

TURBULENCE CHARACTERISTICS OF FLOW IN A FULL-SCALE SPIRAL  
CORRUGATED CULVERT FITTED WITH SLOPED- AND  
SLOTTED-WEIR BAFFLES

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To the Faculty of Washington State University:

The members of the Committee appointed to examine the thesis of RYAN  
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Chair

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Abstract

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Baffles are often used to retrofit culverts to aid in the upstream passage of fish in spite of a lack of research regarding the effect baffles have on the turbulent structure of flow through culverts. The purpose of this experimental investigation was to examine the turbulent flow structure inside a full-scale spiral corrugated culvert fitted with sloped- and slotted-weir baffles. This purpose was accomplished through three objectives:

- Objective 1: Compare the turbulence heterogeneity created by sloped-weir and slotted-weir baffles.
- Objective 2: Compare turbulence parameters to available data for non-baffled culverts.
- Objective 3: Compare turbulent kinetic energy values in a culvert fitted with sloped-weir and slotted-weir baffles to energy dissipation factor calculations suggested by various state fish passage design manuals.

The objectives were completed through the collection of velocity measurements in a 1.83 m diameter, 12.2 m long corrugated metal culvert fitted with sloped- and slotted-weir baffles. Three baffles were spaced 4.57 m apart with the central baffle located 6.71 m from the culvert

inlet. Measurements were collected at six cross sections using a Sontek Micro-acoustic Doppler velocimeter (MicroADV) for flow rates of 0.043, 0.085, 0.113, and 0.198 m<sup>3</sup>/s and culvert slopes of 1.14, 3.00, and 4.33%.

The results show there are only minor differences in the turbulent flow structure created by each baffle type. The most significant differences included higher lateral turbulent intensity (TI<sub>l</sub>) values on the edges of the jet created by the slotted-weir baffles, and higher turbulent kinetic energy (TKE) values on the left side of the culvert (looking downstream) caused by the sloped-weir baffles. At 4.32 m downstream from a slotted-weir baffle, a reduced velocity zone (RVZ) was produced on the left side of the flow that contained streamwise velocities 36% of the velocities in the center of the culvert, similar to the RVZ produced in a bare culvert. Streamwise turbulent intensities also were reduced in this area. The sloped-weir baffles produced a less noticeable RVZ on the right side of the flow. This study was limited by the inability of the MicroADV to collect data in highly aerated flow conditions that exist downstream from baffles and near the culvert edge.

The results also indicate that the use of the energy dissipation factor (EDF) equation does not adequately describe the energy contained in turbulent flow downstream from a baffle. The TKE produced by water plunging over a baffle was nearly 100 times greater than that predicted by the EDF equation. Furthermore, there were no correlations found between the measured TKE values and the predicted EDF values.

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## INTRODUCTION

Culverts have traditionally been used to pass a wide range of flows safely underneath roadways or other structures. While this use of culverts has been effective in ensuring the safety of the general public, it has often neglected to provide ecological continuity for aquatic organisms living in the waterway. Specifically, excessive velocities and inadequate depths can block fish migration and disrupt fish spawning and feeding habits (Baker and Votapka 1990).

Maximum velocity has conventionally been used as the limiting condition for fish passage through culverts, but recent studies show that the turbulence characteristics of a flow may influence fish passage more than velocity (Smith et al. 2005). Since the replacement of culverts can be expensive, they are often retrofitted with baffles to help decrease velocities and increase water depths. Ead et al. (2000) examined velocity distributions in bare culverts and Richmond et al. (2006) examined turbulence intensities inside bare culverts, but no studies exist showing turbulence characteristics inside culverts retrofitted with baffles (Papanicolaou and Talebbeydokhti 2002). Furthermore, in order to limit turbulence in retrofitted culverts, some states agencies require calculation of the energy-dissipation factor (EDF) downstream from a baffle in the culvert (WDFW 2003); unfortunately it is not known how well the EDF calculations represent the turbulent kinetic energy downstream from a baffle.

The objectives of this experimental investigation were to:

- (1) Compare the turbulence heterogeneity created by sloped-weir and slotted-weir baffles.
- (2) Compare turbulence parameters to available data for non-baffled culverts.

- (3) Compare turbulent kinetic energy values downstream from sloped-weir baffles and slotted-weir baffles to EDF calculations suggested by various state fish passage design manuals.

## RELEVANT RESEARCH

To aid in the design of fish-passable culverts, extensive research has been conducted to describe the general flow characteristics inside a culvert fitted with baffles. Rajaratnam et al. (1988) developed an equation to describe the dimensionless discharge through a culvert fitted with baffles:

$$Q_* = \frac{Q}{\sqrt{gS_0 D^5}} = f\left(\frac{y_0}{D}\right) \quad (1)$$

where  $Q_*$  is the dimensionless discharge,  $Q$  is the discharge,  $g$  is acceleration due to gravity,  $S_0$  is the culvert slope,  $D$  is the culvert diameter, and  $y_0$  is the characteristic depth of flow. Equation (1) has been used to study the flow characteristics created by offset, slotted-weir, weir, and spoiler baffles inside round culverts (Rajaratnam et al. 1988, 1989, 1991; Rajaratnam and Katopodis 1990). Ead et al. (2002) further simplified the dimensionless discharge equation for design convenience:

$$Q_* = \alpha\left(\frac{y_0}{D}\right)^2 + \beta\left(\frac{y_0}{D}\right) \quad (2)$$

where  $\alpha$  and  $\beta$  are coefficients that depend of the baffle height to culvert diameter ratio. For example, for baffles with a height to culvert diameter ratio of 0.10,  $\alpha$  equals 9.39 and  $\beta$  equals -1.18.

Although the general flow field in a baffled culvert has been thoroughly studied, no information could be found regarding the turbulence distribution inside a baffled culvert.

Pearson et al. (2005) mention that turbulence conditions near the boundary layer of corrugated culverts may be important because turbulent velocity bursts could exceed the swimming ability of fish, and Papanicolaou and Talebbeydokhti (2002) comment that a three-dimensional analysis should be considered when designing culverts for fish suitability. It has been shown that fish prefer areas of high velocities and low turbulence levels over lower velocity areas with high turbulence levels (Smith et al. 2005). Therefore it is important to understand the turbulence structure of flow in a culvert fitted with baffles for fish passage design.

Turbulence is often described by calculating the turbulent intensities (TI) and turbulent kinetic energy (TKE) of the flow. Turbulence intensities can be calculated for each direction of flow:

$$TI_i = \left( \overline{u_i'^2} \right)^{1/2} \quad (3)$$

where  $u_i'$  represents the velocity fluctuation in the streamwise, transverse, or vertical directions, and the overbar represents the temporal mean (Mathieu and Scott 2000). Calculations for TI represent the degree of fluctuation around the mean velocity in a given direction, with higher numbers indicating more turbulence (Smith et al. 2005). Turbulent kinetic energy can be calculated at any location in the flow (Mathieu and Scott 2000):

$$TKE = \frac{\overline{u_i' u_i'}}{2} \quad (4)$$

The TKE represents energy that is extracted from the mean flow due to shear between the mean and fluctuating velocities (Smith et al. 2005).

Work performed by Richmond et al. (2006) gives information about the turbulence intensity inside a bare spiral corrugated culvert, and describes the formation of a reduced velocity and turbulent intensity zone on one side of the flow. The redistribution of velocity was

caused by secondary currents induced by spiral corrugations in the culvert. The streamwise velocity and turbulence intensity in the reduced velocity zone (RVZ) was approximately 36% and 60% of the velocity and turbulence intensity in the center of the culvert (Richmond et al. 2006). The Richmond et al. study was performed at the Skookumchuck Hatchery near Tenino, Washington where this experimental study was also conducted, and used similar methodologies to those outlined below.

Regulations in the states of Washington and Maine require engineers to calculate the amount of energy being dissipated downstream of a baffle using the energy-dissipation factor equation:

$$EDF = \frac{\gamma Q S}{A} \quad (5)$$

where EDF is the energy-dissipation factor,  $\gamma$  is the specific weight of water,  $Q$  is the discharge,  $S$  is the culvert slope, and  $A$  is the cross-sectional flow area between baffles (WDFW 2003). The EDF is used to quantify the rate of energy dissipation per unit volume of water from an entering flow and is manifested through turbulence (MDOT 2004). Based on observations, it is recommended that the EDF should not be greater than 250 J/m<sup>3</sup>/s for the passage of salmonids (WDFW 2003).

## **EXPERIMENTAL SETUP AND METHODOLOGY**

### General Description

Flow measurements were collected at two locations during this study. During the summer of 2005, data were collected in a full-scale culvert at the Culvert Test Bed (CTB) located at the Skookumchuck Hatchery near Tenino, WA. In the spring of 2006, additional data

were collected in a full-scale culvert in the Albrook Hydraulics Laboratory at Washington State University, Pullman, WA.

### CTB Setup

A 1.83 m diameter corrugated metal culvert was used for the study at the CTB. The culvert was 12.2 m long with six hatches cut into the top to allow access to the flow, and the culvert was set at a 1.14% slope (Fig. 1). Three sloped-weir baffles were spaced 4.6 m apart in the culvert, with the central baffle located 6.7 m from the inlet. The baffle crests were sloped at 4 degree with the high side of the baffle located on the right side of the culvert when looking downstream (Fig. 2). Flow rates of 0.043, 0.057, 0.085, 0.113 and 0.227  $\text{m}^3/\text{s}$  were tested. Data were collected at six cross sections along the length of the culvert; five cross sections were measured using a coarse grid of 23 points, and one cross section was measured using a fine grid of 39 points (Fig. 3). Table 1a gives the location of each cross section. The flow rate was measured using an Ultrameg magnetic digital flow meter. The Richmond et al. study was also performed at the CTB and used methodologies similar to this experimental investigation.

### Albrook Hydraulics Laboratory Setup

A replicate of the culvert installed at the CTB was used in the Albrook Hydraulics Laboratory at WSU, except the top of the culvert was completely removed allowing access to the flow along the entire length of the culvert (Fig. 4). Sloped-weir and slotted-weir baffles (Fig. 2) were both tested with the same spacing used at the CTB. Flow rates of 0.043, 0.085, 0.113, and 0.198  $\text{m}^3/\text{s}$  were tested for culvert slopes of 1.14, 3.00, and 4.33%. Data were collected at 3 coarse grid cross sections and 3 fine grid cross sections (Fig. 3 and Table 1b). The flow rate was measured using a magnetic digital flow meter with an uncertainty of  $\pm 0.0003 \text{ m}^3/\text{s}$ .

## Sampling Protocol

A Sontek 16 MHz Micro acoustic Doppler velocimeter (MicroADV) was used to collect velocity data at a 50 Hz sampling rate for two minutes (yielding 6000 data points). The MicroADV was mounted on a gantry system that could be moved to a specific location within 0.25 mm in any three dimensions. Two minute sampling intervals were deemed sufficient since it was a standard time used in previous experiments (Tritico and Hotchkiss 2005), and the residence time of water in the culvert was less than 60 seconds. The sampling volume of the MicroADV is located about 5 cm from the probe tip and is cylindrical with a diameter of 4.5 mm and length of 5.6 mm. According to Sontek, the instrument can measure velocities between 1 mm/s and 2.5 m/s with an accuracy of  $\pm 1\%$ . The MicroADV data was processed using WinADV (Wahl 2000). The phase-space thresholding method described by Goring and Nikora (2002) was used to filter out spikes caused by air bubbles passing through the sampling volume, and data with a signal-to-noise ratio (SNR) less than 10 dB and correlation less than 20% were filtered out. Calculations for average velocities, turbulence intensities, and turbulent kinetic energy were performed using custom FORTRAN and MATLAB codes.

## **RESULTS AND DISCUSSION**

Results from 3.00 and 4.33% slopes are not presented due to data scatter created by highly aerated flow and shallow depths. The best data were collected when the flow velocity was low and the depth was high. Consequently, measurements taken at a 1.14% culvert slope contained fewer data gaps after filtering than those taken at a 3.00% or 4.33% slope. When the flow velocity became too great, air bubbles were entrained on the probe tip creating high scatter in the data, indicated by low SNR values. At depths less than approximately 7 cm the measurable vertical area decreased and sound waves emitted from the instrument reflected off

the culvert bottom, creating erroneous data. As much as 30% of the data were often removed when the data was filtered to account for these issues. In future tests it is recommended that the baffle spacing decrease as the culvert slope increases. At a 1.14% slope the baffle spacing followed the Washington Department of Washington criteria of calculating the spacing as 0.02 divided by the culvert slope. This same spacing was used at higher slopes, deviating from the WDFW criteria. Further experiments should follow the WDFW criteria at higher slopes. Decreased baffle spacing would also improve the quality of data collected since less data would be filtered out due to erroneous data created by shallow depths and excessive velocities.

### General Flow Structure

The sloped-weir baffles produced three distinct flow features (Fig. 5a). A plunge line formed directly downstream from the baffle, extending from the high side of the baffle (right side) toward the low side (left side). On the low side of the baffle, a high velocity jet formed which became less distinct downstream. To the right of the jet and downstream from the plunge line a recirculation area formed, with the flow circulating clockwise.

The slotted-weir baffles produced a high-velocity jet in the center of the culvert. Small areas of flow directed away from the center of the culvert formed on both edges of the jet (Fig. 5b). A plunge line also occurred directly downstream from the baffle.

At flow rates less than  $0.085 \text{ m}^3/\text{s}$  directly downstream from a sloped-weir baffle ( $0.31 \text{ m}$ ), the streamwise velocity was highest on the low side of the baffle. This is most evident at a 1.14% culvert slope and is less discernable at higher slopes. At flow rates greater than  $0.085 \text{ m}^3/\text{s}$ , high streamwise velocities existed on both sides of the culvert (Figs. 6 and 7). At  $4.32 \text{ m}$  downstream from a sloped-weir baffle, the high streamwise velocities on both sides of the

culvert existed at all flow rates and slopes (Figs 6 and 7). The lateral velocity distribution shows the flow directed toward the center of the culvert after it plunges over the baffle (Fig. 7).

The slotted-weir baffles produced a jet in the center of the culvert, creating high streamwise velocities in the center of the culvert for all flow rates and culvert slopes. The jet was most noticeable directly downstream from a baffle and decreased in intensity farther downstream (Figs. 8 and 9). A RVZ was also noticeable on the left side of the culvert when using slotted-weir baffles. Lateral velocity distributions show the flow is directed away from the centerline jet (Fig. 9).

### Turbulent Kinetic Energy Distribution

The centerline TKE distributions for the sloped- and slotted-weir baffles are very similar (Fig. 10). The highest values of TKE occur directly downstream from a baffle. Farther downstream the TKE values decay to a level comparable to values recorded upstream from a baffle, and almost always remains below  $1000 \text{ cm}^2/\text{s}^2$ . The Tritico and Hotchkiss (2005) study in gravel bed rivers describe unobstructed TKE values around  $150 \text{ cm}^2/\text{s}^2$  and maximum TKE values directly downstream from boulders around  $800 \text{ cm}^2/\text{s}^2$ .

The general shape of the lateral distributions of TKE did not vary between the two baffle types. At 0.31 m downstream from a sloped-weir baffle for a 1.14% culvert slope, the lateral TKE distribution is fairly constant with a slight increase at the left side of the culvert for flow rates below  $0.198 \text{ m}^3/\text{s}$  (Fig. 11). The small increase in TKE occurs near where the flow reaches its highest velocity over the low side of the baffle. Lateral TKE distributions at culvert slopes greater than 1.14% are very scattered and do not show a pattern.

At 0.31 m downstream from a slotted-weir baffle for a 1.14% culvert slope, the lateral TKE distribution exhibits a small increase in TKE near the center and left side of the culvert for

flow rates greater than  $0.085 \text{ m}^3/\text{s}$ . For flow rates less than  $0.085 \text{ m}^3/\text{s}$  the rise in TKE in the center of the culvert is not evident (Fig. 11). For the slotted-weir baffles, lateral TKE distributions at culvert slopes greater than 1.14% are also too scattered to show a pattern 0.31 m from a baffle. Farther downstream the lateral TKE distribution becomes constant for both baffle types. For all flow rates with a culvert slope of 1.14%, the TKE values are all less than  $1000 \text{ cm}^2/\text{s}^2$ .

Centerline TKE versus dimensionless height ( $Z/h$ ) plots, where  $Z$  is the distance above the culvert bottom and  $h$  is the centerline water depth, show that 1.37 m downstream from a sloped-weir baffle with a slope of 1.14% the TKE values are constant throughout the water depth, and even increase slightly near the water surface (Fig. 12). This is contrary to TKE distributions in unobstructed open-channel flow, where the TKE decays exponentially away from the channel bed (Tritico and Hotchkiss 2005, Nezu and Nakagawa 1993). For slotted-weir baffles, the TKE values decrease slightly or remain constant near the water surface (Fig. 12). At all flow rates the slotted-weir baffles create higher centerline TKE values than the sloped-weir baffles due to the jet in the culvert center.

### Turbulent Intensity Distributions

Lateral profiles of streamwise turbulent intensity ( $TI_s$ ) for both baffle types are shown in Fig. 13. The  $TI_s$  profiles for the two baffle types are similar in shape. At 0.31 m downstream from a baffle the sloped-weir baffles produce a maximum  $TI_s$  of approximately  $35 \text{ cm/s}$ , and the slotted-weir baffles produce a maximum  $TI_s$  of approximately  $30 \text{ cm/s}$ . Farther downstream the sloped-weir baffles produced a maximum  $TI_s$  of around  $13 \text{ cm/s}$ , while the slotted-weir baffles produce a maximum  $TI_s$  of approximately  $14 \text{ cm/s}$ . It is uncertain whether the lateral  $TI_s$  profiles at 0.31 m downstream from the baffles have similar distribution shapes as the slope increases.

At 4.32 m downstream from the baffles the  $TI_s$  profiles show the same distribution shape as the culvert slope increases, but have increased  $TI_s$  values.

There were minor variations in the lateral turbulent intensity ( $TI_l$ ) profiles for the two baffle types. At 0.31 m downstream from a sloped-weir baffle, the  $TI_l$  is generally greatest near the low side of the baffle (Fig. 14), except for the flow rate  $0.198 \text{ m}^3/\text{s}$ . With slotted-weir baffles there are minimum  $TI_l$  values in the center of the culvert with increases in  $TI_l$  approximately 20 cm on either side of the culvert center (Fig. 14). It is uncertain whether the same  $TI_l$  distributions exist 0.31 m downstream from the baffles for greater than a 1.14% slope. There are almost no variations in the  $TI_l$  distributions 4.32 m downstream from the baffles (Fig. 14). Both baffle types show similar distributions, except the  $TI_l$  values for the slotted-weir baffles are slightly greater than the values for sloped-weir baffles. The distributions at 4.32 m downstream are similar for all slopes tested.

#### Comparison to Non-baffled Culvert Data

Data were compared to the Richmond et al. (2006) bare culvert study to examine changes in velocity and turbulence caused by sloped- and slotted-weir baffles. The Richmond et al. study provided comparable data for a 1.14% culvert slope and flow rates of  $0.043$  and  $0.113 \text{ m}^3/\text{s}$ .

The reduced velocity zone (RVZ) produced inside a bare culvert was noticeable 4.32 m downstream from slotted-weir baffles on the left side of the flow (Fig. 15). In a bare culvert, the velocity in the RVZ was approximately 30% of the centerline velocity, while the RVZ produced by slotted-weir baffles was 22% of the centerline velocity at a  $0.113 \text{ m}^3/\text{s}$  flow rate. For a flow rate of  $0.043 \text{ m}^3/\text{s}$ , both percentages were approximately 50%. With sloped-weir baffles, a smaller RVZ existed on the right side of the culvert, corresponding to the high side of the baffle (Fig 15). The velocity in the RVZ for the sloped-weir baffle was 49% of the centerline velocity

at  $0.113 \text{ m}^3/\text{s}$  and 50% at  $0.043 \text{ m}^3/\text{s}$ . The streamwise velocity magnitudes in a bare culvert are greater than the velocity magnitudes in a baffled culvert. This was expected since the flow area increased as water backed-up behind baffles.

The lateral  $\text{TI}_s$  profiles for a bare culvert also show an area of lower values on the left side of the flow (Fig. 15). In a bare culvert, the  $\text{TI}_s$  on the left side of the flow was approximately 66% of the centerline  $\text{TI}_s$  at  $0.113 \text{ m}^3/\text{s}$  and 67% at  $0.043 \text{ m}^3/\text{s}$ . At 4.32 m downstream from a slotted-weir baffle, the  $\text{TI}_s$  on the left side was 79% of the centerline  $\text{TI}_s$  at  $0.113 \text{ m}^3/\text{s}$  and 63% at  $0.043 \text{ m}^3/\text{s}$ . The flow downstream from a sloped-weir baffle had reduced  $\text{TI}_s$  values near the center of the culvert, but did not exhibit a reduced  $\text{TI}_s$  area on any particular side of the flow (Fig. 15).

At 0.31 m downstream from a slotted-weir baffle a more noticeable RVZ exists on the left side of the culvert. The velocity in the RVZ was an average 10% of the streamwise velocity in the center of the culvert for flow rates  $0.043$  and  $0.113 \text{ m}^3/\text{s}$ . There was not a reduced  $\text{TI}_s$  at the same location downstream from a slotted-weir baffle. A RVZ or reduction in  $\text{TI}_s$  did not exist 0.31 m downstream from a sloped-weir baffle.

### Energy-dissipation Factor and TKE Comparison

According to the Washington Department of Fish and Wildlife (2003), “in order to maintain a desired velocity in a stream whose flow is too rapid, energy must be dissipated. Energy of falling water is dissipated by turbulence.” The states of Washington and Maine calculate EDF to quantify how much energy is dissipated by turbulence. Therefore, there should be a direct correlation between the predicted dissipated energy (EDF) and the TKE of the flow calculable from collected data. This study examined the effectiveness of the EDF equation (5) to accurately account for the energy in the flow represented by TKE.

Values of TKE can be compared to EDF by taking the square root of the TKE values and multiplying by the specific weight of water ( $\gamma$ ). Data from cross section 3 in the Albrook Hydraulics Laboratory setup (0.31 m downstream from a baffle) were used to compare EDF values because a plunge line at this location created the greatest energy dissipation. The recommended maximum EDF value allowed for successful salmonid passage is 250 J/m<sup>3</sup>/s. When comparing predicted values of EDF both for sloped-weir baffles and slotted-weir baffles using equation (5) to values obtained from collected data, it was found that experimental EDF values were much greater than the equation predicts (Fig. 16). For both baffle types and all culvert slopes, experimental EDF values were nearly 100 times greater than predicted values. The predicted EDF values increased as the culvert slope increased, and also slightly increased as the flow rate increased.

Since dissipated energy is revealed through the generation of TKE, there should be a correlation between EDF and TKE. It is expected that an increase in EDF would also produce an increase in TKE. However, a linear correlation could not be found between predicted EDF values and experimentally determined TKE values (Fig. 17). At a 1.14% slope using slotted-weir baffles there appeared to be a linear relationship between predicted EDF and experimental TKE values, but this correlation did not exist when the slope was increased.

The EDF equation failed to predict the amount of energy downstream from a baffle because the derivation of the equation assumes uniform flow. By assuming uniform flow the equation is also assuming the head loss in the culvert, represented by the slope of the energy grade line, is equal to the culvert slope. The flow inside a culvert fitted with baffles can be considered rapidly varied with an energy grade line slope greater than the culvert slope.

The increase in the energy dissipated downstream from a baffle can be accounted for by adjusting the slope variable,  $S$ , to represent a steepened energy grade line. For sloped-weir baffles the  $S$  can be multiplied by an adjustment coefficient equal to 27, and for the slotted-weir baffles an adjustment coefficient equal to 18. These coefficients represent the ratio of the energy grade line slope in a bare culvert to the energy grade line slope in a baffled culvert.

At a culvert slope of 1.14%, the predicted EDF values were less than the recommended maximum of  $250 \text{ J/m}^3/\text{s}$  for both baffle types. At a 3.00% slope with sloped-weir baffles, the predicted EDF values all exceeded (maximum  $426 \text{ J/m}^3/\text{s}$ ) the recommended value except during the lowest flow rate of  $0.043 \text{ m}^3/\text{s}$ . For a 3.00% culvert slope with slotted-weir baffles, the recommended EDF was exceeded for all flow rates, and a maximum value of  $589 \text{ J/m}^3/\text{s}$  was reached. All the predicted EDF values exceeded the recommended value at a 4.33% slope with both baffle types, with a maximum of  $772 \text{ J/m}^3/\text{s}$  for sloped-weir baffles and  $859 \text{ J/m}^3/\text{s}$  for slotted-weir baffles. The slotted-weir baffles generally produced greater EDF values than the sloped-weir baffles. This was likely due to the added shear zone produced on the edges of the high velocity jet emitted from the central slot in the baffle.

## SUMMARY AND IMPLICATIONS

The first objective of this research was to compare the turbulent heterogeneity produced by sloped- and slotted-weir baffles. Results reveal only minor differences in the turbulent heterogeneity for the two baffle types. The differences in the turbulent heterogeneity are due to the differences in the general flow structure created by each baffle. For all flow rates below  $0.198 \text{ m}^3/\text{s}$ , the lateral TKE distribution for the sloped-weir baffles showed a slight increase in TKE on the low (left) side of the baffle. The increase in TKE is due to an increase in shear stress between the high streamwise velocity region on the low side of the baffle and the slower moving

water in the center of the culvert. The increase in TKE and  $TI_l$  near the center of the culvert with slotted-weir baffles is caused by strong lateral velocities away from the central jet. The strong lateral velocities produced spikes in  $TI_l$  approximately 20 cm away from the culvert center, as well as slight increases in TKE near the center of the culvert for flow rates less than  $0.198 \text{ m}^3/\text{s}$ .

The effects of the general flow structure were not noticeable 4.32 m downstream from a baffle, thus there were almost no variations in turbulence parameters between the two baffle types at this location. The centerline TKE values returned to levels recorded upstream of the previous baffle, and lateral TKE distributions did not vary.

Unobstructed open-channel flow produces a TKE distribution that exponentially decays away from the channel bed (Tritico and Hotchkiss 2005, Nezu and Nakagawa 1993). As seen in this study, the introduction of baffles in a culvert does not fit the criteria of unobstructed flow, and the TKE does not exponentially decay away from the bed. The centerline TKE values remain constant throughout the water column for most experiments in this study.

Although the turbulent flow structures created by each baffle were similar, there were major differences in the downstream velocity distributions. Because it was found that the turbulence downstream from each baffle type were similar, more information could be gathered about the general flow structure by more closely examining mean velocity distributions rather than turbulence parameters. Furthermore, if creating turbulence heterogeneity is a function of baffles in culverts, more work needs to be done to find a baffle shape that creates more turbulence than those examined in these experiments.

The second objective was to compare velocity and turbulent data to the Richmond et al. (2006) bare culvert study. The extent of the evaluation was limited by the amount of comparable data in the Richmond et al. study. The RVZ produced inside a bare culvert on the left side of the

flow was also produced 0.31 and 4.32 m downstream of a slotted-weir baffle for a slope of 1.14% and flow rates of 0.043 and 0.113 m<sup>3</sup>/s. In a bare culvert and one with slotted-weir baffles (4.32 m downstream) the streamwise velocity in the RVZ was approximately 36% of the velocity in the center region of the flow. At 0.31 m downstream from a slotted-weir baffle, the velocity in the RVZ was approximately 10% of the center region velocity. A RVZ was produced with sloped-weir baffles on the right side of the flow 4.32 m downstream, corresponding to the high side of the baffle. This RVZ contained a velocity approximately 50% of the velocity in the center region of the flow.

In a bare culvert and one with slotted-weir baffles, an area of reduced TI<sub>s</sub> was produced on the left side of the flow. The TI<sub>s</sub> in this area was approximately 67% of the TI<sub>s</sub> in the center of a bare culvert, and 71% of the TI<sub>s</sub> in the center of a culvert with slotted-weir baffles. The sloped-weir baffles did not create an area of reduced TI<sub>s</sub> on a particular side of the flow.

The RVZ and reduced TI<sub>s</sub> reported by Richmond et al. (2006) has been utilized by juvenile salmon during upstream passage through culverts. The addition of slotted-weir baffles does not create a more extreme RVZ when compared to center-of-culvert velocities 4.32 m downstream from a baffle; however, the RVZ was more extreme 0.31 m downstream. Velocities downstream of slotted-weir baffles were less than those in a bare culvert at comparable slopes and discharges. The RVZ created by slotted-weir baffles could be utilized more by juvenile salmon since overall velocities are less than in a bare culvert, and are especially important near the baffle where velocities are high in the center of the culvert.

The third objective was to compare TKE values in the culvert fitted with sloped- and slotted-weir baffles to EDF calculations suggested by various state fish passage design manuals. Results show that calculations from the EDF equation used by state agencies do not agree with

TKE values downstream from a baffle. Since dissipated energy should take the form of generated turbulence kinetic energy, there should be a correlation between EDF and TKE values; however, experimental values were nearly 100 times greater than predicted values. The EDF equation underestimates how much energy is contained in turbulent flow below a baffle and should be used for fish passage design with caution. The increase in the energy dissipated downstream from a baffle can be accounted for by adjusting the slope variable,  $S$ , to represent a steepened energy grade line.

According to Smith et al. (2005), structures with simplified geometries and sharp edges (such as baffles) create higher turbulence levels than natural objects and could reduce habitat suitability. It is therefore important to further evaluate the three dimensional flow structure around commonly installed baffles and assess their usefulness in providing habitat for successful fish passage. This study showed how the addition of baffles can create areas of reduced velocity and turbulence and can produce flow structures different than those in a bare culvert depending on the selected baffle type, but large data gaps still exist at slopes greater than 1.14%. More research should be conducted with steeper slopes and decreased baffle spacing to help improve design techniques for fish passage and to provide accurate equations and methods for determining fish passage barriers within the flow structure.

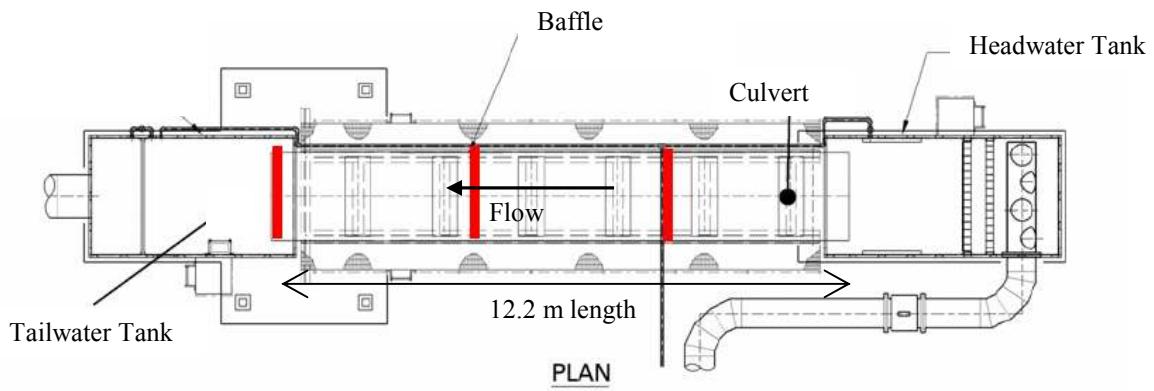
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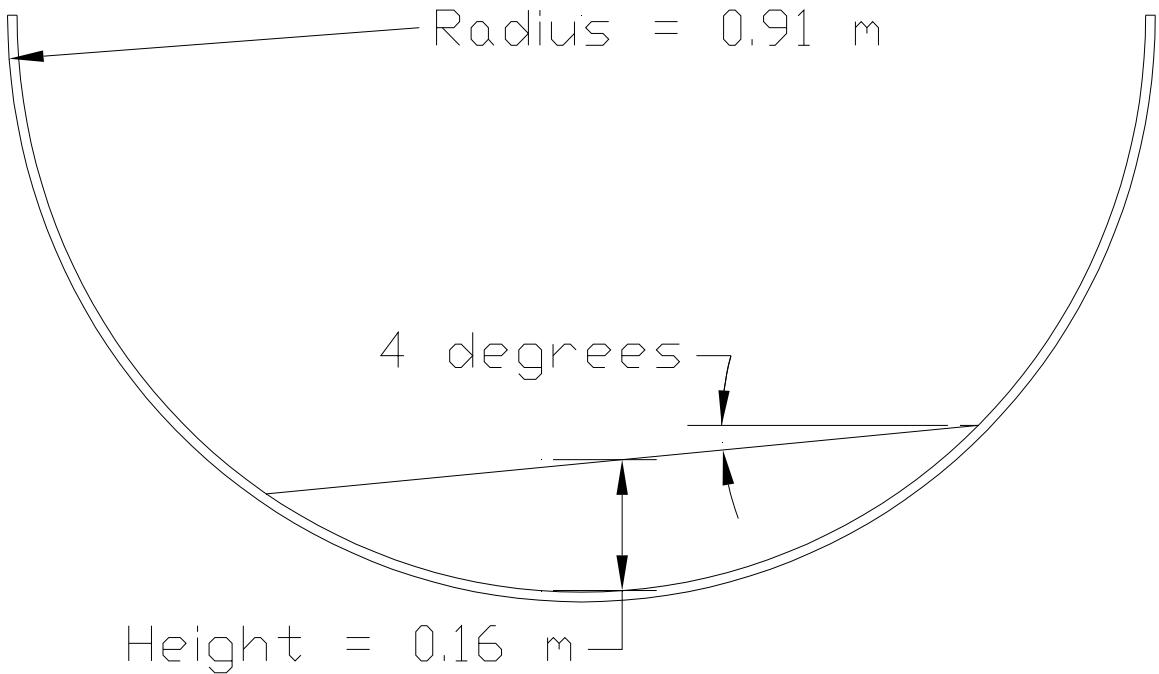
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## FIGURES AND TABLES

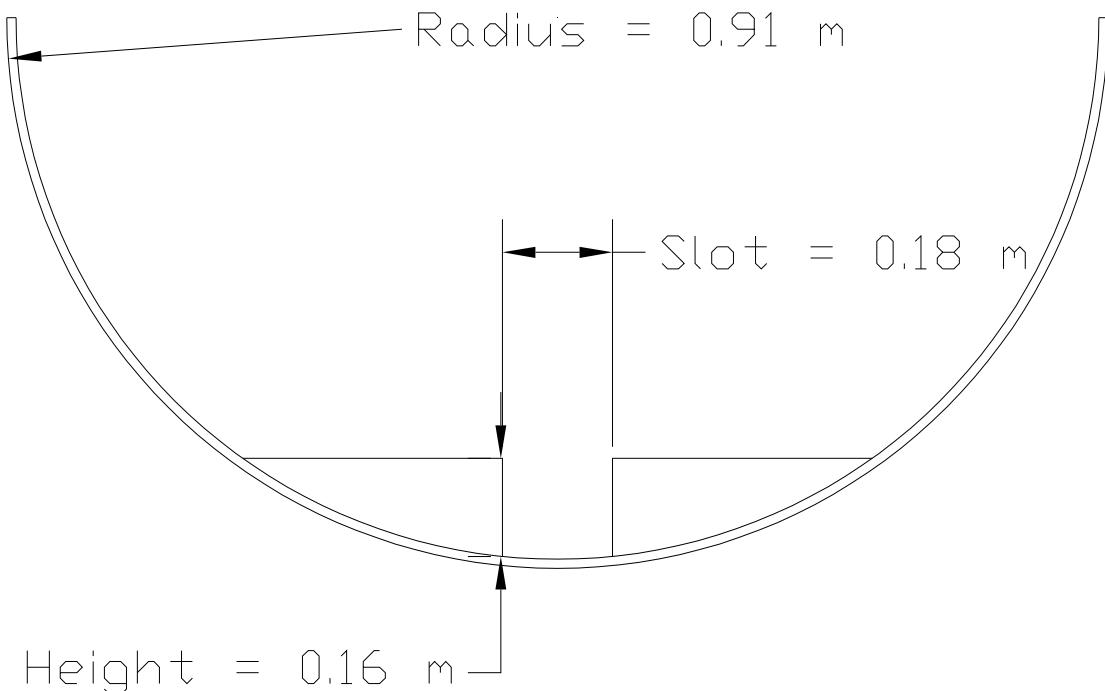


**Fig. 1.** The CTB located at the Skookumchuck Hatchery near Tenino, WA.

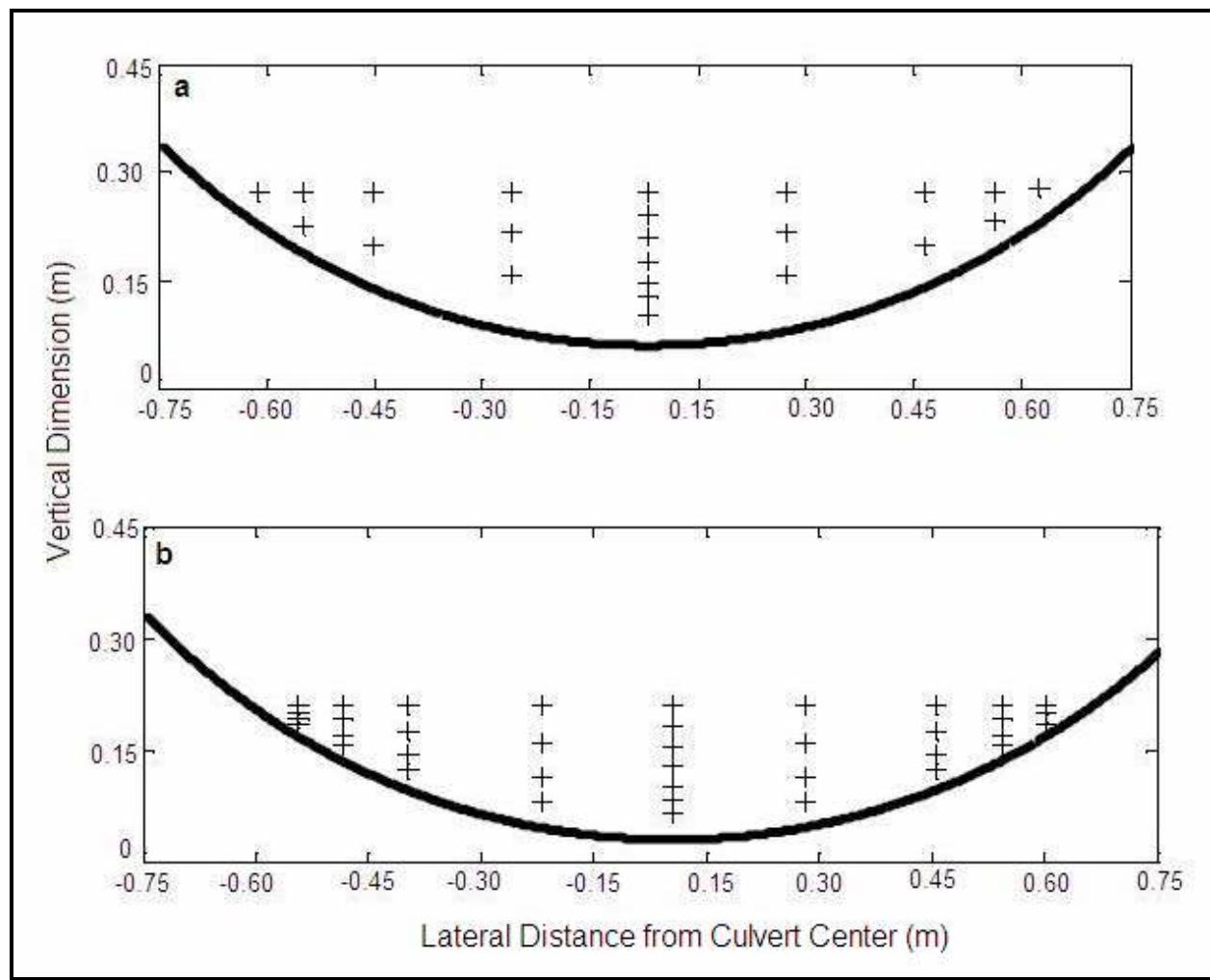
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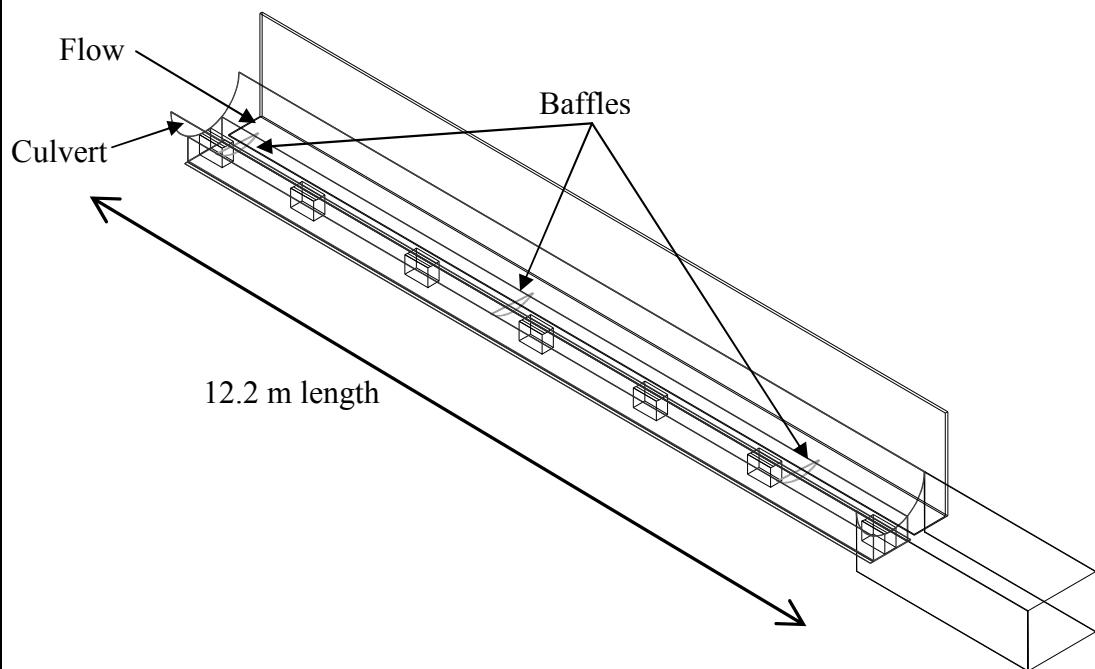
b)



**Fig. 2. Culvert cross section with the installation of a) sloped-weir baffle b) slotted-weir baffle.**

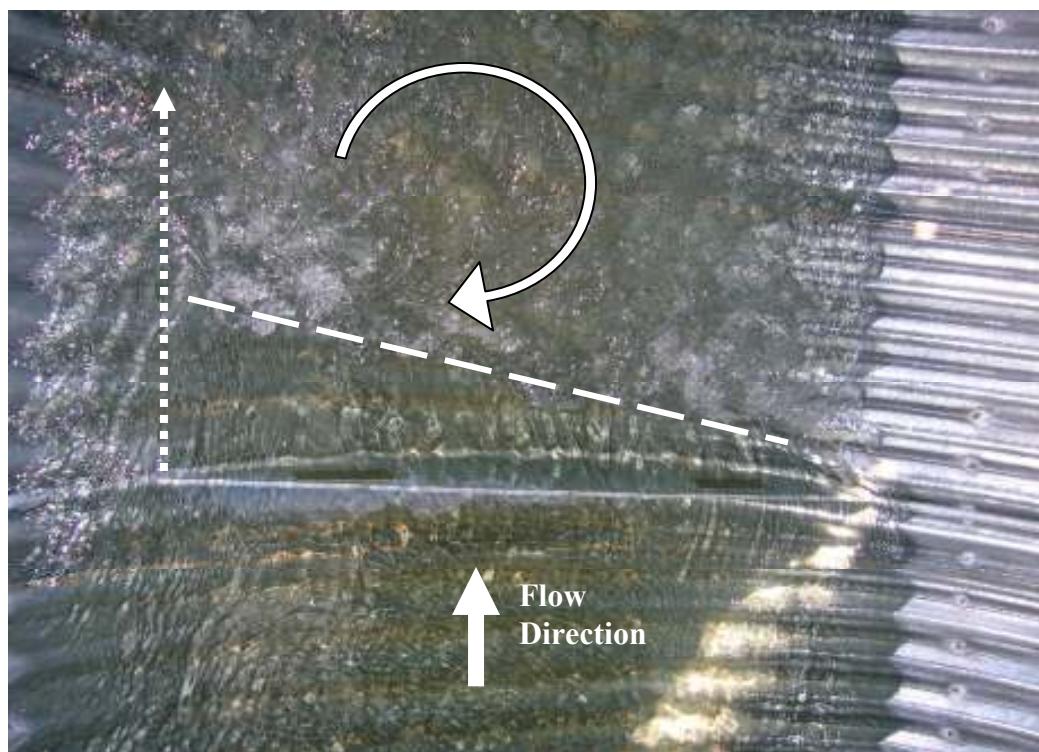


**Fig. 3** Relative measurement locations for a) coarse grid b) fine grid.



**Fig. 4. The test culvert located at the Albrook Hydraulic Laboratory, WSU, Pullman, WA.**

a)



b)

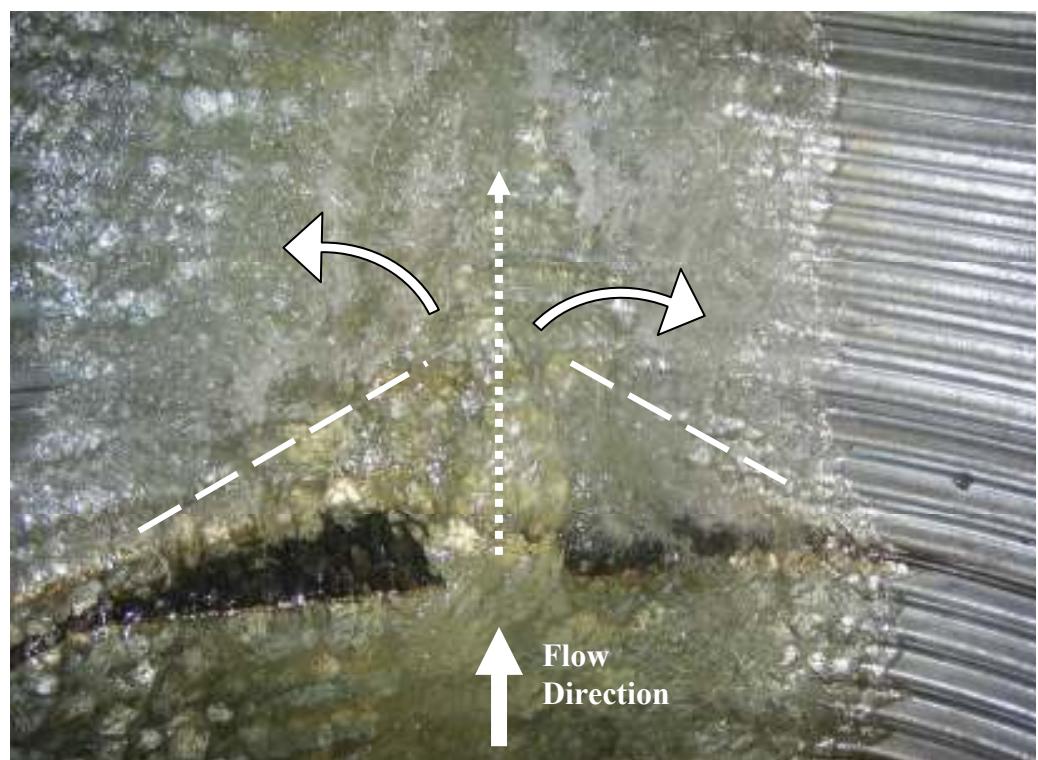
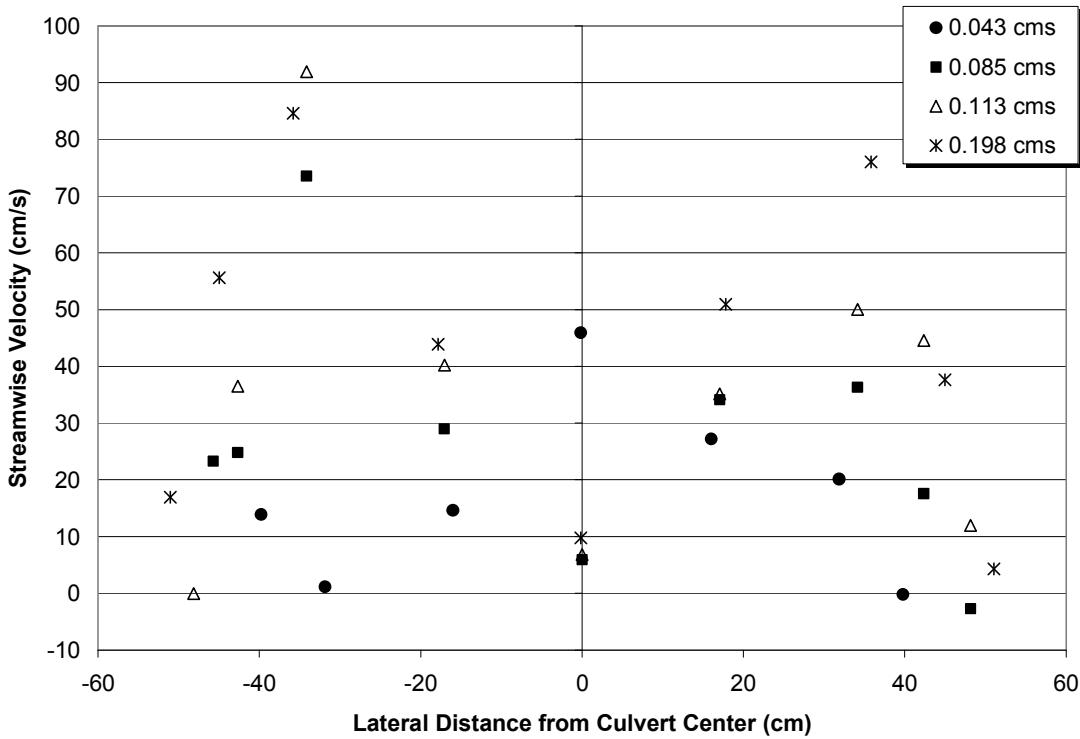


Fig. 5. General flow structure from a) sloped-weir baffles b) slotted-weir baffles. Plunge line—long dashed line; recirculation—solid line; jet—short dashed line.

a)



b)

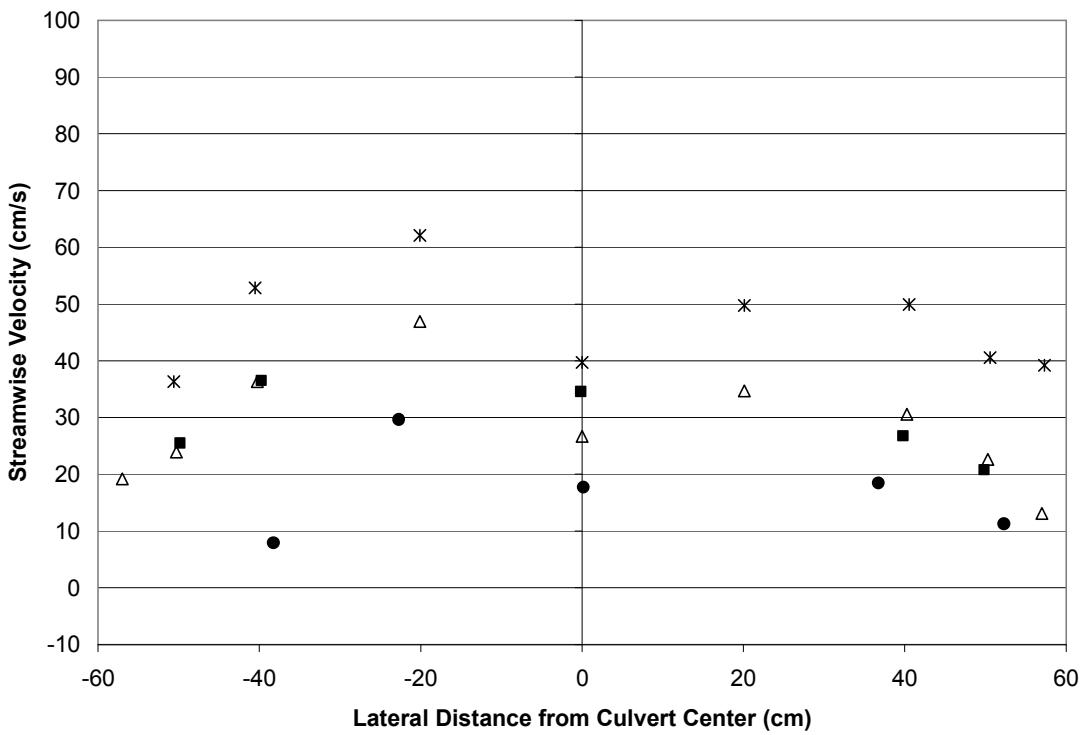
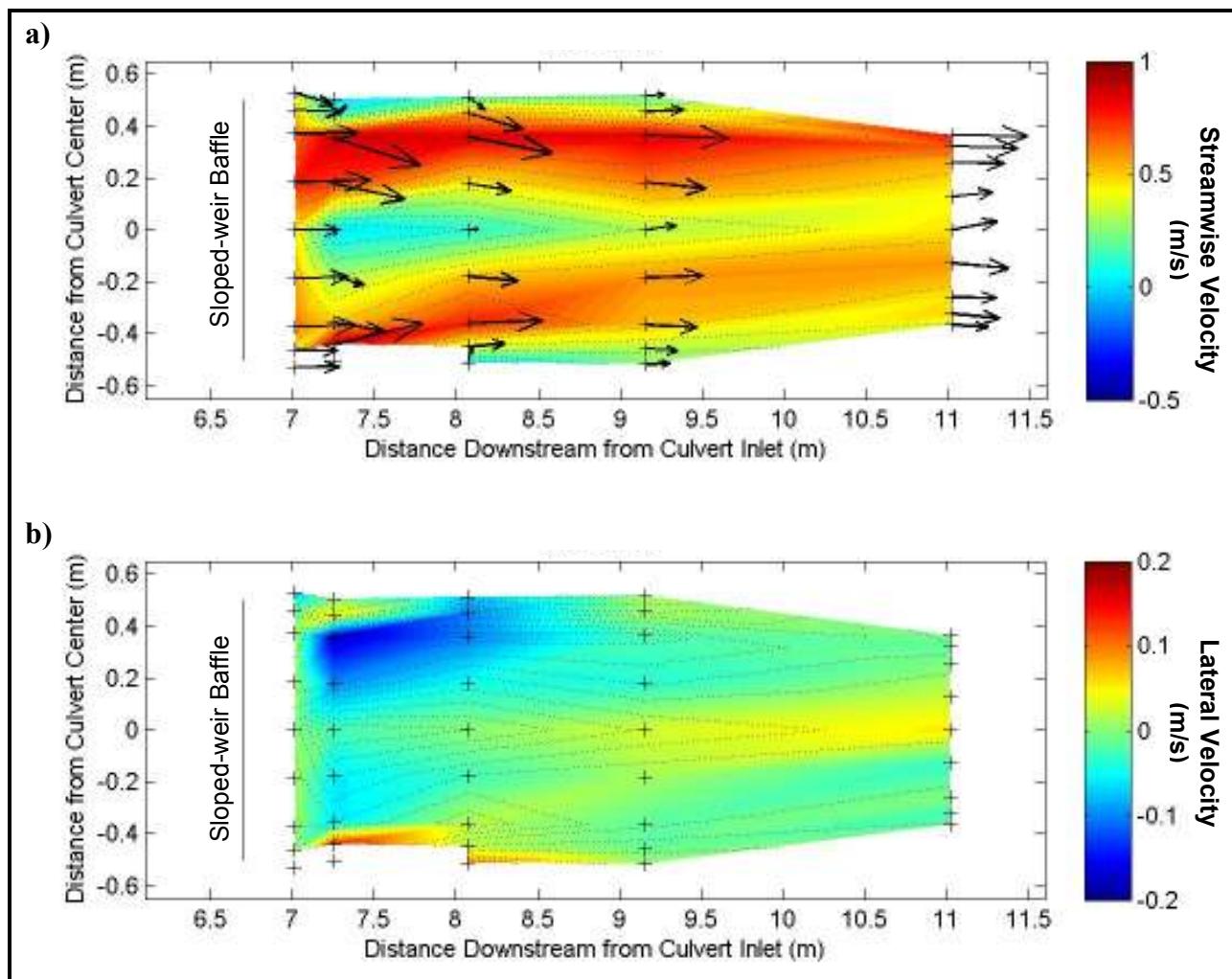
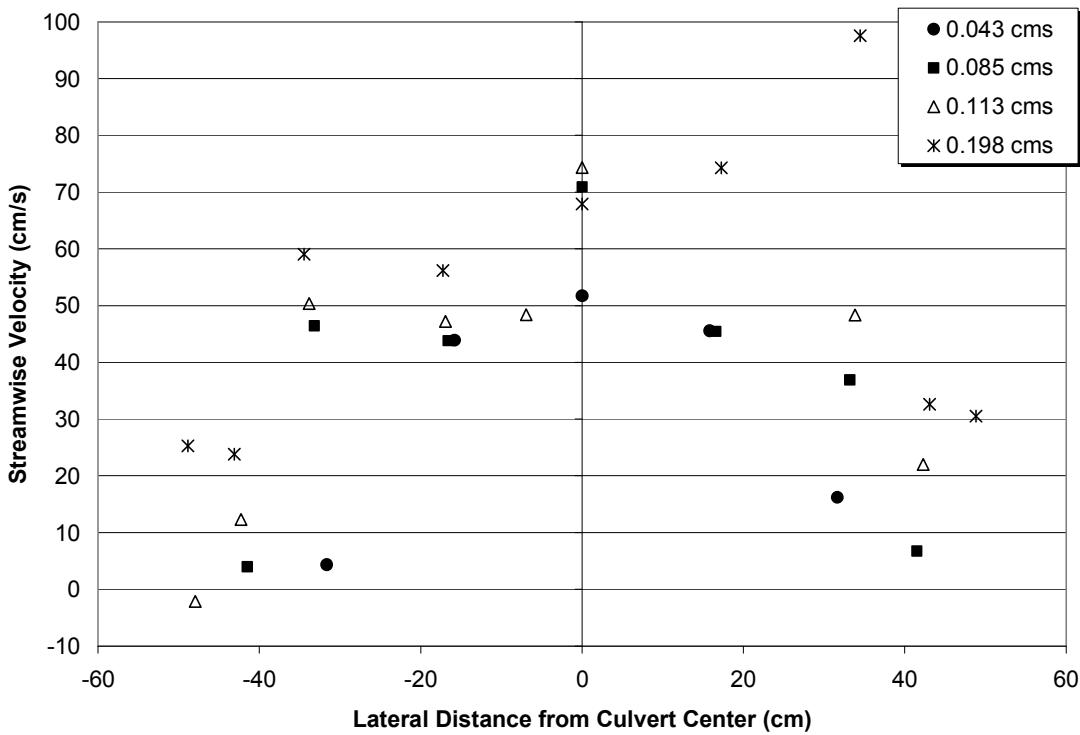


Fig. 6. Streamwise velocity profiles looking downstream for sloped-weir baffle and 1.14% culvert slope a) 0.31 m downstream from a baffle, b) 4.32 m downstream from a baffle.



**Fig. 7. Velocity contour plots showing a) streamwise velocity b) lateral velocity downstream of the central sloped-weir baffle. Positive Vy values are directed toward the top of the page. The cross marks represent measurement locations. The flow rate is 0.198 m<sup>3</sup>/s and the culvert slope is 1.14%.**

a)



b)

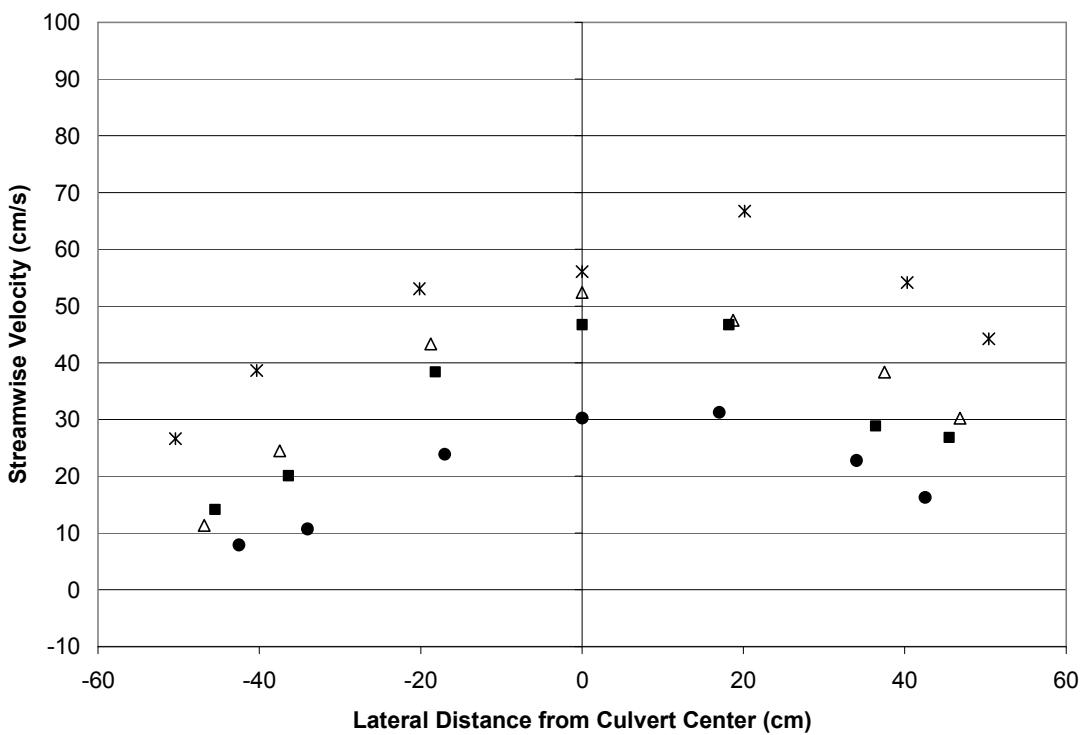
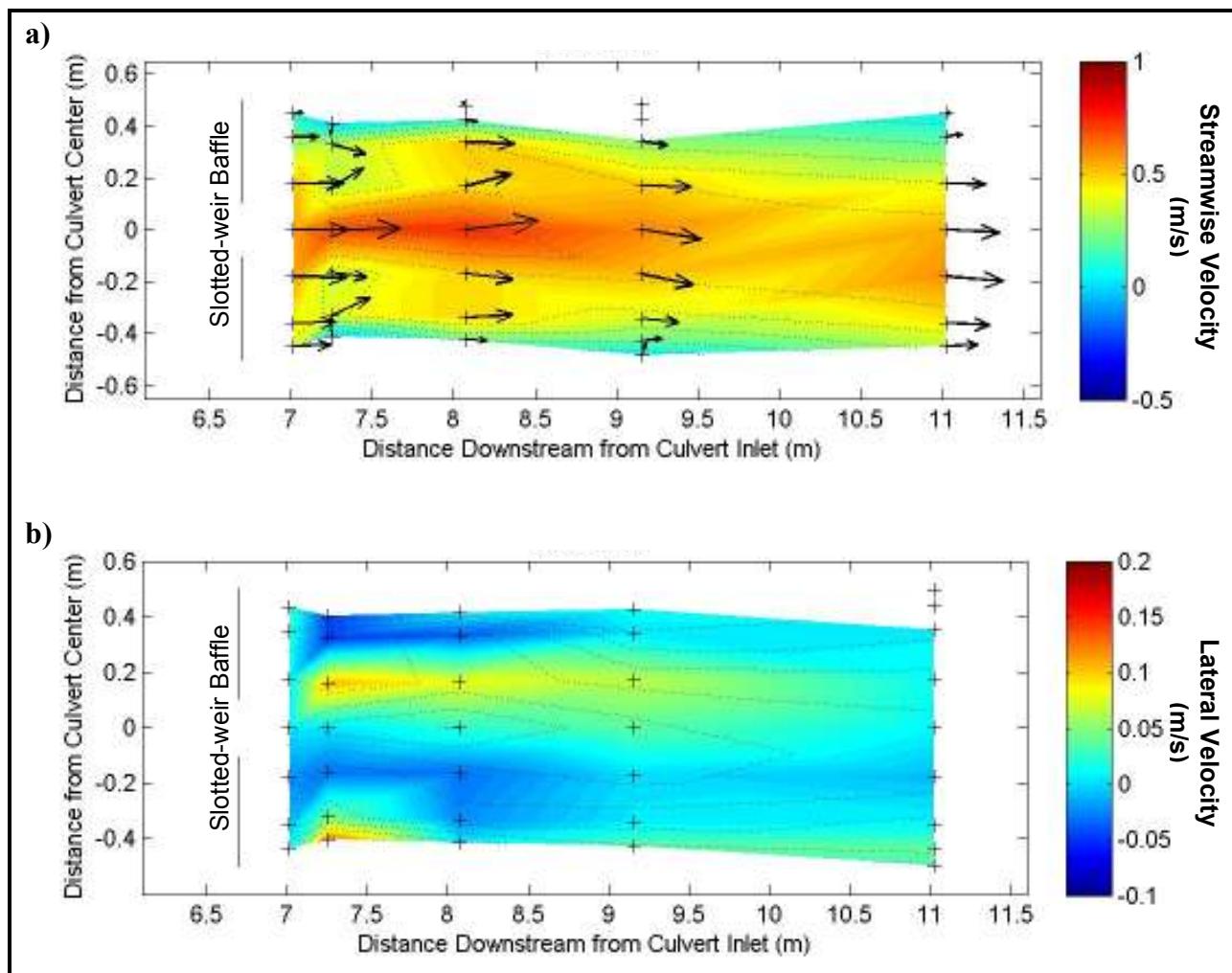
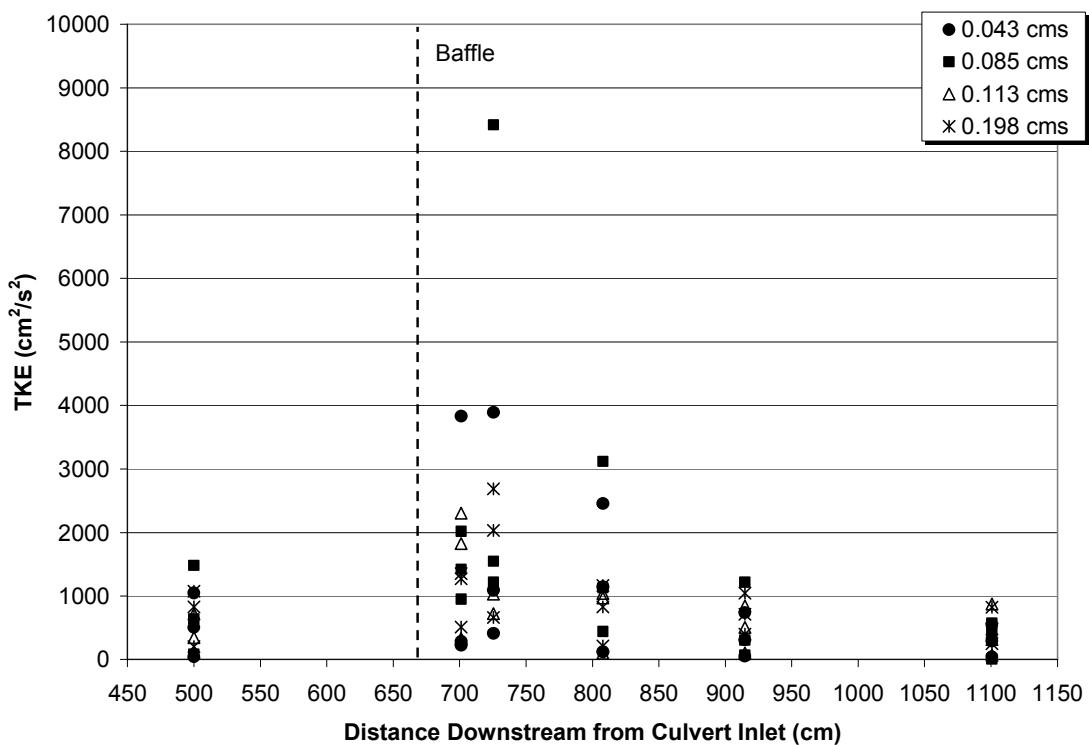


Fig. 8. Streamwise velocity profiles with a slotted-weir baffle and 1.14% culvert slope a) 0.31 m downstream from a baffle, b) 4.32 m downstream from a baffle.



