VGIS HANDBOOK

PART 2 - STANDARDS SECTION H

BRIDGE & CULVERT DATA EXCHANGE STANDARD

Vermont Geographic Information System

Standard History

- August, 2002 – version 1a - Original Standard endorsed by VCGI Technical Advisory Committee
- February, 2003 – version 1b - Minor tweaks made based on user feedback to VCGI.
- March, 2003- version 1c - Corrected field definition error for YR_BUILT and YR_REPAIR.
- April, 2003 - Modified STRC_TNLBL field in TRANSTRUC.PAT from 5 bytes to 6 bytes wide. Also changed STRC_LBL to indicate that points with STRUCT_TYP = "OS" will have null STRC_LBL values.
- May, 2003 – version 1d - Corrected typo in ADDRESS field content description, which is part of TRANSTRUC.LINVENT. Enhanced explanation as well.
- August, 2005 – version 2a - The VCGI TAC adopted a complete re-write of this Standard. It has been changed to a "data exchange" standard. The changes are too numerous to list here.
- November, 2005 – version 2b – VCGI revised the OWNER field to include the entire code set defined in the NBIS. The previous version of the Standard included only a subset of codes.
- March, 2007 – version 2c – Numerous minor revisions and clarifications were made to the Standard. Most of the changes were driven by issues identified during the development of the VT Online Bridge & Culvert Inventory Tool (VOBCIT).
- April, 2007 – version 2d – Added UPDACT to BC_LocalInventoryTable.
- March 2009 – version 2e – PCTOPEN and AMTOPEN changed to optional attributes

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Statutory Authority

Vermont Statutes: Title 10: Conservation & Development – Chapter 8: Geographic Information – 10 V.S.A. § 123. Powers and duties

BRIDGE & CULVERT DATA EXCHANGE STANDARD

I. INTRODUCTION		This document is divided into the following sections: **I. INTRODUCTION** Purpose Scope of Standard Background Terminology **II. DATA EXCHANGE FORMAT** Database Format & Structure Representation of Bridge/Culvert Locations XY Units & Coordinate System Unique Bridge and Culvert Identifiers **III. TECHNICAL APPENDICES AND REFERENCES** Default values should be NULL State Attribute Fields and Domains Local Attribute Fields and Domains Review and Modification of this Standard References Retired Attribute Fields and Domains (old B/C Data Standard)
Purpose		This Standard is intended to define a common data exchange format for bridge and culvert data (xy locations and inventory information) collected in the State of Vermont. The hope is that this standard will enhance data compatibility and sharing between local municipalities, Regional Planning Commissions, and State Agencies.

Scope of Standard		This Standard is limited to the exchange of bridge and culvert inventory information managed by municipalities, Regional Planning Commissions (RPCs), and State Agencies in Vermont. This standard supersedes the "VGIS Bridge & Culvert Data Standard". The old standard guided the development and maintenance of TRANSTRUC (statewide transportation structures database). The revised standard no longer addresses who is responsible for managing TRANSTRUC and how it will be maintained. It only addresses the exchange of information between systems (data exchange standard). NOTE: It should be noted that Vermont's Agency of Transportation (VTrans) and the Agency of Natural Resources (ANR) have established independent bridge/culvert inventories. This standard does not attempt to change how they collect and manage their information, it only addresses how their data will be exchanged with others in the VGIS community.
Background		A statewide geospatial bridge and culvert database (TRANSTRUC – transportation structures) was developed in 2001 as a collaborative effort between the Vermont Agency of Transportation (VTrans), the Vermont Center for Geographic Information (VCGI), and Vermont's Regional Planning Commissions (RPCs). These organizations provided data and technical support services. Numerous municipal bridge and culvert inventories were integrated into TRANSTRUC between 2001 and the summer of 2006. There were over 80,000 state/town bridges and culverts in TRANSTRUC as of January 2007. *A long term maintenance strategy for TRANSTRUC has not been defined, and is beyond the scope of this Standard.*
Terminology		The following terminology is used in this Standard:

Structure:	For the purpose of this standard "structure" refers to a bridge or culvert.
Bridge:	A structure that supports a roadway with abutments or piers erected over a depression like a waterway or highway, or railway and does not have a constructed bottom. Bridges also include arches in which the structure does not have a bottom and usually includes a half

			pipe or open box embedded in fill and supported by footers.
		Culvert:	A structure that supports a roadway with a complete pipe or box embedded in fill and always has a constructed bottom and does not have abutments or piers. Culverts include round, squashed or box type.
		Bridge Point:	Explicit X-Y coordinate representing the center of the bridge span.
		Culvert Point:	Explicit X-Y coordinate representing the center of the culvert.
		NBIS	National Bridge Inspection Standard
		BIS	VTrans Bridge Inventory System (BIS), which is based on the NBIS.
		ESRI Shapefile:	A specific GIS data layer format developed by Environmental Systems Research Institute (ESRI). This is the most common GIS data layer format in the industry.
		Feature:	Representation of a real-world object (e.g.: "bridge," "road", "building", etc.)
		Transverse culverts	Culverts which permit water to flow from one side of a road to the other.
		Longitudinal culverts	Culverts which are parallel to a road and permit continuous flow of water along one side of a road and permit access to driveways, fields, etc.
		Town Structures:	Bridges and culverts located on the Town Highway System (not part of the Interstate, U.S. or State Highway Systems)
		State Structures:	Bridges and culverts located on the Interstate, U.S., or State Highway System (not part of Town Highway System).
		VTrans' Online Bridge & Culvert Inventory Tool (VOBCIT)	This is an Internet application developed by VTrans which allows data developers/managers (eg: RPCs, consultants) to input, retrieve, and maintain bridge/culvert inventory information. *NOTE: VOBCIT is*

Additional References		The intent of this Standard is to incorporate by reference additional terms and, where possible, to identify and eliminate redundancies and conflicts. At this time the reader may want to review the following documents: **1.** The *VGIS Handbook* of the Vermont Geographic Information System (Part 5) includes a Glossary of basic GIS terminology. **2.** The *VTrans Bridge Inspection Manual* defines terms and database nomenclature for VTran's Bridge Inventory System (BIS).
II. DATA EXCHANGE FORMAT		This Standard defines how bridge and culvert data should be exchanged between systems. It specifies a database file format (Microsoft Access) and table structure, as well as specific fields, attributes, and valid domain values.

Database Format and Structure		**Data Exchange Format:** Microsoft Access 2000 database (MDB) **Database Structure (tables):** **Conventions** • BC = Bridge & Culvert **Local Inventory Tables (**Municipal/RPC inventories**)** • **BC_LocalInventoryTable** = This table stores bridge and culvert inventory information collected by municipalities and RPCs. It includes a comprehensive set of inventory attributes and XY coordinates. Refer to "*III. TECHNICAL APPENDICIES AND REFERENCES – Local Attribute Fields and Domains*" for details. o ***Primary Key:*** STRUCT_NUM (global key field) o ***Secondary Key:*** LOC_REF (local identifier) • **BC_LocalCustomTable** = This table stores custom attributes defined by municipalities and RPCs. This table is used to supplement and extend BC_LocalInventoryTable. It DOES NOT replace it. o ***Primary Key:*** STRUCT_NUM (global key field) o ***Secondary Key:*** LOC_REF (local identifier) ***Note:*** *In most cases local inventories (those conducted by RPCs and municipalities) are limited to town structures*[1], however, nothing precludes them from inventorying state structures.* **State Agency Inventory Tables (**B/C inventories managed by state agencies**)** • **BC_VTransInventoryTable** = This table stores bridge and culvert inventory information managed within VTran's Bridge

1 Refer to Terminology section a definition of town and state structures.

Inventory System (BIS). It includes a comprehensive set of inventory attributes and XY coordinates.
  - ***Primary Key:*** STRUCT_NUM (global key field)

- **BC_VTransInventoryTable_Other** = Other state structures which are NOT part of the VTran's Bridge Inventory System (BIS). They include bridges along the border of adjoining states (eg: NH, NY). These bridges are maintained by the adjoining state, and therefore are not represented in the BIS.
  - ***Primary Key:*** STRUCT_NUM (global key field)

- **BC_GeomorphicInventoryTable** = This table stores geomorphic assessment information managed by the Vermont Agency of Natural Resources (ANR). It includes a comprehensive set of geomorphic inventory attributes and XY coordinates. Records in this table are joined to other tables via STRUCT_NUM.
  - ***Primary Key:*** STRUCT_NUM (global key field)

- **BC_<Agency>_StateCustomTable** = This table contains custom attributes defined by State Agencies. The naming convention includes the <Agency> in the name. For example, Vermont Emergency Management might create an inventory which identifies structures which have received disaster mitigations funds, with a resulting table called BC_VEM_StateCustomTable. DO NOT use spaces or special characters for <Agency>. An acronym should be used (eg: ANR, VTrans, VCGI, etc). Records in this table are joined to other tables via STRUCT_NUM.
  - ***Primary Key:*** STRUCT_NUM (global key field)

IMPORTANT NOTE: State Agency inventory tables must comply with the standards defined in section "*III. TECHNICAL APPENDICIES AND REFERENCES – State Attribute Fields and Domains*".

Other Tables

		• **STRUCT_NUM_ChangeLog** = This table logs STRUCT_NUM changes. If a STRUCT_NUM is changed then the change must be recorded in this table. The VOBCIT system will do this automatically, however, those not using VOBCIT will need to do this manually. **Key Field:** STRUCT_NUM is the primary key field (global ID) for all data exchanged via this data exchange format. Refer to "Unique Bridge and Culvert Identifiers" for details.
Representation of Bridge & Culvert Locations		The center point of each bridge and culvert will be represented by a X/Y coordinate. **Bridges:** The reference point for bridge features shall be 1/2 the span based on back of abutments and 1/2 the width, curb to curb (inside of curb). **Culverts:** The reference point for culvert features shall be the point by which the culvert crosses the road centerline for transverse culverts and the mid-point for longitudinal culverts. Transverse culverts are those that permit water to flow from one side of a road to the other. Longitudinal culverts are parallel to a road and permit continuous flow of water along one side of a road and permit access to driveways, fields, etc. Figures 1 and 2 represent the relationship between the real world features (bridges and culverts) and their corresponding graphical representation's in the database.

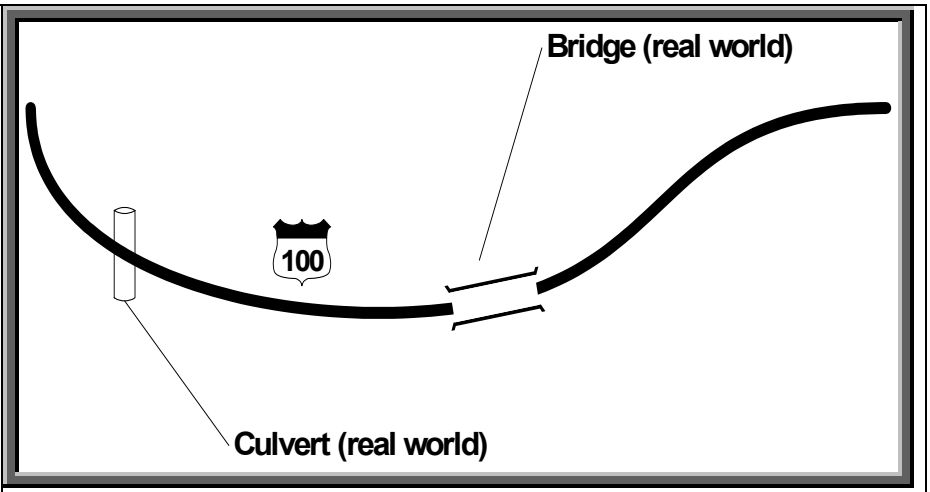


Figure 1

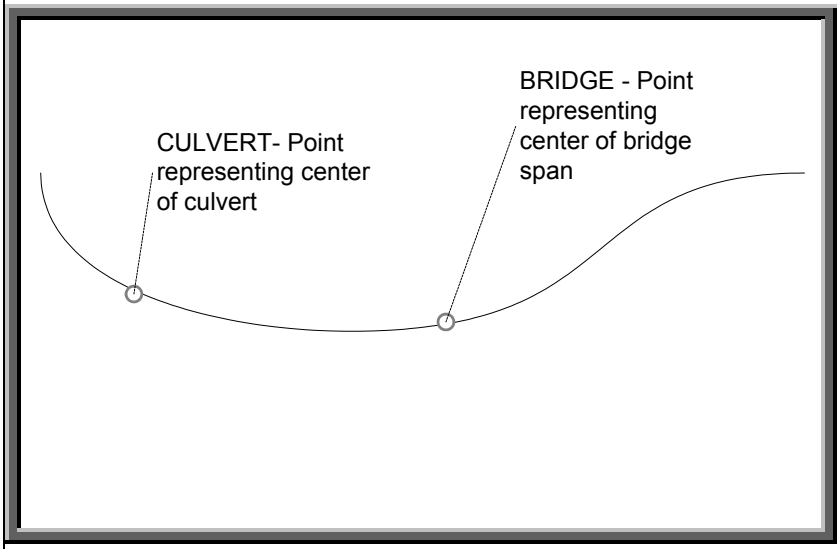


Figure 2

Note: Depending on the method used to collect the bridge and/or culvert location, it may not be practical to digitize the center of the bridge span or culvert. For example, a GPS operator would not want to stand in the middle of a busy road. As a result, this standard allows for some flexibility in how a bridge and/or culvert feature is represented.

		Refer to the LOCMETH. It includes codes which allow the GPS operator to specify where they were standing (ex: center of span and road, edge of road at center of span, either end of span, etc.).
XY Units & Coordinate System		XY coordinates values must be stored in the Vermont State Plane Coordinate System based on the North American Datum (NAD) of 1983. Coordinates are stored in meters. This is the standard map coordinate system used for storage of Vermont GIS (VGIS) data.
Unique Bridge and Culvert Identifiers		**Overview:** Unique bridge and culvert identifiers are critical to the exchange of inventory information. This Standard defines STRUCT_NUM as the unique global identifier (primary key field) for all data exchanged via this Standard. **VTrans is the assigning authority.** Secondary keys are also available for local inventory data, however, STRUCT_NUM is the key field which ties all structure inventory records collected at the municipal, regional, and state level together. ***STRUCT_NUM is the most important unifying element in this standard.*** ***Important Note:*** Municipalities, RPCs, and/or consultants **must** use existing STRUCT_NUMs for structures which have been assigned a number by VTrans. Municipalities, RPCs, and/or consultants should download a copy of the existing inventory information to determine if a STRUCT_NUM has already been assigned to a specific structure. **Primary Key Field** **STRUCT_NUM** **Description:** ***Global identifier.*** STRUCT_NUM is the primary key field which ties all structure inventory records collected at the municipal, regional, and state level together. VTrans is the assigning authority. **Source:** VTrans is the assigning authority. VTrans Online Bridge and Culvert Inventory Tool (VOBCIT) will assign a STRUCT_NUM to records entered or imported into the

VOBCIT system. If the user enters a STRUCT_NUM (or attempts to import data with defined STRUCT_NUMs), VOBCIT will validate the numbers to make sure there is a match. Records with invalid STRUCT_NUMs will be rejected by VOBCIT.

Content: A unique structure number assigned by VOBCIT to a structure if a valid STRUCT_NUM has not been defined. It will use the following schema based on *VTran's Bridge Inspection Manual - Item 8* with modifications.

<STRUCTYPE><ROUTE#><NUM><CTCODE><SYSFLAG>

<STRUCTYPE> Structure Type 2 digits

Structure system designation and bridge length/culvert diameter type grouping. STRUCTYPE will be determined based on OWNER and either SPAN for bridge records or CUL_WIDTH for culverts. Valid values for the Town Bridge and Culvert Inventory are 40, 50, 60, and 70. (Structures with a STRUCTYPE of 10, 20 or 30 are in the NBIS.)

