-Depth Inspection Procedure" will be created for each in-depth inspection and must identify the access and inspection equipment that will be used during the inspection. The "In-Depth Inspection Procedure" will be uploaded to BrM's multimedia section, under the "BRIDGE" tab.

All in-depth inspections must also include the "In-Depth Inspection Supplemental Report". The supplemental report must be completed during or after an inspection is completed, and must be submitted for review along with the inspection report as part of the QC/QA submittal. After approval,

the supplemental report shall be uploaded to BrM's multimedia section, under the "BRIDGE" tab.

2.6 NON-REDUNDANT STEEL TENSION MEMBERS INSPECTIONS

A Non-Redundant Steel Tension Member (NSTM) must meet all of the following criteria:

a) Must be steel
b) Must be in tension
c) The loss of the NSTM would result in a partial or total loss of the structure

An important aspect of steel bridge inspection is to determine potential fatigue and/or fracture. Fatigue cracks are developed at stresses well below the material's yield point stress. Fatigue and fracture can lead to premature and possibly sudden failure of a portion of the bridge or of the entire bridge.

An "INSTM Inspection Procedure" will be created for each bridge with NSTMs and must identify the and qualifications of the Team Leader performing the inspection, the access and inspection equipment, any recommended methods of testing for NSTMs, and any traffic control that will be used during the inspection. The procedure must include highlighted locations of NSTMs in tension zones and typical fatigue prone details (E and E') listed in AASHTO fatigue prone categories in the member. The "NSTM Inspection Procedure" will be uploaded to BrM's multimedia section, under the "BRIDGE" tab.

All NSTM inspections must also include the "NSTM Inspection Supplemental Report". The supplemental report must be completed during or after an inspection is completed, and must be submitted for review along with the inspection report as part of the QC/QA submittal. After approval, the supplemental report shall be uploaded to BrM's multimedia section, under the "BRIDGE" tab.

NSTM inspection intervals will be reduced from 24 months to 12 months if any of the following criteria are met:

- NSTM Inspection Condition (B.C.14) = 4 [Superstructure Condition Rating (Item N59) = 4 or Substructure Condition Rating (Item N60) = 4]

When the NSTM inspection condition (Item B.C.14) or either condition rating noted above are coded 3, ADOT will reduce the NSTM inspection interval to less than 12 months or close the bridge depending on the severity of the condition.

When the NSTM inspection condition (Item B.C.14) or either condition rating noted above are coded 2 or less, ADOT will close the bridge until the deficiency is mitigated.

An initial inventory of existing data will be conducted to identify any structures that meet the criteria listed above, and the inspection interval for those structures will be reduced to 12.

Furthermore, the inspection intervals will be reduced:

1. When Team Leaders change the condition rating for the criteria listed above after an inspection. It will be the Team Leader's responsibility to enter the correct inspection interval for the structure into the database prior to finalizing the inspection report.
2. When a QC/QA of inspection reports is being conducted, the QC/QA Engineer will review the need to reduce the inspection intervals per the criteria listed above. If the Team Leader didn't

reduce the inspection interval, the QC/QA Engineer will instruct the Team Leader to modify the inspection interval accordingly.

An annual inventory check will be conducted to determine that the structures' reduced inspection intervals correspond to the selection criteria noted above. Any structures that meet the above noted criteria will have their inspection interval reduced to 12 months or less.

ADOT may also reduce NSTM structures inspection periods from 24 to 12 months or less based on factors such as structure type, design, materials, age, environment, annual average daily traffic and annual average daily truck traffic, loads and safe load capacity, and known deficiencies.

2.7 DAMAGE INSPECTIONS

A damage Inspection is an unscheduled inspection to assess the structural damage resulting from environmental or human actions. Damage Inspections are performed following extreme weather-related events (major storm with flash flooding), earthquakes, wildfires, and vandalism or damage caused by vehicular, train, or plane collisions. Incidents with scrape marks and small impacts usually go unnoticed until the next inspection cycle.

Upon notification of potential damage to a bridge from an ADOT Maintenance District, Traffic Operations, or a Local Agency, the Program Manager or Bridge Inspection Section Leader will determine if a damage inspection is required and assign the inspection to a qualified Bridge Inspection Team Leader. In the case the damage type requires the input from an experienced engineer, a Professional Engineer from Bridge Group with experience in bridge design, bridge maintenance or construction, or bridge load rating can be requested to assist with the damage inspection by providing analysis of the damaged member or a repair recommendation. The qualified team leader assigned must be present during the duration the experienced engineer is assisting with the damage inspection, and the damage inspection report must include the name and qualifications of the assisting engineer. The qualified team leader can also request that the Bridge Inspection Section Leader assign a special inspection to further investigate the damage. Special inspections must meet the criteria shown in Subsection 2.4 of these guidelines.

