Culvert Information System (CIS)

Coding Guide

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DATA CODES AND CODING INSTRUCTION

GENERAL

This section describes the data codes, their definitions and meanings, and gives detailed instruction in coding them.

The Data Coding Sheet takes on two (2) forms:

1. **Insert New Record:** This is for creating a new record on a new bridge file number.
2. **Change Fields in a Record:** Used to change data in individual fields in the record. Note that this requires a special procedure for blanking out an existing field. (Putting asterisks * in the required field to be blanked).

Some general coding rules are:

1. All numerical items must be coded with leading zeros. Numerical data too large for the field should be coded as all nines (9's).
2. All Data entry has to start on the first column assigned to that Data Field, except where specifically noted. (Where the data is less than the Field length).
3. Character data is always in upper case and must be left-justified.
4. If data cannot be found, the field should be left blank.
5. Items appearing with an asterisk (*) must be coded, as the information is always obtainable.

Any questions regarding the contents of this guide, contact the Alberta Transportation *Regional Bridge Manager* for more information.

1.0 Bridge File Number (*)

(99999) _ _ _ _ _

A Bridge File Number uniquely identifies a Structure Site. This is a five-digit number (coded with leading zeros where applicable) that refers to a specific Structure Site. At least one structure must exist at the site when the site is created. All structures are identified uniquely with a combination of a Bridge File Number and a two-digit Structure Number that stays with the structure forever.

A Structure Number is forced whenever a new Bridge File Number is created. The structure number starts with 1 and is incremented by 1 for every subsequent structure that is added or replaced. Typically structure numbers are chronological in the order they are built, except when historical structures are created (as they are discovered) and entered in TIMS. A *Structure Status* is Mandatory when a structure is created.

Structure Site numbers (Bridge File Numbers) need not be sequential; however, they must be unique to the site forever.

The valid File Number ranges are:

00101	to	02499
06500	to	09999
13000	to	13999
70000	to	99999

This rule shall be strictly adhered to, for all new structures and/or new Bridge Engineering Projects.

Currently, the assignment and management of Bridge File Numbers is the responsibility of the Regional Bridge Manager of each Region. A block of Bridge File Numbers is provided to each Region for simplifying the Administration. The Current Assignments are:

- Region 1 Southern Region 84000 to 84999 and 87000 to 87999
- Region 3 Central Region 83000 to 83999 and 88000 to 88999
- Region 5 North Central Region 85000 to 85999 and 89000 to 89999
- Region 6 Peace Region 86000 to 86999 and 90000 to 90999

Structures and Structure Sites:

Structures may have a Visual Identifier to include travel direction and/or non primary structure associations (like Z for Signs) to facilitate structure identification with a File.

A Bridge or Bridge Culvert (known as Primary Structure) provides a continuous passage over a body of water, pathway, roadway, railway, or valley. Usually, a Bridge or a Bridge Culvert supports a pathway, road, or railroad, but it may support signs, equipment, or devices. The different interaction of the “ON” and “OVER” relationships are known as “Functional Crossings”.

A Structure Site has no clearly defined geographic area. It is established based on the unique functional crossing type to which a Bridge File Number is assigned. All structures related to this

functional crossing site inherit its Bridge File Number.

There are other structures along streams or highways that are not related to a Functional Crossing. Such structures may be Sign Structures guide banks, spurs, drop structures, etc. A Bridge File Number is assigned to these site based on functionality and structures may be grouped.

2.0 Direction (Visual Identifier)

(XXX) _ _ _

This is a *3 character alpha/numeric field* (suffix) and must be coded where there is more than one structure for carrying different directions of traffic flow. Always code left justified. This field will be blank when a single structure carries both directions of traffic. In TIMS (Transportation Information Management System) the direction is referred to as Visual Identifier.

Direction shall be that of the traffic flow. Some possible codes are:

Suffix	**Description**
Blank	For structures carrying two way traffic
N or **E**	For North bound or East bound lanes
S or **W**	For South bound or West bound lanes
NC or **EC**	For North bound or East bound Collectors
SC or **WC**	For South bound or West bound Collectors
O	Use temporarily for structures to become Cat "N"
B	For Bank Protection or River Training Works only
A	Associated file for records with more than 2 Span types
Zdd	Sign Structure with direction (as approaching the bridge).

Where the direction cannot be resolved, the code shall indicate only the Principal direction of that highway and shall be chosen in accordance with the direction.

Example: Highway #43 is mainly an East-West Highway although it goes at an angle and twin structures on that highway will either be W or E.

3.0 Culvert Types (3 allowed)

(XXX , XXX , XXX)_ _ _ , _ _ _ , _ _ _

These three 3-digit alphabetic fields should always be coded unless there is no structure or the span types are unknown. Culverts types are entered from the largest equivalent diameter to the smallest. List all culverts even if they are the same type and size.

These codes are a simplification for classifying a structure without going to the extent of defining

every individual feature. Codes are always left justified.