**Fig. 9.** Velocity contour plots showing a) streamwise velocity at  $0.113 \text{ m}^3/\text{s}$  b) lateral velocity downstream of the central slotted-weir baffle at  $0.085 \text{ m}^3/\text{s}$ . Positive Vy values are directed toward the top of the page. The cross marks represent measurement locations. The culvert slope is 1.14%.

a)



b)

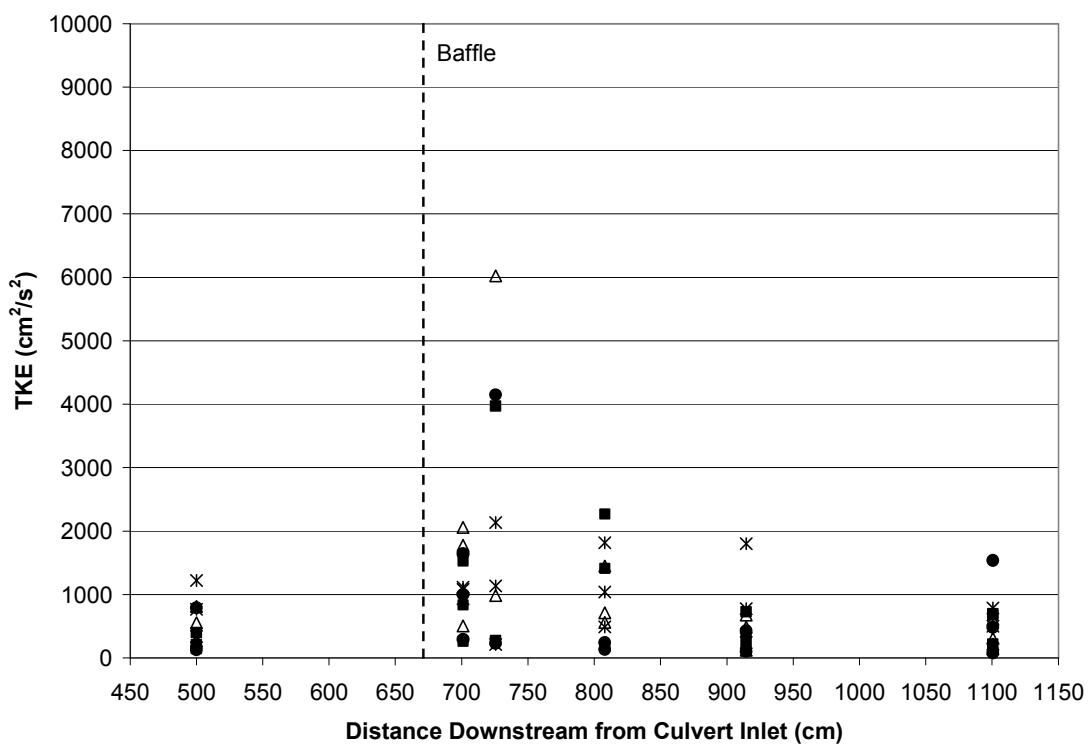
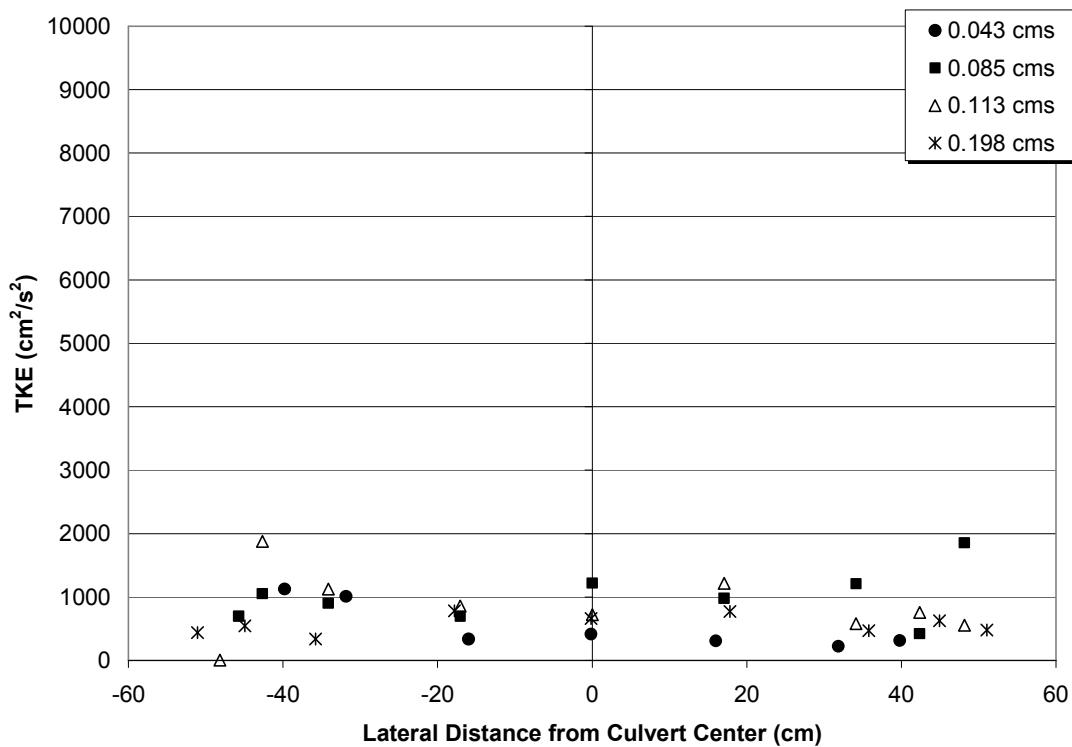
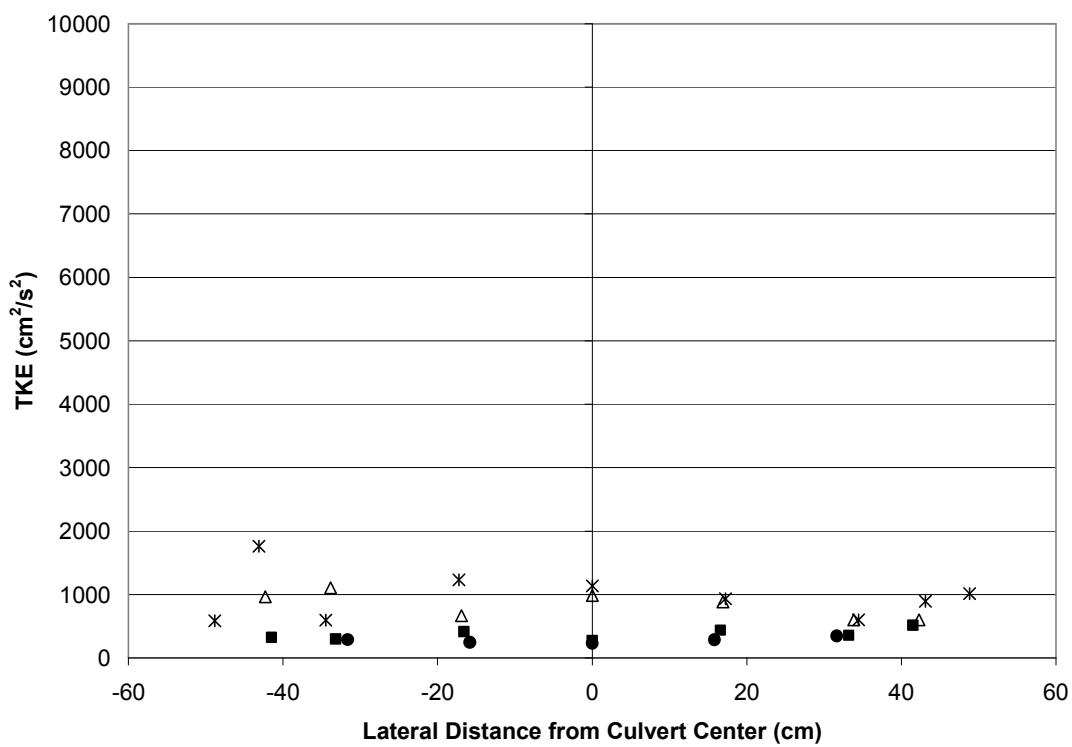


Fig. 10. Centerline TKE profiles for a 1.14% slope for a) sloped-weir baffles, b) slotted-weir baffles.

a)



b)



**Fig. 11. Lateral TKE distribution 0.31 m downstream from a) sloped-weir baffle, b) slotted-weir baffle with a 1.14% culvert slope.**

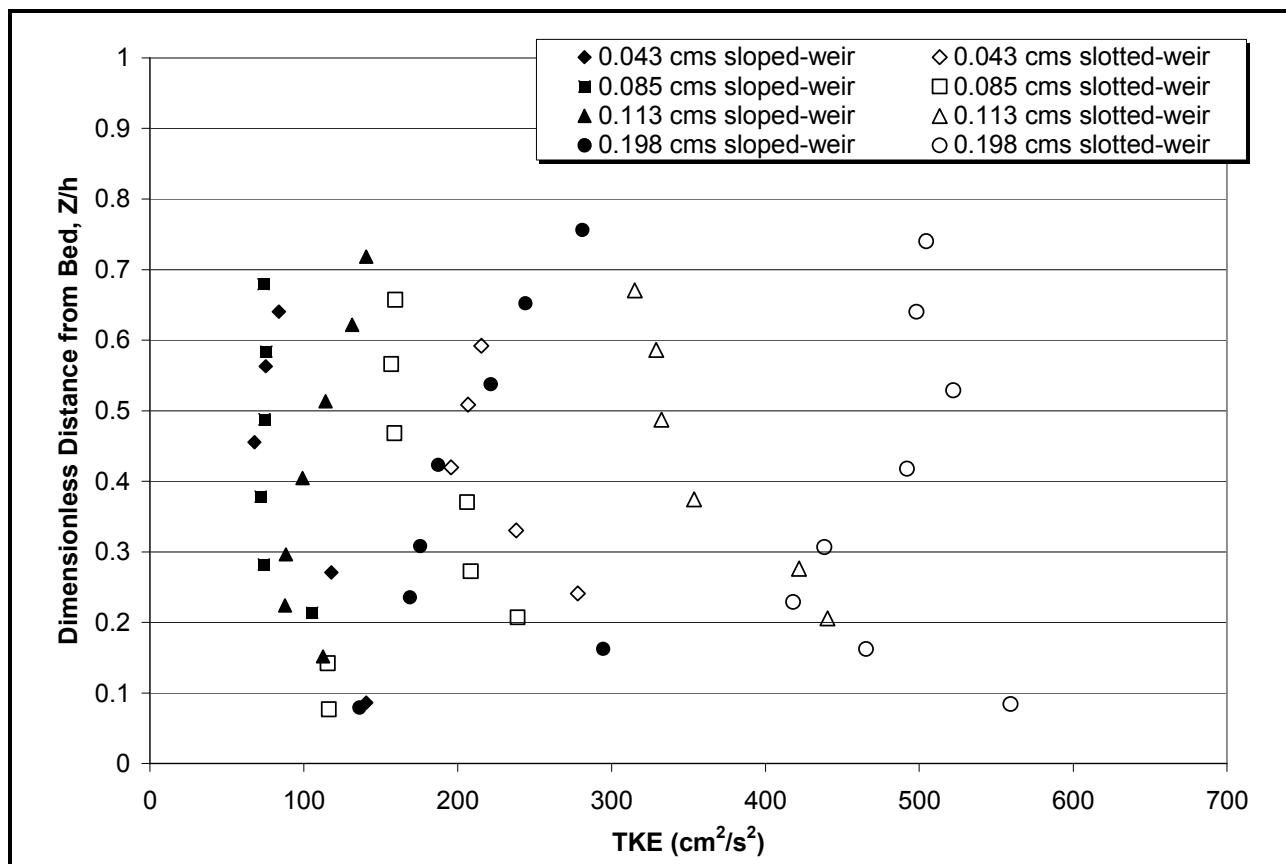
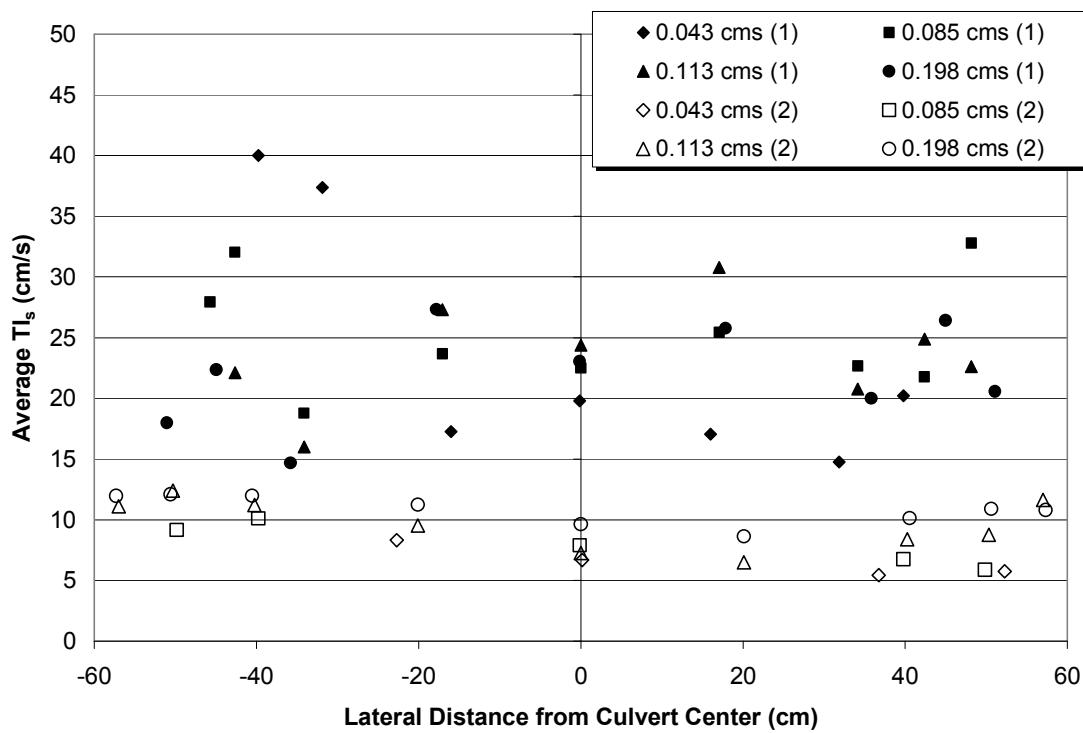
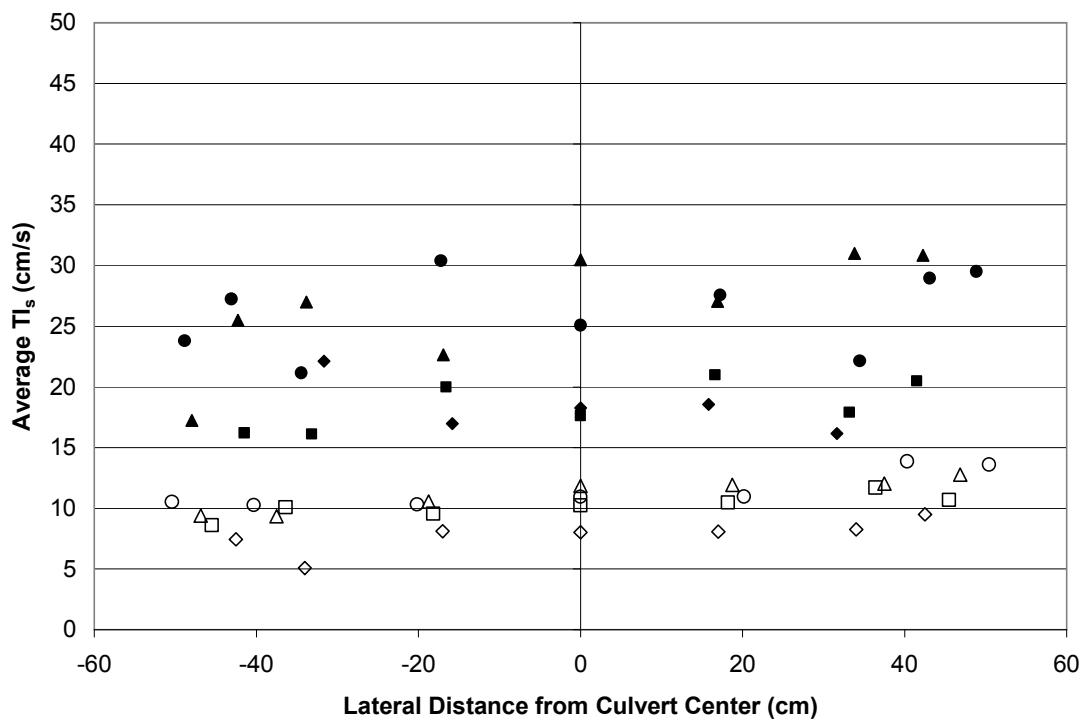


Fig. 12. Centerline TKE profiles 1.37 m downstream with a 1.14% culvert slope for sloped-weir baffles and slotted-weir baffles.

a)

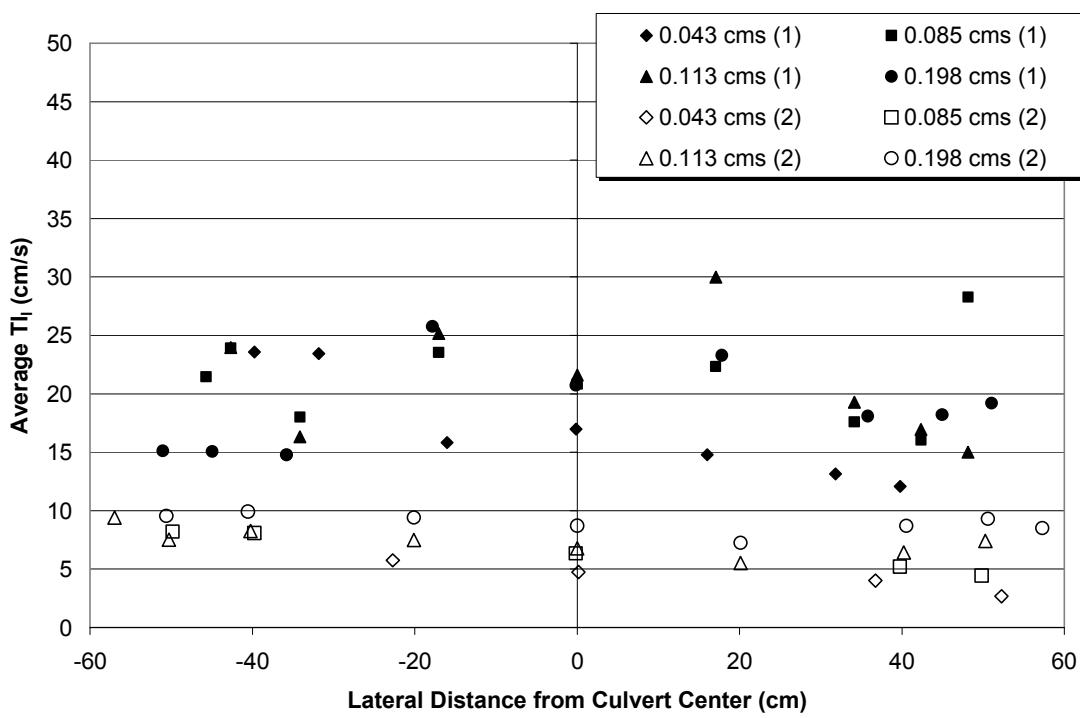


b)

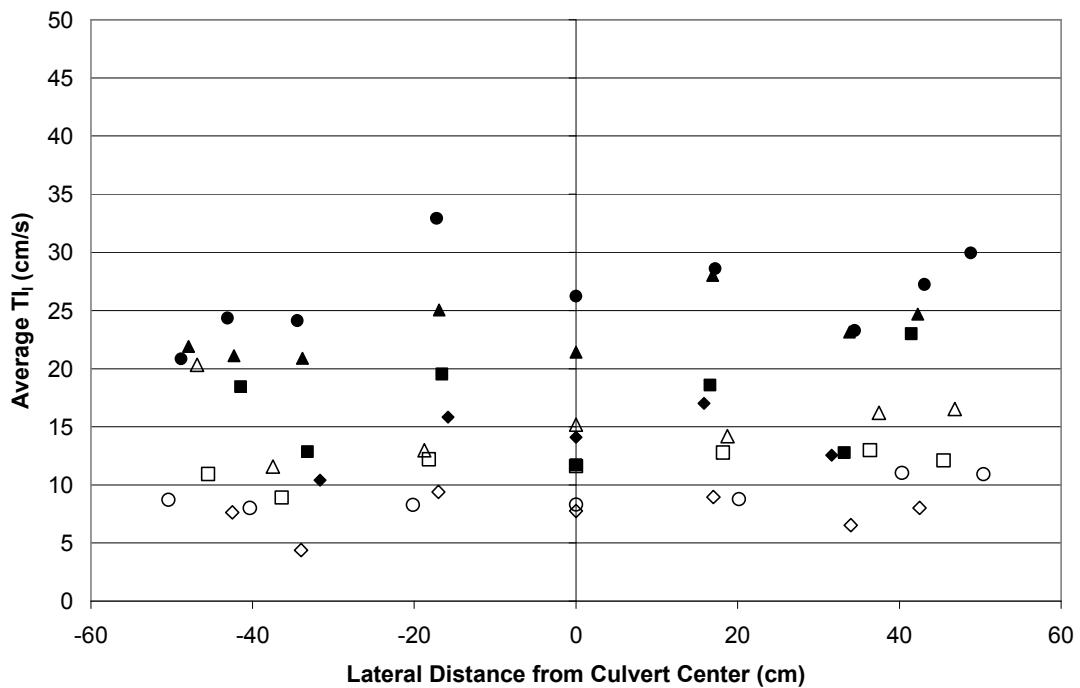


**Fig. 13.** Vertically averaged  $TI_s$  profiles 0.31 m (1) and 4.32 m (2) downstream with a 1.14% culvert slope for a) sloped-weir baffle b) slotted-weir baffle.

a)

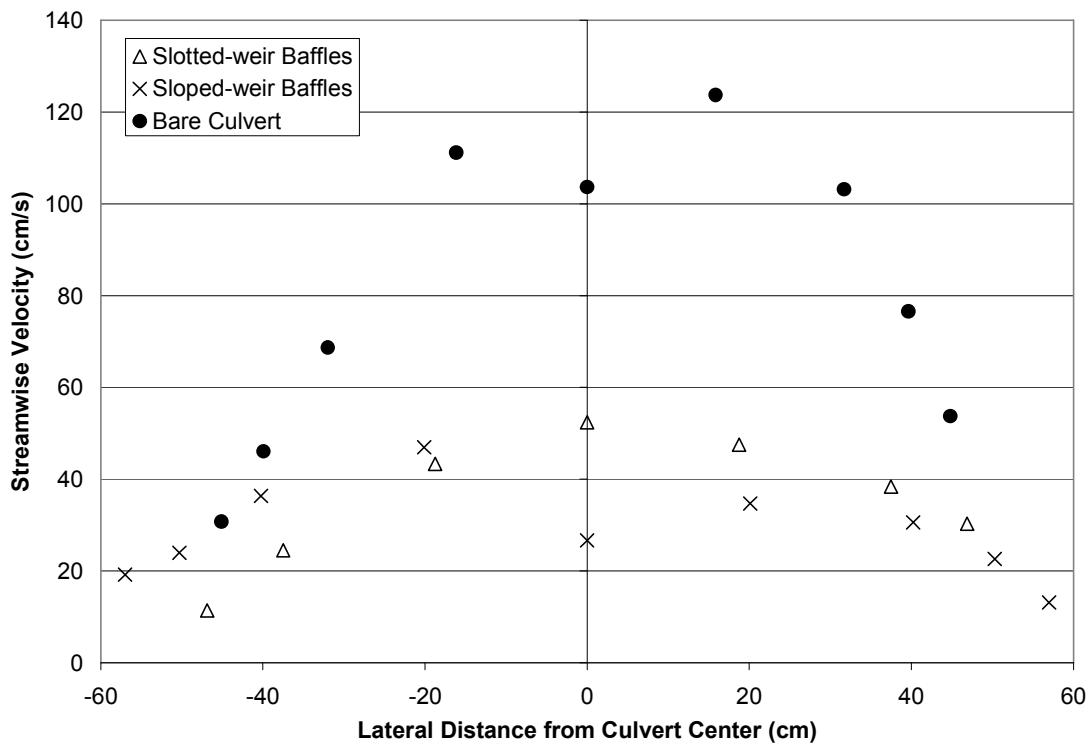


b)

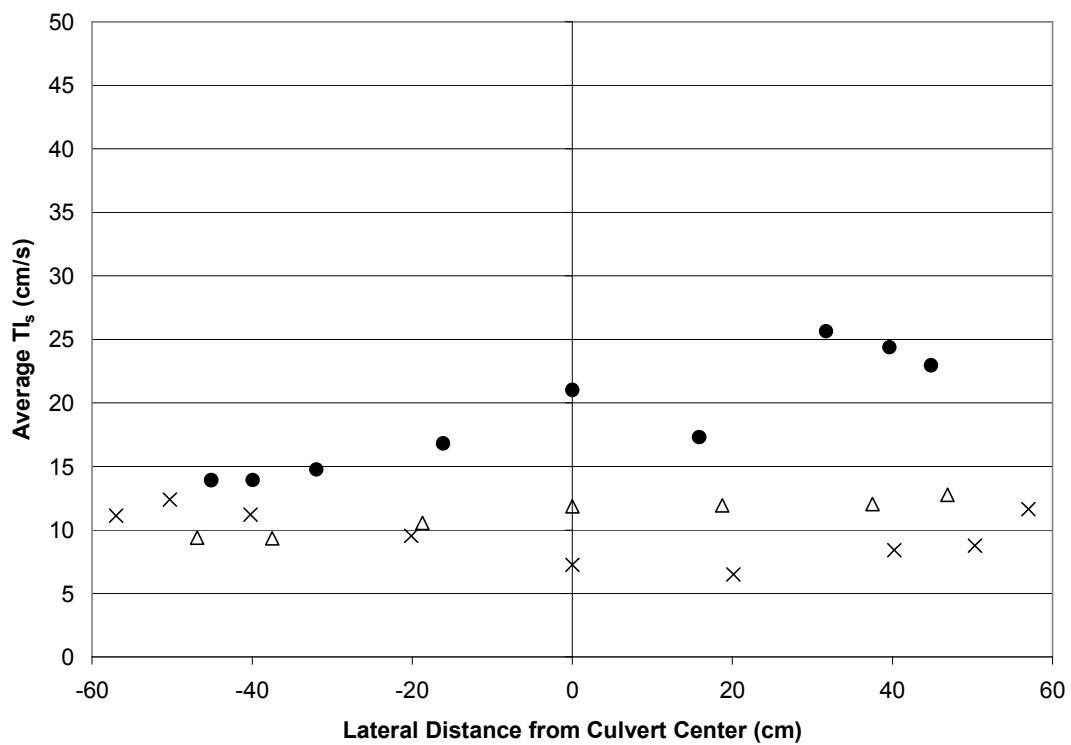


**Fig. 14.** Vertically averaged TI<sub>l</sub> profiles 0.31 m (1) and 4.32 m (2) downstream with a 1.14% culvert slope for a) sloped-weir baffle b) slotted-weir baffle.

a)

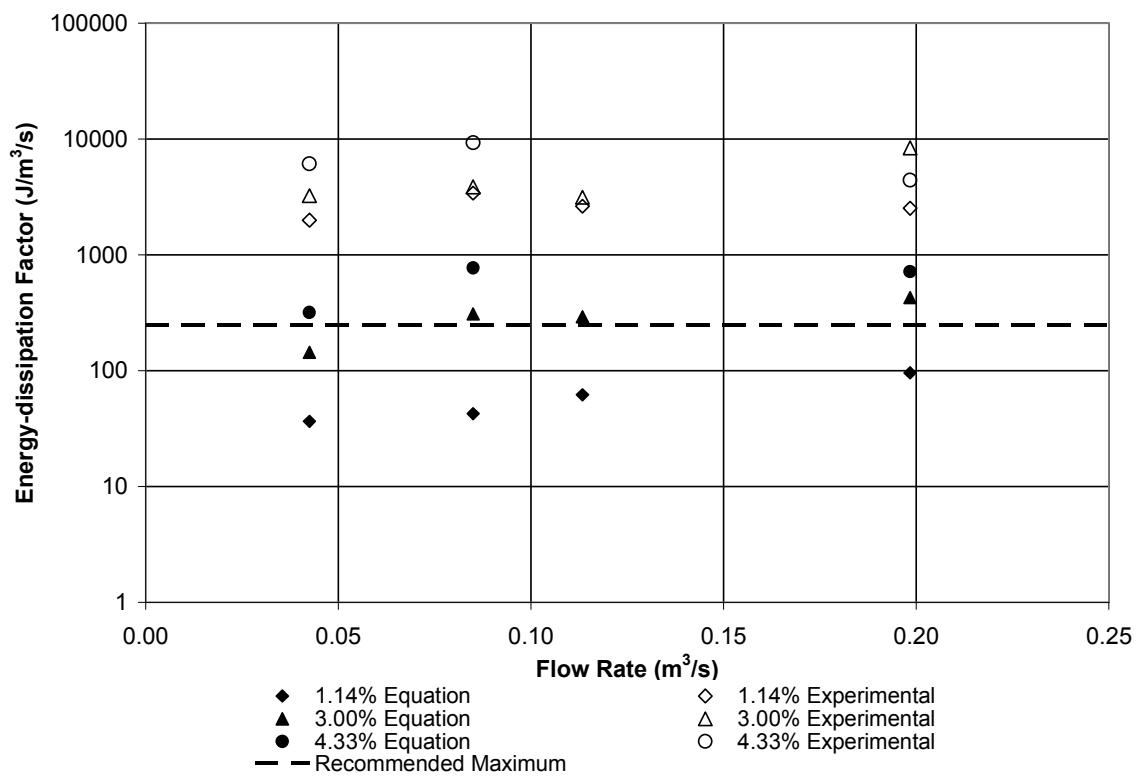


b)

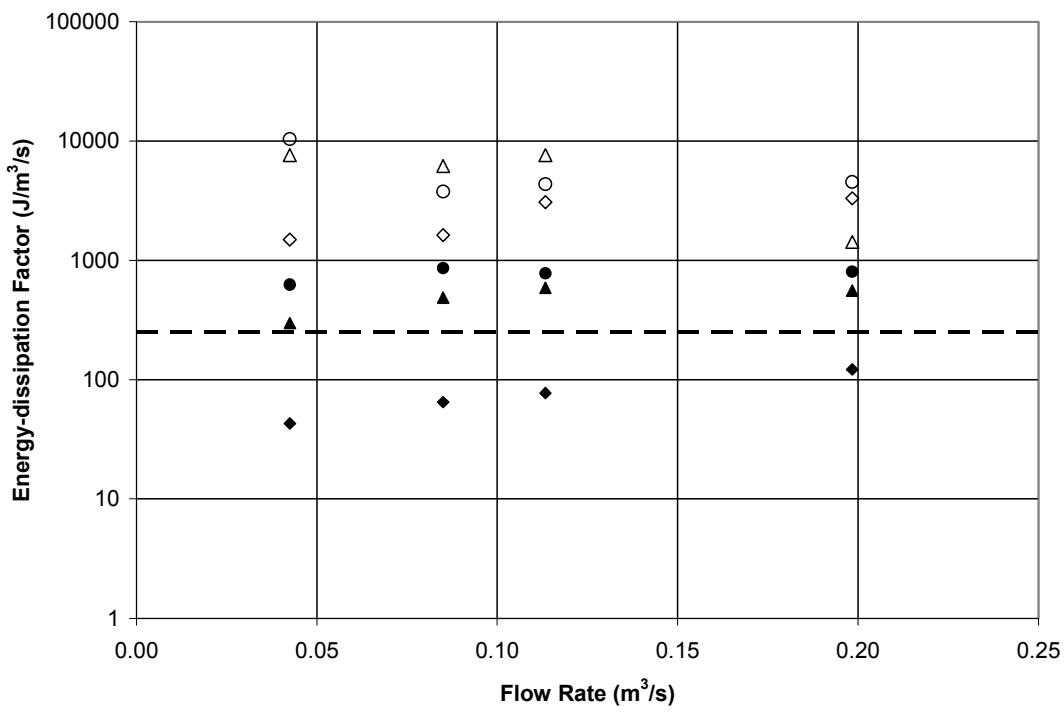


**Fig. 15. Comparison of bare culvert and baffled culvert data for a 1.14% slope and 0.113  $m^3/s$  flow rate for a) streamwise velocity b) streamwise turbulent intensity.**

a)

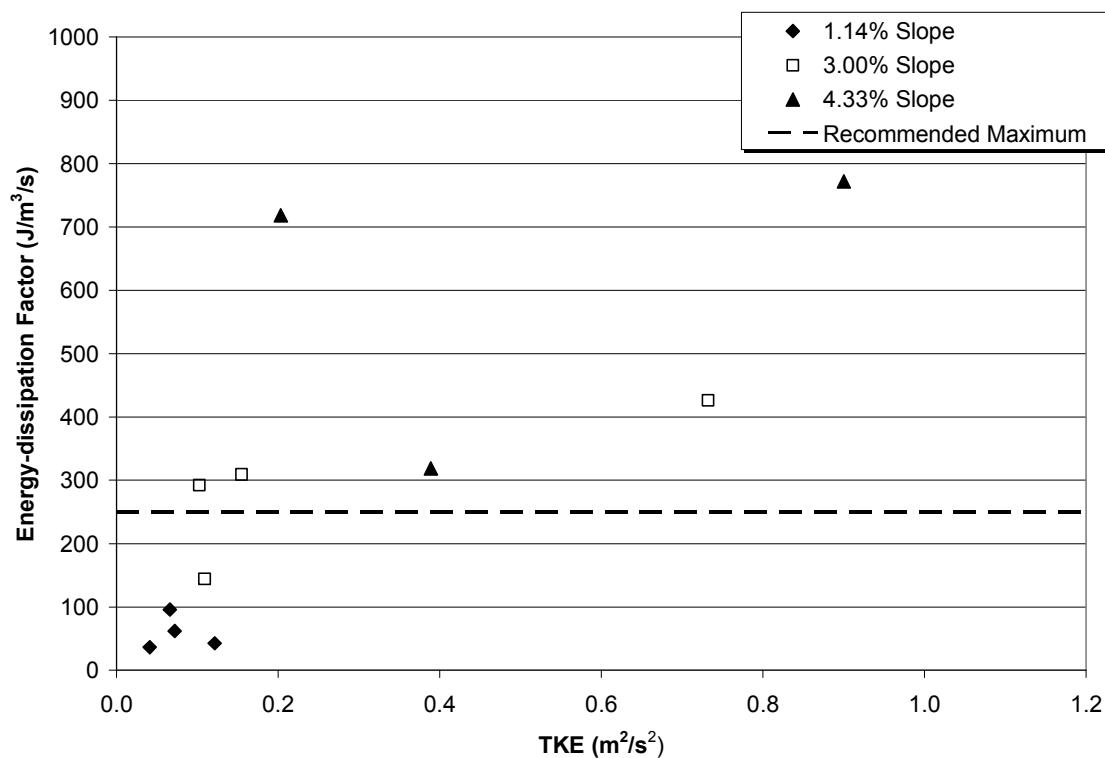


b)



**Fig. 16.** Comparison of predicted and experimentally determined EDF values for a) sloped-weir baffles b) slotted-weir baffles at each slope.

a)



b)

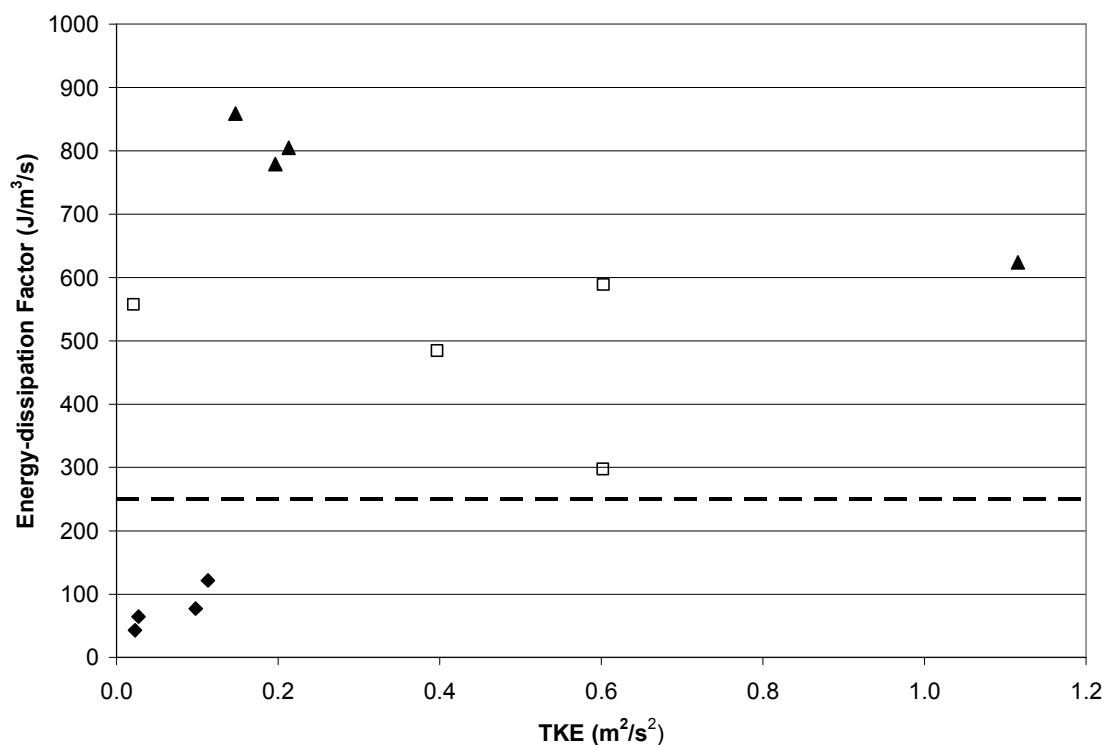


Fig. 17. Lack of correlation between predicted EDF and experimentally determined TKE values for a) sloped-weir baffles b) slotted-weir baffles.

**Table 1. Location of each measurement cross section for the (a) CTB setup (b) Albrook Lab Setup**

(a) Culvert Test Bed Setup		
<i>Cross Section</i>	<i>Distance from Inlet (m)</i>	<i>Grid Type</i>
1	2.87	Coarse
2	5.00	Coarse
3	7.01	Fine
4	7.25	Coarse
5	9.16	Coarse
6	11.02	Coarse

(b) Albrook Hydraulics Laboratory Setup		
	<i>Distance from Inlet (m)</i>	<i>Grid Type</i>
1	5.00	Coarse
2	7.01	Fine
3	7.25	Fine
4	8.07	Fine
5	9.16	Coarse
6	11.02	Coarse

## **APPENDIX A—EXTENDED LITERATURE REVIEW**

### **Abstract**

Traditionally, culverts were designed to convey a wide range of stream flows underneath a roadway. However, engineers and scientists are becoming increasingly aware that culverts can impede the passage of fish, disrupting spawning and fish production. It is therefore necessary to design culverts to not only pass high flood flows, but also to allow fish passage during different seasonal flows. A tool used to improve fish passage conditions through decreasing water velocity and increasing water depth is the installation of baffles in culverts. Rajaratnam et al. tested numerous baffle types (offset, slotted-weir, weir, spoiler, Alberta fish weirs, Alberta fish baffles), and found that the dimensionless flow through a baffled culvert is a function of the ratio of water depth and culvert depth. For most baffle configurations, it was found that a baffle height of 0.10D to 0.15D and a spacing less than 1D produces the best flow conditions for fish passage (Ead et al. 2002). However, all previous studies looked at the general flow field inside the culvert, and did not focus on fine scale hydraulic measurements taken near the baffles or boundary surfaces.

Research has been conducted on turbulent open channel flow through corrugated culverts and rough bottom open-channel flow. Ead et al. (2000) found that for open-channel flow inside a corrugated culvert, the Prandtl equation matched the flow, assuming a von Kármán constant of 0.40. For characterizing the turbulence in a flow, the turbulent intensity and turbulent kinetic energy are often used (Tritico and Hotchkiss 2005).

This paper will describe the laboratory and field research that has been conducted on baffled culverts, as well as the general principals concerning turbulence calculations and descriptions in rough open-channel environments. It has been found that little information exists in the literature regarding the measurement of turbulence parameters in a culvert fitted with baffles, and this paper will establish the foundation necessary for future experimentation work on describing turbulence in baffled culverts.

## Introduction

The traditional role of culverts has been to allow a wide range of stream flows to pass safely underneath a roadway or other obstacle. However, engineers and scientists are finding that culverts can cause an abrupt break in an aquatic ecosystem continuum. Specifically, culverts can block the migration of fish, disrupting the spawning and new production of fish species (Baker and Votapka 1990). Juvenile fish are especially vulnerable because of their small size and lack of strength. Therefore, it has become important that culverts are designed in a manner that allows the conveyance of a wide range of flows, as well as the passage of fish during migration seasons. The culvert must have a large enough capacity to allow flood waters to pass, but during low water periods there must be enough water depth for juvenile and adult fish to travel through the culvert (Pearson et al. 2005).

Common impediments to fish passage in culverts are too high of water velocities and too shallow of depths (Baker and Votapka 1990). One tool used to decrease the velocity and increase the depth of water is the installation of baffles in the culvert. Extensive research has been conducted to predict the general flow through a baffled culvert (Bryant 1981, Rajaratnam et al. 1986, Rajaratnam et al. 1988, Rajaratnam et al. 1989, Clancy 1990, Rajaratnam and Katopodis 1990, Rajaratnam et al. 1990, Rajaratnam et al. 1991, Ead et al. 2002, Gregory et al. 2004), but little has been done to describe the flow field around baffles in detail.

Pearson et al. (2005) mentions that turbulence conditions near the boundary layer of corrugated culverts may be important because turbulent velocity bursts could exceed the swimming ability of fish, and Papanicolaou and Talebbeydokhti (2002) comment that three-dimensional analysis should be considered when designing culverts for fish suitability. It has also been shown that fish prefer areas of high velocities and low turbulence levels over lower

velocity areas with high turbulence levels (Smith et al. 2005). Research has been conducted on turbulent open channel flow through corrugated culverts (Ead et al. 2000), and rough bottom open channel flow using an acoustic Doppler velocimeter or other measurement device (Song and Chiew 2001, Balachandar and Patel 2005, Stone 2005, Tritico and Hotchkiss 2005), but little information exists in the literature regarding the measurement of turbulence parameters in a culvert fitted with baffles.

This paper will describe the laboratory and field research that has been conducted on baffled culverts, as well as the general principals concerning turbulence calculations and descriptions in open-channel environments. There is a need for detailed turbulence information in culverts fitted with baffles, and the knowledge presented in this paper will establish the foundation necessary for future experimentation work on describing turbulence in baffled culverts.

## Baffled Culverts

### *Laboratory Experiments*

There have been numerous laboratory experiments conducted on culverts fitted with baffles. Rajaratnam et al. (1988) conducted a study where two smooth plastic pipes sections (diameters 0.287 and 0.568 meters) were fitted with offset baffles. Smooth pipes were used because it was assumed the turbulence caused by the baffles would dominate over the resistance due to boundary conditions, especially for depths of flow of the same order as the baffle height.

For low stages of flow when the depth of flow is less than the height of the baffles, the flow can be represented as a jet moving through a pool of water to the next baffle slot

(Rajaratnam et al. 1988). The main resistance to flow is assumed to be due to the shear stress between the jet and circulating water mass, such that:

$$b_0 L \beta_1 y_0 \gamma S_0 = 2 \beta_2 y_0 L \bar{\tau} \quad (\text{A1})$$

where  $b_0$  is the slot width,  $S_0$  is the culvert slope,  $\gamma$  is the weight per unit volume of fluid,  $\beta_1 y_0$  is the average depth, and  $2 \beta_2 y_0 L$  is the average total surface area for shear stress of  $\bar{\tau}$  in the slot length  $L$ . The turbulent shear stress can be expressed as:

$$\bar{\tau} = c_f \frac{\rho V^2}{2} \quad (\text{A2})$$

where  $c_f$  is the fluid friction coefficient,  $\rho$  is the mass density of the fluid, and  $V$  is the velocity.

Writing the velocity as:

$$V = \frac{Q}{\beta_3 b_0 y_0} \quad (\text{A3})$$

and substituting equations (A2) and (A3) into equation (A1) yields an equation representing the dimensionless discharge.

$$Q_* = \frac{Q}{\sqrt{g S_0 D^5}} = \sqrt{\frac{\beta_1 \beta_3^2 \beta_4^3 \beta_5}{c_f \beta_2}} \quad (\text{A4})$$

where  $Q_*$  is the dimensionless discharge,  $Q$  is the discharge,  $g$  is the acceleration due to gravity,  $D$  is the diameter of the culvert,  $\beta_4$  is  $b_0/D$ , and  $\beta_5$  is  $y_0/D$ . The right hand side of equation (A4) can be seen to be a function of  $y_0/D$ , and can be rewritten as:

$$Q_* = \frac{Q}{\sqrt{g S_0 D^5}} = f_1 \left( \frac{y_0}{D} \right) \quad (\text{A5})$$

For high stages of flow, represented when the depth of water is greater than the baffle height, the flow can be represented as a uniform velocity flow over a layer of recirculating lower

velocity flow. A similar expression can be derived for the dimensionless discharge (Rajaratnam et al. 1988):

$$Q_* = \frac{Q}{\sqrt{gS_0 D^5}} = f_2 \left( \frac{y_0}{D} \right) \quad (\text{A6})$$

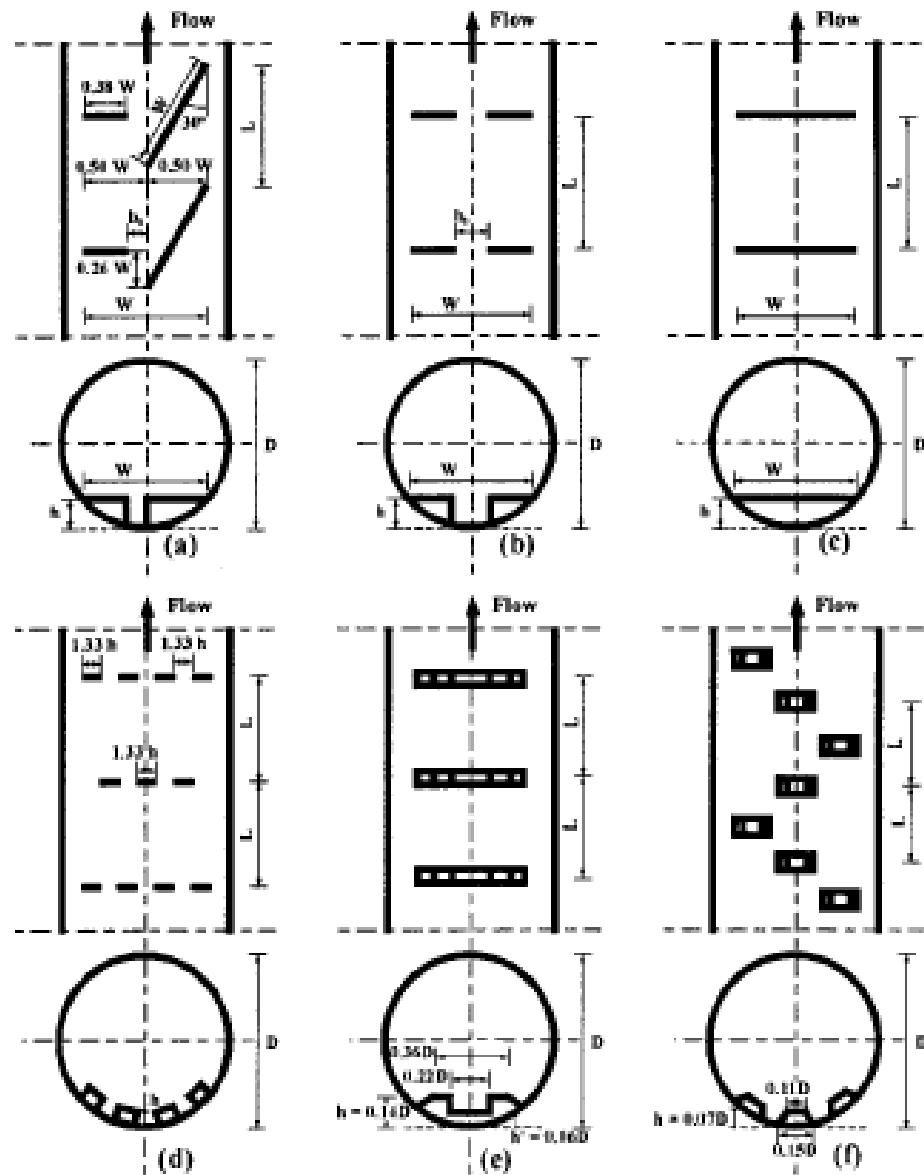
Rajaratnam et al. (1988) found that equations (A5) and (A6) can be represented in the general form:

$$Q_* = C \left( \frac{y_0}{D} \right)^a \quad (\text{A7})$$

Experiments have also been conducted with slotted-weir baffles (Rajaratnam et al. 1989), weir baffles (Rajaratnam and Katopodis 1990), spoiler baffles (Rajaratnam et al. 1991), Alberta fish weirs (Rajaratnam et al. 1990) and Alberta fish baffles (Rajaratnam et al. 1990). Equation (A7) was used to describe the flow for each experimental setup. In Table A1 are the coefficients and exponents found for equation (A7) in each experiment. Figure A1 shows the baffle configuration for each experiment.

**Table A1. Results from various baffled culvert experiments.**

Reference	Baffle Type	Baffle Height	Baffle Spacing	C	a	Comments
Rajaratnam et al. 1988	Offset	0.10D	0.67D	12.0	2.6	Average values
Rajaratnam et al. 1989	Slotted-weir	0.15D	0.6D and 0.3D	9.2	3.0	$y_0/D < 0.5$
		0.15D	1.2D	12.4	3.1	$y_0/D < 0.5$
		0.15D	2.4D	13.8	3.1	$y_0/D < 0.5$
		0.10D	0.6D	13.7	2.9	$y_0/D < 0.5$
		0.10D	1.2D	14.9	3.0	$y_0/D < 0.3$
Rajaratnam and Katopodis 1990	Weir	0.15D	0.6D	5.39	2.43	$y_0/D > 0.25$
				5.49	5.78	$y_0/D < 0.25$
		0.15D	1.2D	6.6	2.62	$y_0/D > 0.35$
				35.3	4.14	$y_0/D < 0.35$
		0.10D	0.6D	8.62	2.53	$y_0/D > 0.20$
				4.43	8.63	$y_0/D < 0.20$
		0.10D	1.2D	9.0	2.36	$y_0/D > 0.20$
Rajaratnam et al. 1991	Spoiler	0.09D	0.53D	9.06	2.83	$y_0/D > 0.10$
				0.85	2.02	$y_0/D < 0.10$
		0.09D	1.06D	6.73	2.44	$y_0/D > 0.09$
				0.29	1.12	$y_0/D < 0.09$
		0.15D	0.53D	5.01	2.84	$y_0/D > 0.15$
				0.33	1.35	$y_0/D < 0.15$
		0.15D	1.06D	2.51	2.10	$y_0/D > 0.10$
Rajaratnam et al. 1990	Alberta fish baffle	0.07D	1.43D	7.96	1.81	
		0.07D	0.72D	9.16	2.09	
		0.07D	0.47D	8.92	2.15	
	Alberta fish weir	0.14D	2.39D	17.63	2.88	
		0.14D	1.20D	38.99	3.57	
		0.14D	0.6D	21.20	3.20	
		0.14D	1.79D	11.57	2.53	



**Fig. A1.** Baffle configurations for the discussed experiments (Ead et al. 2002). (a) offset baffle (Rajaratnam et al. 1988); (b) slotted-weir baffle (Rajaratnam et al. 1989); (c) Weir baffle (Rajaratnam and Katopodis 1990); (d) spoiler baffle (Rajaratnam et al. 1991); (e) Alberta fish weir (Rajaratnam et al. 1990); (f) Alberta fish baffle (Rajaratnam et al. 1990).

The results from the offset baffle experiment show that doubling the baffle height while keeping a constant baffle spacing increases the flow resistance in the culvert, and that reducing the baffle spacing by one-half while keeping the baffle height constant has a similar effect on the flow resistance (Rajaratnam et al. 1988).

The effects on a flow field from adding slotted-weir baffles in a culvert are described by Rajaratnam et al. (1989). This experiment showed that slotted-weir baffles were as effective for slowing down the flow and increasing the water depth in a culvert as the more complicated offset baffles of the same height and spacing.

When weir baffles where added to a culvert, it was found that baffle spacings of 0.6 times the culvert diameter were very effective, and that baffle spacings of 1.2 times the diameter were too large (Rajaratnam and Katopodis 1990). When a spacing of 1.2D was reached, the backward velocity zone located near the bed (caused by recirculation) was reduced, and larger velocities were created between the baffles, compared to a spacing of 0.6D. It was also noted that between baffles the maximum backward velocity located near the bed was more than one-third of the maximum forward velocity (Rajaratnam and Katopodis 1990). This can be important for assisting the migration of fish between baffles. When compared to slotted-weir baffles, weir baffles perform as well in reducing flow velocity and increasing flow depth; the weir baffle design performed slightly better at producing larger depths for smaller flow rates than slotted-weir baffles (Rajaratnam and Katopodis 1990).

Experimentation performed with a spoiler baffle system show that it was effective in reducing the velocity through the culvert and producing larger depths of pools, especially with a baffle spacing of 0.53D. The larger baffle spacing of 1.06D did not create as large of pool depths as a 0.53D spacing for  $Q_*$  less than 0.02 (Rajaratnam et al. 1991). Both spacing designs produced the same relative increase in pool depths for larger values of  $Q_*$ . The performance of the spoiler baffles were comparable to weir baffles, but did not exhibit any large advantages.

Studies on fish weirs used by the Alberta Transportation show that their performance is comparable with weir baffles and slotted-weir baffles (Rajaratnam et al. 1990). The Alberta fish

weirs performed slightly better than the two systems for  $Q_*$  greater than 0.1 at L/D equal to 0.6 and h/D equal to 0.1. When the length between baffles equaled 1.2D, all three systems performed equally well (Rajaratnam et al. 1990). The Alberta fish baffles did not perform well when compared to the Alberta fish weirs, weir baffles, and slotted-weir baffles (Rajaratnam et al. 1990).

Overall, it appears that the best performance from a baffle system occurs when h/D is between 0.1 and 0.15, and the spacing between the baffles is less than the culvert diameter (Ead et al. 2002). Because of their simplicity and effectiveness, the weir and slotted-weir baffle systems are the best choices for producing flows through culverts that are most likely to pass fish (Ead et al. 2002).

#### *Field Observations*

The effects of baffles on fish migration have been observed at locations where culverts are installed in the field. Bryant (1981) reported that on Admiralty Island, Alaska, a baffled culvert placed at a 10 percent grade was used to examine the swimming ability of migrating coho salmon, Dolly Varden, and cutthroat trout. Offset baffles were used in a 36 inch diameter and 30 foot long culvert, and the flow ranged from 0.3 cfs to 0.68 cfs. The baffles were installed at 2 foot intervals throughout the length of the culvert. Bryant (1981) found that below 0.2 cfs, the flow in the culvert was too low for fish passage, and at a discharge greater than 0.65 cfs, no fish moved up the culvert.

Gregory et al. (2004) performed an in-depth study on the effects of baffles on fish passage through culverts. In the study, three baffle types were used: 90° baffle weirs, 30° angled baffles, and 45° angled baffles. Seven culverts sites were selected for the study (see Table A2 for the descriptions of each field site). During the testing, fish were released at the outlet of a

culvert for 3 hours, after which drop screens were released to separate the culvert into sections.

The fish were then collected and counted, and the locations of the fish within the culvert were noted.

Results from the study show that all designs resulted in a lower maximum, minimum, and average velocities compared to the culvert not fitted with baffles, and baffle weirs exhibited the best fish passage conditions (Gregory et al. 2004). The weir baffles created areas of low velocity behind weirs that fell within the range of swimming capabilities of most salmonids, but much higher velocities existed across the top of the weirs. The velocities at the weir crests were comparable to the average velocities in the culvert without weirs, and were approximately twice as great as the velocities in the sections between weirs (Gregory et al. 2004).

**Table A2. Characteristics of culverts used in field studies. Culvert types include reinforced concrete box culvert (RCBC), corrugated metal pipe culvert (CMP), and half corrugated metal pipe with a concrete floor (CMP-CF). Active channel width of the natural stream upstream and downstream of the culvert is represented by the acronym ACW (Gregory et al. 2004).**

	Little Lobster	Canyon #2	Canyon #3	Hough	Stemple	Hayden	Alder Brook
Basin	Alsea	Umpqua	Umpqua	Siletz	Siletz	Alsea	Salmon
Culvert type	RCBC	RCBC	CMP-CF	CMP	RCBC	RCBC	RCBC
Retrofit design	11 baffles	31 baffles	19 weirs	7 weirs	7 baffles	8 baffles	Rack
Length (m)	24.5	83	84	26.8	16.5	14.5	11.7
Width (m)	2.5	2.4	4.7	2.1	1.9	1.9	1.8
Height (m)	2.5	2.4	4.3		2.5	1.2	1.9
Culvert slope (%)	4.4	1.15	0.95	3.1	0.75	2.3	2.7
Upstream slope (%)	9.6	1.7	1.5	2.3	0.4	1.8	3.7
Downstream slope (%)	3.1	1.6	1.2	3	1.7	1.5	3.1
Upstream ACW (m)	4.4	4.7	8.3	4.3	3.1	3.6	4.4
Downstream ACW (m)	4.7	5.3	8.7	3.6	4.1	3.4	4.3
Mean Summer Flow (m <sup>3</sup> /s)	0.05	0.19	0.38	0.08	0.15	0.02	0.20
Max Summer Velocity (m/s)	0.43	1.11	0.76	2.57	1.60	0.33	1.39
Maximum Depth in Culvert (cm)	20	20	22	35	25	23	28
Summer Jump Height (cm)	28	40	10	0	11	20	0
Pool Depth Below Jump (cm)	19	110	100	24	30	40	45

## Turbulence Characteristic in Open Channel Flows

### *Rough Open Channel Flow*

Open-channel flow velocity profiles are usually divided into inner and outer regions. The inner region can further be divided into a viscous and fully turbulent sub-region. In the viscous sub-region, the viscous forces dominate the flow profile which can be described linear by the equation (Klebanoff 1955):

$$\frac{\bar{u}}{u_*} = \frac{u_* z}{\nu} \quad (\text{A8})$$

where  $\bar{u}$  is the time-average velocity,  $u_*$  is the shear velocity,  $z$  is the distance from the boundary, and  $\nu$  is the fluid kinematic viscosity.

Flow through a corrugated culvert must be treated as rough open channel flow because of the large roughness of the corrugations (Ead et al. 2000). In a rough channel, the velocity distribution is affected by the grading, shape and spacing of the roughness elements (Kirkgöz 1989). In the fully turbulent part of the inner region of flow, a logarithmic profile is used to describe the flow for a smooth channel surface (Prandtl 1932, von Karman 1930):

$$\frac{\bar{u}}{u_*} = \frac{1}{\kappa} \ln \frac{u_* z}{\nu} + B_0 \quad (\text{A9})$$

where  $\kappa$  is the von Kármán constant (usually assumed as 0.40 or 0.41) and  $B_0$  is an integration constant (usually 0.56). Equation (A9) is often referred to the “law of the wall.”

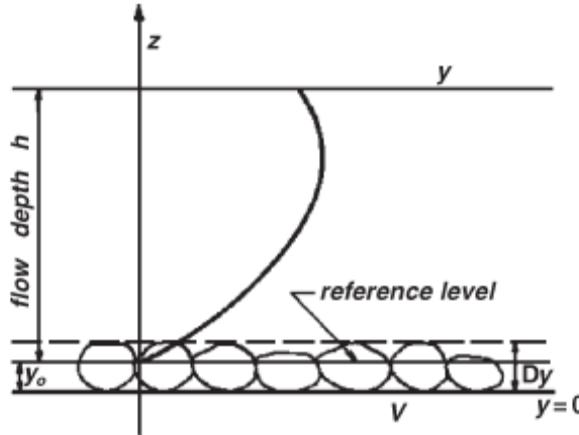
For flows over rough boundaries, the influence from the bed roughness exceeds the viscous influence on the flow, and Equation 9 can be written as (Nikuradse 1933):

$$\frac{\bar{u}}{u_*} = \frac{1}{\kappa} \ln \frac{z}{k_s} + B_1 \quad (\text{A10})$$

where  $k_s$  is Nikuradse's roughness length and  $B_1$  is an integration constant (usually 8.5). The rougher a boundary becomes, the more difficult it is to define the bed surface. The location on the bed where the mean velocity is zero is usually assumed to exist somewhere between  $z = 0$  and  $z = k$ , the average roughness height (Kirkgöz 1989). To account for the shift on boundary reference, equation (A10) can be written as (Rotta 1962):

$$\frac{\bar{u}}{u_*} = \frac{1}{\kappa} \ln \left( \frac{z + \Delta z}{k_s} \right) + B_1 \quad (\text{A11})$$

where  $\Delta z$  is the displacement height. See Figure A2 for a visual representation of the displaced reference level in a rough boundary.



**Fig. A2. Reference level is located somewhere below the apparent surface of the rough boundary, where the mean velocity is equal to zero (Ferro 2003).**

For the outer region of a turbulent boundary layer, the velocity-defect law can describe the flow (Clauser 1956):

$$\frac{\bar{u}_m - \bar{u}}{u_*} = \frac{1}{\kappa} \ln \frac{z}{\delta} + B_2 \quad (\text{A12})$$

where  $u_m$  is the maximum velocity,  $\delta$  is the boundary layer thickness, and  $B_2$  is an integration constant (usually 8.5). The law of the wall (equation (A9)) was extended to include the inner and outer regions of the turbulent layer by Coles (1956):

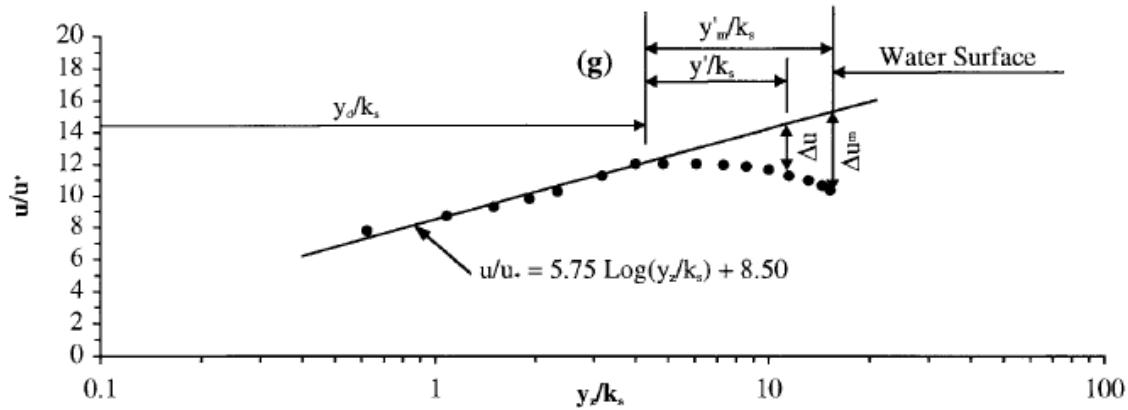
$$\frac{\bar{u}}{u_*} = \frac{1}{\kappa} \ln \frac{u_* z}{\nu} + B_0 + \frac{\Pi}{\kappa} 2 \sin^2 \left( \frac{\pi z}{2\delta} \right) \quad (\text{A13})$$

where  $\Pi$  is the wake parameter.

Experiments performed with a culvert with a 12 mm corrugation height and a 68 mm corrugation spacing show that turbulent open-channel flows follow the Prandtl equation (similar to equation (A10)) for rough turbulent flow (Ead et al. 2000):

$$\frac{\bar{u}}{u_*} = \frac{2.30}{\kappa} \log \frac{y_0}{k_s} + 8.5 \quad (\text{A14})$$

where  $\kappa$  was assumed equal to 0.40,  $k_s$  was the corrugation height of 12 mm, and  $y_0$  is the vertical depth measured from the datum in the central plane of the culvert. It is not clear where the datum was located in relation to the corrugation height. Near the water surface the velocity deviated from equation (A14) by an amount  $\Delta u_m$  (Fig. A3). The velocity deviations occurred closer to the bed as the traverse distance from the culvert center increased (Ead et al. 2000).



**Fig. A3. Sketch showing the velocity deviation from the log-law equation (Ead et al. 2000).**

## Turbulence Characteristics

To apply the Navier-Stokes equations to turbulent flows, the velocity can be decomposed into three components (White 2003):

$$u_i' = u_i - \bar{u}_i \quad (\text{A14})$$

where  $i$  is the  $x$ ,  $y$ , and  $z$  directions, and  $u_i'$ ,  $u_i$ , and  $\bar{u}_i$  represent the fluctuating, instantaneous, and time-averaged velocities. When the time-averaged velocities are substituted into the Navier-Stokes equations, they become (Mathieu and Scott 2000):

$$\rho \frac{\partial \bar{u}_i}{\partial t} + \rho \bar{U}_j \frac{\partial \bar{u}_i}{\partial x_j} = - \frac{\partial \bar{P}}{\partial x_i} + \mu \frac{\partial^2 \bar{u}_i}{\partial x_j \partial x_i} - \rho \frac{\overline{u_i' u_j'}}{\partial x_j} \quad (\text{A15})$$

$$\frac{\partial \bar{u}_i}{\partial x_i} = 0 \quad (\text{A16})$$

where  $\bar{P}$  is the average pressure,  $\rho$  is the fluid density, and  $\mu$  is the fluid viscosity. The term

$\rho \frac{\overline{u_i' u_j'}}{\partial x_j}$  is referred to as the Reynolds shear stress (Mathieu and Scott 2000).

