APPENDIX GUIDE

The Appendix to the Nebraska Department of Transportation Bridge Inspection Program (BIP) Manual provides the information listed below. The Manual sets for policies and procedures to be used for safety inspection and evaluation of bridges in the states that are subject to the National Bridge Inspection Standards.

BRIDGE INSPECTION PROGRAM FORMS

The Manual Appendix also incorporates by reference all forms that are used as part of the Bridge Inspection Program. The Forms Section of each Manual chapter lists forms that apply to work of that chapter. Forms are revised periodically and the most current are posted to the Bridge Division website. All participants are advised to get the most current forms from the Bridge Division website at

http://dot.nebraska.gov/business-center/bridge/inspection/

REFERENCE DOCUMENTS FOR THE MANUAL

This Appendix to the Manual contains documents that are referenced in the Chapters of the Manual, such as lists of County and City codes and the current National Bridge Inspection Standards. Typically these documents do not change.

Item Description (listed alphabetically)	BIP Manual Chapter
Abbreviations	All
Channel Behavior Glossary	6
Example of Permanent Bridge Closure	5
Fracture Critical Inspection Submission Procedures and Naming Convention	4
Legal Sizes and Weights for Nebraska Vehicles	5
Load Rating Report Checklist	5
National Bridge Inspection Standards CFR Vol. 69, Part 650, Subpart C	1
Nebraska Local Public Agencies List	3
Quality Control Examples	All
Referenced Publications	All
Standard Bridge Photo Locations / Descriptions	4
Sufficiency Calculation (English Units)	3

SUPPLEMENTAL MANUAL GUIDANCE

The Manual Appendix also incorporates by reference all supplemental guidance to the BIP Manual that NDOT may provide between the issues of Manual revisions. These will be posted to the Bridge Division website and participants will be notified.

http://dot.nebraska.gov/business-center/bridge/inspection/

BRIDGE INSPECTION PROGRAM MEMOS AND LETTERS

The Manual Appendix also incorporates by reference all NDOT memos, newsletters, letters, policies and other documents that may be issued by NDOT that supplement the BIP Manual, and may be incorporated into future revisions of the Manual. They are not included with this Manual document because they are revised or added periodically; these will be posted to the Bridge Division website. All participants are advised to get the most current forms from the Bridge Division website at

http://dot.nebraska.gov/business-center/bridge/inspection/

REVISION HISTORY

Rev	Date	Description
0	2010 January 25	Initial Issue of Chapter
1	2011 November 01	Revision 1
2	2013 March 04	Revision 2
3	2015 March 15	Revision 3
4	2016 March 11	Revision 4
5	2017 March 16	Revision 5
6	2018 March	Revision 6
7	2020 March	Revision 7

ABBREVIATIONS

AASTHO	American Association of State Highway and Transportation Officials
ADD	Agency Defined Defect
ADE	Agency Defined Element
BDMS	Bridge Document Management System
BIP	Bridge Inspection Program
BIPDM	Bridge Inspection Program Data Manager
BIPPM	Bridge Inspection Program Program Manager
BME	AASHTO Bridge Management Element
BO	Bridge Owner
BrM	AASHTOWare's Bridge Management software
BrR	AASHTOWare's Bridge Rating software
CF	Critical Finding
CP	Complex
DR	Department Roads (DR form prefix)
EI	Element Inspection
FC	Fracture Critical
FHWA	Federal Highway Administration
HE	Hydraulic Engineer
IBR	Individual Bridge Record
ISAT	Interdisciplinary Scour Assessment Team
LPA	Local Public Agency
LRE	Load Rating Engineer
LRSS	Load Rating Summary Sheet
MBE	AASHTO Manual for Bridge Evaluation
MUTCD	Manual for Uniform Traffic Control Devices

NBI	National Bridge Inventory
NBIS	National Bridge Inspection Standards
NBE	AASHTO National Bridge Element
NCHRP	National Cooperative Highway Research Program
NCSPA	National Corrugated Steel Pipe Association
NDOT	Nebraska Department of Transportation
NHS	National Highway System
PE	Professional Engineer
POA	Plan of Action
QA	Quality Assurance
QC	Quality Control
R	Routine
SC	Scour Critical
SHV	Special Hauling Vehicle
SI&A	Structure Inventory and Appraisal sheet
TL	Team Leader
UW	Underwater Water

CHANNEL BEHAVIOR GLOSSARY

Aggradation	General and progressive buildup of the longitudinal profile of a channel bed due to sediment deposition.
Alluvium	Unconsolidated material deposited in floodplain by a stream.
Alluvial stream	A stream which has formed its channel in cohesive or non-cohesive materials that has been and can be transported by the stream.
Alternating bars	Elongated deposits found alternately near the right and left banks of a channel.
Average velocity	Velocity at a given cross section determined by dividing discharge by cross sectional area.
Backwater	The increase in water surface elevation relative to the elevation occurring under natural channel and floodplain conditions, induced by a bridge or other structure that obstructs or constricts a channel. Backwater also can occur downstream of a constriction where flow expands, as in wide, wooded floodplains.
Bank	The side slopes of a channel between which the flow is normally confined.
Bank full discharge	Discharge that, on the average, fills a channel to the point of overflowing.
Bank protecting	Engineering works for the purpose of protecting stream banks from erosion.
Bank Revetment	Erosion-resistant materials placed directly on a streambank to protect the bank from erosion.
Bar	An elongated deposit of alluvium within a channel, not permanently vegetated.
Bed load	Sediment that is transported in a stream by rolling, sliding or skipping along the bed or very close to it; considered to be within the bed layer. Also, called contact load or contact sediment discharge.
Bed material	Material found in and on the bed of a stream (may be transported as bed load or in suspension).

Bedrock	The solid rock exposed at the surface of the earth or overlain by soils and unconsolidated material.
Braided stream	A stream whose flow is divided at normal stage by small mid-channel bars or small islands; the individual width of bars and islands is less than about three times water width; braided stream has the aspect of a single large channel within which are subordinate channels.
Bridge opening	The cross-sectional area beneath a bridge that is available for conveyance of water.
Bridge waterway	The area of a bridge opening available for flow, as measured below a specified stage and normal to the principal direction of flow.
Channel	The bed and banks that confine the surface flow of a stream.
Channelization	Straightening or deepening of a natural channel by artificial cutoffs, grading, flow-control measures or diversion of flow into a man-made channel.
Clear-water scour	Scour at a pier or abutment (or contraction scour) when there is no movement of the bed material upstream of the bridge crossing at the flow causing bridge scour.
Confluence	The junction of two or more streams.
Constriction	A natural or artificial control section, such as a bridge crossing, channel reach or dam, with limited flow capacity in which the upstream water surface elevation is related to discharge.
Contraction	The effect of channel or bridge constriction on flow streamlines.
Countermeasure	A measure intended to prevent, delay or reduce the severity of hydraulic problems.
Contraction scour	Scour in a channel or on a floodplain that is not localized at a pier, abutment, or other obstruction to flow. In a channel, contraction scour results from the contraction of streamlines and usually affects all or most of the channel width.
Critical berm	Elevation on abutment wall below which if material is eroded or scoured away, the increased soil pressure results in potential wall collapse. Sheet piling is designed to support the fill down to the critical berm. For concrete wall abutments critical berm is the bottom of concrete.

Cross section	A section normal to the trend of a channel or flow.
Debris	Floating or submerged material, such as logs or trash, transported by a stream.
Degradation (bed)	A general and progressive lowering of the channel bed due to scour.
Depth of scour	The vertical distance a streambed is lowered by scour below a reference elevation.
Dike	An impermeable linear structure for the control or containment of overbank flow. A dike trending parallel with a stream bank differs from a levee in that it extends for a much shorter distance along the bank, and it may be surrounded by water during floods.
Dike (groin, spur, jetty)	A structure extending from a bank into a channel that is designed to: (a) reduce the stream velocity as the current passes through the dike, thus encouraging sediment along the bank (permeable dike); or (b) deflect erosive current away from the stream bank (impermeable dike).
Dominant discharge	(a) The discharge which is of sufficient magnitude and frequency to have a dominating effect in determining the characteristics and size of the stream course, channel and bed. (b) That discharge which determines the principal dimensions and characteristics of a natural channel. The dominant formative discharge depends on the maximum and mean discharge, duration of flow, and flood frequency. For hydraulic geometry relationships, it is taken to be the bank full discharge which has a return period of approximately 1.5 years in many natural channels.
Drift	Alternative term for “debris”.
Eddy current	A vortex-type motion of a fluid flowing contrary to the main current, such as the circular water movement that occurs when the main flow becomes separated from the bank.
Erosion	Displacement of soil particles on the land surface or in a stream due to water or wind action.
Equilibrium scour	Scour depth in sand-bed stream with dune bed about which 1 live bed pier scour level fluctuates due to variability in bed material transport in the approach flow.

Fine sediment load (wash load)	The part of the total sediment load that is composed of particle sizes finer than those represented in the bed. Normally, the fine-sediment load is finer than 0.062 mm for sand-bed channel. Silts, clays and sand could be considered wash load in course gravel and cobble bed channels.
Flanking	Erosion resulting from stream flow between the bank and the forward end of a countermeasure for stream stabilization.
Floodplain	A nearly flat, alluvial lowland bordering a stream that is subject to inundation by floods.
Flow-control structure	A structure either within or outside a channel that acts as a counter-measure by controlling the direction, depth, or velocity of flowing water.
Gabion	A basket or compartmented rectangular container made of steel wire mesh. When filled with cobbles or other rock of suitable size, the gabion becomes a flexible and permeable block with which flow-control structures can be built.
Geomorphology	That branch of both physiography and geology that / morphology deals with the form of the earth, the general configuration of its surface, and the changes that take place due to erosion of the primary elements and in the buildup of erosional debris.
Grade-control structure (sill, check dam)	Structure placed bank to bank across a stream channel usually with its central axis perpendicular to flow) for the purpose of controlling bed slope and preventing scour or headcutting.
Guide bank	Preferred term for spur dike.
Hardpoint	A streambank protection structure whereby “soft” or erodible materials are removed from a bank and replaced by stone or compacted clay. Some hard points also occur naturally along streambanks as passing currents remove erodible materials leaving nonerodible materials exposed.
Headcutting	Channel degradation associated with abrupt changes in the bed elevation (headcut) that generally migrates in an upstream direction.
Incised reach	A stretch of stream with an incised channel that only rarely overflows its banks.

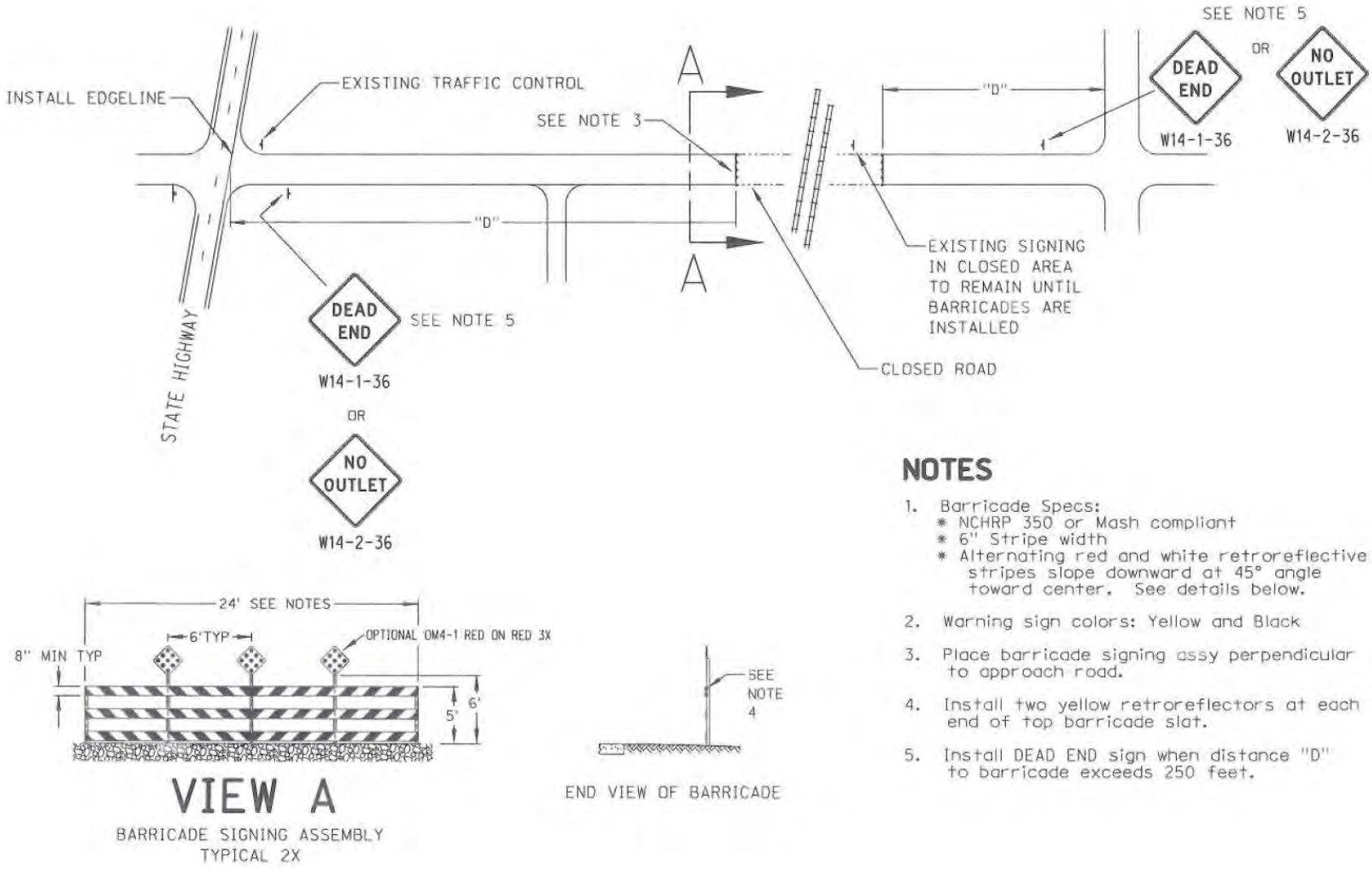
Jetty	(a) An obstruction built of piles, rock or other material extending from a bank into a stream, so placed as to induce scouring or bank building, or to protect against erosion. (b) A similar obstruction to influence stream, lake or tidal currents, or to protect a harbor.
Lateral erosion	Erosion in which the removal of material is extended in a lateral direction, as contrasted with degradation and scour in a vertical direction.
Launching	Release of undercut material (stone riprap, rubble, slag, etc.) downslope or into a scoured area.
Levee	An embankment, generally landward of top bank that confines flow during high water periods, thus preventing overflow into lowlands.
Live-bed scour	Scour at a pier or abutment (or contraction scour) when the bed material in the channel upstream of the bridge is moving at the flow causing bridge scour.
Local scour	Scour in a channel or on a floodplain that is localized at a pier, abutment, or other obstruction to flow.
Meander or full meander	A meander in a river consists of two consecutive loops, one flowing clockwise and the other anti-clockwise.
Meander belt	The distance between lines drawn tangent to the extreme limits of successive fully developed meanders.
Meandering	A stream which follows a sinuous path due to natural physical causes not imposed by external restraint, and is characterized by curved flow and alternating shoals and bank erosion.
Median diameter	The particle diameter of the 50 percentile point on a size distribution curve such that half of the particles (by weight for samples of sand, silt, or clay and by number for samples of gravel) are larger and half are smaller.
Migration	Change in position of a channel by lateral erosion of one bank and simultaneous accretion of the opposite bank.
Natural levee	A low ridge formed along streambanks during floods by deposition that slopes gently away from the channel banks.
Normal stage	The water stage prevailing during the greater part of the year.