0#*	Managed by neighboring state
10	Town Long Structure (>= 20ft). Includes any structure which is part of the Town highway system.
20	State Long Structure (>= 20ft). Includes any structure which is part of the Interstate or State highway system.
30	State Short Structure (< 20 feet >= 6 feet). Includes any structure which is part of the Interstate or State highway system.
40	Town Short Structure (< 20 feet >= 6 feet). Includes any structure which is part of the Town highway system.
50*	State Ultra Short Structure (< 6 feet). Includes any structure which is part of the Interstate or State highway system.
60*	Town Ultra Short Structure (< 6 feet). Includes any structure which is part of the Town highway system.
70*	Other structure inventoried by municipality or RPC. These are usually structures which are not part of the state or town highway system (ex: private bridges and culverts).
99*	The structure cannot be categorized because OWNER, SPAN, or CUL_WIDTH is null or unknown.

* Not currently part of "Item 8" in *VTran's Bridge Inpsection Manual*.

<**ROUTE#**> Route Number 4 digits

The Town Bridge and Culvert Inventory will use THNUM values padded with leading zeros for <ROUTE#>

State System - Federal Aid Route No.
Town System - Town Highway number (THNUM)
Private System - Use 0000 for structures not on the state or town highway system (private culvert or bridge) or for public roads that do not have an official Town Highway number assigned by VTrans.

<**NUM**> Structure Inventory Number 4 digits

Unique 4 digit number within town. The Town Bridge and Culvert Inventory will use TWN_RECNO padded with leading zeros for <NUM>

<**CTCODE**> VTran's County/Town Code 4 digits

The County/Town Code (CTCODE) will be looked up based on the OWNER_FIPS field. A CTCODE number will be stored.

<**SYSFLAG**> Town, State, or Private System Flag 1 digit

1. Town System
2. State System/Structure
*****3. Private System/Structure (private culvert or bridge)

***** Not currently part of "Item 8" in *VTran's Bridge Inspection Manual*.

Example: 400002001714081

40 = Town Short structure
0002 = Town Highway 2
0017 = Town Record Number 17
1408 = VTran's County-Town Code
1 = Town System

Secondary Key Field – *Local Inventory Tables only*

		LOC_REF **Attribute:** Local identifier/reference code **Source:** Municipality, RPC, and/or consultant **Content:** The content of this field is undefined. Local data managers are free to assign whatever they want, however, the code is limited 30 digits. Data managers are discouraged from using numbers with a similar schema to STRUCT_NUM. Doing so will only create confusion since some users will say "if it looks like STRUCT_NUM it must be a STRUCT_NUM". ***IMPORTANT CAUTIONARY NOTE:*** State Inventory Tables DO NOT include the LOC_REF fields. The only way to link Local inventory records to state inventory records (example: joining local inventory record to ANR's geomorphic assessment information) is via STRUCT_NUM (the global primary key field).

Review and Modification of this Standard		Proposed amendments to this document must be provided in writing to the VCGI TAC. This group will consider amendments to this Standard. The VGIS community will be provided with an opportunity to comment.
III. TECHNICAL APPENDICES		
Default values should be NULL		All fields should default to 'null'. Storage of 'blanks' in text fields is not allowed. Numeric fields should never default to zero (0). Zero is generally not an acceptable value unless it has a specific meaning (refer to *III. TECHNICAL APPENDICES*).
State Attribute Fields and Domains		This section addresses the following state agency inventory tables:

- **BC_VTransInventoryTable**
- **BC_VTransInventoryTable_Other**
- **BC_GeomorphicInventoryTable**
- **BC_<Agency>_StateCustomTable**

Each table will include a set of attributes (and domains) defined by the originating agency (ie: not defined in this Standard). The following table defines how the schemas will be defined:

Table	Schema defined by
BC_VTransInventoryTable	VTrans Bridge Inventory System (BIS)
BC_GeomorphicInventoryTable	ANR Geomorphic Assessment Database
BC_<Agency>_StateCustomTable	Source Agency

Additional Attributes: All tables must include STRUCT_NUM. They must also include the following required attributes (appended to the end of each table).

Required Attributes:

- **STRUCT_NUM** – Globally unique structure number.
- **CATEGORY –** Indicates type of structure (Bridge/Culvert)
- **LOCMETH** – Method used to locate/digitize the feature.
- **SRCORG** – Organization/project which located structure.
- **X_COORD --** Vermont State Plane Easting coordinate
- **Y_COORD --** Vermont State Plane Northing coordinate
- **FIPS6** - Town FIPS code

Optional Attributes: Agencies may also choose to include the following optional attributes.

- **STRUCTYPE** – Structure system designation and length type grouping.
- **STRC_LBL** – Vermont Town Highway Map bridge labels
- **SYMBLANGLE** – Angle to place bridge/culvert symbol on

map.

- **CTCODE –** VTrans county/town code
- **COVERED** – Covered bridge (Y/N)
- **OWNER** – Owner of structure
- **QC_FLAG** – Special flag used to identify quality control issues.

Field TYPE definitions (based on MS Access data types):

- Type: I = Number (Long Integer)
- Type: C = Text
- Type: N = Number (Double)
- Type: D = Date/Time

Detail - Required Attributes

Field Name: STRUCT_NUM Required Type: C Width: 15 Decimals: 0
Attribute: Globally unique structure number.
Source: VTrans is the assigning authority for this attribute. No one else can assign this attribute.
Content: Refer to *II. DATA EXCHANGE FORMAT – Unique Bridge & Culvert Identifiers* for details

Field Name: CATEGORY Required Type: C Width: 1 Decimals: 0
Attribute: Indicates category of structure
Source: Data Manager
Content: Code indicating whether the feature is a Bridge or Culvert. Note: Arches are included within Bridges.

B = Bridge
C = Culvert

Field Name: LOCMETH Required Type: I Width: 2 Decimals: 0
Attribute: Method used to locate/digitize the feature
Source: Refer to SRCORG
Content:
1 = Digitized from 1:5000 orthophoto
2 = Captured using mileage info and dynamic segmentation
3 = Intersection of 1:5000 roads and 1:100,000 surface waters
4 = Intersection of 1:5000 roads and 1:24,000 surface waters
5 = Intersection of 1:5000 roads and 1:5,000 surface waters

6 = Latitude/Longitude derived from 1:24,000 USGS paper maps
7 = Collected in the field using GPS (center of span and road)
8 = Collected in the field using GPS (either end of span)
9 = Collected in the field using GPS (edge of structure at center of span)
10 = VTrans Highway Mapping System bridge data
11 = Address geocoded using VT E911 road centerline data
12 = GPSed in the field then moved to match 5K digital ortho and/or road centerline
13 = Located in the field by marking location on 5K orthophoto basemap, then digitized with 5K digital ortho background in the office.

Field Name: SRCORG Required Type: I Width: 2 Decimals: 0
Attribute: Organization/project which created/updated the feature
Source: Assigned when point is digitized or moved.
Content: This attribute identifies the organization or project which digitized the feature. When a feature is digitized, moved or reshaped, the SRCORG code should be updated. The SRCORG codes will serve as a record of who made the change.

1 VCGI
2 VTrans
3 Town/Municipality
4 ANR
5 Other State Agency
10 Addison County RPC
11 Bennington County RC
12 Central VT RPC
13 Chittenden County RPC
14 Northwest RPC
15 Lamoille County PC
16 Northeast VT Development Assoc.
17 Rutland RPC
18 Southern Windsor RPC
19 Two Rivers-Ottauquechee RPDC
20 Upper Valley-Lake Sunapee RPC
21 Windham RPC
99 Contractor/Consultant

Field Name: X_COORD Required Type: N Width: 16 Decimals: 3
Attribute: Vermont State Plane Easting coordinate
Source: Sofware generated
Content: NAD 83 meters.

Field Name: Y_COORD Required Type: N Width: 16 Decimals: 3
Attribute: Vermont State Plane Northing coordinate
Source: Software generated

Content: NAD 83 meters.

Field Name: FIPS6 Type: I Width: 5 Decimals: 0
Attribute: Municipality (town, city, gore, grant) code
Source: Data manager
Content: Standard FIPS code (Refer to VGIS Geocodes Standard)

Detail - Optional Attributes

Field Name: STRUCTYPE Optional Type: C Width: 2 Decimals: 0
Attribute: Structure system designation and bridge length / culvert diameter type grouping.
Source: VTrans Bridge Inventory System (or municipality/RPC)
Content: Structure system designation (ex: state or town highway system) and length type grouping. ***NOTE:*** STRUCTYPE will be determined based on OWNER and either span for bridge records or width/diameter for culverts.

SL = State Long Structure (>= 20 feet). Includes any structure which is part of the Interstate or State highway system.
SS = State Short Structure (< 20 feet >= 6 feet). Includes any structure which is part of the Interstate or State highway system.
TL = Town Long Structure (>= 20 feet). Includes any structure which is part of the Town highway system.
TS = Town Short Structure (< 20 feet >= 6 feet). Includes any structure which is part of the Town highway system.
SU = State Ultra Short Structure (< 6 feet). Includes any structure which is part of the Interstate or State highway system.
TU = Town Ultra Short Structure (< 6 feet). Includes any structure which is part of the Town highway system.
OS = Other structures including those maintained by neighboring states (MA, NH, NY). These are usually structures which are not part of the state or town highway system (ex: private bridges and private culverts).
99 = Unknown. Used for structures for which SPAN or CUL_WIDTH is null, or have an OWNER value = 80 (Unknown). In most cases this should only be used for "legacy" data which does not contain this information.

Field Name: STRC_LBL Optional Type: C Width: 6 Decimals: 0
Attribute: VTrans Town Highway Map bridge labels
Source: VTrans Town Highway Mapping System
Content: Contains structure labels shown on VTrans Town Highway Maps.

Examples include: B34 = bridge, C34 = culvert, CB34 = covered bridge
Note: VTrans' Town Highway maps include labels for State Long (SL), State Short (SS), and Town Long (TL) structures (those maintained in VTrans' BIS). Other structures, such as Town Shorts, are not labeled. A "B" is used for bridges (ex: B34), a "C" for culverts (ex: C34), and "CB" is used with covered bridge (ex: CB34).

Field Name: SYMBLANGLE Optional Type: I Width: 3 Decimals: 0
Attribute: Angle of bridge span or culvert (degrees from north) for rendering of bridge and culvert symbols.
Source: Data Manager
Content: This item specifies the angle of the bridge span or culvert in degrees from north, allowing software such as ArcView to orient marker symbols at the correct angles. The angle for bridge points will be parallel to the road centerline, whereas the angle for culverts will be perpendicular.
Note: *The SYMBLANGLE field does NOT represent the actual angle of the bridge or culvert on the ground. It is designed for cartographic purposes only (so that symbols will be placed properly)!*

Field Name: CTCODE Optional Type:C Width: 4 Decimals: 0
Attribute: VTrans County-Town code
Source: Data Manager
Content: The county-town code identifies the municipality in which each bridge falls. **Note:** CTCODE must be padded with leading zeros. Refer to the commcodes.dbf file bundled with VCGI's"Geocodes" Data Product for a complete listing of CTCODE values.

Field Name: COVERED Optional Type: C Width: 1 Decimals: 0
Attribute: Covered bridge - YES/NO
Source: Vtrans bridge inventory
Content: Identifies whether this is a covered bridge or not. *This field applies only to bridges.*

Y = Yes, this is a covered bridge
N = No, this is NOT a covered bridge (or is a culvert)

Field Name: OWNER Optional Type: C Width: 2 Decimals: 0
Attribute: Ownership designation (state/town/private)
Source: Data developer.
Content: Indicates whether the structure is owned by the State, Town, or is a Private structure. The codes listed below are from the Maintenance Responsibility field in the NBIS (National Bridge Inventory System). NOTE: Code 90 is not part of the NBIS code schema, however, it has been added because TRANSTRUC includes a few structures owned by

neighboring states

Code	Description
01	State Highway Agency
03	Town or Township Highway Agency
11	State Park, Forest, or Reservation Agency
12	Local Park, Forest, or Reservation Agency
26	Private (other than railroad)
27	Railroad
64	US Forest Service
66	National Park Service
70	Military Reservation/Corps of Engineers
80	Unknown
90	Neighboring State

Field Name: QC_FLAG Optional Type: C Width: 10 Decimals: 0
Attribute: Used for flagging QC issues
Source: Used by Data Manager to flag QC issues..
Content: Used to flag points with special quality control issues.

Local Attribute Fields and Domains

This section addresses the following local inventory table:

- **BC_LocalInventoryTable**

This table must include the following attributes (properly named and defined). All attribute values must conform with the domains herein.

Note: *STRUCT_NUM is the only required attribute in the* ***BC_LocalCustomTable*** *table. Local data managers may choose to include LOC_REF as a secondary key field.*

BC_LocalInventoryTable
Attribute Fields and Domains

WARNING: All of the attributes defined below must be included in the BC_LocalInventoryTable even if the data is limited to one type of structure. For example, if you plan to exchange your culvert inventory table (which is limited to culvert structures only), you must include the "Bridge Only attributes" in the table. The attribute values can be "null", but the fields themselves must be there.

Field TYPE definitions (based on MS Access data types):

- Type: I = Number (Long Integer)
- Type: C = Text
- Type: N = Number (Double)
- Type: D = Date/Time

Bridge and Culvert attributes

(√ = required attribute)
(* = Field NOT available in the VOBCIT Access "checkout" file)

- √ **STRUCT_NUM** Unique structure identifier number (Global Key Field) – (page 27)
- √ **OWNER_FIPS** Owner FIPS code – (page 27)
- √ **MNT_FIPS** Maintenance FIPS code – (page 27)
- √ **INV_FIPS** Inventory FIPS code – (page 27)
- √* **CTCODE** VTrans county/town code – (page 27)
- √ **CATEGORY** Indicates type of structure – (page 27)
- √* **STRUCTYPE** – Structure system designation and length type grouping – (page 29)
- **STRC_LBL** – Item used to label structures on maps – (page 29)
- √ **DATE_INSP** Date of inspection – (page 29)
- √ **INSPECTOR** Inspectors name – (page 29)
- √* **TWN_RECNO** Unique inventory record number within a town. (used by VOBCIT only!) – (page 29)
- **LOC_REF** Local identifier/reference code. Assigned at the local level – (page 29)
- √ **OWNER** Owner of structure – (page 30)
- **E911RDCODE** E911 road name code corresponding to

		E911's master road name lookup table – (page 30) • √ **RDFLNAME** Official E911 road name – (page 30) • **THNUM** Town highway number defined by VTrans road map – (page 30) • **AOTCLASS** Classification of road as defined by VTrans road map – (page 31) • **LOC_DESC** Nearby landmarks and description of approximate distances to features. – (page 31) • √ **X_COORD** Vermont State Plane Easting coordinate – (page 31) • √ **Y_COORD** Vermont State Plane Northing coordinate – (page 32) • **STRUCORDER** Numeric value of the order in which structures exist along a given road. – (page 32) • **ADDRESS** Estimated E911 address number – (page 32) • **FEATURE** Type of feature that passes under or through the culvert/bridge. – (page 32) • **FEATURENAM** Name of feature crossed, such as name of stream – (page 33) • **GPSCOND** Conditions under which GPS data was collected. – (page 32) • **GPSOFFSET** Estimated offset distance from center of structure – (page 33) • **GPSPTDIR** Estimated offset direction – (page 33) • **GPSDATE** Date the GPS data was taken – (page 34) • **GPSHOUR** Hour the GPS data was taken – (page 34) • **FLOWFRMDIR** approximate direction the water flows from – (page 34) • **FLOWTODIR** approximate direction the water flows to. – (page 34) • **COMMENTS** Any comments on the structure the inspector wants to enter – (page 35) • **FLOWANGLE** Angle of culvert relative to flow direction. – (page 35) • √ **STR_TYPE** Type of Structure – (page 36) • √ **STR_MAT** Material type – (page 37) • **MATCOMMENT** Comment to describe type and material in

		more detail. – (page 37) • **TYPECOMMNT** Comments to further describe structure type – (page 38) • **MULTISTRUC** Identifies another structure located a distance ½ the diameter of the smallest structure. – (page 38) • **MULTIID** Used to identify groups of structures in a database – (page 38) • **AMTOPEN**- Amount of culvert that is open based on information from inflow and outflow condition – (page 39) • **PCTOPEN** Percentage of culvert that is open – (page 39) • √ **CONDITION** Overall condition of structure – (page 39) • **SUBRATING** Used with CONDITION to allow the inspector to clarify the primary rating and sub-rating fields to form the complete condition – (page 40) • **CONDCOMMNT** Comments about the overall condition of the structure – (page 40) • **IMPORTANCE** Importance of the structure to the function of the road – (page 41) • **EFFCT_NET** Does the structure affect the road network – (page 41) • **OVERTOP** Is there evidence of the road overtopped by water? – (page 41) • **INOPEN** Amount of structure open measured in inches at the inflow end of the structure. – (page 41) • **OUTOPEN** Amount of structure open measured in inches at the outflow end of the structure – (page 42) • **WATERALIGN** describes the way that the stream flow is entering the structure. – (page 42) • **LIMITRDWID** – does the structure limit the width of the road? – (page 42) • **YR_BUILT** Year structure was built – (page 43) • **ORIGCOST** Original cost of the structure – (page 43) • **REPLCCOST** Current replacement cost of structure – (page 43) • **REPAIRCOST** Current repair cost of structure – (page 43) • **CURNTVALUE** Estimated current value of the structure – (page 43)