The fluctuations in turbulent flow are often quantified using turbulent intensities (TI) and turbulent kinetic energy (TKE) (Tritico and Hotchkiss 2005):

$$TI_i = \sqrt{\overline{(u_i')^2}} \quad (\text{A17})$$

$$TKE = \frac{\overline{u_i u_i}}{2} \quad (\text{A18})$$

TI and TKE parameters are often normalized with the shear velocity. Both TI and TKE have been found to decay in flow moving away from the bed (Nezu and Nakagawa 1993):

$$\frac{TI_x}{u_*} = 2.30 \exp(-y/h) \quad (A19)$$

$$\frac{TI_y}{u_*} = 1.27 \exp(-y/h) \quad (A20)$$

$$\frac{TI_z}{u_*} = 1.63 \exp(-y/h) \quad (A21)$$

$$\frac{TKE}{u_*^2} = 4.78 \exp(-2y/h) \quad (A22)$$

where x, y, and z represent the streamwise, transverse, and vertical directions, h represents the water depth, and y represents the height above the boundary. Equations (A19)-(A22) describe the decay of TI and TKE for smooth boundaries, but are not as accurate near the surface of a rough boundary. When  $y/h > 0.30$ , the roughness has no effect on turbulence intensities or energy. When  $y/h < 0.30$ , the TI is mostly influenced by the roughness size (Nezu and Nakagawa 1993).

Using a roughened channel, Song and Chiew developed similar equations for TI decay (2001):

$$\frac{TI_x}{u_*} = D_x \exp(-y/h) \quad (A23)$$

$$\frac{TI_y}{u_*} = D_y \exp(-y/h) \quad (A24)$$

$$\frac{TI_z}{u_*} = D_z \exp(-y/h) \quad (A25)$$

where  $D_x$ ,  $D_y$ , and  $D_z$  are constants shown empirically to equal:

$$D_x = 0.6(0.1\beta^2 + \beta) + 3 \quad (A26)$$

$$D_y = 0.3(0.1\beta^2 + \beta) + 1.5 \quad (A27)$$

$$D_z = 0.45(0.1\beta^2 + \beta) + 2.25 \quad (\text{A28})$$

where  $\beta$  is a constant pressure-gradient parameter. Using Equations (A26)-(A28), Song and Chiew show that  $D_x = 2D_y = 4/3D_z$ , or that  $TI_x = 2TI_y = 4/3TI_z$ .

## Conclusion

There have been many studies in the past 15 years describing the general flow field in a culvert fitted with baffles. Rajaratnam and others have thoroughly described the general flow field through culverts fitted with various baffle types, and field studies give examples of successful and failing baffle structures; equations exist to describe velocity profiles in roughened open-channel flows, including corrugated culverts; and equations for computing turbulence characteristics in a roughened channel are available.

However, all these tools have not been used to understand the flow in a baffled culvert in detail. There are a number of areas in which a more detailed description of the flow field would be useful. First, fish tend to hug the walls of culverts while swimming upstream, so it is therefore important to understand the flow characteristics near the boundary region. As Pearson et al. (2005) mentions, turbulence conditions near the boundary layer of corrugated culverts may be important because turbulent velocity bursts could exceed the swimming ability of fish. Second, large-scale eddies caused by water plunging over the baffles often form areas of recirculation in front of baffles, and may be beneficial in fish passage. Measuring the turbulence characteristics of these eddies may provide answers to how fish use the eddies during upstream travel through a culvert. Third, it is important to have experimental data to verify computational fluid models of the flow through baffled culverts. Turbulence data collected with an acoustic Doppler velocimeter, or other such device, would work best for this purpose.

It is hoped that this paper will provide a strong foundation on which to conduct further experimentation on the topic of baffles culverts in more detail.

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## **APPENDIX B—RAW DATA**

Below is the raw data used in this project as well as calculated turbulent intensities and turbulent kinetic energy. The table column headings represent the cross section number (XS); vertical position measured from the bottom of the culvert (vertical); lateral position measured from the center of the culvert (lateral); streamwise, lateral, and vertical velocities (Vx, Vy, Vz); streamwise, lateral, and vertical turbulence intensities (TIx, TIy, TIz); turbulent kinetic energy (TKE), and data classification (data type). The data classification is “A” if the data is good, and “C” if the data was filtered out.

## Sloped-weir Baffle

**Table B1. Summary of data for sloped-weir baffles at a 1.14% culvert slope.**

XS	Flow rate cfs	Centerline Depth	Vertical	Lateral	Vx ft/s	Vy ft/s	Vz ft/s	Tlx ft/s	Tly ft/s	Tlz ft/s	TKE ft <sup>3</sup> /s <sup>2</sup>	Data Type
		ft	ft	ft								
1	1.5	0.69	0.57	-1.62	0.251	-0.011	-0.031	0.153	0.083	0.085	0.019	A
1	1.5	0.69	0.51	-1.62	0.128	0.039	-0.018	0.173	0.072	0.108	0.023	A
1	1.5	0.69	0.56	-1.15	0.415	-0.035	-0.012	0.174	0.102	0.103	0.026	A
1	1.5	0.69	0.36	-1.15	0.250	0.047	-0.011	0.159	0.094	0.096	0.022	A
1	1.5	0.69	0.56	0.00	1.061	0.006	-0.008	0.215	0.146	0.146	0.044	A
1	1.5	0.69	0.40	0.00	0.869	0.026	0.029	0.220	0.143	0.156	0.047	A
1	1.5	0.69	0.31	0.00	0.810	0.020	0.014	0.217	0.162	0.158	0.049	A
1	1.5	0.69	0.23	0.00	0.729	0.023	0.012	0.247	0.152	0.143	0.052	A
1	1.5	0.69	0.17	0.00	0.640	0.006	0.015	0.237	0.144	0.130	0.047	A
1	1.5	0.69	0.12	0.00	0.563	0.002	0.018	0.232	0.148	0.141	0.048	A
1	1.5	0.69	0.06	0.00	0.456	-0.007	0.016	0.228	0.151	0.129	0.046	A
1	1.5	0.69	0.56	1.15	1.333	-0.018	-0.042	0.343	0.187	0.232	0.103	A
1	1.5	0.69	0.36	1.15	1.177	0.006	-0.033	0.358	0.222	0.242	0.118	A
1	1.5	0.69	0.57	1.62	0.269	-0.018	0.013	0.208	0.110	0.146	0.038	A
1	1.5	0.69	0.51	1.62	0.059	-0.003	-0.002	0.078	0.027	0.060	0.005	A
2	1.5	0.58	0.45	0.00	3.269	-0.579	-1.608	0.335	0.287	0.478	0.212	A
2	1.5	0.58	0.32	0.00	0.999	-0.130	-0.385	0.487	0.413	0.496	0.327	A
2	1.5	0.58	0.25	0.00	0.318	-0.341	-0.054	0.392	0.315	0.401	0.207	A
2	1.5	0.58	0.19	0.00	0.092	-0.346	-0.008	0.380	0.296	0.380	0.188	A
2	1.5	0.58	0.14	0.00	-0.020	-0.132	0.031	0.406	0.340	0.397	0.219	A
2	1.5	0.58	0.09	0.00	-0.077	0.140	0.103	0.458	0.387	0.417	0.267	A
2	1.5	0.58	0.05	0.00	-0.135	0.372	0.106	0.472	0.381	0.407	0.267	A
2	1.5	0.58	0.45	-0.51	0.667	0.458	-0.411	0.900	0.502	0.624	0.726	A
2	1.5	0.58	0.33	-0.51	1.994	-0.229	-1.967	0.832	0.482	0.631	0.661	A
2	1.5	0.58	0.21	-0.51	1.179	0.006	-1.418	0.697	0.454	0.857	0.713	A
2	1.5	0.58	0.13	-0.51	0.466	0.387	-0.974	0.760	0.460	0.890	0.790	A
2	1.5	0.58	0.45	-1.03	-0.412	0.726	-0.157	0.338	0.207	0.352	0.141	A
2	1.5	0.58	0.38	-1.03	0.073	0.782	-0.068	0.455	0.286	0.396	0.223	A
2	1.5	0.58	0.29	-1.03	0.616	0.398	0.261	0.571	0.418	0.553	0.403	A
2	1.5	0.58	0.24	-1.03	1.107	0.060	0.393	0.675	0.428	0.582	0.488	A
2	1.5	0.58	0.46	-1.28	-0.545	0.285	-0.120	0.224	0.140	0.198	0.054	A
2	1.5	0.58	0.41	-1.28	-0.414	0.310	0.001	0.256	0.178	0.239	0.077	A
2	1.5	0.58	0.36	-1.28	-0.163	0.274	0.149	0.339	0.210	0.312	0.128	A
2	1.5	0.58	0.32	-1.28	0.036	0.032	0.383	0.724	0.276	0.612	0.487	A
2	1.5	0.58	0.46	-1.45	-0.540	0.115	-0.123	0.222	0.111	0.172	0.046	A
2	1.5	0.58	0.43	-1.45	-0.405	0.118	-0.099	0.272	0.131	0.187	0.063	A
2	1.5	0.58	0.41	-1.45	-0.187	0.123	-0.031	0.885	0.229	0.660	0.636	A
2	1.5	0.58	0.39	-1.45	-0.222	0.068	0.113	0.198	0.071	0.152	0.034	A
2	1.5	0.58	0.45	0.51	2.768	0.121	-1.076	0.547	0.399	0.640	0.434	A
2	1.5	0.58	0.33	0.51	0.377	0.280	0.120	0.394	0.372	0.451	0.248	A
2	1.5	0.58	0.21	0.51	0.133	0.084	0.368	0.363	0.401	0.417	0.233	A
2	1.5	0.58	0.13	0.51	-0.045	-0.062	0.312	0.400	0.446	0.421	0.268	A
2	1.5	0.58	0.45	1.03	2.785	0.469	-1.028	0.620	0.394	0.614	0.458	A
2	1.5	0.58	0.38	1.03	0.859	0.362	-0.215	0.487	0.385	0.578	0.360	A
2	1.5	0.58	0.29	1.03	0.502	0.035	0.059	0.295	0.286	0.276	0.122	A
2	1.5	0.58	0.24	1.03	0.589	-0.277	0.007	0.417	0.337	0.346	0.204	A
2	1.5	0.58	0.46	1.28							C	
2	1.5	0.58	0.41	1.28							C	
2	1.5	0.58	0.36	1.28	1.113	-0.021	-0.444	0.486	0.435	0.538	0.357	A
2	1.5	0.58	0.33	1.28							C	
2	1.5	0.58	0.46	1.45							C	
2	1.5	0.58	0.41	1.45							C	
2	1.5	0.58	0.36	1.45							C	
2	1.5	0.58	0.43	1.45							C	
2	1.5	0.58	0.39	1.45							C	
3	1.5	0.58	0.35	1.31							C	
3	1.5	0.58	0.34	1.31							C	
3	1.5	0.58	0.32	1.31							C	
3	1.5	0.58	0.31	1.31	0.455	0.245	-0.075	1.313	0.774	0.312	1.210	A
3	1.5	0.58	0.35	1.05							C	
3	1.5	0.58	0.30	1.05							C	
3	1.5	0.58	0.25	1.05							C	
3	1.5	0.58	0.22	1.05	0.037	-0.284	-0.240	1.226	0.769	0.276	1.086	A
3	1.5	0.58	0.35	0.53	1.047	-0.132	-0.049	0.651	0.535	0.426	0.446	A
3	1.5	0.58	0.26	0.53	0.563	-0.078	0.064	0.469	0.415	0.377	0.268	A
3	1.5	0.58	0.17	0.53	0.333	0.189	0.130	0.442	0.462	0.281	0.244	A
3	1.5	0.58	0.11	0.53	-0.025	0.088	0.061	0.702	0.665	0.166	0.481	A
3	1.5	0.58	0.35	0.01	1.436	0.154	-0.030	0.705	0.529	0.416	0.475	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
3	1.5	0.58	0.30	0.01	1.665	0.143	-0.099	0.641	0.522	0.418	0.429	A
3	1.5	0.58	0.25	0.01	1.700	0.181	-0.178	0.607	0.535	0.434	0.421	A
3	1.5	0.58	0.19	0.01	1.633	0.221	-0.139	0.886	0.686	0.395	0.706	A
3	1.5	0.58	0.14	0.01	1.293	0.354	-0.034	0.603	0.645	0.325	0.443	A
3	1.5	0.58	0.11	0.01	1.405	0.349	-0.065	0.551	0.515	0.333	0.340	A
3	1.5	0.58	0.08	0.01	1.416	0.372	0.039	0.555	0.463	0.259	0.295	A
3	1.5	0.58	0.35	-0.52	0.160	0.026	0.016	0.450	0.414	0.328	0.241	A
3	1.5	0.58	0.26	-0.52	0.738	0.023	0.087	0.541	0.457	0.352	0.313	A
3	1.5	0.58	0.17	-0.52	1.433	-0.058	0.087	0.628	0.408	0.294	0.323	A
3	1.5	0.58	0.11	-0.52	1.237	-0.161	0.119	0.622	0.659	0.244	0.440	A
3	1.5	0.58	0.35	-1.04	0.794	-0.128	0.240	0.394	0.343	0.252	0.168	A
3	1.5	0.58	0.30	-1.04	0.777	-0.219	0.206	0.455	0.353	0.227	0.192	A
3	1.5	0.58	0.25	-1.04	0.597	-0.176	0.132	0.563	0.473	0.206	0.292	A
3	1.5	0.58	0.22	-1.04	0.472	-0.125	0.140	0.524	0.556	0.195	0.311	A
3	1.5	0.58	0.35	-1.31	-0.005	-0.043	0.051	0.555	0.498	0.164	0.291	A
3	1.5	0.58	0.34	-1.31	-0.044	-0.066	0.026	0.485	0.382	0.155	0.203	A
3	1.5	0.58	0.32	-1.31	-0.008	-0.024	0.013	0.604	0.438	0.147	0.289	A
3	1.5	0.58	0.31	-1.31	0.033	-0.077	0.003	1.008	0.268	0.172	0.559	A
4	1.5	0.65	0.43	-1.50	0.053	-0.070	-0.011	0.077	0.062	0.013	0.005	A
4	1.5	0.65	0.42	-1.50	0.157	0.036	0.014	0.541	0.809	0.147	0.484	A
4	1.5	0.65	0.43	-1.30								C
4	1.5	0.65	0.40	-1.30	2.022	-0.007	0.245	1.544	0.621	0.235	1.413	A
4	1.5	0.65	0.38	-1.30	0.265	-0.024	0.018	0.166	0.156	0.108	0.032	A
4	1.5	0.65	0.43	-1.06	0.235	-0.022	0.025	0.428	0.547	0.133	0.250	A
4	1.5	0.65	0.36	-1.06								C
4	1.5	0.65	0.29	-1.06								C
4	1.5	0.65	0.25	-1.06	0.532	0.029	0.005	0.214	0.211	0.169	0.060	A
4	1.5	0.65	0.43	-0.53	0.562	-0.005	-0.001	0.226	0.216	0.156	0.061	A
4	1.5	0.65	0.32	-0.53	0.499	-0.039	0.020	0.475	0.708	0.162	0.377	A
4	1.5	0.65	0.21	-0.53				1.578	1.828	0.309	2.962	A
4	1.5	0.65	0.13	-0.53	1.038	-0.016	-0.038	0.277	0.253	0.205	0.091	A
4	1.5	0.65	0.42	0.00	1.015	-0.003	-0.032	0.279	0.243	0.208	0.090	A
4	1.5	0.65	0.37	0.00	1.008	0.002	-0.062	0.273	0.231	0.185	0.081	A
4	1.5	0.65	0.30	0.00	0.968	0.012	-0.050	0.255	0.226	0.173	0.073	A
4	1.5	0.65	0.24	0.00	0.794	0.013	-0.008	0.454	0.556	0.168	0.272	A
4	1.5	0.65	0.18	0.00	0.809	0.048	-0.044	0.376	0.301	0.146	0.127	A
4	1.5	0.65	0.14	0.00								C
4	1.5	0.65	0.10	0.00								C
4	1.5	0.65	0.06	0.00	1.307	0.038	0.013	0.358	0.318	0.271	0.151	A
4	1.5	0.65	0.43	0.53	1.193	-0.028	-0.004	0.365	0.306	0.235	0.141	A
4	1.5	0.65	0.32	0.53	1.004	-0.101	-0.036	0.437	0.428	0.209	0.209	A
4	1.5	0.65	0.21	0.53								C
4	1.5	0.65	0.13	0.53	1.909	0.039	-0.100	0.461	0.324	0.262	0.193	A
4	1.5	0.65	0.43	1.06	1.595	0.084	-0.053	0.532	0.385	0.262	0.250	A
4	1.5	0.65	0.36	1.06	0.338	-0.388	0.181	0.995	1.449	0.312	1.594	A
4	1.5	0.65	0.29	1.06	0.495	0.056	0.039	0.661	0.727	0.176	0.498	A
4	1.5	0.65	0.27	1.06	-0.069	-0.164	0.032	0.098	0.085	0.019	0.009	A
5	1.5	0.72	0.42	0.00	0.929	0.027	0.005	0.274	0.179	0.181	0.070	A
5	1.5	0.72	0.33	0.00	0.849	0.025	-0.017	0.255	0.159	0.160	0.058	A
5	1.5	0.72	0.24	0.00	0.762	0.058	-0.012	0.238	0.152	0.159	0.053	A
5	1.5	0.72	0.18	0.00	0.642	0.049	-0.003	0.233	0.154	0.145	0.049	A
5	1.5	0.72	0.12	0.00	0.519	0.042	0.003	0.227	0.150	0.139	0.047	A
5	1.5	0.72	0.11	0.00								C
5	1.5	0.72	0.59	0.00	0.900	-0.090	-0.018	0.280	0.186	0.153	0.068	A
5	1.5	0.72	0.44	-0.58	0.632	-0.026	-0.016	0.250	0.179	0.168	0.061	A
5	1.5	0.72	0.28	-0.58								C
5	1.5	0.72	0.17	-0.58								C
5	1.5	0.72	0.59	-0.58	0.373	-0.064	-0.008	0.252	0.151	0.139	0.053	A
5	1.5	0.72	0.49	-1.16								C
5	1.5	0.72	0.38	-1.16								C
5	1.5	0.72	0.31	-1.16								C
5	1.5	0.72	0.60	-1.16								C
5	1.5	0.72	0.47	-1.46								C
5	1.5	0.72	0.60	-1.46								C
5	1.5	0.72	0.54	-1.65								C
5	1.5	0.72	0.59	-1.65	1.583	0.100	-0.060	0.365	0.218	0.225	0.116	A
5	1.5	0.72	0.44	0.12	1.381	0.100	-0.075	0.355	0.227	0.233	0.116	A
5	1.5	0.72	0.28	0.12	1.275	0.007	-0.071	0.341	0.219	0.217	0.106	A
5	1.5	0.72	0.17	0.12	0.992	-0.051	-0.079	0.357	0.213	0.198	0.106	A
5	1.5	0.72	0.59	0.12	1.217	0.105	-0.030	0.388	0.267	0.265	0.146	A
5	1.5	0.72	0.49	0.70	1.039	0.082	-0.031	0.400	0.287	0.272	0.158	A
5	1.5	0.72	0.38	0.70	0.620	0.092	-0.027	0.371	0.242	0.244	0.128	A
5	1.5	0.72	0.32	0.70	0.134	0.074	0.028	0.337	0.232	0.264	0.119	A
5	1.5	0.72	0.60	0.70	0.705	0.028	0.023	0.341	0.228	0.220	0.108	A
5	1.5	0.72	0.47	1.00	0.132	0.005	-0.017	0.849	0.222	0.422	0.474	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
5	1.5	0.72	0.60	1.00	0.227	-0.029	-0.098	0.381	0.174	0.275	0.125	A
5	1.5	0.72	0.54	1.19	-0.112	-0.074	0.064	0.676	0.216	0.857	0.619	A
6	1.5	0.83	0.70	-0.01	0.937	-0.094	-0.009	0.236	0.168	0.155	0.054	A
6	1.5	0.83	0.50	-0.01	0.716	-0.037	0.009	0.234	0.163	0.168	0.055	A
6	1.5	0.83	0.39	-0.01	0.683	-0.030	0.001	0.245	0.167	0.140	0.054	A
6	1.5	0.83	0.29	-0.01	0.538	-0.054	0.023	0.202	0.150	0.132	0.040	A
6	1.5	0.83	0.21	-0.01								C
6	1.5	0.83	0.14	-0.01								C
6	1.5	0.83	0.13	-0.01	0.345	-0.021	0.005	0.182	0.131	0.112	0.031	A
6	1.5	0.83	0.70	-1.21								C
6	1.5	0.83	0.44	-1.21	0.511	0.004	-0.022	0.179	0.132	0.111	0.031	A
6	1.5	0.83	0.71	-1.72	0.540	-0.059	-0.023	0.189	0.088	0.102	0.027	A
6	1.5	0.83	0.61	-1.72								C
6	1.5	0.83	0.70	0.75	1.164	0.108	-0.046	0.270	0.191	0.168	0.069	A
6	1.5	0.83	0.44	0.75	0.780	0.094	-0.004	0.276	0.186	0.169	0.070	A
6	1.5	0.83	0.71	1.26	0.542	0.003	0.009				0.813	A
6	1.5	0.83	0.61	1.26								C
1	3.0	0.84	0.62	-1.57	1.001	0.043	-0.064	0.316	0.211	0.141	0.082	A
1	3.0	0.84	0.52	-1.57	0.234	0.170	0.006	1.784	0.899	0.285		C
1	3.0	0.84	0.62	-1.26	1.088	0.013	-0.069	0.258	0.204	0.152	0.066	A
1	3.0	0.84	0.42	-1.26	0.753	0.070	-0.053	0.323	0.214	0.147	0.086	A
1	3.0	0.84	0.61	0.01	1.384	0.086	-0.088	0.239	0.208	0.179	0.066	A
1	3.0	0.84	0.53	0.01	1.451	0.050	-0.084	0.258	0.215	0.188	0.074	A
1	3.0	0.84	0.44	0.01	1.501	-0.017	-0.088	0.258	0.215	0.178	0.072	A
1	3.0	0.84	0.34	0.01	1.524	-0.066	-0.089	0.291	0.221	0.174	0.082	A
1	3.0	0.84	0.25	0.01	1.403	-0.081	-0.069	0.291	0.236	0.174	0.085	A
1	3.0	0.84	0.19	0.01	1.282	-0.123	-0.071	0.342	0.289	0.176	0.116	A
1	3.0	0.84	0.13	0.01	1.002	-0.092	-0.048	0.398	0.407	0.166	0.176	A
1	3.0	0.84	0.62	1.26	1.609	0.101	-0.040	0.377	0.286	0.262	0.146	A
1	3.0	0.84	0.42	1.26	1.256	0.041	-0.048	0.477	0.334	0.236	0.197	A
1	3.0	0.84	0.62	1.57	0.834	0.052	0.029	0.396	0.281	0.187	0.136	A
1	3.0	0.84	0.52	1.57								C
2	3.0	0.77	0.55	-1.69								C
2	3.0	0.77	0.49	-1.49	0.043	0.057	-0.010	0.109	0.157	0.025	0.019	A
2	3.0	0.77	0.46	-1.49	1.468	0.854	0.040	1.284	0.887	0.236	1.246	A
2	3.0	0.77	0.43	-1.49	0.870	1.484	-0.147	4.307	1.749	0.634	11.007	A
2	3.0	0.77	0.45	-1.20	0.435	-0.130	-0.320	0.924	1.068	0.731	1.264	A
2	3.0	0.77	0.37	-1.20	0.179	1.471	-0.750	1.449	2.003	0.543	3.202	A
2	3.0	0.77	0.31	-1.20	-0.588	-0.043	-0.055	1.657	0.376	0.226	1.469	A
2	3.0	0.77	0.51	-0.60	0.255	-0.713	-0.023	0.692	0.688	0.445	0.576	A
2	3.0	0.77	0.40	-0.60	-0.076	-0.627	0.120	0.429	0.406	0.284	0.215	A
2	3.0	0.77	0.26	-0.60	-0.170	0.365	0.058	0.618	0.602	0.288	0.413	A
2	3.0	0.77	0.16	-0.60	-0.003	0.721	-0.081	3.371	3.520	0.670	12.100	A
2	3.0	0.77	0.54	0.01	0.057	0.239	0.220	0.983	1.028	0.601	1.192	A
2	3.0	0.77	0.47	0.01	-0.361	0.204	0.352	0.554	0.489	0.393	0.350	A
2	3.0	0.77	0.39	0.01	-0.532	0.167	0.424	0.462	0.429	0.276	0.237	A
2	3.0	0.77	0.31	0.01	-0.478	0.167	0.337	0.463	0.455	0.231	0.237	A
2	3.0	0.77	0.22	0.01	-0.325	0.265	0.200	0.644	0.489	0.219	0.351	A
2	3.0	0.77	0.17	0.01	-0.138	0.321	0.129	1.348	0.558	0.278	1.103	A
2	3.0	0.77	0.12	0.01	-0.034	0.432	0.096	2.397	1.211	0.395	3.685	A
2	3.0	0.77	0.50	0.60	0.035	0.222	0.111	0.583	0.681	0.445	0.501	A
2	3.0	0.77	0.40	0.60	-0.114	-0.282	0.080	0.488	0.468	0.319	0.279	A
2	3.0	0.77	0.26	0.60								C
2	3.0	0.77	0.55	1.20	1.078	0.062	-0.161	0.720	0.719	0.548	0.668	A
2	3.0	0.77	0.46	1.20	0.579	-0.485	-0.130	0.896	1.107	0.448	1.115	A
2	3.0	0.77	0.55	1.49	1.038	-0.549	-0.931	1.932	2.474	0.538	5.071	A
2	3.0	0.77	0.51	1.49	-0.133	0.098	-0.156	1.318	1.310	0.275	1.765	A
2	3.0	0.77	0.46	1.49	0.242	-0.420	-0.075	0.964	0.783	0.168	0.785	A
3	3.0	0.84	0.51	-1.58	-0.100	0.001	0.041	0.854	1.139	0.245	1.043	A
3	3.0	0.84	0.49	-1.58	-0.114	-0.004	0.028	1.298	1.374	0.276	1.825	A
3	3.0	0.84	0.48	-1.58	-0.052	0.096	0.046	2.462	0.271	0.329	3.121	A
3	3.0	0.84	0.51	-1.39	1.079	0.003	0.065	0.545	0.403	0.351	0.291	A
3	3.0	0.84	0.46	-1.39	0.935	0.006	0.064	0.705	0.689	0.312	0.534	A
3	3.0	0.84	0.42	-1.39	0.438	0.036	0.012	0.887	0.628	0.315	0.640	A
3	3.0	0.84	0.39	-1.39	-0.148	-0.322	-0.115	0.722	0.387	0.152	0.347	A
3	3.0	0.84	0.51	-1.12	1.967	0.232	0.186	0.552	0.513	0.338	0.341	A
3	3.0	0.84	0.42	-1.12	1.669	0.186	0.145	0.614	0.528	0.349	0.388	A
3	3.0	0.84	0.34	-1.12	1.123	0.078	0.141	1.066	0.691	0.373	0.877	A
3	3.0	0.84	0.28	-1.12	0.003	-0.170	0.139	2.189	1.499	0.406	3.602	A
3	3.0	0.84	0.50	-0.56	1.382	-0.097	-0.109	0.910	0.807	0.500	0.865	A
3	3.0	0.84	0.37	-0.56	1.460	-0.060	-0.286	0.848	0.758	0.520	0.782	A
3	3.0	0.84	0.24	-0.56	1.199	0.271	-0.257	0.746	0.632	0.482	0.594	A
3	3.0	0.84	0.15	-0.56	0.432	0.260	0.025	1.598	1.096	0.423	1.968	A
3	3.0	0.84	0.50	0.00	1.105	0.069	0.018	0.991	0.801	0.594	0.989	A
3	3.0	0.84	0.43	0.00	0.690	-0.005	-0.051	0.876	0.738	0.540	0.801	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
3	3.0	0.84	0.36	0.00	0.120	-0.056	-0.011	0.660	0.620	0.493	0.532	A
3	3.0	0.84	0.28	0.00	-0.207	0.017	-0.011	0.554	0.523	0.441	0.387	A
3	3.0	0.84	0.21	0.00	-0.345	0.144	0.032	0.610	0.735	0.364	0.522	A
3	3.0	0.84	0.16	0.00	-0.201	0.098	0.053	1.677	2.503	0.424	4.628	A
3	3.0	0.84	0.50	0.56	1.868	0.296	0.072	1.117	0.883	0.524	1.151	A
3	3.0	0.84	0.37	0.56	1.233	0.138	-0.125	0.920	0.758	0.568	0.871	A
3	3.0	0.84	0.24	0.56	0.906	-0.305	-0.085	0.729	0.867	0.450	0.742	A
3	3.0	0.84	0.15	0.56	-0.204	-0.313	0.046	0.341	0.582	0.085	0.231	A
3	3.0	0.84	0.51	1.12	3.736	-0.239	-0.116	0.322	0.312	0.209	0.123	A
3	3.0	0.84	0.42	1.12	3.531	-0.141	-0.269	0.491	0.404	0.253	0.234	A
3	3.0	0.84	0.34	1.12	2.284	0.200	-0.219	2.054	0.960	0.511	2.701	A
3	3.0	0.84	0.30	1.12	0.098	0.185	-0.218	1.035	0.688	0.288	0.814	A
3	3.0	0.84	0.51	1.40	1.931	-0.173	0.034	0.916	0.562	0.444	0.676	A
3	3.0	0.84	0.46	1.40	1.210	0.033	0.104	1.575	0.760	0.450	1.629	A
3	3.0	0.84	0.42	1.40	0.408	0.182	0.032	0.994	0.942	0.362	1.003	A
3	3.0	0.84	0.38	1.40	-0.294	0.139	-0.117	1.243	0.878	0.353	1.220	A
3	3.0	0.84	0.51	1.50	1.052	-0.127	0.096	0.910	0.701	0.425	0.751	A
3	3.0	0.84	0.49	1.50	0.474	-0.028	0.120	0.923	0.707	0.368	0.744	A
4	3.0	0.73	0.51	-1.40	0.595	-0.017	0.010	0.294	0.232	0.148	0.081	A
4	3.0	0.73	0.46	-1.40	0.290	-0.102	0.009	0.708	0.908	0.193	0.682	A
4	3.0	0.73	0.39	-1.40	-0.212	-0.132	0.091	0.583	0.953	0.157	0.636	A
4	3.0	0.73	0.38	-1.24	-0.098	0.500	0.021	0.767	1.235	0.209	1.079	A
4	3.0	0.73	0.51	-1.24	0.851	-0.034	0.020	0.288	0.248	0.183	0.089	A
4	3.0	0.73	0.44	-1.24	0.723	-0.007	0.012	0.337	0.264	0.177	0.107	A
4	3.0	0.73	0.46	-1.24	0.461	0.133	-0.002	0.911	0.833	0.212	0.785	A
4	3.0	0.73	0.30	-0.98	-0.322	-0.615	0.146	0.540	0.898	0.147	0.560	A
4	3.0	0.73	0.51	-0.98	0.960	-0.038	0.026	0.279	0.230	0.191	0.084	A
4	3.0	0.73	0.41	-0.98	0.794	-0.018	0.050	0.371	0.356	0.169	0.147	A
4	3.0	0.73	0.31	-0.98	0.280	-0.085	-0.018	0.891	0.699	0.179	0.657	A
4	3.0	0.73	0.24	-0.50								C
4	3.0	0.73	0.50	-0.50	1.044	-0.004	0.007	0.227	0.212	0.172	0.063	A
4	3.0	0.73	0.37	-0.50	0.933	-0.058	0.018	0.241	0.209	0.162	0.064	A
4	3.0	0.73	0.23	-0.50	0.691	-0.007	0.046	0.454	0.643	0.160	0.322	A
4	3.0	0.73	0.14	0.00	0.313	-0.071	0.018	0.504	0.728	0.150	0.404	A
4	3.0	0.73	0.50	0.00	1.114	0.044	-0.073	0.243	0.236	0.210	0.079	A
4	3.0	0.73	0.43	0.00	1.052	-0.005	-0.038	0.246	0.236	0.215	0.081	A
4	3.0	0.73	0.36	0.00	0.977	-0.015	-0.026	0.256	0.234	0.200	0.080	A
4	3.0	0.73	0.28	0.00	0.958	-0.039	-0.035	0.262	0.224	0.190	0.077	A
4	3.0	0.73	0.21	0.00	0.848	-0.036	-0.009	0.268	0.244	0.168	0.080	A
4	3.0	0.73	0.16	0.00	0.739	-0.075	-0.013	0.333	0.305	0.152	0.113	A
4	3.0	0.73	0.11	0.00	0.490	-0.165	-0.015	1.545	1.804	0.336	2.877	A
4	3.0	0.73	0.06	0.49								C
4	3.0	0.73	0.50	0.49	1.610	0.057	-0.051	0.379	0.301	0.283	0.157	A
4	3.0	0.73	0.46	0.49	1.639	0.044	-0.071	0.367	0.313	0.278	0.155	A
4	3.0	0.73	0.23	0.49	1.551	-0.148	-0.110	0.393	0.301	0.236	0.150	A
4	3.0	0.73	0.14	0.98	0.906	-0.070	-0.100	0.804	0.657	0.267	0.575	A
4	3.0	0.73	0.51	0.98	2.585	-0.034	-0.155	0.348	0.305	0.240	0.136	A
4	3.0	0.73	0.41	0.98	2.566	-0.022	-0.121	0.383	0.315	0.248	0.154	A
4	3.0	0.73	0.31	0.98	2.181	0.012	-0.125	0.538	0.374	0.273	0.252	A
4	3.0	0.73	0.24	1.24	0.572	-0.006	0.102	1.139	0.806	0.321	1.025	A
4	3.0	0.73	0.51	1.24	1.750	0.032	-0.095	0.449	0.322	0.310	0.201	A
4	3.0	0.73	0.44	1.24	1.781	0.119	-0.045	0.501	0.339	0.290	0.225	A
4	3.0	0.73	0.37	1.24	1.393	0.119	0.001	0.813	0.505	0.281	0.497	A
4	3.0	0.73	0.33	1.40	0.242	-0.075	0.135	0.466	0.422	0.148	0.209	A
4	3.0	0.73	0.51	1.40	1.236	0.139	0.048	0.450	0.326	0.287	0.196	A
4	3.0	0.73	0.46	1.40	1.088	0.167	0.043	0.611	0.510	0.269	0.353	A
4	3.0	0.73	0.41	1.40	0.418	0.391	0.029	0.344	0.306	0.082	0.109	A
4	3.0	0.73	0.38	1.40	-0.122	-0.346	0.044	0.085	0.129	0.030	0.012	A
5	3.0	0.96	0.74	-1.58	0.769	0.041	-0.054	0.323	0.304	0.153	0.110	A
5	3.0	0.96	0.57	-1.58	-0.035	0.038	-0.015	0.265	0.190	0.052	0.054	A
5	3.0	0.96	0.73	-1.27	0.976	-0.016	-0.033	0.252	0.218	0.163	0.069	A
5	3.0	0.96	0.47	-1.27	0.338	0.169	-0.052	0.548	0.842	0.175	0.520	A
5	3.0	0.96	0.73	0.00	1.260	0.067	-0.048	0.276	0.219	0.191	0.080	A
5	3.0	0.96	0.63	0.00	1.122	0.074	-0.015	0.268	0.220	0.193	0.079	A
5	3.0	0.96	0.52	0.00	1.054	0.046	-0.003	0.273	0.217	0.188	0.078	A
5	3.0	0.96	0.41	0.00	0.983	0.013	-0.007	0.291	0.236	0.179	0.086	A
5	3.0	0.96	0.30	0.00	0.892	-0.066	-0.010	0.298	0.251	0.153	0.088	A
5	3.0	0.96	0.23	0.00	0.787	-0.144	-0.010	0.336	0.264	0.146	0.102	A
5	3.0	0.96	0.15	0.00	-0.010	-0.009	0.013	0.136	0.177	0.042	0.026	A
5	3.0	0.96	0.73	1.27	1.593	0.062	-0.049	0.428	0.350	0.290	0.195	A
5	3.0	0.96	0.47	1.27								C
5	3.0	0.96	0.74	1.58	0.665	-0.015	-0.005	0.360	0.323	0.212	0.140	A
5	3.0	0.96	0.57	1.58								C
6	3.0	0.99	0.77	-1.64	0.989	-0.017	-0.061	0.193	0.145	0.098	0.005	A
6	3.0	0.99	0.60	-1.64	0.375	0.108	-0.021	0.844	0.392	0.173	0.015	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
6	3.0	0.99	0.76	-1.31	0.997	-0.031	-0.047	0.207	0.164	0.123	0.005	A
6	3.0	0.99	0.49	-1.31	0.759	0.038	-0.048	0.236	0.178	0.100	0.006	A
6	3.0	0.99	0.76	0.01	1.340	0.057	-0.042	0.242	0.206	0.164	0.007	A
6	3.0	0.99	0.65	0.01	1.311	0.043	-0.034	0.252	0.199	0.172	0.007	A
6	3.0	0.99	0.54	0.01	1.273	0.032	-0.038	0.250	0.198	0.161	0.007	A
6	3.0	0.99	0.43	0.01	1.218	-0.011	-0.021	0.261	0.212	0.157	0.007	A
6	3.0	0.99	0.31	0.01	1.143	-0.041	-0.038	0.268	0.206	0.146	0.007	A
6	3.0	0.99	0.24	0.01	1.073	-0.079	-0.037	0.281	0.229	0.144	0.007	A
6	3.0	0.99	0.16	0.01	0.585	-0.153	0.008	0.711	1.114	0.202	0.022	A
6	3.0	0.99	0.76	1.31	1.404	0.047	-0.016	0.332	0.240	0.204	0.008	A
6	3.0	0.99	0.49	1.31	0.994	0.066	0.002	0.670	0.290	0.202	0.013	A
6	3.0	0.99	0.77	1.64	0.837	-0.004	0.007	0.301	0.269	0.192	0.008	A
6	3.0	0.99	0.60	1.64								C
1	4.0	0.94	0.72	-1.80	0.684	0.217	-0.096	0.507	0.343	0.212	0.210	A
1	4.0	0.94	0.72	-1.59	1.389	0.071	-0.074	0.408	0.283	0.220	0.148	A
1	4.0	0.94	0.59	-1.59	0.824	0.150	-0.069	0.516	0.299	0.201	0.198	A
1	4.0	0.94	0.71	-1.27	1.549	0.054	-0.090	0.302	0.241	0.181	0.091	A
1	4.0	0.94	0.46	-1.27	1.074	0.131	-0.083	0.396	0.268	0.168	0.128	A
1	4.0	0.94	0.71	-0.64	1.315	0.053	-0.043	0.331	0.226	0.193	0.099	A
1	4.0	0.94	0.53	-0.64	1.089	0.030	-0.014	0.299	0.226	0.175	0.085	A
1	4.0	0.94	0.33	-0.64	0.790	0.050	-0.015	0.310	0.222	0.147	0.083	A
1	4.0	0.94	0.71	0.00	1.473	0.164	-0.064	0.293	0.238	0.210	0.093	A
1	4.0	0.94	0.61	0.00	1.335	0.143	-0.032	0.278	0.220	0.204	0.084	A
1	4.0	0.94	0.51	0.00	1.281	0.129	-0.018	0.292	0.224	0.211	0.090	A
1	4.0	0.94	0.40	0.00	1.214	0.084	-0.017	0.312	0.237	0.200	0.097	A
1	4.0	0.94	0.29	0.00	1.114	0.006	-0.016	0.316	0.245	0.178	0.096	A
1	4.0	0.94	0.22	0.00	0.950	-0.074	0.004	0.367	0.347	0.176	0.143	A
1	4.0	0.94	0.17	0.00	0.684	-0.069	0.020	0.429	0.508	0.163	0.235	A
1	4.0	0.94	0.71	0.64	2.418	0.152	-0.146	0.390	0.310	0.254	0.157	A
1	4.0	0.94	0.53	0.64	2.410	0.125	-0.174	0.389	0.296	0.246	0.150	A
1	4.0	0.94	0.33	0.64	2.078	0.077	-0.139	0.450	0.316	0.240	0.180	A
1	4.0	0.94	0.71	1.27	1.582	0.114	-0.039	0.412	0.311	0.290	0.175	A
1	4.0	0.94	0.48	1.27	1.398	0.160	-0.010	0.506	0.350	0.269	0.225	A
1	4.0	0.94	0.72	1.59	0.854	0.087	0.042	0.349	0.257	0.216	0.117	A
1	4.0	0.94	0.62	1.59	0.682	0.144	0.061	0.813	0.389	0.216	0.430	A
1	4.0	0.94	0.82	1.80	0.305	-0.045	0.039	0.260	0.253	0.143	0.076	A
2	4.0	0.81	0.62	-1.72								C
2	4.0	0.81	0.56	-1.52	0.591	1.607	-0.581	1.060	1.323	0.319	1.488	A
2	4.0	0.81	0.49	-1.52								C
2	4.0	0.81	0.54	-1.21	0.420	-0.438	-0.305	0.726	0.779	0.693	0.807	A
2	4.0	0.81	0.39	-1.21	0.272	2.484	-0.969	1.301	1.431	0.394	1.947	A
2	4.0	0.81	0.49	-1.21	0.035	0.103	-0.369	0.674	0.814	0.592	0.733	A
2	4.0	0.81	0.38	-1.21	-1.977	-0.414		1.402	0.358	0.202	1.067	A
2	4.0	0.81	0.58	-0.60	0.306	-0.789	-0.023	0.530	0.448	0.440	0.337	A
2	4.0	0.81	0.43	-0.60	-0.159	-0.531	0.071	0.454	0.441	0.325	0.253	A
2	4.0	0.81	0.28	-0.60	-0.113	0.748	-0.067	0.628	0.712	0.327	0.504	A
2	4.0	0.81	0.26	-0.60	-0.043	0.903	-0.063	0.962	0.785	0.313	0.820	A
2	4.0	0.81	0.58	0.01	-0.170	0.165	0.403	0.562	0.487	0.495	0.399	A
2	4.0	0.81	0.50	0.01	-0.528	0.168	0.355	0.414	0.381	0.321	0.210	A
2	4.0	0.81	0.41	0.01	-0.478	0.206	0.414	0.440	0.422	0.262	0.220	A
2	4.0	0.81	0.33	0.01	-0.478	0.317	0.317	0.464	0.471	0.262	0.253	A
2	4.0	0.81	0.24	0.01	-0.169	0.518	0.170	0.666	0.493	0.233	0.370	A
2	4.0	0.81	0.18	0.01	-0.045	0.494	0.102	1.016	0.616	0.212	0.728	A
2	4.0	0.81	0.16	0.01	-0.107	0.580	0.082	0.466	0.597	0.170	0.301	A
2	4.0	0.81	0.56	0.61	-0.064	0.271	0.151	0.464	0.522	0.387	0.319	A
2	4.0	0.81	0.43	0.61	-0.101	-0.333	0.131	0.434	0.391	0.323	0.223	A
2	4.0	0.81	0.33	0.61	-0.230	-0.758	0.202	0.583	0.595	0.328	0.401	A
2	4.0	0.81	0.59	0.61	0.066	0.501	0.148	0.594	0.568	0.478	0.452	A
2	4.0	0.81	0.58	1.21	1.009	-0.024	-0.087	0.611	0.616	0.513	0.508	A
2	4.0	0.81	0.51	1.21	0.531	-0.564	-0.190	0.760	0.824	0.452	0.731	A
2	4.0	0.81	0.59	1.39	2.070	-0.407	-1.038	1.082	0.910	0.608	1.184	A
2	4.0	0.81	0.58	1.39	1.105	-1.383	-0.948	1.167	1.643	0.529	2.171	A
3	4.0	0.79	0.57	-1.58	0.801	-0.013	0.066	0.655	0.456	0.332	0.374	A
3	4.0	0.79	0.54	-1.58	0.721	-0.015	0.099	0.746	0.535	0.318	0.472	A
3	4.0	0.79	0.50	-1.58	0.571	0.009	0.065	0.589	0.488	0.333	0.348	A
3	4.0	0.79	0.49	-1.58	-0.522	-0.466	0.366	0.978	1.147	0.304	1.182	A
3	4.0	0.79	0.57	-1.39	1.869	0.078	0.033	0.594	0.534	0.376	0.390	A
3	4.0	0.79	0.50	-1.39	1.681	0.097	-0.020	0.672	0.538	0.389	0.446	A
3	4.0	0.79	0.44	-1.39	1.305	0.052	-0.027	1.183	0.596	0.394	0.956	A
3	4.0	0.79	0.40	-1.39	0.988	0.595	0.046	1.228	1.139	0.327	1.456	A
3	4.0	0.79	0.57	-1.12	2.177	-0.057	0.173	0.665	0.665	0.397	0.521	A
3	4.0	0.79	0.46	-1.12	2.007	0.082	0.049	0.661	0.673	0.433	0.539	A
3	4.0	0.79	0.36	-1.12	1.676	0.106	-0.022	0.718	0.681	0.425	0.580	A
3	4.0	0.79	0.29	-1.12	0.706	-0.082	0.048	1.168	0.510	0.280	0.852	A
3	4.0	0.79	0.56	-0.56	1.746	-0.277	-0.019	1.146	1.044	0.640	1.407	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
3	4.0	0.79	0.42	-0.56	1.668	-0.298	-0.301	1.021	0.921	0.636	1.149	A
3	4.0	0.79	0.26	-0.56	0.969	0.168	-0.310	0.893	0.986	0.592	1.059	A
3	4.0	0.79	0.16	-0.56	0.230	-0.110	-0.023	0.978	1.462	0.333	1.603	A
3	4.0	0.79	0.56	0.00	1.549	-0.211	0.248	1.187	0.883	0.664	1.315	A
3	4.0	0.79	0.48	0.00	0.807	-0.152	0.145	1.058	0.846	0.631	1.116	A
3	4.0	0.79	0.40	0.00	0.246	-0.125	0.126	0.856	0.699	0.586	0.782	A
3	4.0	0.79	0.32	0.00	-0.158	-0.018	0.047	0.657	0.601	0.490	0.517	A
3	4.0	0.79	0.23	0.00	-0.349	0.112	0.076	0.633	0.676	0.407	0.512	A
3	4.0	0.79	0.18	0.00	-0.503	0.211	0.075	0.459	0.522	0.325	0.294	A
3	4.0	0.79	0.12	0.00	-0.025	0.000	-0.049	0.749	1.087	0.221	0.896	A
3	4.0	0.79	0.06	0.00								C
3	4.0	0.79	0.56	0.56	2.361	0.193	0.254	1.046	0.841	0.559	1.057	A
3	4.0	0.79	0.42	0.56	1.593	0.086	-0.093	0.952	0.899	0.678	1.087	A
3	4.0	0.79	0.26	0.56	1.025	-0.364	-0.212	0.761	0.849	0.618	0.841	A
3	4.0	0.79	0.16	0.56	0.300	-0.366	-0.243	0.825	0.716	0.468	0.706	A
3	4.0	0.79	0.57	1.12	3.543	-0.603	-0.098	0.258	0.299	0.214	0.101	A
3	4.0	0.79	0.46	1.12	3.431	-0.491	-0.351	0.330	0.342	0.254	0.145	A
3	4.0	0.79	0.36	1.12	2.071	-0.079	-0.055	0.987	0.966	0.556	1.108	A
3	4.0	0.79	0.29	1.12								C
3	4.0	0.79	0.57	1.40	2.531	-0.498	0.055	0.830	0.550	0.379	0.567	A
3	4.0	0.79	0.50	1.40	1.184	-0.367	-0.058	2.295	1.996	0.506	4.752	A
3	4.0	0.79	0.41	1.40	-0.125	-0.527	0.068	0.622	1.022	0.193	0.734	A
3	4.0	0.79	0.39	1.40								C
3	4.0	0.79	0.57	1.58								C
3	4.0	0.79	0.54	1.58	-0.002	0.006	0.000	0.039	0.046	0.008	0.002	A
3	4.0	0.79	0.50	1.58								C
3	4.0	0.79	0.48	1.58								C
4	4.0	0.83	0.61	-1.53	0.889	0.049	-0.025	0.459	0.344	0.234	0.192	A
4	4.0	0.83	0.56	-1.53	0.688	0.110	-0.071	0.903	0.440	0.249	0.535	A
4	4.0	0.83	0.49	-1.53	-0.098	0.248	0.047	0.285	0.328	0.168	0.109	A
4	4.0	0.83	0.47	-1.53	-0.161	0.382	0.028	0.307	0.449	0.113	0.155	A
4	4.0	0.83	0.61	-1.35	1.262	-0.062	-0.015	0.404	0.321	0.266	0.169	A
4	4.0	0.83	0.53	-1.35	1.104	-0.005	-0.022	0.468	0.338	0.246	0.197	A
4	4.0	0.83	0.44	-1.35	0.695	0.124	-0.097	0.635	0.355	0.181	0.281	A
4	4.0	0.83	0.39	-1.35	0.105	0.218	-0.027	0.125	0.184	0.040	0.026	A
4	4.0	0.83	0.60	-1.08	1.382	-0.039	0.038	0.366	0.295	0.239	0.139	A
4	4.0	0.83	0.44	-1.08	0.973	0.014	0.040	0.414	0.378	0.218	0.181	A
4	4.0	0.83	0.37	-1.08								C
4	4.0	0.83	0.29	-1.08								C
4	4.0	0.83	0.60	-0.54	1.341	-0.004	-0.058	0.280	0.259	0.213	0.095	A
4	4.0	0.83	0.44	-0.54	1.201	-0.006	-0.060	0.287	0.246	0.215	0.094	A
4	4.0	0.83	0.28	-0.54	0.914	0.018	-0.008	0.332	0.350	0.187	0.134	A
4	4.0	0.83	0.17	-0.54	0.018	0.040	0.007	0.113	0.136	0.030	0.016	A
4	4.0	0.83	0.60	0.00	1.218	0.032	0.000	0.355	0.317	0.276	0.151	A
4	4.0	0.83	0.52	0.00	1.065	0.048	0.011	0.352	0.294	0.270	0.141	A
4	4.0	0.83	0.43	0.00	0.948	0.036	0.020	0.317	0.287	0.251	0.123	A
4	4.0	0.83	0.34	0.00	0.860	0.030	0.048	0.291	0.279	0.226	0.107	A
4	4.0	0.83	0.25	0.00	0.841	0.038	-0.003	0.282	0.267	0.199	0.095	A
4	4.0	0.83	0.19	0.00	0.650	0.037	0.016	0.302	0.272	0.154	0.095	A
4	4.0	0.83	0.13	0.00	0.380	0.048	-0.034	0.366	0.297	0.142	0.121	A
4	4.0	0.83	0.07	0.00	0.046	0.008	-0.008	0.090	0.090	0.022	0.008	A
4	4.0	0.83	0.59	0.53	1.737	0.094	-0.046	0.451	0.367	0.358	0.233	A
4	4.0	0.83	0.44	0.53	1.704	0.016	-0.085	0.450	0.368	0.350	0.230	A
4	4.0	0.83	0.28	0.53	1.727	-0.183	-0.136	0.478	0.364	0.301	0.226	A
4	4.0	0.83	0.17	0.53	0.770	-0.116	-0.172	0.855	1.092	0.310	1.010	A
4	4.0	0.83	0.60	1.08	2.572	-0.088	-0.095	0.394	0.321	0.273	0.166	A
4	4.0	0.83	0.49	1.08	2.559	-0.017	-0.118	0.447	0.334	0.287	0.197	A
4	4.0	0.83	0.37	1.08	2.197	0.096	-0.052	0.596	0.408	0.309	0.309	A
4	4.0	0.83	0.29	1.08	-0.184	0.424	0.343	0.504	0.676	0.188	0.373	A
4	4.0	0.83	0.61	1.35	1.461	-0.008	0.000	0.447	0.332	0.349	0.216	A
4	4.0	0.83	0.53	1.35	1.500	0.109	0.049	0.523	0.364	0.321	0.255	A
4	4.0	0.83	0.44	1.35	0.580	0.073	0.037	0.420	0.150	0.094	0.104	A
4	4.0	0.83	0.39	1.35	0.123	-0.298	-0.046	0.195	0.306	0.051	0.067	A
4	4.0	0.83	0.61	1.53	0.821	0.060	0.115	0.444	0.358	0.261	0.197	A
4	4.0	0.83	0.56	1.53	0.762	0.118	0.068	0.532	0.530	0.249	0.313	A
4	4.0	0.83	0.50	1.53	-0.046	-0.012	-0.015	0.179	0.274	0.047	0.055	A
4	4.0	0.83	0.47	1.53								C
5	4.0	0.90	0.75	-1.80	0.789	0.062	-0.043	0.340	0.325	0.173	0.126	A
5	4.0	0.90	0.75	-1.59	1.288	-0.035	-0.065	0.333	0.251	0.204	0.108	A
5	4.0	0.90	0.58	-1.59	0.666	0.122	-0.037	0.688	1.038	0.230	0.801	A
5	4.0	0.90	0.45	-1.27	0.935	0.045	-0.050	0.362	0.309	0.195	0.132	A
5	4.0	0.90	0.75	0.00	1.296	0.072	-0.020	0.315	0.258	0.235	0.111	A
5	4.0	0.90	0.58	0.00	1.188	0.099	0.019	0.300	0.258	0.223	0.103	A
5	4.0	0.90	0.48	0.00	1.115	0.081	0.035	0.312	0.265	0.217	0.107	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
5	4.0	0.90	0.38	0.00	1.064	0.055	0.047	0.306	0.274	0.220	0.109	A
5	4.0	0.90	0.28	0.00	1.061	-0.024	0.014	0.339	0.278	0.195	0.115	A
5	4.0	0.90	0.21	0.00	0.999	-0.083	-0.007	0.373	0.292	0.182	0.128	A
5	4.0	0.90	0.14	0.00	0.782	-0.106	0.009	0.343	0.285	0.160	0.112	A
5	4.0	0.90	0.75	1.27	1.492	0.017	-0.071	0.457	0.343	0.310	0.211	A
5	4.0	0.90	0.48	1.27	1.462	0.115	-0.039	0.491	0.377	0.290	0.234	A
5	4.0	0.90	0.75	1.59	0.662	-0.016	0.021	0.353	0.266	0.224	0.123	A
5	4.0	0.90	0.60	1.59	0.675	0.065	0.027	0.448	0.372	0.214	0.192	A
5	4.0	0.90	0.75	1.80	0.274	-0.112	-0.001	0.385	0.399	0.174	0.169	A
6	4.0	1.07	0.85	-1.87	0.431	0.140	-0.044	0.382	0.377	0.157	0.156	A
6	4.0	1.07	0.85	-1.65	1.131	0.062	-0.042	0.256	0.183	0.139	0.059	A
6	4.0	1.07	0.69	-1.65	0.353	0.090	-0.038	0.320	0.304	0.154	0.109	A
6	4.0	1.07	0.84	-1.32	1.280	0.066	-0.069	0.242	0.181	0.134	0.055	A
6	4.0	1.07	0.53	-1.32	0.725	0.048	-0.018	0.310	0.239	0.130	0.085	A
6	4.0	1.07	0.84	-0.66	1.252	0.065	-0.069	0.200	0.180	0.129	0.044	A
6	4.0	1.07	0.62	-0.66	1.180	0.081	-0.078	0.203	0.169	0.121	0.042	A
6	4.0	1.07	0.39	-0.66	0.982	0.117	-0.061	0.238	0.194	0.122	0.054	A
6	4.0	1.07	0.84	0.00	1.146	0.102	0.012	0.215	0.195	0.161	0.055	A
6	4.0	1.07	0.72	0.00	1.090	0.101	0.024	0.212	0.193	0.147	0.052	A
6	4.0	1.07	0.60	0.00	1.057	0.087	0.024	0.235	0.213	0.150	0.062	A
6	4.0	1.07	0.47	0.00	0.976	0.073	0.026	0.251	0.220	0.148	0.067	A
6	4.0	1.07	0.34	0.00	0.846	0.038	0.024	0.256	0.221	0.145	0.068	A
6	4.0	1.07	0.26	0.00	0.675	-0.001	0.029	0.261	0.251	0.120	0.073	A
6	4.0	1.07	0.18	0.00	0.330	0.041	-0.014	0.405	0.263	0.108	0.123	A
6	4.0	1.07	0.84	0.66	1.645	0.163	-0.087	0.310	0.245	0.194	0.097	A
6	4.0	1.07	0.62	0.66	1.592	0.113	-0.080	0.306	0.241	0.189	0.094	A
6	4.0	1.07	0.39	0.66	1.383	0.057	-0.063	0.323	0.252	0.176	0.099	A
6	4.0	1.07	0.84	1.32	1.396	0.098	-0.043	0.307	0.262	0.209	0.103	A
6	4.0	1.07	0.53	1.32	0.986	0.132	0.030	0.429	0.279	0.186	0.148	A
6	4.0	1.07	0.85	1.65	0.930	0.024	0.013	0.316	0.247	0.185	0.097	A
6	4.0	1.07	0.74	1.65	0.641	-0.098	0.048	0.497	0.463	0.169	0.245	A
6	4.0	1.07	0.89	1.87	0.629	-0.089	-0.053	0.365	0.308	0.152	0.126	A
1	7.0	1.00	0.78	1.73	1.235	-0.244	-0.013	0.614	0.496	0.310	0.359	A
1	7.0	1.00	0.78	1.52	1.545	-0.047	0.069	0.598	0.442	0.359	0.341	A
1	7.0	1.00	0.57	1.52							C	
1	7.0	1.00	0.77	1.22	2.355	-0.024	-0.003	0.604	0.490	0.376	0.373	A
1	7.0	1.00	0.47	1.22	1.831	0.072	-0.014	0.668	0.466	0.345	0.391	A
1	7.0	1.00	0.77	0.61	2.588	0.085	-0.024	0.547	0.446	0.333	0.305	A
1	7.0	1.00	0.57	0.61	2.551	0.029	-0.122	0.540	0.453	0.343	0.307	A
1	7.0	1.00	0.35	0.61	2.414	-0.036	-0.136	0.544	0.462	0.325	0.307	A
1	7.0	1.00	0.77	0.00	1.640	0.087	0.055	0.431	0.341	0.290	0.193	A
1	7.0	1.00	0.66	0.00	1.595	0.080	0.073	0.437	0.354	0.283	0.198	A
1	7.0	1.00	0.55	0.00	1.601	0.056	0.078	0.441	0.358	0.291	0.204	A
1	7.0	1.00	0.43	0.00	1.549	-0.004	0.096	0.472	0.360	0.278	0.215	A
1	7.0	1.00	0.32	0.00	1.439	-0.056	0.066	0.496	0.388	0.260	0.232	A
1	7.0	1.00	0.24	0.00	1.334	-0.074	0.027	0.494	0.364	0.231	0.215	A
1	7.0	1.00	0.16	0.00	1.063	-0.076	0.015	0.487	0.516	0.216	0.275	A
1	7.0	1.00	0.77	-0.61	1.939	-0.037	-0.037	0.438	0.366	0.282	0.203	A
1	7.0	1.00	0.57	-0.61	1.798	0.013	-0.048	0.440	0.361	0.274	0.200	A
1	7.0	1.00	0.35	-0.61	1.584	0.103	-0.068	0.446	0.373	0.247	0.199	A
1	7.0	1.00	0.77	-1.22	2.322	0.014	-0.044	0.452	0.407	0.273	0.222	A
1	7.0	1.00	0.47	-1.22	1.780	0.033	-0.073	0.516	0.427	0.280	0.263	A
1	7.0	1.00	0.78	-1.52	1.708	-0.002	0.027	0.529	0.412	0.296	0.269	A
1	7.0	1.00	0.57	-1.52	1.153	-0.003	-0.031	0.624	0.454	0.269	0.334	A
1	7.0	1.00	0.78	-1.73	1.474	0.004	0.008	0.520	0.412	0.285	0.261	A
2	7.0	0.77	0.53	-1.65							C	
2	7.0	0.77	0.52	-1.65							C	
2	7.0	0.77	0.51	-1.45							C	
2	7.0	0.77	0.55	-1.45	3.649	0.797	-0.957	0.433	0.474	0.340	0.264	A
2	7.0	0.77	0.50	-1.45							C	
2	7.0	0.77	0.45	-1.45	2.251	0.118	-1.121	0.940	0.853	0.917	1.226	A
2	7.0	0.77	0.42	-1.16	1.677	0.918	-1.030	0.873	1.082	0.860	1.336	A
2	7.0	0.77	0.55	-1.16	2.432	-0.709	-1.093	0.966	0.984	0.862	1.323	A
2	7.0	0.77	0.43	-1.16	2.123	-0.695	-0.956	0.936	0.930	0.924	1.298	A
2	7.0	0.77	0.37	-1.16	0.356	-0.304	-0.426	0.818	0.958	0.909	1.206	A
2	7.0	0.77	0.30	-0.58	-0.099	0.352	-0.352	0.845	1.092	0.776	1.254	A
2	7.0	0.77	0.42	-0.58							C	
2	7.0	0.77	0.40	-0.58	2.127	-0.455	-0.661	1.037	1.029	0.993	1.561	A
2	7.0	0.77	0.26	-0.58	0.910	-0.481	-0.109	0.898	0.807	1.066	1.297	A
2	7.0	0.77	0.16	0.00	-0.052	-0.431	0.227	0.677	0.618	0.838	0.772	A
2	7.0	0.77	0.49	0.00	-0.375	-0.272	0.533	0.493	0.496	0.437	0.340	A
2	7.0	0.77	0.47	0.00	-0.447	-0.164	0.532	0.512	0.516	0.399	0.344	A
2	7.0	0.77	0.39	0.00	-0.357	0.054	0.555	0.561	0.582	0.383	0.400	A
2	7.0	0.77	0.31	0.00	-0.349	0.326	0.370	0.572	0.628	0.330	0.415	A
2	7.0	0.77	0.22	0.00							C	