Overbank flow	Water movement over top bank either due to stream stage or to inland surface water runoff.
Perennial stream	A stream or reach of a stream that flows continuously for all or most of the year.
Reach	A segment of stream length that is arbitrarily bounded for purposes of study.
Retard (retarder structure)	A permeable or impermeable linear structure in a channel, parallel with the bank and usually at the toe of the bank, intended to reduce flow velocity, induce deposition, or deflect flow from the bank.
Revetment	Rigid or flexible armor placed to inhibit scour and lateral erosion (see bank revetment).
Riparian	Pertaining to anything connected with or adjacent to the banks of a stream.
Riprap	In the restricted sense, layer or facing of broken rock or concrete dumped or placed to protect a structure or embankment from erosion; also the broken rock or concrete suitable for such use. Riprap has also been applied to almost all kinds of armor, including wire-enclosed riprap, grouted riprap, sacked concrete, and concrete slabs.
River training works	Any structure configuration constructed in a stream or placed on, adjacent to, or in the vicinity of a streambank that is intended to deflect currents, induce sediment deposition, induce scour, or in some other way alter the flow and sediment regimes of the stream.
Rubble	Rough, irregular fragments of materials of random size used to retard erosion. The fragments may consist of broken concrete slabs or masonry.
Sack revetment	Sacks (e.g., burlap, paper, or nylon) filled with mortar, concrete, sand, stone or other available materials used as protection against erosion.
Scour	Erosion or removal of streambed or bank material from bridge foundations due to flowing water, usually considered as long-term bed degradation, contraction, and local scour.
Scoured depth	Total depth of the water from water surface to a scoured bed level (compare with “depth of scour”).

Sediment	Fragmental material transported, suspended or deposited fluvial by water.
Sediment discharge	The quantity of sediment that is carried past any cross section of a stream in a unit of time. Discharge may be limited to certain sizes of sediment or to a specific part of the cross section.
Sediment load	Amount of sediment being moved by a stream.
Seepage	The slow movement of water through small cracks and ports of the bank material.
Sinuosity	The ratio between the thalweg length and the valley length of a sinuous stream.
Slope (channel or stream)	Fall per unit length along the channel of the bed water surface or energy gradeline. Also, sideslope of a channel bank.
Sloughing	Sliding of overlying material; same ultimate effect as caving, but usually occurs when a bank or an underlying stratum is saturated.
Spur dike/guide bank	A dike extending upstream from the approach embankment at either or both sides of the bridge opening. Guide banks may also extend downstream from the bridge.
Stable channel	A condition that exists when a stream has a bed slope and cross section which allows its channel to transport the water and sediment delivered from the upstream watershed without aggradation, degradation or bank erosion.
Stage	Water-surface elevation of a stream with respect to a reference elevation.
Stone riprap	Natural cobbles, boulders or rock dumped or placed as protection against erosion.
Stream	A body of water that may range in size from a large river to a small rill flowing in a channel. By extension, the term is sometimes applied to a natural channel or drainage course formed by flowing water whether it is occupied by water or not.
Streambank erosion	Removal of soil particles or a mass of particles from a bank surface due primarily to water action. Other factors such as weathering, ice and debris abrasion, chemical reactions, and land use changes may also directly or indirectly lead to bank erosion.

Streambank failure	Sudden collapse of a bank due to an unstable condition such as due to removal of material at the toe of the bank by scour.
Streambank protection	Any technique used to prevent erosion or failure of a streambank.
Suspended sediment	The quantity of suspended sediment passing through a discharge stream cross section above the bed layer in a unit of time.
Thalweg	The line extending down a channel that follows the main current of the flow.
Tieback	Structure placed between revetment and bank to prevent flanking.
Toe of bank	That portion of a stream cross section where the lower bank terminates and the channel bottom or the opposite lower bank begins.
Toe protection	Loose stones laid or dumped at the toe of an embankment, groin, etc., or masonry or concrete wall built at the junction of the bank and the bed in channels or at extremities of hydraulic structures to counteract erosion.
Turbulence	Motion of fluids in which local velocities and pressures fluctuate irregularly in a random manner as opposed to laminar flow where all particles of the fluid move in distinct and separate lines.
Velocity	The rate of motion in a fluid on a stream or of the objects or particles transported therein, usually expressed in m/s or f/s.
Vortex	Turbulent eddy in the flow generally caused by an obstruction such as a pier or abutment (e.g. horseshoe vortex).
Waterway opening width	Width or area of bridge opening at a specific elevation, (area) measured normal to principle direction of flow.

EXAMPLE OF PERMANENT BRIDGE CLOSURE



NOTES

1. Barricade Specs:
   * NCHRP 350 or Mash compliant
   * 6" Stripe width
   * Alternating red and white retroreflective stripes slope downward at 45° angle toward center. See details below.
2. Warning sign colors: Yellow and Black
3. Place barricade signing assy perpendicular to approach road.
4. Install two yellow retroreflectors at each end of top barricade slat.
5. Install DEAD END sign when distance "D" to barricade exceeds 250 feet.

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FRACTURE CRITICAL INSPECTION DELIVERABLES

A. Fracture Critical Inspections SHALL include the following files:

1. Inspection Reports (BR293). This form include the following parts:

BR 293 Cover - Fracture Critical Inspection Report - ***Cover Page and table of content***
BR 293a - Fracture Critical Inspection Report - ***Introduction***
BR 293g - Fracture Critical Inspection Report - ***Summary & Conclusions***
BR 293b - Fracture Critical Inspection Report - ***Bridge Orientation/Layout***
BR 293c - Fracture Critical Inspection Report - ***Identification of All Fracture Critical Members/Details***
BR 293d - Fracture Critical Procedural Report
BR 293e - Fracture Critical Inspection Report - ***NBIS Condition Rating***
BR 293f - Fracture Critical Inspection Report - ***Reference Photos/Sketches***
BR 293h - Fracture Critical Inspection Report - ***Follow-up Procedure and Appendix table of content***
Attachments (See paragraph 4 below)

Note: All BR293 series forms have been combined into a single report and shall be submitted in electronic (.pdf and .docx) formats.

2. Inspection Photos

   Note: All photos shall be submitted in electronic (.jpg) format thru BrM

3. BrM on line submittal

4. Fracture Critical Inspection report attachment MAY include any of the following files:
   a. Channel cross-section field measurements and plot of current and past cross sections superimposed on one plot.
   b. DR27 – Structure Maintenance Checklist if needed in .pdf format
   c. DR320 – Critical Finding Report in .pdf and .docx formats
   d. DR321 – Structure Repair Report in .pdf format
   e. BR385F – Supplemental Hydraulic Finding & Maintenance
   f. Intelligent PDF Form
   g. Latest Load Rating Summary Sheet (LRSS)
   h. Plans or Measurements

   Note: Items f, g and h shall be submitted in electronic (.pdf) format. All other formats, including Word (.doc) format, will NOT be accepted.

NAMING CONVENTIONS

A. Create folders for each structure

1. Example
    a. **C000100305**

B. All files below shall be named as:

STRUCTURE NUMBER_FORM NAME OR SUBMISSION CATEGORY _4 DIGIT YEAR 3 DIGIT MONTH

1. **Year and Month shall be for the date the file was created**

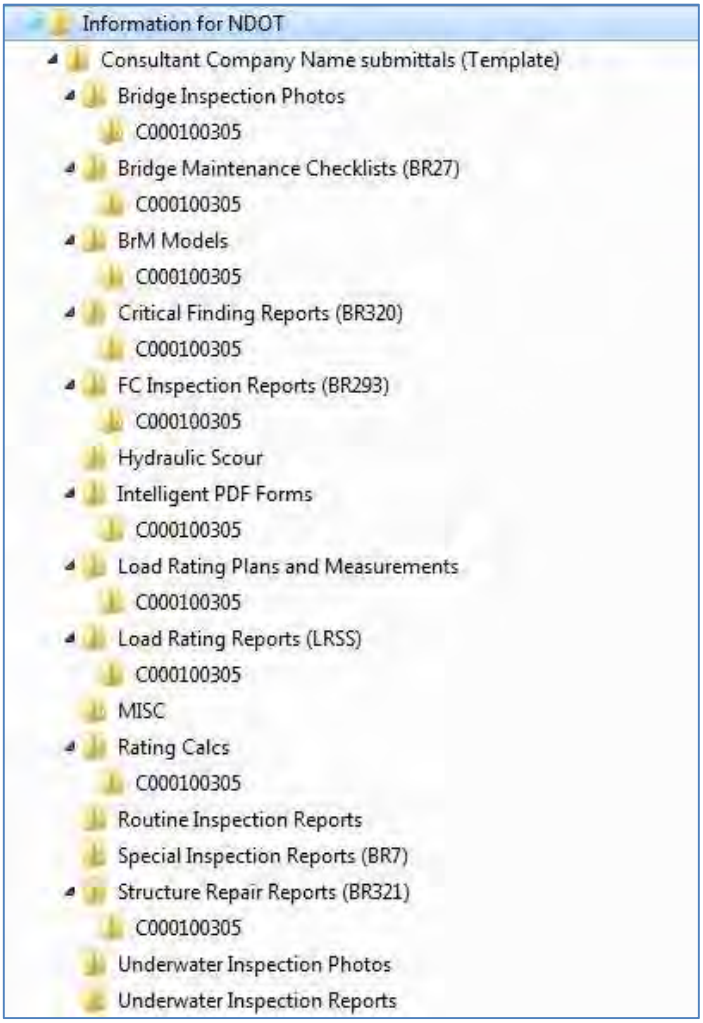
2. **Examples**
    a. Fracture Critical Inspection Report: **C000100305_DR293_2011FEB.pdf**
    b. Structure Maintenance Checklist: **C00010030_DR27_2011FEB.pdf**
    c. Critical Finding Reports: **C00010030_DR320_2011FEB.pdf**
    d. Structure Repair Reports: **C00010030_DR321_2011FEB.pdf**
    e. Rating Calculations (other than BrR output): **C00010030_Calcs_2011FEB.pdf**
    f. Intelligent PDF Form: **C00010030.pdf**
    g. Load Rating Report (LRSS): **C00010030_LRSS_2011FEB.pdf**
    h. Measurements: **C00010030_Field Measurements_2011FEB.pdf**

3. **Exceptions include:**
    a. BrR Model: **C00010030_2011FEB.xml**
    b. Plans: **C00010030_01.pdf**
    C00010030_02.pdf
    c. Inspection Photos: **C000100305_Y11_01.jpg**
    C000100305_Y11_02.jpg
    d. Rating Calculations - BrR output: **C000100305_FLXRPT_2011FEB.LIS**
    ~~e. Pontis File: **COUNTY NAME_FC_2011FEB**~~
    ~~**BURT_FC_2011FEB.pdi**~~

FRACTURE CRITICAL INSPECTION SUBMISSION PROCEDURES

All Fracture Critical Inspection reports, which cannot be submitted through BrM, shall be submitted using the NDOT FTP site. E-mail attachments and CDs will NOT be accepted.

1. Folders shall be created for each structure under each of the predefined submission categories that are applicable to each inspection



Individual files shall be placed within these folders

2. A single CD or flash drive containing all submission data shall be submitted directly to the Bridge Owner

BRM SUBMISSION

A. BrM entries shall be completed within 30 days of inspection

LEGAL SIZES & WEIGHTS FOR VEHICLES IN NEBRASKA

Standard From RM-421b, Sep 93
Updated Oct 1999

LEGAL SIZES AND WEIGHTS FOR VEHICLES IN NEBRASKA

1	Maximum overall width	8 feet 6 inches* (see below)
2	Maximum overall height	14 feet 6 inches*
3	Maximum overall length, single vehicle	40 feet*
4	Maximum overall length, combination of vehicles	65 feet
5	Maximum overall length, semi-trailer (excluding truck-tractor)	53 feet
6	Maximum overall length, semi-trailer and trailer (including connecting devices, excluding truck-tractor)	65 feet
7	Maximum single wheel load	10,000 lbs.
8	Maximum single axle load	20,000 lbs.
9	Maximum tandem axle load	34,000 lbs.

EXCEPTIONS

Width* - Eight feet six inch width shall not apply to farm equipment in temporary movement during daylight hours in normal course of farm operation.

Height - The owners, lessees and operators, jointly and severally, of vehicle exceeding twelve feet six inches in height shall assume the risk of loss to the vehicle and load and shall be liable for any damage that results to overhead obstructions from operation of a vehicle exceeding twelve feet six inches in height.

Length* - The length provisions shall not apply to the temporary moving of farm equipment during daylight hours in the normal course of farm operation, nor to the movement of public utility or other construction and maintenance material and equipment at any time. The length of refrigeration units mounted on the front of trailers which overhang the cab of the truck shall not be counted in determining length. Combination of vehicles, all trailing units of which must be equipped on each wheel with brakes that can be operated from the driving position of the towing vehicle.

