

**Technical Note
e-Notification**

No. 10
September 24, 2020

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1. Clarification of Bridge Definition

The additions to the following sections are indicated with a **highlight**.

The definition of a *Bridge* as defined in Load Rating Guidance Document (LRGD) Section 1.3.1 shall be amended to the following:

Bridge – A structure, including supports, erected over a depression or an obstruction such as water, a highway, or a railway; having a track or passageway for carrying traffic or other moving loads; and having an opening measured along the centerline of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches or extreme ends of openings for multiple boxes. It may also contain multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening; **see *Culvert***. Any bridge meeting this definition needs to be inspected or load rated per the National Bridge Inspection Standards (NBIS).

The definition of a *Culvert* shall be added to LRGD Section 1.3.1 as follows:

Culvert – A type of structure which is designed hydraulically to take advantage of submergence to increase water carrying capacity. Culverts are usually covered with embankment and are composed of structural material around their entire perimeter. **Culverts shall only carry water.** A culvert is considered a bridge and needs to be inspected and load rated per the NBIS if any of the following conditions are met. Whether a culvert has a floor or not does not matter when determining if a culvert is considered a bridge or not.

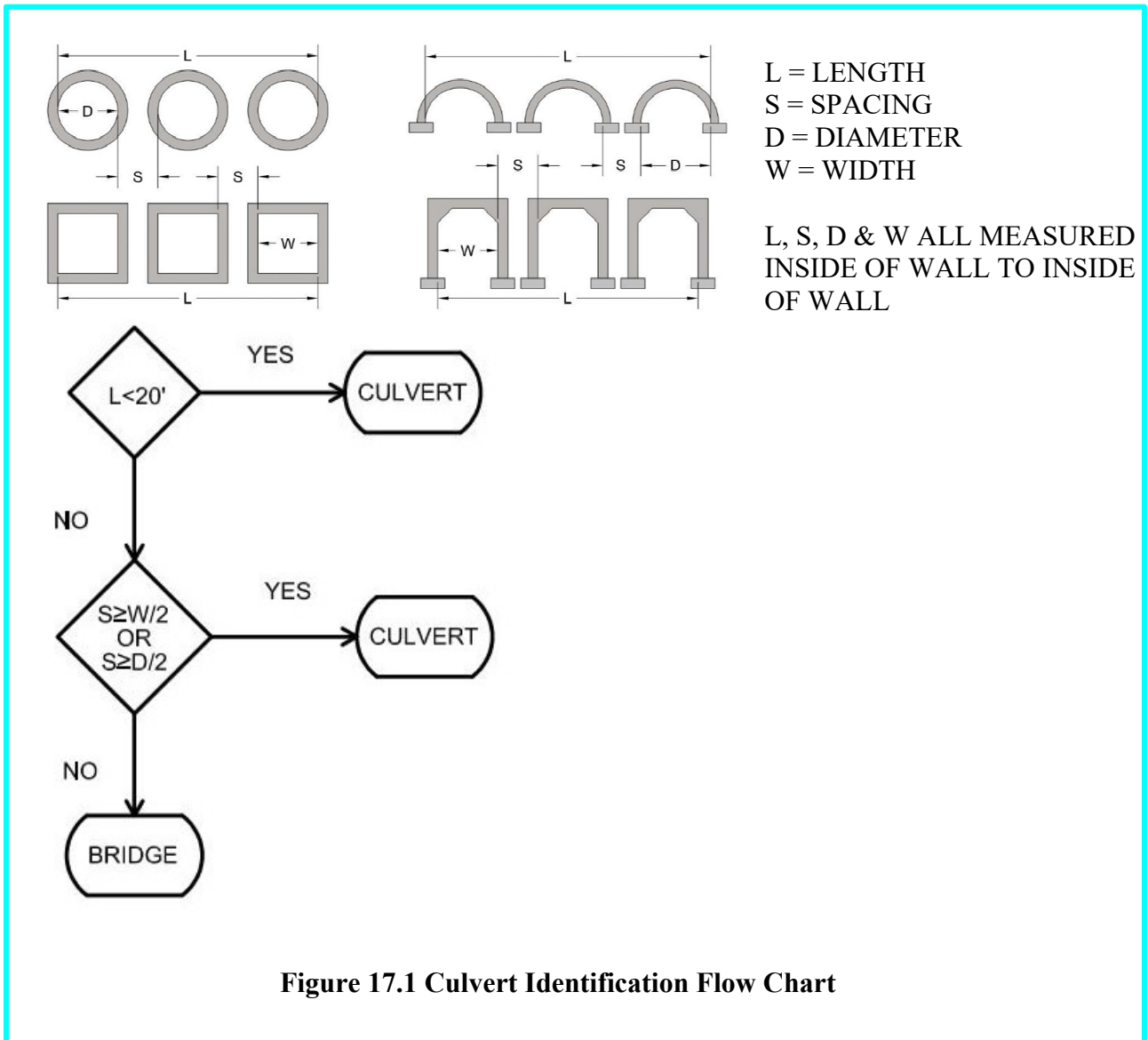
- The culvert has a hydraulic opening greater than 20 feet as measured along the center of the roadway.
- A grouping of culverts with a total length greater than 20 feet as measured along the roadway centerline, and where the clear distance between openings is less than half the smaller contiguous opening.