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
2	7.0	0.77	0.17	0.00	1.522	0.092	-0.449	0.815	0.816	0.901	1.071	A
2	7.0	0.77	0.12	0.00	0.321	-0.215	-0.064	0.548	0.621	0.560	0.500	A
2	7.0	0.77	0.06	0.58	0.137	-0.690	-0.090	0.488	0.536	0.349	0.324	A
2	7.0	0.77	0.50	0.58	3.630	-0.363	-1.179	1.123	1.584	0.406	1.967	A
2	7.0	0.77	0.40	0.58	3.452	0.034	-1.247	0.587	0.598	0.639	0.555	A
2	7.0	0.77	0.26	0.58	2.198	-0.253	-0.907	0.726	0.740	0.731	0.804	A
2	7.0	0.77	0.16	1.16	1.532	-1.014	-0.913	0.636	0.785	0.569	0.672	A
2	7.0	0.77	0.55	1.16	3.522	-0.540	-0.849	0.301	0.388	0.304	0.167	A
2	7.0	0.77	0.46	1.16	3.519	-0.478	-0.790	0.396	0.439	0.305	0.221	A
2	7.0	0.77	0.37	1.16	2.853	-0.249	-0.598	1.922	1.451	0.426	2.990	A
2	7.0	0.77	0.30	1.46	1.029	0.640	-0.201	0.689	0.743	0.143	0.523	A
2	7.0	0.77	0.55	1.46	0.581	0.086	-0.096	1.114	0.665	0.196	0.861	A
2	7.0	0.77	0.50	1.46	0.004	-0.005	-0.001	0.049	0.063	0.011	0.003	A
2	7.0	0.77	0.45	1.46	-0.002	-0.010	-0.007	0.085	0.113	0.019	0.010	A
2	7.0	0.77	0.42	1.65	-0.013	-0.007	0.000	0.157	0.192	0.033	0.031	A
3	7.0	0.86	0.64	-1.68	1.005	0.424	-0.154	0.850	0.720	0.450	0.722	A
3	7.0	0.86	0.60	-1.68	0.178	0.167	-0.101	0.841	0.752	0.378	0.708	A
3	7.0	0.86	0.57	-1.68	-0.322	0.457	0.131	0.571	0.604	0.350	0.406	A
3	7.0	0.86	0.54	-1.68	-0.298	0.181	-0.221	0.440	0.444	0.229	0.221	A
3	7.0	0.86	0.64	-1.48	1.903	0.167	0.065	0.956	0.560	0.499	0.738	A
3	7.0	0.86	0.57	-1.48	2.000	-0.059	0.076	0.940	0.543	0.508	0.719	A
3	7.0	0.86	0.49	-1.48								C
3	7.0	0.86	0.45	-1.48	-0.202	0.099	0.169	0.704	0.690	0.399	0.565	A
3	7.0	0.86	0.63	-1.18	3.496	-0.118	-0.010	0.500	0.431	0.318	0.269	A
3	7.0	0.86	0.52	-1.18	3.215	0.035	-0.256	0.598	0.560	0.409	0.419	A
3	7.0	0.86	0.41	-1.18	2.887	0.192	-0.314	0.729	0.616	0.449	0.556	A
3	7.0	0.86	0.33	-1.18	0.379	0.125	0.388	0.798	0.768	0.543	0.761	A
3	7.0	0.86	0.63	-0.59	2.945	-0.765	0.079	0.915	0.710	0.490	0.790	A
3	7.0	0.86	0.47	-0.59	1.989	-0.231	-0.262	1.021	0.909	0.680	1.166	A
3	7.0	0.86	0.30	-0.59	1.337	0.427	-0.254	0.857	0.908	0.691	1.018	A
3	7.0	0.86	0.20	-0.59	0.414	0.191	-0.110	0.590	0.531	0.241	0.344	A
3	7.0	0.86	0.63	0.00	1.938	-0.393	0.273	1.238	0.848	0.679	1.356	A
3	7.0	0.86	0.54	0.00	1.121	-0.295	0.184	1.133	0.898	0.740	1.319	A
3	7.0	0.86	0.45	0.00	0.328	-0.198	0.211	0.871	0.769	0.681	0.907	A
3	7.0	0.86	0.36	0.00	-0.058	-0.106	0.177	0.722	0.639	0.590	0.639	A
3	7.0	0.86	0.26	0.00	-0.214	0.108	0.184	0.563	0.538	0.469	0.414	A
3	7.0	0.86	0.20	0.00	-0.266	0.182	0.099	0.635	0.775	0.366	0.569	A
3	7.0	0.86	0.14	0.00	-0.124	0.443	-0.004	0.492	0.554	0.289	0.316	A
3	7.0	0.86	0.07	0.00	-0.153	0.317	-0.077	0.395	0.421	0.101	0.172	A
3	7.0	0.86	0.62	0.58	3.206	-0.016	-0.052	0.868	0.704	0.553	0.777	A
3	7.0	0.86	0.47	0.58	1.745	-0.029	-0.127	0.926	0.926	0.716	1.114	A
3	7.0	0.86	0.30	0.58	0.938	-0.431	-0.170	0.748	0.905	0.639	0.894	A
3	7.0	0.86	0.10	0.58	-0.132	-0.130	-0.063	1.045	0.219	0.154	0.582	A
3	7.0	0.86	0.60	1.18	3.922	-0.484	-0.490	0.257	0.301	0.254	0.110	A
3	7.0	0.86	0.52	1.18	3.817	-0.443	-0.608	0.270	0.318	0.266	0.122	A
3	7.0	0.86	0.41	1.18	3.364	-0.449	-0.559	0.491	0.467	0.377	0.301	A
3	7.0	0.86	0.33	1.18	-0.002	0.020	0.170	0.911	0.853	0.505	0.906	A
3	7.0	0.86	0.63	1.47	3.286	-0.462	-0.244	0.587	0.399	0.408	0.335	A
3	7.0	0.86	0.57	1.47	2.797	-0.193	-0.154	0.786	0.478	0.441	0.521	A
3	7.0	0.86	0.49	1.47	0.580	0.131	0.446	0.683	0.605	0.381	0.489	A
3	7.0	0.86	0.48	1.47	0.631	-0.798	0.435	0.878	1.070	0.311	1.007	A
3	7.0	0.86	0.64	1.68	1.255	-0.375	-0.072	0.597	0.733	0.322	0.499	A
3	7.0	0.86	0.62	1.68	0.474	0.179	0.084	0.603	0.259	0.174	0.231	A
3	7.0	0.86	0.57	1.68	-0.061	-0.558	0.081	0.570	1.007	0.200	0.690	A
4	7.0	0.96	0.74	-1.70	0.818	0.013	0.054	0.439	0.333	0.290	0.194	A
4	7.0	0.96	0.70	-1.70	0.787	0.037	0.043	0.441	0.337	0.285	0.195	A
4	7.0	0.96	0.62	-1.70								C
4	7.0	0.96	0.58	-1.70								C
4	7.0	0.96	0.74	-1.50	1.509	-0.031	0.014	0.522	0.409	0.406	0.302	A
4	7.0	0.96	0.64	-1.50	1.435	-0.060	0.018	0.552	0.404	0.372	0.303	A
4	7.0	0.96	0.54	-1.50	1.032	-0.095	0.059	1.028	0.460	0.323	0.686	A
4	7.0	0.96	0.49	-1.50	0.242	0.007	0.045	0.304	0.220	0.095	0.075	A
4	7.0	0.96	0.73	-1.20	2.375	0.005	-0.072	0.517	0.393	0.368	0.279	A
4	7.0	0.96	0.60	-1.20	2.341	-0.057	-0.077	0.542	0.399	0.352	0.288	A
4	7.0	0.96	0.45	-1.20	1.787	-0.057	-0.045	0.684	0.447	0.340	0.391	A
4	7.0	0.96	0.36	-1.20	0.339	-0.104	0.130	0.576	0.241	0.138	0.204	A
4	7.0	0.96	0.73	0.00	1.459	-0.074	0.017	0.516	0.441	0.380	0.302	A
4	7.0	0.96	0.63	0.00	1.290	-0.050	-0.002	0.453	0.421	0.377	0.263	A
4	7.0	0.96	0.52	0.00	1.199	0.023	0.005	0.418	0.398	0.379	0.238	A
4	7.0	0.96	0.41	0.00	1.123	0.094	0.043	0.383	0.377	0.338	0.202	A
4	7.0	0.96	0.20	-0.60								C
4	7.0	0.96	0.73	0.00	1.070	0.166	0.043	0.378	0.374	0.309	0.189	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
4	7.0	0.96	0.23	0.00	1.029	0.250	0.018	0.408	0.354	0.267	0.182	A
4	7.0	0.96	0.16	0.00	0.791	0.228	0.025	0.497	0.577	0.232	0.317	A
4	7.0	0.96	0.08	0.00	0.190	0.161	-0.063	0.405	0.339	0.120	0.147	A
4	7.0	0.96	0.73	0.60	2.298	0.049	-0.113	0.680	0.526	0.459	0.475	A
4	7.0	0.96	0.54	0.60	2.035	0.044	-0.148	0.659	0.510	0.484	0.464	A
4	7.0	0.96	0.34	0.60	2.028	-0.316	-0.202	0.675	0.469	0.364	0.404	A
4	7.0	0.96	0.20	0.60	1.677	-0.285	-0.144	0.701	0.545	0.329	0.449	A
4	7.0	0.96	0.73	1.20	2.861	-0.177	-0.181	0.525	0.372	0.335	0.263	A
4	7.0	0.96	0.60	1.20	2.836	-0.103	-0.212	0.555	0.382	0.347	0.287	A
4	7.0	0.96	0.45	1.20	2.616	0.046	-0.163	0.620	0.434	0.366	0.353	A
4	7.0	0.96	0.36	1.20								C
4	7.0	0.96	0.74	1.50	1.586	-0.078	-0.061	0.529	0.363	0.404	0.287	A
4	7.0	0.96	0.64	1.50	1.498	-0.034	-0.010	0.543	0.399	0.407	0.310	A
4	7.0	0.96	0.54	1.50	1.383	0.108	0.028	0.699	0.478	0.365	0.425	A
4	7.0	0.96	0.48	1.50	0.606	0.124	0.038	0.482	0.201	0.123	0.144	A
4	7.0	0.96	0.74	1.70	0.842	-0.052	0.045	0.512	0.410	0.339	0.272	A
4	7.0	0.96	0.68	1.70	0.795	0.031	0.044	0.478	0.366	0.309	0.229	A
4	7.0	0.96	0.62	1.70	0.655	0.089	0.048	0.478	0.342	0.246	0.203	A
4	7.0	0.96	0.60	1.70	0.241	0.034	0.020	0.263	0.102	0.056	0.041	A
5	7.0	0.94	0.71	-1.20	1.216	-0.042	0.023	0.721	0.293	0.293	0.455	A
5	7.0	0.94	0.71	-1.06	1.612	-0.092	0.015	0.742	0.314	0.314	0.479	A
5	7.0	0.94	0.45	-1.06								C
5	7.0	0.94	0.71	-0.85	2.087	-0.130	-0.080	0.727	0.280	0.280	0.445	A
5	7.0	0.94	0.37	-0.85	0.925	0.112	-0.137	0.888	0.277	0.277	0.750	A
5	7.0	0.94	0.71	-0.42	2.093	-0.165	-0.132	0.681	0.287	0.287	0.395	A
5	7.0	0.94	0.52	-0.42	1.977	-0.135	-0.102	0.670	0.250	0.250	0.377	A
5	7.0	0.94	0.31	-0.42	1.640	-0.010	-0.093	0.670	0.240	0.240	0.388	A
5	7.0	0.94	0.71	0.00	1.614	0.052	-0.038	0.679	0.282	0.282	0.385	A
5	7.0	0.94	0.61	0.00	1.644	0.084	-0.065	0.673	0.269	0.269	0.374	A
5	7.0	0.94	0.51	0.00	1.615	0.122	-0.061	0.672	0.270	0.270	0.364	A
5	7.0	0.94	0.40	0.00	1.614	0.171	-0.063	0.659	0.249	0.249	0.353	A
5	7.0	0.94	0.29	0.00	1.529	0.226	-0.052	0.652	0.235	0.235	0.344	A
5	7.0	0.94	0.22	0.00	1.415	0.241	-0.039	0.660	0.223	0.223	0.363	A
5	7.0	0.94	0.15	0.00	1.187	0.334	-0.018	1.049	0.238	0.238	0.841	A
5	7.0	0.94	0.71	0.42	1.515	0.081	0.033	0.698	0.311	0.311	0.422	A
5	7.0	0.94	0.52	0.42	1.369	0.083	0.121	0.664	0.296	0.296	0.371	A
5	7.0	0.94	0.31	0.42	1.203	0.103	0.110	0.669	0.255	0.255	0.369	A
5	7.0	0.94	0.71	0.85	1.771	0.041	-0.021	0.528	0.352	0.352	0.310	A
5	7.0	0.94	0.37	0.85	1.737	-0.069	-0.041	0.534	0.325	0.325	0.332	A
5	7.0	0.94	0.71	1.06	2.234	-0.009	-0.097	0.551	0.350	0.350	0.358	A
5	7.0	0.94	0.41	1.06	2.215	-0.092	-0.148	0.542	0.324	0.324	0.350	A
5	7.0	0.94	0.71	1.20	2.547	-0.022	-0.158	0.522	0.308	0.308	0.329	A
6	7.0	1.08	0.86	-1.88	1.285	-0.018	-0.029	0.355	0.279	0.196	0.121	A
6	7.0	1.08	0.86	-1.66	1.533	-0.057	0.012	0.345	0.287	0.222	0.125	A
6	7.0	1.08	0.65	-1.66	1.128	0.012	-0.012	0.371	0.324	0.215	0.144	A
6	7.0	1.08	0.85	-1.33	1.882	-0.090	-0.066	0.295	0.272	0.205	0.101	A
6	7.0	1.08	0.53	-1.33	1.391	-0.033	-0.021	0.371	0.298	0.216	0.137	A
6	7.0	1.08	0.85	-0.66	1.693	-0.082	-0.022	0.281	0.224	0.186	0.082	A
6	7.0	1.08	0.62	-0.66	1.683	-0.004	-0.045	0.268	0.235	0.194	0.082	A
6	7.0	1.08	0.39	-0.66	1.518	0.065	-0.073	0.301	0.254	0.175	0.093	A
6	7.0	1.08	0.85	0.00	1.636	0.017	0.018	0.311	0.274	0.209	0.108	A
6	7.0	1.08	0.73	0.00	1.465	0.023	0.072	0.311	0.278	0.235	0.115	A
6	7.0	1.08	0.60	0.00	1.340	0.045	0.092	0.287	0.277	0.226	0.105	A
6	7.0	1.08	0.47	0.00	1.267	0.030	0.103	0.319	0.287	0.219	0.116	A
6	7.0	1.08	0.35	0.00	1.130	0.034	0.076	0.350	0.305	0.206	0.129	A
6	7.0	1.08	0.26	0.00	0.984	0.071	0.051	0.324	0.292	0.182	0.112	A
6	7.0	1.08	0.18	0.00								C
6	7.0	1.08	0.85	0.66	2.148	0.117	-0.043	0.355	0.307	0.245	0.140	A
6	7.0	1.08	0.62	0.66	2.120	0.102	-0.093	0.365	0.310	0.245	0.145	A
6	7.0	1.08	0.39	0.66	1.843	0.088	-0.090	0.387	0.309	0.236	0.150	A
6	7.0	1.08										C
6	7.0	1.08										C
6	7.0	1.08	0.85	1.33	1.831	0.051	-0.041	0.375	0.322	0.276	0.160	A
6	7.0	1.08	0.53	1.33	1.637	0.142	0.029	0.412	0.328	0.278	0.177	A
6	7.0	1.08	0.86	1.66	1.373	-0.015	0.034	0.341	0.317	0.265	0.143	A
6	7.0	1.08	0.65	1.66	1.091	0.068	0.067	0.453	0.324	0.243	0.185	A
6	7.0	1.08	0.86	1.88	1.110	-0.087	-0.014	0.393	0.298	0.233	0.149	A

**Table B2. Summary of data for sloped-weir baffles at a 3.00% culvert slope.**

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
					ft/s	ft	ft	ft/s	ft/s	ft/s	ft/s	
1	1.5	0.56	0.33	-1.22	0.003	0.061	0.008	0.468	0.372	0.125	0.186	A
1	1.5	0.56	0.29	-1.22								C
1	1.5	0.56	0.33	-0.98	0.788	0.142	-0.003	0.903	1.307	0.256	1.295	A
1	1.5	0.56	0.23	-0.98	0.142	0.225	-0.038	0.123	0.191	0.032	0.026	A
1	1.5	0.56	0.33	-0.49	1.722	-0.060	-0.028	0.460	0.493	0.253	0.259	A
1	1.5	0.56	0.25	-0.49	1.352	-0.039	-0.012	0.537	0.641	0.245	0.380	A
1	1.5	0.56	0.16	-0.49	0.138	0.034	0.009	0.479	0.776	0.134	0.425	A
1	1.5	0.56	0.24	0.00	1.587	-0.034	-0.013	0.621	0.807	0.293	0.561	A
1	1.5	0.56	0.28	0.00	1.843	-0.026	-0.046	0.571	0.582	0.308	0.380	A
1	1.5	0.56	0.34	0.00	2.084	-0.038	-0.016	0.521	0.530	0.281	0.316	A
1	1.5	0.56	0.18	0.00	1.330	-0.031	-0.017	0.606	0.670	0.280	0.448	A
1	1.5	0.56	0.14	0.00	0.927	0.101	0.010	1.136	1.215	0.290	1.425	A
1	1.5	0.56	0.10	0.00	0.021	0.013	0.005	0.141	0.160	0.034	0.023	A
1	1.5	0.56	0.07	0.00	0.239	-0.023	0.009	0.977	0.571	0.150	0.652	A
1	1.5	0.56	0.33	0.49	1.022	0.081	0.002	0.504	0.526	0.311	0.314	A
1	1.5	0.56	0.25	0.49	0.924	0.046	-0.005	0.520	0.523	0.268	0.308	A
1	1.5	0.56	0.16	0.49								C
1	1.5	0.56	0.33	0.98	0.024	-0.009	0.016	0.534	0.486	0.156	0.273	A
1	1.5	0.56	0.25	0.98								C
1	1.5	0.56	0.33	1.22	-0.331	-0.818	0.085	0.621	1.109	0.168	0.822	A
1	1.5	0.56	0.29	1.22								C
2	1.5	0.27	0.04	0.00	-0.463	-0.233	0.059	0.969	1.020	0.209	1.011	A
2	1.5	0.27	0.04	0.00	0.153	-0.009	-0.013	0.587	0.197	0.094	0.196	A
2	1.5	0.27	0.03	0.00	0.235	-0.042	-0.006	0.618	0.195	0.099	0.215	A
2	1.5	0.27	0.04	0.00	0.154	-0.104	-0.027	1.124	0.246	0.158	0.675	A
2	1.5	0.27	0.04	0.00	0.042	-0.061	-0.026	0.491	0.168	0.073	0.137	A
2	1.5	0.27	0.03	0.00	-0.007	-0.099	-0.038	0.413	0.206	0.065	0.108	A
2	1.5	0.27	0.03	0.00	0.064	-0.076	-0.022	0.559	0.237	0.088	0.188	A
2	1.5	0.27	0.02	0.00	-0.064	-0.067	-0.033	0.560	0.298	0.100	0.206	A
2	1.5	0.27	0.02	0.00	-0.014	-0.061	-0.027	0.565	0.320	0.104	0.216	A
2	1.5	0.27	0.01	0.00	-0.016	-0.070	-0.025	0.551	0.311	0.100	0.205	A
2	1.5	0.27	0.01	0.00	-0.012	-0.050	-0.008	0.694	0.346	0.126	0.309	A
2	1.5	0.27	0.04	0.41	0.064	-0.021	0.012	1.262	0.498	0.191	0.938	A
2	1.5	0.27	0.04	0.41	-0.049	0.017	-0.009	0.722	0.419	0.119	0.355	A
2	1.5	0.27	0.04	0.41	0.027	0.025	-0.005	0.769	0.429	0.127	0.396	A
2	1.5	0.27	0.03	0.41	-0.006	0.028	-0.006	0.835	0.502	0.147	0.486	A
3	1.5	0.44	0.21	-0.99	0.294	0.432	-0.107	0.491	0.823	0.135	0.468	A
3	1.5	0.44	0.21	-0.99	0.456	0.482	-0.133	0.735	1.269	0.196	1.094	A
3	1.5	0.44	0.19	-0.99								C
3	1.5	0.44	0.18	-0.99	0.259	0.823	0.014	3.009	3.688	0.654	11.541	A
3	1.5	0.44	0.21	-0.79	0.118	0.208	-0.057	0.166	0.240	0.052	0.044	A
3	1.5	0.44	0.18	-0.79	0.770	0.678	-0.234	0.778	1.293	0.208	1.160	A
3	1.5	0.44	0.15	-0.79	-0.639	1.875	0.040	1.906	3.232	0.487	7.159	A
3	1.5	0.44	0.13	-0.79	0.739	-0.630	-0.157	1.538	2.151	0.322	3.547	A
3	1.5	0.44	0.21	-0.39	1.567	-0.234	0.190	0.812	0.856	0.362	0.762	A
3	1.5	0.44	0.16	-0.39	1.306	-0.240	0.111	1.112	1.305	0.339	1.528	A
3	1.5	0.44	0.11	-0.39	-0.048	-0.046	0.013	0.159	0.158	0.032	0.026	A
3	1.5	0.44	0.07	-0.39	1.652	-0.627	0.317	2.607	0.870	0.391	3.853	A
3	1.5	0.44	0.21	0.00	1.771	-0.221	0.081	1.001	1.044	0.408	1.130	A
3	1.5	0.44	0.18	0.00	1.835	-0.326	0.092	0.937	0.950	0.412	0.975	A
3	1.5	0.44	0.15	0.00	1.767	-0.401	0.075	0.941	0.976	0.387	0.994	A
3	1.5	0.44	0.12	0.00	1.450	-0.241	0.147	1.321	1.776	0.387	2.524	A
3	1.5	0.44	0.09	0.00	0.023	-0.017	0.010	0.162	0.097	0.027	0.018	A
3	1.5	0.44	0.07	0.00	-0.579	-0.214	-0.066	0.716	0.273	0.116	0.300	A
3	1.5	0.44	0.05	0.00	-0.052	0.019	0.007	0.622	0.217	0.101	0.222	A
3	1.5	0.44	0.03	0.00	-1.252	-0.659	0.191	2.200	1.204	0.430	3.238	A
3	1.5	0.44	0.21	0.39	1.817	-0.236	0.103	0.964	1.004	0.403	1.050	A
3	1.5	0.44	0.16	0.39	1.618	-0.394	0.067	0.982	0.978	0.392	1.038	A
3	1.5	0.44	0.11	0.39	0.892	-0.212	-0.010	1.159	1.585	0.362	1.993	A
3	1.5	0.44	0.07	0.39	-0.033	-0.020	-0.011	0.216	0.296	0.061	0.069	A
3	1.5	0.44	0.21	0.79							1.801	C
3	1.5	0.44	0.18	0.79							3.366	C
3	1.5	0.44	0.16	0.79	-0.372	-0.266	0.199	1.403	1.358	0.422	1.996	A
3	1.5	0.44	0.13	0.79	-0.063	-0.110	0.018	0.508	0.213	0.093	0.156	A
3	1.5	0.44	0.21	0.99	-0.256	-0.418	0.200	1.230	1.379	0.345	1.767	A
3	1.5	0.44	0.20	0.99	-0.275	0.135	0.107	0.732	1.158	0.196	0.958	A
3	1.5	0.44	0.19	0.99	-0.036	0.016	0.001	0.183	0.296	0.048	0.062	A
3	1.5	0.44	0.18	0.99	-0.040	0.018	0.000	0.197	0.315	0.051	0.070	A
4	1.5	0.48	0.25	-1.00	-0.084	0.024	0.009	0.115	0.138	0.024	0.016	A
4	1.5	0.48	0.23	-1.00	-0.571	2.528	0.143	1.397	3.181	0.371	6.102	A
4	1.5	0.48	0.21	-1.00	2.908	0.497	0.310	3.321	1.943	0.545	7.551	A
4	1.5	0.48	0.19	-1.00	2.381	-3.609	-0.669	2.681	4.643	0.721	14.634	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
4	1.5	0.48	0.25	-0.88	0.021	0.004	0.002	0.056	0.028	0.009	0.002	A
4	1.5	0.48	0.22	-0.88	0.005	0.002	0.000	0.073	0.025	0.010	0.003	A
4	1.5	0.48	0.18	-0.88	-0.131	-0.086	0.030	0.132	0.229	0.033	0.036	A
4	1.5	0.48	0.18	-0.88	-1.629	4.100	-0.348	3.136	6.100	0.988	24.012	A
4	1.5	0.48	0.25	-0.70	0.964	0.316	0.082	1.409	2.467	0.391	4.112	A
4	1.5	0.48	0.21	-0.70	0.049	0.068	0.034	0.192	0.229	0.050	0.046	A
4	1.5	0.48	0.16	-0.70	-0.042	0.039	0.009	0.191	0.179	0.031	0.035	A
4	1.5	0.48	0.12	-0.70	0.651	3.951	0.155	7.478	4.294	1.154	37.846	A
4	1.5	0.48	0.25	-0.35	1.758	-0.061	-0.020	0.508	0.644	0.220	0.360	A
4	1.5	0.48	0.19	-0.35	1.081	0.116	-0.003	1.608	2.457	0.408	4.396	A
4	1.5	0.48	0.12	-0.35	0.139	-0.002	-0.023	0.164	0.187	0.044	0.032	A
4	1.5	0.48	0.07	-0.35	0.091	-0.439	0.409	1.996	0.648	0.346	2.261	A
4	1.5	0.48	0.25	0.00	1.978	-0.084	-0.001	0.507	0.520	0.266	0.299	A
4	1.5	0.48	0.22	0.00	1.826	-0.035	-0.012	0.518	0.614	0.257	0.356	A
4	1.5	0.48	0.18	0.00	1.503	0.046	-0.053	0.678	0.676	0.261	0.492	A
4	1.5	0.48	0.14	0.00	0.804	0.281	-0.089	1.288	2.002	0.381	2.906	A
4	1.5	0.48	0.11	0.00	-0.995	0.480	-0.317	2.338	2.108	0.469	5.065	A
4	1.5	0.48	0.08	0.00	-0.410	0.123	-0.216	0.874	0.747	0.217	0.684	A
4	1.5	0.48	0.06	0.00	0.034	0.000	-0.001	0.137	0.046	0.021	0.011	A
4	1.5	0.48	0.03	0.00	0.002	0.017	-0.002	0.246	0.117	0.038	0.038	A
4	1.5	0.48	0.25	0.35	2.149	-0.102	-0.002	0.638	0.599	0.303	0.429	A
4	1.5	0.48	0.19	0.35	1.657	-0.034	-0.089	0.831	0.776	0.314	0.695	A
4	1.5	0.48	0.12	0.35								C
4	1.5	0.48	0.07	0.35	-0.559	-0.062	-0.159	0.886	1.222	0.242	1.169	A
4	1.5	0.48	0.25	0.70	0.898	0.095	0.027	0.691	0.685	0.283	0.513	A
4	1.5	0.48	0.21	0.70	0.471	-0.073	0.063	0.358	0.301	0.091	0.114	A
4	1.5	0.48	0.16	0.70	0.203	1.321	0.556	4.069	3.889	0.624	16.035	A
4	1.5	0.48	0.12	0.70	0.150	-0.198	0.032	0.864	1.417	0.226	1.404	A
4	1.5	0.48	0.25	0.88	-0.240	0.391	0.052	0.165	0.179	0.032	0.030	A
4	1.5	0.48	0.22	0.88	0.924	0.214	-0.200	1.851	3.021	0.487	6.395	A
4	1.5	0.48	0.18	0.88	0.633	0.773	-0.098	3.029	4.329	0.705	14.205	A
4	1.5	0.48	0.25	0.88								C
4	1.5	0.48	0.23	1.00	-0.371	0.274	-0.057	2.491	2.644	0.502	6.723	A
4	1.5	0.48	0.21	1.00	-0.375	-0.182	-0.048	3.322	3.436	0.640	11.627	A
4	1.5	0.48	0.19	1.00	-0.110	-0.735	0.015	1.820	1.571	0.301	2.935	A
5	1.5	0.63	0.45	-1.33	0.130	0.166	-0.149	0.407	0.551	0.183	0.251	A
5	1.5	0.63	0.41	-1.08	0.895	0.020	-0.056	0.432	0.496	0.201	0.236	A
5	1.5	0.63	0.30	-1.08	-0.213	0.324	-0.183	1.260	1.824	0.327	2.511	A
5	1.5	0.63	0.41	-0.53	1.563	-0.074	-0.045	0.448	0.471	0.236	0.239	A
5	1.5	0.63	0.30	-0.53	1.203	-0.026	-0.046	0.476	0.478	0.234	0.255	A
5	1.5	0.63	0.20	-0.53	0.311	0.017	-0.001	0.538	0.602	0.224	0.351	A
5	1.5	0.63	0.41	0.01	1.898	-0.024	-0.032	0.517	0.527	0.292	0.315	A
5	1.5	0.63	0.35	0.01	1.761	-0.026	-0.049	0.531	0.544	0.288	0.331	A
5	1.5	0.63	0.29	0.01	1.523	-0.033	-0.060	0.524	0.545	0.293	0.329	A
5	1.5	0.63	0.23	0.01	1.241	-0.038	-0.022	0.562	0.561	0.274	0.353	A
5	1.5	0.63	0.17	0.01								C
5	1.5	0.63	0.41	0.54	1.112	0.039	-0.019	0.506	0.529	0.309	0.316	A
5	1.5	0.63	0.30	0.54	1.009	0.096	-0.013	0.560	0.699	0.273	0.438	A
5	1.5	0.63	0.20	0.54								C
5	1.5	0.63	0.41	1.08	-0.112	0.017	0.035	0.366	0.478	0.177	0.197	A
5	1.5	0.63	0.33	1.08								C
5	1.5	0.63	0.41	1.34								C
6	1.5	0.56	0.33	-1.22	-0.007	0.355	-0.033	1.298	1.015	0.234	1.385	A
6	1.5	0.56	0.29	-1.22	0.698	0.057	-0.094	0.307	0.248	0.169	0.092	A
6	1.5	0.56	0.33	-0.98	0.127	0.320	0.019	1.045	1.215	0.243	1.314	A
6	1.5	0.56	0.23	-0.98	0.777	0.011	-0.029	0.351	0.280	0.196	0.120	A
6	1.5	0.56	0.33	-0.49	0.425	0.263	-0.050	0.411	0.453	0.168	0.201	A
6	1.5	0.56	0.25	-0.49	0.915	0.071	0.018	0.404	0.301	0.217	0.150	A
6	1.5	0.56	0.16	-0.49	0.725	0.104	-0.020	0.380	0.281	0.208	0.133	A
6	1.5	0.56	0.24	0.00	0.452	0.183	-0.028	0.431	0.355	0.182	0.172	A
6	1.5	0.56	0.28	0.00	1.098	0.171	0.003	0.396	0.288	0.214	0.143	A
6	1.5	0.56	0.34	0.00	1.058	0.190	-0.002	0.377	0.294	0.218	0.138	A
6	1.5	0.56	0.18	0.00	0.929	0.197	-0.024	0.364	0.291	0.226	0.134	A
6	1.5	0.56	0.14	0.00	0.792	0.209	-0.007	0.387	0.276	0.203	0.133	A
6	1.5	0.56	0.10	0.00	0.596	0.326	0.010	0.653	0.868	0.220	0.614	A
6	1.5	0.56	0.07	0.00	0.473	0.239	0.004	0.896	0.933	0.210	0.859	A
6	1.5	0.56	0.33	0.49	0.169	0.308	0.030	0.301	0.416	0.090	0.136	A
6	1.5	0.56	0.25	0.49	0.801	0.185	0.029	0.309	0.254	0.195	0.099	A
6	1.5	0.56	0.16	0.49	0.755	0.253	0.036	0.305	0.260	0.209	0.102	A
6	1.5	0.56	0.33	0.98	0.583	0.327	0.056	0.336	0.360	0.173	0.136	A
6	1.5	0.56	0.25	0.98	0.395	0.104	0.044	0.206	0.203	0.153	0.054	A
6	1.5	0.56	0.33	1.22	0.227	0.316	0.195	0.609	0.478	0.178	0.316	A
6	1.5	0.56	0.29	1.22	0.287	0.088	0.134	0.264	0.284	0.148	0.086	A
1	3.0	0.67	0.44	-1.47	-0.015	-0.008	0.005	0.051	0.078	0.016	0.004	A
1	3.0	0.67	0.44	-1.30	1.009	0.085	-0.035	0.529	0.524	0.241	0.306	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
1	3.0	0.67	0.36	-1.30	0.375	0.594	-0.103	0.222	0.370	0.060	0.095	A
1	3.0	0.67	0.44	-1.04	1.364	0.032	-0.018	0.510	0.512	0.259	0.295	A
1	3.0	0.67	0.29	-1.04	0.098	0.125	-0.028	0.097	0.148	0.027	0.016	A
1	3.0	0.67	0.44	-0.52	2.027	0.011	-0.025	0.525	0.515	0.275	0.308	A
1	3.0	0.67	0.33	-0.52	1.687	-0.001	-0.032	0.545	0.521	0.281	0.324	A
1	3.0	0.67	0.21	-0.52	0.977	0.117	-0.007	0.892	1.168	0.268	1.116	A
1	3.0	0.67	0.44	0.00	2.765	0.010	-0.005	0.587	0.573	0.306	0.384	A
1	3.0	0.67	0.38	0.00	2.640	0.019	-0.032	0.590	0.582	0.314	0.393	A
1	3.0	0.67	0.31	0.00	2.331	-0.016	-0.015	0.617	0.602	0.331	0.426	A
1	3.0	0.67	0.25	0.00	1.886	0.016	-0.001	0.677	0.798	0.328	0.602	A
1	3.0	0.67	0.18	0.00	1.319	0.283	0.020	1.168	1.917	0.362	2.584	A
1	3.0	0.67	0.14	0.00	0.245	-0.024	0.017	0.438	0.417	0.119	0.190	A
1	3.0	0.67	0.10	0.00	0.093	-0.104	0.058	0.543	0.400	0.095	0.232	A
1	3.0	0.67	0.44	0.52	2.088	0.027	-0.026	0.676	0.590	0.391	0.479	A
1	3.0	0.67	0.33	0.52	1.971	0.084	-0.049	0.652	0.610	0.382	0.472	A
1	3.0	0.67	0.21	0.52	1.226	0.019	-0.112	0.824	0.746	0.319	0.669	A
1	3.0	0.67	0.44	1.04	0.191	-0.061	0.072	0.360	0.414	0.203	0.171	A
1	3.0	0.67	0.30	1.04								C
1	3.0	0.67	0.44	1.30								C
1	3.0	0.67	0.36	1.30	0.159	-0.333	0.010	0.299	0.340	0.083	0.106	A
1	3.0	0.67	0.44	1.47								C
2	3.0	0.56	0.23	-1.23	0.046	0.011	0.015	0.652	0.942	0.160	0.669	A
2	3.0	0.56	0.21	-1.23	-0.121	-0.228	0.009	1.029	1.203	0.234	1.280	A
2	3.0	0.56	0.20	-1.23	-0.390	-0.304	0.045	1.346	1.529	0.301	2.119	A
2	3.0	0.56	0.19	-1.23	-0.120	-0.376	-0.065	1.582	1.963	0.386	3.254	A
2	3.0	0.56	0.16	-1.09	-0.018	0.077	0.022	0.623	0.699	0.126	0.447	A
2	3.0	0.56	0.15	-1.09	-0.248	-0.127	0.085	1.117	1.262	0.248	1.451	A
2	3.0	0.56	0.12	-1.09								C
2	3.0	0.56	0.11	-1.09								C
2	3.0	0.56	0.13	-0.87								C
2	3.0	0.56	0.12	-0.87	-0.025	0.080	0.031	0.410	0.623	0.101	0.283	A
2	3.0	0.56	0.10	-0.87	-0.023	0.064	0.016	0.498	0.582	0.106	0.299	A
2	3.0	0.56	0.09	-0.87	0.089	-0.008	0.041	0.913	1.012	0.194	0.948	A
2	3.0	0.56	0.12	-0.44								C
2	3.0	0.56	0.11	-0.44								C
2	3.0	0.56	0.07	-0.44	1.366	0.521	0.160	0.998	1.380	0.485	1.567	A
2	3.0	0.56	0.05	-0.44	-0.009	0.039	0.010	0.089	0.112	0.023	0.011	A
2	3.0	0.56	0.13	0.00	1.265	-0.145	0.061	0.932	1.126	0.721	1.328	A
2	3.0	0.56	0.08	0.00	0.586	-0.902	-0.015	1.080	1.403	0.606	1.752	A
2	3.0	0.56	0.03	0.00								C
2	3.0	0.56	0.01	0.00	-0.588	-0.958	0.032	2.049	1.572	0.420	3.424	A
2	3.0	0.56	0.14	0.00	1.347	0.014	0.066	1.179	1.188	0.709	1.652	A
2	3.0	0.56	0.10	0.00	1.101	-0.604	-0.016	0.970	1.175	0.726	1.425	A
2	3.0	0.56	0.07	0.00	0.460	-1.084	0.039	1.035	1.426	0.597	1.732	A
2	3.0	0.56	0.04	0.00	-0.625	-1.333	-0.143	2.189	1.634	0.531	3.871	A
2	3.0	0.56	0.17	0.44								C
2	3.0	0.56	0.12	0.44	0.419	-0.795	-0.234	1.586	1.743	0.703	3.023	A
2	3.0	0.56	0.11	0.44	0.324	-0.574	-0.261	1.662	2.161	0.670	3.941	A
2	3.0	0.56	0.09	0.44								C
2	3.0	0.56	0.26	0.87								C
2	3.0	0.56	0.24	0.87	0.174	0.005	-0.044	0.912	0.900	0.182	0.838	A
2	3.0	0.56	0.23	0.87	0.030	0.065	0.008	0.269	0.320	0.061	0.089	A
2	3.0	0.56	0.17	0.87								C
2	3.0	0.56	0.33	1.09								C
2	3.0	0.56	0.29	1.09								C
2	3.0	0.56	0.28	1.09								C
2	3.0	0.56	0.27	1.09	0.019	0.234	0.005	0.444	0.745	0.117	0.383	A
2	3.0	0.56	0.40	1.23								C
2	3.0	0.56	0.35	1.23								C
2	3.0	0.56	0.31	1.23								C
3	3.0	0.42	0.19	-0.99	-0.354	0.670	0.005	0.844	1.286	0.355	1.247	A
3	3.0	0.42	0.18	-0.99								C
3	3.0	0.42	0.18	-0.99								C
3	3.0	0.42	0.19	-0.80	-0.029	0.051	0.009	0.554	0.812	0.224	0.508	A
3	3.0	0.42	0.17	-0.80	-0.171	0.285	-0.100	0.693	1.007	0.352	0.809	A
3	3.0	0.42	0.15	-0.80								C
3	3.0	0.42	0.13	-0.80								C
3	3.0	0.42	0.20	-0.40	1.655	-0.088	0.044	0.918	0.652	0.280	0.673	A
3	3.0	0.42	0.15	-0.40	0.050	0.013	-0.011	0.263	0.396	0.072	0.116	A
3	3.0	0.42	0.10	-0.40	0.033	0.037	-0.012	0.190	0.254	0.046	0.051	A
3	3.0	0.42	0.07	-0.40	0.125	0.291	-0.118	2.015	1.579	0.343	3.334	A
3	3.0	0.42	0.20	0.01	1.871	-0.626	0.126	1.231	0.964	0.460	1.328	A
3	3.0	0.42	0.17	0.01	0.078	-0.226	0.053	0.408	0.460	0.110	0.195	A
3	3.0	0.42	0.14	0.01	0.003	-0.005	0.000	0.083	0.058	0.014	0.005	A
3	3.0	0.42	0.11	0.01	-0.063	-0.106	0.007	0.277	0.432	0.075	0.134	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
3	3.0	0.42	0.08	0.01	-0.132	-0.044	0.042	0.449	0.544	0.121	0.256	A
3	3.0	0.42	0.06	0.01	0.002	-0.142	0.022	0.716	1.006	0.178	0.778	A
3	3.0	0.42	0.05	0.01	1.431	-0.211	0.261	2.378	2.103	0.460	5.145	A
3	3.0	0.42	0.03	0.01	0.171	-2.080	0.343	2.245	2.397	0.453	5.496	A
3	3.0	0.42	0.19	0.39	0.710	-0.795	-0.196	1.133	1.167	0.429	1.415	A
3	3.0	0.42	0.13	0.39	0.217	0.672	0.032	0.651	0.849	0.161	0.586	A
3	3.0	0.42	0.10	0.39	-0.080	-0.273	-0.078	1.134	0.641	0.208	0.870	A
3	3.0	0.42	0.07	0.39	1.412	-0.480	0.063	2.256	0.815	0.330	2.933	A
3	3.0	0.42	0.20	0.80	0.003	-0.021	-0.007	0.064	0.073	0.014	0.005	A
3	3.0	0.42	0.17	0.80	-0.099	0.012	-0.028	0.314	0.293	0.064	0.094	A
3	3.0	0.42	0.15	0.80	-0.022	-0.170	-0.017	0.455	0.641	0.111	0.315	A
3	3.0	0.42	0.13	0.80	-0.020	1.537	0.231	0.934	1.003	0.200	0.958	A
4	3.0	0.59	0.36	-1.15	0.148	0.005	-0.036	0.111	0.142	0.033	0.017	A
4	3.0	0.59	0.33	-1.15	0.049	0.156	-0.028	0.096	0.146	0.025	0.016	A
4	3.0	0.59	0.29	-1.15	0.295	0.563	-0.080	0.882	1.476	0.233	1.506	A
4	3.0	0.59	0.26	-1.15	1.468	-0.336	-0.168	3.426	4.191	0.740	14.927	A
4	3.0	0.59	0.36	-1.02	1.066	0.091	0.058	1.481	2.080	0.378	3.331	A
4	3.0	0.59	0.33	-1.02	0.856	0.163	0.044	0.810	1.067	0.246	0.927	A
4	3.0	0.59	0.25	-1.02	-0.033	-0.051	0.005	0.127	0.141	0.024	0.018	A
4	3.0	0.59	0.22	-1.02	3.940	-1.302	0.083	2.242	3.003	0.538	7.167	A
4	3.0	0.59	0.36	-0.81	1.877	-0.133	0.008	0.594	0.658	0.289	0.435	A
4	3.0	0.59	0.29	-0.81	1.204	0.171	0.091	1.368	2.295	0.392	3.647	A
4	3.0	0.59	0.21	-0.81	-0.001	-0.014	0.001	0.064	0.082	0.014	0.006	A
4	3.0	0.59	0.16	-0.81	0.721	-0.899	0.312	2.901	3.172	0.598	9.419	A
4	3.0	0.59	0.36	-0.41	2.269	-0.135	-0.031	0.582	0.619	0.297	0.405	A
4	3.0	0.59	0.26	-0.41	1.821	-0.099	-0.037	0.680	0.801	0.319	0.603	A
4	3.0	0.59	0.16	-0.41	0.588	0.032	0.108	1.147	1.606	0.305	1.994	A
4	3.0	0.59	0.10	-0.41	0.008	-0.252	0.080	0.260	0.386	0.101	0.113	A
4	3.0	0.59	0.36	0.00	2.612	-0.051	-0.004	0.517	0.588	0.279	0.345	A
4	3.0	0.59	0.31	0.00	2.477	-0.104	-0.029	0.555	0.587	0.294	0.370	A
4	3.0	0.59	0.26	0.00	2.190	-0.110	-0.069	0.613	0.591	0.297	0.406	A
4	3.0	0.59	0.20	0.00	1.879	-0.063	-0.064	0.654	0.702	0.322	0.512	A
4	3.0	0.59	0.15	0.00	0.804	0.118	-0.044	1.402	2.092	0.369	3.240	A
4	3.0	0.59	0.11	0.00	0.550	-0.022	-0.098	0.531	0.569	0.211	0.325	A
4	3.0	0.59	0.10	0.00	0.316	0.044	-0.084	0.499	0.734	0.137	0.403	A
4	3.0	0.59	0.04	0.00	-1.191	-0.799	0.151	2.129	1.889	0.397	4.129	A
4	3.0	0.59	0.36	0.40	3.096	-0.125	0.072	0.602	0.643	0.316	0.438	A
4	3.0	0.59	0.26	0.40	2.871	-0.198	-0.027	0.704	0.661	0.353	0.528	A
4	3.0	0.59	0.16	0.40	1.861	-0.005	-0.143	1.098	0.922	0.375	1.098	A
4	3.0	0.59	0.11	0.40	0.159	0.479	-0.182	2.467	2.201	0.483	5.583	A
4	3.0	0.59	0.36	0.81	1.657	-0.133	0.047	0.703	0.588	0.412	0.504	A
4	3.0	0.59	0.29	0.81	1.706	0.031	0.028	0.810	0.675	0.385	0.630	A
4	3.0	0.59	0.21	0.81	0.355	0.013	0.136	1.070	1.608	0.361	1.929	A
4	3.0	0.59	0.16	0.81	3.294	5.081	-0.873	1.081	1.598	0.288	1.902	A
4	3.0	0.59	0.36	1.01	0.804	0.018	0.038	0.564	0.517	0.295	0.336	A
4	3.0	0.59	0.31	1.01	0.513	0.098	0.000	0.659	0.757	0.229	0.530	A
4	3.0	0.59	0.25	1.01	0.034	-0.107	0.007	0.186	0.250	0.070	0.051	A
4	3.0	0.59	0.22	1.01							C	
4	3.0	0.59	0.36	1.15	0.130	-0.017	-0.004	0.386	0.249	0.111	0.111	A
4	3.0	0.59	0.33	1.15	0.137	-0.150	0.000	0.292	0.435	0.069	0.139	A
4	3.0	0.59	0.29	1.15							C	
4	3.0	0.59	0.26	1.15	1.057	1.113	-0.021	3.368	4.608	0.703	16.534	A
5	3.0	0.65	0.42	-1.22	0.630	0.196	-0.125	0.634	0.890	0.231	0.624	A
5	3.0	0.65	0.38	-1.22	-0.002	0.339	-0.193	1.487	2.501	0.410	4.317	A
5	3.0	0.65	0.33	-1.22	-0.229	0.338	-0.367	0.650	0.887	0.268	0.641	A
5	3.0	0.65	0.31	-1.22	-0.417	0.245	-0.169	0.648	0.957	0.198	0.687	A
5	3.0	0.65	0.42	-1.08	1.137	0.003	-0.002	0.502	0.480	0.252	0.273	A
5	3.0	0.65	0.36	-1.08	0.579	0.129	-0.074	0.752	0.693	0.250	0.554	A
5	3.0	0.65	0.30	-1.08	-0.206	0.220	-0.031	1.177	1.539	0.292	1.920	A
5	3.0	0.65	0.25	-1.08	0.041	0.073	0.015	0.902	0.892	0.167	0.819	A
5	3.0	0.65	0.42	-0.86	1.592	-0.042	-0.035	0.491	0.493	0.272	0.279	A
5	3.0	0.65	0.34	-0.86	1.251	0.017	-0.022	0.542	0.503	0.255	0.306	A
5	3.0	0.65	0.25	-0.86	0.400	0.099	0.011	1.100	0.811	0.263	0.969	A
5	3.0	0.65	0.19	-0.86	-0.149	-0.149	0.034	0.843	0.988	0.209	0.865	A
5	3.0	0.65	0.42	-0.43	2.145	-0.058	-0.033	0.498	0.488	0.280	0.282	A
5	3.0	0.65	0.31	-0.43	1.818	-0.053	-0.033	0.535	0.516	0.286	0.317	A
5	3.0	0.65	0.19	-0.43	1.205	0.026	-0.025	0.799	0.599	0.272	0.536	A
5	3.0	0.65	0.13	-0.43	0.187	0.185	0.159	0.770	0.499	0.183	0.437	A
5	3.0	0.65	0.42	0.00	2.683	-0.024	0.006	0.559	0.551	0.312	0.357	A
5	3.0	0.65	0.36	0.00	2.521	-0.022	-0.025	0.565	0.561	0.319	0.368	A
5	3.0	0.65	0.30	0.00	2.201	-0.046	-0.022	0.646	0.591	0.343	0.442	A
5	3.0	0.65	0.24	0.00	1.913	-0.057	-0.047	0.668	0.611	0.332	0.465	A
5	3.0	0.65	0.18	0.00							C	
5	3.0	0.65	0.13	0.00	0.892	0.024	-0.068	0.510	0.422	0.173	0.234	A
5	3.0	0.65	0.09	0.00	-0.121	-0.101	0.034	0.263	0.395	0.077	0.115	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
5	3.0	0.65	0.05	0.00								C
5	3.0	0.65	0.42	0.43	2.849	-0.032	-0.025	0.605	0.586	0.344	0.414	A
5	3.0	0.65	0.31	0.43	2.505	-0.018	-0.059	0.665	0.600	0.357	0.465	A
5	3.0	0.65	0.19	0.43	1.113	0.158	0.030	1.894	2.161	0.421	4.216	A
5	3.0	0.65	0.15	0.43	0.942	-0.044	-0.048	0.606	0.378	0.159	0.268	A
5	3.0	0.65	0.42	0.86	0.823	0.002	0.028	0.550	0.504	0.335	0.335	A
5	3.0	0.65	0.34	0.86	0.953	0.098	0.034	0.664	0.792	0.310	0.582	A
5	3.0	0.65	0.25	0.86								C
5	3.0	0.65	0.19	0.86	0.106	-0.006	0.013	0.323	0.068	0.044	0.055	A
5	3.0	0.65	0.42	1.08	0.163	-0.034	0.057	0.517	0.562	0.250	0.323	A
5	3.0	0.65	0.36	1.08	0.262	0.089	0.031	0.700	1.016	0.230	0.788	A
5	3.0	0.65	0.30	1.08	0.032	0.209	0.040	1.007	1.656	0.292	1.921	A
5	3.0	0.65	0.26	1.08	0.033	-0.011	0.002	0.141	0.037	0.020	0.011	A
5	3.0	0.65	0.42	1.22	-0.089	-0.056	0.018	0.507	0.684	0.185	0.380	A
5	3.0	0.65	0.38	1.22	0.010	0.019	0.011	1.664	1.899	0.349	3.248	A
5	3.0	0.65	0.36	1.22	-0.270	-0.301	0.068	0.759	1.070	0.186	0.878	A
5	3.0	0.65	0.30	1.22	0.016	-0.030	-0.005	0.047	0.051	0.009	0.002	A
6	3.0	0.83	0.60	-1.72	0.215	0.176	-0.115	0.620	0.971	0.216	0.687	A
6	3.0	0.83	0.61	-1.52	0.801	0.046	-0.042	0.479	0.522	0.214	0.274	A
6	3.0	0.83	0.49	-1.52	0.437	0.082	-0.079	0.763	0.653	0.219	0.528	A
6	3.0	0.83	0.60	-1.21	0.994	0.000	-0.003	0.489	0.576	0.252	0.317	A
6	3.0	0.83	0.40	-1.21	0.516	0.128	-0.034	0.478	0.559	0.224	0.296	A
6	3.0	0.83	0.60	-0.61	1.174	0.071	0.035	0.576	0.610	0.316	0.402	A
6	3.0	0.83	0.44	-0.61	0.990	0.135	-0.007	0.527	0.636	0.305	0.388	A
6	3.0	0.83	0.28	-0.61	0.590	0.197	-0.013	0.537	0.612	0.257	0.364	A
6	3.0	0.83	0.60	0.00	1.902	0.223	0.012	0.614	0.650	0.319	0.450	A
6	3.0	0.83	0.51	0.00	1.733	0.231	-0.035	0.615	0.646	0.315	0.447	A
6	3.0	0.83	0.42	0.00	1.466	0.225	-0.022	0.617	0.642	0.329	0.451	A
6	3.0	0.83	0.33	0.00	1.307	0.244	-0.030	0.636	0.628	0.309	0.448	A
6	3.0	0.83	0.24	0.00	0.992	0.230	-0.019	0.619	0.619	0.271	0.420	A
6	3.0	0.83	0.18	0.00	0.868	0.233	-0.014	0.628	0.730	0.260	0.497	A
6	3.0	0.83	0.12	0.00								C
6	3.0	0.83	0.60	0.61	1.494	0.284	0.031	0.543	0.615	0.320	0.388	A
6	3.0	0.83	0.44	0.61	1.339	0.333	0.041	0.524	0.629	0.321	0.387	A
6	3.0	0.83	0.28	0.61	1.115	0.344	0.041	0.562	0.604	0.285	0.381	A
6	3.0	0.83	0.60	1.21	0.612	0.148	0.095	0.409	0.536	0.280	0.266	A
6	3.0	0.83	0.40	1.21	0.594	0.360	0.248	0.516	0.647	0.251	0.374	A
6	3.0	0.83	0.60	1.52	0.416	0.113	0.120	0.488	0.513	0.240	0.280	A
6	3.0	0.83	0.51	1.52	0.597	-0.176	0.081	0.682	0.523	0.157	0.382	A
6	3.0	0.83	0.66	1.72	0.558	0.386	0.339	1.364	0.928	0.259	1.395	A
1	4.0	0.67	0.44	-1.55								C
1	4.0	0.67	0.44	-1.37	0.874	0.175	-0.070	1.174	1.193	0.324	1.452	A
1	4.0	0.67	0.38	-1.37	0.107	0.398	-0.167	0.504	0.615	0.216	0.340	A
1	4.0	0.67	0.44	-1.09	1.693	-0.104	-0.071	0.553	0.554	0.285	0.347	A
1	4.0	0.67	0.31	-1.09	-0.004	0.030	-0.014	0.121	0.101	0.033	0.013	A
1	4.0	0.67	0.44	-0.55	1.985	-0.176	-0.006	0.513	0.536	0.319	0.326	A
1	4.0	0.67	0.33	-0.55	1.732	-0.202	-0.020	0.548	0.572	0.316	0.364	A
1	4.0	0.67	0.21	-0.55	1.010	0.014	0.005	1.186	1.494	0.315	1.869	A
1	4.0	0.67	0.44	0.00	3.235	-0.251	-0.029	0.575	0.641	0.340	0.429	A
1	4.0	0.67	0.38	0.00	3.054	-0.251	-0.072	0.610	0.607	0.339	0.428	A
1	4.0	0.67	0.31	0.00	2.787	-0.225	-0.071	0.633	0.632	0.353	0.462	A
1	4.0	0.67	0.25	0.00	2.305	-0.195	-0.061	0.716	0.797	0.357	0.638	A
1	4.0	0.67	0.18	0.00								C
1	4.0	0.67	0.14	0.00	0.219	-0.048	0.015	0.414	0.517	0.105	0.225	A
1	4.0	0.67	0.10	0.00	-0.411	0.053	-0.007	0.263	0.235	0.050	0.064	A
1	4.0	0.67	0.44	0.55	2.227	-0.178	-0.025	0.713	0.588	0.420	0.516	A
1	4.0	0.67	0.33	0.55	2.074	-0.086	-0.048	0.676	0.633	0.401	0.509	A
1	4.0	0.67	0.21	0.55	1.318	-0.053	-0.078	0.803	0.815	0.340	0.712	A
1	4.0	0.67	0.18	0.55	0.250	-0.057	0.077	0.425	0.398	0.196	0.189	A
1	4.0	0.67	0.44	1.09	-0.084	-0.165	0.084	0.719	0.634	0.180	0.476	A
1	4.0	0.67	0.31	1.09	0.187	-0.059	0.090	0.430	0.416	0.217	0.202	A
1	4.0	0.67	0.44	1.36	0.013	0.009	-0.002	0.099	0.200	0.031	0.025	A
1	4.0	0.67	0.41	1.36	-0.019	-0.108	0.002	0.113	0.127	0.030	0.015	A
1	4.0	0.67	0.38	1.36								C
1	4.0	0.67	0.44	1.55	-0.345	1.172	0.105	0.907	1.035	0.180	0.963	A
2	4.0	0.68	0.10	-1.20								C
2	4.0	0.68	0.09	-1.20	-1.276	-0.272	-0.054	1.899	1.774	0.387	3.452	A
2	4.0	0.68	0.34	-1.20							0.112	C
2	4.0	0.68	0.13	-1.06	-0.023	0.005	0.001	0.248	0.374	0.058	0.102	A
2	4.0	0.68	0.11	-1.06	-0.019	-0.018	-0.002	0.275	0.369	0.065	0.108	A
2	4.0	0.68	0.09	-1.06	-0.228	-0.073	-0.014	1.125	0.818	0.188	0.985	A
2	4.0	0.68	0.16	-0.85								C
2	4.0	0.68	0.12	-0.85								C
2	4.0	0.68	0.10	-0.85	0.046	0.041	0.018	0.283	0.306	0.057	0.088	A
2	4.0	0.68	0.09	-0.85	-0.014	0.025	0.001	0.096	0.095	0.018	0.009	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
2	4.0	0.68	0.24	-0.42								C
2	4.0	0.68	0.21	-0.42								C
2	4.0	0.68	0.14	-0.42	1.130	-0.354	0.183	1.032	1.249	0.947	1.761	A
2	4.0	0.68	0.10	-0.42	1.145	0.088	0.294	0.959	1.338	0.899	1.758	A
2	4.0	0.68	0.25	0.00								C
2	4.0	0.68	0.14	0.00	1.054	-0.306	0.236	0.861	1.204	0.797	1.413	A
2	4.0	0.68	0.10	0.00	0.674	-1.120	0.149	1.071	1.218	0.653	1.528	A
2	4.0	0.68	0.09	0.00	0.316	-1.222	0.191	1.482	1.592	0.560	2.523	A
2	4.0	0.68	0.06	0.00	-0.130	-1.275	0.132	1.625	2.584	0.532	4.799	A
2	4.0	0.68	0.04	0.00	-0.290	-1.667	0.063	1.152	1.624	0.402	2.062	A
2	4.0	0.68	0.03	0.00	0.141	-1.384	0.031	1.688	1.453	0.352	2.541	A
2	4.0	0.68	0.22	0.42	1.285	-0.229	-0.811	1.592	1.377	0.826	2.555	A
2	4.0	0.68	0.20	0.42	1.025	-0.368	-0.781	0.996	1.190	0.840	1.557	A
2	4.0	0.68	0.16	0.42	0.610	-0.950	-0.573	1.144	1.360	0.876	1.963	A
2	4.0	0.68	0.14	0.42	0.290	-1.198	-0.501	1.056	1.342	0.815	1.790	A
2	4.0	0.68	0.34	0.85								C
2	4.0	0.68	0.30	0.85	2.145	-0.744	-1.165	1.310	1.538	0.539	2.185	A
2	4.0	0.68	0.28	0.85	1.296	-1.361	-1.021	1.421	1.890	0.537	2.940	A
2	4.0	0.68	0.26	0.85	0.567	1.100	-0.724	2.050	3.403	0.615	8.080	A
2	4.0	0.68	0.39	1.06								C
2	4.0	0.68	0.37	1.06	0.759	0.386	-0.027	1.149	0.965	0.247	1.156	A
2	4.0	0.68	0.36	1.06	0.089	0.096	-0.005	0.749	0.875	0.176	0.679	A
2	4.0	0.68	0.35	1.06	0.108	0.001	0.026	0.251	0.222	0.051	0.057	A
2	4.0	0.68	0.46	1.20								C
3	4.0	0.53	0.30	-1.19	2.581	0.180	-0.003	0.916	0.850	0.405	0.863	A
3	4.0	0.53	0.29	-1.19	2.496	0.347	-0.068	0.859	0.804	0.408	0.775	A
3	4.0	0.53	0.27	-1.19	2.393	0.380	-0.079	0.852	0.874	0.405	0.827	A
3	4.0	0.53	0.26	-1.19	2.385	0.416	-0.120	0.874	0.880	0.406	0.851	A
3	4.0	0.53	0.30	-1.05	2.415	0.136	0.249	0.952	0.814	0.434	0.879	A
3	4.0	0.53	0.27	-1.05	2.150	0.206	0.218	0.934	0.856	0.389	0.878	A
3	4.0	0.53	0.24	-1.05	2.062	0.344	0.104	0.922	0.891	0.438	0.918	A
3	4.0	0.53	0.22	-1.05	1.923	0.460	-0.039	0.887	0.917	0.426	0.905	A
3	4.0	0.53	0.30	-0.84	2.738	-0.054	0.373	1.964	0.964	0.455	2.498	A
3	4.0	0.53	0.25	-0.84	3.118	-0.112	0.294	1.052	0.940	0.459	1.101	A
3	4.0	0.53	0.20	-0.84	2.573	-0.049	0.124	1.160	1.042	0.472	1.328	A
3	4.0	0.53	0.16	-0.84	2.373	-0.293	-0.042	1.054	0.967	0.429	1.115	A
3	4.0	0.53	0.17	-0.42								C
3	4.0	0.53	0.15	-0.42								C
3	4.0	0.53	0.14	-0.42								C
3	4.0	0.53	0.12	-0.42	2.335	-0.269	0.272	1.174	0.973	0.438	1.259	A
3	4.0	0.53	0.17	0.00								C
3	4.0	0.53	0.15	0.00								C
3	4.0	0.53	0.13	0.00								C
3	4.0	0.53	0.11	0.00								C
3	4.0	0.53	0.09	0.00	2.259	-0.999	0.033	1.091	1.010	0.477	1.219	A
3	4.0	0.53	0.07	0.00	1.600	-0.920	0.099	1.022	1.031	0.350	1.115	A
3	4.0	0.53	0.06	0.00	1.116	-0.870	0.078	0.919	1.018	0.299	0.985	A
3	4.0	0.53	0.09	0.42								C
3	4.0	0.53	0.15	0.42								C
3	4.0	0.53	0.13	0.42								C
3	4.0	0.53	0.12	0.42								C
3	4.0	0.53	0.30	0.42								C
3	4.0	0.53	0.25	0.84								C
3	4.0	0.53	0.20	0.84								C
3	4.0	0.53	0.16	0.84								C
3	4.0	0.53	0.30	1.05								C
3	4.0	0.53	0.27	1.05								C
3	4.0	0.53	0.24	1.05								C
3	4.0	0.53	0.22	1.05	-0.092	0.068	0.031	0.167	0.248	0.049	0.046	A
3	4.0	0.53	0.30	1.19	-0.001	-0.054	-0.007	0.206	0.276	0.064	0.061	A
3	4.0	0.53	0.29	1.19	-0.102	0.020	0.025	0.191	0.282	0.062	0.060	A
3	4.0	0.53	0.27	1.19	-0.046	-0.125	0.020	0.230	0.314	0.080	0.079	A
3	4.0	0.53	0.26	1.19	-0.197	-0.332	0.041	0.667	0.855	0.242	0.617	A
4	4.0	0.65	0.42	-1.28	0.483	0.030	-0.040	0.492	0.479	0.227	0.261	A
4	4.0	0.65	0.38	-1.28	0.734	1.220	-0.216	0.766	1.306	0.201	1.167	A
4	4.0	0.65	0.34	-1.28								C
4	4.0	0.65	0.34	-1.28	-1.034	-0.039	-0.118	1.911	1.235	0.288	2.629	A
4	4.0	0.65	0.42	-1.13	1.444	0.401	0.017	1.271	1.685	0.372	2.296	A
4	4.0	0.65	0.39	-1.13	1.147	0.367	-0.135	1.011	1.077	0.305	1.137	A
4	4.0	0.65	0.30	-1.13	-0.567	-0.390	0.134	1.234	2.187	0.329	3.207	A
4	4.0	0.65	0.26	-1.13	-0.906	0.892	0.068	1.076	1.482	0.299	1.722	A
4	4.0	0.65	0.42	-0.90	2.174	-0.045	0.065	0.653	0.657	0.348	0.490	A
4	4.0	0.65	0.34	-0.90	1.283	0.253	0.075	1.334	1.826	0.361	2.622	A
4	4.0	0.65	0.26	-0.90	0.008	0.003	-0.003	0.184	0.074	0.021	0.020	A
4	4.0	0.65	0.20	-0.90								C