****Weight** - In all cases, gross weights are subject to wheel and axle load restriction. It shall be unlawful to operate the public highways of this state any motor truck, truck-tractor, or trailer that weighs in excess of the gross weight for which the registration fee on such vehicle has been paid plus one thousand pounds. An axle load shall be defined as the total load transmitted to the road by all wheels whose centers may be included between two parallel transverse vertical planes forty inches apart, extending across the full width of the vehicle. The distance between axles shall be measured to the nearest foot. When a fraction is exactly one-half foot, the next larger whole number shall be used.

No group of two or more consecutive axles shall carry a load in pounds in excess of the value given in the following table corresponding to the distance in feet between the extreme axles of the group, measured longitudinally to the nearest foot, except two consecutive sets of tandem axles may carry a gross load of thirty-four thousand pounds each when the overall distance between the first and last axles of such consecutive sets of tandem axles is thirty-six, thirty-seven, or thirty-eight feet, and except that any group of three axles shall be restricted to a maximum load of thirty-four thousand pounds unless the distance between the extremes of the first and third axles is at least ninety-six inches in fact.

Dummy axles *shall be disregarded in determining the lawful weight of* a *vehicle or vehicle combination for operation on the highway. Dummy axle shall mean an axle attached* to a *vehicle or vehicle combination in* a *manner* so *that it does not articulate or substantially equalize the load and does not carry* at *least the lesser of eight thousand pounds or eight percent of the gross weight of the vehicle or vehicle combination*.

If any truck shall cross a bridge with total gross load in excess of the posted capacity of said bridge, and as a result of such crossing, any damage results to the bridge, the owner of such truck shall be responsible for all such damage.

Excess Size or Weight - The Department of Roads with respect to highways under its jurisdiction and County authorities with respect to highways under their jurisdiction may in their discretion upon application and good cause being shown therefore, issue a special permit in writing authorizing the applicant to operate or move a vehicle, a combination of vehicles or an object of a size or weight of vehicle or load exceeding the maximum specified by law, provided, no permit shall be issued for a vehicle carrying a load which cannot be dismantled or reduced in size or weight without great difficulty. The Department or County authority issuing a permit may require a permit fee not to exceed ten dollars.

MAXIMUM LOAD IN POUNDS CARRIED ON ANY GROUP OF TWO OR MORE CONSECUTIVE AXLES						
Distance in feet between the extremes of any group of two or more consecutive axles	Two Axles	Three Axles	Four Axles	Five Axles	Six Axles	Seven Axles
4	34,000					
5	34,000					
6	34,000					
7	34,000					
8	34,000	42,000				
9	39,000	42,500				
10	40,000	43,500				
11		44,000				
12		45,000	50,000			
13		45,500	50,500			
14		46,500	51,500			
15		47,000	52,000			
16		48,000	52,500	58,000		
17		48,500	53,500	58,500		
18		49,500	54,000	59,000		
19		50,000	54,500	60,000		
20		51,000	55,500	60,500		
21		51,500	56,000	61,000		
22		52,500	56,500	61,500		
23		53,000	57,500	62,500		
24		54,000	58,000	63,000		
25		54,500	58,500	63,500	69,000	
26		55,500	59,500	64,000	69,500	
27		56,000	60,000	65,000	70,000	
28		57,000	60,500	65,500	71,000	
29		57,500	61,500	66,000	71,500	
30		58,500	62,000	66,500	72,000	
31		59,000	62,500	67,500	72,500	
32		60,000	63,500	68,000	73,000	
33			64,000	68,500	74,000	
34			64,500	69,000	74,500	
35			65,500	70,000	75,000	
36			66,000	70,500	75,500	
37			66,500	71,000	76,000	81,500
38			67,500	72,000	77,000	82,000
39			68,000	72,500	77,500	82,500
40			68,500	73,000	78,000	83,500
41			69,500	73,500	78,500	84,000
42			70,000	74,000	79,000	84,500
43			70,500	75,000	80,000	85,000
44			71,500	75,500	80,500	85,500
45			72,000	76,000	81,000	86,000
46			72,500	76,500	81,500	87,000
47			73,500	77,500	82,000	87,500
48			74,000	78,000	83,000	88,000
49			74,500	78,500	83,500	88,500
50			75,500	79,000	84,000	89,000
51			76,000	80,000	84,500	89,500
52			76,500	80,500	85,000	90,500
53			77,500	81,000	86,000	91,000
54			78,000	81,500	86,500	91,500
55			78,500	82,500	87,000	92,000
56			79,500	83,000	87,500	92,500
57			80,000	83,500	88,000	93,000
58				84,000	89,000	94,000
59				85,000	89,500	94,500
60				85,500	90,000	95,000

MOD3-SO

LOAD RATING REPORT CHECKLIST

The Load Rating Engineer prepares the Load Rating Report and transmits the Report and other files to the Owner and to NDOT. See submittal deadlines in BIP Manual Chapter 5.

Load Rating Report

The Load Rating Report includes the items listed below and details are provided for each item in the following sections.

_____ Load Rating Summary Sheet (LRSS) and Load Rating Review Sheets; current version available from http://dot.nebraska.gov/business-center/bridge/forms/. It is recommended that the LRSS be the first page in the Report (see below).

_____ Structure geometry and condition information from the inspection report (see below).

_____ Calculations supporting the load rating (see below).

_____ Software analysis input and output in permanent format such as hard copy (PDF, TXT) or other secured electronic files (see below).

As part of the Load Rating package, the following must be completed.

_____ The person completing QC shall initials and date all pages of the Report.

_____ The Load Rating Engineer (LRE) is responsible for sealing and signing the Report in accordance with the NE Engineers and Architects regulation Act §81-3437 (3c and 3d).

_____ The completed report shall be delivered to the Bridge Owner

_____ An electronic copy of the Report shall be submitted to NDOT. A copy must be furnished to NDOT either by the Owner or, at the direction of the Owner, by the LRE.

_____ Deliver to NDOT the software input file that can be executed in the software package.

The following sections provide details about each element of the Load Rating Report

Load Rating Summary Sheet (LRSS)

_____ Use the current version – available from http://dot.nebraska.gov/business-center/bridge/forms/.

_____ Analyst shall be the engineer performing the load rating. The Analyst can be the same as the Engineer of Record for the load rating.

_____ Enter the Analyst as first initial, last name. For example, F. Last.

_____ Notations of rating by hand calculations as appropriate

_____ Include the software version used in the rating analysis in the comments section of the LRSS.

_____ The Additional Comments section of the LRSS should include comments regarding the controlling member, posting required, inspection results, bridge geometry, structure modifications/repairs, rating considerations for the deck, rating considerations for the substructure, dead load and distribution factor calculation assumptions, section losses, member defects, bracing assumptions and allowable stresses (see Chapter 5 for examples).

_____ Identify the controlling member in the table in the Ratings and Loads section.

_____ Verify that the LRSS has been completely filled out

_____ Completed LRSS shall be included in the Report (recommended as the first page).

Structure Geometry and Condition Information

_____ Verify that bridge plans and/or current field measurements are available on the NDOT Bridge Management FTP site. If not, upload a PDF of the bridge plans and/or current field measurement to the NDOT Bridge Management FTP site.

_____ Include basic bridge geometry such as sketches.

_____ Include inspection information that documents the conditions affecting the load rating.

_____ Include section losses and/or member defects.

_____ Structure geometry and condition documentation shall be included in the Report.

Calculations and Documentation Supporting the Load Rating

The following are typically hand calculations or spreadsheets if not calculated by the program used to complete the rating.

_____ Calculation for dead loads (DL).

_____ Calculation for distribution factors (DF), including assumptions.

_____ Analysis assumptions.

_____ Analyst's initials and date of preparation shall be on each sheet.

_____ QC reviewer's initials and date of review shall be on each sheet.

_____ Calculations and documentation shall be included in the Report.

Software Analysis Model (BrR or other software)

_____ Filename includes bridge number and the year of the load rating.

_____ Analyst's initials and date of analysis shall be in the comments.

_____ QC reviewer's initials and date of review shall be in the comments.

_____ Description of the members analyzed shall be in the comments.

_____ Allowable bending and shear stresses shall be in the comments.

_____ Section losses and/or member defects shall be in the comments.

_____ DF shall be in the comments.

_____ If the timber deck is rated, include the NBI condition code and the issue that required the rating in comments.

_____ Software version shall be in the comments.

_____ Input file (PDF, TXT) shall be included in the Report.

_____ Output file (PDF, TXT) shall be included in the Report.

_____ Rating Summary Report file (PDF, TXT) identifying the controlling rating factor shall be included in the Report.

_____ Executable model (input file) shall be uploaded to the NDOT Bridge Document Management folder on the FTP site.

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PART 650—BRIDGES, STRUCTURES, AND HYDRAULICS

■ 1. The authority citation for part 650 continues to read as follows:

Authority: 23 U.S.C. 109 (a) and (h), 144, 151, 315, and 319; 33 U.S.C. 401, 491 *et seq.*, 511 *et seq.*; 23 CFR 1.32; 49 CFR 1.48(b), E.O. 11988 (3 CFR, 1977 Comp. p. 117); Department of Transportation Order 5650.2 dated April 23, 1979 (44 FR 24678); sec. 161 of Public Law 97–424, 96 Stat. 2097, 3135; sec. 4(b) of Public Law 97–134, 95 Stat. 1699; and sec. 1057 of Public Law 102–240, 105 Stat. 2002; and sec. 1311 of Pub. L. 105–178, as added by Pub. L. 105–206, 112 Stat. 842 (1998).

■ 2. Revise subpart C to read as follows:

Subpart C—National Bridge Inspection Standards

Sec.

Subpart C—National Bridge Inspection Standards

§ 650.301 Purpose.

This subpart sets the national standards for the proper safety inspection and evaluation of all highway bridges in accordance with 23 U.S.C. 151.

§ 650.303 Applicability.

The National Bridge Inspection Standards (NBIS) in this subpart apply to all structures defined as highway bridges located on all public roads.

§ 650.305 Definitions.

Terms used in this subpart are defined as follows:

American Association of State Highway and Transportation Officials (AASHTO) Manual. "Manual for Condition Evaluation of Bridges," second edition, published by the American Association of State Highway and Transportation Officials (incorporated by reference, *see* § 650.317).

Bridge. A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center 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 include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.

Bridge inspection experience. Active participation in bridge inspections in accordance with the NBIS, in either a field inspection, supervisory, or management role. A combination of bridge design, bridge maintenance, bridge construction and bridge inspection experience, with the predominant amount in bridge inspection, is acceptable.

Bridge inspection refresher training. The National Highway Institute "Bridge Inspection Refresher Training Course" [1] or other State, local, or federally developed instruction aimed to improve quality of inspections, introduce new techniques, and maintain the consistency of the inspection program.

Bridge Inspector's Reference Manual (BIRM). A comprehensive FHWA manual on programs, procedures and techniques for inspecting and evaluating a variety of in-service highway bridges. This manual may be purchased from the U.S. Government Printing Office, Washington, DC 20402 and from National Technical Information Service, Springfield, Virginia 22161, and is available at the following URL: *http://www.fhwa.dot.gov/bridge/bripub.htm.*

Complex bridge. Movable, suspension, cable stayed, and other bridges with unusual characteristics.

Comprehensive bridge inspection training. Training that covers all aspects of bridge inspection and enables inspectors to relate conditions observed on a bridge to established criteria (see the Bridge Inspector's Reference Manual for the recommended material to be covered in a comprehensive training course).

Critical finding. A structural or safety related deficiency that requires immediate follow-up inspection or action.

Damage inspection. This is an unscheduled inspection to assess structural damage resulting from environmental factors or human actions.

[1] The National Highway Institute training may be found at the following URL: *http://www.nhi.fhwa.dot.gov/*

Fracture critical member (FCM). A steel member in tension, or with a tension element, whose failure would probably cause a portion of or the entire bridge to collapse.

Fracture critical member inspection. A hands-on inspection of a fracture critical member or member components that may include visual and other nondestructive evaluation.

Hands-on. Inspection within arms length of the component. Inspection uses visual techniques that may be supplemented by nondestructive testing.

Highway. The term "highway" is defined in 23 U.S.C. 101(a)(11).

In-depth inspection. A close-up, inspection of one or more members above or below the water level to identify any deficiencies not readily detectable using routine inspection procedures; hands-on inspection may be necessary at some locations.

Initial inspection. The first inspection of a bridge as it becomes a part of the bridge file to provide all Structure Inventory and Appraisal (SI&A) data and other relevant data and to determine baseline structural conditions.

Legal load. The maximum legal load for each vehicle configuration permitted by law for the State in which the bridge is located.

Load rating. The determination of the live load carrying capacity of a bridge using bridge plans and supplemented by information gathered from a field inspection.

National Institute for Certification in Engineering Technologies (NICET). The NICET provides nationally applicable voluntary certification programs covering several broad engineering technology fields and a number of specialized subfields. For information on the NICET program certification contact: National Institute for Certification in Engineering Technologies, 1420 King Street, Alexandria, VA 22314–2794.

Operating rating. The maximum permissible live load to which the structure may be subjected for the load configuration used in the rating.

Professional engineer (PE). An individual, who has fulfilled education and experience requirements and passed rigorous exams that, under State licensure laws, permits them to offer engineering services directly to the public. Engineering licensure laws vary from State to State, but, in general, to become a PE an individual must be a graduate of an engineering program accredited by the Accreditation Board for Engineering and Technology, pass the Fundamentals of Engineering exam, gain four years of experience working under a PE, and pass the Principles of Practice of Engineering exam.

Program Manager. The individual in charge of the program, that has been assigned or delegated the duties and responsibilities for bridge inspection, reporting, and inventory. The program manager provides overall leadership and is available to inspection team leaders to provide guidance.

Public road. The term "public road" is defined in 23 U.S.C. 101(a)(27).

Quality assurance (QA). The use of sampling and other measures to assure the adequacy of quality control procedures in order to verify or measure the quality level of the entire bridge inspection and load rating program.

Quality control (QC). Procedures that are intended to maintain the quality of a bridge inspection and load rating at or above a specified level.

Routine inspection. Regularly scheduled inspection consisting of observations and/or measurements needed to determine the physical and functional condition of the bridge, to identify any changes from initial or previously recorded conditions, and to ensure that the structure continues to satisfy present service requirements.