- **SERVCDATE** Estimated date the structure was last serviced – (page 43)
- **SERVCACT** Comments on the service that was done – (Page 43)
- **CNSTCOMMNT** Construction comments – (page 44)
- **SYMBLANGLE** Angle to place bridge/culvert symbol on map. – (page 44)
- √ **LOCMETH** Method used to locate/digitize the feature. – (page 44)
- √ **SRCORG** Organization/project which located structure. – (page 44)
- √ **REC_ID** System assigned unique record identifier (used by VOBCIT only!) – (page 45)
- √* **TIME_STAMP** Date and Time of the last record update (used by VOBCIT only!) – (page 45)
- √* **USER_STAMP** User ID of the last record update (used by VOBCIT only!) – (page 45)
- √ **UPDACT** Update Action flag indicating if the record has been Added, Updated, or Deleted. (used by VOBCIT only!) – (page 46)
- **QC_FLAG** – Special flag used to identify quality control issues – (page 46)

Bridge Only attributes

- √ **COVERED** – Covered bridge (Y/N) – (page (46)
- √ **SPAN** - length of roadway supported on bridge – (page 47)
- **VCLEARANCE** Vertical clearance above the roadway. – (page 48)
- √ **UCLEARANCE** Clearance beneath the bridge or arch roadway – (page 49)
- √ **OVERALLWID**- this is the distance from the outside to outside of the deck. – (page 49)
- √ **CLEARWIDTH**-this is the distance of travel width – (page 50)
- **WLIMIT**- posted weight limit – (page 50)
- **END_MARKER** General condition of bridge end makers –

(page 50)
- **ADV_SIGN** – general condition of the advance warning signs – (page 51)
- **BR_RAIL** general condition of bridge railing located on structure – (page 51)
- **APR_RAIL** condition of approach guardrail at structure – (page 51)
- **DECK** general condition of the deck – (page 52)
- **BEAM** general condition of the deck support or beams – (page 52)
- **FOOTERS** general condition of the footers – (page 52)
- **WALLPIER** general condition of the support walls and piers – (page 52)
- **ERSNCOMMNT** erosion condition comments – (page 53)
- **UPCHANNEL** – condition of erosion upstream of the bridge – (page 53)
- **DWNCHANNEL** - condition of erosion downstream of the bridge – (page 54)

Culvert Only Attributes

- **CALIGNTYPE**- how is the culvert aligned with the road? – (page 55)
- √ **CATCHBASIN** - does the structure utilize a catch basin at the inflow. – (page 55)
- √ **CLEANCB** – Does the Catch Basin need to be cleaned? – (page 55)
- √ **CUL_WIDTH** - width of culvert – (page 55)
- √ **CUL_HEIGHT** – height of culvert (page 56)
- √ **CUL_LEN**– length of culvert – (page 56)
- **CUTSHLDR** does the structure cut into the shoulder of the road? – (page 56)
- **RUST** the amount of rust that is occurring on the structure – (page 57)
- **HEADERMATL** what is the material of the header? – (page 57)
- **HEADERCOND** what is the condition of the header? – (page 58)

- **INENDDAM** has the inlet been damaged or crushed? – (page 58)
- **INEROSION** are there signs of channel/bank erosion near the inlet? – (page 58)
- **INRDEROSN** are there signs of erosion in the shoulder at the inlet? – (page 59)
- **INDEPTH** Depth of top of structure from road surface at inflow – (page 59)
- **INFLOWCMNT –** Inflow condition comments – (page 60)
- **INDTCHCND** . Condition of terrain at the inflow end of the structure – (page 60)
- **INDITCHMTL** Material in the inflow channel or ditch – (page 60)
- **FLOWSTO** Type of terrain the structure flows to – (page 60)
- **OUTENDDAM** has the outlet been damaged or crushed? – (page 61)
- **OUTEROSION** are there signs of channel/bank erosion near the outlet? – (page 61)
- **OUTRDEROSN** are there signs of erosion in the shoulder at the outlet? – (page 61)
- **OUTDEPTH** Depth of top of structure from road surface at ouflow. – (page 62)
- **OUTVDROP** Vertical drop measured from culvert invert to channel bottom in inches – (page 62)
- **OUTFL_CMNT** – Outflow condition Comments – (page 63)
- **OUTSPILLWY** Receiving terrain when it is not a ditch. – (page 63)
- **OUTDTCHCND** Condition of terrain at the outflow end of the structure – (page 63)
- **OUTDTCHMTL** Material in the outflow channel or ditch. (page 63)

Field Name: STRUCT_NUM Required Type: C Width: 15 Decimals: 0
Attribute: Global identifier. STRUCT_NUM is the primary keyfield

which ties all structure inventory records collected at the municipal, regional, and state level together. VTrans is the assigning authority.
Source: VTrans is the assigning authority. VTrans Online Bridge and Culvert Inventory Tool (VOBCIT) will assign a STRUCT_NUM to any data that is entered or imported into the VOBCIT system.
Content: Refer to section II. DATA EXCHANGE FORMAT – Unique Bridge and Culvert Identifiers.

Field Name: OWNER_FIPS Required Type: I Width: 5 Decimals: 0
Attribute: FIPS code of the Municipality (town, city, gore, grant) which owns the structure
Source:
Content: Standard FIPS code (Refer to *VGIS Geocodes Standard*)

Field Name: MNT_FIPS Required Type: I Width: 5 Decimals: 0
Attribute: FIPS code of the Municipality (town, city, gore, grant) which is responsible for maintenance of the structure
Source:
Content: Standard FIPS code (Refer to *VGIS Geocodes Standard*)

Field Name: INV_FIPS Required Type: I Width: 5 Decimals: 0
Attribute: FIPS code of the Municipality (town, city, gore, grant) code which is responsible for the inventory record for the structure. This field will be used to control access to records.
Source:
Content: Standard FIPS code (Refer to *VGIS Geocodes Standard*)

Field Name: CTCODE Required Type: C Width: 4 Decimals: 0
Attribute: VTrans County-town code
Source:
Content: The county-town code identifies the municipality in which each structure falls. This code will be looked up based on the OWNER_FIPS field.

Field Name: CATEGORY Required Type: C Width: 1 Decimals: 0
Attribute: Indicates category of structure
Source:
Content: Code indicating whether the feature is a Bridge or Culvert

Code	**Description**
B	Bridge
C	Culvert

Field Name: STRUCTYPE Required Type: C Width: 2 Decimals: 0
Attribute: Structure system designation and bridge length / culvert diameter

type grouping.
Source: VTrans Bridge Inventory System (or municipality/RPC)
Content: Structure system designation (ex: state or town highway system) and length type grouping. ***NOTE:*** STRUCTYPE will be determined based on OWNER and either span for bridge records or width/diameter for culverts.

SL = State Long Structure (>= 20 feet). Includes any structure which is part of the Interstate or State highway system.
SS = State Short Structure (< 20 feet >= 6 feet). Includes any structure which is part of the Interstate or State highway system.
TL = Town Long Structure (>= 20 feet). Includes any structure which is part of the Town highway system.
TS = Town Short Structure (< 20 feet >= 6 feet). Includes any structure which is part of the Town highway system.
SU = State Ultra Short Structure (< 6 feet). Includes any structure which is part of the Interstate or State highway system.
TU = Town Ultra Short Structure (< 6 feet). Includes any structure which is part of the Town highway system.
OS = Other structures including those maintained by neighboring states (MA, NH, NY). These are usually structures which are not part of the state or town highway system (ex: private bridges and private culverts).
99 = Unknown. Used for structures for which SPAN or CUL_WIDTH is null, or have an OWNER value = 80 (Unknown). Since SPAN/CUL_WIDTH are required (and OWNER is usually known), the use of 99 should be limited to "legacy" data that does not contain this information (such as some legacy data loaded into VOBCIT).

Field Name: STRC_LBL Optional Type: C Width: 6 Decimals: 0
Attribute: Bridge/Culvert map labels
Source: Source Agency
Content: Defined by the originating agency.
Note: Data managers are encouraged to use the labels depicted on VTrans' official Town Highway Maps, such as B4 or B9, for structures which correspond with those depicted on Town Highway Maps.

Examples include:

- B4 = Structure #4 depicted on VTran's Town Highway map
- CB13 = Covered bridge #13 depicted on VTran's Town Highway map
- TS9 = Town Short structure #9 (not depicted on VTran's Town Highway map)

- SU34 = State Ultra Short structure #34 (depicted on VTran's Town Highway map)
- TU5 = Town Ultra Short structure #5 (depicted on VTran's Town Highway map)
- OS6 = Other structure number #6 (depicted on VTran's Town Highway map)

Field Name: DATE_INSP Required Type: D Width: 10 Decimals: 0
Attribute: Date inspected
Source: Inspector
Content: Date indicating when the structure was last inspected.

Field Name: INSPECTOR Required Type: C Width: 30 Decimals: 0
Attribute: Name of inspector
Source: Inspector
Content: Name of person who inspected the structure.

Field Name: TWN_RECNO Required Type: N Width: 4 Decimals: 0
Attribute: VOBCIT Town Inventory Record Number
Source: Software generated (VOBCIT software). VTrans is the assigning authority. VTrans' Online Bridge and Culvert Inventory Tool (VOBCIT)
Content: This will be a sequential number assigned to each inventory record within a town as the inventory record is added via VOBCIT. Each record can be uniquely identified by combining the OWNER_FIPS and TWN_RECNO fields.

NOTE: This field is only required for data that is being exchanged with VOBCIT.

Field Name: LOC_REF Optional Type: C Width: 30 Decimals: 0
Attribute: Local identifier/reference code
Source: Municipality, RPC, and/or consultant
Content: The content of this field is undefined. Local data managers are free to assign whatever they want, however, the code is limited 30 digits.

Note: VTrans' "official" town highway numbers are not necessarily unique within a given town. VTrans assigns unique town highway numbers by "road class". For example, a class 2 road in the village might be assigned TH-5, however, there could be a class 3 or 4 road in the rural part of town with the same town highway number (TH-5). Municipalities, RPCs, and consulstants should take this into consideration when assigning LOC_REF identifiers.

Field Name: OWNER Required Type: C Width: 2 Decimals: 0
Attribute: Ownership designation (state/town/private)

Source: Data developer.
Content: Indicates whether the structure is owned by the State, Town, or is a Private structure. The codes listed below are from the Maintenance Responsibility field in the NBIS (National Bridge Inventory System).

Code	Description
01	State Highway Agency
03	Town or Township Highway Agency
11	State Park, Forest, or Reservation Agency
12	Local Park, Forest, or Reservation Agency
26	Private (other than railroad)
27	Railroad
64	US Forest Service
66	National Park Service
70	Military Reservation/Corps of Engineers
80	Unknown

Field Name: E911RDCODE Optional Type: I Width: 6Decimals: 0
Attribute: E911 road name code
Source: RDNAME attribute in E911's road centerline data
Content: This field contains the E911 road name code (RDNAME attribute in E911 RDS layer) for the road on which the structure is located. It is to be left blank if the road does not have an E911 road name.

Field Name: RDFLNAME Required Type: C Width: 30 Decimals: 0
Attribute: Full E911 road name.
Source: E911's road centerline data
Content: This field contains the complete road name as defined by E911, when an E911RDCODE is selected. Enter the name for the town highway when the road has no E911 name.

Note: Nothing needs to be entered (the value can be left as NULL) if the structure is located on a private road or trail that does not have an official E911 road name. There are also cases in which structures may be located on roads or trails within federal, state, or town forests. These roads and trails may or may not have names (and in most cases will not have official E911 names). These can be left as NULL or the common trail/road name can be used.

Field Name: THNUM Optional Type: C Width: 4 Decimals: 0
Attribute: Town Highway Number.
Source: VTrans "official" town highway map (or RTNO attribute in VTrans road centerline data).
Content: A THNUM value must be assigned to all structures found on public roads that have been assigned an "official" Town Highway number by VTrans. It is not required for private roads (or public roads which do not

have an "official" Town Highway number assigned by VTrans). DO NOT include "TH-", only the number should be recorded. The THNUM value can be obtained from VTrans' official Town Highway Maps (or from the TransRoad_RDS GIS data layer used to generate the maps).

Example: "TH-4" would be recorded as "4"

Note: VTrans' "official" town highway numbers are not necessarily unique within a given town. VTrans assigns unique town highway numbers by "road class". For example, a class 2 road in the village might be assigned TH-5, however, there could be a class 3 or 4 road in the rural part of town with the same town highway number (TH-5).

Field Name: AOTCLASS Optional Type: N Width: 2 Decimals: 0
Attribute: Town Highway Road Class.
Source: VTrans' "official" Town Highway Map
Content: The following codes are a subset of the AOTCLASS field defined in *VGIS Road Centerline Data Standard*.

Code	Content
1-4	Class 1-4 town highway
5	State forest highway
6	US Forest Service (USFS) Forest Road
7	Legal trail
8	Private road
30	Vermont State Highway
40	US Highway, undivided centerline (most US Highways)
50	Interstate
92	Military road, no public access

Field Name: LOC_DESC Optional Type:C Width: 255 Decimals: 0
Attribute: Description of location of structure.
Source: Municipality/RPC
Content: The distance from a nearby landmark when one exists. Examples include feet from nearest intersection, E911 address, power or telephone poles.

Field Name: X_COORD Required Type: N Width: 16 Decimals: 3
Attribute: Vermont State Plane Easting coordinate
Source: GIS Software generated
Content: NAD 83 meters.

Field Name: Y_COORD Required Type: N Width: 16 Decimals: 3
Attribute: Vermont State Plane Northing coordinate

Source: GIS Software generated
Content: NAD 83 meters.