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
4	4.0	0.65	0.42	-0.45	2.125	-0.043	0.063	0.617	0.608	0.326	0.428	A
4	4.0	0.65	0.31	-0.45	1.693	-0.043	0.065	0.683	0.784	0.320	0.592	A
4	4.0	0.65	0.19	-0.45	0.908	0.096	0.133	1.585	2.165	0.378	3.670	A
4	4.0	0.65	0.12	-0.45	-0.122	-0.095	0.041	0.832	0.317	0.125	0.405	A
4	4.0	0.65	0.42	0.00	2.740	0.083	-0.009	0.577	0.670	0.319	0.442	A
4	4.0	0.65	0.36	0.00	2.718	0.011	-0.032	0.602	0.674	0.318	0.459	A
4	4.0	0.65	0.30	0.00	2.572	-0.035	-0.071	0.597	0.649	0.332	0.444	A
4	4.0	0.65	0.24	0.00	2.293	-0.057	-0.072	0.713	0.819	0.336	0.646	A
4	4.0	0.65	0.17	0.00								C
4	4.0	0.65	0.13	0.00	-0.011	-0.002	-0.001	0.095	0.049	0.014	0.006	A
4	4.0	0.65	0.09	0.00	0.051	-0.252	0.107	1.290	0.479	0.197	0.966	A
4	4.0	0.65	0.05	0.00	-0.947	-0.399	0.250	2.078	2.294	0.431	4.883	A
4	4.0	0.65	0.42	0.45								C
4	4.0	0.65	0.31	0.45	3.829	-0.042	-0.211	0.717	0.749	0.382	0.610	A
4	4.0	0.65	0.19	0.45	1.943	0.162	-0.244	1.580	1.076	0.453	1.930	A
4	4.0	0.65	0.17	0.45	0.941	0.354	-0.270	1.097	1.408	0.418	1.680	A
4	4.0	0.65	0.42	0.90	1.919	-0.051	0.070	0.691	0.620	0.435	0.525	A
4	4.0	0.65	0.34	0.90	1.585	0.186	0.055	0.888	0.728	0.397	0.738	A
4	4.0	0.65	0.28	0.90	0.257	0.260	0.141	0.990	1.497	0.294	1.654	A
4	4.0	0.65	0.20	0.90	-0.198	0.115	0.073	0.537	0.905	0.151	0.566	A
4	4.0	0.65	0.42	1.13	0.502	0.130	0.023	0.824	0.844	0.285	0.736	A
4	4.0	0.65	0.36	1.13	-0.022	0.051	0.004	0.162	0.224	0.044	0.039	A
4	4.0	0.65	0.30	1.13	0.172	-0.213	-0.055	0.633	1.083	0.177	0.802	A
4	4.0	0.65	0.26	1.13								C
4	4.0	0.65	0.42	1.28	0.006	-0.007	-0.002	0.055	0.061	0.011	0.003	A
4	4.0	0.65	0.38	1.28	-0.060	0.130	0.008	0.265	0.439	0.069	0.134	A
4	4.0	0.65	0.34	1.28								C
4	4.0	0.65	0.32	1.28	-2.016	0.803	-0.132	2.400	1.568	0.429	4.202	A
5	4.0	0.71	0.48	-1.28	1.653	-0.017	-0.055	0.594	0.562	0.288	0.376	A
5	4.0	0.71	0.43	-1.28	1.021	0.132	-0.130	0.718	0.667	0.278	0.519	A
5	4.0	0.71	0.37	-1.28	-0.038	0.617	-0.172	1.696	2.042	0.392	3.599	A
5	4.0	0.71	0.33	-1.28	-0.410	1.073	0.000	0.789	1.260	0.215	1.128	A
5	4.0	0.71	0.48	-1.13	1.859	-0.047	-0.012	0.558	0.547	0.286	0.346	A
5	4.0	0.71	0.41	-1.13	1.439	0.038	-0.046	0.591	0.546	0.282	0.363	A
5	4.0	0.71	0.33	-1.13	0.458	0.173	-0.123	0.635	0.664	0.289	0.464	A
5	4.0	0.71	0.28	-1.13	-0.322	0.319	-0.089	1.156	1.447	0.299	1.760	A
5	4.0	0.71	0.48	-0.90	2.009	-0.091	0.004	0.559	0.537	0.284	0.340	A
5	4.0	0.71	0.38	-0.90	1.620	-0.006	-0.031	0.544	0.539	0.297	0.337	A
5	4.0	0.71	0.28	-0.90	1.022	0.128	-0.037	0.652	0.670	0.268	0.473	A
5	4.0	0.71	0.21	-0.90	0.059	0.097	0.079	1.892	2.312	0.415	4.548	A
5	4.0	0.71	0.48	-0.45	2.262	-0.085	-0.025	0.527	0.519	0.292	0.317	A
5	4.0	0.71	0.35	-0.45	1.895	-0.071	-0.018	0.562	0.553	0.316	0.361	A
5	4.0	0.71	0.22	-0.45	1.346	-0.025	-0.017	0.718	0.548	0.301	0.453	A
5	4.0	0.71	0.13	-0.45	0.295	-0.186	0.139	1.426	1.701	0.370	2.532	A
5	4.0	0.71	0.48	0.00	3.074	-0.043	-0.069	0.582	0.629	0.328	0.421	A
5	4.0	0.71	0.41	0.00	3.062	-0.090	-0.107	0.578	0.569	0.319	0.380	A
5	4.0	0.71	0.34	0.00	2.779	-0.100	-0.096	0.626	0.600	0.339	0.433	A
5	4.0	0.71	0.27	0.00	2.432	-0.097	-0.103	0.671	0.623	0.356	0.482	A
5	4.0	0.71	0.20	0.00	1.947	-0.081	-0.065	0.819	0.699	0.345	0.639	A
5	4.0	0.71	0.15	0.00								C
5	4.0	0.71	0.10	0.00	1.004	-0.080	-0.068	1.234	0.891	0.302	1.204	A
5	4.0	0.71	0.05	0.00	-0.258	-0.042	0.060	0.401	0.595	0.106	0.263	A
5	4.0	0.71	0.48	0.45	2.810	-0.053	-0.079	0.705	0.633	0.410	0.533	A
5	4.0	0.71	0.35	0.45	2.713	0.019	-0.107	0.679	0.638	0.416	0.520	A
5	4.0	0.71	0.22	0.45	2.092	-0.011	-0.080	0.754	0.709	0.384	0.610	A
5	4.0	0.71	0.14	0.45	0.801	0.056	-0.027	0.459	0.394	0.133	0.192	A
5	4.0	0.71	0.48	0.90	0.704	-0.069	0.048	0.598	0.557	0.361	0.399	A
5	4.0	0.71	0.38	0.90	0.929	0.035	0.022	0.597	0.537	0.339	0.380	A
5	4.0	0.71	0.28	0.90	0.873	0.160	0.034	0.659	0.794	0.293	0.575	A
5	4.0	0.71	0.21	0.90	0.090	0.078	0.013	0.190	0.239	0.074	0.049	A
5	4.0	0.71	0.48	1.13	0.129	-0.051	0.059	0.442	0.459	0.293	0.246	A
5	4.0	0.71	0.41	1.13	0.079	0.007	0.057	0.551	0.653	0.221	0.389	A
5	4.0	0.71	0.33	1.13								C
5	4.0	0.71	0.29	1.13	-0.540	-0.546	0.092	0.760	1.282	0.196	1.129	A
5	4.0	0.71	0.48	1.28	-0.162	-0.073	0.039	0.336	0.378	0.193	0.147	A
5	4.0	0.71	0.43	1.28	-0.150	-0.023	0.001	0.414	0.472	0.175	0.212	A
5	4.0	0.71	0.37	1.28	-0.080	-0.030	0.024	1.081	1.395	0.256	1.590	A
5	4.0	0.71	0.34	1.28								C
6	4.0	0.90	0.67	-1.76	0.623	0.042	-0.046	0.409	0.415	0.201	0.190	A
6	4.0	0.90	0.67	-1.55	1.104	-0.066	-0.019	0.406	0.307	0.228	0.156	A
6	4.0	0.90	0.53	-1.55	0.666	0.129	-0.056	0.481	0.406	0.200	0.218	A
6	4.0	0.90	0.67	-1.24	1.286	-0.057	-0.038	0.419	0.320	0.243	0.169	A
6	4.0	0.90	0.44	-1.24	0.812	0.077	-0.071	0.404	0.306	0.212	0.151	A
6	4.0	0.90	0.67	-0.62	1.470	0.050	0.022	0.524	0.378	0.299	0.254	A
6	4.0	0.90	0.49	-0.62	1.014	0.085	0.007	0.489	0.396	0.307	0.245	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
6	4.0	0.90	0.31	-0.62	0.634	0.141	-0.007	0.419	0.375	0.240	0.187	A
6	4.0	0.90	0.67	0.00	2.239	0.195	-0.010	0.542	0.412	0.322	0.284	A
6	4.0	0.90	0.57	0.00	1.957	0.227	-0.025	0.610	0.416	0.340	0.330	A
6	4.0	0.90	0.47	0.00	1.760	0.209	-0.048	0.585	0.423	0.346	0.320	A
6	4.0	0.90	0.37	0.00	1.495	0.205	-0.037	0.616	0.416	0.344	0.335	A
6	4.0	0.90	0.28	0.00	1.249	0.210	-0.045	0.610	0.415	0.309	0.320	A
6	4.0	0.90	0.21	0.00	1.057	0.242	-0.079	0.696	0.487	0.269	0.397	A
6	4.0	0.90	0.14	0.00	0.906	0.242	-0.033	0.595	0.577	0.216	0.367	A
6	4.0	0.90	0.67	0.62	1.818	0.233	0.023	0.539	0.411	0.358	0.294	A
6	4.0	0.90	0.49	0.62	1.713	0.318	0.045	0.525	0.403	0.360	0.284	A
6	4.0	0.90	0.31	0.62	1.405	0.353	0.046	0.522	0.431	0.330	0.284	A
6	4.0	0.90	0.67	1.24	0.624	0.108	0.072	0.337	0.330	0.298	0.156	A
6	4.0	0.90	0.44	1.24	0.742	0.337	0.211	0.391	0.352	0.262	0.173	A
6	4.0	0.90	0.67	1.55	0.398	0.110	0.119	0.284	0.288	0.231	0.109	A
6	4.0	0.90	0.53	1.55	0.293	0.329	0.208	0.309	0.277	0.178	0.102	A
6	4.0	0.90	0.67	1.76	0.219	-0.139	0.063	0.345	0.214	0.123	0.090	A
1	7.0	0.73	0.51	-1.39	1.831	0.115	0.005	0.772	0.698	0.434	0.636	A
1	7.0	0.73	0.51	-1.22	2.669	0.056	0.016	0.820	0.744	0.478	0.727	A
1	7.0	0.73	0.36	-1.22	1.556	0.356	-0.049	1.257	1.276	0.403	1.685	A
1	7.0	0.73	0.42	-0.98	3.177	0.107	-0.111	0.760	0.712	0.409	0.626	A
1	7.0	0.73	0.30	-0.98	2.320	0.185	-0.125	0.841	0.784	0.410	0.745	A
1	7.0	0.73	0.42	-0.48	2.417	0.054	0.183	0.646	0.662	0.420	0.516	A
1	7.0	0.73	0.37	-0.48	2.248	0.048	0.159	0.681	0.671	0.417	0.544	A
1	7.0	0.73	0.22	-0.48	1.609	0.113	0.095	0.707	0.812	0.359	0.643	A
1	7.0	0.73	0.42	0.01	3.783	0.152	-0.003	0.687	0.610	0.383	0.495	A
1	7.0	0.73	0.39	0.01	3.682	0.136	-0.023	0.704	0.616	0.392	0.514	A
1	7.0	0.73	0.36	0.01	3.574	0.110	-0.043	0.709	0.648	0.406	0.544	A
1	7.0	0.73	0.28	0.01	3.256	0.059	-0.083	0.798	0.674	0.419	0.634	A
1	7.0	0.73	0.21	0.01	2.933	0.052	-0.107	0.785	0.696	0.427	0.641	A
1	7.0	0.73	0.16	0.01	2.502	-0.026	-0.082	0.882	0.823	0.414	0.813	A
1	7.0	0.73	0.11	0.01	1.675	0.119	0.055	1.288	1.838	0.391	2.595	A
1	7.0	0.73	0.42	0.48	3.841	0.076	0.000	0.729	0.666	0.401	0.568	A
1	7.0	0.73	0.37	0.48	3.748	0.107	-0.075	0.762	0.686	0.406	0.608	A
1	7.0	0.73	0.23	0.48	2.846	0.146	-0.079	0.846	0.754	0.430	0.735	A
1	7.0	0.73	0.46	0.98	3.883	0.035	0.056	0.765	0.703	0.410	0.624	A
1	7.0	0.73	0.30	0.98	3.292	0.101	-0.079	0.815	0.716	0.447	0.688	A
1	7.0	0.73	0.51	1.22	1.728	-0.048	0.062	0.819	0.664	0.486	0.674	A
1	7.0	0.73	0.36	1.22	1.371	0.019	0.036	0.715	0.637	0.420	0.547	A
1	7.0	0.73	0.51	1.39	0.303	-0.081	0.076	0.538	0.531	0.285	0.326	A
2	7.0	0.51	0.28	-1.17								C
2	7.0	0.51	0.27	-1.17								C
2	7.0	0.51	0.26	-1.17								C
2	7.0	0.51	0.25	-1.17	0.065	-0.059	0.003	0.451	0.674	0.112	0.335	A
2	7.0	0.51	0.25	-0.94								C
2	7.0	0.51	0.21	-0.94	1.385	1.817	-0.714	1.593	1.785	0.472	2.973	A
2	7.0	0.51	0.18	-0.94	0.026	0.111	-0.069	1.341	2.298	0.353	3.602	A
2	7.0	0.51	0.28	-0.47								C
2	7.0	0.51	0.21	-0.47								C
2	7.0	0.51	0.14	-0.47	0.759	0.891	-0.457	1.301	1.725	1.018	2.852	A
2	7.0	0.51	0.28	0.00								C
2	7.0	0.51	0.24	0.00	0.732	-0.764	0.054	1.259	1.319	1.054	2.218	A
2	7.0	0.51	0.20	0.00	0.475	-0.824	0.240	0.943	1.151	0.988	1.595	A
2	7.0	0.51	0.16	0.00	0.386	-0.509	0.219	0.923	1.164	0.963	1.567	A
2	7.0	0.51	0.12	0.00	0.504	0.284	0.260	1.002	1.217	0.911	1.657	A
2	7.0	0.51	0.09	0.00								C
2	7.0	0.51	0.06	0.00	0.045	1.165	0.030	0.573	0.973	0.297	0.682	A
2	7.0	0.51	0.08	0.00	0.162	0.233	-0.008	0.897	0.383	0.144	0.486	A
2	7.0	0.51	0.28	0.47								C
2	7.0	0.51	0.21	0.47	1.033	-0.380	-0.337	0.756	1.017	0.672	1.029	A
2	7.0	0.51	0.14	0.47	0.379	-1.612	-0.370	0.861	1.055	0.488	1.046	A
2	7.0	0.51	0.15	0.47	-0.286	-1.117	-0.293	1.199	1.162	0.277	1.433	A
2	7.0	0.51	0.28	0.94	2.615	-0.170	-1.405	0.831	0.996	0.646	1.050	A
2	7.0	0.51	0.25	0.94	1.935	-0.726	-1.234	1.220	1.266	0.605	1.728	A
2	7.0	0.51	0.28	1.17								C
2	7.0	0.51	0.27	1.17								C
2	7.0	0.51	0.26	1.17								C
2	7.0	0.51	0.25	1.17	1.401	-1.308	-0.424	2.580	3.358	0.556	9.122	A
3	7.0	0.60	0.42	-1.33								C
3	7.0	0.60	0.41	-1.33	-0.092	-0.003	-0.055	0.361	0.354	0.084	0.131	A
3	7.0	0.60	0.38	-1.33	0.592	1.060	-0.190	1.089	1.420	0.322	1.652	A
3	7.0	0.60	0.36	-1.33	0.628	1.164	-0.230	1.356	1.555	0.416	2.216	A
3	7.0	0.60	0.34	-1.33	0.313	0.933	-0.144	1.388	2.007	0.439	3.072	A
3	7.0	0.60	0.33	-1.33	0.411	0.860	-0.317	1.549	1.682	0.540	2.760	A
3	7.0	0.60	0.37	-1.17	1.345	1.395	-0.502	1.256	1.714	0.573	2.421	A
3	7.0	0.60	0.33	-1.17	-0.012	0.084	-0.016	0.451	0.573	0.123	0.273	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
3	7.0	0.60	0.29	-1.17	1.140	1.219	-0.322	1.790	1.560	0.501	2.944	A
3	7.0	0.60	0.27	-1.17	1.275	0.954	-0.554	1.728	1.790	0.548	3.245	A
3	7.0	0.60	0.37	-0.94								C
3	7.0	0.60	0.31	-0.94	0.695	0.248	-0.055	1.456	1.016	0.333	1.631	A
3	7.0	0.60	0.24	-0.94	0.921	1.443	-0.277	1.584	2.464	0.437	4.386	A
3	7.0	0.60	0.19	-0.94	0.767	0.135	-0.430	2.330	3.121	0.611	7.770	A
3	7.0	0.60	0.37	-0.47								C
3	7.0	0.60	0.27	-0.47								C
3	7.0	0.60	0.24	-0.47	1.144	-0.196	0.035	0.980	0.635	0.187	0.699	A
3	7.0	0.60	0.13	-0.47	-0.302	0.202	-0.020	2.771	3.058	0.556	8.670	A
3	7.0	0.60	0.37	0.00								C
3	7.0	0.60	0.32	0.00	2.746	-0.897	0.660	1.136	1.460	0.870	2.089	A
3	7.0	0.60	0.26	0.00	2.256	-0.624	0.364	1.782	2.674	0.655	5.377	A
3	7.0	0.60	0.23	0.00	2.011	-1.199	0.421	1.276	1.704	0.576	2.432	A
3	7.0	0.60	0.15	0.00	0.070	-0.051	0.002	1.768	0.382	0.238	1.664	A
3	7.0	0.60	0.11	0.00	0.328	-1.443	-0.232	4.597	4.212	0.815	19.773	A
3	7.0	0.60	0.08	0.00	-0.274	0.194	0.339	3.587	4.293	0.768	15.942	A
3	7.0	0.60	0.37	0.47								C
3	7.0	0.60	0.27	0.47	0.888	-0.513	-0.047	1.891	2.995	0.558	6.429	A
3	7.0	0.60	0.17	0.47	-0.308	-0.150	-0.018	2.066	0.760	0.337	2.478	A
3	7.0	0.60	0.15	0.47	-0.865	-0.531	-0.193	2.874	2.297	0.536	6.910	A
3	7.0	0.60	0.37	0.94								C
3	7.0	0.60	0.36	0.94								C
3	7.0	0.60	0.34	0.94	-1.318	0.043	-0.399	1.499	1.500	0.567	2.408	A
3	7.0	0.60	0.33	0.94	0.026	0.105	-0.058	0.636	0.819	0.163	0.551	A
3	7.0	0.60	0.49	1.17								C
3	7.0	0.60	0.47	1.17								C
3	7.0	0.60	0.45	1.17	-0.608	-0.264	0.118	1.355	1.908	0.501	2.865	A
3	7.0	0.60	0.43	1.17	-0.341	-0.204	0.083	0.928	0.710	0.219	0.707	A
3	7.0	0.60	0.56	1.33								C
3	7.0	0.60	0.54	1.33	-0.115	-0.452	0.053	0.787	0.852	0.229	0.699	A
3	7.0	0.60	0.52	1.33	0.038	0.007	0.003	0.225	0.120	0.038	0.033	A
4	7.0	0.63	0.40	-1.13	-0.126	0.147	0.097	0.871	1.343	0.355	1.344	A
4	7.0	0.63	0.35	-1.13	1.935	-0.150	0.096	1.311	1.385	0.433	1.912	A
4	7.0	0.63	0.30	-1.13	0.474	-0.117	0.003	0.672	0.224	0.121	0.258	A
4	7.0	0.63	0.26	-1.13	0.012	-0.024	0.007	0.082	0.079	0.016	0.007	A
4	7.0	0.63	0.40	-0.99								C
4	7.0	0.63	0.34	-0.99	2.680	-0.155	0.086	1.101	1.153	0.448	1.371	A
4	7.0	0.63	0.27	-0.99	0.038	-0.013	-0.013	0.094	0.133	0.022	0.014	A
4	7.0	0.63	0.22	-0.99	0.446	0.759	-0.119	0.508	0.878	0.134	0.523	A
4	7.0	0.63	0.40	-0.80								C
4	7.0	0.63	0.32	-0.80	3.458	-0.104	-0.017	0.898	0.920	0.435	0.921	A
4	7.0	0.63	0.23	-0.80	2.031	0.143	-0.065	2.071	1.628	0.442	3.567	A
4	7.0	0.63	0.21	-0.80	0.856	-0.138	-0.064	0.720	0.657	0.167	0.489	A
4	7.0	0.63	0.40	-0.40	3.329	-0.183	0.228	0.717	0.773	0.469	0.666	A
4	7.0	0.63	0.29	-0.40	3.150	-0.091	0.114	0.728	0.715	0.459	0.626	A
4	7.0	0.63	0.18	-0.40	2.544	-0.008	0.054	0.936	1.077	0.408	1.101	A
4	7.0	0.63	0.11	-0.40	0.014	0.014	0.004	0.084	0.082	0.015	0.007	A
4	7.0	0.63	0.40	0.00	3.433	-0.109	0.042	0.737	0.858	0.543	0.787	A
4	7.0	0.63	0.35	0.00	3.467	-0.186	-0.007	0.722	0.808	0.546	0.736	A
4	7.0	0.63	0.29	0.00	3.406	-0.198	-0.060	0.728	0.791	0.516	0.710	A
4	7.0	0.63	0.23	0.00	3.237	-0.291	-0.091	0.776	0.802	0.507	0.751	A
4	7.0	0.63	0.17	0.00	2.886	-0.342	-0.051	0.883	0.923	0.469	0.926	A
4	7.0	0.63	0.13	0.00	2.215	-0.079	-0.019	1.377	1.500	0.408	2.157	A
4	7.0	0.63	0.09	0.00	1.422	-0.312	0.015	0.916	1.060	0.358	1.046	A
4	7.0	0.63	0.05	0.00	0.013	0.003	0.001	0.191	0.126	0.032	0.027	A
4	7.0	0.63	0.40	0.40								C
4	7.0	0.63	0.29	0.40	4.509	-0.168	-0.360	0.909	0.922	0.508	0.967	A
4	7.0	0.63	0.18	0.40	3.937	-0.200	-0.288	1.008	0.998	0.504	1.133	A
4	7.0	0.63	0.11	0.40	1.796	0.163	-0.312	1.277	1.393	0.449	1.886	A
4	7.0	0.63	0.40	0.79								C
4	7.0	0.63	0.32	0.79	3.666	0.034	-0.273	1.005	0.870	0.527	1.022	A
4	7.0	0.63	0.23	0.79	3.071	0.220	-0.167	1.133	1.001	0.537	1.287	A
4	7.0	0.63	0.17	0.79	1.266	0.413	-0.047	1.221	1.160	0.574	1.583	A
4	7.0	0.63	0.40	0.99	2.825	-0.063	-0.118	0.980	0.870	0.509	0.988	A
4	7.0	0.63	0.34	0.99	2.719	0.168	-0.097	1.001	0.837	0.540	0.997	A
4	7.0	0.63	0.27	0.99	2.056	0.274	0.022	1.132	1.038	0.495	1.301	A
4	7.0	0.63	0.22	0.99	0.578	0.141	0.323	1.296	1.720	0.468	2.428	A
4	7.0	0.63	0.40	1.13	2.112	0.051	0.017	0.895	0.797	0.513	0.850	A
4	7.0	0.63	0.35	1.13	1.954	0.195	0.043	0.881	0.798	0.488	0.826	A
4	7.0	0.63	0.30	1.13	1.111	0.156	0.122	1.008	1.356	0.382	1.500	A
4	7.0	0.63	0.26	1.13	0.720	0.372	0.166	0.824	0.675	0.193	0.586	A
5	7.0	0.87	0.65	-1.44	1.990	-0.073	0.002	0.775	0.720	0.435	0.654	A
5	7.0	0.87	0.57	-1.44	1.100	0.115	-0.220	0.811	0.766	0.390	0.698	A
5	7.0	0.87	0.49	-1.44	0.126	0.118	-0.346	0.858	1.097	0.292	1.013	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
5	7.0	0.87	0.44	-1.44	-0.390	0.893	-0.306	0.925	0.652	0.206	0.661	A
5	7.0	0.87	0.65	-1.27	2.697	-0.118	0.002	0.812	0.725	0.448	0.693	A
5	7.0	0.87	0.54	-1.27	1.936	0.021	-0.088	0.827	0.784	0.421	0.738	A
5	7.0	0.87	0.44	-1.27	-0.230	0.493	-0.566	1.063	1.220	0.457	1.413	A
5	7.0	0.87	0.37	-1.27	0.120	0.231	-0.041	0.187	0.291	0.048	0.061	A
5	7.0	0.87	0.64	-1.02	3.222	-0.153	0.022	0.772	0.739	0.408	0.655	A
5	7.0	0.87	0.51	-1.02	2.715	-0.076	-0.074	0.786	0.732	0.421	0.666	A
5	7.0	0.87	0.37	-1.02	0.641	0.179	-0.045	0.953	1.034	0.408	1.071	A
5	7.0	0.87	0.28	-1.02	-0.316	0.183	-0.093	0.639	0.229	0.105	0.236	A
5	7.0	0.87	0.64	-0.51	2.789	-0.213	0.131	0.644	0.615	0.375	0.466	A
5	7.0	0.87	0.47	-0.51	2.229	-0.075	0.085	0.672	0.652	0.390	0.514	A
5	7.0	0.87	0.29	-0.51	1.404	0.097	0.007	0.829	0.701	0.346	0.649	A
5	7.0	0.87	0.17	-0.51	0.054	-0.077	0.099	1.094	0.992	0.232	1.117	A
5	7.0	0.87	0.64	0.00	3.400	-0.057	0.040	0.655	0.674	0.409	0.525	A
5	7.0	0.87	0.55	0.00	3.412	-0.122	-0.030	0.681	0.646	0.402	0.521	A
5	7.0	0.87	0.46	0.00	3.241	-0.152	-0.084	0.745	0.671	0.404	0.584	A
5	7.0	0.87	0.36	0.00	2.973	-0.172	-0.094	0.775	0.724	0.416	0.649	A
5	7.0	0.87	0.27	0.00	2.547	-0.171	-0.125	0.865	0.750	0.402	0.736	A
5	7.0	0.87	0.20	0.00	1.406	0.170	-0.057	1.347	1.451	0.388	2.036	A
5	7.0	0.87	0.14	0.00	-0.226	0.056	0.074	0.418	0.682	0.116	0.327	A
5	7.0	0.87	0.08	0.00								C
5	7.0	0.87	0.63	0.51	3.652	-0.196	0.021	0.759	0.702	0.420	0.622	A
5	7.0	0.87	0.47	0.51	3.263	-0.122	-0.085	0.781	0.689	0.453	0.645	A
5	7.0	0.87	0.29	0.51								C
5	7.0	0.87	0.17	0.51								C
5	7.0	0.87	0.64	1.02	1.176	-0.136	0.026	0.762	0.681	0.516	0.655	A
5	7.0	0.87	0.51	1.02	1.154	0.005	0.037	0.703	0.621	0.430	0.532	A
5	7.0	0.87	0.37	1.02	0.565	0.143	0.014	1.714	2.388	0.429	4.413	A
5	7.0	0.87	0.28	1.02	-0.076	0.392	0.162	1.645	0.778	0.275	1.694	A
5	7.0	0.87	0.65	1.28	0.255	-0.150	0.098	0.536	0.539	0.340	0.346	A
5	7.0	0.87	0.54	1.28	0.112	-0.063	0.033	0.517	0.570	0.237	0.325	A
5	7.0	0.87	0.44	1.28	-0.097	0.043	0.001	1.328	2.199	0.357	3.363	A
5	7.0	0.87	0.38	1.28	-0.214	-0.007	-0.042	2.421	0.099	0.328	2.988	A
5	7.0	0.87	0.65	1.45	-0.008	-0.166	-0.004	0.457	0.531	0.237	0.274	A
5	7.0	0.87	0.57	1.45	-0.028	-0.051	-0.046	0.896	1.095	0.246	1.031	A
5	7.0	0.87	0.49	1.45	-0.162	-0.236	-0.071	0.802	0.985	0.206	0.828	A
5	7.0	0.87	0.45	1.45	-0.061	0.012	-0.073	0.257	0.253	0.096	0.070	A
6	7.0	1.02	0.79	-1.86	1.114	-0.002	-0.023	0.531	0.450	0.312	0.291	A
6	7.0	1.02	0.79	-1.64	1.730	-0.175	0.012	0.590	0.461	0.362	0.345	A
6	7.0	1.02	0.61	-1.64	1.023	0.021	-0.056	0.603	0.520	0.334	0.373	A
6	7.0	1.02	0.79	-1.31	2.445	-0.255	-0.074	0.555	0.441	0.338	0.309	A
6	7.0	1.02	0.50	-1.31	1.464	-0.084	-0.070	0.591	0.476	0.346	0.348	A
6	7.0	1.02	0.79	-0.66	1.899	-0.114	0.061	0.553	0.428	0.359	0.309	A
6	7.0	1.02	0.58	-0.66	1.541	-0.014	0.041	0.594	0.453	0.373	0.349	A
6	7.0	1.02	0.36	-0.66	1.174	0.102	-0.032	0.571	0.422	0.304	0.299	A
6	7.0	1.02	0.79	0.00	2.532	0.131	-0.015	0.594	0.451	0.385	0.352	A
6	7.0	1.02	0.68	0.00	2.290	0.115	-0.061	0.607	0.440	0.392	0.358	A
6	7.0	1.02	0.56	0.00	2.050	0.132	-0.076	0.701	0.482	0.406	0.444	A
6	7.0	1.02	0.44	0.00	1.847	0.135	-0.081	0.695	0.475	0.393	0.431	A
6	7.0	1.02	0.32	0.00	1.555	0.146	-0.085	0.693	0.498	0.380	0.436	A
6	7.0	1.02	0.24	0.00	1.270	0.207	-0.065	0.777	0.629	0.334	0.555	A
6	7.0	1.02	0.16	0.00	0.892	0.160	-0.024	0.970	1.038	0.293	1.052	A
6	7.0	1.02	0.79	0.66	2.347	0.204	-0.006	0.687	0.493	0.418	0.445	A
6	7.0	1.02	0.58	0.66	2.158	0.282	-0.021	0.613	0.504	0.418	0.402	A
6	7.0	1.02	0.36	0.66	1.803	0.404	0.008	0.589	0.508	0.371	0.371	A
6	7.0	1.02	0.79	1.32	0.881	-0.017	0.034	0.476	0.408	0.388	0.272	A
6	7.0	1.02	0.50	1.32	0.966	0.427	0.240	0.445	0.437	0.327	0.248	A
6	7.0	1.02	0.79	1.64	0.586	-0.035	0.119	0.361	0.382	0.309	0.186	A
6	7.0	1.02	0.61	1.64	0.551	0.140	0.199	0.776	1.257	0.322	1.143	A
6	7.0	1.02	0.79	1.86	0.454	-0.010	0.124	0.619	0.872	0.325	0.625	A

**Table B3. Summary of data for sloped-weir baffles at a 4.33% culvert slope.**

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
					ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
1	1.5	0.42	0.19	-1.02	0.111	0.783	-0.141	0.940	1.660	0.278	1.859	A
1	1.5	0.42	0.19	-1.02								C
1	1.5	0.42	0.19	-0.81	0.041	-0.023	-0.006	0.088	0.074	0.017	0.007	A
1	1.5	0.42	0.15	-0.81	-0.427	-0.209	0.165	1.181	1.782	0.283	2.326	A
1	1.5	0.42	0.19	-0.41	1.876	-0.013	0.003	0.839	0.906	0.384	0.836	A
1	1.5	0.42	0.15	-0.41	1.152	0.059	0.091	1.546	2.019	0.415	3.319	A
1	1.5	0.42	0.08	-0.41	-0.077	-0.152	0.022	0.199	0.325	0.052	0.074	A
1	1.5	0.42	0.19	0.00	1.943	-0.068	0.031	0.830	1.033	0.385	0.952	A
1	1.5	0.42	0.17	0.00	1.863	-0.142	-0.030	0.821	0.902	0.384	0.818	A
1	1.5	0.42	0.14	0.00	1.568	-0.079	0.012	0.979	1.305	0.358	1.395	A
1	1.5	0.42	0.11	0.00	1.118	0.002	0.073	1.562	2.036	0.400	3.371	A
1	1.5	0.42	0.08	0.00	0.012	0.024	0.024	0.356	0.480	0.095	0.183	A
1	1.5	0.42	0.06	0.00	-0.123	-0.026	0.002	0.248	0.099	0.035	0.036	A
1	1.5	0.42	0.05	0.00								C
1	1.5	0.42	0.19	0.41	1.566	-0.153	-0.048	0.781	0.875	0.370	0.756	A
1	1.5	0.42	0.15	0.41	1.010	-0.048	-0.108	0.865	0.967	0.319	0.892	A
1	1.5	0.42	0.10	0.41	0.163	0.145	-0.219	1.849	1.797	0.437	3.418	A
1	1.5	0.42	0.19	0.81	-0.028	-0.082	-0.016	1.079	0.888	0.250	1.007	A
1	1.5	0.42	0.15	0.81	-0.156	-0.050	-0.002	0.571	0.255	0.100	0.201	A
2	1.5	0.25	0.02	-0.25	-1.747	-0.639	0.061	1.965	2.284	0.414	4.624	A
2	1.5	0.25	0.02	-0.25	-1.672	-0.581	0.074	1.968	2.360	0.407	4.805	A
2	1.5	0.25	0.02	-0.25	-2.711	-1.248	0.057	2.972	2.525	0.549	7.757	A
2	1.5	0.25	0.02	-0.25	-2.876	-1.334	0.100	2.811	2.295	0.538	6.729	A
2	1.5	0.25	0.02	0.00	-0.077	-1.364	0.123	1.729	2.509	0.461	4.749	A
2	1.5	0.25	0.02	0.00	-0.066	-1.545	0.200	1.842	2.465	0.474	4.847	A
2	1.5	0.25	0.02	0.00	-0.822	-1.805	0.345	1.738	2.297	0.437	4.243	A
2	1.5	0.25	0.02	0.00	-0.881	-1.733	0.341	1.689	2.318	0.428	4.204	A
2	1.5	0.25	0.01	0.00	-0.793	-1.733	0.337	1.797	2.485	0.447	4.802	A
2	1.5	0.25	0.01	0.00	-1.219	-2.415	0.525	1.798	1.893	0.406	3.489	A
2	1.5	0.25	0.01	0.00	-1.313	-2.222	0.505	1.706	1.852	0.413	3.255	A
2	1.5	0.25	0.01	0.00	-1.389	-2.208	0.514	1.769	1.870	0.407	3.396	A
2	1.5	0.25	0.02	0.25	0.438	0.005	-0.034	1.856	1.130	0.311	2.410	A
2	1.5	0.25	0.02	0.25	0.493	0.047	-0.019	1.853	1.114	0.306	2.384	A
2	1.5	0.25	0.02	0.25	0.556	0.175	0.039	1.416	1.131	0.293	1.685	A
2	1.5	0.25	0.02	0.25	0.628	0.199	0.044	1.405	1.137	0.283	1.674	A
3	1.5	0.33	0.10	-0.76	0.321	0.479	-0.131	0.589	0.899	0.158	0.590	A
3	1.5	0.33	0.10	-0.76	0.342	0.486	-0.145	0.615	0.935	0.166	0.640	A
3	1.5	0.33	0.10	-0.76	1.115	1.195	-0.365	1.044	1.492	0.274	1.695	A
3	1.5	0.33	0.10	-0.76	1.172	1.212	-0.380	1.006	1.450	0.267	1.592	A
3	1.5	0.33	0.10	-0.38	-0.682	-0.141	0.024	2.042	1.732	0.371	3.654	A
3	1.5	0.33	0.08	-0.38	-0.034	0.359	0.249	2.133	2.892	0.472	6.569	A
3	1.5	0.33	0.06	-0.38	-1.522	-1.077	-0.023	2.904	2.480	0.526	7.431	A
3	1.5	0.33	0.04	-0.38	-1.381	-0.439	0.001	3.220	2.434	0.563	8.306	A
3	1.5	0.33	0.10	0.00	-0.540	-0.803	0.258	3.017	1.192	0.555	5.416	A
3	1.5	0.33	0.09	0.00	-0.320	-0.809	0.297	2.298	1.323	0.532	3.656	A
3	1.5	0.33	0.07	0.00	-0.342	-0.687	0.244	2.012	1.652	0.532	3.530	A
3	1.5	0.33	0.06	0.00	0.067	-0.757	0.139	2.047	1.880	0.500	3.987	A
3	1.5	0.33	0.04	0.00	-0.603	-0.488	0.179	2.937	1.863	0.600	6.228	A
3	1.5	0.33	0.03	0.00	0.257	-0.699	0.113	2.678	1.608	0.570	5.041	A
3	1.5	0.33	0.02	0.00	-0.129	-0.701	-0.142	2.305	1.092	0.456	3.357	A
3	1.5	0.33	0.01	0.00	1.120	-0.569	-0.018	1.982	0.695	0.345	2.266	A
3	1.5	0.33	0.10	0.38	0.260	-0.561	-0.258	1.608	1.042	0.284	1.877	A
3	1.5	0.33	0.08	0.38	0.126	-0.266	-0.071	0.759	0.945	0.168	0.749	A
3	1.5	0.33	0.06	0.38	0.599	-0.061	-0.206	1.154	1.704	0.297	2.162	A
3	1.5	0.33	0.05	0.38	1.085	-0.391	-0.002	1.928	0.916	0.319	2.329	A
3	1.5	0.33	0.10	0.76	-0.200	-0.075	0.019	1.129	2.019	0.273	2.712	A
3	1.5	0.33	0.10	0.76	-0.130	-0.121	0.002	1.289	2.183	0.321	3.266	A
3	1.5	0.33	0.10	0.76	0.842	0.801	-0.219	1.824	2.123	0.390	3.995	A
3	1.5	0.33	0.10	0.76	0.159	0.775	-0.271	2.190	2.344	0.404	5.226	A
4	1.5	0.31	0.08	-0.35	0.014	0.008	-0.004	0.122	0.154	0.027	0.020	A
4	1.5	0.31	0.07	-0.35	-0.037	-0.091	0.023	0.420	0.338	0.080	0.149	A
4	1.5	0.31	0.05	-0.35	-1.200	0.065	-0.074	2.541	1.396	0.488	4.323	A
4	1.5	0.31	0.04	-0.35								C
4	1.5	0.31	0.08	0.00	0.794	0.175	-0.189	0.743	0.845	0.323	0.685	A
4	1.5	0.31	0.07	0.00	-0.003	0.022	0.002	0.086	0.120	0.020	0.011	A
4	1.5	0.31	0.06	0.00	-0.043	-0.067	0.023	0.332	0.321	0.072	0.109	A
4	1.5	0.31	0.05	0.00	0.332	-1.062	0.444	1.780	1.399	0.390	2.638	A
4	1.5	0.31	0.04	0.00	-0.766	-1.852	0.461	3.262	1.683	0.520	6.873	A
4	1.5	0.31	0.03	0.00	-2.204	-0.944	0.447	2.413	1.527	0.412	4.164	A
4	1.5	0.31	0.02	0.00	-1.109	-0.609	0.330	2.056	2.881	0.488	6.381	A
4	1.5	0.31	0.01	0.00	-0.026	0.201	0.002	0.377	0.614	0.102	0.265	A
4	1.5	0.31	0.08	0.35	0.059	-0.004	0.000	0.315	0.107	0.048	0.057	A
4	1.5	0.31	0.07	0.35	1.550	0.067	0.149	2.172	0.159	0.290	2.414	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
4	1.5	0.31	0.05	0.35	0.146	0.009	-0.011	3.427	0.145	0.461	5.988	A
5	1.5	0.46	0.23	-1.07	-0.246	0.029	-0.137	0.436	0.645	0.199	0.323	A
5	1.5	0.46	0.22	-1.07	0.001	-0.042	-0.049	0.121	0.130	0.044	0.017	A
5	1.5	0.46	0.23	-0.85	0.753	-0.234	0.090	0.709	0.710	0.348	0.564	A
5	1.5	0.46	0.17	-0.85	0.031	0.336	0.213	0.374	0.451	0.125	0.180	A
5	1.5	0.46	0.23	-0.43	1.940	-0.282	-0.063	0.768	0.721	0.398	0.634	A
5	1.5	0.46	0.18	-0.43	1.383	-0.250	0.005	0.747	0.788	0.374	0.660	A
5	1.5	0.46	0.12	-0.43	-0.244	-0.179	0.435	0.824	0.982	0.312	0.870	A
5	1.5	0.46	0.23	0.00	1.977	-0.349	0.002	0.743	0.768	0.386	0.645	A
5	1.5	0.46	0.20	0.00	1.720	-0.381	-0.029	0.732	0.730	0.380	0.607	A
5	1.5	0.46	0.17	0.00	1.329	-0.052	-0.045	1.295	1.643	0.382	2.261	A
5	1.5	0.46	0.13	0.00	0.818	-0.178	-0.057	0.612	0.770	0.259	0.517	A
5	1.5	0.46	0.10	0.00	-0.128	0.072	0.050	0.205	0.308	0.064	0.070	A
5	1.5	0.46	0.07	0.00	-0.012	-0.855	0.059	0.552	1.001	0.201	0.674	A
5	1.5	0.46	0.05	0.00								C
5	1.5	0.46	0.23	0.43	1.093	0.017	-0.013	1.666	1.936	0.416	3.349	A
5	1.5	0.46	0.18	0.43	0.613	0.071	-0.042	0.409	0.308	0.107	0.137	A
5	1.5	0.46	0.12	0.43								C
5	1.5	0.46	0.17	0.86	0.337	-0.251	0.050	1.336	1.062	0.228	1.482	A
5	1.5	0.46	0.23	1.07								C
5	1.5	0.46	0.22	1.07	-1.273	-2.883	0.495	1.631	1.724	0.351	2.879	A
6	1.5	0.71	0.55	-1.53	-0.215	0.073	-0.024	0.485	0.707	0.213	0.390	A
6	1.5	0.71	0.47	-1.35	0.226	0.071	-0.067	0.568	0.668	0.283	0.424	A
6	1.5	0.71	0.39	-1.35	0.005	0.102	-0.036	0.467	0.678	0.238	0.367	A
6	1.5	0.71	0.48	-1.08	0.932	0.109	-0.089	0.635	0.758	0.330	0.543	A
6	1.5	0.71	0.36	-1.08	0.708	0.147	-0.077	0.588	0.718	0.303	0.476	A
6	1.5	0.71	0.48	-0.54	1.366	0.117	0.053	0.658	0.791	0.333	0.584	A
6	1.5	0.71	0.36	-0.54	1.037	0.197	0.000	0.641	0.786	0.314	0.564	A
6	1.5	0.71	0.23	-0.54	0.673	0.310	-0.043	0.665	0.750	0.265	0.537	A
6	1.5	0.71	0.48	0.00	1.403	0.273	0.047	0.668	0.782	0.350	0.590	A
6	1.5	0.71	0.41	0.00	1.273	0.309	0.012	0.672	0.766	0.352	0.581	A
6	1.5	0.71	0.34	0.00	1.084	0.350	0.000	0.657	0.788	0.341	0.584	A
6	1.5	0.71	0.27	0.00	0.936	0.372	-0.012	0.641	0.764	0.308	0.545	A
6	1.5	0.71	0.20	0.00	0.756	0.434	-0.035	0.640	0.837	0.287	0.596	A
6	1.5	0.71	0.15	0.00	0.595	0.487	-0.051	0.699	0.905	0.257	0.687	A
6	1.5	0.71	0.14	0.00								C
6	1.5	0.71	0.48	0.54	0.559	0.247	0.059	0.545	0.728	0.311	0.461	A
6	1.5	0.71	0.36	0.54	0.582	0.324	0.066	0.523	0.722	0.302	0.443	A
6	1.5	0.71	0.23	0.54	0.454	0.380	0.042	0.544	0.742	0.242	0.452	A
6	1.5	0.71	0.48	1.08	0.094	0.169	0.088	0.417	0.620	0.252	0.310	A
6	1.5	0.71	0.35	1.08	0.116	0.236	0.150	0.546	0.790	0.223	0.485	A
6	1.5	0.71	0.48	1.35	-0.020	0.161	0.127	0.403	0.622	0.231	0.301	A
6	1.5	0.71	0.42	1.35	-0.042	0.184	0.133	0.380	0.604	0.201	0.275	A
6	1.5	0.71	0.57	1.53	-0.074	0.043	0.087	0.401	0.590	0.208	0.276	A
1	3.0	0.48	0.25	-1.11	-0.018	0.004	0.007	0.388	0.372	0.108	0.150	A
1	3.0	0.48	0.23	-1.11	0.470	0.522	-0.146	0.840	1.437	0.221	1.410	A
1	3.0	0.48	0.25	-0.89	0.427	-0.194	-0.061	0.491	0.309	0.141	0.178	A
1	3.0	0.48	0.19	-0.89	0.558	0.599	-0.272	1.386	2.328	0.391	3.745	A
1	3.0	0.48	0.25	-0.44	1.637	0.186	-0.058	0.960	0.995	0.382	1.029	A
1	3.0	0.48	0.19	-0.44	0.347	0.605	-0.096	0.392	0.672	0.106	0.308	A
1	3.0	0.48	0.12	-0.44								C
1	3.0	0.48	0.25	0.00								C
1	3.0	0.48	0.22	0.00	2.374	-0.025	0.152	0.904	0.963	0.458	0.976	A
1	3.0	0.48	0.18	0.00	2.005	-0.010	0.082	1.035	1.251	0.427	1.409	A
1	3.0	0.48	0.14	0.00	1.588	0.110	0.076	1.475	2.054	0.446	3.297	A
1	3.0	0.48	0.11	0.00	-0.072	0.080	0.024	0.143	0.191	0.035	0.029	A
1	3.0	0.48	0.08	0.00	0.148	0.099	0.042	0.632	0.381	0.099	0.277	A
1	3.0	0.48	0.06	0.00	-1.022	0.208	0.101	2.561	0.678	0.367	3.575	A
1	3.0	0.48	0.25	0.44	2.819	-0.152	-0.087	0.943	0.858	0.470	0.923	A
1	3.0	0.48	0.19	0.44	2.127	-0.219	-0.159	1.052	0.979	0.446	1.133	A
1	3.0	0.48	0.12	0.44	0.178	-0.059	-0.445	1.168	1.215	0.468	1.529	A
1	3.0	0.48	0.25	0.89	0.120	-0.150	0.026	1.637	1.967	0.404	3.357	A
1	3.0	0.48	0.19	0.89	-0.220	-0.088	0.001	0.326	0.169	0.075	0.070	A
1	3.0	0.48	0.25	1.11	2.650	-4.442	-0.716	0.853	1.631	0.229	1.719	A
1	3.0	0.48	0.23	1.11	-0.440	-0.124	0.125	0.834	1.228	0.226	1.127	A
2	3.0	0.45	0.22	-1.04								C
2	3.0	0.45	0.21	-1.04								C
2	3.0	0.45	0.19	-1.04								C
2	3.0	0.45	0.17	-1.04								C
2	3.0	0.45	0.16	-0.83								C
2	3.0	0.45	0.15	-0.83	0.126	0.176	0.000	1.002	1.112	0.209	1.142	A
2	3.0	0.45	0.13	-0.83	0.050	0.140	-0.031	1.069	0.901	0.200	0.997	A
2	3.0	0.45	0.12	-0.83	-0.014	0.272	-0.027	1.247	1.354	0.274	1.732	A
2	3.0	0.45	0.19	-0.41								C
2	3.0	0.45	0.17	-0.41	1.216	0.207	0.031	1.220	1.265	0.648	1.753	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
2	3.0	0.45	0.11	-0.41	1.040	0.756	0.071	1.088	1.397	0.513	1.699	A
2	3.0	0.45	0.10	-0.41	0.860	0.809	0.111	0.870	1.126	0.443	1.110	A
2	3.0	0.45	0.18	0.00	1.190	0.131	-0.263	1.031	1.205	0.843	1.613	A
2	3.0	0.45	0.17	0.00	1.088	-0.009	-0.149	0.966	1.215	0.882	1.593	A
2	3.0	0.45	0.16	0.00	1.032	-0.148	-0.103	0.878	1.152	0.887	1.442	A
2	3.0	0.45	0.14	0.00	0.852	-0.360	-0.123	1.101	1.514	0.745	2.029	A
2	3.0	0.45	0.12	0.00	0.522	-0.534	0.038	1.326	1.821	0.628	2.734	A
2	3.0	0.45	0.11	0.00	0.469	-0.851	0.018	0.912	1.249	0.625	1.391	A
2	3.0	0.45	0.09	0.00	0.357	-0.902	0.022	0.750	1.073	0.465	0.966	A
2	3.0	0.45	0.08	0.00	0.084	-0.610	0.002	0.588	0.704	0.196	0.440	A
2	3.0	0.45	0.21	0.41								C
2	3.0	0.45	0.17	0.41	0.971	-0.648	-0.464	1.159	1.295	0.809	1.837	A
2	3.0	0.45	0.14	0.41	0.292	-0.390	-0.274	1.610	2.120	0.578	3.710	A
2	3.0	0.45	0.11	0.41	-0.292	-0.433	-0.293	1.591	1.614	0.505	2.696	A
2	3.0	0.45	0.26	0.83	0.666	-0.017	0.005	1.459	1.154	0.423	1.818	A
2	3.0	0.45	0.24	0.83	0.590	0.131	0.082	1.018	0.206	0.145	0.550	A
2	3.0	0.45	0.19	0.83	0.098	0.676	0.268	1.544	2.089	0.514	3.508	A
2	3.0	0.45	0.18	0.83	0.462	-0.133	0.148	1.472	2.024	0.510	3.261	A
2	3.0	0.45	0.38	1.04	0.465	0.000	-0.036	0.539	0.439	0.096	0.246	A
3	3.0	0.29	0.06	-0.34	-1.143	0.267	0.092	2.106	2.380	0.396	5.128	A
3	3.0	0.29	0.05	-0.34								C
3	3.0	0.29	0.04	-0.34								C
3	3.0	0.29	0.03	-0.34								C
3	3.0	0.29	0.06	0.00	-0.702	-0.860	0.309	2.844	2.300	0.548	6.841	A
3	3.0	0.29	0.06	0.00	-1.565	-0.668	-0.048	2.369	2.358	0.538	5.731	A
3	3.0	0.29	0.05	0.00	-1.225	-0.821	0.284	3.012	2.940	0.635	9.059	A
3	3.0	0.29	0.04	0.00								C
3	3.0	0.29	0.03	0.00	0.060	0.580	0.534	3.868	3.283	0.645	13.075	A
3	3.0	0.29	0.02	0.00	0.125	0.602	0.523	3.892	3.367	0.661	13.458	A
3	3.0	0.29	0.02	0.00	-0.652	0.168	0.020	3.911	3.258	0.719	13.212	A
3	3.0	0.29	0.01	0.00	-0.902	-0.475	0.091	2.785	2.193	0.509	6.411	A
3	3.0	0.29	0.06	0.34	0.102	-0.300	-0.129	3.211	1.971	0.582	7.267	A
3	3.0	0.29	0.05	0.34	-0.183	-1.029	-0.471	2.521	2.033	0.478	5.359	A
3	3.0	0.29	0.04	0.34	-0.412	-0.022	-0.083	1.834	0.228	0.251	1.740	A
4	3.0	0.40	0.17	-0.98	0.793	0.366	-0.112	1.282	1.494	0.260	1.972	A
4	3.0	0.40	0.17	-0.98	0.754	0.261	-0.111	1.305	1.576	0.273	2.131	A
4	3.0	0.40	0.17	-0.98	0.695	0.331	-0.104	1.326	1.494	0.269	2.032	A
4	3.0	0.40	0.17	-0.98	0.677	0.386	-0.111	1.340	1.544	0.264	2.124	A
4	3.0	0.40	0.17	-0.79	1.137	0.495	-0.316	1.008	1.709	0.264	2.003	A
4	3.0	0.40	0.16	-0.79	1.246	-0.016	-0.341	1.422	2.375	0.370	3.899	A
4	3.0	0.40	0.14	-0.79	0.379	0.390	0.000	1.885	2.761	0.429	5.678	A
4	3.0	0.40	0.13	-0.79	2.332	-1.374	-0.380	1.758	2.879	0.466	5.798	A
4	3.0	0.40	0.17	-0.39								C
4	3.0	0.40	0.13	-0.39	-0.056	0.149	0.096	0.454	0.626	0.117	0.306	A
4	3.0	0.40	0.09	-0.39	0.119	-0.051	0.027	0.527	0.387	0.092	0.218	A
4	3.0	0.40	0.06	-0.39	-0.797	-0.159	0.080	1.766	2.295	0.396	4.272	A
4	3.0	0.40	0.17	0.00								C
4	3.0	0.40	0.15	0.00								C
4	3.0	0.40	0.12	0.00	1.739	0.223	0.007	0.947	1.080	0.356	1.095	A
4	3.0	0.40	0.10	0.00	0.097	0.036	0.023	0.172	0.224	0.042	0.041	A
4	3.0	0.40	0.08	0.00	0.011	-0.006	0.002	0.238	0.216	0.045	0.053	A
4	3.0	0.40	0.06	0.00	0.564	-0.500	0.216	3.633	0.879	0.511	7.117	A
4	3.0	0.40	0.04	0.00	-0.398	-1.498	0.382	3.233	1.782	0.485	6.930	A
4	3.0	0.40	0.03	0.00	-0.989	-0.534	0.276	1.775	2.537	0.441	4.890	A
4	3.0	0.40	0.17	0.39								C
4	3.0	0.40	0.13	0.39								C
4	3.0	0.40	0.09	0.39	0.312	-0.013	0.036	0.838	0.087	0.114	0.362	A
4	3.0	0.40	0.06	0.39	0.445	-0.031	0.039	2.002	0.124	0.268	2.048	A
4	3.0	0.40	0.17	0.79	-0.359	0.233	0.203	1.631	1.647	0.416	2.773	A
4	3.0	0.40	0.16	0.79	-0.508	0.428	0.164	0.761	0.763	0.191	0.599	A
4	3.0	0.40	0.14	0.79	-0.080	-0.002	0.022	0.260	0.133	0.049	0.044	A
4	3.0	0.40	0.13	0.79	-0.084	-0.002	0.022	0.266	0.134	0.048	0.045	A
4	3.0	0.40	0.17	0.98	-0.111	0.470	0.170	0.684	0.899	0.163	0.651	A
4	3.0	0.40	0.17	0.98	-0.311	0.868	0.242	0.990	1.541	0.259	1.712	A
4	3.0	0.40	0.17	0.98	-1.505	3.119	0.583	0.946	1.449	0.241	1.526	A
4	3.0	0.40	0.17	0.98	-1.521	3.186	0.589	0.910	1.349	0.235	1.351	A
5	3.0	0.46	0.23	-1.07	-0.619	0.377	-0.113	0.890	0.993	0.347	0.950	A
5	3.0	0.46	0.22	-1.07	-0.133	0.221	-0.167	0.523	0.650	0.198	0.367	A
5	3.0	0.46	0.23	-0.85	0.968	0.032	-0.017	0.925	0.928	0.467	0.967	A
5	3.0	0.46	0.17	-0.85	-0.691	0.230	-0.041	0.791	0.915	0.368	0.799	A
5	3.0	0.46	0.23	-0.43	2.029	-0.071	0.037	1.006	0.984	0.479	1.105	A
5	3.0	0.46	0.18	-0.43	1.693	-0.107	0.031	1.026	0.953	0.489	1.100	A
5	3.0	0.46	0.12	-0.43	-0.340	-0.163	0.534	1.162	1.139	0.402	1.404	A
5	3.0	0.46	0.22	0.00	2.406	-0.107	0.062	0.931	0.905	0.458	0.948	A
5	3.0	0.46	0.20	0.00	2.287	-0.117	-0.022	1.081	0.925	0.468	1.122	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
5	3.0	0.46	0.17	0.00	1.647	0.194	0.008	1.834	2.394	0.508	4.676	A
5	3.0	0.46	0.13	0.00	0.918	-0.150	-0.064	0.665	0.698	0.270	0.501	A
5	3.0	0.46	0.10	0.00	-0.067	0.132	0.032	0.133	0.170	0.040	0.024	A
5	3.0	0.46	0.07	0.00	-0.463	-0.475	0.121	0.646	0.832	0.205	0.576	A
5	3.0	0.46	0.05	0.00								C
5	3.0	0.46	0.23	0.43								C
5	3.0	0.46	0.20	0.43	1.834	-0.222	-0.068	1.309	1.440	0.399	1.973	A
5	3.0	0.46	0.12	0.43	-0.156	-1.240	0.039	1.059	1.878	0.283	2.363	A
5	3.0	0.46	0.34	0.86	1.121	-0.178	-0.046	0.909	1.168	0.341	1.154	A
5	3.0	0.46	0.29	0.86	0.659	-0.029	0.070	1.072	1.316	0.327	1.493	A
5	3.0	0.46	0.36	1.07	0.221	-0.158	-0.103	1.162	1.591	0.326	1.995	A
5	3.0	0.46	0.34	1.07	0.493	-0.179	-0.046	0.636	0.736	0.288	0.515	A
6	3.0	0.73	0.57	-1.60	0.262	0.000	-0.021	0.512	0.548	0.283	0.321	A
6	3.0	0.73	0.50	-1.41	0.685	0.053	-0.066	0.594	0.571	0.332	0.395	A
6	3.0	0.73	0.41	-1.41	0.234	0.162	-0.025	0.541	0.563	0.273	0.342	A
6	3.0	0.73	0.50	-1.13	1.103	0.048	-0.016	0.655	0.644	0.374	0.492	A
6	3.0	0.73	0.34	-1.13	0.589	0.237	-0.059	0.578	0.609	0.317	0.403	A
6	3.0	0.73	0.50	-0.57	1.946	0.084	0.043	0.766	0.711	0.405	0.628	A
6	3.0	0.73	0.37	-0.57	1.388	0.236	-0.026	0.743	0.715	0.403	0.612	A
6	3.0	0.73	0.23	-0.57	0.881	0.323	-0.062	0.766	0.706	0.366	0.610	A
6	3.0	0.73	0.50	0.00	2.414	0.325	0.035	0.752	0.685	0.411	0.602	A
6	3.0	0.73	0.43	0.00	2.120	0.356	0.012	0.728	0.686	0.410	0.584	A
6	3.0	0.73	0.35	0.00	1.826	0.390	0.014	0.774	0.709	0.419	0.639	A
6	3.0	0.73	0.28	0.00	1.664	0.465	-0.039	0.789	0.717	0.396	0.646	A
6	3.0	0.73	0.20	0.00	1.344	0.503	-0.039	0.786	0.718	0.383	0.640	A
6	3.0	0.73	0.15	0.00	1.010	0.496	-0.046	0.751	0.719	0.318	0.591	A
6	3.0	0.73	0.10	0.00								C
6	3.0	0.73	0.50	0.57	1.107	0.275	0.086	0.632	0.644	0.458	0.512	A
6	3.0	0.73	0.37	0.57	1.069	0.426	0.093	0.593	0.633	0.408	0.459	A
6	3.0	0.73	0.23	0.57	0.944	0.596	0.098	0.619	0.640	0.347	0.456	A
6	3.0	0.73	0.50	1.13	0.196	0.261	0.123	0.422	0.521	0.334	0.280	A
6	3.0	0.73	0.34	1.13	0.244	0.564	0.288	0.695	0.723	0.288	0.544	A
6	3.0	0.73	0.50	1.41	-0.007	0.348	0.279	0.404	0.487	0.286	0.241	A
6	3.0	0.73	0.41	1.41	-0.047	0.289	0.302	0.822	1.216	0.317	1.128	A
6	3.0	0.73	0.50	1.60	-0.206	0.298	0.246	0.449	0.567	0.219	0.286	A
1	4.0	0.46	0.25	-1.06	0.067	0.119	-0.025	0.105	0.171	0.028	0.021	A
1	4.0	0.46	0.24	-0.94	0.916	-0.064	0.008	0.552	0.521	0.191	0.306	A
1	4.0	0.46	0.21	-0.94	0.045	0.099	-0.021	0.107	0.156	0.028	0.018	A
1	4.0	0.46	0.23	-0.75								C
1	4.0	0.46	0.19	-0.75	1.817	-0.027	-0.094	0.805	0.688	0.352	0.622	A
1	4.0	0.46	0.24	-0.38								C
1	4.0	0.46	0.18	-0.38								C
1	4.0	0.46	0.12	-0.38	1.466	-0.065	0.024	0.715	0.584	0.243	0.456	A
1	4.0	0.46	0.15	0.00	2.308	0.138	0.095	0.869	0.776	0.374	0.749	A
1	4.0	0.46	0.14	0.00	2.210	0.012	0.070	0.898	0.745	0.395	0.759	A
1	4.0	0.46	0.13	0.00	2.329	0.001	0.046	0.936	0.730	0.399	0.784	A
1	4.0	0.46	0.11	0.00	2.066	-0.049	0.071	0.954	0.749	0.372	0.805	A
1	4.0	0.46	0.07	0.00	1.770	-0.066	0.065	0.924	0.763	0.335	0.775	A
1	4.0	0.46	0.15	0.38	0.590	0.024	0.060	0.526	0.426	0.141	0.239	A
1	4.0	0.46	0.14	0.38	0.021	0.030	0.009	0.107	0.085	0.020	0.010	A
1	4.0	0.46	0.13	0.38								C
1	4.0	0.46	0.24	0.74	1.998	-0.103	-0.068	0.951	0.783	0.408	0.843	A
1	4.0	0.46	0.16	0.74	1.864	-0.195	-0.142	1.023	0.798	0.430	0.934	A
1	4.0	0.46	0.24	0.93	2.087	-0.140	-0.063	0.855	0.601	0.423	0.636	A
1	4.0	0.46	0.19	0.93	0.263	-0.277	-0.165	0.770	0.703	0.421	0.632	A
1	4.0	0.46	0.30	1.06	0.512	-0.180	0.009	0.647	0.629	0.340	0.465	A
2	4.0	0.48	0.22	-1.10								C
2	4.0	0.48	0.16	-1.10								C
2	4.0	0.48	0.14	-1.10								C
2	4.0	0.48	0.13	-1.10								C
2	4.0	0.48	0.17	-0.88								C
2	4.0	0.48	0.15	-0.88								C
2	4.0	0.48	0.14	-0.88	0.109	0.209	-0.037	0.923	1.082	0.197	1.031	A
2	4.0	0.48	0.13	-0.88	0.127	0.195	-0.033	0.861	1.037	0.190	0.926	A
2	4.0	0.48	0.23	-0.44								C
2	4.0	0.48	0.19	-0.44	0.967	-0.013	-0.169	1.221	1.203	0.663	1.689	A
2	4.0	0.48	0.13	-0.44	0.699	0.637	-0.206	0.955	1.184	0.677	1.386	A
2	4.0	0.48	0.08	-0.44	0.553	1.110	-0.123	0.862	1.166	0.432	1.145	A
2	4.0	0.48	0.19	0.00	0.937	0.261	0.096	0.906	1.090	0.970	1.474	A
2	4.0	0.48	0.17	0.00	0.932	0.085	0.103	0.862	1.081	0.955	1.413	A
2	4.0	0.48	0.16	0.00	0.888	-0.141	0.131	0.872	1.131	0.978	1.498	A
2	4.0	0.48	0.14	0.00	0.780	-0.289	0.168	0.837	1.084	0.943	1.382	A
2	4.0	0.48	0.12	0.00	0.649	-0.584	0.112	0.782	1.102	0.924	1.340	A
2	4.0	0.48	0.09	0.00	0.217	-0.634	0.127	1.911	2.962	0.650	6.422	A
2	4.0	0.48	0.07	0.00	0.258	-1.181	0.140	0.801	1.149	0.573	1.145	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type	
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>		
2	4.0	0.48	0.06	0.00	0.214	-1.194	0.149	0.746	1.130	0.524	1.054	A	
2	4.0	0.48	0.22	0.44	1.085	0.024	-0.580	1.439	1.572	0.875	2.654	A	
2	4.0	0.48	0.19	0.44	1.055	-0.290	-0.610	1.037	1.321	0.906	1.820	A	
2	4.0	0.48	0.16	0.44	0.789	-0.705	-0.539	1.177	1.381	0.872	2.027	A	
2	4.0	0.48	0.13	0.44	0.494	-1.004	-0.550	0.958	1.217	0.772	1.498	A	
2	4.0	0.48	0.30	0.88	2.192	-0.444	-0.948	1.085	1.317	0.577	1.623	A	
2	4.0	0.48	0.28	0.88	1.042	-1.723	-0.632	1.137	1.793	0.525	2.392	A	
2	4.0	0.48	0.26	0.88	0.332	-0.525	-0.105	1.588	1.149	0.421	2.010	A	
2	4.0	0.48	0.25	0.88	0.610	-0.300	0.084	1.418	0.802	0.345	1.386	A	
2	4.0	0.48	0.40	1.10	3.039	-0.073	0.017	0.891	1.169	0.599	0.542	1.227	A
2	4.0	0.48	0.38	1.10	1.129	0.097	0.025	1.119	0.599	0.220	0.830	A	
2	4.0	0.48	0.35	1.10	0.163	-0.084	0.030	0.354	0.380	0.096	0.140	A	
3	4.0	0.53	ALL DATA IS BAD									C	
4	4.0	0.40	0.21	-0.87	1.195	1.984	-0.323	0.775	1.300	0.202	1.165	A	
4	4.0	0.40	0.17	-0.77	0.609	0.900	-0.163	0.841	1.457	0.220	1.439	A	
4	4.0	0.40	0.15	-0.77	1.434	2.242	-0.375	1.643	2.635	0.419	4.907	A	
4	4.0	0.40	0.14	-0.77								C	
4	4.0	0.40	0.12	-0.77	0.219	1.448	-0.178	0.561	0.742	0.141	0.443	A	
4	4.0	0.40	0.17	-0.61	0.691	-0.099	-0.008	0.544	0.863	0.140	0.530	A	
4	4.0	0.40	0.14	-0.61	0.227	-0.031	-0.074	0.898	1.489	0.235	1.539	A	
4	4.0	0.40	0.11	-0.61	0.284	-0.405	-0.079	1.203	1.742	0.295	2.284	A	
4	4.0	0.40	0.11	-0.61								C	
4	4.0	0.40	0.17	-0.31								C	
4	4.0	0.40	0.13	-0.31								C	
4	4.0	0.40	0.12	-0.31	0.083	0.035	0.089	0.200	0.224	0.039	0.046	A	
4	4.0	0.40	0.11	-0.31								C	
4	4.0	0.40	0.15	0.00								C	
4	4.0	0.40	0.14	0.00								C	
4	4.0	0.40	0.12	0.00								C	
4	4.0	0.40	0.10	0.00	1.646	0.137	0.058	0.934	1.033	0.345	1.029	A	
4	4.0	0.40	0.11	0.00								C	
4	4.0	0.40	0.16	0.31								C	
4	4.0	0.40	0.13	0.31								C	
4	4.0	0.40	0.08	0.31	0.294	0.134	-0.069	0.118	0.156	0.027	0.019	A	
4	4.0	0.40	0.05	0.31								C	
4	4.0	0.40	0.17	0.62								C	
4	4.0	0.40	0.14	0.62								C	
4	4.0	0.40	0.11	0.62								C	
4	4.0	0.40	0.09	0.62								C	
4	4.0	0.40	0.17	0.77								C	
4	4.0	0.40	0.15	0.77								C	
4	4.0	0.40	0.14	0.77	-0.925	0.618	0.216	0.825	0.754	0.234	0.652	A	
4	4.0	0.40	0.12	0.77	-0.690	0.166	0.127	1.095	1.241	0.362	1.435	A	
4	4.0	0.40	0.17	0.87	-0.456	0.498	0.487	1.257	1.556	0.300	2.045	A	
4	4.0	0.40	0.16	0.87	0.198	-0.820	0.399	0.913	0.734	0.202	0.707	A	
4	4.0	0.40	0.16	0.87	-0.004	-0.118	0.198	1.513	2.215	0.451	3.698	A	
5	4.0	0.43	0.20	-1.07	0.033	0.171	-0.056	1.539	1.974	0.437	3.230	A	
5	4.0	0.43	0.20	-1.07	-0.311	0.499	-0.154	1.003	0.973	0.452	1.079	A	
5	4.0	0.43	0.20	-0.85	1.745	-0.006	0.098	0.927	1.171	0.467	1.224	A	
5	4.0	0.43	0.16	-0.85	0.545	0.019	-0.072	1.158	1.023	0.513	1.325	A	
5	4.0	0.43	0.20	-0.43	2.530	-0.274	0.159	1.065	0.962	0.427	1.121	A	
5	4.0	0.43	0.15	-0.43	2.418	-0.080	0.032	1.065	1.086	0.509	1.286	A	
5	4.0	0.43	0.10	-0.43	1.830	-0.096	-0.010	0.878	0.931	0.425	0.909	A	
5	4.0	0.43	0.21	0.00	2.855	-0.116	0.354	0.978	0.849	0.461	0.945	A	
5	4.0	0.43	0.17	0.00	2.719	-0.095	0.101	0.947	0.926	0.467	0.986	A	
5	4.0	0.43	0.14	0.00	2.458	-0.057	0.063	1.484	0.998	0.461	1.705	A	
5	4.0	0.43	0.11	0.00	2.180	-0.039	-0.101	1.092	1.197	0.432	1.406	A	
5	4.0	0.43	0.08	0.00	1.802	-0.018	-0.094	0.653	0.524	0.222	0.376	A	
5	4.0	0.43	0.06	0.00	0.629	-0.226	0.000	0.198	0.199	0.052	0.041	A	
5	4.0	0.43	0.04	0.00	0.018	0.018	0.036	0.891	1.093	0.468	1.104	A	
5	4.0	0.43	0.20	0.43	2.686	-0.099	0.084	1.644	1.757	0.425	2.986	A	
5	4.0	0.43	0.16	0.43	1.863	-0.006	0.004	1.157	1.226	0.401	1.502	A	
5	4.0	0.43	0.14	0.43	2.076	-0.234	-0.096	0.791	0.853	0.307	0.724	A	
5	4.0	0.43	0.21	0.85	1.060	-0.091	0.081	1.128	1.743	0.354	2.217	A	
5	4.0	0.43	0.31	1.07	0.649	0.007	-0.051	1.036	1.260	0.309	1.377	A	
5	4.0	0.43	0.28	1.07	0.273	0.018	-0.089	1.513	2.215	0.451	3.698	A	
6	4.0	0.80	0.57	-1.65	0.033	0.171	-0.056	1.539	1.974	0.437	3.230	A	
6	4.0	0.80	0.57	-1.46	-0.311	0.499	-0.154	1.003	0.973	0.452	1.079	A	
6	4.0	0.80	0.46	-1.46	1.745	-0.006	0.098	0.927	1.171	0.467	1.224	A	
6	4.0	0.80	0.57	-1.17	0.545	0.019	-0.072	1.158	1.023	0.513	1.325	A	
6	4.0	0.80	0.37	-1.17	2.530	-0.274	0.159	1.065	0.962	0.427	1.121	A	
6	4.0	0.80	0.53	-0.58	2.418	-0.080	0.032	1.065	1.086	0.509	1.286	A	
6	4.0	0.80	0.42	-0.58	1.830	-0.096	-0.010	0.878	0.931	0.425	0.909	A	
6	4.0	0.80	0.27	-0.58	2.855	-0.116	0.354	0.978	0.849	0.461	0.945	A	
6	4.0	0.80	0.52	0.00	2.719	-0.095	0.101	0.947	0.926	0.467	0.986	A	