Routine permit load. A live load, which has a gross weight, axle weight or distance between axles not conforming with State statutes for legally configured vehicles, authorized for unlimited trips over an extended period of time to move alongside other heavy vehicles on a regular basis.

Scour. Erosion of streambed or bank material due to flowing water; often considered as being localized around piers and abutments of bridges.

Scour critical bridge. A bridge with a foundation element that has been determined to be unstable for the observed or evaluated scour condition.

Special inspection. An inspection scheduled at the discretion of the bridge owner, used to monitor a particular known or suspected deficiency.

State transportation department. The term "State transportation department" is defined in 23 U.S.C. 101(a)(34).

Team leader. Individual in charge of an inspection team responsible for planning, preparing, and performing field inspection of the bridge.

Underwater diver bridge inspection training. Training that covers all aspects of underwater bridge inspection and enables inspectors to relate the conditions of underwater bridge elements to established criteria (see the Bridge Inspector's Reference Manual section on underwater inspection for the recommended material to be covered in an underwater diver bridge inspection training course).

Underwater inspection. 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.

§ 650.307 Bridge inspection organization.

(a) Each State transportation department must inspect, or cause to be inspected, all highway bridges located on public roads that are fully or partially located within the State's boundaries, except for bridges that are owned by Federal agencies.

(b) Federal agencies must inspect, or cause to be inspected, all highway bridges located on public roads that are fully or partially located within the respective agency responsibility or jurisdiction.

(c) Each State transportation department or Federal agency must include a bridge inspection organization that is responsible for the following:

(1) Statewide or Federal agencywide bridge inspection policies and procedures, quality assurance and quality control, and preparation and maintenance of a bridge inventory.

(2) Bridge inspections, reports, load ratings and other requirements of these standards.

(d) Functions identified in paragraphs (c)(1) and (2) of this section may be delegated, but such delegation does not relieve the State transportation department or Federal agency of any of its responsibilities under this subpart.

(e) The State transportation department or Federal agency bridge inspection organization must have a program manager with the qualifications defined in § 650.309(a), who has been delegated responsibility for paragraphs (c)(1) and (2) of this section.

§ 650.309 Qualifications of personnel.

(a) A program manager must, at a minimum:

(1) Be a registered professional engineer, or have ten years bridge inspection experience; and

(2) Successfully complete a Federal Highway Administration (FHWA) approved comprehensive bridge inspection training course.

(b) There are five ways to qualify as a team leader. A team leader must, at a minimum:

(1) Have the qualifications specified in paragraph (a) of this section; or

(2) Have five years bridge inspection experience and have successfully completed an FHWA approved comprehensive bridge inspection training course; or

(3) Be certified as a Level III or IV Bridge Safety Inspector under the National Society of Professional Engineer's program for National Certification in Engineering Technologies (NICET) and have successfully completed an FHWA approved comprehensive bridge inspection training course, or

(4) Have all of the following:

(i) A bachelor's degree in engineering from a college or university accredited by or determined as substantially equivalent by the Accreditation Board for Engineering and Technology;

(ii) Successfully passed the National Council of Examiners for Engineering and Surveying Fundamentals of Engineering examination;

(iii) Two years of bridge inspection experience; and

(iv) Successfully completed an FHWA approved comprehensive bridge inspection training course, or

(5) Have all of the following:

(i) An associate's degree in engineering or engineering technology from a college or university accredited by or determined as substantially equivalent by the Accreditation Board for Engineering and Technology;

(ii) Four years of bridge inspection experience; and

(iii) Successfully completed an FHWA approved comprehensive bridge inspection training course.

(c) The individual charged with the overall responsibility for load rating bridges must be a registered professional engineer.

(d) An underwater bridge inspection diver must complete an FHWA approved comprehensive bridge inspection training course or other FHWA approved underwater diver bridge inspection training course.

§ 650.311 Inspection frequency.

(a) *Routine inspections.* (1) Inspect each bridge at regular intervals not to exceed twenty-four months.

(2) Certain bridges require inspection at less than twenty-four-month intervals. Establish criteria to determine the level and frequency to which these bridges are inspected considering such factors as age, traffic characteristics, and known deficiencies.

(3) Certain bridges may be inspected at greater than twenty-four month intervals, not to exceed forty-eight-months, with written FHWA approval. This may be appropriate when past inspection findings and analysis justifies the increased inspection interval.

(b) *Underwater inspections.* (1) Inspect underwater structural elements at regular intervals not to exceed sixty months.

(2) Certain underwater structural elements require inspection at less than sixty-month intervals. Establish criteria to determine the level and frequency to which these members are inspected considering such factors as construction material, environment, age, scour characteristics, condition rating from past inspections and known deficiencies.

(3) Certain underwater structural elements may be inspected at greater than sixty-month intervals, not to exceed seventy-two months, with written FHWA approval. This may be appropriate when past inspection findings and analysis justifies the increased inspection interval.

(c) *Fracture critical member (FCM) inspections.* (1) Inspect FCMs at intervals not to exceed twenty-four months.

(2) Certain FCMs require inspection at less than twenty-four-month intervals. Establish criteria to determine the level and frequency to which these members are inspected considering such factors as age, traffic characteristics, and known deficiencies.

(d) Damage, in-depth, and special inspections. Establish criteria to determine the level and frequency of these inspections.

§ 650.313 Inspection procedures.

(a) Inspect each bridge in accordance with the inspection procedures in the AASHTO Manual (incorporated by reference, *see* § 650.317).

(b) Provide at least one team leader, who meets the minimum qualifications stated in § 650.309, at the bridge at all times during each initial, routine, in-depth, fracture critical member and underwater inspection.

(c) Rate each bridge as to its safe load-carrying capacity in accordance with the AASHTO Manual (incorporated by reference, *see* § 650.317). Post or restrict the bridge in accordance with the AASHTO Manual or in accordance with State law, when the maximum unrestricted legal loads or State routine permit loads exceed that allowed under the operating rating or equivalent rating factor.

(d) Prepare bridge files as described in the AASHTO Manual (incorporated by reference, *see* § 650.317). Maintain reports on the results of bridge inspections together with notations of any action taken to address the findings of such inspections. Maintain relevant maintenance and inspection data to allow assessment of current bridge condition. Record the findings and results of bridge inspections on standard State or Federal agency forms.

(e) Identify bridges with FCMs, bridges requiring underwater inspection, and bridges that are scour critical.

(1) Bridges with fracture critical members. In the inspection records, identify the location of FCMs and describe the FCM inspection frequency and procedures. Inspect FCMs according to these procedures.

(2) Bridges requiring underwater inspections. Identify the location of underwater elements and include a description of the underwater elements, the inspection frequency and the procedures in the inspection records for each bridge requiring underwater inspection. Inspect those elements requiring underwater inspections according to these procedures.

(3) Bridges that are scour critical. Prepare a plan of action to monitor known and potential deficiencies and to address critical findings. Monitor bridges that are scour critical in accordance with the plan.

(f) *Complex bridges.* Identify specialized inspection procedures, and additional inspector training and experience required to inspect complex bridges. Inspect complex bridges according to those procedures.

(g) *Quality control and quality assurance.* Assure systematic quality control (QC) and quality assurance (QA) procedures are used to maintain a high degree of accuracy and consistency in the inspection program. Include periodic field review of inspection teams, periodic bridge inspection refresher training for program managers and team leaders, and independent review of inspection reports and computations.

(h) *Follow-up on critical findings.* Establish a statewide or Federal agency wide procedure to assure that critical findings are addressed in a timely manner. Periodically notify the FHWA of the actions taken to resolve or monitor critical findings.

§ 650.315 Inventory.

(a) Each State or Federal agency must prepare and maintain an inventory of all bridges subject to the NBIS. Certain Structure Inventory and Appraisal (SI&A) data must be collected and retained by the State or Federal agency for collection by the FHWA as requested. A tabulation of this data is contained in the SI&A sheet distributed by the FHWA as part of the "Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges," (December 1995) together with subsequent interim changes or the most recent version. Report the data using FHWA established procedures as

outlined in the "Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges."

(b) For routine, in-depth, fracture critical member, underwater, damage and special inspections enter the SI&A data into the State or Federal agency inventory within 90 days of the date of inspection for State or Federal agency bridges and within 180 days of the date of inspection for all other bridges.

(c) For existing bridge modifications that alter previously recorded data and for new bridges, enter the SI&A data into the State or Federal agency inventory within 90 days after the completion of the work for State or Federal agency bridges and within 180 days after the completion of the work for all other bridges.

(d) For changes in load restriction or closure status, enter the SI&A data into the State or Federal agency inventory within 90 days after the change in status of the structure for State or Federal agency bridges and within 180 days after the change in status of the structure for all other bridges.

§ 650.317 Reference manuals.

(a) The materials listed in this subpart are incorporated by reference in the corresponding sections noted. These incorporations by reference were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. These materials are incorporated as they exist on the date of the approval, and notice of any change in these documents will be published in the **Federal Register**. The materials are available for purchase at the address listed below, and are available for inspection at the National Archives and Records Administration (NARA). These materials may also be reviewed at the Department of Transportation Library, 400 Seventh Street, SW., Washington, DC, in Room 2200. For information on the availability of these materials at NARA call (202) 741–6030, or go to the following URL: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*. In the event there is a conflict between the standards in this subpart and any of these materials, the standards in this subpart will apply.

(b) The following materials are available for purchase from the American Association of State Highway and Transportation Officials, Suite 249, 444 N. Capitol Street, NW., Washington, DC 20001. The materials may also be ordered via the AASHTO bookstore located at the following URL: *http://www.aashto.org/aashto/home.nsf/FrontPage*.

(1) The Manual for Condition Evaluation of Bridges, 1994, second edition, as amended by the 1995, 1996, 1998, and 2000 interim revisions, AASHTO, incorporation by reference approved for §§ 650.305 and 650.313.

(2) 2001 Interim Revision to the Manual for Condition Evaluation of Bridges, AASHTO, incorporation by reference approved for §§ 650.305 and 650.313.

(3) 2003 Interim Revision to the Manual for Condition Evaluation of Bridges, AASHTO, incorporation by reference approved for §§ 650.305 and 650.313.

[FR Doc. 04–27355 Filed 12–13–04; 8:45 am]

BILLING CODE 4910–22–P

Nebraska County, Municipality and City Numbers

* Municipality in multiple counties

(These codes are **not** the NBI FPIS codes for NBI Items 3 or 4.)

County	County No.	District No.
Adams	01	4
Antelope	02	3
Arthur	03	6
Banner	04	5
Blaine	05	6
Boone	06	3
Box Butte	07	5
Boyd	08	8
Brown	09	8
Buffalo	10	4
Burt	11	3
Butler	12	1
Cass	13	1
Cedar	14	3
Chase	15	7
Cherry	16	8
Cheyenne	17	5
Clay	18	4
Colfax	19	3
Cuming	20	3
Custer	21	6
Dakota	22	3
Dawes	23	5
Dawson	24	6
Deuel	25	5
Dixon	26	3
Dodge	27	2
Douglas	28	2
Dundy	29	7
Fillmore	30	4
Franklin	31	7

County	County No.	District No.
Frontier	32	7
Furnas	33	7
Gage	34	1
Garden	35	5
Garfield	36	8
Gosper	37	7
Grant	38	6
Greeley	39	4
Hall	40	4
Hamilton	41	4
Harlan	42	7
Hayes	43	7
Hitchcock	44	7
Holt	45	8
Hooker	46	6
Howard	47	4
Jefferson	48	1
Johnson	49	1
Kearney	50	7
Keith	51	6
Keya Paha	52	8
Kimball	53	5
Knox	54	3
Lancaster	55	1
Lincoln	56	6
Logan	57	6
Loup	58	8
Madison	59	3
McPherson	60	6
Merrick	61	4
Morrill	62	5

County	County No.	District No.
Nance	63	4
Nemaha	64	1
Nuckolls	65	4
Otoe	66	1
Pawnee	67	1
Perkins	68	7
Phelps	69	7
Pierce	70	3
Platte	71	3
Polk	72	4
Red Willow	73	7
Richardson	74	1
Rock	75	8
Saline	76	1
Sarpy	77	2
Saunders	78	1
Scotts Bluff	79	5
Seward	80	1
Sheridan	81	5
Sherman	82	4
Sioux	83	5
Stanton	84	3
Thayer	85	4
Thomas	86	6
Thurston	87	3
Valley	88	4
Washington	89	2
Wayne	90	3
Webster	91	4
Wheeler	92	8
York	93	4
Border State County	96	n/a

Nebraska County, Municipality and City Numbers

* Municipality in multiple counties

(These codes are **not** the NBI FPIS codes for NBI Items 3 or 4.)

Municipality or City	City No.	County
Abie	0005	Butler
Adams	0010	Gage
Ainsworth	0015	Brown
Alma	0045	Harlan
Albion	0020	Boone
Alda	0025	Hall
Alexandria	0030	Thayer
Allen	0035	Dixon
Alliance	0040	Box Butte
Alvo	0050	Cass
Amherst	0055	Buffalo
Anoka	0065	Boyd
Anselmo	0070	Custer
Ansley	0075	Custer
Arapahoe	0080	Furnas
Arcadia	0085	Valley
Arlington	0090	Washington
Arnold	0095	Custer
Arthur	0100	Arthur
Ashland	0105	Saunders
Ashton	0110	Sherman
Atkinson	0115	Holt
Atlanta	0120	Phelps
Auburn	0125	Nemaha
Aurora	0130	Hamilton
Avoca	0135	Cass
Axtell	0140	Kearney
Ayr	0145	Adams
Bancroft	0150	Cuming
Barada	0155	Richardson
Barneston	0160	Gage
Bartlett	0165	Wheeler
Bartley	0170	Red Willow
Bassett	0175	Rock
Battle Creek	0180	Madison
Bayard	0185	Morrill
Bazile Mills	0190	Knox
Beatrice	0195	Gage
Beaver City	0200	Furnas
Beaver Crossing	0205	Seward
Bee	0210	Seward
Beemer	0215	Cuming
Belden	0220	Cedar
Belgrade	0225	Nance

Municipality or City	City No.	County
Bellevue	0230	Sarpy
Bellwood	0235	Butler
Belvidere	0240	Thayer
Benedict	0245	York
Benkelman	0250	Dundy
Bennet	0255	Lancaster
Bennington	0260	Douglas
Bertrand	0265	Phelps
Berwyn	0270	Custer
Big Springs	0275	Deuel
Bladen	0280	Webster
Blair	0285	Washington
Bloomfield	0290	Knox
Bloomington	0295	Franklin
Blue Hill	0300	Webster
Blue Springs	0305	Gage
Boelus	1250	Howard
Boys Town	0310	Douglas
Bradshaw	0315	York
Brady	0320	Lincoln
Brainard	0325	Butler
Brewster	0330	Blaine
Bridgeport	0335	Morrill
Bristow	0340	Boyd
Broadwater	0345	Morrill
Brock	0350	Nemaha
Broken Bow	0355	Custer
Brownville	0360	Nemaha
Brule	0365	Keith
Bruning	0370	Thayer
Bruno	0375	Butler
Brunswick	0380	Antelope
Burchard	0385	Pawnee
Burr	0390	Otoe
Burton	0395	Keya Paha
Burwell	0400	Garfield
Bushnell	0405	Kimball
Butte	0410	Boyd
Byron	0415	Thayer
Cairo	0420	Hall
Callaway	0425	Custer
Cambridge	0430	Furnas
Campbell	0435	Franklin
Carleton	0440	Thayer

Nebraska County, Municipality and City Numbers

* Municipality in multiple counties

(These codes are **not** the NBI FPIS codes for NBI Items 3 or 4.)