Field Name: STRUCORDER Optional Type: N Width: 7 Decimals: 2
Attribute: Numeric value indicating the order in which structures exist along a given road.
Source: Inspector
Content: Order in which structures occur along a road, i.e. from 1.00 to n.nn. This field enables the creation of reports in which structures are listed in the order in which they occur along a road. Order should be presented in the same order as increasing addressing. Whole numbers (eg: 1.00,2.00,3.00,etc.) should be used upon initial assignment. This will leave 99 additional "spaces" between each STRUCORDER number so that new structures can be assigned an appropriate number. This schema reduces or eliminates the need to re-assign STRUCORDER values to all structures along a given road whenever a new structure is added. For example, if three new structures are added between 5.00 and 6.00 they would be assigned 5.10, 5.20, and 5.30. It is a good idea to increment by 0.10 so that you will still have nine additional numbers in case more structures are added in the future

Field Name: ADDRESS Optional Type: I Width: 6 Decimals: 0
Attribute: E911 address number
Source: Approximated from E911\RDS road centerline data layer or on-the-ground measurements. ***NOTE:*** *On-the-ground measurements made with a wheel or other measuring device should be done in the same direction as the address ranges in the E911\RDS data. Measurements should also begin at the start of the road as defined in the E911\RDS data.*
Content: This field should hold the equivalent E911 address number for the structure. If you are using a measuring device in the field you will need to convert your measurements into the correct E911 addressing units for your town. Not all towns use this approach, but as an example, if your addressing increment is 1000 address numbers per mile divide your measurements (in feet) by 5280 and then multiply by 1000 [(3245 ft/5280 * 1000) = 615)]. It should be rounded to the nearest whole number.

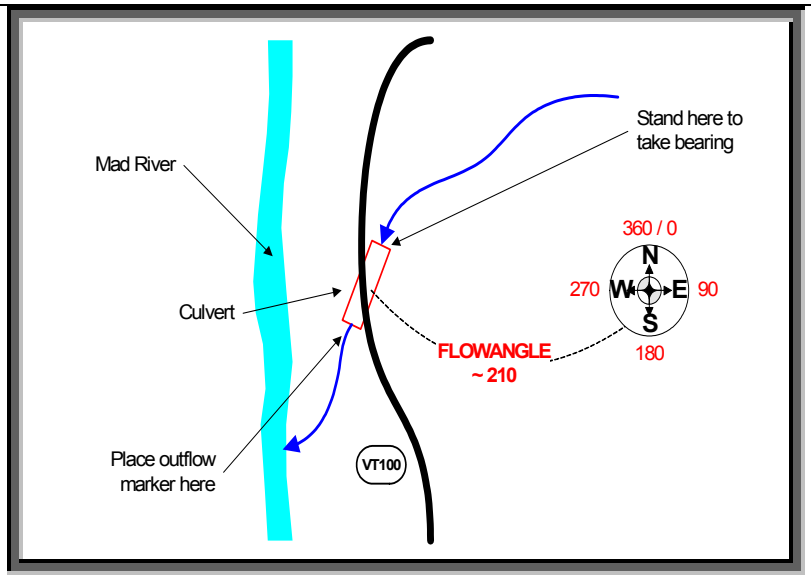
Field Name: FEATURE Optional Type: C Width: 1 Decimals: 0
Attribute: Type of feature crossed.
Source: Inspector
Content: This field uses a 1-digit code to flag the type of feature, if readily identifiable, the structure spans.

Code	Description
A	Animal Crossing
B	Rail Road

		C Pedestrian Crossing D Pond E Road I Inlet L Lake P Perennial stream R River S Seasonal Stream O Other N None **Field Name: FEATURENAM** Optional Type: C Width: 30 Decimals:0 **Attribute:** The name of the feature crossed **Source:** Inspector or reference VCGI information **Content:** The name of the feature can be found on USGS maps. *Used in combination with Feature.* NOTE: It is unlikely that a structure that is between 6 feet and 20 feet will cross a named stream or roadway. The features crossed will likely be a constructed drainage channel or a storm water feature. **Field Name: GPSCOND** Optional Type: C Width: 40 Decimals:0 **Attribute:** Condition of GPS. **Source:** Operator of GPS equipment **Content:** Indication of possible degradation of GPS Signal, for example dense canopy, building etc… **Field Name: GPSOFFSET** Optional Type: I Width:3 Decimals: 0 **Attribute:** Offset distance (nearest foot) from actual center of structure. **Source:** Operator of GPS equipment **Content:** Distance in feet from the point at which the GPS location was obtained to the center of the structure. **Field Name: GPSPTDIR** Optional Type:C Width:2 Decimals:0 **Attribute:** Direction of point. **Source:** Operator of GPS unit **Content:** This is the general direction from the point at which the GPS location was obtained to the center of the structure. **Code** **Description** N North NE North East E East SE South East S South

		SW South West W West NW North West **Field Name: GPSDATE** Optional Type: D Width: 10 Decimals: 0 **Attribute:** Date the GPS date was taken. **Source:** Operator of GPS unit **Content:** Date GPS point was acquired. Enables one to isolate points in the event of GPS equipment or Base Station Problem. **Field Name: GPSHOUR** Optional Type: I Width: 4 Decimals: 0 **Attribute:** Hour the GPS data was taken. **Source:** Operator of GPS unit **Content:** Hour GPS point was acquired. Enables one to isolate points in the event of GPS equipment or Base Station problems. Use military time. For example 2:15pm would result in 1415. **Field Name: FLOWFRMDIR** Optional Type: C Width: 2 Decimals: 0 **Attribute:** Direction the flow comes from. **Source:** Inspector **Content:** It is possible that there are no clear indicators as to which direction the water may flow through a structure. Since the assumed direction of flow will dictate other data associated with the inflow and outflow ends, it is essential that the user know the direction assumed. *Used in combination with FlowToDir.* **Code** **Description** N North NE North East E East SE South East S South SW South West W West NW North West **Field Name: FLOWTODIR** Optional Type: C Width: 2 Decimals: 0 **Attribute:** Direction the flow goes to. **Source:** Inspector **Content:** It is possible that there are no clear indicators as to which direction the water may flow through a structure. Since the assumed direction of flow will dictate other data associated with the inflow and outflow ends, it is essential that the user know the direction assumed. *Used in combination with FlowFrmDir.*

		Code **Description** N North NE North East E East SE South East S South SW South West W West NW North West **Field Name: COMMENTS** Optional Type: C Width: 255 Decimals: 0 **Attribute:** Comments **Source:** Inspector **Content:** Comments. Used to more specifically describe conditions observed and/or unique situations**.** **Field Name: FLOWANGLE** Optional Type: I Width: 3 Decimals: 0 **Attribute:** Angle of structure (from true north) relative to flow direction (based on a compass bearing). Declination must be factored in when taking a bearing (which is standard practice). **Source:** Inspector **Content:** This item specifies the angle of the structure (from true north) relative to flow direction (based on a compass bearing). Declination must be factored in when taking a bearing (which is standard practice). The measurement should be taken by placing a marker at the outflow point of the structure, then walking to the inflow point and taking a bearing. Refer to the figure below.



Field Name: STR_TYPE Required Type: C Width: 2 Decimals: 0

Attribute: Type of structure

Source: Inspector

Content: The following codes will be used to document structural type. Codes 00 to 22 are consistent with standards specified in *VTrans Bridge Inspection Manual*.

WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.

Abbrev	Code	Description	Applies To
SL	01	Slab	Bridge
SM	02	Stringer/multi-beam or girder	Bridge
GF	03	Girder and floor beam system	Bridge
TB	04	Tee Beam	Bridge
BB	05	Box beam	Bridge
FR	07	Frame	Bridge
AC	11	Arch	Both
SG	14	Stayed girder	Bridge
MX	20	Mixed types	Both
CB	22	Channel beam	Bridge
RN	30	Round	Culvert
BX	31	Box	Culvert

ES	32	Ellipse/Squashed	Culvert
DI	33	Drop inlet	Culvert
O	00	Other	Both
UN	99	Unknown	Both

Field Name: STR_MAT Required Type: I Width: 2 Decimals: 0

Attribute: Structure material

Source: Inspector

Content: This describes the material of the main structure. This is coded. When structure is constructed using a combination of materials, code the type which predominates or use mixed. Codes 0 to 9 are consistent with standards specified in *VTrans Bridge Inspection Manual*. The remaining codes have been added to support local bridge and culvert inventories.

WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.

Code	Abbrev	Description	Applies To
0	O	Other	Both
1	CS	Concrete Sectional	Both
2	CP	Concrete Poured	Both
3	SL	Steel	Bridge
5	PT	Prestressed concrete & post-tensioned	Bridge
7	TM	Timber	Bridge
8	MS	Masonry (arches) & slabs	Bridge
9	AI	Aluminum, wrought iron, or cast iron	Both
10	SC	Steel Corrugated	Both (Arch)
11	ST	Stone	Both
12	AC	Aluminum Corrugated	Culvert
13	PC	Plastic Corrugated	Culvert
14	PS	Plastic Smooth	Culvert
15	PM	Pipe, Metal (exact type unknown)	Culvert
16	PP	Pipe, PVC Plastic	Culvert
17	TK	Tank	Culvert
18	MU	Metal – undefined type	Both
97	MX	Mixed	Both
99	UN	Unknown	Both

Field name: MATCOMMENT Optional Type: C Width: 255 Decimals: 0

Attribute: Comments to describe Structure material type in more detail if needed

Source: Inspector
Content: Language describing more detail of the structure. This field can be used to describe mixed materials or unique situations of the material that are not apparent through the field names.

Field name: TYPECOMMNT Optional Type: C Width: 255 Decimals: 0
Attribute: Comments to describe Structure type in more detail if needed
Source: Inspector
Content: Language describing more detail of the type of structure. This field can be used to describe mixed types or unique situations that may not be apparent through the code for STR_TYPE.

Field Name: **MULTISTRUC** Optional Type: C Width: 1 Decimals: 0
Attribute: This field is used to identify if another structure is located within a distance ½ the diameter of the smallest structure. **Note:** *In certain circumstances, multiple structures may be installed in close proximity to each other. These structures may be considered as a single structure if specific conditions are met. Most notably, the federal definition for VTrans to be responsible for inspecting multiple structures consists of the diameter of the structures must add up to over 20 feet and the distance between the multiple structures must be less than or equal to half of the diameter of the smallest structure. For VTrans to be responsible for the inspection, the distance between structures is not included, only the diameter of the structure.*

There are numerous other situations which result in multiple structures being placed in close proximity. For example, added flowed handled by installation of a second structure; both (or all) of which may subsequently be replaced by a single larger structure.
Source: Inspector
Content: This attribute helps the inspector identify if a structure is located within a distance less than ½ of the diameter of the smaller structure. This is coded Yes or No.

Code	**Description**
Y	**Yes**
N	**No**

Field Name: MULTIID Optional Type: C Width: 6 Decimals: 0
Attribute: Refer to field **MULTISTRUC**. This field is used to group those structures meeting the criteria established for the field MULTISTRUC. This is accomplished by using the same value for the **MULTIID** field for all structures located within the required distance.
Source: Inspector
Content: This attribute does NOT have a specific code. The attribute helps

the inspector identify groups of structures located at one location. For example, an inspector may want to use the number 1 for the first set of structures that fall under the above circumstance; number 2 for the second set of structures, etc. This attribute can be used to identify a circumstance where several structures are acting like one structure.

Field Name: AMTOPEN Optional Type: I Width: 5 Decimals: 0
Attribute: Amount of structure open to the flow of water measured to the nearest whole number in inches.
Source: Inspector
Content: The remaining height open at the most restrictive point.
Note: The most restrictive area may not be at the ends if obstructions are present inside of the culvert. Round to nearest whole number in inches.

Examples:	**Amount**	**Value**
	50”	50
	5”	5
	18 inches	18
	2 feet	24

Field Name: PCTOPEN Optional Type: I Width: 3 Decimals: 0
Attribute: Percentage of structure that is open.
Source: Inspector
Content: Note: The field “PCTOPEN” is derived by dividing the field AMTOPEN open by the field CUL_HEIGHT (Culvert) or UCLEARANCE (Bridge) and multiplying by 100.

$$\frac{\text{AMTOPEN}}{\text{CUL\_HEIGHT or UCLEARANCE}} \times 100 \quad \text{or} \quad \frac{24}{36} \times 100 = 67$$

Field Name: CONDITION Required Type: IWidth: 1 Decimals: 0
Attribute: Overall condition of Structure.
Source: Inspector
Content The conditions are coded. When determining condition for a culvert it may be helpful to consider the codes determined for LIMITRD WID, CUTSHLDR, OVERTOP, RUSTCOND, HEADERCOND, IN(OUT)DAM, IN(OUT)EROSION, IN(OUT)RDEROSN, IN(OUT)OPEN, IN(OUT)DTCHCND, AMTOPEN, PCTOPEN when considering the level of deficiencies. When determining condition for a bridge, it may be helpful to evaluate the materials related to the physical condition of the deck, superstructure, and substructure components of the bridge. It may be necessary to have a professional engineer determine the condition of a bridge.

WARNING: This field must hold the “code” values defined below, NOT

the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.

Code	Abbrev	Description
7	**E**	**Excellent**- recently constructed, no visible deficiencies
6	**G**	**Good-At least** 75% open, few if any minor deficiencies.
5	**F**	**Fair**-At least 50% open, some existing or developing deficiencies.
4	**P**	**Poor**-At least 25% open and/or has serious deficiencies.
3	**C**	**Critical** -Less than 25% open and/or has critical deficiencies.
2	**U**	**Urgent-** Critical deficiencies that must be attended to immediately.
1	**CL**	**Closed** – Critical deficiencies have forced the structure to be closed. Structure is closed to traffic.
0	**X**	**Unknown –** Can not provide a reasonable evaluation due to the structure not being visible, property owner, etc

Field Name: SUBRATING Optional Type: I Width: 2 Decimals: 0

Attribute: Used to specify in further detail the condition of a structure. To be used with CONDITION.

Source: Inspector/Professional Engineer

Content: This is coded. For towns that may have many bridges and culverts, this data can help a town better prioritize repair/replacement. For example, this will give an opportunity for the inspector to indicate that the condition is somewhat better or worse than that indicated for overall condition.

Code	Description
1	On the positive side of condition
0	No adjustment to condition
-1	On the negative side of condition

Field Name: CONDCOMMNT Optional Type: C Width: 255 Decimals: 0

Attribute: Comments to describe Structure condition in more detail if needed

Source: Inspector

Content: Language describing more detail of the structure. This field can be used to describe multiple condition problems or unique situations of the condition that is not apparent through the field names.

Field Name: IMPORTANCE Optional Type: IWidth: 1 Decimals: 0

Attribute: Used to represent how critical the function of the structure is to the road section.
Source: Inspector
Content: This is coded. It is important to consider traffic volumes, detours and other aspects of the network the road surrounds. The following codes will be used:

Code	Description
1	Critical to road function
2	Very important to road function
3	Somewhat important to road function
4	Not important to road function
5	Un-necessary

Field Name: EFFCT_NET Optional Type: C Width: 1 Decimals: 0
Attribute: Used to identify structure important to the road network.
Source: Inspector
Content: This is coded. It is important to consider traffic volumes, detours and other aspects of the network. The following codes will be used:

Code	Description
Y	Yes
N	No

Field Name: OVERTOP Optional Type: C Width: 1 Decimals: 0
Attribute: Evidence of water flowing over road.
Source: Inspector
Content: This is a yes or no determination. Use yes to indicate that evidence exists that water flows over the road. This can be an indication that the size of structure may need to be increased. This attribute contributes to the overall condition of the structure.

Code	Description
Y	**Yes**
N	**No**

Field Name: INOPEN Optional Type: I Width: 5 Decimals: 0
Attribute: Amount of structure open measured in inches at the inflow end of the structure. Rounded to the nearest whole number.
Source: Inspector
Content: To be used with AMTOPEN, PCTOPEN and OUTOPEN.