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
6	4.0	0.80	0.49	0.00	2.458	-0.057	0.063	1.484	0.998	0.461	1.705	A
6	4.0	0.80	0.40	0.00	2.180	-0.039	-0.101	1.092	1.197	0.432	1.406	A
6	4.0	0.80	0.32	0.00	1.802	-0.018	-0.094	0.653	0.524	0.222	0.376	A
6	4.0	0.80	0.23	0.00	0.629	-0.226	0.000	0.198	0.199	0.052	0.041	A
6	4.0	0.80	0.18	0.00	0.018	0.018	0.036	0.891	1.093	0.468	1.104	A
6	4.0	0.80	0.12	0.00	2.686	-0.099	0.084	1.644	1.757	0.425	2.986	A
6	4.0	0.80	0.57	0.58	1.863	-0.006	0.004	1.157	1.226	0.401	1.502	A
6	4.0	0.80	0.42	0.58	2.076	-0.234	-0.096	0.791	0.853	0.307	0.724	A
6	4.0	0.80	0.27	0.58	1.060	-0.091	0.081	1.128	1.743	0.354	2.217	A
6	4.0	0.80	0.57	1.17	0.649	0.007	-0.051	1.036	1.260	0.309	1.377	A
6	4.0	0.80	0.37	1.17								C
1	7.0	0.53	0.31	-1.19	0.039	0.046	-0.014	0.201	0.304	0.049	0.068	A
1	7.0	0.53	0.31	-1.05								C
1	7.0	0.53	0.24	-1.05	0.064	0.090	-0.035	0.492	0.776	0.149	0.433	A
1	7.0	0.53	0.27	-0.84								C
1	7.0	0.53	0.20	-0.84	0.024	-0.049	-0.021	0.245	0.168	0.044	0.045	A
1	7.0	0.53	0.27	-0.42	3.082	0.185	0.209	0.851	0.862	0.469	0.844	A
1	7.0	0.53	0.23	-0.42	3.035	0.178	0.028	0.924	0.946	0.461	0.981	A
1	7.0	0.53	0.14	-0.42	1.224	0.169	0.019	0.703	0.687	0.197	0.503	A
1	7.0	0.53	0.25	0.00								C
1	7.0	0.53	0.22	0.00								C
1	7.0	0.53	0.20	0.00								C
1	7.0	0.53	0.17	0.00	3.051	0.199	-0.007	1.142	1.283	0.461	1.581	A
1	7.0	0.53	0.13	0.00	2.672	0.121	0.122	1.307	1.420	0.411	1.947	A
1	7.0	0.53	0.11	0.00	0.992	0.071	0.128	1.027	1.027	0.265	1.090	A
1	7.0	0.53	0.07	0.00	-0.031	0.055	0.013	0.124	0.101	0.021	0.013	A
1	7.0	0.53	0.25	0.42								C
1	7.0	0.53	0.20	0.42								C
1	7.0	0.53	0.14	0.42								C
1	7.0	0.53	0.31	0.84	3.315	0.353	-0.108	0.918	0.852	0.481	0.900	A
1	7.0	0.53	0.20	0.84								C
1	7.0	0.53	0.31	1.05	1.197	0.148	0.131	1.057	1.230	0.497	1.439	A
1	7.0	0.53	0.28	1.05	0.038	-0.079	0.476	1.277	1.458	0.492	1.999	A
1	7.0	0.53	0.36	1.19	0.661	0.146	0.175	0.824	1.206	0.470	1.177	A
2	7.0	0.81	0.32	-1.34	-0.015	0.036	-0.012	0.404	0.486	0.090	0.204	A
2	7.0	0.81	0.31	-1.34	0.012	-0.015	-0.007	0.298	0.359	0.065	0.111	A
2	7.0	0.81	0.30	-1.34	0.365	0.656	-0.103	0.891	1.518	0.235	1.576	A
2	7.0	0.81	0.29	-1.34	0.109	0.160	-0.038	1.068	1.773	0.281	2.182	A
2	7.0	0.81	0.31	-1.19								C
2	7.0	0.81	0.29	-1.19	2.253	1.180	-1.075	1.624	1.787	0.647	3.125	A
2	7.0	0.81	0.28	-1.19	2.162	1.267	-1.062	1.360	1.744	0.601	2.627	A
2	7.0	0.81	0.27	-1.19	0.043	-0.405	-0.354	1.107	1.225	0.291	1.405	A
2	7.0	0.81	0.33	-0.95								C
2	7.0	0.81	0.30	-0.95								C
2	7.0	0.81	0.27	-0.95	1.380	0.612	-0.733	1.649	1.630	1.051	3.242	A
2	7.0	0.81	0.24	-0.95	0.036	1.357	-0.483	2.728	3.170	0.774		C
2	7.0	0.81	0.40	-0.47								C
2	7.0	0.81	0.36	-0.47								C
2	7.0	0.81	0.26	-0.47	0.141	1.257	-0.446	1.412	1.988	0.734	3.243	A
2	7.0	0.81	0.15	-0.47	0.683	-0.467	0.509	1.477	1.272	0.721	2.160	A
2	7.0	0.81	0.41	0.00								C
2	7.0	0.81	0.34	0.00	0.398	-0.856	0.735	0.838	1.003	0.853	1.217	A
2	7.0	0.81	0.30	0.00	0.407	-0.736	0.900	0.859	1.032	0.830	1.246	A
2	7.0	0.81	0.26	0.00	0.391	-0.685	0.953	0.830	1.097	0.699	1.190	A
2	7.0	0.81	0.24	0.00	0.450	-0.511	0.977	0.868	1.177	0.651	1.281	A
2	7.0	0.81	0.18	0.00	0.543	-0.389	0.552	1.190	1.755	0.540	2.394	A
2	7.0	0.81	0.12	0.00	0.433	0.264	0.434	0.825	1.359	0.446	1.364	A
2	7.0	0.81	0.09	0.00	1.104	0.724	0.109	1.224	1.055	0.620	1.499	A
2	7.0	0.81	0.40	0.47								C
2	7.0	0.81	0.36	0.47	0.374	-0.247	-0.283	0.764	0.928	0.624	0.918	A
2	7.0	0.81	0.26	0.47	-0.378	-1.824	-0.504	0.849	1.003	0.477	0.977	A
2	7.0	0.81	0.15	0.47								C
2	7.0	0.81	0.48	0.95	2.453	0.149	-1.417	2.349	1.214	0.803	3.817	A
2	7.0	0.81	0.44	0.95	1.762	-0.381	-1.185	0.935	1.117	0.718	1.319	A
2	7.0	0.81	0.36	0.95	0.722	-0.694	-0.731	1.209	1.579	0.716	2.233	A
2	7.0	0.81	0.29	0.95	2.974	-0.071	-1.016	0.773	0.980	0.518	0.913	A
2	7.0	0.81	0.54	1.19	2.886	0.004	-0.815	0.753	1.018	0.553	0.955	A
2	7.0	0.81	0.46	1.19	2.851	0.027	-0.803	0.758	0.964	0.508	0.881	A
2	7.0	0.81	0.42	1.19	-0.061	-0.249	0.122	0.879	1.382	0.288	1.382	A
2	7.0	0.81	0.34	1.19	3.004	0.098	-0.175	0.743	0.877	0.613	0.849	A
2	7.0	0.81	0.58	1.34	3.127	0.375	-0.066	0.711	0.692	0.480	0.608	A
2	7.0	0.81	0.51	1.34	3.136	0.248	-0.101	0.728	0.673	0.491	0.612	A
3	7.0	0.65	0.35	-1.28	4.960	0.571	0.356	1.357	1.257	0.523	1.847	A
3	7.0	0.65	0.33	-1.28	4.512	0.557	0.283	1.480	1.549	0.521	2.431	A
3	7.0	0.65	0.31	-1.28								C

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
3	7.0	0.65	0.29	-1.28								C
3	7.0	0.65	0.25	-1.13								C
3	7.0	0.65	0.24	-1.13								C
3	7.0	0.65	0.23	-1.13								C
3	7.0	0.65	0.22	-1.13								C
3	7.0	0.65	0.19	-0.91								C
3	7.0	0.65	0.17	-0.91	1.874	-0.001	-0.088	1.297	1.403	0.439	1.921	A
3	7.0	0.65	0.15	-0.91	0.020	-0.045	-0.001	0.266	0.291	0.063	0.080	A
3	7.0	0.65	0.13	-0.91	-0.062	-0.016	0.026	0.549	0.802	0.157	0.485	A
3	7.0	0.65	0.13	-0.45								C
3	7.0	0.65	0.11	-0.45								C
3	7.0	0.65	0.09	-0.45	0.723	-0.187	0.003	0.908	0.750	0.179	0.709	A
3	7.0	0.65	0.08	-0.45	0.027	-0.025	-0.012	0.257	0.283	0.051	0.074	A
3	7.0	0.65	0.15	0.00	2.730	0.001	0.432	1.190	1.451	0.878	2.147	A
3	7.0	0.65	0.14	0.00	2.603	-0.120	0.385	1.220	1.469	0.858	2.191	A
3	7.0	0.65	0.12	0.00								C
3	7.0	0.65	0.10	0.00	2.372	-0.149	0.386	1.206	1.762	0.702	2.525	A
3	7.0	0.65	0.08	0.00	0.053	0.041	0.132	0.909	1.085	0.230	1.029	A
3	7.0	0.65	0.21	0.00								C
3	7.0	0.65	0.18	0.00								C
3	7.0	0.65	0.15	0.00	2.262	-0.657	-0.211	1.415	1.883	0.738	3.047	A
3	7.0	0.65	0.12	0.45	1.547	-0.478	-0.264	1.266	1.720	0.586	2.452	A
3	7.0	0.65	0.42	0.45	4.572	-0.204	-0.484	0.752	0.990	0.511	0.903	A
3	7.0	0.65	0.30	0.45	4.045	0.034	-0.467	0.821	1.015	0.554	1.006	A
3	7.0	0.65	0.26	0.45	3.404	0.247	-0.528	1.405	1.229	0.681	1.974	A
3	7.0	0.65	0.20	0.91	-0.724	0.241	-0.156	1.616	1.666	0.645	2.900	A
3	7.0	0.65	0.39	0.91	3.802	0.158	-0.107	0.851	0.921	0.517	0.920	A
3	7.0	0.65	0.37	0.91	3.535	0.236	-0.062	0.999	1.016	0.577	1.181	A
3	7.0	0.65	0.31	0.91	0.793	0.191	0.356	1.356	1.593	0.635	2.390	A
3	7.0	0.65	0.29	1.13	-0.577	0.028	0.684	1.160	1.331	0.579	1.727	A
3	7.0	0.65	0.42	1.13	2.710	0.240	0.050	1.072	1.055	0.565	1.291	A
3	7.0	0.65	0.39	1.13	0.712	0.058	0.326	1.224	1.803	0.603	2.556	A
3	7.0	0.65	0.38	1.13	0.257	-0.065	0.465	0.990	1.370	0.573	1.592	A
3	7.0	0.65	0.36	1.28	0.262	-0.202	0.448	0.917	0.903	0.442	0.926	A
4	7.0	0.54	0.31	-1.11	1.918	-0.318	-0.091	1.089	1.023	0.404	1.197	A
4	7.0	0.54	0.31	-1.11	1.728	-0.383	-0.044	0.987	1.002	0.418	1.076	A
4	7.0	0.54	0.30	-1.11	0.562	-0.330	-0.029	0.745	0.502	0.173	0.418	A
4	7.0	0.54	0.29	-1.11	0.152	-0.094	-0.010	0.373	0.278	0.083	0.111	A
4	7.0	0.54	0.21	-0.98	0.946	1.652	-0.289	0.885	1.585	0.262	1.683	A
4	7.0	0.54	0.20	-0.98	0.404	0.800	-0.235	1.637	2.526	0.436	4.625	A
4	7.0	0.54	0.19	-0.98	0.158	1.731	-0.318	1.986	2.916	0.502		C
4	7.0	0.54	0.18	-0.98	0.596	1.626	-0.585	2.012	2.842	0.494		C
4	7.0	0.54	0.22	-0.78	2.676	-0.418	-0.082	1.185	1.194	0.533	1.557	A
4	7.0	0.54	0.19	-0.78	0.120	0.012	-0.051	0.247	0.347	0.062	0.093	A
4	7.0	0.54	0.18	-0.78	-0.061	0.026	-0.022	0.228	0.267	0.049	0.063	A
4	7.0	0.54	0.16	-0.78	1.102	1.887	-0.303	0.887	1.513	0.231	1.565	A
4	7.0	0.54	0.23	-0.39	3.648	-0.264	0.001	1.085	1.074	0.561	1.323	A
4	7.0	0.54	0.21	-0.39	3.604	-0.178	-0.041	1.084	1.055	0.532	1.285	A
4	7.0	0.54	0.18	-0.39								C
4	7.0	0.54	0.13	-0.39	2.027	-0.234	0.083	1.011	0.934	0.283	0.987	A
4	7.0	0.54	0.31	0.00								C
4	7.0	0.54	0.27	0.00	3.719	-0.198	-0.042	1.014	1.156	0.575	1.348	A
4	7.0	0.54	0.22	0.00	3.630	-0.288	-0.069	0.982	1.076	0.560	1.218	A
4	7.0	0.54	0.17	0.00	3.367	-0.250	-0.052	1.011	1.093	0.561	1.266	A
4	7.0	0.54	0.13	0.00	2.833	-0.037	0.040	1.307	1.464	0.483	2.043	A
4	7.0	0.54	0.10	0.00	2.348	-0.018	0.135	1.330	1.662	0.447	2.365	A
4	7.0	0.54	0.07	0.00	0.707	0.041	0.129	0.684	0.677	0.191	0.481	A
4	7.0	0.54	0.03	0.00	-0.024	0.000	0.013	0.272	0.182	0.045	0.054	A
4	7.0	0.54	0.26	0.39								C
4	7.0	0.54	0.21	0.39								C
4	7.0	0.54	0.14	0.39	3.576	-0.174	-0.224	1.179	1.193	0.567	1.567	A
4	7.0	0.54	0.09	0.39	1.916	0.177	-0.331	1.230	1.162	0.489	1.550	A
4	7.0	0.54	0.31	0.78								C
4	7.0	0.54	0.25	0.78								C
4	7.0	0.54	0.19	0.78								C
4	7.0	0.54	0.15	0.78								C
4	7.0	0.54	0.24	0.98								C
4	7.0	0.54	0.22	0.98								C
4	7.0	0.54	0.21	0.98								C
4	7.0	0.54	0.20	0.98								C
4	7.0	0.54	0.23	1.11	0.960	0.822	0.666	1.157	1.063	0.361	1.299	A
4	7.0	0.54	0.22	1.11	0.289	0.732	0.819	1.072	1.242	0.423	1.435	A
4	7.0	0.54	0.21	1.11	0.604	0.001	0.506	1.130	1.378	0.345	1.648	A
4	7.0	0.54	0.24	1.11	-1.330	2.708	0.624	1.057	1.602	0.260	1.875	A
5	7.0	0.55	0.33	-1.35								C

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
5	7.0	0.55	0.30	-1.19								C
5	7.0	0.55	0.28	-1.19								C
5	7.0	0.55	0.26	-0.95								C
5	7.0	0.55	0.23	-0.95								C
5	7.0	0.55	0.26	-0.48								C
5	7.0	0.55	0.24	-0.48								C
5	7.0	0.55	0.16	-0.48	3.052	0.081	-0.191	1.207	1.036	0.538	1.410	A
5	7.0	0.55	0.30	0.00								C
5	7.0	0.55	0.28	0.00								C
5	7.0	0.55	0.23	0.00	3.166	-0.157	0.043	1.008	0.983	0.542	1.137	A
5	7.0	0.55	0.18	0.00	3.026	-0.080	-0.038	1.034	0.956	0.508	1.121	A
5	7.0	0.55	0.14	0.00	2.624	0.015	-0.134	1.238	1.058	0.502	1.452	A
5	7.0	0.55	0.10	0.00	1.527	-0.006	-0.095	1.009	1.208	0.440	1.336	A
5	7.0	0.55	0.07	0.00	0.681	-0.137	0.143	0.904	0.514	0.264	0.576	A
5	7.0	0.55	0.28	0.48								C
5	7.0	0.55	0.24	0.48								C
5	7.0	0.55	0.21	0.48								C
5	7.0	0.55	0.36	0.95	2.320	-0.082	0.042	0.909	0.800	0.439	0.830	A
5	7.0	0.55	0.29	0.95	1.240	0.180	0.138	0.931	1.067	0.406	1.085	A
5	7.0	0.55	0.37	1.19	0.431	0.127	-0.103	0.815	1.114	0.357	1.017	A
5	7.0	0.55	0.35	1.19	0.001	0.260	-0.184	1.149	1.173	0.347	1.408	A
5	7.0	0.55	0.45	1.35	0.069	0.093	-0.150	0.680	0.980	0.299	0.757	A
6	7.0	0.94	0.71	-1.73	0.369	0.053	-0.004	0.549	0.573	0.368	0.383	A
6	7.0	0.94	0.71	-1.52	1.009	-0.075	0.025	0.764	0.728	0.482	0.673	A
6	7.0	0.94	0.54	-1.52	0.424	-0.003	0.030	0.613	0.622	0.380	0.454	A
6	7.0	0.94	0.71	-1.22	2.075	-0.360	0.105	0.911	0.774	0.587	0.887	A
6	7.0	0.94	0.45	-1.22	1.031	-0.122	0.029	0.766	0.705	0.462	0.649	A
6	7.0	0.94	0.66	-0.61	3.288	0.182	0.119	0.861	0.729	0.472	0.747	A
6	7.0	0.94	0.52	-0.61	2.717	0.171	0.049	0.934	0.770	0.497	0.856	A
6	7.0	0.94	0.33	-0.61	1.798	0.274	-0.091	0.938	0.772	0.489	0.858	A
6	7.0	0.94	0.65	0.00	3.328	0.373	0.179	0.918	0.695	0.481	0.779	A
6	7.0	0.94	0.61	0.00	3.216	0.383	0.185	0.948	0.708	0.486	0.819	A
6	7.0	0.94	0.50	0.00	2.926	0.393	0.130	0.955	0.718	0.506	0.841	A
6	7.0	0.94	0.40	0.00	2.474	0.436	0.093	0.996	0.748	0.495	0.898	A
6	7.0	0.94	0.29	0.00	1.894	0.422	0.004	1.039	0.774	0.497	0.963	A
6	7.0	0.94	0.22	0.00	1.661	0.496	-0.030	1.072	0.814	0.469	1.016	A
6	7.0	0.94	0.15	0.00	0.981	0.521	-0.022	1.871	2.243	0.459		C
6	7.0	0.94	0.71	0.61	2.188	0.332	0.141	0.942	0.747	0.587	0.895	A
6	7.0	0.94	0.52	0.61	2.282	0.535	0.142	0.866	0.743	0.572	0.815	A
6	7.0	0.94	0.33	0.61	2.013	0.774	0.131	0.832	0.719	0.510	0.735	A
6	7.0	0.94	0.71	1.22	0.182	0.015	0.002	0.507	0.525	0.433	0.360	A
6	7.0	0.94	0.45	1.22	0.687	0.694	0.298	0.572	0.575	0.400	0.409	A
6	7.0	0.94	0.71	1.52	0.022	0.256	0.144	0.465	0.510	0.384	0.312	A
6	7.0	0.94	0.54	1.52	0.151	0.616	0.605	0.616	0.684	0.398	0.503	A
6	7.0	0.94	0.71	1.73	-0.061	0.254	0.503	0.474	0.577	0.356	0.342	A

## Slotted-weir Baffles

**Table B4. Summary of data for slotted-weir baffles at a 1.14% culvert slope.**

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
					ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
1	1.5	0.57	0.34	-1.26	0.674	0.016	-0.028	0.389	0.249	0.130	0.115	A
1	1.5	0.57	0.34	-1.01	0.904	0.039	-0.013	0.416	0.425	0.166	0.190	A
1	1.5	0.57	0.25	-1.01	0.623	-0.176	-0.036	0.291	0.276	0.102	0.086	A
1	1.5	0.57	0.34	-0.50	1.333	-0.054	-0.027	0.230	0.196	0.142	0.056	A
1	1.5	0.57	0.26	-0.50	1.221	-0.054	-0.042	0.256	0.215	0.145	0.067	A
1	1.5	0.57	0.17	-0.50	0.898	-0.040	-0.011	0.336	0.326	0.147	0.121	A
1	1.5	0.57	0.34	0.00	1.356	-0.024	-0.022	0.200	0.178	0.128	0.044	A
1	1.5	0.57	0.29	0.00	1.316	-0.016	-0.041	0.195	0.172	0.117	0.041	A
1	1.5	0.57	0.24	0.00	1.230	-0.014	-0.052	0.237	0.197	0.136	0.057	A
1	1.5	0.57	0.19	0.00	1.159	0.005	-0.039	0.270	0.219	0.135	0.070	A
1	1.5	0.57	0.14	0.00	0.780	0.095	-0.014	0.436	0.582	0.147	0.275	A
1	1.5	0.57	0.11	0.00	0.771	0.073	-0.023	0.358	0.381	0.137	0.146	A
1	1.5	0.57	0.08	0.00	0.440	0.042	-0.066	0.709	0.356	0.153	0.327	A
1	1.5	0.57	0.34	0.50	1.013	0.008	0.011	0.235	0.201	0.152	0.059	A
1	1.5	0.57	0.26	0.50	0.866	-0.017	-0.005	0.241	0.208	0.145	0.061	A
1	1.5	0.57	0.17	0.50	0.619	0.054	0.004	0.368	0.507	0.141	0.206	A
1	1.5	0.57	0.34	1.01	0.575	-0.019	-0.014	0.335	0.182	0.118	0.080	A
1	1.5	0.57	0.28	1.01	0.337	-0.050	0.004	0.519	0.713	0.144	0.399	A
1	1.5	0.57	0.45	1.26	0.413	-0.024	-0.006	0.269	0.186	0.109	0.059	A
1	1.5	0.57	0.41	1.26	0.330	-0.014	-0.006	0.266	0.304	0.105	0.087	A
2	1.5	0.52	0.29	-1.22	-0.088	0.078	0.084	0.493	0.663	0.168	0.355	A
2	1.5	0.52	0.29	-1.22	0.226	-0.469	-0.041	0.221	0.330	0.066	0.081	A
2	1.5	0.52	0.28	-1.22	0.316	-0.565	-0.058	0.234	0.378	0.069	0.101	A
2	1.5	0.52	0.27	-1.22	0.230	-0.395	-0.053	0.378	0.508	0.094	0.205	A
2	1.5	0.52	0.29	-0.98	0.861	0.019	0.104	0.871	0.855	0.286	0.786	A
2	1.5	0.52	0.26	-0.98	0.917	-0.160	0.051	0.534	0.489	0.253	0.294	A
2	1.5	0.52	0.22	-0.98	0.044	0.018	-0.012	0.084	0.129	0.023	0.012	A
2	1.5	0.52	0.19	-0.98	0.283	0.439	-0.070	0.254	0.411	0.070	0.119	A
2	1.5	0.52	0.29	-0.49	2.043	-0.714	0.019	0.674	0.748	0.504	0.634	A
2	1.5	0.52	0.22	-0.49	1.963	-0.670	-0.103	0.742	0.880	0.447	0.762	A
2	1.5	0.52	0.14	-0.49	1.625	-0.077	0.014	1.191	1.439	0.376	1.815	A
2	1.5	0.52	0.09	-0.49	-0.009	-0.015	0.000	0.079	0.089	0.015	0.007	A
2	1.5	0.52	0.29	0.00	3.305	-0.309	-0.222	0.211	0.284	0.204	0.075	A
2	1.5	0.52	0.25	0.00	3.239	-0.329	-0.194	0.233	0.261	0.219	0.085	A
2	1.5	0.52	0.21	0.00	3.109	-0.282	-0.153	0.341	0.322	0.274	0.148	A
2	1.5	0.52	0.16	0.00	2.595	-0.118	-0.029	0.673	0.845	0.314	0.633	A
2	1.5	0.52	0.12	0.00								C
2	1.5	0.52	0.09	0.00	1.815	0.227	0.064	0.972	1.136	0.323	1.170	A
2	1.5	0.52	0.06	0.00	0.010	0.127	0.004	0.248	0.322	0.064	0.085	A
2	1.5	0.52	0.03	0.00	-0.049	0.003	-0.007	0.062	0.066	0.013	0.004	A
2	1.5	0.52	0.29	0.49	1.629	0.183	-0.062	0.688	0.674	0.461	0.570	A
2	1.5	0.52	0.22	0.49	1.684	0.208	-0.273	0.619	0.624	0.458	0.491	A
2	1.5	0.52	0.14	0.49	1.640	0.422	-0.332	0.839	0.947	0.462	0.907	A
2	1.5	0.52	0.09	0.49	1.231	0.408	-0.312	1.029	1.237	0.349	1.356	A
2	1.5	0.52	0.29	0.97	1.129	-0.216	0.140	0.607	0.499	0.326	0.362	A
2	1.5	0.52	0.26	0.97	1.041	-0.088	0.121	0.754	0.643	0.321	0.543	A
2	1.5	0.52	0.22	0.97	0.553	0.029	-0.009	1.138	1.311	0.327	1.560	A
2	1.5	0.52	0.19	0.97								C
2	1.5	0.52	0.29	1.22	0.042	0.114	0.018	0.832	1.206	0.288	1.114	A
2	1.5	0.52	0.29	1.22	0.028	-0.034	-0.031	1.360	1.191	0.312	1.683	A
2	1.5	0.52	0.28	1.22	-0.013	-0.069	0.018	1.238	1.522	0.320	1.976	A
2	1.5	0.52	0.27	1.22	-0.074	-0.093	0.053	0.875	0.612	0.231	0.597	A
3	1.5	0.52	0.29	-1.04	0.545	-0.052	0.080	0.373	0.302	0.178	0.131	A
3	1.5	0.52	0.26	-1.04	0.451	-0.041	0.102	0.500	0.520	0.190	0.278	A
3	1.5	0.52	0.23	-1.04	0.313	-0.096	0.079	0.523	0.810	0.203	0.485	A
3	1.5	0.52	0.21	-1.04	0.818	-0.190	-0.055	0.724	0.798	0.164	0.594	A
3	1.5	0.52	0.29	-0.52	2.170	-0.372	0.089	0.516	0.490	0.380	0.326	A
3	1.5	0.52	0.22	-0.52	2.108	-0.307	0.027	0.684	0.615	0.350	0.484	A
3	1.5	0.52	0.15	-0.52	1.702	-0.290	0.015	0.628	0.571	0.322	0.412	A
3	1.5	0.52	0.10	-0.52	-0.005	0.006	-0.001	0.058	0.049	0.014	0.003	A
3	1.5	0.52	0.29	0.00	2.762	0.018	-0.199	0.590	0.430	0.377	0.337	A
3	1.5	0.52	0.25	0.00	2.912	0.006	-0.188	0.499	0.371	0.340	0.251	A
3	1.5	0.52	0.21	0.00	2.865	-0.003	-0.195	0.483	0.344	0.303	0.221	A
3	1.5	0.52	0.16	0.00								C
3	1.5	0.52	0.12	0.00	2.050	0.311	-0.037	0.725	0.610	0.276	0.487	A
3	1.5	0.52	0.09	0.00	1.326	0.064	-0.025	0.700	0.559	0.212	0.424	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
3	1.5	0.52	0.06	0.00	-0.031	0.118	0.021	0.068	0.104	0.017	0.008	A
3	1.5	0.52	0.03	0.00	-0.010	0.008	0.000	0.064	0.082	0.014	0.006	A
3	1.5	0.52	0.29	0.52	1.961	0.333	0.031	0.560	0.524	0.392	0.371	A
3	1.5	0.52	0.22	0.52	2.104	0.400	-0.023	0.511	0.486	0.359	0.313	A
3	1.5	0.52	0.15	0.52	1.688	0.295	-0.001	0.601	0.548	0.286	0.372	A
3	1.5	0.52	0.10	0.52	0.008	-0.007	0.002	0.043	0.043	0.008	0.002	A
3	1.5	0.52	0.29	1.04	0.400	-0.017	0.027	0.312	0.271	0.152	0.097	A
3	1.5	0.52	0.26	1.04	0.302	-0.026	0.015	0.408	0.407	0.153	0.177	A
3	1.5	0.52	0.23	1.04	0.226	0.065	-0.018	0.698	0.327	0.161	0.310	A
3	1.5	0.52	0.21	1.04	-0.362	0.138	-0.074	1.072	0.362	0.192	0.659	A
4	1.5	0.56	0.33	-1.27	0.028	0.025	-0.007	0.047	0.067	0.011	0.003	A
4	1.5	0.56	0.32	-1.27	0.033	-0.189	-0.017	0.124	0.158	0.027	0.021	A
4	1.5	0.56	0.30	-1.27	0.363	-0.430	-0.092	0.142	0.221	0.038	0.035	A
4	1.5	0.56	0.29	-1.27	-0.470	-0.338	0.108	0.683	1.058	0.176	0.809	A
4	1.5	0.56	0.33	-1.01	1.031	-0.026	0.061	0.522	0.665	0.246	0.388	A
4	1.5	0.56	0.29	-1.01							C	
4	1.5	0.56	0.24	-1.01	0.025	0.020	-0.009	0.063	0.075	0.014	0.005	A
4	1.5	0.56	0.21	-1.01	0.186	0.283	-0.061	0.161	0.256	0.042	0.047	A
4	1.5	0.56	0.33	-0.51	1.820	-0.100	-0.002	0.426	0.467	0.259	0.234	A
4	1.5	0.56	0.25	-0.51	1.852	-0.114	-0.001	0.549	0.582	0.251	0.351	A
4	1.5	0.56	0.16	-0.51							C	
4	1.5	0.56	0.10	-0.51	0.004	-0.004	-0.001	0.050	0.040	0.009	0.002	A
4	1.5	0.56	0.33	0.00	1.742	0.096	-0.049	0.434	0.461	0.249	0.232	A
4	1.5	0.56	0.28	0.00	1.857	0.129	-0.086	0.431	0.444	0.249	0.222	A
4	1.5	0.56	0.23	0.00	1.841	0.151	-0.109	0.417	0.437	0.238	0.211	A
4	1.5	0.56	0.18	0.00	1.856	0.144	-0.082	0.457	0.495	0.240	0.256	A
4	1.5	0.56	0.14	0.00	1.648	0.171	-0.080	0.500	0.543	0.232	0.299	A
4	1.5	0.56	0.10	0.00							C	
4	1.5	0.56	0.07	0.00	-0.075	0.506	0.031	0.583	0.875	0.164	0.566	A
4	1.5	0.56	0.04	0.00	-0.083	-0.161	0.029	0.154	0.182	0.033	0.029	A
4	1.5	0.56	0.33	0.51	1.399	0.132	0.052	0.408	0.418	0.253	0.203	A
4	1.5	0.56	0.25	0.51	1.249	0.128	0.021	0.437	0.441	0.243	0.222	A
4	1.5	0.56	0.16	0.51	0.809	0.124	-0.003	1.068	0.834	0.239	0.947	A
4	1.5	0.56	0.10	0.51							C	
4	1.5	0.56	0.33	1.01	0.501	0.155	0.057	0.515	0.402	0.194	0.232	A
4	1.5	0.56	0.29	1.01	0.338	-0.019	0.032	0.655	0.263	0.102	0.254	A
4	1.5	0.56	0.24	1.01	0.055	-0.239	-0.085	0.262	0.294	0.071	0.080	A
4	1.5	0.56	0.21	1.01							C	
4	1.5	0.56	0.33	1.27							C	
5	1.5	0.60	0.37	-1.33	0.350	0.333	-0.048	0.554	0.875	0.167	0.550	A
5	1.5	0.60	0.36	-1.33	0.115	0.232	-0.172	0.648	0.516	0.155	0.355	A
5	1.5	0.60	0.34	-1.33	0.236	-0.132	-0.235	0.601	0.525	0.149	0.330	A
5	1.5	0.60	0.32	-1.33	0.643	0.094	-0.086	0.343	0.326	0.096	0.117	A
5	1.5	0.60	0.37	-1.06	0.861	-0.032	-0.014	0.282	0.248	0.157	0.083	A
5	1.5	0.60	0.32	-1.06	0.769	0.012	-0.027	0.339	0.260	0.146	0.102	A
5	1.5	0.60	0.27	-1.06							C	
5	1.5	0.60	0.23	-1.06	-0.281	0.509	0.066	0.593	0.676	0.148	0.415	A
5	1.5	0.60	0.37	-0.53	1.393	-0.088	-0.026	0.226	0.200	0.137	0.055	A
5	1.5	0.60	0.28	-0.53	1.251	-0.060	-0.027	0.262	0.239	0.146	0.073	A
5	1.5	0.60	0.18	-0.53	0.814	0.001	-0.046	0.817	0.301	0.176	0.395	A
5	1.5	0.60	0.11	-0.53	0.142	-0.055	0.019	0.382	0.421	0.121	0.169	A
5	1.5	0.60	0.37	0.00	1.453	-0.029	-0.026	0.211	0.194	0.131	0.049	A
5	1.5	0.60	0.32	0.00	1.398	-0.030	-0.065	0.223	0.199	0.131	0.053	A
5	1.5	0.60	0.26	0.00	1.381	-0.012	-0.033	0.240	0.212	0.136	0.061	A
5	1.5	0.60	0.21	0.00	1.082	-0.003	-0.072	0.307	0.229	0.133	0.082	A
5	1.5	0.60	0.15	0.00	0.926	0.055	0.017	0.505	0.600	0.154	0.320	A
5	1.5	0.60	0.11	0.00	0.890	0.075	-0.036	0.435	0.377	0.156	0.178	A
5	1.5	0.60	0.08	0.00	-0.196	-0.021	-0.033	0.166	0.054	0.027	0.016	A
5	1.5	0.60	0.04	0.00	-0.334	0.197	0.057	0.343	0.332	0.073	0.116	A
5	1.5	0.60	0.37	0.53	1.061	0.018	0.001	0.261	0.221	0.164	0.072	A
5	1.5	0.60	0.28	0.53	0.936	0.020	-0.017	0.268	0.233	0.159	0.076	A
5	1.5	0.60	0.18	0.53	0.640	0.029	0.027	0.459	0.398	0.144	0.195	A
5	1.5	0.60	0.09	0.53	-0.012	-0.071	-0.005	0.095	0.129	0.024	0.013	A
5	1.5	0.60	0.37	1.06	0.499	-0.022	0.000	0.224	0.190	0.127	0.051	A
5	1.5	0.60	0.32	1.06	0.344	-0.027	0.004	0.417	0.615	0.130	0.285	A
5	1.5	0.60	0.27	1.06	0.038	0.187	0.019	0.381	0.283	0.063	0.115	A
5	1.5	0.60	0.23	1.06	-0.050	0.001	-0.006	0.047	0.044	0.008	0.002	A
5	1.5	0.60	0.37	1.33							C	
5	1.5	0.60	0.36	1.33	-0.388	0.406	0.058	0.142	0.165	0.030	0.024	A
5	1.5	0.60	0.34	1.33	0.200	0.018	0.037	0.089	0.035	0.013	0.005	A
5	1.5	0.60	0.32	1.33	0.267	0.046	0.044	0.065	0.041	0.010	0.003	A
6	1.5	0.67	0.44	-1.40	0.633	0.049	-0.035	0.289	0.218	0.120	0.073	A
6	1.5	0.67	0.39	-1.40	0.434	0.045	-0.024	0.335	0.308	0.123	0.111	A
6	1.5	0.67	0.44	-1.12	0.855	-0.020	-0.034	0.223	0.185	0.132	0.051	A
6	1.5	0.67	0.31	-1.12	0.641	0.069	-0.030	0.319	0.243	0.120	0.088	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
6	1.5	0.67	0.44	-0.56	1.206	-0.017	-0.040	0.208	0.174	0.126	0.045	A
6	1.5	0.67	0.33	-0.56	1.065	-0.009	-0.059	0.232	0.197	0.138	0.056	A
6	1.5	0.67	0.21	-0.56	0.807	0.050	-0.009	0.356	0.509	0.146	0.204	A
6	1.5	0.67	0.44	0.00	1.239	-0.017	-0.037	0.183	0.160	0.120	0.037	A
6	1.5	0.67	0.38	0.00	1.199	-0.019	-0.034	0.187	0.166	0.123	0.039	A
6	1.5	0.67	0.31	0.00	1.111	-0.009	-0.024	0.207	0.175	0.134	0.046	A
6	1.5	0.67	0.25	0.00	1.018	-0.007	-0.017	0.228	0.189	0.127	0.052	A
6	1.5	0.67	0.18	0.00	0.918	0.042	0.001	0.372	0.398	0.137	0.158	A
6	1.5	0.67	0.14	0.00	0.783	0.034	0.015	0.376	0.440	0.131	0.176	A
6	1.5	0.67	0.10	0.00	0.674	0.065	0.014	0.293	0.252	0.113	0.081	A
6	1.5	0.67	0.44	0.56	0.901	-0.020	-0.004	0.199	0.158	0.128	0.040	A
6	1.5	0.67	0.33	0.56	0.830	-0.020	-0.021	0.203	0.168	0.131	0.043	A
6	1.5	0.67	0.21	0.56	0.616	0.009	0.015	0.397	0.599	0.142	0.268	A
6	1.5	0.67	0.44	1.12	0.512	-0.018	0.002	0.167	0.144	0.093	0.029	A
6	1.5	0.67	0.31	1.12	0.189	0.176	0.009	0.636	0.791	0.166	0.529	A
6	1.5	0.67	0.44	1.40	0.315	-0.081	-0.031	0.248	0.242	0.089	0.064	A
6	1.5	0.67	0.39	1.40	0.204	0.340	0.032	0.240	0.259	0.044	0.063	A
1	3.0	0.71	0.48	-1.43	0.946	0.045	-0.053	0.464	0.276	0.168	0.160	A
1	3.0	0.71	0.41	-1.43	0.051	0.024	-0.026	0.224	0.143	0.060	0.037	A
1	3.0	0.71	0.48	-1.14	1.268	-0.049	-0.005	0.309	0.259	0.182	0.098	A
1	3.0	0.71	0.33	-1.14	0.863	0.001	-0.031	0.432	0.329	0.160	0.161	A
1	3.0	0.71	0.48	-0.57	1.906	-0.088	-0.065	0.221	0.223	0.141	0.059	A
1	3.0	0.71	0.36	-0.57	1.759	-0.063	-0.072	0.263	0.232	0.164	0.075	A
1	3.0	0.71	0.23	-0.57								C
1	3.0	0.71	0.48	0.00	1.860	-0.078	-0.048	0.216	0.214	0.152	0.058	A
1	3.0	0.71	0.41	0.00	1.860	-0.044	-0.046	0.221	0.215	0.149	0.059	A
1	3.0	0.71	0.34	0.00	1.797	-0.030	-0.053	0.255	0.219	0.156	0.068	A
1	3.0	0.71	0.27	0.00	1.648	0.004	-0.027	0.300	0.257	0.169	0.092	A
1	3.0	0.71	0.20	0.00	1.470	0.029	-0.055	0.319	0.263	0.168	0.099	A
1	3.0	0.71	0.15	0.00	1.128	0.145	0.007	0.548	0.829	0.185	0.511	A
1	3.0	0.71	0.10	0.00	0.968	0.101	-0.009	0.455	0.381	0.160	0.189	A
1	3.0	0.71	0.38	0.57	1.500	0.028	-0.006	0.288	0.247	0.181	0.088	A
1	3.0	0.71	0.36	0.57	1.476	0.017	-0.008	0.296	0.253	0.183	0.093	A
1	3.0	0.71	0.23	0.57	1.148	0.034	-0.006	0.342	0.282	0.178	0.114	A
1	3.0	0.71	0.48	1.14	0.868	0.029	0.023	0.258	0.232	0.156	0.072	A
1	3.0	0.71	0.33	1.14	0.505	0.095	0.036	0.551	0.684	0.166	0.400	A
1	3.0	0.71	0.48	1.43	0.232	0.324	0.053	0.375	0.554	0.128	0.232	A
1	3.0	0.71	0.46	1.43	0.270	-0.106	-0.021	0.308	0.440	0.098	0.149	A
2	3.0	0.58	0.35	-1.32	0.395	0.205	0.023	1.048	1.186	0.407	1.335	A
2	3.0	0.58	0.34	-1.32	-0.020	0.093	0.163	0.780	0.973	0.348	0.838	A
2	3.0	0.58	0.33	-1.32	-0.351	0.305	0.252	0.694	0.802	0.266	0.598	A
2	3.0	0.58	0.32	-1.32	-0.696	1.005	0.182	0.326	0.469	0.097	0.168	A
2	3.0	0.58	0.35	-1.05	2.110	0.256	0.068	0.847	0.861	0.428	0.820	A
2	3.0	0.58	0.31	-1.05	1.628	0.216	-0.011	0.981	0.950	0.419	1.020	A
2	3.0	0.58	0.26	-1.05	0.022	-0.042	-0.009	0.248	0.077	0.038	0.034	A
2	3.0	0.58	0.22	-1.05	-0.129	0.130	0.032	0.213	0.342	0.065	0.083	A
2	3.0	0.58	0.35	-0.53	1.966	-0.783	-0.116	1.094	0.901	0.644	1.212	A
2	3.0	0.58	0.26	-0.53	1.268	-0.327	-0.120	0.911	0.856	0.681	1.013	A
2	3.0	0.58	0.17	-0.53	1.199	0.667	-0.288	0.996	1.109	0.477	1.225	A
2	3.0	0.58	0.11	-0.53	0.027	0.041	-0.014	0.144	0.193	0.036	0.030	A
2	3.0	0.58	0.35	0.00	3.578	-0.156	-0.201	0.203	0.245	0.198	0.070	A
2	3.0	0.58	0.30	0.00	3.458	-0.213	-0.196	0.236	0.283	0.227	0.094	A
2	3.0	0.58	0.25	0.00	3.292	-0.196	-0.200	0.328	0.328	0.263	0.142	A
2	3.0	0.58	0.20	0.00	2.953	-0.023	-0.122	0.635	0.733	0.324	0.523	A
2	3.0	0.58	0.14	0.00								C
2	3.0	0.58	0.11	0.00	1.549	0.347	0.026	1.005	1.065	0.281	1.112	A
2	3.0	0.58	0.07	0.00	0.000	0.001	0.000	0.064	0.040	0.010	0.003	A
2	3.0	0.58	0.04	0.00	-0.009	-0.028	-0.005	0.112	0.130	0.023	0.015	A
2	3.0	0.58	0.35	0.53	1.295	-0.068	-0.056	0.831	0.812	0.588	0.849	A
2	3.0	0.58	0.26	0.53	1.289	0.350	-0.171	0.697	0.768	0.650	0.749	A
2	3.0	0.58	0.17	0.53	1.273	0.733	-0.220	0.968	1.381	0.516	1.554	A
2	3.0	0.58	0.11	0.53	0.311	0.376	-0.092	0.611	0.702	0.189	0.451	A
2	3.0	0.58	0.35	1.05	2.126	-0.376	-0.066	0.756	0.746	0.473	0.676	A
2	3.0	0.58	0.31	1.05	1.594	-0.345	-0.176	1.129	1.087	0.477	1.342	A
2	3.0	0.58	0.26	1.05								C
2	3.0	0.58	0.22	1.05	-0.469	0.258	0.179	1.099	1.100	0.367	1.277	A
2	3.0	0.58	0.35	1.32	0.264	-0.324	0.195	0.796	0.979	0.233	0.823	A
2	3.0	0.58	0.34	1.32	0.290	-0.088	0.020	0.367	0.092	0.055	0.073	A
2	3.0	0.58	0.33	1.32	0.101	-0.207	0.033	0.284	0.155	0.052	0.054	A
2	3.0	0.58	0.32	1.32	-0.037	0.025	0.008	0.058	0.066	0.013	0.004	A
3	3.0	0.63	0.40	-1.36	0.512	-0.023	0.063	0.715	0.771	0.241	0.581	A
3	3.0	0.63	0.38	-1.36	0.321	0.007	0.050	0.748	0.914	0.244	0.728	A
3	3.0	0.63	0.36	-1.36	0.138	0.066	0.027	0.735	0.774	0.238	0.598	A
3	3.0	0.63	0.35	-1.36	-0.085	0.013	0.063	0.493	0.560	0.232	0.305	A
3	3.0	0.63	0.40	-1.09	1.757	-0.044	0.072	0.494	0.412	0.308	0.254	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
3	3.0	0.63	0.35	-1.09	1.457	-0.062	0.072	0.536	0.427	0.302	0.280	A
3	3.0	0.63	0.29	-1.09	1.049	-0.050	0.052	0.691	0.709	0.264	0.525	A
3	3.0	0.63	0.25	-1.09	0.579	-0.148	0.136	0.630	0.687	0.267	0.470	A
3	3.0	0.63	0.40	-0.54	1.957	-0.336	0.130	0.690	0.612	0.460	0.531	A
3	3.0	0.63	0.30	-0.54	1.686	-0.285	0.059	0.667	0.618	0.465	0.521	A
3	3.0	0.63	0.20	-0.54	1.323	0.053	-0.010	0.712	0.599	0.385	0.507	A
3	3.0	0.63	0.13	-0.54	0.999	0.153	-0.037	0.562	0.502	0.245	0.314	A
3	3.0	0.63	0.40	0.00	2.850	0.047	-0.090	0.708	0.492	0.413	0.457	A
3	3.0	0.63	0.35	0.00	3.137	0.034	-0.095	0.494	0.384	0.353	0.258	A
3	3.0	0.63	0.29	0.00	3.183	0.014	-0.123	0.398	0.332	0.293	0.177	A
3	3.0	0.63	0.23	0.00	3.062	0.010	-0.145	0.415	0.329	0.266	0.176	A
3	3.0	0.63	0.17	0.00								C
3	3.0	0.63	0.13	0.00	2.175	0.258	-0.035	0.743	0.689	0.267	0.549	A
3	3.0	0.63	0.09	0.00	1.883	0.181	-0.136	0.714	0.559	0.280	0.450	A
3	3.0	0.63	0.05	0.00	0.000	0.000	-0.002	0.060	0.049	0.009	0.003	A
3	3.0	0.63	0.40	0.54	1.511	-0.015	-0.087	0.600	0.513	0.383	0.385	A
3	3.0	0.63	0.30	0.54	1.793	0.176	-0.204	0.617	0.534	0.417	0.420	A
3	3.0	0.63	0.20	0.54	1.504	0.549	-0.003	0.751	0.876	0.292	0.709	A
3	3.0	0.63	0.13	0.54	0.938	0.348	0.067	0.520	0.493	0.172	0.271	A
3	3.0	0.63	0.40	1.09	1.766	-0.208	-0.079	0.479	0.416	0.305	0.248	A
3	3.0	0.63	0.35	1.09	1.667	-0.139	-0.096	0.495	0.428	0.314	0.263	A
3	3.0	0.63	0.29	1.09	1.137	-0.023	0.005	0.613	0.674	0.270	0.452	A
3	3.0	0.63	0.25	1.09								C
3	3.0	0.63	0.40	1.36	0.288	0.035	0.037	0.537	0.647	0.196	0.373	A
3	3.0	0.63	0.38	1.36	0.183	0.060	0.025	0.526	0.654	0.189	0.370	A
3	3.0	0.63	0.36	1.36	0.084	0.046	-0.015	0.598	0.632	0.193	0.397	A
3	3.0	0.63	0.35	1.36	-0.035	-0.046	0.062	0.467	0.490	0.178	0.245	A
4	3.0	0.67	0.44	-1.40	0.930	0.100	-0.026	0.441	0.332	0.210	0.175	A
4	3.0	0.67	0.42	-1.40	0.847	0.095	-0.051	0.363	0.299	0.192	0.129	A
4	3.0	0.67	0.39	-1.40	0.408	0.233	-0.067	0.370	0.472	0.184	0.197	A
4	3.0	0.67	0.37	-1.40	0.342	0.048	-0.061	0.373	0.526	0.172	0.222	A
4	3.0	0.67	0.44	-1.12	1.290	0.012	0.019	0.360	0.290	0.215	0.130	A
4	3.0	0.67	0.38	-1.12	0.952	0.018	-0.013	0.397	0.312	0.192	0.146	A
4	3.0	0.67	0.31	-1.12	0.261	0.000	-0.016	0.209	0.153	0.064	0.036	A
4	3.0	0.67	0.27	-1.12	1.947	0.037	-0.036	0.333	0.284	0.258	0.129	A
4	3.0	0.67	0.44	-0.56	1.996	-0.042	-0.043	0.377	0.324	0.265	0.159	A
4	3.0	0.67	0.33	-0.56	1.754	0.026	0.013	0.478	0.497	0.252	0.270	A
4	3.0	0.67	0.21	-0.56	1.410	-0.066	0.049	0.502	0.400	0.212	0.228	A
4	3.0	0.67	0.14	-0.56	2.014	0.082	-0.117	0.414	0.326	0.284	0.179	A
4	3.0	0.67	0.44	0.00	2.088	0.087	-0.119	0.402	0.317	0.285	0.172	A
4	3.0	0.67	0.38	0.00	2.168	0.108	-0.137	0.395	0.320	0.282	0.169	A
4	3.0	0.67	0.31	0.00	2.224	0.126	-0.089	0.405	0.318	0.278	0.171	A
4	3.0	0.67	0.25	0.00	2.073	0.230	-0.087	0.461	0.406	0.257	0.222	A
4	3.0	0.67	0.18	0.00	1.912	0.200	-0.094	0.486	0.384	0.256	0.225	A
4	3.0	0.67	0.14	0.00	1.521	0.210	-0.109	0.545	0.408	0.226	0.257	A
4	3.0	0.67	0.10	0.00	0.310	-0.094	-0.060	0.358	0.333	0.097	0.124	A
4	3.0	0.67	0.05	0.00	1.688	0.087	-0.015	0.326	0.291	0.244	0.125	A
4	3.0	0.67	0.44	0.56	1.762	0.204	-0.025	0.350	0.316	0.264	0.146	A
4	3.0	0.67	0.33	0.56	1.509	0.287	-0.013	0.444	0.395	0.245	0.207	A
4	3.0	0.67	0.21	0.56	0.885	0.249	-0.019	0.543	0.556	0.223	0.326	A
4	3.0	0.67	0.14	0.56	0.723	0.126	0.062	0.307	0.241	0.209	0.098	A
4	3.0	0.67	0.44	1.12	0.713	0.202	0.091	0.348	0.279	0.193	0.118	A
4	3.0	0.67	0.38	1.12	0.580	-0.033	0.098	0.367	0.428	0.143	0.169	A
4	3.0	0.67	0.31	1.12	0.059	-0.140	-0.023	0.068	0.108	0.021	0.008	A
4	3.0	0.67	0.27	1.12	0.039	0.011	0.006	0.072	0.059	0.015	0.004	A
4	3.0	0.67	0.44	1.40	0.080	0.149	-0.020	0.090	0.149	0.024	0.015	A
4	3.0	0.67	0.42	1.40	-0.016	0.006	0.003	0.037	0.043	0.009	0.002	A
4	3.0	0.67	0.39	1.40	-0.014	-0.028	0.001	0.068	0.092	0.017	0.007	A
5	3.0	0.75	0.52	-1.63	0.010	-0.003	-0.003	0.064	0.054	0.016	0.004	A
5	3.0	0.75	0.51	-1.63	0.181	0.440	-0.184	1.006	1.067	0.247	1.106	A
5	3.0	0.75	0.50	-1.63	0.395	-0.015	-0.110	0.539	0.799	0.152	0.476	A
5	3.0	0.75	0.49	-1.63	0.423	-0.017	-0.118	0.541	0.805	0.152	0.482	A
5	3.0	0.75	0.52	-1.44	1.076	0.068	-0.056	0.391	0.465	0.185	0.201	A
5	3.0	0.75	0.48	-1.44	0.817	0.117	-0.079	0.473	0.578	0.183	0.296	A
5	3.0	0.75	0.43	-1.44	0.373	0.206	-0.147	0.573	0.715	0.203	0.440	A
5	3.0	0.75	0.40	-1.44								C
5	3.0	0.75	0.52	-1.15	1.237	-0.035	0.020	0.375	0.442	0.207	0.189	A
5	3.0	0.75	0.44	-1.15	1.073	-0.017	-0.007	0.356	0.429	0.190	0.174	A
5	3.0	0.75	0.35	-1.15	0.817	0.077	-0.013	0.531	0.534	0.181	0.300	A
5	3.0	0.75	0.29	-1.15	0.353	0.091	-0.018	0.794	0.654	0.210	0.551	A
5	3.0	0.75	0.52	-0.57	1.866	-0.036	-0.032	0.319	0.412	0.172	0.150	A
5	3.0	0.75	0.39	-0.57	1.792	-0.064	-0.055	0.339	0.409	0.180	0.157	A
5	3.0	0.75	0.25	-0.57	1.728	-0.044	-0.047	0.365	0.441	0.186	0.181	A
5	3.0	0.75	0.15	-0.57	0.806	0.024	-0.031	0.994	0.811	0.258	0.855	A
5	3.0	0.75	0.52	0.00	1.978	-0.034	-0.053	0.305	0.419	0.169	0.149	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
5	3.0	0.75	0.45	0.00	2.021	-0.025	-0.065	0.310	0.418	0.164	0.149	A
5	3.0	0.75	0.37	0.00	1.976	-0.016	-0.059	0.306	0.408	0.169	0.144	A
5	3.0	0.75	0.29	0.00	1.904	0.007	-0.058	0.340	0.427	0.170	0.164	A
5	3.0	0.75	0.21	0.00	1.613	0.058	-0.037	0.604	0.749	0.206	0.484	A
5	3.0	0.75	0.16	0.00								C
5	3.0	0.75	0.11	0.00	0.672	-0.033	0.045	0.867	0.437	0.145	0.482	A
5	3.0	0.75	0.06	0.00	-0.147	0.259	0.038	0.140	0.314	0.038	0.060	A
5	3.0	0.75	0.52	0.57	1.601	-0.005	0.013	0.335	0.410	0.199	0.160	A
5	3.0	0.75	0.39	0.57	1.573	0.062	-0.030	0.367	0.431	0.204	0.181	A
5	3.0	0.75	0.25	0.57	1.260	0.103	0.011	0.540	0.717	0.211	0.425	A
5	3.0	0.75	0.15	0.57	-0.007	0.005	0.000	0.040	0.047	0.009	0.002	A
5	3.0	0.75	0.52	1.15	0.903	0.048	0.036	0.306	0.363	0.194	0.131	A
5	3.0	0.75	0.44	1.15	0.740	0.014	0.048	0.415	0.598	0.192	0.284	A
5	3.0	0.75	0.35	1.15								C
5	3.0	0.75	0.29	1.15	0.006	-0.001	0.002	0.042	0.039	0.009	0.002	A
5	3.0	0.75	0.52	1.44	0.395	0.044	0.040	0.386	0.512	0.148	0.216	A
5	3.0	0.75	0.48	1.44								C
5	3.0	0.75	0.43	1.44								C
5	3.0	0.75	0.40	1.44	-0.063	-0.012	-0.006	0.042	0.034	0.008	0.001	A
5	3.0	0.75	0.52	1.63	0.342	-0.023	0.031	0.394	0.623	0.142	0.282	A
5	3.0	0.75	0.51	1.63								C
5	3.0	0.75	0.50	1.63								C
5	3.0	0.75	0.49	1.63	-0.099	-0.006	-0.012	0.119	0.098	0.027	0.012	A
6	3.0	0.77	0.54	-1.49	1.037	0.019	-0.044	0.312	0.362	0.141	0.124	A
6	3.0	0.77	0.46	-1.49	0.723	0.123	-0.045	0.391	0.432	0.155	0.182	A
6	3.0	0.77	0.54	-1.19	1.072	-0.024	0.013	0.325	0.385	0.162	0.140	A
6	3.0	0.77	0.37	-1.19	0.823	0.055	-0.011	0.444	0.467	0.163	0.221	A
6	3.0	0.77	0.54	-0.60	1.687	-0.003	-0.046	0.320	0.405	0.161	0.146	A
6	3.0	0.77	0.40	-0.60	1.550	-0.019	-0.044	0.329	0.393	0.172	0.146	A
6	3.0	0.77	0.26	-0.60	1.361	0.009	-0.048	0.384	0.459	0.174	0.194	A
6	3.0	0.77	0.54	0.00	1.843	-0.009	-0.034	0.263	0.355	0.140	0.107	A
6	3.0	0.77	0.46	0.00	1.811	0.010	-0.070	0.269	0.363	0.146	0.113	A
6	3.0	0.77	0.38	0.00	1.752	0.023	-0.046	0.283	0.369	0.152	0.120	A
6	3.0	0.77	0.30	0.00	1.612	0.016	-0.021	0.336	0.407	0.168	0.153	A
6	3.0	0.77	0.22	0.00	1.445	0.053	-0.023	0.369	0.412	0.177	0.168	A
6	3.0	0.77	0.17	0.00	1.206	0.021	0.017	0.501	0.740	0.191	0.417	A
6	3.0	0.77	0.11	0.00	1.059	0.158	0.009	0.591	0.884	0.200	0.585	A
6	3.0	0.77	0.54	0.60	1.398	0.011	0.011	0.280	0.349	0.156	0.112	A
6	3.0	0.77	0.40	0.60	1.326	0.024	-0.001	0.300	0.364	0.160	0.124	A
6	3.0	0.77	0.26	0.60	1.055	0.052	-0.003	0.363	0.488	0.170	0.199	A
6	3.0	0.77	0.54	1.19	0.778	-0.008	0.011	0.250	0.292	0.140	0.084	A
6	3.0	0.77	0.37	1.19	0.540	0.061	0.037	0.412	0.576	0.144	0.261	A
6	3.0	0.77	0.54	1.49	0.463	-0.008	0.029	0.283	0.359	0.115	0.111	A
6	3.0	0.77	0.46	1.49								C
1	4.0	0.75	0.52	-1.47	1.248	0.033	-0.038	0.519	0.617	0.227	0.351	A
1	4.0	0.75	0.44	-1.47								C
1	4.0	0.75	0.52	-1.18	1.709	-0.040	-0.020	0.458	0.588	0.229	0.304	A
1	4.0	0.75	0.36	-1.18	1.131	0.072	-0.042	0.753	0.690	0.234	0.549	A
1	4.0	0.75	0.52	-0.59	2.042	-0.061	-0.041	0.380	0.545	0.188	0.238	A
1	4.0	0.75	0.39	-0.59	1.866	-0.027	-0.047	0.421	0.551	0.202	0.260	A
1	4.0	0.75	0.25	-0.59	1.479	0.012	-0.019	0.580	0.829	0.235	0.539	A
1	4.0	0.75	0.52	0.00	2.143	-0.043	-0.023	0.355	0.538	0.172	0.222	A
1	4.0	0.75	0.45	0.00	2.093	-0.058	-0.063	0.377	0.519	0.181	0.222	A
1	4.0	0.75	0.37	0.00	2.013	0.000	-0.065	0.411	0.561	0.189	0.260	A
1	4.0	0.75	0.29	0.00	1.851	0.020	-0.048	0.432	0.548	0.209	0.266	A
1	4.0	0.75	0.21	0.00	1.633	0.021	-0.046	0.455	0.581	0.209	0.294	A
1	4.0	0.75	0.16	0.00	1.380	0.077	-0.027	0.523	0.715	0.219	0.417	A
1	4.0	0.75	0.11	0.00								C
1	4.0	0.75	0.52	0.59	1.850	-0.021	-0.005	0.406	0.563	0.205	0.262	A
1	4.0	0.75	0.39	0.59	1.769	0.010	-0.032	0.419	0.557	0.211	0.265	A
1	4.0	0.75	0.25	0.59	1.450	0.056	-0.023	0.467	0.582	0.219	0.302	A
1	4.0	0.75	0.52	1.18	1.000	-0.010	0.017	0.382	0.506	0.198	0.221	A
1	4.0	0.75	0.36	1.18	0.675	0.007	0.046	0.498	0.624	0.186	0.336	A
1	4.0	0.75	0.52	1.47	0.511	0.024	0.010	0.372	0.512	0.155	0.212	A
1	4.0	0.75	0.44	1.47	0.084	0.038	0.011	0.182	0.185	0.038	0.034	A
2	4.0	0.60	0.37	-1.35	-0.149	0.602	0.061	1.039	1.024	0.363	1.130	A
2	4.0	0.60	0.36	-1.35	-0.333	0.330	-0.039	0.649	0.685	0.210	0.467	A
2	4.0	0.60	0.34	-1.35	-0.042	0.464	-0.001	0.439	0.597	0.147	0.286	A
2	4.0	0.60	0.33	-1.35	0.274	0.216	-0.088	0.812	1.332	0.256	1.250	A
2	4.0	0.60	0.37	-1.08	2.980	0.350	-0.072	0.732	0.727	0.375	0.603	A
2	4.0	0.60	0.32	-1.08	2.263	0.705	-0.201	1.168	1.305	0.429	1.626	A
2	4.0	0.60	0.27	-1.08	0.177	0.000	0.027	0.304	0.221	0.080	0.074	A
2	4.0	0.60	0.24	-1.08	-0.302	0.412	0.072	0.598	0.879	0.223	0.590	A
2	4.0	0.60	0.37	-0.54	2.205	-0.897	-0.177	1.058	0.911	0.701	1.221	A
2	4.0	0.60	0.28	-0.54	1.315	-0.327	-0.268	0.911	0.958	0.703	1.121	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
2	4.0	0.60	0.18	-0.54	1.030	0.740	-0.290	1.047	1.196	0.487	1.382	A
2	4.0	0.60	0.11	-0.54	0.085	0.119	-0.028	0.172	0.260	0.046	0.050	A
2	4.0	0.60	0.37	0.00	3.727	-0.139	-0.193	0.277	0.359	0.252	0.134	A
2	4.0	0.60	0.32	0.00	3.575	-0.166	-0.154	0.302	0.366	0.279	0.152	A
2	4.0	0.60	0.26	0.00	3.432	-0.126	-0.120	0.375	0.431	0.326	0.216	A
2	4.0	0.60	0.21	0.00	3.083	0.026	-0.108	0.630	0.810	0.351	0.588	A
2	4.0	0.60	0.15	0.00	2.238	0.291	-0.028	1.328	1.492	0.372	2.065	A
2	4.0	0.60	0.11	0.00	2.192	0.361	0.090	0.968	1.091	0.311	1.112	A
2	4.0	0.60	0.08	0.00	0.025	-0.004	0.001	0.085	0.050	0.015	0.005	A
2	4.0	0.60	0.04	0.00	-0.012	0.027	-0.009	0.210	0.187	0.039	0.040	A
2	4.0	0.60	0.37	0.54	1.569	0.008	0.021	0.879	0.954	0.759	1.129	A
2	4.0	0.60	0.28	0.54	1.348	0.416	-0.150	0.760	0.912	0.743	0.980	A
2	4.0	0.60	0.18	0.54	1.007	0.653	-0.080	0.955	1.176	0.519	1.281	A
2	4.0	0.60	0.11	0.54	0.289	0.535	-0.110	0.647	0.827	0.220	0.575	A
2	4.0	0.60	0.37	1.08	2.173	-0.258	-0.308	0.796	0.890	0.616	0.903	A
2	4.0	0.60	0.32	1.08	1.756	-0.420	-0.380	1.091	1.103	0.596	1.381	A
2	4.0	0.60	0.27	1.08								C
2	4.0	0.60	0.24	1.08	-0.591	0.106	0.161	1.564	1.197	0.443	2.037	A
2	4.0	0.60	0.37	1.35	-0.034	-0.150	0.410	0.933	1.267	0.397	1.317	A
2	4.0	0.60	0.36	1.35	-0.171	-0.490	0.298	0.957	0.706	0.259	0.741	A
2	4.0	0.60	0.34	1.35	0.033	-0.262	0.151	0.493	0.376	0.137	0.202	A
2	4.0	0.60	0.33	1.35	0.003	0.003	0.006	0.061	0.069	0.014	0.004	A
3	4.0	0.68	0.45	-1.39								C
3	4.0	0.68	0.45	-1.39	1.315	-0.003	0.060	0.612	0.667	0.308	0.457	A
3	4.0	0.68	0.42	-1.39	1.151	-0.020	0.019	0.789	0.883	0.325	0.754	A
3	4.0	0.68	0.39	-1.39	0.523	-0.106	-0.041	0.765	0.878	0.326	0.731	A
3	4.0	0.68	0.37	-1.11								C
3	4.0	0.68	0.45	-1.11	2.470	-0.019	-0.093	0.646	0.711	0.372	0.531	A
3	4.0	0.68	0.38	-1.11	2.156	0.001	-0.091	0.670	0.702	0.384	0.545	A
3	4.0	0.68	0.31	-1.11	1.672	0.036	-0.076	0.912	0.865	0.387	0.865	A
3	4.0	0.68	0.27	-0.56	0.868	-0.072	-0.061	0.938	0.913	0.389	0.933	A
3	4.0	0.68	0.45	-0.56	2.220	-0.333	0.070	0.947	0.970	0.569	1.081	A
3	4.0	0.68	0.34	-0.56	1.827	-0.225	-0.033	0.840	0.921	0.558	0.933	A
3	4.0	0.68	0.22	-0.56	1.436	0.167	-0.035	0.823	0.873	0.496	0.843	A
3	4.0	0.68	0.14	0.00								C
3	4.0	0.68	0.45	0.00	3.137	0.137	0.009	0.779	0.786	0.447	0.712	A
3	4.0	0.68	0.39	0.00	3.368	0.103	-0.003	0.538	0.649	0.341	0.413	A
3	4.0	0.68	0.32	0.00	3.276	0.069	-0.037	0.499	0.584	0.299	0.340	A
3	4.0	0.68	0.25	0.00	3.005	0.058	-0.074	0.633	0.618	0.340	0.449	A
3	4.0	0.68	0.19	0.00	2.593	0.109	-0.107	0.901	0.875	0.377	0.859	A
3	4.0	0.68	0.14	0.00	1.776	0.400	-0.073	1.550	1.687	0.381	2.696	A
3	4.0	0.68	0.10	0.00	1.571	0.185	-0.074	1.439	1.286	0.368	1.930	A
3	4.0	0.68	0.45	0.56	1.393	-0.086	0.012	0.672	0.749	0.457	0.611	A
3	4.0	0.68	0.34	0.56	1.649	0.152	-0.161	0.710	0.775	0.492	0.674	A
3	4.0	0.68	0.22	0.56	1.980	0.522	-0.167	0.746	0.866	0.499	0.778	A
3	4.0	0.68	0.14	0.56	1.169	0.395	0.069	0.842	0.897	0.268	0.793	A
3	4.0	0.68	0.45	1.11	2.250	-0.232	-0.120	0.622	0.642	0.345	0.459	A
3	4.0	0.68	0.38	1.11	2.162	-0.132	-0.166	0.627	0.663	0.338	0.474	A
3	4.0	0.68	0.31	1.11	1.788	0.017	-0.178	0.770	0.751	0.367	0.646	A
3	4.0	0.68	0.27	1.11	0.413	0.246	-0.129	1.522	1.963	0.422	3.173	A
3	4.0	0.68	0.45	1.39	0.630	-0.023	0.080	0.570	0.620	0.283	0.395	A
3	4.0	0.68	0.42	1.39	0.464	0.009	0.023	0.731	0.765	0.264	0.595	A
3	4.0	0.68	0.39	1.39	0.117	-0.062	-0.003	1.209	1.630	0.331	2.113	A
3	4.0	0.68	0.37	1.39								C
3	4.0	0.68	0.45	1.57	-0.071	0.085	0.039	0.566	0.719	0.181	0.435	A
4	4.0	0.71	0.49	-1.59	0.168	0.300	-0.016	0.869	1.154	0.262	1.077	A
4	4.0	0.71	0.48	-1.59	0.196	0.274	-0.027	0.770	0.871	0.233	0.703	A
4	4.0	0.71	0.47	-1.59	0.030	0.248	0.017	0.565	0.621	0.184	0.369	A
4	4.0	0.71	0.49	-1.40	1.111	-0.079	-0.029	0.584	0.627	0.291	0.409	A
4	4.0	0.71	0.45	-1.40	0.948	-0.007	-0.078	0.570	0.588	0.261	0.369	A
4	4.0	0.71	0.41	-1.40	0.472	0.220	-0.043	1.351	1.798	0.375	2.598	A
4	4.0	0.71	0.39	-1.40	0.171	0.051	0.009	0.415	0.363	0.140	0.162	A
4	4.0	0.71	0.49	-1.12	1.780	-0.263	0.013	0.498	0.556	0.271	0.315	A
4	4.0	0.71	0.41	-1.12	1.521	-0.180	-0.015	0.535	0.592	0.276	0.356	A
4	4.0	0.71	0.33	-1.12	0.903	0.217	-0.010	1.573	1.878	0.375	3.072	A
4	4.0	0.71	0.30	-1.12	0.683	-0.077	-0.088	0.921	0.702	0.210	0.693	A
4	4.0	0.71	0.48	-0.56	1.936	-0.245	0.051	0.442	0.554	0.297	0.295	A
4	4.0	0.71	0.36	-0.56	1.768	-0.224	-0.015	0.468	0.581	0.303	0.324	A
4	4.0	0.71	0.23	-0.56	1.422	-0.170	0.023	0.583	0.784	0.288	0.518	A
4	4.0	0.71	0.15	-0.56								C
4	4.0	0.71	0.48	0.00	2.395	-0.270	-0.047	0.495	0.578	0.316	0.339	A
4	4.0	0.71	0.42	0.00	2.371	-0.263	-0.080	0.508	0.585	0.329	0.354	A
4	4.0	0.71	0.35	0.00	2.345	-0.259	-0.095	0.514	0.584	0.333	0.358	A
4	4.0	0.71	0.27	0.00	2.205	-0.218	-0.095	0.558	0.583	0.332	0.381	A
4	4.0	0.71	0.20	0.00	1.977	-0.184	-0.083	0.624	0.639	0.331	0.454	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
4	4.0	0.71	0.15	0.00	1.718	-0.134	-0.068	0.624	0.680	0.311	0.474	A
4	4.0	0.71	0.11	0.00								C
4	4.0	0.71	0.09	0.00	0.856	0.008	-0.072	1.384	1.292	0.308	1.839	A
4	4.0	0.71	0.48	0.56	1.838	-0.200	-0.014	0.436	0.516	0.279	0.267	A
4	4.0	0.71	0.36	0.56	1.888	-0.066	-0.058	0.464	0.524	0.285	0.285	A
4	4.0	0.71	0.23	0.56	1.812	0.034	-0.066	0.503	0.546	0.289	0.318	A
4	4.0	0.71	0.15	0.56	1.053	0.113	-0.092	0.885	0.846	0.302	0.795	A
4	4.0	0.71	0.49	1.12	1.181	0.195	0.081	0.440	0.476	0.287	0.251	A
4	4.0	0.71	0.41	1.12	1.098	0.227	0.083	0.528	0.506	0.270	0.304	A
4	4.0	0.71	0.33	1.12	0.733	0.173	0.052	1.051	0.888	0.252	0.978	A
4	4.0	0.71	0.28	1.12	0.358	-0.962	0.070	0.785	1.577	0.235	1.579	A
4	4.0	0.71	0.49	1.40								C
4	4.0	0.71	0.45	1.40								C
4	4.0	0.71	0.58	1.59	0.087	0.205	0.089	1.138	1.229	0.260	1.436	A
4	4.0	0.71	0.56	1.59	-0.107	-0.206	0.104	0.708	0.918	0.192	0.691	A
5	4.0	0.79	0.56	-1.47	1.342	-0.025	-0.043	0.391	0.348	0.233	0.164	A
5	4.0	0.79	0.46	-1.47	0.818	0.096	-0.121	0.398	0.345	0.193	0.158	A
5	4.0	0.79	0.56	-1.18	1.741	-0.099	-0.036	0.359	0.290	0.207	0.128	A
5	4.0	0.79	0.37	-1.18	1.189	0.019	-0.055	0.391	0.314	0.217	0.149	A
5	4.0	0.79	0.56	-0.59	1.901	-0.090	-0.013	0.294	0.245	0.201	0.093	A
5	4.0	0.79	0.41	-0.59	1.734	-0.087	-0.025	0.326	0.265	0.204	0.109	A
5	4.0	0.79	0.26	-0.59	2.192	-0.116	-0.039	0.230	0.235	0.176	0.070	A
5	4.0	0.79	0.56	0.00	2.162	-0.108	-0.105	0.235	0.229	0.178	0.070	A
5	4.0	0.79	0.48	0.00	2.150	-0.083	-0.108	0.256	0.238	0.181	0.078	A
5	4.0	0.79	0.40	0.00	2.022	-0.075	-0.101	0.296	0.247	0.188	0.092	A
5	4.0	0.79	0.31	0.00	1.812	-0.045	-0.094	0.345	0.274	0.211	0.119	A
5	4.0	0.79	0.23	0.00	1.490	-0.034	-0.101	0.689	0.310	0.210	0.308	A
5	4.0	0.79	0.17	0.00	1.250	0.049	-0.043	0.450	0.361	0.201	0.186	A
5	4.0	0.79	0.12	0.00	1.674	-0.095	-0.029	0.260	0.210	0.197	0.075	A
5	4.0	0.79	0.56	0.59	1.670	-0.021	-0.047	0.299	0.237	0.203	0.093	A
5	4.0	0.79	0.41	0.59	1.451	0.015	-0.043	0.355	0.327	0.196	0.136	A
5	4.0	0.79	0.26	0.59	0.861	-0.026	0.013	0.238	0.211	0.166	0.065	A
5	4.0	0.79	0.56	1.18	0.542	0.142	0.063	0.501	0.761	0.167	0.429	A
5	4.0	0.79	0.37	1.18	0.531	-0.027	-0.005	0.226	0.196	0.133	0.054	A
5	4.0	0.79	0.56	1.47	0.153	0.009	-0.024	0.701	0.608	0.154	0.443	A
6	4.0	0.83	0.60	-1.54	1.292	-0.008	-0.046	0.419	0.459	0.201	0.214	A
6	4.0	0.83	0.50	-1.54	0.693	0.143	-0.116	0.616	0.626	0.216	0.409	A
6	4.0	0.83	0.60	-1.23	1.468	-0.047	-0.015	0.395	0.480	0.202	0.214	A
6	4.0	0.83	0.40	-1.23	1.048	0.069	-0.043	0.607	0.582	0.198	0.373	A
6	4.0	0.83	0.60	-0.62	1.749	-0.015	-0.009	0.382	0.445	0.192	0.190	A
6	4.0	0.83	0.44	-0.62	1.616	0.006	-0.034	0.376	0.463	0.201	0.198	A
6	4.0	0.83	0.28	-0.62	1.309	0.035	-0.058	0.419	0.489	0.198	0.227	A
6	4.0	0.83	0.60	0.00	2.012	-0.013	-0.050	0.302	0.407	0.162	0.141	A
6	4.0	0.83	0.51	0.00	1.958	-0.003	-0.060	0.318	0.425	0.165	0.155	A
6	4.0	0.83	0.42	0.00	1.844	0.003	-0.049	0.352	0.429	0.171	0.169	A
6	4.0	0.83	0.33	0.00	1.720	0.023	-0.044	0.377	0.442	0.194	0.187	A
6	4.0	0.83	0.24	0.00	1.533	0.033	-0.035	0.405	0.466	0.199	0.210	A
6	4.0	0.83	0.18	0.00	1.245	0.048	-0.008	0.581	0.822	0.215	0.530	A
6	4.0	0.83	0.12	0.00								C
6	4.0	0.83	0.60	0.61	1.565	0.013	-0.011	0.315	0.407	0.188	0.150	A
6	4.0	0.83	0.44	0.61	1.452	0.035	-0.016	0.355	0.438	0.196	0.178	A
6	4.0	0.83	0.28	0.61	1.250	0.079	-0.020	0.368	0.432	0.184	0.178	A
6	4.0	0.83	0.60	1.23	0.854	-0.021	0.021	0.280	0.347	0.156	0.112	A
6	4.0	0.83	0.40	1.23	0.751	0.084	0.040	0.333	0.414	0.151	0.152	A
6	4.0	0.83	0.60	1.54	0.616	-0.034	0.029	0.308	0.300	0.126	0.101	A
6	4.0	0.83	0.50	1.54								C
1	7.0	0.90	0.67	-1.70	1.371	0.118	-0.055	0.518	0.566	0.290	0.336	A
1	7.0	0.90	0.67	-1.50	1.949	-0.034	-0.003	0.561	0.551	0.327	0.363	A
1	7.0	0.90	0.52	-1.50	1.261	0.083	-0.039	0.609	0.603	0.287	0.408	A
1	7.0	0.90	0.61	-1.20	2.597	-0.065	-0.075	0.475	0.527	0.277	0.290	A
1	7.0	0.90	0.43	-1.20	1.956	0.007	-0.075	0.598	0.578	0.287	0.387	A
1	7.0	0.90	0.62	-0.60	2.654	-0.101	-0.062	0.376	0.461	0.232	0.204	A
1	7.0	0.90	0.49	-0.60	2.364	-0.063	-0.046	0.415	0.466	0.234	0.222	A
1	7.0	0.90	0.31	-0.60	2.012	0.017	-0.043	0.479	0.506	0.257	0.276	A
1	7.0	0.90	0.67	0.00	2.509	-0.096	-0.026	0.372	0.459	0.222	0.199	A
1	7.0	0.90	0.57	0.00	2.408	-0.059	-0.062	0.371	0.458	0.230	0.200	A
1	7.0	0.90	0.47	0.00	2.309	-0.042	-0.060	0.400	0.478	0.227	0.220	A
1	7.0	0.90	0.37	0.00	2.168	0.005	-0.071	0.411	0.466	0.235	0.221	A
1	7.0	0.90	0.28	0.00	1.906	0.029	-0.047	0.447	0.487	0.244	0.248	A
1	7.0	0.90	0.21	0.00	1.703	0.074	-0.042	0.481	0.529	0.241	0.285	A
1	7.0	0.90	0.14	0.00	1.404	0.198	-0.017	0.797	1.257	0.268	1.144	A
1	7.0	0.90	0.67	0.60	2.107	-0.044	-0.005	0.400	0.447	0.231	0.207	A
1	7.0	0.90	0.49	0.60	2.007	-0.038	-0.023	0.432	0.464	0.237	0.229	A
1	7.0	0.90	0.31	0.60	1.729	0.031	-0.020	0.462	0.490	0.244	0.257	A
1	7.0	0.90	0.67	1.20	1.714	0.017	0.006	0.430	0.460	0.260	0.232	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
1	7.0	0.90	0.43	1.20	1.239	-0.009	-0.015	0.479	0.506	0.250	0.274	A
1	7.0	0.90	0.67	1.50	1.238	0.022	0.005	0.443	0.449	0.254	0.231	A
1	7.0	0.90	0.52	1.50	0.485	0.534	0.076	0.826	1.105	0.238	0.980	A
1	7.0	0.90	0.67	1.70								C
2	7.0	0.68	0.45	-1.58								C
2	7.0	0.68	0.44	-1.40	2.704	-0.175	-0.254	1.095	1.000	0.482	1.217	A
2	7.0	0.68	0.42	-1.40	2.427	-0.207	-0.169	1.126	1.037	0.515	1.304	A
2	7.0	0.68	0.39	-1.40	0.923	-0.233	0.037	1.282	1.385	0.531	1.922	A
2	7.0	0.68	0.37	-1.40								C
2	7.0	0.68	0.45	-1.12								C
2	7.0	0.68	0.38	-1.12	3.501	-0.224	-0.682	0.753	0.826	0.480	0.740	A
2	7.0	0.68	0.31	-1.12	3.329	0.207	-0.730	0.730	0.956	0.512	0.855	A
2	7.0	0.68	0.26	-1.12	1.099	0.122	0.069	1.431	1.692	0.677	2.685	A
2	7.0	0.68	0.45	-0.56	2.564	-0.643	-0.679	1.046	1.191	0.822	1.594	A
2	7.0	0.68	0.33	-0.56	2.112	-0.503	-0.677	0.956	1.077	0.858	1.405	A
2	7.0	0.68	0.21	-0.56	0.945	0.508	-0.666	0.922	1.184	0.767	1.421	A
2	7.0	0.68	0.13	-0.56	0.842	1.383	-0.713	0.920	1.104	0.587	1.205	A
2	7.0	0.68	0.39	0.00	3.843	0.547	-0.141	0.449	0.642	0.324	0.359	A
2	7.0	0.68	0.32	0.00	3.693	0.598	-0.088	0.466	0.568	0.361	0.335	A
2	7.0	0.68	0.25	0.00	3.347	0.661	-0.077	0.643	0.661	0.441	0.522	A
2	7.0	0.68	0.18	0.00	2.908	0.721	-0.061	0.894	0.893	0.473	0.910	A
2	7.0	0.68	0.14	0.00	2.041	0.816	-0.010	1.641	2.075	0.439	3.595	A
2	7.0	0.68	0.09	0.00	1.802	0.606	0.124	1.173	1.346	0.356	1.657	A
2	7.0	0.68	0.09	0.00	1.481	0.210	0.075	0.934	1.025	0.247	0.993	A
2	7.0	0.68	0.45	0.56	1.961	0.081	-0.473	1.001	1.176	0.882	1.581	A
2	7.0	0.68	0.33	0.56	1.305	0.498	-0.340	0.780	1.164	0.873	1.363	A
2	7.0	0.68	0.21	0.56	1.005	0.939	-0.138	0.796	1.115	0.772	1.236	A
2	7.0	0.68	0.13	0.56								C
2	7.0	0.68	0.45	1.12	2.285	0.307	-0.851	0.914	1.137	0.757	1.350	A
2	7.0	0.68	0.38	1.12	1.944	-0.212	-0.769	0.878	1.097	0.774	1.286	A
2	7.0	0.68	0.31	1.12	1.192	-0.348	-0.511	1.251	1.224	0.703	1.778	A
2	7.0	0.68	0.26	1.12	-0.419	-0.077	0.044	1.716	1.541	0.488	2.780	A
2	7.0	0.68	0.45	1.40	3.050	-0.176	-0.447	0.597	0.770	0.401	0.555	A
2	7.0	0.68	0.42	1.40	2.387	-0.307	-0.298	0.885	0.964	0.510	0.986	A
2	7.0	0.68	0.39	1.40	1.482	0.184	-0.038	1.592	1.819	0.557	3.076	A
2	7.0	0.68	0.55	1.58								C
3	7.0	0.73	0.50	-1.60	1.308	0.202	-0.308	0.964	0.936	0.498	1.027	A
3	7.0	0.73	0.50	-1.60	1.093	0.190	-0.294	1.006	0.946	0.519	1.088	A
3	7.0	0.73	0.49	-1.60	0.970	0.234	-0.356	0.951	0.976	0.539	1.073	A
3	7.0	0.73	0.48	-1.60	0.634	0.264	-0.357	0.952	1.075	0.522	1.167	A
3	7.0	0.73	0.50	-1.41	1.300	-0.044	0.276	0.939	0.853	0.515	0.937	A
3	7.0	0.73	0.46	-1.41	1.193	-0.123	0.276	0.904	0.849	0.494	0.891	A
3	7.0	0.73	0.42	-1.41	1.013	-0.166	0.192	0.979	0.902	0.443	0.985	A
3	7.0	0.73	0.39	-1.41	0.775	-0.111	0.105	0.979	0.970	0.410	1.034	A
3	7.0	0.73	0.50	-1.13	3.571	-0.438	-0.009	0.578	0.647	0.297	0.421	A
3	7.0	0.73	0.42	-1.13	3.489	-0.417	-0.207	0.609	0.678	0.319	0.466	A
3	7.0	0.73	0.34	-1.13	3.144	-0.440	-0.254	0.747	0.760	0.397	0.646	A
3	7.0	0.73	0.29	-1.13	2.596	-0.376	-0.260	0.973	0.969	0.464	1.050	A
3	7.0	0.73	0.50	-0.57	2.995	-1.149	0.174	0.781	0.782	0.432	0.704	A
3	7.0	0.73	0.37	-0.57	2.512	-0.743	-0.199	0.904	0.945	0.557	1.010	A
3	7.0	0.73	0.24	-0.57	2.297	-0.152	-0.384	0.899	1.009	0.605	1.096	A
3	7.0	0.73	0.15	-0.57	1.944	0.073	-0.247	1.034	1.019	0.528	1.193	A
3	7.0	0.73	0.50	0.00	3.634	-0.706	0.413	0.527	0.592	0.375	0.385	A
3	7.0	0.73	0.43	0.00	3.309	-0.611	0.266	0.649	0.709	0.431	0.555	A
3	7.0	0.73	0.36	0.00	2.724	-0.477	0.189	0.878	0.861	0.499	0.881	A
3	7.0	0.73	0.28	0.00	2.198	-0.419	0.174	0.940	0.982	0.568	1.085	A
3	7.0	0.73	0.21	0.00	1.669	-0.282	0.160	0.970	1.032	0.557	1.158	A
3	7.0	0.73	0.16	0.00	1.294	-0.266	0.096	0.973	0.987	0.507	1.090	A
3	7.0	0.73	0.11	0.00								C
3	7.0	0.73	0.06	0.00	0.760	-0.156	0.084	1.698	1.919	0.452	3.387	A
3	7.0	0.73	0.50	0.57	1.787	-0.590	0.331	0.991	0.881	0.648	1.090	A
3	7.0	0.73	0.37	0.57	1.855	-0.228	0.096	0.880	0.873	0.686	1.003	A
3	7.0	0.73	0.24	0.57	2.167	0.217	-0.121	0.919	0.960	0.662	1.103	A
3	7.0	0.73	0.15	0.57	1.567	0.372	0.025	1.199	1.607	0.425	2.100	A
3	7.0	0.73	0.50	1.13	2.943	-0.934	-0.264	0.562	0.723	0.311	0.467	A
3	7.0	0.73	0.42	1.13	2.739	-0.865	-0.327	0.632	0.759	0.372	0.557	A
3	7.0	0.73	0.34	1.13	2.084	-0.560	-0.324	0.888	0.893	0.449	0.894	A
3	7.0	0.73	0.29	1.13								C
3	7.0	0.73	0.50	1.41	1.644	-0.438	0.031	0.834	0.741	0.439	0.719	A
3	7.0	0.73	0.46	1.41	1.368	-0.230	0.056	0.954	0.856	0.453	0.924	A
3	7.0	0.73	0.42	1.41	0.346	0.016	0.017	1.344	1.744	0.425	2.515	A
3	7.0	0.73	0.39	1.41	-0.230	0.085	0.043	1.626	1.992	0.440	3.403	A
3	7.0	0.73	0.65	1.60	0.880	-0.428	-0.006	0.785	0.656	0.438	0.619	A
3	7.0	0.73	0.60	1.60	0.777	-0.398	-0.036	0.777	0.712	0.403	0.636	A
4	7.0	0.90	0.68	-1.73	0.842	0.087	-0.071	0.513	0.581	0.294	0.344	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
4	7.0	0.90	0.64	-1.73	0.617	0.179	-0.078	0.504	0.627	0.256	0.357	A
4	7.0	0.90	0.61	-1.73	0.420	0.212	-0.105	0.509	0.636	0.252	0.364	A
4	7.0	0.90	0.58	-1.73	0.123	0.354	-0.039	0.912	1.315	0.282	1.321	A
4	7.0	0.90	0.68	-1.53	1.206	-0.081	0.100	0.578	0.658	0.376	0.454	A
4	7.0	0.90	0.60	-1.53	1.073	-0.083	0.064	0.573	0.645	0.357	0.436	A
4	7.0	0.90	0.53	-1.53	0.872	-0.056	0.048	0.559	0.645	0.329	0.419	A
4	7.0	0.90	0.48	-1.53	0.471	-0.022	0.043	0.932	0.941	0.308	0.925	A
4	7.0	0.90	0.67	-1.22	2.501	-0.274	-0.022	0.633	0.691	0.407	0.522	A
4	7.0	0.90	0.56	-1.22	2.429	-0.299	-0.050	0.640	0.680	0.397	0.515	A
4	7.0	0.90	0.44	-1.22	2.222	-0.343	-0.042	0.684	0.690	0.380	0.544	A
4	7.0	0.90	0.35	-1.22								C
4	7.0	0.90	0.67	-0.61	2.371	-0.404	-0.003	0.602	0.694	0.363	0.488	A
4	7.0	0.90	0.50	-0.61	2.313	-0.372	-0.085	0.566	0.647	0.384	0.443	A
4	7.0	0.90	0.32	-0.61	2.234	-0.210	-0.137	0.577	0.632	0.360	0.431	A
4	7.0	0.90	0.20	-0.61	1.869	-0.058	-0.090	0.685	0.829	0.312	0.627	A
4	7.0	0.90	0.67	0.00	2.519	-0.408	-0.003	0.652	0.713	0.390	0.543	A
4	7.0	0.90	0.58	0.00	2.352	-0.373	-0.065	0.641	0.707	0.403	0.536	A
4	7.0	0.90	0.48	0.00	2.098	-0.296	-0.062	0.657	0.714	0.427	0.562	A
4	7.0	0.90	0.38	0.00	1.922	-0.247	-0.033	0.611	0.709	0.427	0.530	A
4	7.0	0.90	0.28	0.00	1.643	-0.151	-0.012	0.570	0.683	0.390	0.472	A
4	7.0	0.90	0.21	0.00	1.498	-0.086	-0.002	0.557	0.676	0.363	0.450	A
4	7.0	0.90	0.15	0.00	1.322	-0.005	-0.013	0.593	0.744	0.313	0.501	A
4	7.0	0.90	0.08	0.00	0.695	0.187	-0.040	0.622	0.872	0.238	0.602	A
4	7.0	0.90	0.67	0.61	1.978	-0.337	0.035	0.492	0.610	0.359	0.371	A
4	7.0	0.90	0.50	0.61	2.033	-0.226	-0.009	0.520	0.636	0.372	0.407	A
4	7.0	0.90	0.32	0.61	2.065	-0.020	-0.065	0.569	0.630	0.366	0.427	A
4	7.0	0.90	0.20	0.61	1.715	0.046	-0.067	0.647	0.642	0.322	0.467	A
4	7.0	0.90	0.67	1.22	2.233	-0.254	-0.031	0.552	0.590	0.348	0.388	A
4	7.0	0.90	0.56	1.22	2.109	-0.176	-0.047	0.547	0.584	0.365	0.386	A
4	7.0	0.90	0.44	1.22	1.737	-0.126	-0.005	0.620	0.625	0.332	0.442	A
4	7.0	0.90	0.35	1.22	0.551	0.110	0.015	0.500	0.589	0.160	0.311	A
4	7.0	0.90	0.68	1.53	1.169	-0.016	0.075	0.538	0.558	0.363	0.366	A
4	7.0	0.90	0.60	1.53	1.120	0.030	0.101	0.570	0.624	0.329	0.411	A
4	7.0	0.90	0.53	1.53	0.756	0.039	0.072	0.535	0.366	0.150	0.221	A
4	7.0	0.90	0.68	1.73	0.451	0.028	0.115	0.745	0.847	0.260	0.670	A
4	7.0	0.90	0.67	1.73								C
5	7.0	0.94	0.71	-1.56	1.628	0.010	0.040	0.553	0.597	0.330	0.386	A
5	7.0	0.94	0.55	-1.56	1.022	0.122	-0.092	0.560	0.623	0.275	0.389	A
5	7.0	0.94	0.71	-1.25	2.520	-0.046	0.068	0.581	0.575	0.325	0.387	A
5	7.0	0.94	0.45	-1.25	1.811	0.023	-0.068	0.613	0.623	0.316	0.432	A
5	7.0	0.94	0.71	-0.62	2.725	-0.151	0.067	0.441	0.536	0.262	0.275	A
5	7.0	0.94	0.52	-0.62	2.488	-0.102	-0.040	0.442	0.523	0.263	0.269	A
5	7.0	0.94	0.33	-0.62	2.062	0.009	-0.067	0.481	0.538	0.270	0.297	A
5	7.0	0.94	0.71	0.00	2.434	-0.136	-0.004	0.419	0.515	0.248	0.251	A
5	7.0	0.94	0.61	0.00	2.289	-0.120	-0.042	0.431	0.511	0.267	0.259	A
5	7.0	0.94	0.50	0.00	2.144	-0.079	-0.062	0.444	0.523	0.266	0.270	A
5	7.0	0.94	0.40	0.00	1.950	-0.025	-0.060	0.456	0.537	0.267	0.284	A
5	7.0	0.94	0.29	0.00	1.731	0.009	-0.049	0.472	0.527	0.262	0.285	A
5	7.0	0.94	0.22	0.00								C
5	7.0	0.94	0.15	0.00	2.138	-0.089	-0.002	0.393	0.473	0.241	0.218	A
5	7.0	0.94	0.71	0.62	1.937	-0.042	-0.033	0.427	0.495	0.250	0.245	A
5	7.0	0.94	0.52	0.62	1.577	0.031	-0.018	0.480	0.563	0.246	0.304	A
5	7.0	0.94	0.33	0.62	1.608	0.028	-0.007	0.439	0.488	0.282	0.255	A
5	7.0	0.94	0.71	1.25	0.999	-0.038	-0.022	0.514	0.680	0.250	0.395	A
5	7.0	0.94	0.45	1.25	1.033	0.043	0.006	0.421	0.465	0.252	0.229	A
5	7.0	0.94	0.71	1.56								C
6	7.0	1.00	0.77	-1.65	1.711	-0.092	0.001	0.448	0.346	0.264	0.195	A
6	7.0	1.00	0.61	-1.65	1.190	0.114	-0.108	0.445	0.370	0.246	0.198	A
6	7.0	1.00	0.77	-1.32	2.033	-0.095	0.022	0.446	0.351	0.277	0.200	A
6	7.0	1.00	0.50	-1.32	1.520	-0.057	-0.027	0.464	0.373	0.279	0.216	A
6	7.0	1.00	0.77	-0.66	2.467	-0.133	-0.003	0.334	0.260	0.222	0.114	A
6	7.0	1.00	0.57	-0.66	2.248	-0.109	-0.049	0.357	0.282	0.222	0.128	A
6	7.0	1.00	0.36	-0.66	1.847	-0.020	-0.098	0.390	0.323	0.233	0.155	A
6	7.0	1.00	0.77	0.00	2.266	-0.106	-0.049	0.276	0.248	0.196	0.088	A
6	7.0	1.00	0.66	0.00	2.178	-0.081	-0.031	0.293	0.250	0.193	0.093	A
6	7.0	1.00	0.54	0.00	2.052	-0.075	-0.031	0.337	0.279	0.220	0.120	A
6	7.0	1.00	0.43	0.00	1.930	-0.027	-0.036	0.352	0.276	0.212	0.122	A
6	7.0	1.00	0.31	0.00	1.726	-0.005	-0.032	0.371	0.279	0.215	0.131	A
6	7.0	1.00	0.24	0.00	1.552	0.026	-0.032	0.376	0.303	0.217	0.140	A
6	7.0	1.00	0.16	0.00	1.169	0.168	0.007	0.513	0.641	0.196	0.356	A
6	7.0	1.00	0.77	0.66	1.969	-0.048	-0.026	0.316	0.250	0.212	0.104	A
6	7.0	1.00	0.57	0.66	1.798	-0.027	-0.046	0.336	0.275	0.217	0.118	A
6	7.0	1.00	0.36	0.66	1.452	-0.011	-0.004	0.364	0.290	0.215	0.131	A
6	7.0	1.00	0.77	1.32	1.490	-0.019	-0.030	0.324	0.262	0.217	0.110	A
6	7.0	1.00	0.50	1.32	1.043	-0.038	-0.018	0.350	0.265	0.199	0.116	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
6	7.0	1.00	0.77	1.65	1.097	-0.045	0.000	0.309	0.248	0.183	0.095	A
6	7.0	1.00	0.61	1.65	0.650	0.005	0.035	0.382	0.324	0.189	0.143	A