If the damage is considered to be a Critical Finding, then the process identified in the Bridge Inspection Guidelines shall take place. Determinations of necessary actions to close the bridge or place restrictions to vehicular or pedestrian traffic on or below the bridge will be communicated to the District or local agency owner, immediately.

The inspector will only inspect the eligible component(s) by verifying the changes during a field visit and will document those changes by taking photos and measurements that will later be used to produce the damage inspection report. A ground level visual inspection is expected to be performed to assess the damage, but in some instances access equipment such as ladders, aerial lifts or other equipment might be needed to get a closer look at the damage or perform a hands-on physical inspection.

There are two levels of incidents reported by ADOT District's personnel:

- A level I Damage Inspection to the primary member with distortions of 2 inches or more of the bottom flange, spalling of concrete more than 6 inches in width with cracking and exposed reinforcement.

- A level II Damage Inspection takes place when critical damage to the primary structural elements causes concern for the structural stability or the loss of structural capacity. A hands-on inspection must be performed as soon as the scene is safe for the inspectors and their equipment to inspect the affected component(s). In most cases when a Type II Damage Inspection is requested, immediate repairs and other restrictions are required in order to maintain safe passage of vehicles under and/or on the bridge. Restrictions and an appropriate traffic control setup shall remain in place until the structure has been deemed safe to the travelling public. An assessment must be made if the damage has reduced the safe load carrying capacity of the structure and/or if ~~a~~ temporary shoring or a support system is required. After stabilizing the structure and providing permanent lane/load restrictions as needed, a request for action is developed and plans for the permanent repair and restoration of the structure are developed for construction. Additionally, a narrative of activities completed is to be provided and included with the Level II Damage report in the bridge file as pdf attachment in bridge inspection database, Multimedia section, Context = BRIDGE.

The extent of damage and repair recommendations should be reported to ADOT's District Maintenance personnel and to ADOT's Risk Management Section for State owned bridges, and to the owner for local government bridges.

When major damage has occurred, the inspectors will need to:

- Identify fractured or failed members and/or effected elements
- Measure any material section loss
- Measure any member misalignment
- Identify the number of and location of damaged reinforcement or tensioned strands
- Determine any loss of foundation support
- Check for damage at connection locations near the damaged area

When the damage is a result of flooding event, the inspectors will need to:

- Identify scour around foundation elements
- Identify bank protection erosion
- Document any failure to scour or bank protection measures
- Document debris collection at foundation elements blocking flow
- Measure freeboard (if possible)

The damage inspection report will utilize the "Damage Inspection Report" template, and the report will be reviewed by the Bridge Inspection Section Leader and/or the Program Manager. Final sealed and signed damage inspection report will be sent to ADOT's Maintenance District or the local agency owner, and to ADOT's Insurance Recovery Unit, only if it is a State owned bridge. Local agencies will follow their own protocols and procedures for insurance recovery.

Drafts of damage inspection reports must be forwarded to Bridge Inspection Program Manager for review prior to sealing and signing, and uploading the report to the structure's folder in the database.

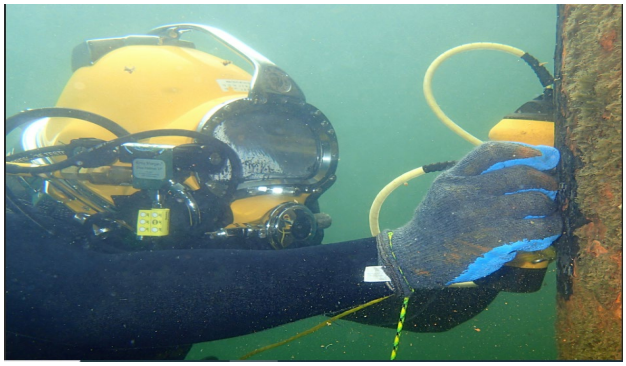
The final sealed and signed report will be uploaded to the Bridge multimedia tab of BrM.

If the damage warrants a change in bridge component condition rating, a special inspection will be scheduled by the Bridge Inspection Team Leader or the Program manager. The special inspection will follow the guidelines noted in the "ADOT Special Bridge Inspection Criteria".