Municipality or City	City No.	County
Carroll	0445	Wayne
Cedar Bluffs	0450	Saunders
Cedar Creek	0453	Cass
Cedar Rapids	0455	Boone
Center	0460	Knox
Central City	0465	Merrick
Ceresco	0470	Saunders
Chadron	0475	Dawes
Chambers	0480	Holt
Chapman	0485	Merrick
Chappel	0490	Deuel
Chester	0495	Thayer
Clarks	0500	Merrick
Clarkson	0505	Colfax
Clatonia	0510	Gage
Clay Center	0515	Clay
Clearwater	0520	Antelope
Clinton	0525	Sheridan
Cody	0530	Cherry
Coleridge	0535	Cedar
Colon	0540	Saunders
Columbus	0545	Platte
Comstock	0550	Custer
Concord	0555	Dixon
Cook	0560	Johnson
Cordova	0565	Seward
Cornlea	0570	Platte
Cortland	0575	Gage
Cotesfield	0580	Howard
Cowles	0585	Webster
Cozad	0590	Dawson
Crab Orchard	0595	Johnson
Craig	0600	Burt
Crawford	0605	Dawes
Creighton	0610	Knox
Creston	0615	Platte
Crete	0620	Saline
Crofton	0625	Knox
Crookston	0630	Cherry
Culbertson	0635	Hitchcock
Curtis	0640	Frontier
Cushing	0645	Howard
Dakota City	0650	Dakota
Dalton	0655	Cheyenne

Municipality or City	City No.	County
Danbury	0660	Red Willow
Dannebrog	0665	Howard
Davenport	0675	Thayer
Davey	0680	Lancaster
David City	0685	Butler
Dawson	0690	Richardson
Daykin	0695	Jefferson
Decatur	0700	Burt
Denton	0705	Lancaster
Deshler	0710	Thayer
Deweese	0715	Clay
DeWitt	0720	Saline
Dickens	0725	Lincoln
Diller	0730	Jefferson
Dix	0735	Kimball
Dixon	0740	Dixon
Dodge	0745	Dodge
Doniphan	0750	Hall
Dorchester	0755	Saline
Douglas	0760	Otoe
DuBois	0765	Pawnee
Dunbar	0770	Otoe
Duncan	0775	Platte
Dunning	0780	Blaine
Dwight	0785	Butler
Eagle	0790	Cass
Edgar	0800	Clay
Edison	0805	Furnas
Elba	0810	Howard
Elgin	0815	Antelope
Elk Creek	0820	Johnson
Elkhorn	0825	Douglas
Elm Creek	0830	Buffalo
Elmwood	0835	Cass
Elsie	0840	Perkins
Elwood	0845	Gosper
Elyria	0850	Valley
Emerson	0855*	Dakota
Emerson	0855*	Dixon
Emerson	0855*	Thurston
Emmet	0860	Holt
Endicott	0865	Jefferson
Ericson	0870	Wheeler
Eustis	0875	Frontier

Nebraska County, Municipality and City Numbers

* Municipality in multiple counties

(These codes are **not** the NBI FPIS codes for NBI Items 3 or 4.)

Municipality or City	City No.	County
Ewing	0880	Holt
Exeter	0885	Fillmore
Fairbury	0890	Jefferson
Fairfield	0895	Clay
Fairmont	0900	Fillmore
Falls City	0905	Richardson
Farnam	0915	Dawson
Farwell	0910	Howard
Filley	0920	Gage
Firth	0925	Lancaster
Fordyce	0930	Cedar
Fort Calhoun	0935	Washington
Foster	0940	Pierce
Franklin	0945	Franklin
Fremont	0950	Dodge
Friend	0955	Saline
Fullerton	0960	Nance
Funk	0965	Phelps
Gandy	0970	Logan
Garland	0975	Seward
Garrison	0980	Butler
Geneva	0985	Fillmore
Genoa	0990	Nance
Gering	0995	Scotts Bluff
Gibbon	1000	Buffalo
Gilead	1005	Thayer
Giltner	1010	Hamilton
Glenvil	1015	Clay
Goehner	1020	Seward
Gordon	1025	Sheridan
Gothenburg	1030	Dawson
Grafton	1035	Fillmore
Grainton	1040	Perkins
Grand Island	1045	Hall
Grant	1050	Perkins
Greeley Center	1055	Greeley
Greenwood	1060	Cass
Gresham	1065	York
Gretna	1070	Sarpy
Gross	1075	Boyd
Guide Rock	1080	Webster
Gurley	1085	Cheyenne
Hadar	1090	Pierce
Haigler	1095	Dundy

Municipality or City	City No.	County
Hallam	1100	Lancaster
Halsey	1105*	Blaine
Halsey	1105*	Thomas
Hamlet	1110	Hayes
Hampton	1115	Hamilton
Harbine	1120	Jefferson
Hardy	1125	Nuckolls
Harrison	1130	Sioux
Hartington	1135	Cedar
Harvard	1140	Clay
Hastings	1145	Adams
Hay Springs	1155	Sheridan
Hayes Center	1150	Hayes
Hazard	1160	Sherman
Heartwell	1165	Kearney
Hebron	1170	Thayer
Hemingford	1175	Box Butte
Henderson	1180	York
Hendley	1185	Furnas
Herman	1195	Washington
Hershey	1200	Lincoln
Hickman	1205	Lancaster
Hildreth	1210	Franklin
Holbrook	1215	Furnas
Holdrege	1220	Phelps
Holstein	1225	Adams
Homer	1230	Dakota
Hooper	1235	Dodge
Hordville	1240	Hamilton
Hoskins	1245	Wayne
Howells	1255	Colfax
Hubbard	1260	Dakota
Hubbell	1265	Thayer
Humboldt	1270	Richardson
Humphrey	1275	Platte
Huntley	1280	Harlan
Hyannis	1290	Grant
Imperial	1295	Chase
Indianola	1300	Red Willow
Inglewood	1305	Dodge
Inman	1310	Holt
Ithaca	1315	Saunders
Jackson	1320	Dakota
Jansen	1325	Jefferson

Nebraska County, Municipality and City Numbers

* Municipality in multiple counties

(These codes are **not** the NBI FPIS codes for NBI Items 3 or 4.)

Municipality or City	City No.	County
Johnson	1330	Nemaha
Johnstown	1335	Brown
Julian	1340	Nemaha
Juniata	1345	Adams
Kearney	1350	Buffalo
Kenesaw	1355	Adams
Kennard	1368	Washington
Kilgore	1365	Cherry
Kimball	1370	Kimball
Lamar	1375	Chase
Laurel	1380	Cedar
LaVista	1383	Sarpy
Lawrence	1385	Nuckolls
Lebanon	1390	Red Willow
Leigh	1395	Colfax
Leshara	1400	Saunders
Lewellen	1405	Garden
Lewiston	1410	Pawnee
Lexington	1415	Dawson
Liberty	1420	Gage
Lincoln	1425	Lancaster
Lindsay	1430	Platte
Linwood	1435	Butler
Litchfield	1440	Sherman
Lodgepole	1445	Cheyenne
Long Pine	1450	Brown
Loomis	1455	Phelps
Lorton	1460	Otoe
Louisville	1465	Cass
Loup City	1470	Sherman
Lushton	1475	York
Lyman	1480	Scotts Bluff
Lynch	1485	Boyd
Lyons	1490	Burt
Madison	1515	Madison
Madrid	1520	Perkins
Magnet	1525	Cedar
Malcolm	1530	Lancaster
Malmo	1535	Saunders
Manley	1540	Cass
Marquette	1545	Hamilton
Marsland	1550	Dawes
Martinsburg	1555	Dixon
Maskell	1560	Dixon
Mason City	1565	Custer
Maxwell	1570	Lincoln
Maywood	1575	Frontier
McCook	1495	Red Willow
McCool Jct.	1500	York
McGrew	1505	Scotts Bluff
McLean	1510	Pierce
Mead	1580	Saunders
Meadow Grove	1585	Madison
Melbeta	1590	Scotts Bluff
Memphis	1595	Saunders
Merriman	1605	Cherry
Milford	1610	Seward
Millard	1615	Douglas
Miller	1620	Buffalo
Milligan	1625	Fillmore
Minatare	1630	Scotts Bluff
Minden	1635	Kearney
Mitchell	1640	Scotts Bluff
Monowi	1645	Boyd
Monroe	1650	Platte
Moorefield	1655	Frontier
Morrill	1660	Scotts Bluff
Morse Bluff	1665	Saunders
Mullen	1670	Hooker
Murdock	1675	Cass
Murray	1680	Cass
Naper	1685	Boyd
Naponee	1690	Franklin
Nebraska City	1695	Otoe
Nehawka	1700	Cass
Neligh	1705	Antelope
Nelson	1710	Nuckolls
Nemaha	1715	Nemaha
Nenzel	1720	Cherry
Newcastle	1725	Dixon
Newman Grove	1730*	Madison
Newman Grove	1730*	Platte
Newport	1735	Rock
Nickerson	1740	Dodge
Niobrara	1745	Knox
Nora	1750	Nuckolls
Norfolk	1755	Madison
Norman	1760	Kearney

Nebraska County, Municipality and City Numbers

* Municipality in multiple counties

(These codes are **not** the NBI FPIS codes for NBI Items 3 or 4.)

Municipality or City	City No.	County
North Bend	1765	Dodge
North Loup	1770	Valley
North Platte	1775	Lincoln
Oak	1780	Nuckolls
Oakdale	1785	Antelope
Oakland	1790	Burt
Obert	1795	Cedar
Octavia	1805	Butler
Odell	1810	Gage
Ogallala	1815	Keith
Ohiowa	1820	Fillmore
Omaha	1825	Douglas
O'Neill	1830	Holt
Ong	1835	Clay
Orchard	1840	Antelope
Ord	1845	Valley
Orleans	1855	Harlan
Osceola	1860	Polk
Oshkosh	1865	Garden
Osmond	1870	Pierce
Otoe	1875	Otoe
Overton	1880	Dawson
Oxford	1885*	Furnas
Oxford	1885*	Harlan
Page	1890	Holt
Palisade	1895*	Hayes
Palisade	1895*	Hitchcock
Palmer	1900	Merrick
Palmyra	1905	Otoe
Panama	1910	Lancaster
Papillion	1915	Sarpy
Pawnee City	1920	Pawnee
Paxton	1925	Keith
Pender	1935	Thurston
Peru	1940	Nemaha
Petersburg	1945	Boone
Phillips	1950	Hamilton
Pickrell	1955	Gage
Pierce	1960	Pierce
Pilger	1965	Stanton
Plainview	1970	Pierce
Platte Center	1975	Platte
Plattsmouth	1980	Cass
Pleasant Dale	1985	Seward

Municipality or City	City No.	County
Pleasanton	1990	Buffalo
Plymouth	1995	Jefferson
Polk	2000	Polk
Ponca	2005	Dixon
Potter	2015	Cheyenne
Prague	2020	Saunders
Preston	2025	Richardson
Primrose	2030	Boone
Prosser	2035	Adams
Ragan	2040	Harlan
Ralston	2045	Douglas
Randolph	2050	Cedar
Ravenna	2055	Buffalo
Raymond	2060	Lancaster
Red Cloud	2065	Webster
Republican City	2070	Harlan
Reynolds	2075	Jefferson
Richland	2080	Colfax
Rising City	2085	Butler
Riverdale	2090	Buffalo
Riverton	2095	Franklin
Roca	2100	Lancaster
Rockville	2105	Sherman
Boelus	1250	Howard
Rogers	2110	Colfax
Rosalie	2115	Thurston
Roseland	2120	Adams
Royal	2125	Antelope
Rulo	2130	Richardson
Rushville	2135	Sheridan
Ruskin	2140	Nuckolls
Salem	2160	Richardson
Santee	2161	Knox
Sargent	2165	Custer
Saronville	2170	Clay
Schuyler	2175	Colfax
Scotia	2180	Greeley
Scottsbluff	2185	Scotts Bluff
Scribner	2190	Dodge
Seneca	2195	Thomas
Seward	2200	Seward
Shelby	2205	Polk
Shelton	2210	Buffalo
Sholes	2220	Wayne

Nebraska County, Municipality and City Numbers

* Municipality in multiple counties

(These codes are **not** the NBI FPIS codes for NBI Items 3 or 4.)