**Table B5. Summary of data for slotted-weir baffles at a 3.00% culvert slope.**

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
					ft/s	ft	ft	ft/s	ft/s	ft/s	ft/s	
1	1.5	0.44	0.21	-0.89	0.005	0.006	-0.003	0.065	0.067	0.013	0.004	A
1	1.5	0.44	0.17	-0.89	-0.125	-0.222	0.031	0.398	0.677	0.104	0.314	A
1	1.5	0.44	0.21	-0.45	1.956	-0.067	0.001	0.734	0.755	0.338	0.612	A
1	1.5	0.44	0.16	-0.45								C
1	1.5	0.44	0.11	-0.45	-0.018	-0.045	0.007	0.105	0.100	0.021	0.011	A
1	1.5	0.44	0.21	0.00	2.082	-0.074	-0.017	0.660	0.646	0.331	0.481	A
1	1.5	0.44	0.18	0.00	1.802	-0.076	-0.019	0.725	0.781	0.342	0.626	A
1	1.5	0.44	0.15	0.00	1.614	0.129	-0.014	0.948	1.377	0.341	1.456	A
1	1.5	0.44	0.12	0.00	1.081	0.208	0.050	1.519	1.951	0.373	3.125	A
1	1.5	0.44	0.09	0.00	-0.014	-0.018	0.012	0.355	0.131	0.055	0.073	A
1	1.5	0.44	0.07	0.00	-0.070	0.044	0.003	0.130	0.090	0.023	0.013	A
1	1.5	0.44	0.05	0.00	-0.113	0.221	0.016	0.452	0.345	0.094	0.166	A
1	1.5	0.44	0.21	0.45	1.127	-0.016	-0.010	0.564	0.628	0.277	0.394	A
1	1.5	0.44	0.16	0.45	0.887	-0.033	-0.050	0.651	0.737	0.258	0.517	A
1	1.5	0.44	0.11	0.45	0.187	0.108	-0.138	1.521	1.070	0.303	1.775	A
1	1.5	0.44	0.21	0.89	0.047	-0.052	0.010	1.496	1.560	0.310	2.384	A
1	1.5	0.44	0.17	0.89	-0.216	0.234	0.086	1.941	1.260	0.339	2.735	A
2	1.5	0.29	0.06	-0.39	0.014	0.006	0.018	0.484	0.466	0.094	0.230	A
2	1.5	0.29	0.05	-0.39	-0.024	-0.009	0.003	0.368	0.409	0.081	0.154	A
2	1.5	0.29	0.04	-0.39	-0.014	0.000	0.001	0.471	0.458	0.091	0.220	A
2	1.5	0.29	0.04	-0.39	0.036	0.038	-0.015	0.732	0.617	0.121	0.466	A
2	1.5	0.29	0.05	0.00								C
2	1.5	0.29	0.04	0.00								C
2	1.5	0.29	0.03	0.00	0.100	0.068	-0.021	0.786	0.693	0.151	0.561	A
2	1.5	0.29	0.02	0.00	0.135	-0.002	-0.032	0.846	0.786	0.171	0.681	A
2	1.5	0.29	0.02	0.00	0.222	0.077	-0.049	1.051	0.959	0.208	1.033	A
2	1.5	0.29	0.01	0.00	0.238	0.229	-0.080	1.685	1.058	0.294	2.023	A
2	1.5	0.29	0.06	0.39								C
2	1.5	0.29	0.05	0.39	-1.458	0.467	-0.102	1.609	1.354	0.374	2.281	A
2	1.5	0.29	0.04	0.39	-1.122	0.269	-0.218	1.388	0.812	0.231	1.319	A
2	1.5	0.29	0.04	0.39	-0.081	0.040	-0.010	0.562	0.296	0.092	0.206	A
3	1.5	0.27	0.04	-0.35								C
3	1.5	0.27	0.04	-0.35	0.642	0.911	-0.042	2.402	2.745	0.491	6.773	A
3	1.5	0.27	0.03	-0.35	-0.325	0.235	-0.061	2.746	2.720	0.481	7.584	A
3	1.5	0.27	0.03	-0.35	-1.054	-0.837	-0.168	3.342	2.799	0.674	9.728	A
3	1.5	0.27	0.04	0.00								C
3	1.5	0.27	0.04	0.00								C
3	1.5	0.27	0.03	0.00								C
3	1.5	0.27	0.03	0.00	-3.155	0.833	0.279	2.429	2.640	0.587	6.609	A
3	1.5	0.27	0.02	0.00	-0.072	-1.768	0.153	1.852	1.881	0.429	3.577	A
3	1.5	0.27	0.02	0.00	-0.159	-1.748	0.165	1.822	1.820	0.423	3.406	A
3	1.5	0.27	0.01	0.00	-0.021	-1.417	0.035	1.894	2.164	0.493	4.257	A
3	1.5	0.27	0.01	0.00	2.097	3.406	-0.344	4.198	3.261	0.902	14.537	A
3	1.5	0.27	0.04	0.35								C
3	1.5	0.27	0.04	0.35	-1.292	0.073	-0.009	3.051	3.702	0.833	11.855	A
3	1.5	0.27	0.03	0.35	-1.547	-0.262	0.040	3.088	3.710	0.858	12.018	A
3	1.5	0.27	0.03	0.35								C
4	1.5	0.28	ALL DATA IS BAD									C
5	1.5	0.38	0.15	-0.82	0.656	0.128	0.007	0.814	0.787	0.260	0.675	A
5	1.5	0.38	0.14	-0.82	0.172	0.164	0.056	0.798	0.868	0.253	0.727	A
5	1.5	0.38	0.15	-0.41	2.058	0.099	-0.042	0.675	0.522	0.344	0.423	A
5	1.5	0.38	0.12	-0.41	1.710	0.071	-0.054	0.768	0.522	0.343	0.490	A
5	1.5	0.38	0.08	-0.41	1.326	0.168	-0.035	0.860	0.723	0.311	0.680	A
5	1.5	0.38	0.15	0.00	2.225	0.114	-0.071	0.617	0.494	0.338	0.370	A
5	1.5	0.38	0.13	0.00	1.952	0.184	-0.068	0.731	0.601	0.327	0.501	A
5	1.5	0.38	0.11	0.00	1.658	0.306	-0.057	0.916	0.735	0.295	0.734	A
5	1.5	0.38	0.09	0.00	1.612	0.172	-0.083	0.740	0.600	0.305	0.500	A
5	1.5	0.38	0.07	0.00	1.547	0.107	-0.086	0.675	0.535	0.309	0.419	A
5	1.5	0.38	0.05	0.00	1.052	0.173	-0.106	0.502	0.429	0.205	0.239	A
5	1.5	0.38	0.14	0.41	0.947	0.116	-0.023	0.787	0.669	0.241	0.563	A
5	1.5	0.38	0.12	0.41	0.956	0.125	0.000	0.566	0.578	0.235	0.355	A
5	1.5	0.38	0.08	0.41	0.430	0.063	0.010	0.260	0.216	0.075	0.060	A
5	1.5	0.38	0.15	0.82	0.216	-0.080	-0.028	0.280	0.348	0.119	0.107	A
6	1.5	0.63	0.40	-1.43	0.403	0.240	-0.050	1.082	0.811	0.266	0.950	A
6	1.5	0.63	0.40	-1.26	0.894	0.197	-0.105	0.509	0.465	0.225	0.263	A
6	1.5	0.63	0.33	-1.26	0.396	0.329	-0.001	1.274	1.214	0.282	1.588	A
6	1.5	0.63	0.40	-1.01	1.013	0.075	-0.005	0.515	0.553	0.267	0.321	A
6	1.5	0.63	0.27	-1.01	0.555	0.309	-0.053	1.047	0.604	0.244	0.760	A
6	1.5	0.63	0.40	-0.51	1.562	0.066	0.015	0.558	0.575	0.296	0.365	A
6	1.5	0.63	0.30	-0.51	1.391	0.147	-0.029	0.560	0.588	0.293	0.372	A
6	1.5	0.63	0.19	-0.51	0.978	0.218	-0.019	0.606	0.711	0.256	0.469	A
6	1.5	0.63	0.40	0.00	1.295	0.071	0.009	0.511	0.549	0.298	0.326	A
6	1.5	0.63	0.34	0.00	1.291	0.099	-0.035	0.512	0.537	0.295	0.319	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
6	1.5	0.63	0.28	0.00	1.143	0.120	-0.015	0.491	0.544	0.283	0.308	A
6	1.5	0.63	0.22	0.00	1.123	0.122	-0.023	0.476	0.532	0.278	0.293	A
6	1.5	0.63	0.16	0.00	0.915	0.199	0.013	0.632	0.884	0.250	0.622	A
6	1.5	0.63	0.12	0.00								C
6	1.5	0.63	0.08	0.00	0.632	0.355	0.044	0.847	1.308	0.237	1.242	A
6	1.5	0.63	0.40	0.51	0.545	0.007	0.020	0.406	0.469	0.249	0.223	A
6	1.5	0.63	0.30	0.51	0.427	0.028	0.051	0.370	0.458	0.224	0.198	A
6	1.5	0.63	0.19	0.51	0.321	0.110	0.075	0.443	0.599	0.200	0.298	A
6	1.5	0.63	0.40	1.01	0.203	-0.052	0.005	0.307	0.368	0.165	0.129	A
6	1.5	0.63	0.27	1.01	0.058	-0.107	0.000	0.916	1.046	0.214	0.989	A
6	1.5	0.63	0.40	1.26	0.193	-0.105	-0.065	0.356	0.404	0.146	0.156	A
6	1.5	0.63	0.33	1.26								C
6	1.5	0.63	0.50	1.43	0.178	0.009	-0.068	0.385	0.442	0.137	0.181	A
1	3.0	0.52	0.29	-1.25	0.088	-0.076	0.004	0.137	0.149	0.039	0.021	A
1	3.0	0.52	0.28	-1.25	-0.267	0.508	0.091	0.322	0.493	0.096	0.178	A
1	3.0	0.52	0.29	-1.00	1.503	0.082	-0.018	1.148	1.437	0.384	1.766	A
1	3.0	0.52	0.22	-1.00	0.334	0.540	-0.091	0.252	0.409	0.066	0.117	A
1	3.0	0.52	0.29	-0.50	2.459	-0.222	0.000	0.745	0.764	0.380	0.642	A
1	3.0	0.52	0.22	-0.50	2.078	-0.189	-0.056	0.794	0.812	0.378	0.717	A
1	3.0	0.52	0.15	-0.50	1.300	-0.049	-0.022	1.074	1.157	0.315	1.295	A
1	3.0	0.52	0.29	0.00	2.617	-0.278	0.033	0.673	0.704	0.345	0.534	A
1	3.0	0.52	0.25	0.00	2.512	-0.227	-0.029	0.696	0.693	0.363	0.548	A
1	3.0	0.52	0.21	0.00	2.318	-0.202	-0.030	0.723	0.690	0.373	0.569	A
1	3.0	0.52	0.16	0.00	1.999	-0.123	-0.050	0.765	0.762	0.356	0.647	A
1	3.0	0.52	0.12	0.00								C
1	3.0	0.52	0.09	0.00	0.198	0.064	0.010	0.512	0.487	0.123	0.257	A
1	3.0	0.52	0.06	0.00	-0.027	-0.008	0.002	0.078	0.082	0.015	0.007	A
1	3.0	0.52	0.29	0.50	2.055	-0.187	-0.061	0.664	0.634	0.343	0.481	A
1	3.0	0.52	0.22	0.50	1.749	-0.213	-0.075	0.740	0.806	0.355	0.662	A
1	3.0	0.52	0.15	0.50	0.942	0.023	-0.102	0.915	1.154	0.311	1.133	A
1	3.0	0.52	0.29	1.00	0.601	-0.203	0.009	0.656	0.740	0.267	0.525	A
1	3.0	0.52	0.22	1.00								C
1	3.0	0.52	0.29	1.25	0.021	-0.048	0.000	0.041	0.137	0.014	0.010	A
1	3.0	0.52	0.28	1.25								C
2	3.0	0.40	0.31	-1.16								C
2	3.0	0.40	0.29	-1.16	0.246	0.047	0.057	1.104	1.449	0.266	1.695	A
2	3.0	0.40	0.22	-1.03	0.038	-0.154	-0.008	0.670	1.049	0.164	0.787	A
2	3.0	0.40	0.15	-0.82	-0.010	-0.051	0.002	0.616	0.802	0.140	0.521	A
2	3.0	0.40	0.14	-0.82	-0.207	-0.566	0.050	0.974	1.477	0.237	1.594	A
2	3.0	0.40	0.13	-0.82	-0.228	-0.621	0.052	1.339	1.805	0.326	2.578	A
2	3.0	0.40	0.12	-0.82								C
2	3.0	0.40	0.17	-0.41								C
2	3.0	0.40	0.13	-0.41								C
2	3.0	0.40	0.13	-0.41	1.715	0.814	0.306	1.191	1.591	0.570	2.138	A
2	3.0	0.40	0.17	0.00								C
2	3.0	0.40	0.15	0.00	3.740	0.690	-0.276	1.101	1.283	0.450	1.530	A
2	3.0	0.40	0.12	0.00								C
2	3.0	0.40	0.10	0.00	2.107	1.140	-0.316	1.271	1.336	0.469	1.810	A
2	3.0	0.40	0.09	0.00	1.573	1.046	-0.307	1.293	1.152	0.408	1.583	A
2	3.0	0.40	0.17	0.41	2.423	1.112	-0.572	1.285	1.445	0.832	2.215	A
2	3.0	0.40	0.13	0.41	1.653	1.289	-0.484	1.138	1.600	0.631	2.126	A
2	3.0	0.40	0.09	0.41	-0.617	0.384	-0.279	2.733	3.059	0.682		C
2	3.0	0.40	0.09	0.41	-0.467	0.811	-0.294	2.171	2.330	0.589	5.246	A
2	3.0	0.40	0.28	0.82								C
2	3.0	0.40	0.26	0.82	1.324	0.222	0.194	1.673	2.102	0.592	3.785	A
2	3.0	0.40	0.25	0.82	0.900	0.303	0.169	1.435	1.661	0.523	2.546	A
2	3.0	0.40	0.24	0.82	1.248	0.689	0.385	1.537	1.482	0.512	2.409	A
2	3.0	0.40	0.28	1.03	0.446	-0.120	0.142	1.660	2.657	0.479	5.023	A
2	3.0	0.40	0.27	1.03								C
2	3.0	0.40	0.32	1.16	0.354	0.028	-0.233	2.082	2.963	0.557	6.711	A
2	3.0	0.40	0.29	1.16	1.183	1.087	-0.256	2.184	2.478	0.461	5.562	A
3	3.0	0.31	0.08	-0.42	0.006	-0.040	-0.002	0.242	0.271	0.050	0.067	A
3	3.0	0.31	0.07	-0.42	0.016	-0.055	0.003	0.575	0.900	0.145	0.581	A
3	3.0	0.31	0.05	0.00								C
3	3.0	0.31	0.04	0.00								C
3	3.0	0.31	0.08	0.42	-0.045	0.001	-0.003	0.090	0.138	0.019	0.014	A
3	3.0	0.31	0.07	0.42	0.645	-0.024	0.060	4.718	0.259	0.635	11.367	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
3	3.0	0.31	0.05	0.42	-0.483	-1.377	-0.424	3.938	2.339	0.727	10.754	A
3	3.0	0.31	0.04	0.42	-2.648	0.032	-0.411	2.235	0.474	0.324	2.663	A
4	3.0	0.37	0.14	-0.42								C
4	3.0	0.37	0.11	-0.42	1.292	0.157	0.225	1.281	1.624	0.360	2.203	A
4	3.0	0.37	0.11	-0.42	1.428	0.345	-0.019	1.104	1.476	0.388	1.774	A
4	3.0	0.37	0.11	0.00								C
4	3.0	0.37	0.10	0.00								C
4	3.0	0.37	0.09	0.00	1.495	0.291	-0.096	1.174	1.404	0.411	1.759	A
4	3.0	0.37	0.08	0.00	0.731	-0.011	-0.098	0.788	0.980	0.269	0.827	A
4	3.0	0.37	0.06	0.00	0.743	0.479	-0.290	1.195	1.521	0.446	1.970	A
4	3.0	0.37	0.14	0.42								C
4	3.0	0.37	0.13	0.42	1.330	0.356	-0.180	1.355	1.715	0.446	2.488	A
4	3.0	0.37	0.11	0.42	0.445	0.636	-0.199	1.652	2.683	0.489	5.084	A
4	3.0	0.37	0.09	0.42								C
4	3.0	0.37	0.12	0.83	-1.130	1.297	0.337	1.922	3.410	0.527	7.798	A
4	3.0	0.37	0.11	0.83								C
5	3.0	0.45	0.22	-1.12	0.363	0.158	-0.098	0.685	0.707	0.295	0.528	A
5	3.0	0.45	0.22	-0.89	1.638	0.140	-0.014	0.732	0.681	0.375	0.570	A
5	3.0	0.45	0.17	-0.89	1.103	0.136	-0.018	1.048	0.811	0.364	0.944	A
5	3.0	0.45	0.16	-0.45	2.072	0.141	-0.028	0.816	0.729	0.407	0.682	A
5	3.0	0.45	0.13	-0.45	1.832	0.123	-0.024	0.926	0.732	0.403	0.778	A
5	3.0	0.45	0.11	-0.45	1.703	0.144	-0.023	0.904	0.821	0.411	0.830	A
5	3.0	0.45	0.17	0.00	2.668	0.189	-0.056	0.816	0.741	0.399	0.687	A
5	3.0	0.45	0.15	0.00	2.430	0.197	-0.077	0.941	0.782	0.408	0.833	A
5	3.0	0.45	0.13	0.00	2.386	0.186	-0.072	0.888	0.764	0.400	0.766	A
5	3.0	0.45	0.11	0.00	2.157	0.186	-0.080	0.855	0.756	0.398	0.730	A
5	3.0	0.45	0.09	0.00	1.836	0.207	-0.116	1.346	0.844	0.399	1.342	A
5	3.0	0.45	0.08	0.00								C
5	3.0	0.45	0.05	0.00	0.976	-0.050	-0.060	0.624	0.497	0.212	0.341	A
5	3.0	0.45	0.22	0.45	2.336	0.109	-0.078	0.699	0.683	0.364	0.543	A
5	3.0	0.45	0.17	0.45	1.889	0.054	-0.052	0.771	0.781	0.359	0.666	A
5	3.0	0.45	0.11	0.45								C
5	3.0	0.45	0.22	0.89	0.634	0.039	-0.010	0.706	0.985	0.269	0.770	A
5	3.0	0.45	0.17	0.89	0.360	0.098	-0.005	1.003	1.668	0.313	1.944	A
5	3.0	0.45	0.22	1.12								C
6	3.0	0.70	0.47	-1.57	0.344	0.191	-0.040	0.662	0.781	0.243	0.554	A
6	3.0	0.70	0.47	-1.39	0.979	0.134	-0.046	0.536	0.524	0.256	0.313	A
6	3.0	0.70	0.39	-1.39	0.512	0.198	-0.031	0.775	0.822	0.268	0.674	A
6	3.0	0.70	0.47	-1.11	1.203	0.042	0.011	0.551	0.605	0.333	0.390	A
6	3.0	0.70	0.32	-1.11	0.654	0.187	0.005	0.536	0.556	0.248	0.329	A
6	3.0	0.70	0.47	-0.56	2.124	0.023	0.009	0.636	0.615	0.345	0.451	A
6	3.0	0.70	0.35	-0.56	1.726	0.087	-0.025	0.609	0.622	0.345	0.439	A
6	3.0	0.70	0.22	-0.56	1.340	0.154	-0.042	0.677	0.689	0.316	0.516	A
6	3.0	0.70	0.47	0.00	2.067	0.052	0.005	0.604	0.596	0.346	0.420	A
6	3.0	0.70	0.40	0.00	1.896	0.072	-0.010	0.609	0.586	0.342	0.415	A
6	3.0	0.70	0.33	0.00	1.768	0.096	-0.029	0.598	0.603	0.343	0.419	A
6	3.0	0.70	0.26	0.00	1.595	0.120	-0.017	0.618	0.604	0.326	0.427	A
6	3.0	0.70	0.19	0.00	1.283	0.168	-0.018	0.670	0.751	0.305	0.553	A
6	3.0	0.70	0.14	0.00	1.181	0.200	-0.013	0.753	0.866	0.285	0.699	A
6	3.0	0.70	0.10	0.00	0.827	0.313	0.048	1.133	1.705	0.317	2.146	A
6	3.0	0.70	0.47	0.56	1.000	0.037	0.038	0.557	0.561	0.352	0.374	A
6	3.0	0.70	0.35	0.56	0.824	0.032	0.021	0.502	0.544	0.312	0.323	A
6	3.0	0.70	0.22	0.56	0.720	0.132	0.051	0.477	0.535	0.257	0.290	A
6	3.0	0.70	0.47	1.11	0.309	-0.015	0.042	0.369	0.425	0.205	0.180	A
6	3.0	0.70	0.32	1.11	0.196	-0.021	0.023	0.768	0.856	0.209	0.683	A
6	3.0	0.70	0.47	1.39	0.268	-0.109	-0.039	0.393	0.438	0.165	0.187	A
6	3.0	0.70	0.39	1.39	-0.254	-0.067	0.062	1.096	1.758	0.307	2.194	A
6	3.0	0.70	0.47	1.57	0.219	-0.018	-0.041	0.381	0.392	0.167	0.163	A
1	4.0	0.52	0.29	-1.19	1.061	0.060	-0.033	0.923	1.156	0.354	1.157	A
1	4.0	0.52	0.29	-1.19	0.718	-0.108	-0.056	0.600	0.658	0.310	0.445	A
1	4.0	0.52	0.29	-0.95	2.047	-0.134	-0.029	0.837	0.777	0.420	0.740	A
1	4.0	0.52	0.21	-0.95	1.421	0.020	-0.110	0.879	0.748	0.335	0.722	A
1	4.0	0.52	0.29	-0.48	2.809	-0.260	0.046	0.760	0.772	0.412	0.672	A
1	4.0	0.52	0.22	-0.48	2.426	-0.202	-0.016	0.884	0.888	0.419	0.873	A
1	4.0	0.52	0.14	-0.48								C
1	4.0	0.52	0.29	0.00	2.750	-0.277	0.053	0.764	0.732	0.398	0.639	A
1	4.0	0.52	0.25	0.00	2.648	-0.229	0.019	0.765	0.718	0.409	0.634	A
1	4.0	0.52	0.21	0.00	2.424	-0.208	-0.016	0.796	0.725	0.424	0.669	A
1	4.0	0.52	0.16	0.00	2.060	-0.111	-0.016	0.875	0.999	0.404	0.963	A
1	4.0	0.52	0.12	0.00								C
1	4.0	0.52	0.09	0.00	1.178	0.015	0.062	1.197	1.603	0.346	2.061	A
1	4.0	0.52	0.06	0.00	0.246	-0.071	0.009	0.502	0.514	0.139	0.267	A
1	4.0	0.52	0.28	0.48	2.535	-0.254	-0.091	0.733	0.682	0.383	0.575	A
1	4.0	0.52	0.22	0.48	2.285	-0.256	-0.101	0.787	0.732	0.401	0.658	A
1	4.0	0.52	0.14	0.48	1.679	-0.187	-0.149	0.858	0.812	0.375	0.768	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
1	4.0	0.52	0.29	0.95	0.856	-0.165	0.003	0.597	0.576	0.327	0.398	A
1	4.0	0.52	0.21	0.95	0.184	0.012	-0.001	0.959	1.045	0.299	1.050	A
1	4.0	0.52	0.35	1.19	0.383	-0.171	-0.006	0.566	0.635	0.251	0.393	A
1	4.0	0.52	0.30	1.19	-0.112	-0.175	0.116	0.933	1.328	0.292	1.359	A
2	4.0	0.48	0.30	-1.30	0.086	-0.115	-0.017	0.329	0.463	0.079	0.164	A
2	4.0	0.48	0.18	-1.15								C
2	4.0	0.48	0.17	-1.15								C
2	4.0	0.48	0.19	-0.92								C
2	4.0	0.48	0.18	-0.92								C
2	4.0	0.48	0.19	-0.92								C
2	4.0	0.48	0.25	-0.46								C
2	4.0	0.48	0.19	-0.46	1.614	-0.649	0.308	1.251	1.394	0.791	2.068	A
2	4.0	0.48	0.13	-0.46	1.176	0.543	0.085	2.162	2.482	0.565	5.575	A
2	4.0	0.48	0.11	-0.46	1.296	1.189	0.053	1.397	1.836	0.528	2.801	A
2	4.0	0.48	0.21	0.00	3.611	0.046	-0.255	1.083	1.070	0.476	1.272	A
2	4.0	0.48	0.19	0.00	3.752	0.116	-0.212	0.788	0.874	0.498	0.816	A
2	4.0	0.48	0.17	0.00	3.826	0.258	-0.226	0.677	0.914	0.447	0.747	A
2	4.0	0.48	0.14	0.00	3.874	0.382	-0.219	0.663	0.829	0.460	0.669	A
2	4.0	0.48	0.11	0.00	2.450	0.812	0.033	1.919	2.958	0.508	6.344	A
2	4.0	0.48	0.08	0.00	2.012	0.769	-0.139	1.289	1.444	0.462	1.980	A
2	4.0	0.48	0.08	0.00	1.566	0.995	-0.213	1.198	1.212	0.414	1.538	A
2	4.0	0.48	0.25	0.46								C
2	4.0	0.48	0.19	0.46	2.019	0.918	-0.203	0.946	1.190	0.855	1.520	A
2	4.0	0.48	0.13	0.46	1.301	1.188	-0.134	1.238	1.650	0.554	2.281	A
2	4.0	0.48	0.09	0.46	-0.619	1.357	0.030	1.613	1.713	0.440	2.864	A
2	4.0	0.48	0.25	0.92	-0.064	-0.016	0.034	0.219	0.310	0.064	0.074	A
2	4.0	0.48	0.25	1.15								C
2	4.0	0.48	0.40	1.30								C
2	4.0	0.48	0.37	1.30	-1.093	0.660	-0.522	2.662	2.132	0.473	5.928	A
3	4.0	0.33	0.10	-0.46	0.021	-0.016	-0.008	0.254	0.289	0.056	0.076	A
3	4.0	0.33	0.08	-0.46	0.025	-0.001	-0.010	0.349	0.353	0.068	0.125	A
3	4.0	0.33	0.06	-0.46	-0.063	0.030	0.009	0.916	1.422	0.238	1.459	A
3	4.0	0.33	0.05	-0.46								C
3	4.0	0.33	0.10	0.00								C
3	4.0	0.33	0.09	0.00								C
3	4.0	0.33	0.07	0.00								C
3	4.0	0.33	0.06	0.00	0.010	-0.092	-0.003	0.694	0.611	0.125	0.435	A
3	4.0	0.33	0.04	0.00	0.391	0.030	0.102	2.940	0.769	0.415	4.705	A
3	4.0	0.33	0.03	0.00	0.307	0.161	0.267	3.627	0.931	0.530	7.151	A
3	4.0	0.33	0.02	0.00	-0.993	-0.677	0.085	4.885	1.732	0.642	13.639	A
3	4.0	0.33	0.01	0.00								C
3	4.0	0.33	0.10	0.46	0.003	-0.136	-0.032	1.288	2.186	0.343	3.277	A
3	4.0	0.33	0.08	0.46	0.001	0.002	-0.002	0.084	0.060	0.014	0.005	A
3	4.0	0.33	0.06	0.46	0.780	0.115	0.103	3.553	0.516	0.486	6.563	A
3	4.0	0.33	0.05	0.46								C
4	4.0	0.38	0.15	-0.87	0.216	0.234	0.054	0.582	0.746	0.135	0.456	A
4	4.0	0.38	0.15	-0.44								C
4	4.0	0.38	0.13	-0.44	2.728	0.063	0.080	0.978	1.168	0.430	1.254	A
4	4.0	0.38	0.12	-0.44	2.681	0.071	0.057	1.001	1.222	0.406	1.331	A
4	4.0	0.38	0.10	-0.44								C
4	4.0	0.38	0.13	0.00								C
4	4.0	0.38	0.12	0.00								C
4	4.0	0.38	0.11	0.00								C
4	4.0	0.38	0.09	0.00	2.709	0.183	-0.055	1.003	1.041	0.450	1.145	A
4	4.0	0.38	0.08	0.00	2.428	0.251	-0.041	1.228	1.637	0.431	2.188	A
4	4.0	0.38	0.06	0.00								C
4	4.0	0.38	0.03	0.00	1.700	0.220	-0.127	1.282	1.269	0.412	1.713	A
4	4.0	0.38	0.03	0.00	1.450	0.191	-0.118	0.979	1.114	0.379	1.172	A
4	4.0	0.38	0.15	0.44								C
4	4.0	0.38	0.14	0.44	3.273	0.226	-0.169	1.012	0.928	0.436	1.037	A
4	4.0	0.38	0.11	0.44	2.892	0.246	-0.267	1.198	1.104	0.449	1.428	A
4	4.0	0.38	0.06	0.44								C
4	4.0	0.38	0.25	0.87								C
4	4.0	0.38	0.22	0.87	1.962	0.247	0.059	0.854	0.863	0.426	0.828	A
4	4.0	0.38	0.19	0.87	1.517	0.307	0.049	1.357	1.285	0.426	1.837	A
4	4.0	0.38	0.17	0.87	0.410	0.232	0.309	0.934	1.166	0.347	1.176	A
5	4.0	0.55	0.32	-1.21	1.736	0.016	-0.015	0.804	0.637	0.409	0.610	A
5	4.0	0.55	0.29	-1.21	0.979	0.173	-0.136	0.841	0.721	0.360	0.679	A
5	4.0	0.55	0.28	-0.97	2.337	-0.029	-0.012	0.830	0.646	0.396	0.632	A
5	4.0	0.55	0.23	-0.97	2.050	0.038	-0.066	0.857	0.684	0.430	0.694	A
5	4.0	0.55	0.28	-0.48	3.017	-0.050	0.039	0.754	0.555	0.373	0.508	A
5	4.0	0.55	0.24	-0.48	2.917	-0.090	-0.026	0.787	0.571	0.401	0.554	A
5	4.0	0.55	0.16	-0.48	2.293	-0.021	-0.066	0.845	0.601	0.402	0.618	A
5	4.0	0.55	0.28	0.00	2.879	-0.102	0.015	0.734	0.582	0.384	0.513	A
5	4.0	0.55	0.25	0.00	2.782	-0.093	0.006	0.747	0.546	0.396	0.507	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
5	4.0	0.55	0.23	0.00	2.641	-0.100	-0.010	0.771	0.554	0.417	0.537	A
5	4.0	0.55	0.18	0.00	2.499	-0.132	-0.043	0.745	0.585	0.410	0.532	A
5	4.0	0.55	0.13	0.00	2.098	-0.080	-0.037	0.807	0.639	0.383	0.604	A
5	4.0	0.55	0.10	0.00	1.709	-0.146	-0.048	0.735	0.599	0.379	0.522	A
5	4.0	0.55	0.07	0.00	1.365	-0.116	-0.065	0.668	0.537	0.307	0.415	A
5	4.0	0.55	0.30	0.48	3.176	-0.081	-0.147	0.638	0.474	0.370	0.384	A
5	4.0	0.55	0.24	0.48	2.969	-0.061	-0.149	0.668	0.487	0.388	0.417	A
5	4.0	0.55	0.16	0.48	2.199	-0.035	-0.042	0.770	0.614	0.347	0.545	A
5	4.0	0.55	0.32	0.97	1.193	-0.084	0.019	0.530	0.447	0.320	0.292	A
5	4.0	0.55	0.23	0.97	0.515	-0.027	-0.041	0.512	0.478	0.240	0.274	A
5	4.0	0.55	0.32	1.21	0.326	0.021	-0.112	0.884	0.453	0.241	0.523	A
5	4.0	0.55	0.29	1.21	0.207	0.200	-0.077	0.404	0.391	0.138	0.168	A
6	4.0	0.76	0.57	-1.59	0.977	0.087	-0.052	0.484	0.366	0.252	0.216	A
6	4.0	0.76	0.53	-1.40	1.085	0.046	-0.014	0.509	0.394	0.282	0.247	A
6	4.0	0.76	0.43	-1.40	0.560	0.243	-0.028	0.505	0.630	0.233	0.353	A
6	4.0	0.76	0.53	-1.12	1.458	-0.043	0.027	0.564	0.439	0.346	0.315	A
6	4.0	0.76	0.35	-1.12	0.914	0.086	-0.032	0.591	0.441	0.276	0.310	A
6	4.0	0.76	0.53	-0.56	2.356	-0.021	0.000	0.608	0.445	0.343	0.342	A
6	4.0	0.76	0.39	-0.56	2.026	0.022	-0.044	0.597	0.463	0.357	0.349	A
6	4.0	0.76	0.25	-0.56	1.412	0.143	-0.068	0.609	0.491	0.304	0.352	A
6	4.0	0.76	0.53	0.00	2.429	0.025	-0.006	0.613	0.432	0.352	0.343	A
6	4.0	0.76	0.46	0.00	2.276	0.029	-0.050	0.572	0.448	0.352	0.326	A
6	4.0	0.76	0.38	0.00	1.995	0.053	-0.024	0.552	0.443	0.357	0.314	A
6	4.0	0.76	0.30	0.00	1.816	0.076	-0.036	0.607	0.446	0.343	0.343	A
6	4.0	0.76	0.22	0.00	1.483	0.111	-0.025	0.582	0.458	0.312	0.323	A
6	4.0	0.76	0.16	0.00	1.182	0.205	-0.007	0.594	0.646	0.256	0.418	A
6	4.0	0.76	0.11	0.00	0.891	0.220	-0.010	0.513	0.457	0.188	0.254	A
6	4.0	0.76	0.53	0.56	1.233	-0.010	0.022	0.527	0.404	0.361	0.285	A
6	4.0	0.76	0.39	0.56	1.074	0.008	0.004	0.472	0.402	0.344	0.251	A
6	4.0	0.76	0.25	0.56	0.818	0.140	0.022	0.476	0.361	0.274	0.216	A
6	4.0	0.76	0.61	1.12	0.300	-0.058	0.049	0.325	0.280	0.199	0.112	A
6	4.0	0.76	0.40	1.12	0.191	-0.070	0.056	0.272	0.262	0.173	0.086	A
6	4.0	0.76	0.53	1.40	0.260	-0.085	-0.026	0.285	0.245	0.163	0.084	A
6	4.0	0.76	0.43	1.40	-0.030	-0.156	0.009	0.229	0.269	0.127	0.070	A
6	4.0	0.76	0.53	1.59	0.347	-0.040	-0.086	0.332	0.246	0.164	0.099	A
1	7.0	0.63	0.40	-1.44	0.588	0.140	0.056	1.027	1.154	0.455	1.296	A
1	7.0	0.63	0.36	-1.27	1.733	-0.041	-0.049	1.276	1.221	0.470	1.669	A
1	7.0	0.63	0.34	-1.27	1.179	0.034	-0.017	1.301	1.681	0.491	2.380	A
1	7.0	0.63	0.37	-1.01								C
1	7.0	0.63	0.27	-1.01	2.531	-0.215	-0.115	1.115	0.914	0.479	1.154	A
1	7.0	0.63	0.28	-0.51	3.457	-0.325	-0.077	0.765	0.763	0.407	0.667	A
1	7.0	0.63	0.26	-0.51	3.507	-0.309	-0.111	0.817	0.760	0.399	0.702	A
1	7.0	0.63	0.19	-0.51	2.984	-0.220	-0.123	0.957	0.825	0.438	0.895	A
1	7.0	0.63	0.37	0.00	3.209	-0.398	0.196	0.791	0.795	0.447	0.729	A
1	7.0	0.63	0.35	0.00	3.086	-0.392	0.176	0.787	0.758	0.451	0.699	A
1	7.0	0.63	0.29	0.00	2.960	-0.371	0.113	0.852	0.772	0.462	0.768	A
1	7.0	0.63	0.23	0.00	2.699	-0.291	0.040	0.827	0.797	0.462	0.767	A
1	7.0	0.63	0.17	0.00	2.263	-0.232	0.046	0.890	0.913	0.443	0.911	A
1	7.0	0.63	0.13	0.00								C
1	7.0	0.63	0.09	0.00	1.267	-0.154	0.129	0.941	1.094	0.314	1.091	A
1	7.0	0.63	0.34	0.51								C
1	7.0	0.63	0.30	0.51	3.432	-0.341	-0.132	0.824	0.790	0.462	0.758	A
1	7.0	0.63	0.19	0.51	2.937	-0.281	-0.159	0.899	0.878	0.463	0.897	A
1	7.0	0.63	0.40	1.01	2.418	-0.209	-0.050	0.765	0.672	0.423	0.608	A
1	7.0	0.63	0.27	1.01	1.374	-0.113	0.010	0.825	0.852	0.416	0.790	A
1	7.0	0.63	0.40	1.27	1.110	-0.089	0.017	0.646	0.624	0.345	0.463	A
1	7.0	0.63	0.34	1.27	-0.336	0.430	0.339	1.243	1.910	0.405	2.678	A
1	7.0	0.63	0.46	1.44	0.350	0.097	0.021	0.945	1.480	0.312	1.590	A
2	7.0	0.65	0.42	-1.46								C
2	7.0	0.65	0.41	-1.46								C
2	7.0	0.65	0.40	-1.46								C
2	7.0	0.65	0.39	-1.46								C
2	7.0	0.65	0.34	-1.29								C
2	7.0	0.65	0.33	-1.29	1.073	0.374	-0.364	1.398	1.502	0.409	2.189	A
2	7.0	0.65	0.32	-1.29	0.181	-0.317	-0.157	0.902	0.998	0.219	0.929	A
2	7.0	0.65	0.29	-1.03								C
2	7.0	0.65	0.27	-1.03								C
2	7.0	0.65	0.25	-1.03	1.098	1.751	-0.869	2.554	3.364	0.706	9.170	A
2	7.0	0.65	0.23	-1.03	1.332	1.643	-0.791	1.500	1.881	0.491	3.015	A
2	7.0	0.65	0.29	-0.51								C
2	7.0	0.65	0.27	-0.51	1.333	-0.486	-0.803	1.182	1.302	0.797	1.863	A
2	7.0	0.65	0.22	-0.51	0.837	0.266	-0.898	0.948	1.250	0.768	1.526	A
2	7.0	0.65	0.18	-0.51	0.531	0.774	-0.920	0.943	1.209	0.804	1.498	A
2	7.0	0.65	0.31	0.00	3.928	0.609	-0.305	0.962	1.035	0.534	1.142	A
2	7.0	0.65	0.29	0.00	3.982	0.586	-0.307	0.790	0.919	0.556	0.888	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
2	7.0	0.65	0.26	0.00	3.998	0.657	-0.280	0.733	0.881	0.590	0.831	A
2	7.0	0.65	0.21	0.00	3.829	0.728	-0.281	0.778	0.908	0.627	0.911	A
2	7.0	0.65	0.17	0.00	3.580	0.852	-0.221	0.910	0.941	0.667	1.080	A
2	7.0	0.65	0.13	0.00	3.455	0.945	-0.127	0.985	0.941	0.676	1.157	A
2	7.0	0.65	0.09	0.00								C
2	7.0	0.65	0.09	0.00								C
2	7.0	0.65	0.42	0.51	1.378	0.749	-0.057	1.001	1.222	0.975	1.724	A
2	7.0	0.65	0.31	0.51	1.311	1.233	0.144	1.317	1.405	0.688	2.092	A
2	7.0	0.65	0.28	0.51	0.910	1.249	0.125	1.198	1.322	0.606	1.775	A
2	7.0	0.65	0.26	0.51								C
2	7.0	0.65	0.42	1.03	1.200	-0.119	-0.135	1.071	1.336	1.030	1.996	A
2	7.0	0.65	0.35	1.03	0.936	-0.528	-0.241	0.972	1.318	0.980	1.822	A
2	7.0	0.65	0.28	1.03	0.428	-0.272	-0.027	1.250	1.852	0.765	2.789	A
2	7.0	0.65	0.24	1.03	1.353	4.535	-0.333	4.076	6.100	1.101		C
2	7.0	0.65	0.42	1.29	-0.787	0.436	-0.312	1.283	1.179	0.280	1.557	A
2	7.0	0.65	0.39	1.29	0.122	-0.078	-0.028	0.228	0.374	0.067	0.098	A
2	7.0	0.65	0.35	1.29								C
2	7.0	0.65	0.32	1.29								C
2	7.0	0.65	0.42	1.46								C
2	7.0	0.65	0.41	1.46								C
2	7.0	0.65	0.40	1.46	-0.103	0.784	-0.083	3.710	3.135	0.716	12.053	A
2	7.0	0.65	0.39	1.46	-2.856	1.396	-0.026	2.376	2.067	0.440	5.057	A
3	7.0	0.50	0.15	0.00								C
3	7.0	0.50	0.11	0.00	2.383	1.064	0.119	0.837	0.918	0.409	0.855	A
3	7.0	0.50	0.09	0.00	-0.025	0.050	0.008	0.076	0.100	0.016	0.008	A
3	7.0	0.50	0.06	0.00	0.069	-0.009	0.008	0.209	0.081	0.027	0.024	A
3	7.0	0.50	0.03	0.00	0.003	-0.001	0.005	0.165	0.105	0.026	0.019	A
3	7.0	0.50	0.27	0.53								C
3	7.0	0.50	0.21	0.53	3.088	0.871	0.095	0.780	0.835	0.394	0.731	A
3	7.0	0.50	0.14	0.53	2.210	0.293	0.016	0.965	1.034	0.345	1.061	A
3	7.0	0.50	0.10	0.53	0.033	0.175	-0.019	0.201	0.227	0.045	0.047	A
3	7.0	0.50	0.27	1.07	0.671	0.232	0.163	0.847	0.812	0.398	0.767	A
3	7.0	0.50	0.25	1.07	0.126	0.182	0.287	0.843	0.813	0.397	0.765	A
3	7.0	0.50	0.23	1.07	-0.087	0.086	0.278	0.793	0.807	0.381	0.713	A
3	7.0	0.50	0.21	1.07	0.104	-0.014	0.173	0.792	0.519	0.200	0.468	A
4	7.0	0.66	0.43	-1.22	2.528	-0.007	0.264	1.144	1.022	0.512	1.308	A
4	7.0	0.66	0.38	-1.22	2.042	-0.181	0.126	1.314	1.192	0.483	1.691	A
4	7.0	0.66	0.38	-1.22	2.003	-0.243	0.138	1.229	1.052	0.498	1.432	A
4	7.0	0.66	0.37	-1.22	1.768	-0.287	0.050	1.059	0.931	0.423	1.083	A
4	7.0	0.66	0.32	-0.98								C
4	7.0	0.66	0.30	-0.98								C
4	7.0	0.66	0.28	-0.98	1.202	-0.123	0.014	1.054	0.936	0.238	1.021	A
4	7.0	0.66	0.27	-0.98	0.553	-0.167	-0.004	0.627	0.553	0.127	0.357	A
4	7.0	0.66	0.27	-0.49								C
4	7.0	0.66	0.22	-0.49	3.567	0.482	-0.092	1.193	1.497	0.472	1.943	A
4	7.0	0.66	0.17	-0.49	2.853	0.294	0.057	1.500	1.232	0.393	1.961	A
4	7.0	0.66	0.43	0.00								C
4	7.0	0.66	0.37	0.00	3.347	0.201	0.037	0.848	0.877	0.565	0.904	A
4	7.0	0.66	0.31	0.00	3.176	0.148	-0.029	0.854	0.877	0.550	0.901	A
4	7.0	0.66	0.24	0.00	3.003	0.227	-0.021	0.853	0.862	0.550	0.886	A
4	7.0	0.66	0.18	0.00	2.585	0.387	-0.028	0.876	0.885	0.482	0.891	A
4	7.0	0.66	0.13	0.00	1.744	0.542	-0.053	1.291	1.303	0.389	1.757	A
4	7.0	0.66	0.13	0.00	1.679	0.598	-0.056	1.175	1.235	0.402	1.533	A
4	7.0	0.66	0.12	0.00	1.490	0.526	-0.092	0.907	0.971	0.396	0.961	A
4	7.0	0.66	0.43	0.49								C
4	7.0	0.66	0.32	0.49	4.323	0.252	-0.266	0.929	0.859	0.514	0.933	A
4	7.0	0.66	0.20	0.49	3.401	0.172	-0.259	1.134	1.023	0.505	1.294	A
4	7.0	0.66	0.12	0.49								C
4	7.0	0.66	0.34	0.97	2.568	0.134	0.040	0.996	0.873	0.494	0.999	A
4	7.0	0.66	0.31	0.97	2.016	0.289	0.029	1.122	1.219	0.454	1.475	A
4	7.0	0.66	0.28	0.97	0.565	0.083	0.324	1.007	1.179	0.452	1.304	A
4	7.0	0.66	0.27	0.97	0.923	0.151	0.298	1.038	1.105	0.314	1.199	A
4	7.0	0.66	0.43	1.22								C
4	7.0	0.66	0.38	1.22	0.133	-0.160	0.118	0.555	0.893	0.198	0.573	A
5	7.0	0.59	0.36	-1.28	2.404	-0.042	0.066	1.038	0.886	0.539	1.076	A
5	7.0	0.59	0.32	-1.28	2.019	-0.068	-0.007	1.035	0.901	0.513	1.074	A
5	7.0	0.59	0.28	-1.02	2.885	-0.076	0.022	1.101	0.977	0.543	1.231	A
5	7.0	0.59	0.20	-1.02	2.174	-0.095	-0.108	1.218	1.066	0.535	1.453	A
5	7.0	0.59	0.26	-0.51								C
5	7.0	0.59	0.23	-0.51	3.577	-0.099	-0.082	0.866	0.886	0.452	0.870	A
5	7.0	0.59	0.17	-0.51	3.357	-0.032	-0.124	0.909	0.842	0.484	0.884	A
5	7.0	0.59	0.30	0.00	2.998	-0.128	0.088	0.814	0.790	0.467	0.752	A
5	7.0	0.59	0.28	0.00	2.902	-0.148	0.074	0.818	0.772	0.474	0.745	A
5	7.0	0.59	0.26	0.00	2.800	-0.131	0.059	0.825	0.779	0.478	0.757	A
5	7.0	0.59	0.20	0.00	2.548	-0.079	0.066	0.843	0.799	0.481	0.790	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
5	7.0	0.59	0.15	0.00	2.110	-0.049	0.041	0.959	0.832	0.448	0.906	A
5	7.0	0.59	0.11	0.00	1.986	-0.008	0.032	0.856	0.823	0.443	0.803	A
5	7.0	0.59	0.09	0.00	1.650	-0.019	-0.010	1.138	0.840	0.427	1.091	A
5	7.0	0.59	0.36	0.51	3.626	-0.149	-0.080	0.713	0.677	0.364	0.550	A
5	7.0	0.59	0.27	0.51	3.365	-0.084	-0.145	0.821	0.726	0.411	0.685	A
5	7.0	0.59	0.17	0.51	2.683	-0.033	-0.126	0.937	0.849	0.437	0.895	A
5	7.0	0.59	0.36	1.02	1.940	-0.138	-0.063	0.808	0.700	0.408	0.654	A
5	7.0	0.59	0.25	1.02								C
5	7.0	0.59	0.36	1.28	0.601	-0.011	-0.047	0.717	0.630	0.280	0.495	A
5	7.0	0.59	0.32	1.28	0.156	0.241	-0.095	1.808	1.437	0.354	2.730	A
6	7.0	0.90	0.62	-1.69	1.282	-0.056	0.025	0.702	0.671	0.401	0.552	A
6	7.0	0.90	0.62	-1.49	1.936	-0.188	0.066	0.796	0.766	0.489	0.729	A
6	7.0	0.90	0.46	-1.49	1.292	-0.100	-0.003	0.753	0.722	0.409	0.628	A
6	7.0	0.90	0.62	-1.19	3.043	-0.376	0.055	0.864	0.797	0.492	0.812	A
6	7.0	0.90	0.37	-1.19	2.052	-0.183	-0.053	0.839	0.782	0.463	0.764	A
6	7.0	0.90	0.57	-0.60	3.123	-0.357	0.044	0.696	0.644	0.385	0.524	A
6	7.0	0.90	0.44	-0.60	2.736	-0.261	0.010	0.709	0.656	0.397	0.545	A
6	7.0	0.90	0.26	-0.60	2.189	-0.026	-0.082	0.766	0.712	0.401	0.627	A
6	7.0	0.90	0.62	0.00	2.901	-0.216	0.117	0.664	0.631	0.376	0.490	A
6	7.0	0.90	0.52	0.00	2.685	-0.189	0.070	0.668	0.636	0.391	0.502	A
6	7.0	0.90	0.42	0.00	2.362	-0.175	0.043	0.713	0.653	0.391	0.544	A
6	7.0	0.90	0.32	0.00	1.970	-0.104	0.046	0.704	0.639	0.392	0.529	A
6	7.0	0.90	0.23	0.00	1.621	-0.068	0.030	0.658	0.652	0.368	0.496	A
6	7.0	0.90	0.16	0.00	1.334	-0.001	0.053	0.730	0.804	0.335	0.646	A
6	7.0	0.90	0.09	0.00								C
6	7.0	0.90	0.62	0.60	2.046	-0.062	0.034	0.713	0.615	0.458	0.548	A
6	7.0	0.90	0.44	0.60	1.820	-0.012	-0.006	0.656	0.610	0.429	0.493	A
6	7.0	0.90	0.26	0.60	1.480	0.102	0.002	0.634	0.593	0.374	0.447	A
6	7.0	0.90	0.62	1.19	0.364	-0.085	0.063	0.458	0.502	0.307	0.278	A
6	7.0	0.90	0.37	1.19	0.488	0.199	0.162	0.496	0.555	0.269	0.313	A
6	7.0	0.90	0.62	1.49	0.146	-0.080	0.057	0.400	0.470	0.260	0.224	A
6	7.0	0.90	0.46	1.49	0.006	0.123	0.199	0.949	0.740	0.300	0.769	A
6	7.0	0.90	0.69	1.69	0.176	-0.096	-0.020	0.428	0.421	0.214	0.203	A