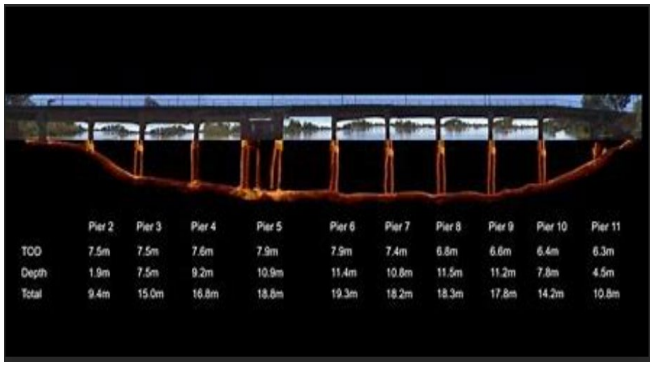
2.8 UNDERWATER INSPECTIONS

An underwater (UW) inspection is to provide information on an inspection of the underwater portion of a bridge substructure and the surrounding channel which cannot be inspected visually at low water by wading or probing, generally requiring diving or other appropriate techniques.

New technologies, including ground sensing radar, ultrasonic techniques, remote video recorders, and others are useful aids for underwater inspections of substructure foundations for limited situations. Key information to be determined in every underwater inspection is the top of streambed relative to the elevation of the substructure foundations. Since scour can vary significantly from one end of a footing to the other, a single probe reading is not sufficient. Baseline streambed conditions should be established by waterway opening cross sections and by grid pattern of probe readings around the face of a substructure unit.



Underwater inspection by NBIS-qualified diver



Underwater imagery with sonar scan

The baseline information is essential for future monitoring and assessment. The current streambed conditions and changes since the last inspection are critical inputs to the bridge scour assessment. Each bridge should have local benchmarks established near each substructure unit to enable inspectors to quickly and accurately determine the depth of adjacent scour. These benchmarks can be as simple as a

painted line or PK survey nail driver into the wall in a place visible during high water. The location of these scour-monitoring benchmarks should be referenced in the inspection records and bridge file. Use previously established benchmarks when possible to provide a consistent long term record of scour conditions. If new benchmarks need to be established, provide conversion from new to old datum.

Underwater inspections by divers are required at least once every 60 months for structures with water depths typically greater than 4 feet or due to other unfavorable conditions such as darkness, turbidity, high velocity flow, etc. in a perennial stream (channel). Since some changes to the NBI ratings, Condition State values, and recommended repair/maintenance items may be necessary as a result of the UW inspection; the UW inspection Team Leader should make the necessary changes in the UW inspection report in BrM. This includes additional repairs/maintenance work associated with the UW inspection. The inspector then prints the draft report and sends it in for review and handles subsequent revision(s) before sealing and signing the final copy. See Appendix J for the Underwater Inspection Procedures Template.

2.8 INSPECTION INTERVAL FREQUENCY AND CRITERIA

Inspection frequency will vary depending on the type of inspection and the condition of the structure. The maximum inspection interval shall not exceed 24 months for a bridge and 48 months for a culvert.

Bridge inspection must be completed during the month in which the inspection is due. The due month is determined by the date of the previous inspection. If a bridge inspection cannot be completed in the month it is due, then the inspection team leader must notify Bridge Inspection Program Manager~~,~~ and document the reason for the delay in the inspection report, under the inspection notes section.

All ADOT culverts are routinely inspected on a 48-month cycle. If a local agency formally requests for a more frequent inspection of its culverts, ADOT will do so.

2.8.1 Reduced Inspection Interval Criteria

The following criteria will be implemented by the Arizona Department of Transportation (ADOT) in order to comply with the guidance FHWA outlined in 23 CFR 650.311 to establish reduced inspection intervals for *routine*, *underwater*, and *NSTM* inspections utilizing Method 1.

2.8.1.1 Reduced Routine Inspection Intervals:

Condition ratings that are considered for the reduced inspection interval are noted below. ADOT may consider other factors for bridges and culverts to be inspected at a 12 month interval or less. Such factors include the structure type, design, materials, age, environment, annual average daily traffic and annual average daily truck traffic, history of vehicle or debris impact damage, loads and safe load capacity, and other known deficiencies.

When condition ratings are coded 3 or less due to localized deficiencies, ADOT will determine if a special inspection limited to those deficiencies will be performed at an interval of 12 months or less. The special inspection of those deficiencies will be used in lieu of a routine inspection.