Municipality or City	City No.	County
Shubert	2225	Richardson
Sidney	2230	Cheyenne
Silver Creek	2235	Merrick
Smithfield	2240	Gosper
Snyder	2245	Dodge
South Bend	2250	Cass
South Sioux City	2255	Dakota
Spalding	2260	Greeley
Spencer	2265	Boyd
Sprague	2270	Lancaster
Springfield	2275	Sarpy
Springview	2280	Keya Paha
St. Edward	2145	Boone
St. Helena	2150	Cedar
St. Paul	2155	Howard
Stamford	2285	Harlan
Stanton	2290	Stanton
Staplehurst	2295	Seward
Stapleton	2300	Logan
Steele City	2305	Jefferson
Steinauer	2310	Pawnee
Stella	2315	Richardson
Sterling	2320	Johnson
Stockham	2325	Hamilton
Stockville	2330	Frontier
Strang	2335	Fillmore
Stratton	2340	Hitchcock
Stromsburg	2345	Polk
Stuart	2350	Holt
Sumner	2355	Dawson
Superior	2360	Nuckolls
Surprise	2365	Butler
Sutherland	2370	Lincoln
Sutton	2375	Clay
Swanton	2380	Saline
Syracuse	2385	Otoe
Table Rock	2390	Pawnee
Talmage	2395	Otoe
Tamora	2400	Seward
Taylor	2410	Loup
Tecumseh	2415	Johnson
Tekamah	2420	Burt
Terrytown	2425	Scotts Bluff
Thayer	2430	York
Thedford	2435	Thomas
Thurston	2440	Thurston
Tilden	2445*	Antelope
Tilden	2445*	Madison
Tobias	2450	Saline
Trenton	2455	Hitchcock
Trumball	2460	Clay
Uehling	2465	Dodge
Ulysses	2470	Butler
Unadilla	2475	Otoe
Union	2480	Cass
Upland	2485	Franklin
Utica	2490	Seward
Valentine	2495	Cherry
Valley	2500	Douglas
Valparaiso	2505	Saunders
Venango	2510	Perkins
Verdel	2515	Knox
Verdigre	2520	Knox
Verdon	2525	Richardson
Virginia	2530	Gage
Waco	2535	York
Wahoo	2540	Saunders
Wakefield	2545*	Dixon
Wakefield	2545*	Wayne
Wallace	2550	Lincoln
Walthill	2555	Thurston
Washington	2560	Washington
Waterbury	2565	Dixon
Waterloo	2570	Douglas
Wauneta	2575	Chase
Wausa	2580	Knox
Waverly	2585	Lancaster
Wayne	2590	Wayne
Weeping Water	2595	Cass
Wellfleet	2600	Lincoln
West Point	2620	Cuming
Western	2605	Saline
Weston	2615	Saunders
Whitney	2625	Dawes
Wilber	2630	Saline
Wilcox	2635	Kearney
Wilsonville	2640	Furnas
Winnebago	2645	Thurston

Nebraska County, Municipality and City Numbers

* Municipality in multiple counties

(These codes are **not** the NBI FPIS codes for NBI Items 3 or 4.)

Municipality or City	City No.	County
Winnetoon	2650	Knox
Winside	2655	Wayne
Winslow	2660	Dodge
Wisner	2665	Cuming
Wolbach	2670	Greeley
Wood Lake	2675	Cherry
Wood River	2680	Hall
Wymore	2685	Gage
Wynot	2690	Cedar
York	2695	York
Yutan	2700	Saunders

QC.1 GENERAL

Quality Control (QC) is simply a check on every document, inspection dataset, or activity completed for the Bridge Inspection Program (BIP). When QC is completed on the work, ideally there are no errors, omissions or inaccuracies. QC may be done by the organization or another party engaged by the organization to complete QC.

The person who completes QC is called the "QC Officer" in accordance with quality management practice. The QC Officer must have a working knowledge of the BIP and associated manuals and publications. QC review is nearly always completed by an individual with equal or better qualifications than the document/dataset originator.

Quality Assurance (QA) is done by an independent party on a small random sample to assure that QC is attaining the required level of quality. See the BIP Manual Chapter 1, Section 10 for additional information.

QC.2 OWNER RECORDS, BIP MANUAL CHAPTER 2

QC items

- Individual Bridge Records
- Master lists of Critical Findings
- Master list of Scour Critical Bridges

QC Officer

- Any member of the Bridge Owner's staff who is familiar with the BIP Program

QC example activities

- Creating and maintaining a record for each structure under a Bridge Owner's control
- Systematic and regular updates of the information in the records
- Filing new load ratings in the bridge record within one week of receipt from Load Rating Engineer
- Filing a Scour Assessment within one week of receipt from the Hydraulic Engineer
- Filing inspection documents (revised SI&A, BrM print out, fracture critical reports, special reports) within one month of the completion of the inspection data input or receipt of report
- File information on maintenance or repair work done within one month of completion
- Maintaining a log of critical findings activity and updating when new reports are filed or closed
- Maintain a log of activities related to monitoring for Plans of Action

QC.3 INSPECTION CODING & REPORTS, MANUAL CHAPTERS 3 & 4

QC items

- Data such as condition codes
- Inspection reports such as fracture critical reports
- Critical Finding reports

QC Officer

- An in-house Team Leader (TL) or a TL from a neighboring agency
- The TL's supervisor
- An in-house engineer (PE or EI) or engineering technician
- A consulting engineer
- County highway superintendent
- Local Public Agency Responsible Charge (RC)
- An Assistant Team Leader (ALT) for BrM input completed by others

QC example activities

- TL name on every page of the document. The QC reviewer name the on first page of the document and initials all pages that are reviewed. Many NDOT forms for inspection include a field for this purpose.
- An additional TL can be present when the inspection is being completed. The additional TL's name and initials should be included on the inspection document.
- Data input from manual field notes is often input by administrative staff. The TL must review the BrM file when the input has been completed.
- A TL may determine BrM values in the field, record manually, and then revisit their coding on a later date prior to input into BrM.
- A TL may determine BrM values within BrM in the field, then have another TL or ATL review a BrM printout of the values against the inspection notes and photos.
- Critical finding reports are reviewed with the TL who originated the report.

QC.4 LOAD RATING, BIP MANUAL CHAPTER 5

QC items

- Load rating reports
- Load rating calculations, both manual and electronic
- Load Rating Summary Sheets (LRSS) and Load Rating Review Sheets (LRRS)

QC Officer

- A Nebraska PE with experience that equals or exceeds the originator of the work. An engineering intern can be the originator, but QC must be completed and sealed by the PE.

QC example activities

- Check manual calculations then initial each sheet of the document
- Check software input then initial the first sheet of the document
- Check software output then initial the first sheet of the document
- Check the document then initial the first sheet of any multi-page documentation. For example field measurements documenting the cause for rerating, photos, etc.
- Seal of PE on the LRSS

QC.5 SCOUR, BIP MANUAL CHAPTER 6

QC items

- Scour assessment reports
- Hydraulic calculations, both manual and electronic
- DR385 Bridge Scour Report, DR385B Bridge Scour Assessment, DR385C Bridge Scour Plan of Action, DR385D Bridge Scour Worksheet, DR385E POA Monitoring log, DR385F Change in Scour Conditions

QC Officer

- A Nebraska PE with experience that equals or exceeds the originator of the work. An engineering intern can be the originator, but QC must be completed and sealed by the PE.

QC example activities

- Check manual calculations then initial each sheet of the document
- Check software input then initial the first sheet of the document
- Check software output then initial the first sheet of the document
- Check the document then initial the first sheet of any multi-page documentation. For example channel cross sections, USGS maps, photos, etc.
- Seal of PE the Scour Assessment Report

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REFERENCED PUBLICATIONS

The information in this Bridge Inspection Program Manual supplements the requirements, procedures and information in documents by:

- The American Association of State Highway and Transportation Officials (AASHTO)
- The U.S. Department of Transportation, Federal Highway Administration (FHWA)
- The National Cooperative Highway Research Program (NCHRP).

The reference list of applicable documents is included in the Manual Appendix. The National Bridge Inspection Standards are also included in the Appendix.

Persons involved with the Nebraska Bridge Inspection Program and the bridge inventory must be knowledgeable of the requirements in National Bridge Inspection Standards, the AASHTO *Manual for Bridge Evaluation*, and FHWA publications and technical advisories related to the NBIS. The references set forth procedures to be used by Bridge Owners in managing their Bridge File and Bridge Records.

The NBIS takes precedence over any material contained in the reference manuals, i.e. the AASHTO Manual. Where there may be implied or conflicting language between the documents, the nationwide direction provided by the NBIS will always govern.

The information in this Bridge Inspection Program Manual supplements the information in these references.

Primary Operation (Coding and Records may also be included)	Publisher or Author	Publication	Publication Date
Coding	FHWA	Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, Report No. FHWA-PD-96-001	December 1995 with Errata, March 2004
Inspection	FHWA	Bridge Inspector's Reference Manual (BIRM), FHWA Publication No. FHWA-NHI-12-053	December 2001
Inspection	NCHRP	Synthesis 354: Inspection and Management of Bridges with Fracture-Critical Details	
Inspection, Load Rating	AASHTO	Manual for Bridge Evaluation (MBE), Second Edition with 2016 Edition Interim	
Load Rating	FHWA	Revisions to the Recording and Coding Guide for the Structure, Inventory, and Appraisal of the Nation's Bridges (Coding Guide) Items 63 and 65, Method Used to Determine Operating and Inventory Rating	November 15, 2011
Load Rating	FHWA	Revisions to the Recording and Coding Guide for the Structure, Inventory and Appraisal of the Nation's bridges (Coding Guide) – Item 31, Design Load, and Items 63 and 65, Method Used to Determine Operating and Inventory Ratings	February 2, 2011
Load Rating	FHWA	Revisions to Items 63-66 to Support Load Reporting by Rating Factor	March 22, 2004
Load Rating	AASHTO	Standard Specifications for Highway Bridges, 17th Edition	September 1, 2002
Load Rating	AASHTO	LRFD Bridge Design Specifications, Seventh Edition with 2015 and 2016 Interims	2014
Load Rating	FHWA	Bridge Load Ratings for the National Bridge Inventory	October 30, 2006

Primary Operation (Coding and Records may also be included)	Publisher or Author	Publication	Publication Date
Load Rating	Nebraska Department of Transportation Bridge Division	Bridge Office Policies and Procedures (BOPP), Current version	See NDOT Bridge Division website.
Load Rating	Joseph A. Yura, and Brett A. Phillips	"Bracing Requirements for Elastic Steel Beams", University of Texas at Austin, Center for Transportation Research, Report No. FHWA/TX-92+1239-1	
Load Rating	Swarnalatha Vegesna, and Joseph A. Yura	"An Ultimate Load Test to Study Bracing Effects of Bridge Decks", University of Texas at Austin, Center for Transportation Research, Report No. FHWA/TX-92+1239-2	
Load Rating	Stuart T. Webb and Joseph A. Yura	"Evaluation of Bridge Decks as Lateral Bracing for Supporting Steel Stringers", University of Texas at Austin, Center for Transportation Research, Report No. FHWA/TX-92+1239-3	
Load Rating	Joseph A. Yura, Brett A. Phillips, Swarna Raju and Stuart T. Webb	"Bracing of Steel Beams in Bridges", University of Texas at Austin, Center for Transportation Research, Report No. FHWA/TX-92+1239-4F	
Load Rating	National Corrugated Steel Pipe Association (NCSPA), Washington, D C	"Load rating and structural evaluation of in-service, corrugated steel structures" Design Data Sheet No. 19	1995
Load Rating	David C. Cowherd, Vlad G. Perlea, Bowser Morner Associates, Dayton, Ohio	"An Evaluation of Flexible Metal Pipes"	1989
Load Rating	FHWA	Technical Advisory 5140.29, Load-carrying Capacity Considerations of Gusset Plates in Non-load-path-redundant Steel Truss Bridges	January 15, 2008

Primary Operation (Coding and Records may also be included)	Publisher or Author	Publication	Publication Date
Scour	FHWA	Technical Advisory T5140 23, Evaluating Scour at Bridges	October 28, 1991
Scour	FHWA	Evaluating Scour at Bridges, Fifth Edition, Hydraulic Engineering Circular, No. 18 (HEC 18)	April 2012
Scour	FHWA	Stream Stability at Highway Structures, Fourth Edition, Hydraulic Engineering Circular, No. 20 (HEC 20)	April 2012
Scour	FHWA	Bridge Scour and Stream Instability Countermeasures, Experience, Selection and Design Guidance, Third Edition, Volume 1, Hydraulic Engineering Circular, No. 23 (HEC 23)	2009
Scour	FHWA	Bridge Scour and Stream Instability Countermeasures, Experience, Selection and Design Guidance, Third Edition, Volume 2, Hydraulic Engineering Circular, No. 23 (HEC 23)	2009
Scour	FHWA	Revision of Coding Guide, Item 113 – Scour Critical Bridges	April 27, 2001
Scour	FHWA	Compliance with the National Bridge Inspection Standards – Plan of Action for Scour Critical Bridges	March 29, 2005
Scour	FHWA	National Bridge Inspection Standards – Scour Evaluations and Plans of Action for Scour Critical Bridges	January 4, 2008
Scour	FHWA	Technical Guidance for Bridges over Waterways with Unknown Foundations	January 9, 2008
Scour	FHWA	Scourability of Rock Formations	July 19, 1991
Scour	FHWA	Frequently Asked Questions – Bridges Over Waterways with Unknown Foundations	June 3, 2009

Primary Operation (Coding and Records may also be included)	Publisher or Author	Publication	Publication Date
Scour	FHWA	Additional Guidance for Assessment of Bridges Over Waterways with Unknown Foundations	October 29, 2009
Scour	NDOT	Hydraulic Analysis Guidelines, Current version	See NDOT Bridge Division website.

Note to Manual Users:

The AASHTO MBE superseded the AASHTO Manual for Condition Evaluation of Bridge and interims with the AASHTO Guide Manual for Condition Evaluation and Load and Resistance Factor Rating (LRFR) of Highway Bridges. Revisions based on approved agenda items from annual AASHTO Highways Subcommittee on Bridges and Structures meetings in 2007 and 2008 are also incorporated into the MBE. The MBE was adopted by the AASHTO Highways Subcommittee on Bridges and Structures in 2005. With the 2008 publication of the MBE, the Subcommittee conferred archive status on the Manual for Condition Evaluation of Bridges, the Guide Manual for Condition Evaluation and Load and Resistance Factor Rating (LRFR) of Highway Bridges and all Interim Revisions of both prior bridge evaluation titles.

In December 2009, FHWA updated the NBIS regulation to define the AASHTO Manual in 23 CFR § 650.317 as the MBE, effective January 25, 2010. The AASHTO Manual is included in the NBIS through incorporation by reference (IBR). IBR is a technique used by federal agencies to include and make enforceable materials published elsewhere without republishing those materials in full text in the agencies' regulations. The FHWA uses IBR extensively to incorporate documents such as AASHTO design standards into 23 CFR part 625 and to incorporate FHWA's *Manual on Uniform Traffic Control Devices* into 23 CFR part 655.

