CONSOLIDATED RAIL CORPORATION

GENERAL INSTRUCTIONS FOR INSPECTION OF BRIDGES, CULVERTS AND TUNNELS

I. DEFINTIONS

(a) UNDERGRADE BRIDGE – Any single opening under the track, measuring five feet or more along the centerline of the track.

(b) OVERHEAD BRIDGE – Any overhead vehicular, pedestrian, pipe crossing or other miscellaneous overhead structure that spans over the tracks and is supported by structural elements on both sides of the tracks.

(c) SIGNAL BRIDGE – Any overhead structure specifically designed for mounting of railroad signal lights and which is supported by structural elements on one side of the tracks or both sides of the tracks (except bracket masts).

(d) CULVERT – For purposes of inspection, any drainage structure with less than a five foot clear opening other than a 24" in diameter and smaller pipe.

(e) PIPE – All drainage pipes 24" in diameter and smaller.

(f) BRIDGE STATUS – Bridge status for purposes of inspection is defined as follows:

(1) In Service – Undergrade bridges currently subjected to railroad loads; overhead bridges currently subjected to vehicular loads.

(2) Out of Service –Undergrade bridges currently not subjected to railroad loads due to official line segment abandonment, either the bridge or the line segment have been bulletined out of service.

(3) Bridge Closed – Undergrade bridges with the track removed or the connecting tracks removed, preventing train access to the bridge; overhead bridges that are closed to vehicular traffic.

II. LEVELS OF INSPECTION

(a) LEVEL 1 – Complete, hands-on inspection of all structural elements. The condition evaluation code system will be applied and documented for each element inspected and recorded on Form MW 203, "Bridge Inspection Report". The date of the inspection will also be recorded in the headquarters computer database. Supplemental information will be recorded on Form MW 204 "Supplemental Bridge Inspection Report," when sketches, dimensions, and additional comments are necessary in regards to the conditions noted. Photographs of the conditions reported can also be included along with any other inspection information.

(b) LEVEL 2 – Cursory inspection of all structural elements. A complete report will be filled out and documented on the MW 203 form.

II. LEVELS OF INSPECTION (CONTINUED)

Observation of any defect affecting the integrity of the structure for its present use or in any way endangers rail or vehicular operations (as in the case of loose material overhanging the railroad or highway) will require the inspector to notify supervision immediately. An MW 203 report detailing the deficiencies will also be completed.

III. INSPECTION RESPONSIBILITY

(a) It is the responsibility of the Manager – Bridge and Buildings to oversee the entire inspection process on his Division and to ensure that all aspects of Conrail's Bridge Management System policies are in compliance.

(b) It is the responsibility of the Supervisor of Structures to ensure that all inspections are properly conducted and documented. The Supervisor of Structures will participate in the annual training and certification of the bridge inspectors under their charge. The Supervisor of Structures will review all LEVEL 1 inspection reports and will maintain a log of dates of all LEVEL 1 and LEVEL 2 inspections.

(c) It is the responsibility of the Bridge Inspector to participate in safety training and technical seminars to maintain his certification status. The Bridge Inspector is responsible for inspecting, evaluating and documenting all bridge conditions according to the references cited in this instruction. The Bridge Inspector will record the bridge conditions on the proper forms and at the time of the inspection.

IV. INSPECTION FREQUENCY

(a) Inspection frequencies outlined below are the minimum required. More frequent inspections for any structure or any component of a structure may be necessary based on deficient conditions.

(b) All in-service undergrade bridge superstructures and substructures will be given a LEVEL 1 inspection once in each calendar year with no more than 540 days between any successive inspections. All undergrade open deck bridges will be given an additional LEVEL 2 inspection each calendar year but not within 60 days of the LEVEL 1 inspection, unless otherwise noted below.

(c) Movable bridges will be inspected on three month intervals whenever operational. Structural conditions will be documented on Forms MW 203 and MW 205 by the Bridge Inspector. Also attending theses inspections will be competent representatives from the Track, Electrical, Mechanical and Signal Departments who will be responsible for inspecting, evaluating and coding the conditions in their areas of responsibility and documenting such conditions on the MW 205.

(d) Tunnels will receive a LEVEL 1 inspection on 12 month intervals and a LEVEL 2 inspection on intervening 6 month intervals. Conditions are documented on Form MW 203 and MW 207.

(e) All in-service timber trestle bridges will be given a LEVEL 1 inspection on 6 month intervals.

IV. INSPECTION FREQUENCY (CONTINUED)

(f) All out of service or closed undergrade bridges will be given a LEVEL 2 inspection on 12 month intervals.

(g) All overhead structures for which inspection responsibility resides with competent agencies (e.g., State DOT, other Class 1 Railroads, etc.) will be given a LEVEL 2 inspection once a year.

(h) All other overhead bridges for which Conrail has undertaken inspection responsibility or "orphan" bridges for which inspection responsibility is not assigned to a competent agency will have a LEVEL 1 inspection conducted once a year.