Routine inspection intervals will be reduced from 24 months to 12 months if any of the following criteria are met:

- Deck Condition Rating (B.C.01) = 3 [Deck condition rating (Item N58) = 3]
- Superstructure Condition Rating (B.C.02) = 3 [Superstructure condition rating

(Item N59) = 3]
- Substructure Condition Rating (B.C.03) = 3 [Substructure condition rating (Item N60) = 3]
- Culvert Condition Rating (B.C.04) = 3 [Culvert Condition Rating (Item N62) = 3]
- Scour Condition Rating (B.C.11) = 3 [Scour Critical Bridges (Item N113) = 3]

If any of the condition ratings noted above are coded 2, the inspection interval will be reduced to an interval less than 12 months depending on the severity of the condition.

An initial inventory of existing data will be conducted to identify any structures that meet the criteria listed above, and the inspection interval for those structures will be reduced to 12 months.

Furthermore, the inspection intervals will be reduced:

1. When Team Leaders change the condition rating for the criteria listed above after an inspection. It will be the Team Leader's responsibility to enter the correct inspection interval for the structure into the database prior to finalizing the inspection report.
2. When a QC/QA of inspection reports is being conducted, the QC/QA Engineer will review the need to reduce the inspection intervals per the criteria listed above. If the Team Leader didn't reduce the inspection interval, the QC/QA Engineer will instruct the Team Leader to modify the inspection interval accordingly.

An annual inventory check will be conducted to determine that the structures' reduced inspection intervals correspond to the selection criteria noted above. Any structures that meet the above noted criteria will have their inspection interval reduced to 12 months or less.

A Scour Condition Ratings (N113) of 3 or less under the Recording Guide will require the Team Leader to assign a temporary Scour Condition Rating (B.C.11) under the SNBI coding requirements based on observed or measured scour while performing routine inspections. If the current rating is greater than or equal to 4, the inspection interval will not be reduced to 12 months, unless any of the other noted condition ratings listed above are less than or equal to 3. The B.C.11 rating for scour condition shall be coded in the appraisal page under Observed Scour Rating.

2.8.1.2 Reduced Underwater Inspection Intervals:

Condition ratings that are considered for the reduced inspection interval are noted below. ADOT may consider other factors for bridges and culverts to be inspected at a 24 month interval or less. Such factors include the structure type, design, materials, age, environment, annual average daily traffic and annual average daily truck traffic, history of vehicle or debris impact damage, loads and safe load capacity, and other known deficiencies.

When condition ratings are coded 3 or less due to localized deficiencies, ADOT will not use a special inspection limited to those deficiencies. Instead, an underwater inspection will be performed at an inspection interval of 24 months or less.

Underwater inspection intervals will be reduced from 60 months to 24 months if any of the following criteria are met:

- Underwater Inspection Condition (B.C.15) = 3 [Substructure condition rating (Item N60) = 3]

- Channel Condition Rating (B.C.09) = 3 [Channel and Channel Protection Condition Rating (Item N61 = 3)]
- Channel Protection Condition Rating Item B.C.10 = 3 [Channel and Channel Protection Condition Rating (Item N61 = 3)]
- Scour Condition Rating (B.C.11) = 3 [Scour Critical Bridges (Item N113) = 3]

If any of the condition ratings noted above are coded 2, the inspection interval will be reduced to an interval less than 24 months depending on the severity of the condition.

An initial inventory of existing data will be conducted to identify any structures that meet the criteria listed above, and the inspection interval for those structures will be reduced to 24 months.
Furthermore, the inspection intervals will be reduced:

1. When Team Leaders change the condition rating for the criteria listed above after an inspection. It will be the Team Leader's responsibility to enter the correct inspection interval for the structure into the database prior to finalizing the inspection report.
2. When a QC/QA of inspection reports is being conducted, the QC/QA Engineer will review the need to reduce the inspection intervals per the criteria listed above. If the Team Leader didn't reduce the inspection interval, the QC/QA Engineer will instruct the Team Leader to modify the inspection interval accordingly.

An annual inventory check will be conducted to determine that the structures' reduced inspection intervals correspond to the selection criteria noted above. Any structures that meet the above noted criteria will have their inspection interval reduced to 24 months or less.

A Scour Condition Ratings (N113) of 3 or less under the Recording Guide will require the Team Leader to assign a temporary Scour Condition Rating (B.C.11) under the SNBI coding requirements based on observed or measured scour while performing underwater inspections. If the current rating is greater than or equal to 4, the inspection interval will not be reduced to 24 months, unless any of the other noted condition ratings listed above are less than or equal to 3. The B.C.11 rating for scour condition shall be noted in A300.

2.8.1.3 Reduced NSTM Inspection Intervals:

Reduced NSTM inspection intervals are shown in Subsection 2.6 of these guidelines.

2.8.2 Extended Inspection Interval Criteria

The following criteria will be implemented by the Arizona Department of Transportation (ADOT) in order to comply with the guidance FHWA outlined in 23 CFR 650.311 to establish extended inspection intervals for routine inspections utilizing Method 1.