Examples:	**Amount Open**	**Value**
	50”	50

		5” 5 18 inches 18 2 feet 24 **Field Name: OUTOPEN** Optional Type: I Width: 5 Decimals: 0 **Attribute:** Amount of structure open measured in inches to the flow of water at the outflow end of the structure. Measured in inches to the nearest whole number. **Source:** Inspector **Content:** To be used with AMTOPEN, PCTOPEN and INOPEN **Examples:** **Amount Open** **Value** 50” 50 5” 5 18 inches 18 2 feet 24 **Field Name: WATERALIGN** Optional Type: C Width: 2 Decimals: 0 **Attribute:** The angle of stream flow. **Source:** Inspector **Content:** This is a coded category that describes the way that the stream flow is entering the structure. This specification is consistent with *Vermont Stream Geomorphic Assessment Appendix G.* **Code** **Description**. S Sharp bend -Severe angle of entry, 45 to 90 degree bend M Mild Bend-Gentle angle of entry, 5-45 degree bend N Naturally straight-flow enters the structure straight on with no channelization evident. C Channelized straight channel was modified to a straight planform and flow enters the structure straight – on. Indicators of channelization include: armored streambanks, channel just upstream of straightened section is naturally sinuous, or documentation from local municipality. NA Not applicable for structures other than those that pass intermittent and perennial streams. **Field Name: LIMITRDWID** Optional Type: C Width: 1 Decimals: 0 **Attribute:** Culvert limits road width **Source:** Inspector **Content:** This is a yes or no determination. The inspector must determine if the culvert limits the road width. For example if an end of the culvert is at the edge of the travel area of the road, this would indicate that the length of the structure needs to be increased when replaced.

		Code **Description** Y Yes N No **Field Name: YR_BUILT** Optional Type: I Width: 4 Decimals: 0 **Attribute:** Year structure was built **Source:** Inspector **Content:** Year structure was built. **Field Name: ORIGCOST** Optional Type: I Width: 8 Decimals: 0 **Attribute:** Original cost to build structure. **Source:** Inspector **Content:** Original cost to build structure to the nearest dollar. **Field Name: REPLCCOST** Optional Type: I Width: 8 Decimals: 0 **Attribute:** Cost estimate to replace structure. **Source:** Inspector **Content:** Cost estimate to replace structure to the nearest dollar. **Field Name: REPAIRCOST** Optional Type: I Width: 8 Decimals: 0 **Attribute:** Cost estimate to improve/repair structure. **Source:** Inspector **Content:** Cost estimate to improve/repair structure to the nearest dollar. . **Note:** For those inventories being completed for towns to received 10% match, this field must be complete when condition of a culvert is less than good. **Field Name: CURNTVALUE** Optional Type: I Width: 8 Decimals: 0 **Attribute:** Current value of structure. **Source:** Inspector **Content:** Current value of structure to the nearest dollar. **Field Name: SERVCDATE** Optional Type: D Width: 10 Decimals: 0 **Attribute:** The date when the structure was last serviced **Source:** Inspector **Content:** If the actual month and day is not known use 01/01 followed by the estimated year. **Field Name: SERVCACT** Optional Type: C Width: 255 Decimals: 0 **Attribute:** Description of last service done to the structure **Source:** Inspector **Content:** Description of services done associated with each date entered into the attribute SERVCDATE. This includes but is not limited to services such as maintenance, repairs or replacement.

Field Name: CNSTCOMMNT Optional Type: C Width: 255 Decimals: 0
Attribute: Comments to describe Construction of Structure.
Source: Inspector
Content: Language describing in detail the construction of a structure. This field can be used to describe possible construction techniques needed of the construction of a structure.

Field Name: SYMBLANGLE Optional Type: I Width: 3 Decimals: 0
Attribute: Angle of bridge span or culvert (degrees from north) for rendering of bridge and culvert symbols.
Source: Data Manager.
Content: This item specifies the angle of the bridge span or culvert in degrees from north, allowing software such as ArcView to orient marker symbols at the correct angles. The angle for bridge points will be parallel to the road centerline, where as the angle for culverts will be perpendicular.
Note: *The SYMBLANGLE field does NOT represent the actual angle of the bridge or culvert on the ground. It is designed for cartographic purposes only (so that symbols will be placed properly)!*

Field Name: LOCMETH Required Type: I Width: 2 Decimals: 0
Attribute: Method used to locate/digitize the feature
Source: Refer to SRCORG
Content:
1 = Digitized from 1:5000 orthophoto
2 = Captured using mileage info and dynamic segmentation
3 = Intersection of 1:5000 roads and 1:100,000 surface waters
4 = Intersection of 1:5000 roads and 1:24,000 surface waters
5 = Intersection of 1:5000 roads and 1:5,000 surface waters
6 = Latitude/Longitude derived from 1:24,000 USGS paper maps
7 = Collected in the field using GPS (center of span and road)
8 = Collected in the field using GPS (either end of span)
9 = Collected in the field using GPS (edge of structure at center of span)
10 = VTrans Highway Mapping System bridge data
11 = Address geocoded using VT E911 road centerline data
12 = GPSed in the field then moved to match 5K digital ortho and/or road centerline
13 = Located in the field by marking location on 5K orthophoto basemap, then digitized with 5K digital ortho background in the office.

Field Name: SRCORG Required Type: I Width: 2 Decimals: 0
Attribute: Organization/project which created/updated the feature
Source: Assigned when point is digitized or moved.
Content: This attribute identifies the organization or project which digitized the feature. When a feature is digitized, moved or reshaped, the

SRCORG code should be updated. The SRCORG codes will serve as a record of who made the change. **Note:** *Additional codes will be added for other organizations on an "as needed" basis.*

1 VCGI
2 VTrans
3 Town
4 ANR
5 Other Agency
10 Addison County RPC
11 Bennington County RC
12 Central VT RPC
13 Chittenden County RPC
14 Northwest RPC
15 Lamoille County PC
16 Northeast VT Development Assoc.
17 Rutland RPC
18 Southern Windsor RPC
19 Two Rivers-Ottauquechee RPDC
20 Upper Valley-Lake Sunapee RPC
21 Windham RPC
99 Contractor/Consultant

Field Name: REC_ID Required Type: I Width: Decimals: 0
Attribute: VOBCIT generated record identifier
Source: VOBCIT
Content: Unique record ID. For use by VOBCIT software only!

NOTE: This field is only required for data that is being exchanged with VOBCIT.

Field Name: TIME_STAMP Required Type: D Width: Decimals: 0
Attribute: VOBCIT generated date/time stamp of the last update to the record.
Source: VOBCIT
Content: Date/time stamp of the last update to the record.. For use by VOBCIT software only!

NOTE: This field is only required for data that is being exchanged with VOBCIT.

Field Name: USER_STAMP Required Type: C Width: 50 Decimals: 0
Attribute: VOBCIT user ID identifying who made the last change to the record
Source: VOBCIT
Content: VOBCIT user ID. For use by VOBCIT software only!

NOTE: This field is only required for data that is being exchanged with VOBCIT.

Field Name: UPDACT Required Type: C Width: 1 Decimals: 0
Attribute: Update Action flag
Source: VOBCIT
Content: Flag indicating if the record is an Add, Update, or Delete. Used for data which is check-out then checked-in to VOBCIT. Adds, Updates, and Deletes must be properly flagged for the change to take affect.

UPDACT	Action
A	Added record
U	Updated record
D	Deleted record

NOTE: This field is only required for data that is being exchanged with VOBCIT.

Field Name: QC_FLAG Optional Type: C Width: 20 Decimals: 0
Attribute: Used for flagging QC issues
Source: Used by Data Manager to flag QC issues..
Content: Used to flag points with special quality control issues.

Bridge Only Attributes

Field Name: COVERED Required Type: C Width: 1 Decimals: 0
Attribute: Covered bridge – YES/NO
Source:
Content: Identifies whether this is a covered bridge or not.

Code	**Description**
Y	Yes
N	No

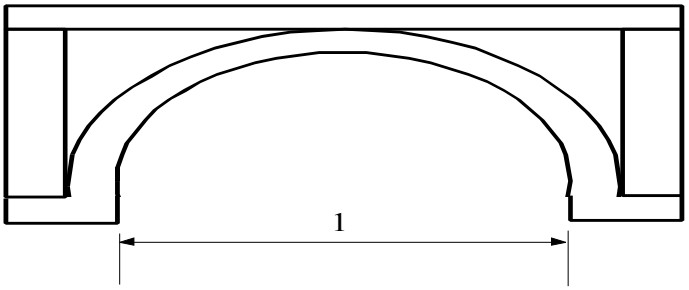
Field Name: SPAN Required Type: I Width: 6 Decimals: 0
Attribute: Length of structure, including arches and bridges, to the nearest

foot.

Source: Inspector

Content: These specifications are consistent with standards specified in *VTrans' Bridge Inspection Manual* for bridge structures (except for the fact that the field is defined as character in the BIS but numeric here...which makes it easier to perform summary operations). Record and code a 6-digit number to represent the length of the structure to the nearest foot. This shall be the length of roadway which is supported on the bridge structure. The length should be measured back to back of backwalls of abutments or from paving notch to paving notch (refer to BIS figures below), including covered bridges. For arches, measure the distance between where the arch sits on its footers.

Examples:	**Length**	**Value**
	50 feet	50
	5,421 feet	5421
	333 feet	333
	101,235 feet	101235



Field Name: VCLEARANCE Optional Type: N Width: 5 Decimals: 2

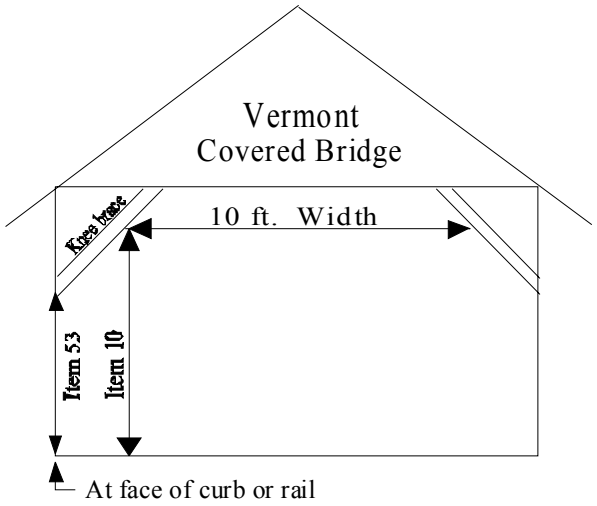
Attribute: Minimum vertical clearance over bridge roadway in feet.

Source: Inspector

Content: Code the minimum vertical clearance over the roadway (refer to Item 10 in the BIS figure below). The minimum clearance for a 10-foot width of the pavement or traveled part of the roadway where the clearance is the greatest shall be recorded and coded to the nearest hundredth of a foot. For structures having multiple openings, only the greatest shall be recorded (but only the greatest of the minimum clearances for the two or more openings shall be coded regardless of the direction of travel). This would be the practical maximum clearance. When no restrictions exist, code 0.

For horizontal clearances less than 10 feet, measurement will be taken at the horizontal restriction.

Examples:	**Value**
Clearance above roadway (17'-3")	17.25



Field Name: UCLEARANCE Required Type: N Width: 4 Decimals: 2

Attribute: Minimum clearance or height beneath/under the bridge or arch roadway in feet.

Source: Inspector

Content: Using a 4-digit number, record the minimum vertical clearance from the roadway, waterway or railroad track etc, beneath the structure to the underside of the superstructure. (When both a railroad and highway are under the structure, code the most critical dimension.).

Code a 4-digit number to represent the minimum vertical clearance from that feature to the structure (coded to the nearest hundredth of a foot).

Examples:	**Value**
River beneath structure (10”)	1.00
Railroad beneath structure (17’-3”)	17.25

Field Name: OVERALLWID Required Type: I Width: 6 Decimals: 0

Attribute: This is the distance from the outside to outside of the deck to the nearest foot.

Source: Inspector

Content: Record and code a 6-digit number to represent the entire width of the deck (out-to-out width). Travel width of the structure to the nearest foot. This is different than the CLEARWIDTH and is not the most restrictive

distance between curbs or rails.

Examples:	**Length**	**Value**
	50 feet	50
	5,421 feet	5421
	333 feet	333
	101,235 feet	101235

Field Name: CLEARWIDTH Required Type: I Width: 6 Decimals: 0

Attribute: Distance of travel width of the structure to the nearest foot.

Source: Inspector

Content: Record and code a 6-digit number to represent the travel width (curb-to-curb/rail-to-rail) of the structure to the nearest foot. This shall be the most restrictive distance between curbs or rails in which a vehicle can pass on the structure.

Examples:	**Width**	**Value**
	50 feet	50
	5,421 feet	5421
	333 feet	333
	101,235 feet	101235

Field Name: WLIMIT Optional Type: I Width: 4 Decimals: 0

Attribute: Posted weight limit in tons.

Source: Inspector

Content: Posted weight limit. Based on *VTrans Bridge Inspection Manual* codes (except for the fact that the field is defined as character in the BIS but numeric here...which makes it easier to perform summary operations).

Examples:	**Weight Limit**	**Value**
	1.1 tons	1
	3 tons	3

Field Name: END_MARKER Optional Type: C Width: 1 Decimals: 0

Attribute: Condition of the bridge end markers at the structure

Source: Inspector

Content: The condition does not assess adequacy or capacity, just the general condition of the End Marker. Note that it may be necessary to have a professional engineer give his/her professional opinion of the condition of the end marker in certain circumstances.

Code	**Description**
G	Good – new, no noticeable deficiencies
F	Fair- minor deficiencies, no immediate attention necessary
P	Poor-missing or needs replacing soon, major deficiencies

		N Not Applicable V Viewed but not rated **Field Name: ADV_SIGN** Optional Type: C Width: 1 Decimals: 0 **Attribute:** Condition of an advance warning sign near the structure. **Source:** Inspector **Content:** The condition does not assess adequacy or capacity, just the general condition of the Advance Warning Sign. Note that it may be necessary to have a professional engineer give his/her professional opinion of the condition of the advance warning sign in certain circumstances. **Code Description** G Good – new, no noticeable deficiencies F Fair- minor deficiencies, no immediate attention necessary P Poor-missing or needs replacing soon, major deficiencies N Not Applicable V Viewed but not rated **Field Name: BR_RAIL** Optional Type: C Width: 1 Decimals: 0 **Attribute:** Condition of a bridge railing located on the structure.. **Source:** Inspector **Content:** The condition does not assess adequacy or capacity, just the general condition of the Bridge Rail. Note that it may be necessary to have a professional engineer give his/her professional opinion of the condition of the bridge rail in certain circumstances. **Code Description** G Good – new, no noticeable deficiencies F Fair- minor deficiencies, no immediate attention necessary P Poor-missing or needs replacing soon, major deficiencies N Not Applicable V Viewed but not rated **Field Name: APR_RAIL** Optional Type: C Width: 1 Decimals: 0 **Attribute:** Condition of an approach guardrail at the structure. **Source:** Inspector **Content:** The condition does not assess adequacy or capacity, just the general condition of the approach guardrail. Note that it may be necessary to have a professional engineer give his/her professional opinion of the condition of the approach guardrail in certain circumstances. **Code Description** G Good – new, no noticeable deficiencies F Fair- minor deficiencies, no immediate attention necessary P Poor-missing or needs replacing soon, major deficiencies N Not Applicable

		V Viewed but not rated **Field Name: DECK** Optional Type: C Width: 1 Decimals: 0 **Attribute:** Condition of the slab (deck). **Source:** Inspector **Content:** The condition does not assess adequacy or capacity, just the general condition of the slab. Note that it may be necessary to have a professional engineer give his/her professional opinion of the condition of the slab or deck in certain circumstances. **Code Description** G Good – new, no noticeable deficiencies F Fair- minor deficiencies, no immediate attention necessary P Poor-missing or needs replacing soon, major deficiencies N Not Applicable V Viewed but not rated **Field Name: BEAM** Optional Type: C Width: 1 Decimals: 0 **Attribute:** Condition of the deck support or beams. **Source:** Inspector **Content:** The condition does not assess adequacy or capacity, just the general condition of the deck support or beams. Note that it may be necessary to have a professional engineer give his/her professional opinion of the condition of the deck support or beams in certain circumstances. **Code Description** G Good – new, no noticeable deficiencies F Fair- minor deficiencies, no immediate attention necessary P Poor-missing or needs replacing soon, major deficiencies N Not Applicable V Viewed but not rated **Field Name: FOOTERS** Optional Type: C Width: 1 Decimals: 0 **Attribute:** Condition of the footers. **Source:** Inspector **Content:** The condition does not assess adequacy or capacity, just the general condition of the footers. Note that it may be necessary to have a professional engineer give his/her professional opinion of the condition of the footers in certain circumstances. **Code Description** G Good – new, no noticeable deficiencies F Fair- minor deficiencies, no immediate attention necessary P Poor-missing or needs replacing soon, major deficiencies N Not Applicable V Viewed but not rated **Field Name: WALLPIER** Optional Type: C Width: 1 Decimals: 0

Attribute: Condition of the support walls and piers.
Source: Inspector
Content: The condition does not assess adequacy or capacity, just the general condition of the support walls and piers. Note that it may be necessary to have a professional engineer give his/her professional opinion of the condition of the support walls and piers in certain circumstances.