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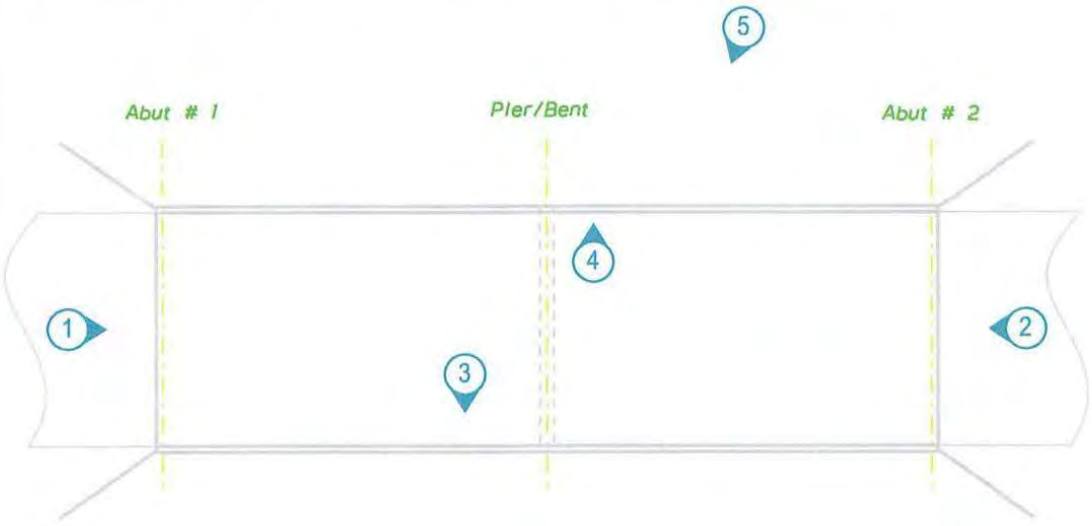
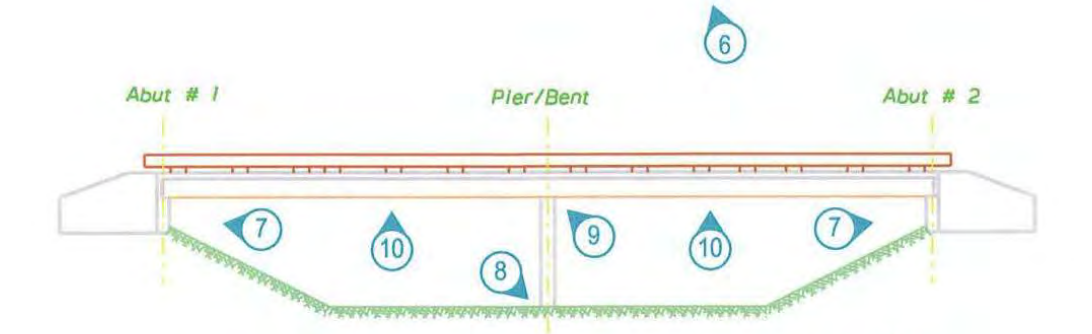
STANDARD BRIDGE PHOTO LOCATIONS & DESCRIPTIONS

Standard Bridge Photo Locations / Descriptions





Abutments and piers/bents should be numbered in the direction of increasing station.

(1) (2) Looking up and down station along the bridge deck, showing deck and roadway beyond. Photo should clearly show the entire deck from each direction. If not too far back, include posting limit sign, if posted.

(3) (4) Looking up stream and down stream from bridge.

(5) (6) Looking at the bridge from both sides. Photos should be taken from far enough away to see the entire bridge and at an angle as perpindicular to the bridge as possible.

(7) Looking at the abutments. Photos should show the entire abutment.

(8) Looking at the piers/bents. Photos should be taken of each pier/bent and should show the entire pier/bent.

(9) Looking at the pier/bent cap(s). Photos should show the entire cap and the girders.

(10) Looking at the underside of the bridge in each span. If possible, the photos should be taken to show the entire width of the bridge and all of the girders in a single photo for each span.

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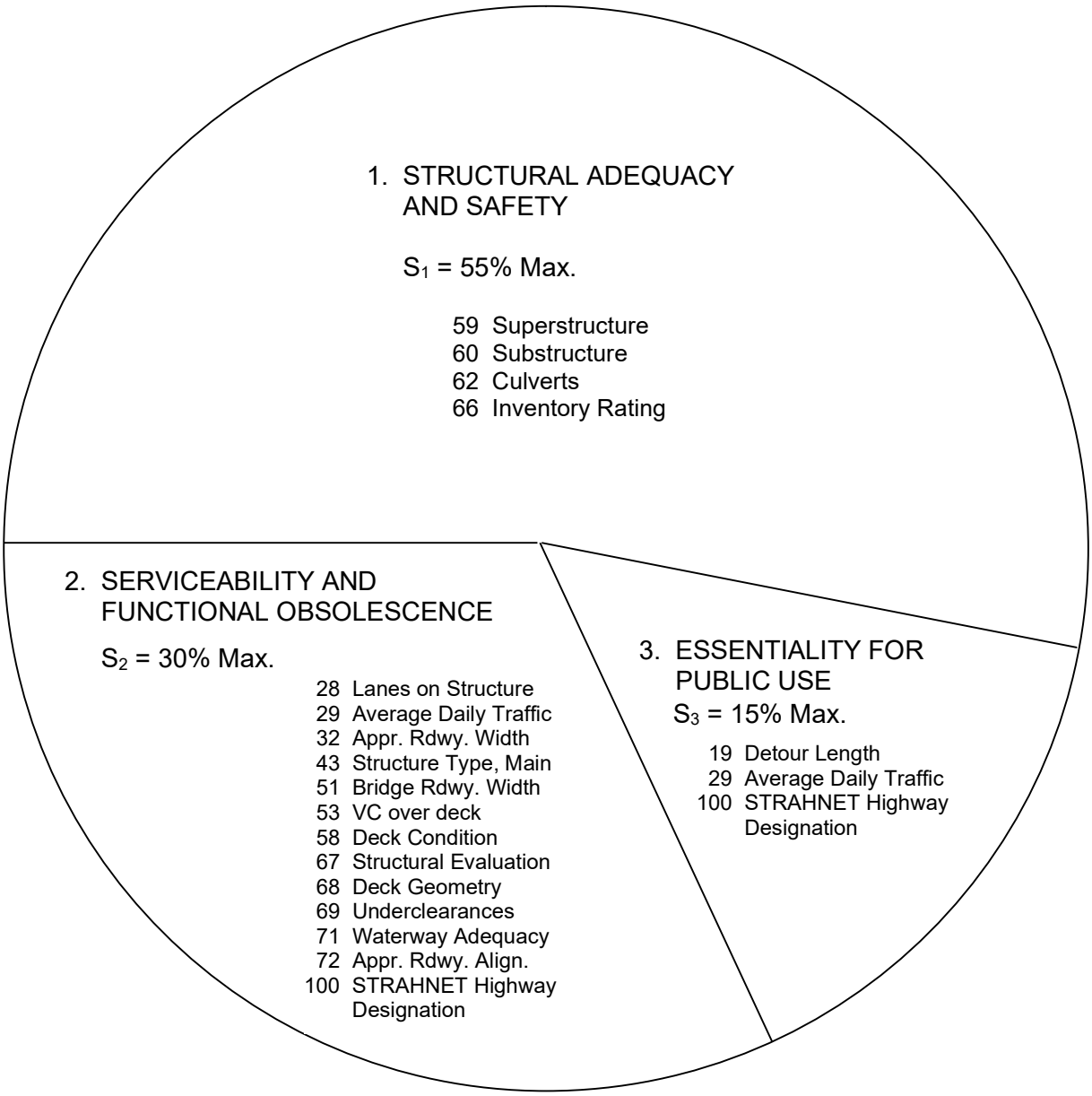
SUFFICIENCY RATING CALCULATION

Sufficiency Rating Formula and Example

The sufficiency rating formula described herein is a method of evaluating highway bridge data by calculating four separate factors to obtain a numeric value which is indicative of bridge sufficiency to remain in service. The result of this method is a percentage in which 100 percent would represent an entirely sufficient bridge and zero percent would represent an entirely insufficient or deficient bridge.

An asterisk prefix is used to identify a sufficiency rating that was calculated even though some essential data was missing or coded incorrectly. The Edit/Update Program will substitute a value for the unusable data (which will not lower the rating) and calculate the sufficiency rating. The asterisk is dropped when the unusable data is corrected. It is normal that all culverts with Bridge Roadway Width, Curb-to-Curb – Item 51 coded '0000' will have an asterisk prefixed sufficiency.

Figure 1. Summary of Sufficiency Rating Factors



4. SPECIAL REDUCTIONS

S_4 = 13% Max.

19 Detour Length
36 Traffic Safety Features
43 Structure Type, Main

SUFFICIENCY RATING = $S_1 + S_2 + S_3 - S_4$

Sufficiency Rating shall not be less than 0% nor greater than 100%

Sufficiency Rating Formula

1. Structural Adequacy and Safety (55% maximum)

   a. Only the lowest code of Item 59, 60, or 62 applies.

   If #59 (Superstructure Rating) or

#60 (Substructure Rating) is	≤ 2	then	A = 55%
	= 3		B = 40%
	= 4		C = 25%
	= 5		D = 10%

   If #59 and #60 = N and

#62 (Culvert Rating) is	≤ 2	then	E = 55%
	= 3		F = 40%
	= 4		G = 25%
	= 5		H = 10%

   b. Reduction for Load Capacity:

   Calculate using the following formulas where IR is the Inventory Rating in tons or use Figure 2:

   $$I = (36 - IR)^{1.5} \times 0.2778$$

   If $(36 - IR) \leq 0$, then B = 0

   "B" shall not be less than 0% nor greater than 55%.

$S_1 = 55 - (A + B + C + D + E + F + G + H + I)$

S_1 shall not be less than 0% nor greater than 55%.

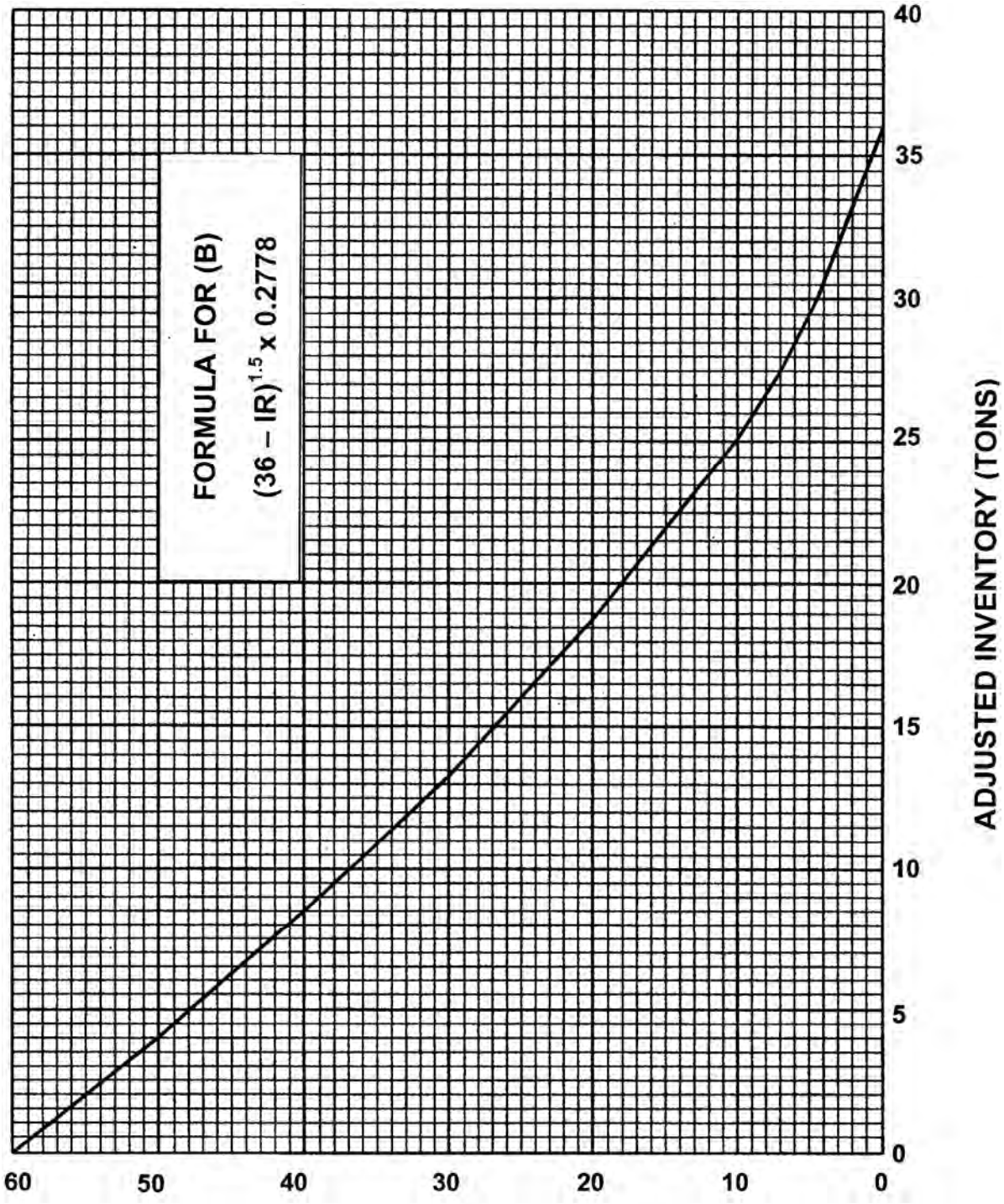


Figure 2. Reduction for Adjusted Inventory Tons

2. Serviceability and Functional Obsolescence (30% maximum)

a. Rating Reductions (13% maximum)

If #58 (Deck Condition) is	≤ 3	then	A = 5%
	= 4		A = 3%
	= 5		A = 1%
If #67 (Structural Evaluation) is	≤ 3	then	B = 4%
	= 4		B = 2%
	= 5		B = 1%
If #68 (Deck Geometry) is	≤ 3	then	C = 4%
	= 4		C = 2%
	= 5		C = 1%
If #69 (Underclearances) is	≤ 3	then	D = 4%
	= 4		D = 2%
	= 5		D = 1%
If #71 (Waterway Adequacy) is	≤ 3	then	E = 4%
	= 4		E = 2%
	= 5		E = 1%
If #72 (Approach Road Alignment) is	≤ 3	then	F = 4%
	= 4		F = 2%
	= 5		F = 1%

J = (A + B + C + D + E + F)

J shall not be less than 0% nor greater than 13%.

b. Width of Roadway Insufficiency (15% maximum)

Use the sections that apply:

(1) applies to all bridges;
(2) applies to 1-lane bridges only;
(3) applies to 2 or more lane bridges;
(4) applies to all <u>except</u> 1-lane bridges.