(i) All signal bridges will be given a LEVEL 1 inspection once a year.

(j) All culverts will be given a LEVEL 1 inspection (subject to confined space entry limitations) on 24 month intervals and reported on Form MW 208.

(k) All pipes (whose outside dimension is 24" and smaller) are the responsibility of the Track Inspection Foreman under the direction of the Track Supervisor and Engineer of Track. When riding or walking the track, the Track Inspection Foreman will note and report any wet track conditions or standing water on upstream ends of pipes which would indicate a plugged, collapsed or pull-apart condition. The Track Inspection Foreman will also note depressions or holes in the track which would indicate loss of ballast through collapsed or separated pipe joints. Frequency of inspection will be based on frequency of the track inspection itself.

V. UNDERWATER INSPECTIONS

(a) The Bridge Inspector will maintain a checklist of bridges over fast running streams and areas subject to flash flooding conditions. During and after extreme rainfall, the Bridge Inspector will check these bridges for evidence of substructure undermining due to scour and any damage to the substructure or superstructure elements due to debris being washed downstream.

(b) Routine inspections for stream bed scour for all bridges over water will be conducted during the course of the LEVEL 1 inspection, when such inspection can be conducted by wading the stream and probing the stream bed around the substructure. Stream bed cross section will be checked for significant scour which would indicate inadequate hydraulic opening. When the water is too deep for wading, soundings will be taken by use of boat when such soundings can reliably be achieved by probing or use of fathometer. Sounding information will be recorded on Form MW 206.

(c) In cases where the water is too deep to obtain reliable sounding and channel cross section information by either wading or boat, the bridge will be evaluated for inclusion on an underwater inspection program by use of contract divers. This program will include bridges which are built on spread footing foundations, mats, on stream bed material subject to scouring action or have shown evidence of previous settlement and contain other submerged elements (e.g., fender systems and piling) requiring periodic diving inspection. Diving inspections of underwater structural elements will be accomplished on a minimum five year cycle. Diving inspection reports will be maintained in the bridge file in the Division office.

VI. CONDITION CODES

(a) Condition Codes from 1 through 5 will be used for documenting and evaluating all inspected bridge components. Definition of Condition Codes are referenced in the MW 202.

(b) Any condition requiring a restriction to maintain safe train operation will be marked Code 5 and reported immediately to the office of the Manager – Bridge and Buildings. The Bridge Inspector will take immediate action to protect train operations.

(c) All structural elements marked Code 5 for an in-service bridge will be personally inspected by the Manager – Bridge and Buildings and/or Supervisor of Structures. Upon inspection, an engineering judgment will be made and arrangements for repair initiated to remove restriction for safe train operations.

(d) Upon completing of repairs the Bridge Inspector will re-inspect the bridge, documenting the upgraded condition and submit a new MW 203, Bridge Inspection Report.

VII. EMERGENCY CONDITIONS

(a) In emergency situations when a bridge has sustained damage due to water borne or vehicular collision, fire, undermining of any other condition which would affect continued safe train operations, the bridge will be inspected by the Manager – Bridge and Buildings.

(b) The Manager – Bridge and Buildings, in coordination with the Supervisor of Structures, will establish train restrictions, formulate and direct emergency repairs.

VIII. ANNUAL BRIDGE INSPECTION

(a) The Supervisor of Structures will schedule dates for the Annual Bridge Inspection on each operating Sub-Division.

(b) The Supervisor of Structures on each Division will be responsible for establishing the Annual Inspection Itinerary for his Division, arranging for transportation and lodging, track time for hi-railing and scheduling Division Engineering Department personnel who will comprise the Annual Bridge Inspection Team.

(c) The Annual Bridge Inspection Team will consist, at all times, of the Manager – Bridge and Buildings, the local Supervisor of Structures (maintenance) and the Bridge Inspector for the territory being inspected. In addition, representatives of the Engineering staff will be called upon to participate in those areas for which Track, Electrical, Mechanical or Signal technical competence are required to accurately assess and evaluate bridge conditions and needs (e.g., drainage problems, movable bridges, etc.)

IX. REFERENCES

(a) **MW 202** – "Detailed Instructions for Maintenance Inspection of Bridges"

(b) **MW 203** – "Bridge Inspection Report"

(c) **MW 204** – "Supplemental Inspection Report"

(d) **MW 205** – "Movable Bridge Inspection Report"

(e) **MW 206** – "Bridge Sounding Report"

(f) **MW 208** – "Culvert Inspection Report"

(g) "Reference Guide for Preparing Bridge Inspection Reports"

(h) "Reference Guide for Preparing Culvert Inspection Reports"

(i) AREMA Manuals

1. Chapter 7 – Timber Structures
2. Chapter 8 – Concrete Structures and Foundations
3. Chapter 15 – Steel Structures

(j) Conrail Bridge Inspector Training Seminar Modules