Code	Description
G	Good – new, no noticeable deficiencies
F	Fair- minor deficiencies, no immediate attention necessary
P	Poor-missing or needs replacing soon, major deficiencies
N	Not Applicable
V	Viewed but not rated

Field Name: ERSNCOMMNT Optional Type: C Width: 255 Decimals: 0
Attribute: Comments to describe erosion at structure in more detail if needed
Source: Inspector
Content: Language describing more detail of the erosion. This field can be used to describe multiple erosion problems or unique situations of the erosion that is not apparent through the field names.

Field Name: UPCHANNEL Optional Type: C Width: 2 Decimals: 0
Attribute: Physical condition of waterway upstream of the bridge.
Source: Inspector
Content: The physical conditions to evaluate include stream stability, condition of channel, riprap, slope protection or stream control devices including spur dikes. Slope protection or footings, erosion of banks and realignment of the stream should be considered. Note accumulation of drift and debris on the superstructure and substructure in the comment section. This is coded. *This attribute can be a basis for coming up with condition.*

Code	Description
E	**Excellent** – No noticeable or noteworthy deficiencies
G	**Good** – The banks are well vegetated, river control devices are not required or are have little to minor damage. Banks and/or channel have minor drifts.
F	**Fair** – Bank protection is being eroded or is beginning to slump. The river control devices and embankments have wide spread minor damage to major damage. Debris is restricting the waterway slightly, or trees and brush restrict the channel.
P	**Poor** – Bank protection is severely undermined or has failed. River control devices have severe damage or have been destroyed. Streambed aggradation, degradation or lateral movement has changed the waterway that will threaten the bridge and/or approach roadway.

		C **Critical/Closed** – The waterway has changed and the bridge is near a state of collapse or the bridge has closed because of channel failure, corrective action may put it back in light service or replacement is necessary. **U** **Urgent –** used to signify immediate attention to Town while inventory is being observed **X** **Unknown-** can not provide a reasonable evaluation due to the bridge not visible, property owner, etc. **NA** **Not applicable**. Use when structure is not over a waterway. **Field Name: DWNCHANNEL** Optional Type: C Width: 2 Decimals: 0 **Attribute:** Physical condition of waterway downstream of the bridge. **Source:** Inspector **Content:** The physical conditions to evaluate include stream stability, condition of channel, riprap, slop protection or stream control devices including spur dikes. Slope protection or footings, erosion of banks and realignment of the stream should be considered. Note accumulation of drift and debris on the superstructure and substructure in the comment section. This is coded. *This attribute can be a basis for coming up with condition.* **Code** **Description** **E** **Excellent** – No noticeable or noteworthy deficiencies **G** **Good** – The banks are well vegetated, river control devices are not required or are have little to minor damage. Banks and/or channel have minor drifts. **F** **Fair** – Bank protection is being eroded or is beginning to slump. The river control devices and embankments have wide spread minor damage to major damage. Debris is restricting the waterway slightly, or trees and brush restrict the channel. **P** **Poor** – Bank protection is severely undermined or has failed. River control devices have severe damage or have been destroyed. Streambed aggradation, degradation or lateral movement has changed the waterway that will threaten the bridge and/or approach roadway. **C** **Critical/Closed** – The waterway has changed and the bridge is near a state of collapse or the bridge has closed because of channel failure, corrective action may put it back in light service or replacement is necessary. **U** **Urgent –** used to signify immediate attention to Town while inventory is being observed **X** **Unknown-** can not provide a reasonable evaluation due to the bridge not visible, property owner, etc. **NA** **Not applicable**. Use when structure is not over a waterway.

Culvert Only Attributes

Field Name: CALIGNTYPE Optional Type: C Width: 1 Decimals: 0

Attribute: The alignment of the structure to the road.
Source: Inspector
Content: This is coded. The intent of this field is to identify structures that (1) cross under a road (value of "C"), i.e. allowing water to flow from one side of the road to the other; or (2) allow continuous flow of water along one side of the road (value of "P"), i.e. culverts under a driveway or a field access.

Code	Description
P	Parallel
C	Cross

Field Name: CATCHBASIN Required Type: C Width: 1 Decimals: 0

Attribute: The flow is via a catch basin or inlet.
Source: Inspector
Content: The code indicates whether or not there is a catch basin or inlet present. This field name is to inventory the fact that water is coming from a structure into the culvert.

Code	Description
Y	Yes
N	No

Field Name: CLEANCB Required Type: C Width: 1 Decimals: 0

Attribute: Code if the catch basin needs to be cleaned or not.
Source: Inspector
Content: This is coded. It is the inspector's discretion if he/she feels that the catch basin needs to be cleaned.

Code	Description
Y	Yes the catch basin needs to be cleaned
N	No the catch basin does not need to be cleaned

Field Name: CUL_WIDTH Required Type: I Width: 6 Decimals: 0

Attribute: Width of culvert in inches. **Note:** *The CUL_WIDTH and CUL_HEIGHT fields should have the same value for round culverts.*
Source: Inspector
Content: The diameter of a round culvert. Where walls are irregular, use the narrowest distance found. For rectangular culverts, measure the horizontal distance between supports. **NOTE:** Where the ends of a culvert are distorted, use the best estimate of the diameter. For elliptical

(squish) culverts the width and height will not be the same. Round to nearest whole number.

Examples:

Width	Value
50”	50
5”	5
18 inches	18
2 feet	24

Field Name: CUL_HEIGHT Required Type: I Width: 6 Decimals: 0

Attribute: Height of culvert in inches. **Note:** *The CUL_WIDTH and CUL_HEIGHT fields should have the same value for round culverts.*

Source: Inspector

Content: The diameter of a round culvert. Where walls are irregular or mixed types are encountered, use the narrowest distance found. **NOTE**: Where the ends of a culvert are distorted, use the best estimate of the diameter For elliptical (squish) culverts, the width and height will not be the same. Round to nearest whole number.

Examples:

Height	Value
50”	50
5”	5
18 inches	18
2 feet	24

Field Name: CUL_LEN Required Type: I Width: 6 Decimals: 0

Attribute: Length of structure to the nearest foot.

Source: Inspector

Content: The length of the culvert. to the nearest foot. **NOTE**: In some cases, the ends of the culverts may be distorted. For distorted culverts include the best estimate. Round to nearest whole number.

Examples:

Length	Value
21 feet	21
333 feet	333
12.25 feet	12

Field Name: CUTSHLDR Optional Type: C Width: 1 Decimals: 0

Attribute: Culvert cut into road shoulder.

Source: Inspector
Content: This is a yes or no determination. The inspector must determine if the structure cuts into the shoulder of the road. Erosion of shoulder material can occur, which may determine that the length of the structure needs to be increased when replaced.

Code	Description
Y	Yes
N	No

Field Name: RUST Optional Type: I Width: 1 Decimals: 0
Attribute: The amount of rust that is occurring on the structure
Source: Inspector
Content: This is a coded determination. This attribute can be a basis for coming up with condition and planning structure replacement.

WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.

Code	Abbrev	Description
6	NA	N/A (not applicable for concrete or plastic materials)
5	O	None (no rust evident or visible)
4	B	Beginning
3	M	Moderate (rust scaling beginning)
2	H	Heavy/Holes (heavy scaling or holes developing)
1	BG	Bottom Gone
0	X	Unknown

Field Name: HEADERMATL Optional Type: C Width: 1 Decimals: 0
Attribute: Header material at inflow.
Source: Inspector
Content: This is a coded determination. Includes the type of material forming the header at the inflow end of the structure

Code	Description
S	Stone
C	Concrete
M	Metal
P	Plastic
N	None

Field Name: HEADERCOND Optional Type: IWidth: 1 Decimals: 0

Attribute: Condition of header

Source: Inspector

Content: Condition of the header. For example, a poor rating would be assigned if a stone header had caved in and was partially or completely blocking the inflow; a fair rating could be used to indicate that erosion was occurring behind the header or the header was becoming unstable; etcThis attribute can be a basis for coming up with condition.

WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.

Code	Abbrev	Description
3	G	Good
2	F	Fair
1	P	Poor

Field Name: INENDDAM Optional Type: I Width: 1 Decimals: 0

Attribute: Damage of inflow end of structure.

Source: Inspector

Content: This is coded. This attribute can be a basis for coming up with condition.

WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.

Code	Abbrev	Description
4	N	None
3	B	Beginning
2	M	Moderate
1	E	Extensive

Field Name: INEROSION Optional Type: IWidth: 1 Decimals: 0

Attribute: Erosion in channel, ditch, or banks at inflow end of structure

Source: Inspector

Content: This is coded. This attribute can be a basis for coming up with condition.

WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.

Code	Abbrev	Description
4	N	None
3	B	Beginning
2	M	Moderate
1	E	Extensive

Field Name: INRDEROSN Optional Type: IWidth: 1 Decimals: 0

Attribute: Erosion in shoulder or road at inflow end of structure.

Source: Inspector

Content: This is coded. This attribute can be a basis for coming up with condition.

WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.

Code	Abbrev	Description
4	N	None
3	B	Beginning
2	M	Moderate
1	E	Extensive

Field Name: INDEPTH Optional Type: I Width: 5 Decimals: 0

Attribute: Depth of top of structure at inflow.

Source: Inspector

Content: Measure in inches and round to the nearest whole number. It is measured at the inflow end of the structure starting from the top of the structure to the road surface. In that the type of equipment required may be indicated and/or the depth of excavation is defined, this attribute can assist with coming up with repair cost. Round to the nearest whole number.

Examples:

Height	Value
50.249"	50
5.0"	5
18 inches	18

2 feet 24

Field Name: INFLOWCMNT Optional Type: C Width: 255 Decimals: 0
Attribute: Comments to describe inflow condition in more detail if needed
Source: Inspector
Content: Language describing more detail of the structure condition at inflow end. This field can be used to describe multiple problems with the inflow condition or unique situations of the inflow condition that is not apparent through the field names.

Field Name: INDTCHCND Optional Type: I Width: 1 Decimals: 0
Attribute: Condition of ditch at the inflow end of the structure.
Source: Inspector
Content: This is coded. Can be a basis for coming up with condition.

WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.

Code	Abbrev	Description
4	O	Open
3	P	Part filled
2	F	Full
1	E	Eroded

Field Name: INDITCHMTL Optional Type: C Width: 1 Decimals: 0
Attribute: Material in the inflow channel or ditch.
Source: Inspector
Content: This is coded. This can be an indicator for erosion potential.

Code	Description
S	Stone-lined
P	Planted/seeded
B	Bare soil
C	Channel
W	Water

Field Name: FLOWSTO Optional Type: C Width: 1 Decimals: 0
Attribute: Type of terrain the structure flows to.
Source: Inspector
Content: This is coded.

		Code **Description** S Spillway D Ditch **Field Name: OUTENDDAM** Optional Type: I Width: 1 Decimals: 0 **Attribute:** Damage of outflow end of structure. **Source:** Inspector **Content:** This is coded. This attribute can be a basis for coming up with condition. **WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.** **Code** **Abbrev** **Description** 4 N None 3 B Beginning 2 M Moderate 1 E Extensive **Field Name: OUTEROSION** Optional Type: I Width: 1 Decimals: 0 **Attribute:** Erosion in channel, ditch or banks at outflow end of structure **Source:** Inspector **Content:** This is coded. This attribute can be a basis for coming up with condition. **WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.** **Code** **Abbrev** **Description** 4 N None 3 B Beginning 2 M Moderate 1 E Extensive **Field Name: OUTRDEROSN** Optional Type: I Width: 1 Decimals: 0 **Attribute:** Erosion in shoulder at outflow end of structure. **Source:** Inspector **Content:** This is coded. This attribute can be a basis for coming up with condition.

WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.

Code	Abbrev	Description
4	N	None
3	B	Beginning
2	M	Moderate
1	E	Extensive

Field Name: OUTDEPTH Optional Type: I Width: 5 Decimals: 0

Attribute: Depth of top of structure at outflow.

Source: Inspector

Content: Measure in inches and round to the nearest whole number. It is measured at the outflow end of the structure starting from the top of the structure to the road surface. In that the type of equipment required may be indicated and/or the depth of excavation is defined, this attribute combined with INDEPTH can assist in coming up with repair cost.

Examples:

Depth	Value
50.249"	50
5.0"	5
18 inches	18
2 feet	24

Field Name: OUTVDROP Optional Type: I Width: 5 Decimals: 0

Attribute: Vertical drop measured in inches

Source: Inspector

Content: The attribute is measured from the bottom (invert) of the structure to the natural soil, ditch bottom or channel bottom. This value can determine warning signs for undercutting the culvert, and erosion in the shoulder and road over time. Measure to the nearest whole number. Negative numbers are allowed to reflect level of ditch is above culvert invert (i.e. ditch is filling in with sediment).

Examples:

Vertical Drop	Value
50"	50
5"	5
18 inches	18
2 feet	24

Field Name: OUTFL_CMNT Optional Type: C Width: 255 Decimals: 0
Attribute: Comments to describe outflow condition in more detail if needed
Source: Inspector
Content: Language describing more detail of the structure condition at outflow end. This field can be used to describe multiple problems with the outflow condition or unique situations of the outflow condition that is not apparent through the field names.

Field Name: OUTSPILLWY Optional Type: C Width: 2 Decimals: 0
Attribute: Receiving terrain when it is not a ditch.
Source: Inspector
Content: This is coded

Code	Description
WE	Wetlands
B	Brook
F	Field
WO	Woods
WA	Waterbody
NA	Not Applicable

Field Name: OUTDTCHCND Optional Type: I Width: 1 Decimals: 0
Attribute: Condition of terrain at the outflow of structure.
Source: Inspector
Content: This is coded. Can be a basis for coming up with condition.
WARNING: This field must hold the "code" values defined below, NOT the "Abbrev" values! Abbreviations will be rejected! They have been included for those who wish to associate a lookup table which links "codes" to "abbrev" for those users who do not like to see "codes" in their data.

Code	Abbrev	Description
4	O	Open
3	P	Part filled
2	F	Full
1	E	Eroded

Field Name: OUTDTCHMTL Optional Type: C Width: 1 Decimals: 0
Attribute: Type of material in the outflow channel or ditch.
Source: Inspector
Content: This is coded. This can be an indicator for erosion potential.

Code	Description
S	Stone-lined

		P Planted/Seeded B Bare soil C Channel W Water

References		The following online resources and publications were used to help draft this standard.
		
		• VGIS Bridge & Culvert Data Standard (May, 2003 release)
		  ○ NOTE: The *VGIS Bridge & Culvert Data Exchange Standard* (you're looking at it) replaces the standard referenced above.
		• VGIS Geographic Area Codes Standard
		  ○ http://www.vcgi.org/techres/standards
		• VGIS Road Centerline Data Standard
		  ○ http://www.vcgi.org/techres/standards
		• National Bridge Inspection Standards (NBIS)
		  ○ http://www.fhwa.dot.gov/bridge/nbis.htm
		• Vermont Bridge Inspection Manual and Bridge Inventory System (BIS)
		• Vermont Geomorphic Assessment Protocols
		  ○ http://www.anr.state.vt.us/dec/waterq/rivers/htm/rv_geoassesspro.htm

Retired Tables, Attribute Fields, and Domains		This section includes tables, attribute fields, and domain values defined in the old *VGIS Bridge & Culvert Data Standard (May 2003)*. It is included herein in order to help those who may have data which was built to the old standard. Users are encouraged to migrate their data to the new *VGIS Bridge & Culvert Data Exchange Standard* format.
		Retired Tables, Attributes Fields, and Domains
		NOTE: All attribute definitions are based on "host" ARC/INFO implementation (with INFO as the database manager). The attribute definitions may differ when converted to xBase formats (or others). √ = Field supports GASB-34 requirements

TABLE: TRANSTRUC.PAT	

Field Name: **STRUCT_NUM** √ Type: C Width: 15 Decimals: 0

Attribute: VTrans structure number for bridges and culverts.