Also determine X and Y:

X (ADT/Lane) = #29 (ADT) ÷ first 2 digits of #28 (Lanes)

Y (Width/Lane) = #51 (Bridge Rdwy. Width) ÷ first 2 digits of #28

(1) Use when the last 2 digits of #43 (Structure Type) are not equal to 19 (Culvert):

If (#51 + 2 Ft.) < #32 (Approach Roadway Width) G = 5%

(2) For 1-lane bridges only, use Figure 3 or the following:

If the first 2 digits of #28 (Lanes) are equal to 01 and

$Y < 14$	then	$H = 15\%$
$Y \geq 14 < 18$		$H = 15 \left(\frac{18-Y}{4}\right)\%$
$Y \geq 18$		$H = 0\%$

(3) For 2 or more lane bridges. If these limits apply, do not continue on to (4) as no lane width reductions are allowed.

If the first 2 digits of #28 = 02 and $Y \geq 16$, $H = 0\%$
If the first 2 digits of #28 = 03 and $Y \geq 15$, $H = 0\%$
If the first 2 digits of #28 = 04 and $Y \geq 14$, $H = 0\%$
If the first 2 digits of #28 $\geq$ 05 and $Y \geq 12$, $H = 0\%$

(4) For all <u>except</u> 1-lane bridges, use Figure 3 or the following:

If $Y < 9$ and $X > 50$	then	$H = 15\%$
$Y < 9$ and $X \leq 50$		$H = 7.5\%$
$Y \geq 9$ and $X \leq 50$		$H = 0\%$

If $X > 50$ but ≤ 125 and

$Y < 10$	then	$H = 15\%$
$Y \geq 10 < 13$		$H = 15 \left(\frac{13-Y}{3}\right)\%$
$Y \geq 13$		$H = 0\%$

If $X > 125$ but ≤ 375 and

$Y < 11$	then	$H = 15\%$
$Y \geq 11 < 14$		$H = 15 \left(\frac{14-Y}{3}\right)\%$
$Y \geq 14$		$H = 0\%$

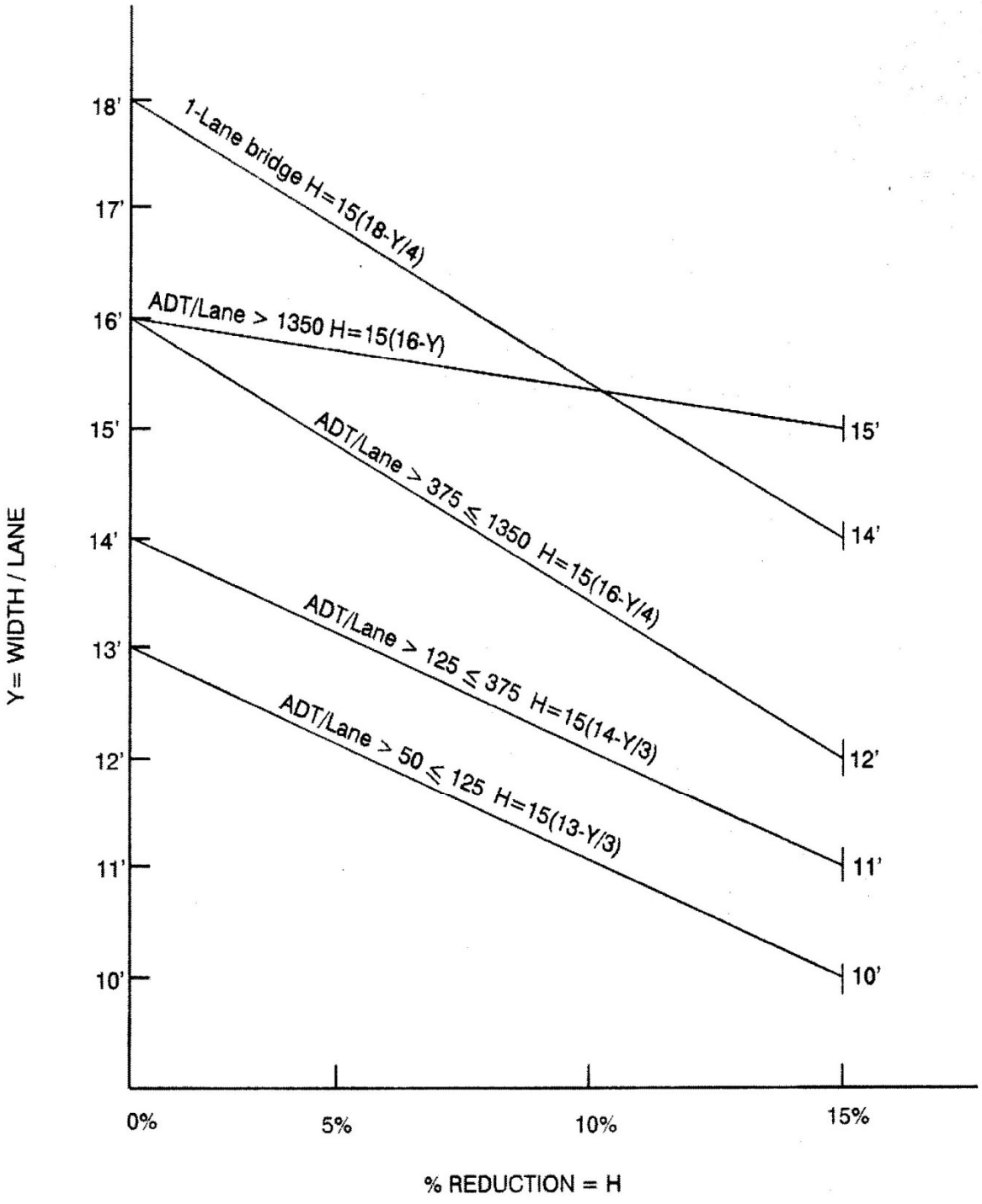


Figure 3. Width of Roadway Sufficiency

If X > 375 but ≤ 1350 and

Y < 12	then	H = 15%
Y ≥ 12 < 16		$H = 15 \left(\frac{16-Y}{4}\right)\%$
Y ≥ 16		H = 0%

If X > 1350 and

Y < 15	then	H = 15%
Y ≥ 15 < 16		H = 15 (16–Y) %
Y ≥ 16		H = 0%

G + H shall not be less than 0% nor greater than 15%.

c. Vertical Clearance Insufficiency – (2% maximum)

If #100 (STRAHNET Highway Designation) > 0 and

#53 (VC over Deck) ≥ 1600	then	I = 0%
#53 < 1600		I = 2%

If #100 = 0 and

#53 ≥ 1400	then	I = 0%
#53 < 1400		I = 2%

$S_2 = 30 – [J + (G + H) + I]$

S_2 shall not be less than 0% nor greater than 30%.

3. Essentiality for Public Use (15% maximum)

   a. Determine:

$$K = \frac{S_1 + S_2}{85}$$

   b. Calculate

$$A = \frac{\#29\ (ADT) \times \#19\ (Detour\ Length)}{200{,}000 \times K} \times 15$$

   "A" shall not be less than 0% nor greater than 15%.

   c. STRAHNET Highway Designation:

If #100 is > 0	then	B = 2%
If #100 = 0	then	B = 0%

$S_3 = 15 - (A + B)$

S_3 shall not be less than 0% nor greater than 15%.

4. Special Reductions (Use only when $S_1 + S_2 + S_3 \geq 50$)

   a. Detour Length Reduction, use Figure 4 or the following:

$$A = (\#19)^4 \times (5.205 \times 10^{-8})$$

   "A" shall not be less than 0% nor greater than 5%.

   b. If the 2nd and 3rd digits of #43 (Structure Type, Main) are equal to 10, 12, 13, 14, 15, 16, or 17; then B = 5%

   c.

If 2 digits of #36 (Traffic Safety Features)	= 0	C = 1%
If 3 digits of #36	= 0	C = 2%
If 4 digits of #36	= 0	C = 3%

$S_4 = A + B + C$

S_4 shall not be less than 0% nor greater than 13%.

$$\text{Sufficiency Rating} = S_1 + S_2 + S_3 - S_4$$

The Rating shall not be less than 0% nor greater than 100%.

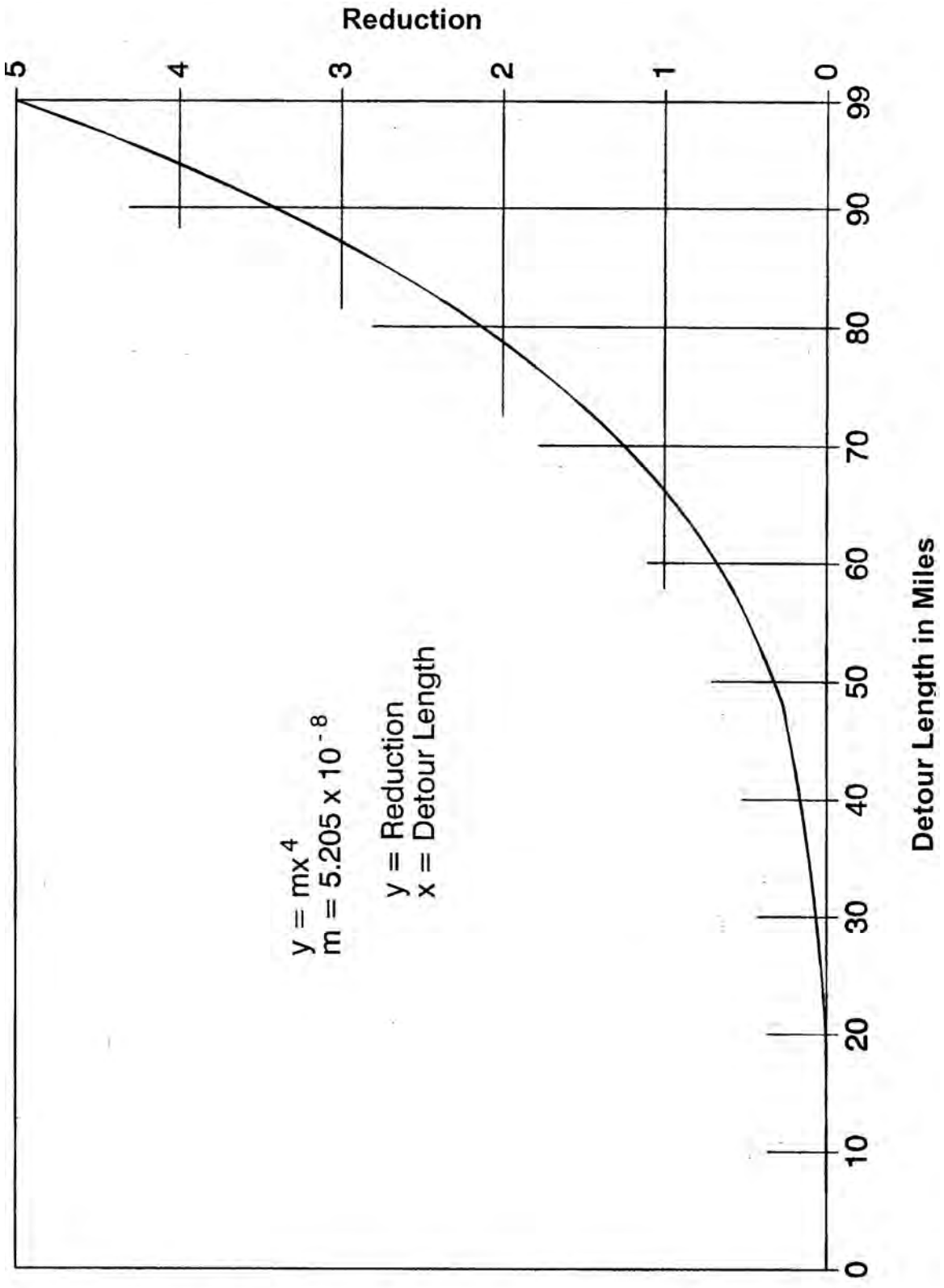


Figure 4. Special Reduction for Detour Length

Example
Calculation of Sufficiency Rating

1. Structural Adequacy and Safety

A, B, C, E, F, G, H = Not Applicable
D = 10%
$I = [36 - (1.00 \times 22)]^{1.5} \times 0.2778 = 14.6$
$S_1 = 55 - (10 + 14.6) = 30.4$

2. Serviceability and Functional Obsolescence

A = 3%, B = 1%, C = 4%, D = NA, E = NA, F = NA
J = (3 + 1 + 4) = 8%
$X = \frac{18500}{2} = 9250$ $Y = \frac{26.0}{2} = 13.0$

(1) If (26.0 + 2) < 40 then G = 5
(2) Not Applicable
(3) Not Applicable
(4) If X = 9250 and Y = 13.0 then H = 15

G + H = 5 + 15 = 20 (however, maximum allowable = 15)
I = 0
$S_2 = 30 - [8 + (15) + 0] = 7.0$

3. Essentiality for Public Use

$K = \frac{30.4 + 7.0}{85} = 0.44$

$A = \frac{18500 \times 8}{200{,}000 \times 0.44} \times 15 = 25.2$ (however, maximum allowable = 15)

B = 0
$S_3 = 15 - (15 + 0) = 0$

4. Special Reductions

$S_1 + S_2 + S_3 = (30.4 + 7.0 + 0.0) = 37.4 < 50$
S_4 = NA

SUFFICIENCY RATING = 30.4 + 7.0 + 0.0 = 37.4

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