Extended intervals are not applicable for new, rehabilitated, or structurally modified bridges and culverts. These structures must receive an initial inspection, be in service for 24 months, and receive its next routine inspection before being eligible for inspection intervals greater than 24 months. For these structures, the Team Leader will input the date for the next scheduled inspection in the database to be 24 months after the initial inspection was performed.

ADOT is electing to establish extended inspection intervals only for culverts that qualify based on the criteria noted below.

2.8.2.1 Extended Inspection Intervals - Culverts:

Routine inspection intervals of designated culvert structures will be extended from 24 to 48 months. Currently, ADOT is responsible for the inspection of about 4800 NBI culverts in Arizona's inventory, covering all jurisdictions. If a local agency requests ADOT to perform more frequent inspection of its culverts every 24 months, ADOT will do so.

ADOT was granted approval from FHWA on August 25, 1995 to extend the inspection frequency of culverts eligible under certain conditions from 24 to 48 months. A second approval was granted to ADOT on December 15, 2009 to add 24 local agencies to the previously approved local agencies under the conditions set forth in the 1995 approval. Extended inspection interval policies approved by FHWA under the previous regulation were rescinded in June 2024 pursuant to 23 CFR 650.311(g)(2).

ADOT received letters from local agencies requesting a 48 month inspection frequency of qualified culverts within their jurisdiction, and ADOT will maintain the letters from those local agencies in an "Extended Interval inspections Registry". The following local agencies have requested to remain on a standard 24 month interval:

Bisbee
Paradise Valley
Sahuarita
Tempe
Tolleson

The selection criteria in order for culverts to qualify for an extended inspection interval is as follows (All criteria must be met):

1. Deck condition rating (Item B.C.01) coded N [Deck condition rating (Item N58) coded N].
2. Superstructure condition rating (Item B.C.02) coded N [Superstructure condition rating (Item N59) coded N].
3. Substructure condition rating (Item B.C.03) coded N [Substructure condition rating (Item N60) coded N].
4. Year built (Item B.W. 01) [Item N27]: All culverts constructed in the year 1930 or later.
5. All culverts with a condition rating B.C.04 ≥ 6 [Culvert Condition Rating (Item N62) ≥ 6].
6. All culverts with a channel condition rating B.C.09 ≥ 6 [Channel and Channel Protection Condition Rating (Item N61) ≥ 6].
7. All culverts with channel protection condition B.C.10 ≥ 6 [Channel and Channel Protection Condition Rating (Item N61) ≥ 6].
8. Inventory Load Rating Factor (Item B.LR.05 ≥ 1.0) [Inventory Rating (Item N66) ≥ 1.0 when expressed as a rating factor].
9. Routine permit loads (Item B.LR.08) = A or N.
10. Fatigue details (Item B.IR.02) = N.
11. Highway minimum vertical clearance (Item B.H.13) ≥ 14.0 [Minimum vertical clearance over bridge roadway (Items N53) ≥ 1400 (i.e., 14.00 feet) and minimum vertical underclearance (Item N54B) coded N].
12. Span material (Item B.SP.04) = C01-C02 and S01-S05 [Main Span Structure Material (Item N43A) = 1, 2, 3, or 4]

13. Span type (Item B.SP.06) = A01, F01-F02, P01-P02 [Main Structure Construction (Item N43B] = 19].
14. All culverts with scour vulnerability B.AP.03 equals to A or B [Scour critical bridges (Item N113) = 5 or 8].
15. All culverts with scour condition rating (Item B.C.11) ≥ 6

When all the criteria noted above are not met for a culvert, the Team Leader will revise the inspection interval to 24 months.

An annual inventory check will be conducted to determine that the extended inspection intervals for culverts correspond to all of the selection criteria noted above. Any culverts that don't meet all the criteria will have the inspection interval reduced to 24 months.

For culverts meeting the above criteria, ADOT may consider other factors that may result in the inspection interval remaining at 24 months. Such factors include the environment, annual average daily traffic and annual average daily truck traffic, history of vehicle or debris impact damage, history of repairs, and other known deficiencies.

During the QC/QA review of inspection reports, when the QC/QA Engineer notices the need to reduce the inspection intervals per the criteria listed above, but the inspection interval was not reduced, the QC/QA Engineer will instruct the Team Leader to modify the inspection interval accordingly.

A structure is not eligible for an extended inspection interval after an initial inspection. The requirements a structure to be eligible for an extended interval after an initial inspection are covered in Subsection 2.2 of these guidelines.