Source: VTrans Bridge Inventory System (or municipality/RPC for >local= structures).

Content: Contains primary* bridge numbers stored in VTrans' bridge inventory system. This is a unique identifier for every bridge and culvert in the state. Refer to *II. Data Design and Model - Associating Information to Bridge Points* for more information. *NOTE: Secondary structure records in the VTrans Bridge Inventory (ex: roads that may go under the bridge) will be stored in a related table (BRIDGE.SINVENT_SEC).*

***** In most cases points will be assigned a STRUCT_NUM based on the primary record (record_type = 1 in VTrans BIS). However, there will be cases (such as rail bridges) in which a primary record does not exist. Points will be assigned secondary STRUCT_NUMs in these cases.

Note: Structures with a STRUCT_TYP = >SU=,=TU=, or >OS= will <u>not</u> have structure numbers derived from VTrans' Bridge Inventory System. Instead they will be assigned structure numbers based on the following schema.

Schema = <STRUCTYPE><ROUTE#><NUM><CTCODE><SYSFLAG>

<STRUCTYPE>

0#*	Managed by neighboring state
10	Town Long Structure (>= 20ft). Includes any structure which is part of the Town highway system.
20	State Long Structure (>= 20ft). Includes any structure which is part of the Interstate or State highway system.
30	State Short Structure (< 20 feet >= 6 feet). Includes any structure which is part of the Interstate or State highway system.
40	Town Short Structure (< 20 feet >= 6 feet). Includes any structure which is part of the Town highway system.
50*	State Ultra Short Structure (< 6 feet). Includes any structure which is part of the Interstate or State highway system.
60*	Town Ultra Short Structure (< 6 feet). Includes any structure which is part of the Town highway system.
70*	Other structure inventoried by municipality or RPC. These are usually structures which are not part of the state or town highway system (ex: private bridges and culverts).

-* Not currently part of VTrans BIS.

<ROUTE#> = (4 digits)

State System - State Route Number (ex:

VT-100 would be (0100).
Town System - Town Highway Number (ex: TH-23 would be 0023).
Private System - Use 0000 for structures not on the state or town highway system.

<NUM> = (4 digits) Unique 4 digit number within town (padded with leading zeros). **This number must be unique within each town.**

<CTCODE> = (4 digits) VTrans county/town code.

<SYSFLAG> = (1 digit) Town, State, or Private System Flag**.**
1. Town System/Structure
2. State System/Structure
3. Private System/Structure (private culvert or bridge)

Examples:

1) Town Ultra Short (usually culverts) on TH-23 = 600023004311011
2) State Ultra Short on US-2 = 500002007811012
3) Other structure on TH-12 = 700012007811013

Note: It is anticipated that municipalities and RPCs will generally inventory State/Town Ultra Shorts and Other structures (STRUCT_TYP = to >SU=,=TU=, or >OS=). However, it is possible for a municipality or RPC to collect their own inventory information for state and town structures (shorts and longs). This may be especially true for town shorts since VTran=s does not maintain an inventory for these structures (as of 3/2002).

Field Name: STRUCT_TYP Type: C Width: 2 Decimals: 0

Attribute: Structure system designation and bridge length / culvert diameter type grouping.

Source: VTrans Bridge Inventory System (or municipality/RPC)

Content: Structure system designation (ex: state or town highway system) and length type grouping. ***NOTE****: For bridges refer to LENGTH when determine which category to use. For culverts refer to diameter (WIDTH/HEIGHT).*

SL = State Long Structure (>= 20 feet). Includes any structure which is part of the Interstate or State highway system.
SS = State Short Structure (< 20 feet >= 6 feet). Includes any structure which is part of the Interstate or State highway system.
TL = Town Long Structure (>= 20 feet). Includes any structure which is part of the Town highway system.
TS = Town Short Structure (< 20 feet >= 6 feet). Includes any structure which is part of the Town highway system.

SU = State Ultra Short Structure (< 6 feet). Includes any structure which is part of the Interstate or State highway system.
TU = Town Ultra Short Structure (< 6 feet). Includes any structure which is part of the Town highway system.
OS = Other structures including those maintained by neighboring states (MA, NH, NY). These are usually structures which are not part of the state or town highway system (ex: private bridges and private culverts).

Field Name: STRC_LBL Type: C Width: 5 Decimals: 0
Attribute: VTrans Bridge Inventory System - structure label
Source: VTrans Bridge Inventory System
Content: Contains structure labels shown on VTrans Route Logs. An example would be A00006" or A0012S@. All structure points with a STRUCT_TYP not equal to >OS,SU,TU= will be assigned a STRC_LBL value based on what is contained in VTrans's Bridge Inventory System. State State/Town Ultra Shorts (SU,TU) and Other structures (OS) will have null (blank) STRC_LBL values.

Field Name: STRC_TNLBL Type: C Width: 6 Decimals: 0
Attribute: VTrans Town Highway Map bridge labels
Source: VTrans Town Highway Mapping System
Content: Contains structure labels shown on VTrans Town Highway Maps. An example would be AB6" or AB13".
Note: VTran=s Town Highway maps do not label State Long and Short structures. As a result, only Town Long (TL) and Town Short (TS) structures have STRC_TNLBL values since they are the only structures labeled on VTrans' Town Highway Maps. A >CB= is used with covered bridge names (ex: CB03). State/Town Ultra Shorts (SU,TU) and Other structures (OS) can be assigned a STRC_TNLBL using the following convention: <*STRUCT_TYP*><*num*>. For example OS23 for Other structure 23, or TU35 for Town Ultra Short 25. **Note:** *Culverts are not generally labeled on VTrans' Town Highway Maps, however, those that are labeled on the VTrans maps will be assigned a label consistent with the maps.*

Field Name: TYPE √ Type: C Width: 1 Decimals: 0
Attribute: Bridge or Culvert type flag
Source: Data Manager
Content: Code indicating whether the feature is a Bridge or Culvert.

B = Bridge
C = Culvert

Field Name: **FIPS6** Type: I Width: 5 Decimals: 0
Attribute: Municipality (town, city, gore, grant) code
Source:
Content: Standard FIPS code (Refer to VGIS Geocodes Standard)

Field Name: **POINTID** Type: I Width: 6 Decimals: 0
Attribute: Unique point identifier
Source: Assigned by VCGI or data developer
Content: The POINTID is a unique point identifier within each town. When combined with the FIPS6 code, this provides a unique point identifier statewide.

Field Name: **CTCODE** Type:C Width: 4 Decimals: 0
Attribute: VTrans County-Town code
Source:
Content: The county-town code identifies the municipality in which each bridge falls. **Note:** CTCODE must be padded with leading zeros. Refer to the commcodes.dbf file bundled with VCGI=s AGeocodes@ Data Product for a complete listing of CTCODE values.

Field Name: **LOCMETH** Type: I Width: 2 Decimals: 0
Attribute: Method used to locate/digitize the feature
Source: Refer to SRCORG
Content:
1 = Digitized from 1:5000 orthophoto
2 = Captured using mileage info and dynamic segmentation
3 = Intersection of 1:5000 roads and 1:100,000 surface waters
4 = Intersection of 1:5000 roads and 1:24,000 surface waters
5 = Intersection of 1:5000 roads and 1:5,000 surface waters
6 = Latitude/Longitude derived from 1:24,000 USGS paper maps
7 = Collected in the field using GPS (center of span and road)
8 = Collected in the field using GPS (either end of span)
9 = Collected in the field using GPS (edge of structure at center of span)
10 = VTrans Highway Mapping System bridge data
11 = Address geocoded using VT E911 road centerline data
12 = GPSed in the field then moved to match 5K digital ortho and/or road centerline
13 = Located in the field by marking location on 5K orthophoto basemap, then digitized with 5K digital ortho background in the office

Field Name: **SRCORG** Type: I Width: 2 Decimals: 0
Attribute: Organization/project which created/updated the feature
Source: Assigned when point is digitized or moved.
Content: This attribute identifies the organization or project which digitized the feature. When a feature is digitized, moved or reshaped, the

SRCORG code should be updated. The SRCORG codes will serve as a record of who made the change. **Note:** *Additional codes will be added for other organizations on an Aas needed@ basis.*

1 VCGI
2 VTrans
10 Addison County RPC
11 Bennington County RC
12 Central VT RPC
13 Chittenden County RPC
14 Northwest RPC
15 Lamoille County PC
16 Northeast VT Development Assoc.
17 Rutland RPC
18 Southern Windsor RPC
19 Two Rivers-Ottauquechee RPDC
20 Upper Valley-Lake Sunapee RPC
21 Windham RPC
22 Lyndon State College
23 RJ Turner Company

Field Name: COVERED Type: C Width: 1 Decimals: 0
Attribute: Covered bridge - YES/NO
Source: Vtrans bridge inventory
Content: Identifies whether this is a covered bridge or not. *This field applies only to bridges.*

Y = Yes, this is a covered bridge
N = No, this is NOT a covered bridge (or is a culvert)

Field Name: ANGLE Type: I Width: 3 Decimals: 0
Attribute: Angle of bridge span or culvert (degrees from north) for rendering of bridge and culvert symbols.
Source: VCGI will populate via automated procedures.
Content: This item specifies the angle of the bridge span or culvert in degrees from north, allowing software such as ArcView to orient marker symbols at the correct angles. The angle for bridge points will be parallel to the road centerline, where as the angle for culverts will be perpendicular.
Note: *The ANGLE field does NOT represent the actual angle of the bridge or culvert on the ground. It is designed for cartographic purposes only (so that symbols will be placed properly)!*

Field Name: RPC Type: C Width: 2 Decimals: 0
Attribute: Regional Planning Commission code

Source: *VGIS Handbook: Geographic Area Codes Standard.*
Content: The RPC code will be used to identify which RPC region the bridge point resides in. This will facilitate the Acheck-in/check-out@ procedure with the RPCs for update and integration back into the master bridge and culvert data layer.

AC	Addison County RPC	NV	Northeastern VT Development Assc.
BC	Bennington County RC	RR	Rutland RPC
CC	Chittenden County RPC	SW	Southern Windsor County RPDC
CV	Central Vermont RPC	TR	Two Rivers-Ottauquechee RC
NW	Northwest RPC	UV	Upper Valley-Lake Sunapee Council
LC	Lamoille County PC	WR	Windham Regional Commission

Field Name: NHD_ID Type: C Width: 18 Decimals: 0
Attribute: National Hydrography Dataset (NHD) identifier for bridges.
Source: Assigned and maintained by VCGI
Content: The NHD_ID attribute is a concatenation of HUC_8 and COM_ID (which is carried in the NHD data set). VCGI will periodically compare bridges contained in the TRANSTRUC coverage to bridges in the NHD to identify omission and commission errors. Refer to http://nhd.usgs.gov/ for more information on the National Hydrography Dataset. Also refer to Aredefined fields@ below.

Field Name: UPDACT Type: C Width: 1 Decimals: 0
Attribute: Used for flagging the type of update made to a point
Source: Assigned by the organization performing the updates
Content: Updated data sets received by VCGI will be compared with the original data set provided to the data developer, and a record of changes made to the data will be generated. To enable this process, data developers must record any changes made to the point topology in the UPDACT field with the following codes:

UPDACT	Action
A	Added point (i.e., a new point)
M	Moved point

Note: Deleted points will be logged in the TRANSTRUC.DELETED data file.

Field Name: QC_FLAG Type: C Width: 5 Decimals: 0
Attribute: Used for flagging QC issues
Source: Used by Data Manager (VCGI) to flag QC issues. *Not for general use.*

		Content: Used to flag points with special quality control issues. This attribute is used by the Data Manager (VCGI) to track quality control issues than span update cycles. The active set of QC_FLAG codes will be listed in the TRANSTRUC=s metadata *** REDEFINED FIELDS *** **Field Name: HUC_8** Type: C Width: 8 Decimals: 0 **Attribute:** Eight digit hydrologic unit code. **Source:** Assigned and maintained by VCGI **Content:** This field is a redefine of the first eight digits of the NHD_ID field. **Field Name: COM_ID** Type: N Width: 10 Decimals: 0 **Attribute:** Unique identifier **Source:** Assigned and maintained by VCGI **Content:** This field is a redefine of the last 10 digits of the NHD_ID field. **Field Name: FEAT_ID** Type: I Width: 11 Decimals: 0 **Attribute:** Unique feature identifier **Source:** Assigned and maintained by VCGI or data developer **Content:** The FEAT_ID field is a unique feature identifier assigned to each bridge and culvert point. The FEAT_ID field is a redefine (concatenation) of FIPS6 + POINTID.
TRANSTRUC.SINVENT_PRIM		This table will be derived from VTran's Bridge Inventory System and will include all primary bridge records. It will include a subset of fields from the database. *Note: Secondary bridge records will be appended to this table for those cases in which a point has been assigned a secondary STRUCT_NUM (ex: rail bridge over road).*
TRANSTRUC.SINVENT_SEC		This table will be derived from VTran's Bridge Inventory System and will include all secondary bridge records. It will include the same subset of fields as TRANSTRUC.SINVENT_PRIM.
TRANSTRUC.SLINVENT		Local structures inventory information collected by RPCs and/or municipalities (and their consultants) will be stored in the TRANSTRUC.LINVENT table. Field definitions and codes have been based on existing VGIS and VTrans standards as much as possible. **Note:** Some fields have been flagged as "optional". Also, an RPC or municipality may choose to add additional fields.

Field Name: **STRUCT_NUM** √ Type: C Width: 15 Decimals: 0

Attribute: Structure ID number

Source: Municipality/RPC

Content: Includes structure ID linking records in this table to points in the TRANSTRUC coverage. **Note:** *It is anticipated that most records in the LINVENT table will relate to TRANSTRUC points with a STRUCT_TYP = to >SU=,=TU=, or >OS=. However, it is possible for a municipality or RPC to collect their own inventory information for state and town structures (shorts and longs). This may be especially true for town shorts since VTran=s does not maintain an inventory for these structures (as of 3/2002). Municipalities and/or RPCs should always use established STRUCT_NUMs.*

Schema = <STRUCTYPE><ROUTE#><NUM><CTCODE><SYSFLAG>

<STRUCTYPE>	= (2 digits) State Ultra Short (50), Town Ultra Short (60), or Other Structure (70)
<ROUTE#>	= (4 digits) *State System* - State Route Number (ex: VT-100 would be (0100). *Town System* - Town Highway Number (ex: TH-23 would be 0023). *Private System* - Use 0000 for structures not on the state or town highway system.
<NUM>	= (4 digits) Unique 4 digit number within town (padded with leading zeros). **This number must be unique within each town.**
<CTCODE>	= (4 digits) VTrans county/town code.
<SYSFLAG>	= (1 digit) Town, State, or Private System Flag**.** 1. Town System/Structure 2. State System/Structure 3. Private System/Structure (private culvert or bridge)

Examples:

1) Town Ultra Short (usually culverts) on TH-23 = 600023004311011
2) State Ultra Short on US-2 = 500002007811012
3) Other structure on TH-12 = 700012007811013

Field Name: **LOCAL_ID** (optional) Type: C Width: 20 Decimals: 0

Attribute: Local Structure ID number. **NOTE:** *STRUCT_NUM is the primary key field. The LOCAL_ID field is optional and generally should not be used.*

Source: Municipality/RPC
Content: An optional local structure ID.

