



Texas Department of Transportation

DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

July 19, 1995

Subject: Inspection Frequency Change

Mr. Don Harley, P.E.
Division Structural Engineer
Federal Highway Administration
Austin, TX 78701

Dear Mr. Harley:

The Texas Department of Transportation would like to take this opportunity to resubmit for approval a request for a variance in bridge inspection frequencies as described in 23 CFR Part 650.305c. This submittal is prepared in accordance with FHWA Technical Advisory T 5140.21 and its subsequent revisions.

TxDOT would like to be allowed to exercise a four (4) year inspection frequency for multiple box culverts. The request for extended frequency applies only to routine, comprehensive inspections. It does not apply to special inspections (i.e. Underwater Inspections) which will continue at the normal interval. Concrete culverts have load path redundancy and are very common in Texas. These structures have provided load-carrying service for at least 30 years with an excellent overall performance record. Enclosed are the limiting criteria developed under the applicable regulations, technical advisories and direction provided by the Federal Highway Administration.

Sincerely,

Robert L. Wilson, P.E.
Director, Design Division

By:

Michael R. Lynch, P.E.
State Bridge Inspection Engineer

Enclosure

REQUEST FOR EXTENDED INSPECTION FREQUENCY STATE OF TEXAS

I. **STRUCTURE TYPE AND DESCRIPTION.**

Only culverts that are on the state highway system will be considered for the extended frequency. Span length will be limited to those culverts with individual box opening less than or equal to 12 feet.

Screening Criteria

NBI Item 21 (Maintenance Responsibility) equal 01, State maintained bridges, and

NBI Item 43 (Structure Type, Main) equal 119, Concrete culvert.

NBI Item 48 (Length of Maximum Span) less than or equal to 12 feet.

II. **STRUCTURE AGE.**

All concrete culverts will receive an inventory inspection and then an initial comprehensive inspection two years after construction is completed to assure that there are no major construction errors. After the initial inspection they will be placed on the list for extended frequency for 50 years or until they fail to qualify due to the condition or appraisal rating criteria.

If a structure has a major modification made to it, the inspection interval will be reduced to two years until the modification is determined to be stable and performing satisfactory.

Screening Criteria

Culvert age will be greater than 2 years but less than 50 years.

III. **STRUCTURE LOAD RATING.**

All structures included in the extended frequency will accommodate state legal loads at the inventory rating level.

Screening Criteria

NBI Item 66 (Inventory Rating) equal 236, HS20.

IV. STRUCTURE CONDITION AND APPRAISAL RATINGS.

Screening Criteria

NBI Item 62 (Culvert) greater than 5.

NBI Item 61 (Channel) greater than 5.

NBI Item 67 (Structural Evaluation Appraisal) greater than 5.

V. VOLUME OF TRAFFIC CARRIED.

Screening Criteria

NBI Item 29 (Average Daily traffic) less than 100,001.

VI. ADTT.

Screening Criteria

NBI Item 109 (Average Daily Truck Traffic) less than 25,001.

VII. MAJOR MAINTENANCE OR STRUCTURAL REPAIRS PERFORMED WITHIN THE LAST 2 YEARS.

The structures selected for the 4 year frequency have had no major maintenance or structural repairs performed in the last 2 years. Should a major repair be required, the structure will be removed from the 4 year list and inspected on a two year interval. If the repaired condition proves stable, it may be reconsidered for the 4 year interval.

VIII.

AN ASSESSMENT OF THE FREQUENCY AND DEGREE OF OVERLOAD THAT IS ANTICIPATED ON THE STRUCTURE.

It is difficult to make definitive statements concerning the frequency and degree of overloads that might be anticipated on the structures selected for a four year frequency. Certainly there are a number of overloads that have been and continue to be permitted on these structures. Typically the routing criteria and analysis checks made have indicated that other structure types on the frequently used routes control maximum weights, axle spacings, travel speeds and transit conditions. Based on this experience and observations of field conditions of these structures, TxDOT believes that overloads should continue to be monitored but are not an overriding concern on the group of structures proposed for a four year inspection interval. Routing of permitted overloads will be done so as to preclude including stresses above 75 % of yield on any structure on the route.

XI.

FAILURE EXPERIENCE, MAINTENANCE HISTORY, AND LOAD PATH REDUNDANCY.

Structural failures in concrete culverts has been rare. The failures that have occurred have been the result of catastrophic events such as major floods or impacts by trucks or heavy construction equipment that leave the travel way. To the extent practical, the selection criteria attempts to screen for susceptibility to these conditions. Absolute protection from this type failure mode would exclude all structures from consideration. All the structures listed have load path redundancy.

X.

PROPOSED INSPECTION INTERVAL.

4 years for the structures defined by the aforementioned criteria. NBI Item 91 (Designated Inspection Frequency) equal 48. The attached diskette lists the 5,009 structures that qualified on 05/25/95. Future proposed changes in the list will be accompanied by a new diskette.

NBI DATA ITEMS CONTAINED ON DISKETTES

Item 8 Structure Number
Item 21 Maintenance Responsibility
Item 27 Year Built
Item 29 Average Daily Traffic
Item 42 Type of service
Item 43 Structure Type, Main
Item 48 Length of span
Item 61 Channel and Channel Protection
Item 62 Culverts
Item 66 Inventory Rating
Item 67 Structural Evaluation Appraisal
Item 109 Average Daily Truck Traffic