Appendix VI

Output Data Description

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This appendix contains a description of all output variables that apply to any cross section. Many of these variables can be selected for summary printout display.

Variable	Description
ACH	Cross section area of the channel.
ACULV	Gross area of culvert.
AEX	Area of channel improvement excavation in square feet at cross section.
ALOB	Cross section area of the left overbank.
ALPHA	Velocity head coefficient.
AREA	Cross section area.
AROB	Cross section area of the right overbank.
ASQ	The assumed **split flow** value used to compute the water surface elevation.
AV DEPTH	The average depth of flow for the normal depth section based on the total area divided by the water surface topwidth (split flow option).
AVG VELOCITY	The average velocity of the normal depth overflow reach (split flow option).
B	Stream width, used for ice stability analysis.
BANK ELEV LEFT/RIGHT	Left and right bank elevations.
BAREA	Net area of the bridge opening below the low chord. Entered on SB record.
B-S N	Value of composite Manning's 'n' for ice covered stream computed by Belokon-Sabaneev formula.
BW	The bottom width of the trapezoidal excavation.
C	Chezy's roughness coefficient, used in ice stability equation.

Variable	Description
CASE	A variable indicating how the water surface elevation was computed. Values of -1, -2, -3, and 0 indicate assumptions of critical depth, minimum difference, a fixed change (X5 record), or a balance between the computed and assumed water surface elevations, respectively.
CCHV	Contraction coefficient.
CEHV	Expansion coefficient.
CHRT	Chart number for FHWA culvert nomographs
CHSLOP	Channel slope.
CLASS	Identification number for following types of bridge/culvert flow.

Class	Type of Flow
1	Low Flow - Class A
2	Low Flow - Class B
3	Low Flow - Class C
6	Culvert Analysis, Inlet Control
7	Culvert Analysis, Outlet Control
10	Pressure Flow Alone
11,15	Weir and Low Flow - Class A
12	Weir and Low Flow - Class B
13	Weir and Low Flow - Class C
16	Culvert Analysis, Weir Flow & Inlet Control
17	Culvert Analysis, Weir Flow & Outlet Control
30	Pressure Flow and Weir Flow
59	Special Bridge Reverts to Normal Bridge Method
67	For Encroachment Methods 3 through 6

CLSTA	The centerline station of the trapezoidal excavation.
CORAR	Area of the bridge deck subtracted from the total cross sectional area in the normal bridge method.
CRIWS	Critical water surface elevation.
CULVLN	Length of culvert barrel.
CUMDS	Cumulative channel distance from first cross section. (Units are based on J1.6 and J6.4 input).
CUNO	Number of identical culverts.
CUNV	Manning's 'n' value for culvert barrel.
CWSEL	Computed water surface elevation.
DEPTH	Depth of flow.

Variable	Description
DIFEG	Difference in energy elevation for each profile.
DIFKWS	Difference in water surface elevation between known and computed.
DIFWSP	Difference in water surface elevation for each profile.
DIFWSX	Difference in water surface elevation between sections.
DSSNO	The downstream section number where the **split flow** reach begins.
DSWS	The computed downstream water surface elevation (split flow option).
EG	Energy gradient elevation for a cross section which is equal to the computed water surface elevation CWSEL plus the velocity head HV.
EGIC	Energy grade elevation for inlet control when using culvert analysis option
EGLWC	The energy grade line elevation computed assuming low flow.
EGOC	Energy grade elevation for outlet control when using culvert analysis option.
EGPRS	The energy grade line elevation computed assuming pressure flow.
ELENCL	Elevation of left encroachment.
ELENCR	Elevation of right encroachment.
ELLC	Elevation of the bridge low chord. Equals ELLC entered on the X2 record if used, otherwise it equals maximum low chord in the BT table.
ELMIN	Minimum elevation in the cross section.
ELTRD	Elevation of the top of roadway. Equals ELTRD entered on the X2 record if used, otherwise it equals the minimum top of the road in the BT table.
ENDST	Ending station where the water surface intersects the ground on the right side.
ENTLC	Entrance loss coefficient for culvert analysis.
ERRAC	The percent error between the assumed discharge and computed discharge using the **split flow** option.
FRCH	Channel Froude number for uniform conditions.
H	Hydraulic radius, used in ice stability equation.
H3	Drop in water surface elevation from upstream to downstream sides of the bridge computed using Yarnell's equation assuming Class A low flow.
H4	Drop in energy elevation from upstream to downstream using culvert analysis option.