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In addition, Figure 17.1 (below) shall be added to LRGD Section 17.1.



Refer to Section 6.1 of the Bridge Inspection Guidance Document (BIGD) for additional information.

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2. Concrete Segmental Box Girder Bridge In-Span Hinges

Due to their non-redundant nature and potential to control the rating, in-span hinges of concrete segmental bridges (including shiplap joints) are considered primary members. The in-span hinge determined by engineering judgment to produce the least favorable rating factor shall be rated in accordance with the LRGD and published supplemental guidance.

3. Updating Element Level Quantities in BIO

Because the bridge element condition state quantities are not linked to the NBI Items defining the bridge geometry in Bridge Inspection Online (BIO), the element quantities are not automatically updated when a geometric change is made. When completing a BIO update, the load rater should update the affected bridge element quantities by adding to or subtracting from the best condition state that is non-zero. The load rater shall add a note to the *Miscellaneous Notes* section stating, "Bridge element level quantities updated [MM/YYYY] due to geometric bridge data change(s). Verify for accurateness."

If the load rater is not comfortable making the quantity changes, he or she may instead elect to add a note to the *Miscellaneous Notes* section stating, "Geometric bridge data revised [MM/YYYY]. Bridge element level quantities need updating. Revise as necessary." NBI data updates that have already been routed in BIO need not be retroactively corrected to satisfy this guidance.

Note: Condition states range from 1 (best condition) to 4 (worst condition).

4. Reporting NBI Items 64 & 66 for Timber Substructures

For cases where a bridge is supported by a timber substructure, a load rating is warranted, and the substructure controls the load rating, NBI Items 63 & 65 shall be coded as 7 – *Allowable Stress (AS) rating reported by rating factor (RF) method using MS 18 loading* and NBI Items 64 & 66 shall be coded as the Allowable Stress rating factors. Otherwise, report NBI Items 63-66 using the LRFR rating factors in accordance with Item #12 of Technical Note 03.

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5. Removing Existing Posting Sign Procedure

- I. If a bridge is posted and load rating results indicate:
 - a. it does not need to be, or
 - b. the bridge be posted, but the State Bridge Maintenance Engineer (SBME) elects not to post,

then the load rater shall notify the District that the posting sign can be removed and provide a copy of the signed and sealed Load Rating Summary Form (LRSF).

In either case, if the District confirms the posting sign will be removed, NBI Item 41 shall be updated to *A – Open, No Restriction* in BIO by the load rater. If the District elects to leave the posting sign in place or post at a higher value than the existing sign, the load rater should ensure Item 41 remains coded as *P – Posted for Load*.

If a bridge is posted when not required by the rating, then this decision must be documented in the Bridge File for future inspections, load ratings, and general understanding. A separate Posting Form with the actual posting must be created and saved in the Bridge File. Include a note in the comment section indicating the decision was made by the District to post at lower value(s) than required by the rating. The District Engineering Administrator (DEA) is considered a Designee of the SBME only when the District is electing to post lower than the rating requires and should subsequently sign the form. No other signatures on the form will be required. All e-mail correspondence with the District and the Posting Form shall be placed in the Bridge File by the load rater to document the decision(s).

- II. If a bridge posting is needed, regardless of whether the bridge has been posted previously, the District may elect to post stricter weight limits than what is required by the load rating for logistical reasons.

If the actual posting is more conservative than required by the rating, then this decision must be documented in the Bridge File for future inspections, load ratings, and general understanding. A separate Posting Form with the actual posting must be created and saved in the Bridge File. Include a note in the comment section indicating the decision was made by the District to post at lower value(s) than required by the rating. The District Engineering Administrator (DEA) is considered a Designee of the SBME only when the District is electing to post lower than the rating requires and should subsequently sign the form. No other signatures on the form will be required. All e-mail correspondence with the District and the Posting Form shall be placed in the Bridge File by the load rater to document the decision(s).

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In addition to the documentation required for situations where existing postings are removed or revised as described above, the final deliverables presented in Section 20.2.1.1 of the LRGD shall also be submitted to the Bridge File, as is customary for each load rating.

6. Unknown Minimum Prestressed Concrete Compressive Strength

South Carolina State Highway Department Standard Specifications for Highway Construction Section (1973), Section 704.02, states that “All concrete for prestressed members shall be Class X, unless otherwise shown on the plans, and shall be expected to attain a minimum cylinder compressive strength of 5,000 psi at the age of 28 days”.

The revision to the following section is indicated with a **highlight**.

The date when unknown minimum compressive strength of prestressed concrete components shall be assumed in Load Rating Guidance Document (LRGD) Section 6.8.5 shall be amended to the following:

For prestressed concrete components where the minimum compressive strength of the concrete is unknown, the minimum compressive strength, f'_c , shall be assumed to be 3.125 ksi (2.5 ksi x 1.25%) for bridges built before the year **1973**. For bridges built after **1973**, the minimum compressive strength shall be assumed to be 5.0 ksi.

Please direct any questions concerning the above to:

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