BIS CODES - TABLE OF CULVERT TYPES

Description	Code	Description	Code
CIP Arch	AP	Precast Box, Cell	PCB
CIP Arch Extended* Note 2:	APX	SPCSP or SPCMP Arch	RP
CIP Box, Cell	BP	SPCSP Arch Beams (ABC)	RPA
CIP Box, Cell w/Liner	BPL	SPCSP Ellipse (True Ellipse)	RPE
CIP Box, Cell Extended* Note 2:	BPX	SPCSP Integral w/Bridge	RPB
Precast-Pipe	CP	SPCSP Arch Pipe	RPP
Precast –Pipe Ellipsed	CPE	Any SPCSP Extended* Note 2:	RPX
Precast-Pipe Extended* Note 2:	CPX	SPCSP or SPCMP Round	SP
CSP or CMP Arch	FP	SPCSP or SPCMP Ellipsed (5% Vertically Ellipsed)	SPE
ARCH CSP Lined	FPL		
ARCH CSP Extended* Note 2:	FPX	SPCSP with Liner	SPL
CSP or CMP Round	MP	Timber-Pile or Timber-Box	TP
CSP or CMP Ellipsed	MPE	Timber (Pile or Box) with Liner	TPL
CSP Integral w/Bridge	MPB	Wood-Stave	WP
CSP with Liners	MPL	Smooth Steel Pipe	SSP
		Smooth Steel Pipe Extended* Note 2:	SSX
CSP Extended* Note 2:	MPX	Corrugated Plastic Pipe	CPP
Structural Culvert – Arch(Super Cor)	SCA	Smooth Plastic Pipe	SPP
Structural Culvert - Round	SCR	Stone Rock Arch	SRA
Precast Arch Culvert	CPA	Other Culverts * Note 1: (Temporary Code Only)	XP
Low Level Crossing	LLC	Cast in place Box Culvert	BPR

*Note 1: The code XP for Other Culverts is to be only used ONLY if there is no other relevant culvert code. Alberta Transportation will create new codes as required and replace the XP code.

*Note 2: Culverts coded as “Extended” require a Barrel Extension Data Coding Sheet. Contact the Head Office (Twin Atria), Byron Chelak for details.

4.0 Number of Culverts or Pipes

(99) _ _

If a structure is present this number would be coded and has a value from 01 to 99.

5.0 Span 1: Span and Rise (mm)

(99999 , 99999) _ _ _ _ _ , _ _ _ _ _

Code the design span and rise dimensions to the nearest millimeter for the largest (equivalent) diameter culvert. If the pipe is round, code its diameter as Span and omit the Rise. Record 5% vertically ellipsed pipes with the vertically ellipsed dimensions. All dimensions are inside the structure and no decimals may be added.

6.0 Span 2: Span and Rise (mm)

(99999 , 99999) _ _ _ _ _ , _ _ _ _ _

As above, code the design span and rise dimensions (as above) for the next smaller culvert. Omit if there is only one culvert.

7.0 Span 3: Span and Rise (mm)

(99999 , 99999) _ _ _ _ _ , _ _ _ _ _

As above for the third largest culvert. Omit if there are less than three culverts.

8.0 Nominal Culvert Invert Length (m) (1,2,3)

999.9 _ _ _ . _
999.9 _ _ _ . _
999.9 _ _ _ . _

These fields correspond to the invert lengths of the culverts in item 3 above. The number of entries must be the same as the number of culverts in item 3.

The length is nominal, given in metres, rounded to the nearest decimeter.

9.0 Corrugation Profile (mm) (1,2,3)

(999 , 999) _ _ _ x _ _ _
(999 , 999) _ _ _ x _ _ _
(999 , 999) _ _ _ x _ _ _

The corrugation profile only applies to flexible metal culverts and consists of:

1. Pitch, which is the distance from crest to crest or valley to valley. It is analagous to wave length.
2. Depth, which is the perpendicular distance between the bottom of a corrugation valley and the top of an adjacent crest. It is analagous to wave amplitude or height.

The pitch is coded first, followed by the depth for each culvert. The fields correspond to the culvert types in item 2 above. The number of entries must be the same as the number of culverts in item 2. The most common corrugation profiles are:

152 x 51mm	68 x 13 mm
125 x 26 mm	3.8 x 6.5 mm
76 x 25 mm	200 x 55 mm
380 x 140 mm	

10.0 Plate Thickness (mm) (1,2,3)

(9.9 x / 9.9 x / 9.9 x) _ . _ _ / _ . _ _ / _ . _ _
(9.9 x / 9.9 x / 9.9 x) _ . _ _ / _ . _ _ / _ . _ _
(9.9 x / 9.9 x / 9.9 x) _ . _ _ / _ . _ _ / _ . _ _

This information only applies to metal culverts, whether corrugated or smooth-walled. Corrugated steel pipes, CSP's, are manufactured with up to seven nominal thicknesses, depending on the corrugation profile. They are 1 mm, 1.3 mm, 1.6 mm, 2.0 mm, 2.8 mm, 3.5 mm, and 4.2 mm. Structural Plate Corrugated Steel Pipes, SPCSP's, are manufactured with 5 nominal plate thicknesses. They are 3 mm, 4 mm, 5 mm, 6 mm, and 7 mm.