Variable	Description
HL	Energy loss due to friction for standard-step solutions. For all others it is the change in energy elevation.
HV	Discharge-weighted velocity head for a cross section.
IDC	Number of trials required to determine critical depth.
ICE N	Manning's 'n' value for floating ice entered on IC record.
ICONT	Number of trails to determine the water surface elevation by the slope area method, or the number of trials to balance the energy gradient by the special bridge method, or the number of trials required to calculate encroachment stations by encroachment methods 5 and 6.
IHLEQ	Friction loss equation index.
ITRIAL	Number of trials required to balance the assumed and computed water surface elevations.
K*CHSL	Channel bed slope (times 1,000).
KRATIO	Ratio of the upstream to downstream conveyance.
L-BANK ELEV	Elevation of left bank station.
MAX DEPTH	The maximum depth that occurs on the normal depth overflow section (split flow option).
NICE	Manning's 'n' for underside of ice cover.
NITER	The number of iterations executed to compute split flow discharge.
OLOSS	Energy loss due to minor losses such as transition losses.
PCWSE	Previous computed water surface elevation.
PERENC	The target of encroachment requested on the ET record.
POWER	Channel stream power (lb/(ft*s) or N/(m*s)).
Q	Total flow in the cross section.
QCH	Amount of flow in channel.
QCHP	Percent of flow in the channel.
QCOMP	The computed **split flow** value based on the computed water surface elevation.
QCULV	Flow through culvert, using culvert analysis option.
QLOB	Amount of flow in the left overbank.

Variable	Description
QLOBP	Percent of flow in the left overbank.
QLOW	Low flow at bridge, special bridge analysis. Pressure flow at the bridge, special bridge analysis.
QPR	Total pressure of low flow at the bridge.
QROB	Amount of flow in the right overbank.
QROBP	Percent of flow in the right overbank.
QWEIR	Total weir flow at the bridge.
R-BANK ELEV	Elevation of right bank station.
RBEL	Right bank elevation.
RISE	Height of box culvert or diameter of pipe culvert.
SCL	Scale number for FHWA culvert nomographs.
SECNO	Identifying cross section number. Equal to the number in the first field of the X1 record.
SHEAR	Boundary shear stress within channel (lb/ft^2 or N/m^2).
SLOPE	Slope of the energy grade line for the current section.
SPAN	Width of box culvert.
SPGR	Specific gravity of floating ice. Entered on IC record.
SSTA	Starting station where the water surface intersects the ground on the left side of the cross section.
STENCL	The station of the left encroachment.
STENCR	The station of the right encroachment.
STCHL	Station of the left bank.
STCHR	Station of the right bank.
TABER	Percent of error between the total assumed **split flow** and total computed **split flow**.
TASQ	The total assumed **split flow** for the entire stream.
TCQ	The total computed **split flow** for the entire stream.
TELMX	Elevation of the lower of the end points of the cross section.

Variable	Description
T/H (TH1)	Ratio of channel ice thickness and hydraulic radius, used in ice stability equation.
TIME	Travel time from the first cross section to the current cross section in hours.
TOF WIDTH	The width of the normal depth over flow section (split flow option).
TOP WIDTH	The width of the overflow section based on the computed water surface (split flow option).
TOPWID	Width at the calculated water surface elevation.
TOTAL AREA	The total cross sectional area for a normal depth overflow reach (split flow option).
TRAPEZOID AREA	Net area of the bridge opening up to the low chord as defined by SS, BWP and BWC on the SB record. Should be close to BAREA on the SB record.
TVOLI	Total volume of ice in channel and overbanks.
TWA	Cumulative surface area (acres or 1000 square meters) of the stream (floodplain) from the first cross section.
USSNO	The upstream section number where the **split flow** reach ends.
USWS	The computed upstream water surface elevation (split flow option).
VCH	Mean velocity in the channel.
VEXR	Volume of channel improvement excavation in thousands of cubic yards in a reach (between two adjacent cross sections).
VEXT	Cumulative volume of channel improvement excavation in thousands of cubic yards up to the current cross section.
VLOB	Mean velocity in the left overbank.
VOL	Cumulative volume (acre-feet or 1000 cubic meters) of water in the stream from the first cross section.
VOLICH	Cumulative volume of ice in channel.
VOLIL	Cumulative volume of ice in left overbank.
VOLIR	Cumulative volume of ice in right overbank.
VROB	Mean velocity in the right overbank.
WEIRLN	Length of roadway for weir flow computations, defined by "BT" data and energy grade elevation.

Variable	Description
WSELK	Known water surface elevation; for example, a high water mark.
WTN	Length weighted value of Manning's 'n' for the channel. Used when computing Manning's 'n' from high water marks.
X*K	Pariset's ice stability indicator (times 1000).
XFCH1	Froude number for ice stability analysis.
XICE1	Computed ice stability factor (Pariset' X).
XLBEL	Left bank elevation.
XLCH	Distance in the channel between the previous cross section and the current cross section.
XLOBL	Distance in the left overbank between the previous cross section and the current cross section.
XLOBR	Distance in the right overbank between the previous cross section and the current cross section.
XNCH	Manning's 'n' for the channel area.
XNL	Manning's 'n' for the left overbank area.
XNR	Manning's 'n' for the right overbank area.
XSTAB1	Maximum ice stability factor X, for stable ice cover, from Pariset's ice stability function.
ZINCH	Composite 'n' value for ice covered channel computed with Belokon-Sabaneev formula.
ZITL	Ice thickness in left overbank.
ZITR	Ice thickness in right overbank.
ZITCH	Ice thickness in channel.
.01K	The total discharge (index Q) computed assuming $S^{1/2} = .01$.
10*KS	Slope of energy grade line (times 10,000).