

**LEVEL B HYDRAULIC ANALYSIS FIELD FORM (3/18/2019)**

<sup>1</sup>Site ID \_\_\_\_\_

<sup>2</sup>Culvert Number \_\_\_\_\_

<sup>5</sup>Datum Elevation \_\_\_\_\_

<sup>6</sup>Datum Location \_\_\_\_\_

<sup>3</sup> Crew _____
<sup>4</sup> Date _____

**<sup>7</sup>CULVERT MEASUREMENTS**

	IH	RH	VD +/-	ELEV
Upstream Invert				
Upstream Culvert Bed				
Downstream Invert				
Downstream Culvert Bed				

IH = Instrument Height; RH = Rod Height; VD = Vertical Distance (for equipment that measures incline); ELEV = Elevation (relative to Datum Elevation). Formulas on reverse side.

<sup>8</sup>Culvert Roughness    concrete    smooth    paved invert  
 corrugation:    0.5" x 2.67"    1" x 3"    2" x 6"    other \_\_\_\_\_

<sup>9</sup>Sediment Through Length of Pipe?    yes    no    unknown

**<sup>10</sup>DOWNSTREAM CONTROL CROSS-SECTION**

	STA	IH	RH	VD +/-	ELEV	DEP	WSE	SUB
Top LB	0.00							
Toe LB								
Bed 1								
Bed 2								
Bed 3								
Toe RB								
Top RB								

<sup>10</sup>Avg. WSE \_\_\_\_\_

STA = Station; DEP = Water Depth; WSE = Water Surface Elevation; SUB = Dominant Substrate (F = Fines, C = Gravels/Cobbles/Bedrock, B = Boulders, W = Wood)

	IH	RH	VD +/-	WSE
<sup>12</sup> Water Surface Downstream of X-Section;				

<sup>13</sup>Distance from X-section \_\_\_\_\_

## LEVEL B FORMULAS

### Formulas for Determining Instrument Height (IH)

For survey equipment that measures incline:

if VD is positive:  $IH = \text{Datum Elevation} + RH - VD$

if VD is negative:  $IH = \text{Datum Elevation} + RH + |VD|$

\*\*\* | | Denotes absolute value

For Auto Level:  $IH = \text{Datum Elevation} + RH$

### Formulas for Calculating Elevations

For survey equipment that measures incline:

if VD is positive:  $ELEV = IH - (RH - VD)$

\*\*\* Do math in parentheses first

if VD is negative:  $ELEV = IH - RH - |VD|$

\*\*\* | | Denotes absolute value

For Auto Level:  $ELEV = IH - RH$

## LEVEL B FORM INSTRUCTIONS

- 1) Database unique identifier
- 2) Culvert Number: if 1 culvert at: 1.1; if 2 then 1.2 or 2.2, etc.
- 3) Last name(s) of field review team responsible for data
- 4) Field review date: MM/DD/YYYY format
- 5) Elevation assigned to datum
- 6) Location of datum
- 7) Data used to calculate relative elevations at culvert inlet and outlet
- 8) Corrugation dimensions in inches, measured valley to peak x peak to peak. If the corrugations at the culvert invert are completely covered with asphalt or concrete, select 'paved invert'.
- 9) Does bed material cover the low-flow channel throughout the entire length of the culvert (i.e., no missing substrate or exposed corrugation)?
- 10) The downstream control is usually the head of the first riffle downstream of the culvert. Start at the top of the left bank (facing downstream) and measure 7 elevations to the top of the right bank (measure to the nearest 0.01 meters) to describe the cross sectional profile of the stream. The station is the distance read from measuring tape from the top of left bank to top of right bank.
- 11) Average of the Water Surface Elevations calculated at only those points in the downstream control that have a water depth recorded in the DEP column.
- 12) Water surface elevation downstream of the control to the nearest 0.01 meter
- 13) Distance downstream of the control that the water surface elevation was measured.