Plate thickness may change over time due to corrosion, however the coded value is the design nominal thickness; it does not change. Different plate thicknesses may be used in two (2) design situations.

1. When plate thickness is thinner Upstream (U) and Downstream (D) than plates near the Middle (M) of the pipe. Indicate the change in plate thickness by adding the appropriate letter, U, D, or M as appropriate. *Example*: a culvert having plate thickness of 4 mm at the upstream and downstream ends with 5 mm thickness near the middle would be coded thus: Plate Thickness (mm) (1,2,3) 4.0 U /5.0 M /4.0 D
2. Plates are of different thickness at the Top (T), Sides (S) or Bottom (B) of a pipe. Indicate plate thickness along with the corresponding letter, T, S, or B, to indicate the location of the plates. Place the letter after each thickness. *Example*: a culvert having plate thickness of 4 mm at the bottom (B) and sides (S) with 5 mm thickness on the Top (T) plates would be coded thus: Plate Thickness (mm) (1,2,3) 4.0 B / 5.0 S / 4.0 T

When there is uniform plate thickness throughout, the letter designation shall be omitted and the plate thickness coded in the middle slot. This allows for future pipe extensions up and downstream with material of different thickness.

Example: a culvert having uniform 2.8 mm plate thickness throughout would be coded thus:

Plate Thickness (mm) (1,2,3) _._ _ / 2.8 _ / _._ _

11.0 Span 1 Radii (mm) (Top, Side, Bottom)

(9999 , 9999 , 9999) _ _ _ _ , _ _ _ _ , _ _ _ _

To be coded for non-round culvert shapes such as horizontal and vertical ellipses. Omit for round pipes.

12.0 Span 2 Radii (mm) (Top, Side Bottom)

(9999 , 9999 , 9999) _ _ _ _ , _ _ _ _ , _ _ _ _

Code as in item 11 above for the second largest culvert.

13.0 Span 3 Radii (mm) (Top, Side, Bottom)

(9999 , 9999 , 9999) _ _ _ _ , _ _ _ _ , _ _ _ _

Code as in item 11 above for the third largest culvert.

14.0 Height of Cover (m)

(XX.X) _ _ . _

This is the minimum distance from the roadway surface to the crown of the structure, measured in metres, and coded to the nearest decimeter. This distance is typically measured from the road shoulder to the crown of pipe on the upstream side, however there are exceptions such as road superelevation, where minimum cover does not always occur at the upstream side. A minimum height of cover shall be measured for each culvert.

15.0 End Treatment

(9 9 9 / 9 9 9) _ _ _ / _ _ _

End treatment refers to any appurtenances located at either the upstream or downstream end. If there are no appurtenances at either end, the fields should be coded "N" indicating square ends with no treatment. The first entry is for the upstream end and the second is for the downstream end. Code for main culvert only. End treatment is used for strengthening the ends, for resisting buoyancy forces, to act as retaining walls, to prevent piping to smooth stream flow, or for aesthetics. The following codes may be used:

Code	End Treatment
FCC	Full Concrete Collar, includes headwall, shoulders, and cutoff wall
PCC	Partial Concrete Collar; missing one or two items from a full collar
WWC	Concrete Wingwalls
WWT	Timber Wingwalls

16.0 Headwall (Yes, No)

_ _ _

Does a headwall exist?

17.0 Special Features

(XX , XX , XX) _ _ , _ _ , _ _

Code any special features using the following codes.

Code	Special Feature
AP	Abrasion Plates
CD	Concrete Distribution Slab
CE	Concrete Ears (Thrust Blocks)
DP	Diaphragms
FB	Fish Baffles
FL	Fishway (Fish Ladder)
GR	Geotextile Reinforced Bed
PR	Pile Reinforced Foundation
RP	Research Project
SR	Steel Reinforcing Ribs
SG	Strain Gauges Attached

Code	Special Feature
TI	Tunnelled Installation
UF	Unique Feature (use comments for items such as insulation, filter cloth, flotation pads, etc.)
WS	Water Survey Gauge Nearby

18.0 Fabricator Code

(XXXXXXXXXXXXXXXXXXX) _

Input the name of the pipe fabricator, up to 20 characters.

19.0 Contractor

(XXXXXXXXXXXXXXXXXXX) _

Input the full name, up to 20 characters, of the company that installed the culvert. If it was a department installation, the code is: **AT & U**

Comments

Input important information or unique features which are not covered by the standard codes above. Data sorts by "COMMENT" are not possible.