Field Name: **DATE_INSP** √ Type: D Width: 8 Decimals: 0
Attribute: Date inpsected
Source: inspector
Content: Date indicating when the structure was last inspected.

Field Name: **INSPECTOR** Type: C Width: 30 Decimals: 0
Attribute: Name of inspector
Source: Municipality/RPC/Contractor
Content: Name of person who inspected the structure.

Field Name: **TYPE** √ Type: C Width: 1 Decimals: 0
Attribute: Type of structure: Bridge or Culvert
Source: Inspector
Content: Code indicating whether the inventory record pertains to a Bridge or Culvert. **Note:** This is somewhat redundant with STRUC_TYPE="19" as well as TYPE in the TRANSTRUC.PAT file, however, it has been retained for "ease of use".

B = Bridge
C = Culvert

Field Name: **RDFLNAME** Type: C Width: 30 Decimals: 0
Attribute: Full E911 road name. *Consistent with VGIS Road Standard*
Source: E911\RDS data layer
Content: This field contains the complete road name as defined by E911.

Field Name: **ADDRESS** (optional) Type: N Width: 6 Decimals: 0
Attribute: E911 address number
Source: Approximated from E911\RDS road centerline data layer or on-the-ground measurements. ***NOTE:*** *On-the-ground measurements made with a wheel or other measuring device should be done in the same direction as the address ranges in the E911\RDS data. Measurements should also begin at the start of the road as defined in the E911\RDS data.*
Content: This field should hold the equivalent E911 address number for the culvert or bridge. If you are using a measuring device in the field you will need to convert your measurements into the correct E911 addressing units for your town. For example, if your measurements are in feet divide your measurements by 5280 and then multiply by 1000 [(3245 ft / 5280 * 1000) = 615)]. It should be rounded to the nearest whole number.

Field Name: **LOC_DESC** Type: C Width: 100 Decimals: 0

Attribute: Description of structures location.
Source: Inspector
Content: Narrative description of structures location. Designed to help future users locate structures in the field.

Field Name: FIPS6 Type: I Width: 5 Decimals: 0
Attribute: Municipality (town, city, gore, grant) code
Source:
Content: Standard FIPS code (Refer to *VGIS Geocodes Standard*)

Field Name: STRUC_MAT √ Type: N Width: 2 Decimals: 0

Attribute: Structural material/design.
Source: Inspector
Content: The following codes will be used to document structural material/design. These codes are consistent with standards specified in *VTrans' Bridge Inspection Manual* (except for code 10).

1 = Concrete
2 = Concrete continuous
3 = Steel
4 = Steel continuous
5 = Prestressed concrete & post-tensioned
6 = Prestressed & post-tensioned concrete continuous
7 = Timber
8 = Masonry (arches) & slabs
9 = Aluminum, wrought iron, or cast iron
10 = Rigid plastic
11 = Metal – type not defined
12 = Mix of material types
13 = Stone
0 = Other

Field Name: STRUC_TYPE √ Type: C Width: 2 Decimals: 0

Attribute: Type of structure
Source: Inspector
Content: The following codes will be used to document structural type. These codes are consistent with standards specified in *VTrans' Bridge Inspection Manual* (except for 23 and 24).

01	Slab
02	Stringer/multi-beam or girder
03	Girder and floorbeam system
04	Tee Beam

		05	Box beam or girders - multiple	
		06	Box beam or girders - single or spread	
		07	Frame	
		08	Orthotropic	
		09	Truss - deck	
		10	Truss - thru	
		11	Arch - deck	
		12	Arch - thru	
		13	Suspension	
		14	Stayed girder	
		15	Movable - lift	
		16	Movable - bascule	
		17	Movable - swing	
		18	Tunnel	
		19	Culvert - Standard	
		20	Mixed types	
		21	Segmental box girder	
		22	Channel beam	
		23	Culvert - Drop Inlet	
		24	Culvert - Squish Tube	
		25	Culvert - Box	
		00	Other	

Field Name: **STRUC_LEN** √ Type: N Width: 6 Decimals: 0

Attribute: Length of structure to the nearest foot.
Source: Inspector
Content: These specification are consistent with standards specified in *VTrans' Bridge Inspection Manual* (except for the fact that the field is defined as character in the BIS but numeric here...which makes it easier to perform summary operations). Record and code a 6-digit number to represent the length of the structure to the nearest foot. This shall be the length of roadway which is supported on the bridge structure. The length should be measured back to back of backwalls of abutments or from paving notch to paving notch, including covered bridges. If length is unknown use 999999 .

Culvert lengths should be measured along the center line of roadway, regardless of their depth below grade. Measurement should be made between inside faces of exterior walls.

Examples:	**Length**	**Value**
	50 feet	50
	5,421 feet	5421
	333 feet	333

		101,235 feet 101235 Unknown 999999 **Field Name: WIDTH** √ Type: N Width: 6 Decimals: 2 **Attribute:** For bridges this attribute represents the width (curb-to-curb) of the structure. For culverts this represents the width of the culvert (or diameter for round culverts). **Note:** *The WIDTH and HEIGHT fields should have the same value for round culverts.* **Source:** Inspector **Content:** These specifications are consistent with standards specified in *VTrans' Bridge Inspection Manual* (except for the fact that the field is defined as character in the BIS but numeric here...which makes it easier to perform summary operations). The information to be recorded is the most restrictive minimum distance between curbs or rails on the structure roadway. For structures with closed medians and usually for double decked structures, coded data will be the sum of the most restrictive minimum distances for all roadways carried by the structure*. The measurement should be exclusive of flared areas for ramps. A number should be used to represent the distance to the nearest 100th of a foot. If width is unknown use 999.99. Where traffic runs directly on the top slab (or wearing surface) of a culvert-type structure - e.g., an R/C box without fill - code the actual roadway width (curb-to-curb or rail-to-rail). This will also apply where the fill is minimal and headwalls or parapets affect the flow of traffic. Where the roadway is on fill carried across a structure, and the headwalls or parapets do not affect the flow of traffic, code 0.00. This is considered proper inasmuch as a filled section simply maintains the roadway cross-section. * Raised or non-mountable medians, open medians, and barrier widths are to be excluded from the summation, along with barrier-protected bicycle and equestrian lanes. **Examples:** **Width** **Value** 1.00' wide 1.00 36.00' wide 36.00 66.37' wide 66.37 110.13' wide 110.13 Unknown 999.99 **Field Name: HEIGHT** √ Type: N Width: 6 Decimals: 2 **Attribute:** For bridges this represents the minimum height/clearance over the

roadway. For culverts this represents the height of the culvert (or diameter for round culverts). **Note:** *The WIDTH and HEIGHT fields should have the same value for round culverts.*
Source: Inspector
Content: The information to be recorded for this item is the actual minimum vertical clearance over the bridge roadway, including shoulders, to any superstructure restriction, rounded down to the nearest inch.* When no superstructure restriction exists above the bridge roadway, code 9999.99. When a restriction is 100 feet or greater, code 912.99. A number should be used to represent the distance to the nearest 100th of a foot.

* For culverts record the height from the bottom to the top of the culvert.

Examples:

Height/Clearance	Value
1.00' high	1.00
0.50' high	0.50
66.37' high	66.37
110.13' high	110.13
No restriction / Unknown	999.99
115'-6"	912.99

Field Name: **UCLEARREF** (optional) Type: C Width: 1 Decimals: 0

Attribute: Clearance reference feature. *Used in combination with UCLEARANCE.*
Source: Inspector
Content: These specifications are consistent with standards specified in *VTrans' Bridge Inspection Manual.* This field uses a 1-digit code to flag the reference feature reference feature from which the clearance measurement is taken:

Code	Description
H	Highway beneath structure
R	Railroad beneath structure
N	Feature not a highway or railroad

Field Name: **UCLEARANCE** (optional) Type: N Width: 5 Decimals: 2

Attribute: Clearance beneath the bridge roadway. *For bridge structures only.*
Source: Inspector
Content: These specifications are consistent with standards specified in *VTrans' Bridge Inspection Manual.* Using a 4-digit number, record and code the minimum vertical clearance from the roadway or railroad track beneath

the structure to the underside of the superstructure. (When both a railroad and highway are under the structure, code the most critical dimension.).

Code a 4-digit number to represent the minimum vertical clearance from that feature to the structure (coded to the nearest 100th of a foot). If the feature is not a highway or railroad, code the minimum vertical clearance 0.00. Use 99.99 if clearance is unknown.

Examples:	**Value**
River beneath structure	0.00
Railroad beneath structure (17'-3")	17.25
Unknown	99.99

Field Name: **WLIMIT** (optional) Type: N Width: 4 Decimals: 1

Attribute: Posted weight limit
Source: Inspector
Content: Posted wight limit to the nearest tenth of a ton. Based on *VTrans Bridge Inspection Manual* codes (except for the fact that the field is defined as character in the BIS but numeric here...which makes it easier to perform summary operations).

Examples:	**Weight Limit**	**Value**
	1.1 tons	1.1
	3 tons	3.0
	Unknown	99.9

Field Name: **CDEPTH** √ (optional) Type: N Width:5 Decimals: 2

Attribute: Depth of culvert. *For use with culverts only!*
Source: Inspector
Content: Depth of culvert to the nearest 100th of a foot. Use 99.99 if depth is unknown. Culvert depth is measured from the road grade to the bottom of the culvert.

Examples:	**Culvert Depth**	**Value**
	1' 3" deep	1.25
	3' deep	3.0
	Unknown	99.99

Field Name: **BCONDITION** √ Type: C Width: 1 Decimals: 0

Attribute: Overall condition of bridge.
Source: Inspector

Content: The following codes will be used (based on *VTrans Bridge Inspection Manual* codes).

Code	Description
X	Unknown
N	NOT APPLICABLE. Use if structure is not a bridge.
9	EXCELLENT CONDITION
8	VERY GOOD CONDITION - no problems noted
7	GOOD CONDITION - some minor problems
6	SATISFACTORY CONDITION - structural elements show some minor deterioration
5	FAIR CONDITION - all primary structural elements are sound, but may have minor section loss, cracking, spalling or scour
4	POOR CONDITION - advanced section loss, deterioration, spalling or scour
3	SERIOUS CONDITION - loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present
2	CRITICAL CONDITION - advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present, or scour may have removed substructure support. Unless closely monitored, it may be necessary to close the bridge until corrective action is taken
1	"IMMINENT FAILURE" CONDITION" - major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but, with corrective action, may be put back in light service
0	FAILED CONDITION - out of service - beyond corrective action

Field Name: **CCONDITION** √ Type: C Width: 1 Decimals: 0

Attribute: Overall condition of culvert.

Source: Inspector

Content: The following codes will be used (based on *VTrans Bridge Inspection Manual* codes).

Code	Description
X	Unknown
N	NOT APPLICABLE. Use if structure is not a culvert.
9	EXCELLENT CONDITION
8	VERY GOOD CONDITION. No noticeable or noteworthy deficiencies which affect the condition of the culvert. Insignificant scrape marks caused by drift.
7	GOOD CONDITION. Shrinkage cracks, light scaling, and insignif-

		icant spalling which does not expose reinforcing steel. Insignificant damage caused by drift with no misalignment and not requiring corrective action. Some minor scouring has occurred near curtain walls, wingwalls, or pipes. Metal culverts have a smooth symmetrical curvature with superficial corrosion and no pitting. 6 SATISFACTORY CONDITION. Deterioration or initial disintegration, minor chloride contamination, cracking with some leaching, or spalls on concrete or masonry walls and slabs. Local minor scouring at curtain walls, wingwalls, or pipes. Metal culverts have a smooth curvature, non-symmetrical shape, significant corrosion or moderate pitting. 5 FAIR CONDITION. Moderate to major deterioration or disintegration, extensive cracking and leaching, or spalls on concrete or masonry walls and slabs. Minor settlement or misalignment. Noticeable scouring or erosion at curtain walls, wingwalls, or pipes. Metal culverts have significant distortion and deflection in one section, significant corrosion or deep pitting. 4 POOR CONDITION. Large spalls, heavy scaling, wide cracks, considerable efflorescence, or opened construction joint permitting loss of backfill. Considerable settlement or misalignment. Considerable scouring or erosion at curtain walls, wingwalls, or pipes. Metal culverts have significant distortion and deflection throughout, extensive corrosion or deep pitting. 3 CRITICAL CONDITION. Any condition described in Code 4 but which is excessive in scope. Severe movement or differential settlement of the segments, or loss of fill. Holes may exist in walls or slabs. Integral wingwalls nearly severed from culvert. Severe scour or erosion at curtain walls, wingwalls or pipes. Metal culverts have extreme distortion and deflection in one section, extensive corrosion, or deep pitting with scattered perforations. 2 "IMMINENT FAILURE" CONDITION. Integral wingwalls collapsed, severe settlement of roadway due to loss of fill. Section of culvert may have failed and can no longer support embankment. Complete undermining at curtain walls and pipes. Corrective action required to maintain traffic. Metal culverts have extreme distortion and deflection throughout with extensive perforations due to corrosion. 1 Closed. Corrective action may put it back in light service. 0 Closed. Replacement necessary. **Field Name:** **PCTOPEN** (optional) Type: N Width: 3 Decimals: 0 **Attribute:** Percentage of culvert that is open. *For culvert structures only.* **Source:** Inspector **Content:** The inches remaining open divided by the height of the culvert.

(Then, multiply by one hundred to obtain percentage.) Use -99 if unknown .

Field Name: **CFLOWANGLE** (optional) Type: I Width: 3 Decimals: 0
Attribute: Angle of culvert (from true north) relative to flow direction (based on a compass bearing). Declination must be factored in when taking a bearing (which is standard practice). **Note:** *This field applies to culverts only.*
Source: Inspector
Content: This item specifies the angle of the culvert (from true north) relative to flow direction (based on a compass bearing). Declination must be factored in when taking a bearing (which is standard practice). The measurement should be taken by placing a marker at the outflow point of the culvert, then walking to the inflow point and taking a bearing.

Field Name: **IMPORTANCE** (optional) Type: N Width: 1 Decimals: 0
Attribute: Used to represent how critical the function of the structure is to the road section.
Source: Inspector
Content: The following codes will be used:

0	Unknown
1	Critical to road function
2	Very Important to road function
3	Somewhat Important to road function
4	Not important to road function
5	Un-necessary

Field Name: **YR_BUILT** √ (optional) Type: N Width: 4 Decimals: 0
Attribute: Year structure was built
Source: Inspector
Content: Year structure was built

Field Name: **ORIGCOST** √ (optional) Type: N Width: 8 Decimals: 0
Attribute: Original cost to build structure.
Source: Inspector
Content: Original cost to build structure to the nearest dollar. Use -9999999 if unknown.

Field Name: **CURNTVALUE** √ (optional) Type: N Width: 8 Decimals: 0
Attribute: Current value of structure.
Source: Inspector

		Content: Current value of structure to the nearest dollar. Use -9999999 if unknown. **Field Name:** **REPAIRCOST** √ (optional) Type: N Width: 8 Decimals: 0 **Attribute:** Cost estimate to improve/repair structure. **Source:** Inspector **Content:** Cost estimate to improve/repair structure to the nearest dollar. Use -9999999 if unknown. **Field Name:** **REPLCCOST** √ (optional) Type: N Width: 8 Decimals: 0 **Attribute:** Cost estimate to replace structure. **Source:** Inspector **Content:** Cost estimate to replace structure to the nearest dollar. Use -9999999 if unknown. **Field Name:** **YR_REPAIR** (optional) Type: N Width: 4 Decimals: 0 **Attribute:** Year last major improvement/repair/replacement **Source:** Inspector **Content:** Year last major repair **Field Name:** **COMMENTS** (optional) Type: C Width: 255 Decimals: 0 **Attribute:** Comments **Source:** Inspector **Content:** Comments. For example make note that the culvert needs cleaning ("CLEANING).