**Table B6. Summary of data for slotted-weir baffles at a 4.33% culvert slope.**

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
					ft/s	ft	ft	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
1	1.5	0.26	ALL DATA IS BAD									
2	1.5	0.36	0.17	-1.02	-0.800	-0.500	0.270	2.012	1.830	0.421	3.787	A
2	1.5	0.36	0.15	-1.02	-0.540	0.449	-0.166	1.774	1.829	0.365	3.314	A
2	1.5	0.36	0.17	-0.90	0.160	0.008	0.096	0.829	0.747	0.168	0.637	A
2	1.5	0.36	0.18	-0.90	-0.023	-0.413	0.207	1.293	1.273	0.278	1.684	A
2	1.5	0.36	0.17	-0.90	-0.507	-0.411	0.287	1.479	1.433	0.332	2.176	A
2	1.5	0.36	0.16	-0.90	-0.897	-0.346	0.307	1.757	1.566	0.383	2.844	A
2	1.5	0.36	0.17	-0.72	1.105	-0.433	0.573	1.763	1.825	0.420	3.308	A
2	1.5	0.36	0.06	-0.72								C
2	1.5	0.36	0.07	-0.36								C
2	1.5	0.36	0.06	-0.36								C
2	1.5	0.36	0.05	-0.36								C
2	1.5	0.36	0.04	-0.36								C
2	1.5	0.36	0.07	0.00								C
2	1.5	0.36	0.05	0.00	-0.015	-0.100	-0.041	0.721	0.550	0.130	0.420	A
2	1.5	0.36	0.04	0.00	-0.064	-0.066	-0.035	0.985	0.487	0.152	0.615	A
2	1.5	0.36	0.03	0.00	-0.292	0.051	-0.067	2.863	0.416	0.401	4.265	A
2	1.5	0.36	0.19	0.36	2.518	1.236	0.037	1.269	1.444	0.551	1.999	A
2	1.5	0.36	0.17	0.36	2.209	1.135	0.007	1.607	1.567	0.545	2.666	A
2	1.5	0.36	0.15	0.36	1.548	1.115	-0.005	1.241	1.389	0.518	1.869	A
2	1.5	0.36	0.13	0.36	0.944	0.658	-0.026	1.736	2.316	0.505	4.315	A
2	1.5	0.36	0.23	0.72	1.325	0.499	0.208	1.389	1.629	0.422	2.381	A
2	1.5	0.36	0.20	0.72	0.722	0.259	0.411	1.087	1.080	0.372	1.243	A
2	1.5	0.36	0.18	0.72	-0.372	2.229	0.542	1.572	2.097	0.422	3.523	A
2	1.5	0.36	0.16	0.72	0.078	-0.160	-0.015	0.306	0.524	0.082	0.188	A
2	1.5	0.36	0.24	0.90	0.013	0.069	0.129	0.536	0.797	0.180	0.477	A
2	1.5	0.36	0.22	0.90	0.515	-0.336	0.027	1.870	3.063	0.511	6.568	A
2	1.5	0.36	0.20	0.90	0.495	-0.491	-0.002	1.852	2.230	0.441	4.298	A
2	1.5	0.36	0.26	1.02	0.701	0.109	-0.234	1.545	2.103	0.373	3.475	A
3	1.5	0.21	0.10	-0.98								C
3	1.5	0.21	0.09	-0.98	-0.700	0.145	-0.497	1.679	2.146	0.405	3.794	A
3	1.5	0.21	0.09	-0.86	0.328	0.640	-0.155	1.963	3.291	0.535	7.487	A
3	1.5	0.21	0.08	-0.86	-0.340	-0.771	-0.421	2.245	2.783	0.490	6.511	A
3	1.5	0.21	0.07	-0.86	-0.320	-0.379	-0.366	2.315	2.531	0.489	6.002	A
3	1.5	0.21	0.06	-0.86	-1.454	0.076	-0.543	1.975	2.000	0.403	4.031	A
3	1.5	0.21	0.08	-0.69	1.260	0.693	-0.423	1.483	2.079	0.421	3.350	A
3	1.5	0.21	0.07	-0.69								C
3	1.5	0.21	-0.03	0.00								C
3	1.5	0.21	-0.06	0.00	-0.386	-4.056	-0.726	2.841	3.929	0.703	12.001	A
3	1.5	0.21	-0.07	0.00								C
3	1.5	0.21	0.12	0.35								C
3	1.5	0.21	0.08	0.35								C
3	1.5	0.21	0.07	0.35	0.056	-0.178	-0.035	1.126	1.720	0.296	2.156	A
3	1.5	0.21	0.16	0.69	1.328	0.252	-0.129	1.065	1.156	0.557	1.390	A
3	1.5	0.21	0.15	0.69								C
3	1.5	0.21	0.13	0.69	-0.338	-0.004	-0.359	1.222	1.312	0.548	1.758	A
3	1.5	0.21	0.11	0.69	-0.195	0.020	-0.202	0.755	0.864	0.297	0.702	A
3	1.5	0.21	0.18	0.86	-0.238	-0.286	0.193	1.890	1.331	0.463	2.779	A
3	1.5	0.21	0.17	0.86	-0.507	-0.221	0.262	1.302	1.525	0.414	2.097	A
3	1.5	0.21	0.16	0.86	-0.781	-0.141	-0.064	0.972	1.186	0.405	1.257	A
4	1.5	0.27	0.04	-0.32	-0.055	-0.062	0.010	0.300	0.334	0.061	0.103	A
4	1.5	0.27	0.04	-0.32	-0.056	-0.076	0.023	0.467	0.545	0.104	0.263	A
4	1.5	0.27	0.03	-0.32	-0.100	-0.017	-0.001	0.692	0.617	0.139	0.439	A
4	1.5	0.27	0.04	0.00	-0.010	-0.003	-0.004	0.153	0.147	0.029	0.023	A
4	1.5	0.27	0.04	0.00	0.012	-0.065	0.027	0.248	0.272	0.069	0.070	A
4	1.5	0.27	0.03	0.00	0.032	-0.073	0.036	0.658	0.317	0.161	0.279	A
4	1.5	0.27	0.02	0.00	0.166	-0.031	0.010	0.670	0.316	0.155	0.287	A
4	1.5	0.27	0.01	0.00	0.038	0.013	-0.007	0.233	0.234	0.054	0.056	A
4	1.5	0.27	0.09	0.32	-0.089	0.228	-0.141	0.629	0.657	0.306	0.461	A
5	1.5	0.27	ALL DATA IS BAD									
6	1.5	0.57	0.34	-1.23	0.709	0.124	-0.091	0.609	0.656	0.290	0.443	A
6	1.5	0.57	0.30	-1.23	0.140	0.244	0.025	1.020	1.186	0.317	1.274	A
6	1.5	0.57	0.34	-0.99	1.052	0.049	-0.055	0.608	0.702	0.333	0.487	A
6	1.5	0.57	0.24	-0.99	0.670	0.312	-0.053	1.691	1.679	0.393	2.916	A
6	1.5	0.57	0.34	-0.49	1.834	-0.069	0.012	0.675	0.698	0.364	0.537	A
6	1.5	0.57	0.25	-0.49	1.561	0.005	-0.046	0.654	0.707	0.348	0.524	A
6	1.5	0.57	0.16	-0.49	1.055	0.287	-0.074	2.022	2.170	0.460	4.506	A
6	1.5	0.57	0.34	0.00	1.574	-0.070	0.012	0.648	0.670	0.366	0.502	A
6	1.5	0.57	0.29	0.00	1.359	-0.031	0.014	0.626	0.640	0.367	0.468	A
6	1.5	0.57	0.24	0.00	1.222	-0.016	-0.015	0.594	0.672	0.350	0.463	A
6	1.5	0.57	0.19	0.00	1.081	0.099	0.003	0.672	0.798	0.325	0.597	A
6	1.5	0.57	0.14	0.00	0.894	0.299	0.016	1.756	2.109	0.420	3.855	A
6	1.5	0.57	0.11	0.00	0.689	0.164	0.015	1.423	2.115	0.361	3.314	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
6	1.5	0.57	0.10	0.00	0.705	0.344	0.030	1.175	1.800	0.337	2.367	A
6	1.5	0.57	0.34	0.49	0.454	-0.019	0.067	0.510	0.565	0.326	0.343	A
6	1.5	0.57	0.25	0.49	0.362	0.034	0.077	0.447	0.513	0.285	0.272	A
6	1.5	0.57	0.16	0.49	0.323	0.100	0.039	0.515	0.641	0.229	0.365	A
6	1.5	0.57	0.34	0.99	-0.110	-0.017	-0.011	0.365	0.459	0.173	0.187	A
6	1.5	0.57	0.24	0.99	-0.084	-0.066	-0.055	1.420	2.180	0.362	3.450	A
6	1.5	0.57	0.34	1.23	-0.138	-0.192	-0.097	0.814	0.652	0.182	0.560	A
6	1.5	0.57	0.30	1.23	-0.026	0.141	-0.037	1.324	0.849	0.265	1.273	A
1	3.0	0.37	0.19	-0.83								C
1	3.0	0.37	0.13	-0.42								C
1	3.0	0.37	0.11	-0.42	0.074	-0.083	-0.024	0.322	0.427	0.076	0.146	A
1	3.0	0.37	0.09	-0.42	0.178	-0.333	-0.067	0.560	0.836	0.135	0.516	A
1	3.0	0.37	0.11	0.00								C
1	3.0	0.37	0.10	0.00								C
1	3.0	0.37	0.09	0.00	0.082	0.227	0.058	0.526	0.624	0.134	0.342	A
1	3.0	0.37	0.08	0.00	0.004	0.112	0.054	0.324	0.336	0.069	0.112	A
1	3.0	0.37	0.14	0.42	2.307	0.432	-0.066	0.952	1.022	0.410	1.059	A
1	3.0	0.37	0.11	0.42								C
1	3.0	0.37	0.08	0.42	0.263	0.355	-0.274	1.005	1.085	0.383	1.167	A
1	3.0	0.37	0.14	0.83	-0.231	0.085	0.180	1.384	1.543	0.387	2.224	A
1	3.0	0.37	0.13	0.83	-0.563	0.055	0.085	1.007	0.835	0.337	0.913	A
1	3.0	0.37	0.22	1.04	0.137	-0.607	0.210	1.301	1.803	0.379	2.543	A
1	3.0	0.37	0.21	1.04	-0.272	-0.196	0.251	1.536	1.117	0.322	1.856	A
2	3.0	0.44	0.21	-1.08								C
2	3.0	0.44	0.21	-1.08								C
2	3.0	0.44	0.13	-0.96								C
2	3.0	0.44	0.12	-0.96								C
2	3.0	0.44	0.16	-0.77								C
2	3.0	0.44	0.15	-0.77	0.035	0.048	0.013	0.381	0.373	0.073	0.145	A
2	3.0	0.44	0.12	-0.77								C
2	3.0	0.44	0.16	-0.38								C
2	3.0	0.44	0.15	-0.38	2.093	-0.116	0.060	1.701	0.813	0.484	1.894	A
2	3.0	0.44	0.13	-0.38	2.360	-0.135	0.112	1.159	0.826	0.438	1.109	A
2	3.0	0.44	0.11	-0.38	2.235	-0.121	0.216	0.993	0.841	0.381	0.919	A
2	3.0	0.44	0.18	0.00								C
2	3.0	0.44	0.15	0.00								C
2	3.0	0.44	0.12	0.00	3.261	1.123	-0.203	0.885	0.790	0.365	0.770	A
2	3.0	0.44	0.10	0.00	2.660	1.106	-0.272	1.022	0.847	0.364	0.947	A
2	3.0	0.44	0.08	0.00	1.398	0.947	-0.218	0.980	0.946	0.307	0.975	A
2	3.0	0.44	0.24	0.38								C
2	3.0	0.44	0.20	0.38	1.407	0.909	-0.002	2.672	1.051	0.474	4.235	A
2	3.0	0.44	0.16	0.38								C
2	3.0	0.44	0.09	0.38	-0.059	0.827	-0.106	0.969	0.885	0.434	0.955	A
2	3.0	0.44	0.26	0.77	1.734	0.268	0.274	1.215	0.991	0.448	1.330	A
2	3.0	0.44	0.23	0.77	1.481	0.296	0.112	1.029	1.077	0.405	1.192	A
2	3.0	0.44	0.21	0.77								C
2	3.0	0.44	0.17	0.77	0.251	-0.216	0.050	0.695	0.384	0.135	0.324	A
2	3.0	0.44	0.31	0.96	1.817	0.182	0.135	1.021	0.858	0.387	0.964	A
2	3.0	0.44	0.28	0.96	1.056	0.308	0.012	1.053	0.678	0.285	0.825	A
2	3.0	0.44	0.27	0.96	0.476	0.137	0.064	0.784	0.579	0.194	0.494	A
2	3.0	0.44	0.32	1.08	0.094	0.037	-0.012	0.275	0.365	0.091	0.109	A
2	3.0	0.44	0.31	1.08	0.258	-0.110	0.018	0.352	0.444	0.114	0.167	A
3	3.0	0.27	0.24	-1.12	0.135	0.366	-0.158	0.839	1.114	0.287	1.014	A
3	3.0	0.27	0.23	-1.12	0.036	0.413	-0.235	0.985	1.345	0.362	1.455	A
3	3.0	0.27	0.24	-0.99	0.067	0.047	-0.093	0.353	0.458	0.094	0.171	A
3	3.0	0.27	0.22	-0.99	0.222	0.202	-0.092	0.562	0.845	0.166	0.529	A
3	3.0	0.27	0.22	-0.79								C
3	3.0	0.27	0.21	-0.79	0.940	0.018	-0.143	0.955	0.870	0.210	0.857	A
3	3.0	0.27	0.19	-0.79	0.070	-0.035	-0.123	0.478	0.594	0.127	0.299	A
3	3.0	0.27	0.18	-0.79	0.145	0.027	-0.095	0.471	0.677	0.137	0.349	A
3	3.0	0.27	0.08	-0.40								C
3	3.0	0.27	0.06	-0.40								C
3	3.0	0.27	0.04	0.00								C
3	3.0	0.27	0.03	0.00								C
3	3.0	0.27	0.18	0.40	2.772	0.851	0.215	1.085	1.306	0.415	1.528	A
3	3.0	0.27	0.17	0.40	2.492	0.624	0.188	1.227	1.615	0.409	2.140	A
3	3.0	0.27	0.16	0.40	2.180	0.733	0.082	1.107	1.196	0.406	1.410	A
3	3.0	0.27	0.15	0.40	1.927	0.658	0.055	1.097	1.063	0.442	1.265	A
3	3.0	0.27	0.30	0.79	2.636	1.137	0.058	0.780	0.835	0.499	0.778	A
3	3.0	0.27	0.28	0.79	2.647	1.239	0.053	0.858	0.913	0.495	0.907	A
3	3.0	0.27	0.27	0.79	2.597	1.251	0.065	1.067	1.042	0.529	1.252	A
3	3.0	0.27	0.26	0.79	2.519	1.287	0.059	1.187	1.042	0.525	1.385	A
3	3.0	0.27	0.33	0.99	1.821	0.796	0.308	0.806	0.904	0.470	0.844	A
3	3.0	0.27	0.32	0.99	1.596	0.807	0.286	0.957	0.922	0.475	0.996	A
3	3.0	0.27	0.31	0.99	1.365	0.731	0.264	0.926	0.910	0.482	0.959	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
3	3.0	0.27	0.29	0.99	0.878	0.453	0.159	1.106	1.328	0.466	1.603	A
3	3.0	0.27	0.32	1.12	0.251	0.149	0.195	0.683	0.816	0.429	0.659	A
3	3.0	0.27	0.30	1.12	0.272	-0.115	0.209	0.628	0.710	0.283	0.490	A
4	3.0	0.36	0.09	-0.74								C
4	3.0	0.36	0.08	-0.74	-0.433	-1.218	-0.262	3.138	2.566	0.426	8.308	A
4	3.0	0.36	0.07	-0.74								C
4	3.0	0.36	0.12	-0.37	0.010	-0.018	0.009	0.269	0.355	0.065	0.101	A
4	3.0	0.36	0.10	-0.37	0.032	-0.046	-0.013	0.201	0.241	0.043	0.050	A
4	3.0	0.36	0.08	0.00	0.025	0.025	0.011	0.364	0.373	0.071	0.138	A
4	3.0	0.36	0.06	0.00	0.024	-0.042	-0.002	0.427	0.470	0.092	0.206	A
4	3.0	0.36	0.04	0.00	-0.501	-0.323	0.096	2.457	1.011	0.387	3.604	A
4	3.0	0.36	0.02	0.00								C
4	3.0	0.36	0.01	0.00								C
4	3.0	0.36	0.10	0.37	0.358	0.466	-0.319	1.477	1.919	0.437	3.027	A
4	3.0	0.36	0.09	0.37	0.403	0.115	-0.278	3.603	1.402	0.509	7.605	A
4	3.0	0.36	0.11	0.37	0.296	0.951	-0.252	1.653	2.644	0.488	4.981	A
4	3.0	0.36	0.13	0.74	0.100	0.907	0.118	1.443	1.468	0.328	2.172	A
4	3.0	0.36	0.13	0.74	0.021	-0.061	0.104	0.564	0.269	0.104	0.200	A
4	3.0	0.36	0.16	0.74								C
4	3.0	0.36	0.15	0.74								C
5	3.0	0.40	0.20	-0.94	-0.475	0.558	-0.075	1.351	1.573	0.435	2.245	A
5	3.0	0.40	0.17	-0.75								C
5	3.0	0.40	0.15	-0.75	-0.578	0.503	0.087	1.139	1.116	0.401	1.352	A
5	3.0	0.40	0.11	-0.38	0.147	0.132	0.362	1.075	1.025	0.381	1.176	A
5	3.0	0.40	0.10	-0.38	0.592	0.153	0.230	0.988	0.784	0.247	0.826	A
5	3.0	0.40	0.10	0.00	-0.096	0.031	0.018	0.299	0.441	0.081	0.145	A
5	3.0	0.40	0.09	0.00	-0.035	-0.025	-0.036	0.602	0.986	0.176	0.683	A
5	3.0	0.40	0.07	0.00								C
5	3.0	0.40	0.05	0.00								C
5	3.0	0.40	0.11	0.38	-0.090	0.205	0.018	0.602	1.057	0.160	0.752	A
5	3.0	0.40	0.10	0.38	0.434	1.297	-0.031	1.505	2.592	0.394	4.569	A
5	3.0	0.40	0.24	0.75	1.103	0.040	0.070	0.746	0.848	0.319	0.689	A
6	3.0	0.65	0.42	-1.45	0.185	0.168	-0.088	0.537	0.548	0.261	0.329	A
6	3.0	0.65	0.42	-1.28	0.737	0.051	-0.047	0.611	0.583	0.322	0.409	A
6	3.0	0.65	0.34	-1.28	0.375	0.171	-0.061	0.538	0.576	0.279	0.349	A
6	3.0	0.65	0.42	-1.02	1.336	-0.056	-0.006	0.696	0.691	0.405	0.563	A
6	3.0	0.65	0.28	-1.02	0.670	0.128	-0.023	0.672	0.623	0.330	0.474	A
6	3.0	0.65	0.39	-0.51	2.608	-0.200	-0.027	0.727	0.730	0.429	0.623	A
6	3.0	0.65	0.31	-0.51	2.309	-0.120	-0.060	0.728	0.714	0.414	0.606	A
6	3.0	0.65	0.20	-0.51	1.731	0.045	-0.121	0.786	0.711	0.378	0.633	A
6	3.0	0.65	0.42	0.00	2.470	-0.217	0.001	0.720	0.673	0.411	0.570	A
6	3.0	0.65	0.36	0.00	2.278	-0.158	0.007	0.734	0.653	0.417	0.569	A
6	3.0	0.65	0.30	0.00	2.070	-0.091	-0.024	0.720	0.674	0.417	0.573	A
6	3.0	0.65	0.24	0.00	1.833	-0.037	-0.030	0.712	0.674	0.403	0.562	A
6	3.0	0.65	0.17	0.00	1.567	0.116	-0.018	0.716	0.769	0.364	0.619	A
6	3.0	0.65	0.13	0.00								C
6	3.0	0.65	0.11	0.00	1.110	0.253	0.013	1.058	1.411	0.319	1.606	A
6	3.0	0.65	0.42	0.51	1.115	-0.098	0.042	0.639	0.590	0.431	0.471	A
6	3.0	0.65	0.31	0.51	0.892	-0.015	0.029	0.603	0.568	0.371	0.412	A
6	3.0	0.65	0.20	0.51	0.717	0.162	0.050	0.572	0.599	0.292	0.386	A
6	3.0	0.65	0.42	1.02	-0.046	-0.063	0.020	0.369	0.431	0.262	0.195	A
6	3.0	0.65	0.28	1.02	-0.063	-0.056	0.050	0.669	0.672	0.199	0.469	A
6	3.0	0.65	0.42	1.28	-0.245	-0.077	-0.016	0.350	0.370	0.180	0.146	A
6	3.0	0.65	0.34	1.28	-0.272	0.161	-0.011	1.156	1.419	0.287	1.716	A
6	3.0	0.65	0.42	1.45	-0.315	-0.007	-0.110	0.907	0.657	0.205	0.648	A
1	4.0	0.41	0.18	-0.86	0.068	0.014	-0.023	0.223	0.319	0.052	0.077	A
1	4.0	0.41	0.15	-0.86	0.659	1.098	-0.212	0.694	1.129	0.175	0.894	A
1	4.0	0.41	0.16	-0.43								C
1	4.0	0.41	0.14	-0.43								C
1	4.0	0.41	0.09	-0.43	0.068	-0.106	-0.022	0.422	0.536	0.095	0.238	A
1	4.0	0.41	0.13	0.00								C
1	4.0	0.41	0.11	0.00								C
1	4.0	0.41	0.09	0.00	0.528	0.317	0.056	0.945	1.116	0.263	1.104	A
1	4.0	0.41	0.08	0.00	-0.083	0.143	0.049	0.268	0.330	0.063	0.092	A
1	4.0	0.41	0.12	0.43								C
1	4.0	0.41	0.11	0.43	0.924	0.440	-0.219	1.306	1.352	0.453	1.870	A
1	4.0	0.41	0.09	0.43								C
1	4.0	0.41	0.18	0.86								C
1	4.0	0.41	0.15	0.86	-0.484	0.229	0.030	1.314	1.028	0.419	1.479	A
1	4.0	0.41	0.28	1.08	0.749	-0.088	0.128	1.880	2.555	0.491	5.152	A
1	4.0	0.41	0.27	1.08	0.226	-0.013	0.269	1.369	2.106	0.450	3.256	A
2	4.0	0.55	0.31	-1.19	0.000	0.022	0.033	0.753	1.044	0.178	0.844	A
2	4.0	0.55	0.26	-1.19								C
2	4.0	0.55	0.27	-1.05								C
2	4.0	0.55	0.23	-1.05								C

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
2	4.0	0.55	0.21	-1.05								C
2	4.0	0.55	0.20	-1.05								C
2	4.0	0.55	0.23	-0.84								C
2	4.0	0.55	0.29	-0.42								C
2	4.0	0.55	0.24	-0.42	0.106	0.219	-0.063	0.858	1.096	0.203	0.989	A
2	4.0	0.55	0.15	-0.42	0.114	0.150	-0.034	0.953	1.201	0.217	1.199	A
2	4.0	0.55	0.28	-0.42								C
2	4.0	0.55	0.23	0.00	0.838	0.888	-0.045	1.941	2.440	0.671	5.087	A
2	4.0	0.55	0.20	0.00	0.890	1.209	-0.062	1.326	1.534	0.610	2.242	A
2	4.0	0.55	0.14	0.00								C
2	4.0	0.55	0.09	0.00	4.020	1.038	-0.506	0.918	1.180	0.449	1.218	A
2	4.0	0.55	0.21	0.00	3.977	1.114	-0.476	0.762	0.964	0.432	0.848	A
2	4.0	0.55	0.18	0.00	3.671	1.370	-0.354	1.187	1.329	0.433	1.681	A
2	4.0	0.55	0.16	0.42	1.996	1.211	-0.213	1.030	0.989	0.377	1.091	A
2	4.0	0.55	0.14	0.42	2.429	1.252	-0.405	1.041	1.237	0.880	1.695	A
2	4.0	0.55	0.28	0.42	2.194	1.143	-0.261	1.256	1.584	0.812	2.372	A
2	4.0	0.55	0.25	0.42	1.943	1.162	-0.303	1.586	1.368	0.728	2.458	A
2	4.0	0.55	0.23	0.84	1.459	1.070	-0.263	1.117	1.510	0.625	1.959	A
2	4.0	0.55	0.34	0.84	1.623	0.099	0.245	1.391	1.748	0.590	2.668	A
2	4.0	0.55	0.32	0.84	1.262	0.483	0.205	1.460	1.769	0.641	2.836	A
2	4.0	0.55	0.31	1.05	1.468	0.024	0.301	1.607	1.120	0.453	2.021	A
2	4.0	0.55	0.39	1.05	1.226	0.142	-0.010	1.111	0.820	0.251	0.985	A
2	4.0	0.55	0.39	1.05	0.571	0.117	0.009	1.149	0.732	0.241	0.957	A
2	4.0	0.55	0.39	1.19	0.258	-0.019	0.002	0.700	0.477	0.136	0.368	A
2	4.0	0.55	0.39	1.19	0.111	-0.026	-0.020	0.420	0.527	0.100	0.232	A
3	4.0	0.35	0.22	-1.25	0.387	0.471	-0.396	1.435	2.117	0.512	3.400	A
3	4.0	0.35	0.19	-1.10	0.584	0.878	-0.355	1.630	2.431	0.427	4.376	A
3	4.0	0.35	0.18	-1.10	0.022	0.247	-0.424	1.589	2.288	0.602	4.061	A
3	4.0	0.35	0.17	-1.10								C
3	4.0	0.35	0.26	-0.88								C
3	4.0	0.35	0.21	-0.88	2.845	-0.087	-0.007	1.500	1.548	0.467	2.431	A
3	4.0	0.35	0.19	-0.88	0.025	-0.055	-0.035	0.292	0.438	0.074	0.141	A
3	4.0	0.35	0.16	-0.88	0.499	0.571	-0.167	0.848	1.335	0.231	1.277	A
3	4.0	0.35	0.08	-0.44							0.790	C
3	4.0	0.35	0.07	-0.44								C
3	4.0	0.35	0.06	-0.44								C
3	4.0	0.35	0.10	0.00								C
3	4.0	0.35	0.09	0.00								C
3	4.0	0.35	0.08	0.00								C
3	4.0	0.35	0.07	0.00								C
3	4.0	0.35	0.05	0.00								C
3	4.0	0.35	0.20	0.44	3.156	0.929	0.286	1.021	1.110	0.541	1.285	A
3	4.0	0.35	0.17	0.44	2.741	0.872	0.155	1.272	1.294	0.513	1.778	A
3	4.0	0.35	0.15	0.44	1.899	0.659	0.087	1.436	2.079	0.520	3.327	A
3	4.0	0.35	0.13	0.44	1.275	0.667	-0.044	1.353	1.426	0.536	2.075	A
3	4.0	0.35	0.30	0.88	2.537	1.257	0.328	0.950	1.051	0.619	1.195	A
3	4.0	0.35	0.28	0.88	2.308	1.248	0.356	1.188	1.201	0.622	1.620	A
3	4.0	0.35	0.24	0.88	0.808	0.629	0.365	1.471	1.627	0.599	2.585	A
3	4.0	0.35	0.20	0.88	-0.888	0.213	0.582	1.674	1.501	0.506	2.656	A
3	4.0	0.35	0.37	1.10	1.784	0.585	0.199	0.857	0.950	0.505	0.947	A
3	4.0	0.35	0.34	1.10	1.388	0.544	0.155	0.984	1.011	0.500	1.120	A
3	4.0	0.35	0.32	1.10	0.559	0.276	0.230	1.455	2.042	0.559	3.298	A
3	4.0	0.35	0.30	1.10	0.310	0.119	0.326	1.080	1.078	0.455	1.268	A
3	4.0	0.35	0.38	1.25	0.464	0.198	0.182	0.739	0.775	0.269	0.610	A
4	4.0	0.45	0.32	-1.00								C
4	4.0	0.45	0.30	-1.00	0.258	-0.023	-0.028	0.227	0.247	0.062	0.058	A
4	4.0	0.45	0.33	-0.80								C
4	4.0	0.45	0.25	-0.80								C
4	4.0	0.45	0.17	-0.40								C
4	4.0	0.45	0.16	-0.40	-0.013	0.021	0.043	0.338	0.419	0.072	0.148	A
4	4.0	0.45	0.08	-0.40								C
4	4.0	0.45	0.14	0.00	1.805	0.269	-0.054	1.065	1.240	0.372	1.406	A
4	4.0	0.45	0.13	0.00	0.839	0.210	-0.005	0.817	0.947	0.265	0.817	A
4	4.0	0.45	0.12	0.00	0.051	0.051	0.014	0.230	0.303	0.060	0.074	A
4	4.0	0.45	0.17	0.40	1.516	0.585	-0.177	1.708	1.816	0.468	3.218	A
4	4.0	0.45	0.16	0.40	-0.013	0.021	0.043	0.338	0.419	0.072	0.148	A
4	4.0	0.45	0.14	0.40	0.515	0.717	-0.299	1.739	1.726	0.467	3.111	A
4	4.0	0.45	0.32	0.80								C
4	4.0	0.45	0.31	0.80								C
4	4.0	0.45	0.28	0.80	2.337	0.449	0.008	1.037	0.958	0.423	1.085	A
4	4.0	0.45	0.25	0.80	1.738	0.334	0.035	1.245	1.469	0.453	1.957	A
4	4.0	0.45	0.31	1.00	0.532	0.144	0.156	0.749	0.761	0.234	0.597	A
4	4.0	0.45	0.25	1.00	0.388	0.538	0.092	1.435	2.433	0.402	4.071	A
5	4.0	0.44	0.21	-1.05	-0.369	0.516	-0.176	1.169	1.485	0.429	1.879	A

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
5	4.0	0.44	0.20	-1.05	-0.796	0.644	-0.303	0.927	1.224	0.410	1.262	A
5	4.0	0.44	0.20	-0.84	1.157	-0.065	-0.028	1.457	1.402	0.515	2.178	A
5	4.0	0.44	0.16	-0.84	0.016	0.243	-0.093	1.515	1.738	0.461	2.763	A
5	4.0	0.44	0.13	-0.42								C
5	4.0	0.44	0.12	-0.42								C
5	4.0	0.44	0.11	-0.42								C
5	4.0	0.44	0.12	0.00	1.822	-0.261	-0.145	1.002	0.879	0.315	0.938	A
5	4.0	0.44	0.15	0.00								C
5	4.0	0.44	0.14	0.00								C
5	4.0	0.44	0.12	0.00								C
5	4.0	0.44	0.11	0.00	0.746	-0.019	-0.075	0.752	0.648	0.177	0.508	A
5	4.0	0.44	0.20	0.42	0.003	0.005	-0.020	0.263	0.199	0.051	0.056	A
5	4.0	0.44	0.16	0.42								C
5	4.0	0.44	0.27	0.84	1.392	-0.041	0.067	0.774	0.867	0.219	0.699	A
5	4.0	0.44	0.16	0.84	1.312	0.095	0.050	1.448	1.506	0.387	2.257	A
5	4.0	0.44	0.32	1.05	1.234	0.127	-0.008	1.035	1.337	0.378	1.501	A
5	4.0	0.44	0.31	1.05	0.491	0.091	-0.079	0.857	1.185	0.336	1.127	A
6	4.0	0.73	0.50	-1.52	0.574	-0.002	-0.079	0.566	0.596	0.339	0.395	A
6	4.0	0.73	0.50	-1.34	1.070	-0.096	-0.001	0.675	0.667	0.402	0.532	A
6	4.0	0.73	0.40	-1.34	0.688	0.052	-0.059	0.625	0.643	0.371	0.471	A
6	4.0	0.73	0.50	-1.07	1.809	-0.229	0.095	0.800	0.765	0.503	0.739	A
6	4.0	0.73	0.33	-1.07	1.022	0.045	0.008	0.703	0.725	0.432	0.603	A
6	4.0	0.73	0.41	-0.54	3.041	-0.293	0.109	0.839	0.785	0.453	0.762	A
6	4.0	0.73	0.37	-0.54	2.999	-0.288	0.053	0.797	0.770	0.452	0.717	A
6	4.0	0.73	0.24	-0.54	2.357	-0.089	-0.051	0.840	0.781	0.449	0.759	A
6	4.0	0.73	0.37	0.00	2.889	-0.291	0.082	0.769	0.717	0.417	0.639	A
6	4.0	0.73	0.35	0.00	2.849	-0.259	0.075	0.805	0.709	0.420	0.664	A
6	4.0	0.73	0.33	0.00	2.747	-0.251	0.051	0.782	0.719	0.435	0.659	A
6	4.0	0.73	0.28	0.00	2.662	-0.201	0.028	0.758	0.733	0.424	0.645	A
6	4.0	0.73	0.21	0.00	2.273	-0.120	0.009	0.756	0.730	0.425	0.643	A
6	4.0	0.73	0.16	0.00	2.049	-0.066	-0.023	0.737	0.739	0.419	0.632	A
6	4.0	0.73	0.11	0.00	1.711	0.049	-0.003	0.780	0.808	0.401	0.711	A
6	4.0	0.73	0.34	0.54	1.455	-0.094	0.012	0.734	0.649	0.441	0.577	A
6	4.0	0.73	0.32	0.54	1.406	-0.064	0.011	0.733	0.642	0.453	0.578	A
6	4.0	0.73	0.24	0.54	0.959	0.084	0.059	0.648	0.672	0.359	0.501	A
6	4.0	0.73	0.50	1.07	0.173	-0.036	0.032	0.498	0.499	0.323	0.301	A
6	4.0	0.73	0.33	1.07	0.006	-0.046	0.034	0.365	0.460	0.254	0.205	A
6	4.0	0.73	0.50	1.34	-0.141	-0.036	-0.065	0.387	0.446	0.254	0.207	A
6	4.0	0.73	0.40	1.34	-0.159	-0.074	-0.048	0.362	0.408	0.210	0.171	A
6	4.0	0.73	0.50	1.52	-0.208	-0.013	-0.087	0.437	0.431	0.236	0.216	A
1	7.0	0.52	0.29	-1.19								C
1	7.0	0.52	0.27	-1.19	0.032	-0.070	-0.022	0.307	0.325	0.081	0.103	A
1	7.0	0.52	0.22	-0.95								C
1	7.0	0.52	0.20	-0.95	-0.002	-0.021	-0.023	0.321	0.360	0.076	0.119	A
1	7.0	0.52	0.17	-0.48								C
1	7.0	0.52	0.15	-0.48								C
1	7.0	0.52	0.13	-0.48	2.710	0.546	-0.238	1.241	1.275	0.459	1.689	A
1	7.0	0.52	0.21	0.00								C
1	7.0	0.52	0.19	0.00								C
1	7.0	0.52	0.18	0.00	3.393	0.516	-0.003	0.934	1.001	0.500	1.062	A
1	7.0	0.52	0.16	0.00	3.288	0.568	-0.047	0.929	0.952	0.482	1.001	A
1	7.0	0.52	0.14	0.00	3.125	0.602	-0.042	1.054	1.122	0.464	1.293	A
1	7.0	0.52	0.12	0.00								C
1	7.0	0.52	0.10	0.00	2.529	0.530	0.117	1.227	1.458	0.421	1.905	A
1	7.0	0.52	0.18	0.48	3.023	0.502	-0.047	1.074	0.992	0.520	1.205	A
1	7.0	0.52	0.16	0.48	2.931	0.548	-0.118	1.099	1.015	0.495	1.241	A
1	7.0	0.52	0.14	0.48	2.598	0.547	-0.162	1.220	1.178	0.487	1.556	A
1	7.0	0.52	0.29	0.95	2.716	0.436	0.001	0.948	0.849	0.515	0.943	A
1	7.0	0.52	0.21	0.95								C
1	7.0	0.52	0.29	1.19	0.319	0.061	0.500	0.747	0.996	0.402	0.856	A
1	7.0	0.52	0.29	1.19	0.680	0.259	0.276	0.711	0.571	0.208	0.438	A
2	7.0	0.70	0.37	-1.38								C
2	7.0	0.70	0.33	-1.38	0.174	0.062	-0.009	0.618	0.961	0.167	0.667	A
2	7.0	0.70	0.31	-1.22								C
2	7.0	0.70	0.30	-1.22	1.132	0.584	-0.571	1.498	1.875	0.464	2.987	A
2	7.0	0.70	0.29	-0.97								C
2	7.0	0.70	0.25	-0.97								C
2	7.0	0.70	0.23	-0.97	1.111	2.182	-0.981	1.336	1.793	0.685	2.735	A
2	7.0	0.70	0.22	-0.97	0.958	1.825	-0.822	1.289	1.833	0.551	2.664	A
2	7.0	0.70	0.32	-0.49								C
2	7.0	0.70	0.29	-0.49	0.889	-0.680	-0.287	1.444	1.367	0.837	2.326	A
2	7.0	0.70	0.26	-0.49	0.505	-0.297	-0.344	1.155	1.327	0.869	1.925	A
2	7.0	0.70	0.20	-0.49	0.065	0.452	-0.462	1.101	1.352	0.874	1.902	A
2	7.0	0.70	0.28	0.00	4.182	1.099	-0.394	1.030	1.053	0.629	1.282	A
2	7.0	0.70	0.26	0.00	4.200	1.141	-0.381	0.895	1.023	0.632	1.123	A

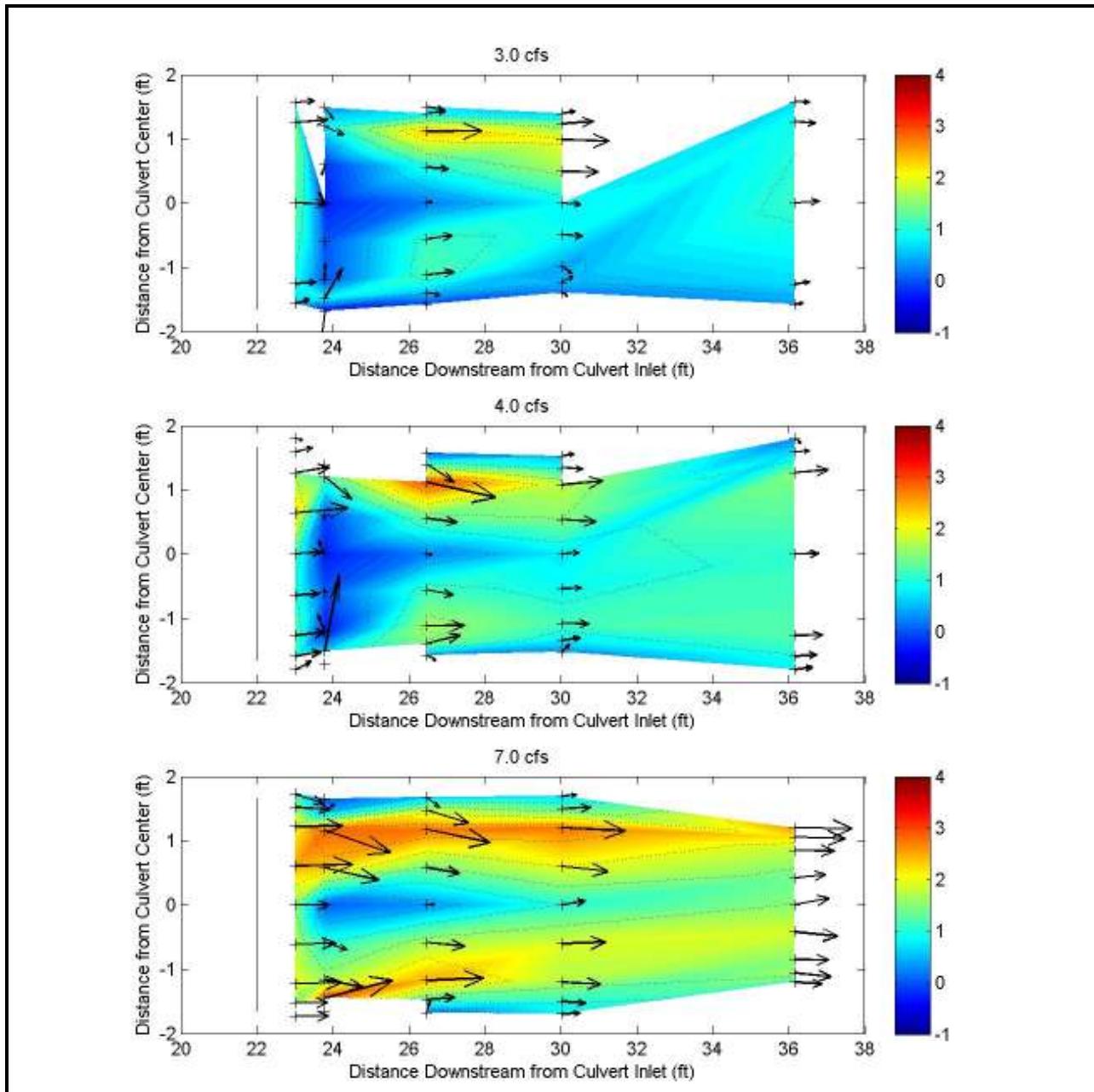
XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
2	7.0	0.70	0.23	0.00	4.106	1.151	-0.344	0.918	1.001	0.631	1.121	A
2	7.0	0.70	0.21	0.00	4.188	1.170	-0.396	0.874	0.974	0.629	1.054	A
2	7.0	0.70	0.19	0.00	4.049	1.254	-0.377	0.935	0.944	0.655	1.097	A
2	7.0	0.70	0.17	0.00	3.901	1.206	-0.300	1.034	0.978	0.697	1.256	A
2	7.0	0.70	0.14	0.00	3.822	1.222	-0.274	1.000	0.970	0.659	1.187	A
2	7.0	0.70	0.09	0.00								C
2	7.0	0.70	0.31	0.49	1.474	0.784	-0.568	1.083	1.340	1.007	1.992	A
2	7.0	0.70	0.27	0.49	1.414	0.948	-0.307	0.972	1.261	0.968	1.736	A
2	7.0	0.70	0.23	0.49	1.461	1.062	-0.180	0.962	1.174	0.971	1.623	A
2	7.0	0.70	0.17	0.49	1.550	1.490	0.019	0.987	1.196	0.869	1.581	A
2	7.0	0.70	0.33	0.97	1.205	-0.114	0.169	1.030	1.261	0.997	1.823	A
2	7.0	0.70	0.32	0.97	1.052	-0.418	0.008	0.980	1.278	0.939	1.738	A
2	7.0	0.70	0.27	0.97	0.776	-0.351	-0.163	1.170	1.577	0.792	2.242	A
2	7.0	0.70	0.24	0.97	0.458	-0.156	-0.034	0.941	1.248	0.737	1.494	A
2	7.0	0.70	0.40	1.22	1.891	0.552	-0.688	1.345	1.930	0.654	2.982	A
2	7.0	0.70	0.37	1.22	-0.139	0.787	-0.357	1.227	1.220	0.331	1.551	A
2	7.0	0.70	0.46	1.38	2.245	0.359	-0.104	0.922	1.099	0.416	1.115	A
3	7.0	0.50	0.43	-1.40								C
3	7.0	0.50	0.38	-1.24	4.529	0.216	0.039	1.319	1.216	0.574	1.774	A
3	7.0	0.50	0.36	-1.24								C
3	7.0	0.50	0.27	-0.99								C
3	7.0	0.50	0.25	-0.99								C
3	7.0	0.50	0.18	-0.49								C
3	7.0	0.50	0.16	-0.49								C
3	7.0	0.50	0.14	-0.49	0.914	0.494	-0.211	1.499	1.374	0.361	2.132	A
3	7.0	0.50	0.23	0.00								C
3	7.0	0.50	0.20	0.00								C
3	7.0	0.50	0.18	0.00								C
3	7.0	0.50	0.15	0.00								C
3	7.0	0.50	0.12	0.00	2.304	1.331	0.334	1.348	1.609	0.566	2.363	A
3	7.0	0.50	0.11	0.00	2.333	1.368	0.285	1.350	1.531	0.534	2.226	A
3	7.0	0.50	0.26	0.49								C
3	7.0	0.50	0.24	0.49	3.795	1.291	-0.074	0.938	1.159	0.779	1.415	A
3	7.0	0.50	0.22	0.49	3.740	1.208	-0.036	0.968	1.132	0.769	1.404	A
3	7.0	0.50	0.20	0.49	3.628	1.207	-0.052	0.982	1.252	0.699	1.510	A
3	7.0	0.50	0.43	0.99	2.542	0.114	0.589	0.968	1.084	0.752	1.339	A
3	7.0	0.50	0.40	0.99	2.577	0.255	0.614	0.999	1.130	0.745	1.415	A
3	7.0	0.50	0.38	0.99	2.490	0.374	0.611	0.945	1.111	0.740	1.338	A
3	7.0	0.50	0.35	0.99	2.444	0.678	0.594	0.970	1.140	0.759	1.409	A
3	7.0	0.50	0.47	1.24	3.067	0.527	-0.064	0.957	0.867	0.552	0.986	A
3	7.0	0.50	0.44	1.24	2.820	0.554	-0.029	1.019	0.940	0.594	1.138	A
3	7.0	0.50	0.41	1.24	2.575	0.594	0.013	1.100	0.995	0.614	1.288	A
3	7.0	0.50	0.39	1.24	1.862	0.608	0.049	1.235	1.389	0.625	1.922	A
3	7.0	0.50	0.50	1.40	2.375	0.674	0.148	1.012	0.932	0.546	1.096	A
3	7.0	0.50	0.48	1.40	2.053	0.689	0.177	1.440	2.094	0.515	3.362	A
3	7.0	0.50	0.47	1.40	1.404	0.741	0.235	1.117	1.690	0.501	2.177	A
3	7.0	0.50	0.46	1.40	1.235	0.494	0.245	1.062	1.387	0.508	1.655	A
4	7.0	0.52	0.29	-1.09								C
4	7.0	0.52	0.27	-1.09								C
4	7.0	0.52	0.20	-0.87	0.066	0.084	-0.026	0.289	0.454	0.075	0.147	A
4	7.0	0.52	0.17	-0.87								C
4	7.0	0.52	0.16	-0.44								C
4	7.0	0.52	0.15	-0.44	3.268	0.718	-0.173	1.542	1.309	0.430	2.138	A
4	7.0	0.52	0.18	0.00	3.012	0.519	-0.045	1.103	1.085	0.566	1.357	A
4	7.0	0.52	0.17	0.00	2.955	0.538	-0.013	1.068	1.026	0.568	1.258	A
4	7.0	0.52	0.16	0.00	2.926	0.591	-0.039	1.026	0.999	0.551	1.176	A
4	7.0	0.52	0.15	0.00	2.660	0.611	-0.004	1.103	1.145	0.474	1.375	A
4	7.0	0.52	0.14	0.00	1.915	0.649	-0.054	2.070	1.708	0.463	3.707	A
4	7.0	0.52	0.13	0.00	1.901	0.633	0.064	1.699	1.959	0.428	3.454	A
4	7.0	0.52	0.12	0.00	2.071	0.662	0.046	1.338	1.607	0.426	2.277	A
4	7.0	0.52	0.09	0.00	1.880	0.644	0.054	1.016	0.952	0.402	1.050	A
4	7.0	0.52	0.20	0.44								C
4	7.0	0.52	0.16	0.44	3.265	0.422	-0.252	1.173	1.103	0.516	1.430	A
4	7.0	0.52	0.15	0.44	2.957	0.493	-0.198	1.242	1.358	0.497	1.817	A
4	7.0	0.52	0.24	0.87	2.694	0.599	-0.046	1.365	1.282	0.556	1.908	A
4	7.0	0.52	0.23	0.87	2.275	0.494	-0.019	1.237	1.219	0.540	1.654	A
4	7.0	0.52	0.22	0.87	1.879	0.512	0.028	1.283	1.428	0.545	1.991	A
4	7.0	0.52	0.19	0.87								C
4	7.0	0.52	0.29	1.09								C
4	7.0	0.52	0.27	1.09	0.811	0.361	0.242	0.960	0.766	0.283	0.794	A
4	7.0	0.52	0.29	1.24	0.070	-0.145	0.086	0.609	0.940	0.226	0.653	A
5	7.0	0.50	0.18	-1.15	0.168	0.014	-0.083	0.513	0.674	0.128	0.367	A
5	7.0	0.50	0.16	-0.92	0.867	0.244	-0.136	1.217	1.483	0.560	1.996	A
5	7.0	0.50	0.14	-0.92	-0.256	0.644	-0.310	1.582	1.826	0.546	3.067	A
5	7.0	0.50	0.05	-0.46								C

XS	Flow rate	Centerline Depth	Vertical	Lateral	Vx	Vy	Vz	Tlx	Tly	Tlz	TKE	Data Type
	cfs	ft	ft	ft	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft <sup>2</sup> /s <sup>2</sup>	
5	7.0	0.50	0.03	-0.46	-0.724	0.512	0.229	1.341	1.545	0.502	2.219	A
5	7.0	0.50	0.02	-0.46	-0.950	0.563	0.136	1.223	1.299	0.475	1.704	A
5	7.0	0.50	0.12	0.00	3.148	0.516	-0.137	1.106	0.989	0.507	1.230	A
5	7.0	0.50	0.11	0.00	2.747	0.600	-0.216	1.725	1.043	0.514	2.164	A
5	7.0	0.50	0.10	0.00	2.712	0.735	-0.181	1.490	1.242	0.509	2.010	A
5	7.0	0.50	0.09	0.00	2.655	0.828	-0.176	1.489	1.470	0.502	2.314	A
5	7.0	0.50	0.08	0.00	2.263	0.921	-0.121	1.519	1.570	0.465	2.494	A
5	7.0	0.50	0.07	0.00	2.010	0.718	-0.154	1.338	1.409	0.485	2.006	A
5	7.0	0.50	0.06	0.00	1.284	0.242	-0.087	1.093	1.140	0.421	1.336	A
5	7.0	0.50	0.13	0.46	2.630	0.275	-0.081	1.233	1.208	0.414	1.575	A
5	7.0	0.50	0.12	0.46	2.190	0.357	-0.105	1.246	1.097	0.378	1.449	A
5	7.0	0.50	0.24	0.92								C
5	7.0	0.50	0.20	0.92	1.483	0.290	0.087	1.104	1.381	0.377	1.634	A
6	7.0	0.71	0.48	-1.60	0.510	0.041	-0.023	0.684	0.855	0.350	0.661	A
6	7.0	0.71	0.48	-1.41	1.230	-0.128	0.040	0.795	0.864	0.495	0.812	A
6	7.0	0.71	0.41	-1.41	0.949	-0.071	0.028	0.768	0.835	0.443	0.742	A
6	7.0	0.71	0.48	-1.13	2.454	-0.324	0.118	0.976	0.974	0.575	1.116	A
6	7.0	0.71	0.33	-1.13	1.575	-0.185	0.055	0.908	0.897	0.489	0.935	A
6	7.0	0.71	0.41	-0.56	3.572	-0.338	0.069	0.892	0.915	0.490	0.936	A
6	7.0	0.71	0.36	-0.56	3.545	-0.367	-0.013	0.865	0.933	0.498	0.933	A
6	7.0	0.71	0.23	-0.56	3.026	-0.230	-0.108	0.961	0.918	0.496	1.007	A
6	7.0	0.71	0.42	0.00	3.285	-0.322	0.108	0.784	0.895	0.482	0.824	A
6	7.0	0.71	0.38	0.00	3.231	-0.333	0.061	0.826	0.871	0.488	0.840	A
6	7.0	0.71	0.34	0.00	3.004	-0.298	0.062	0.837	0.870	0.482	0.845	A
6	7.0	0.71	0.27	0.00	2.735	-0.243	0.037	0.839	0.874	0.478	0.849	A
6	7.0	0.71	0.20	0.00	2.289	-0.166	0.034	0.854	0.875	0.465	0.855	A
6	7.0	0.71	0.15	0.00	2.050	-0.055	0.021	0.852	0.940	0.437	0.900	A
6	7.0	0.71	0.10	0.00	1.837	0.020	-0.018	0.811	0.883	0.417	0.806	A
6	7.0	0.71	0.48	0.56	2.352	-0.151	-0.011	0.895	0.780	0.504	0.832	A
6	7.0	0.71	0.36	0.56	2.116	-0.068	-0.014	0.835	0.786	0.501	0.783	A
6	7.0	0.71	0.23	0.56	1.938	0.048	-0.020	0.815	0.794	0.475	0.760	A
6	7.0	0.71	0.48	1.13	0.226	-0.088	0.076	0.522	0.631	0.373	0.405	A
6	7.0	0.71	0.33	1.13	0.478	0.198	0.155	0.613	0.698	0.326	0.484	A
6	7.0	0.71	0.48	1.41	-0.056	-0.069	0.049	0.450	0.588	0.279	0.313	A
6	7.0	0.71	0.41	1.41	-0.066	0.009	0.069	0.451	0.653	0.241	0.344	A
6	7.0	0.71	0.59	1.60	-0.149	-0.072	-0.056	0.468	0.609	0.279	0.334	A

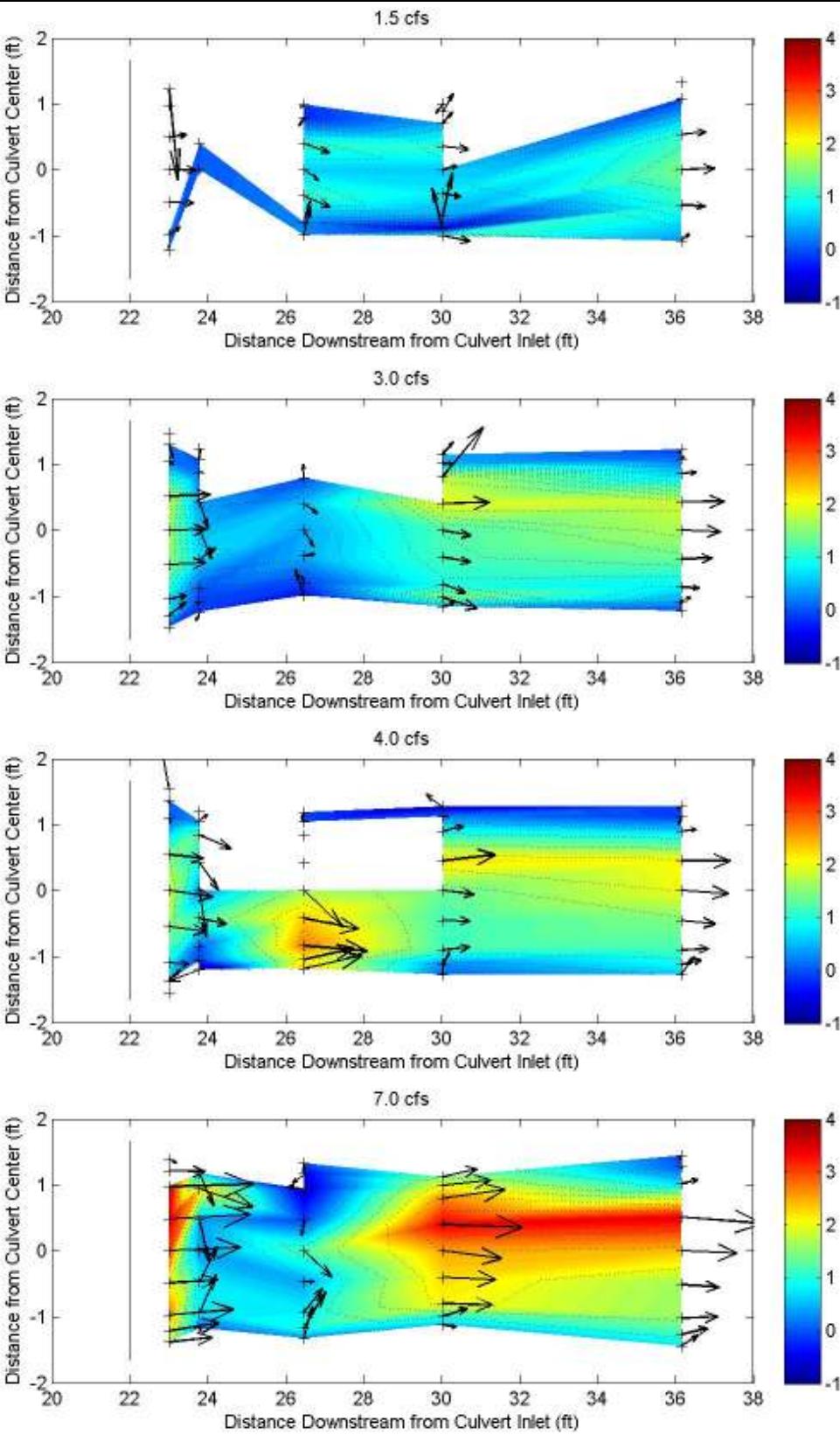
## **APPENDIX C—CONTOUR PLOTS**

Below are contour plots showing vertically averaged streamwise velocities, lateral velocities, turbulence intensities, and turbulent kinetic energy. The vertical line on the left of the plots represents the central baffle, the cross-marks represent the measurement locations, and the direction of flow is from left to right. The best plots were created with data from tests conducted at a 1.14% culvert slope. Plots of 3.00% and 4.33% slopes are not complete due to filtered out data and the inability of MATLAB to interpret between gaps in the data. The contour plots show how difficult it is to collect accurate data with a MicroADV in flows with high velocities and shallow depths.

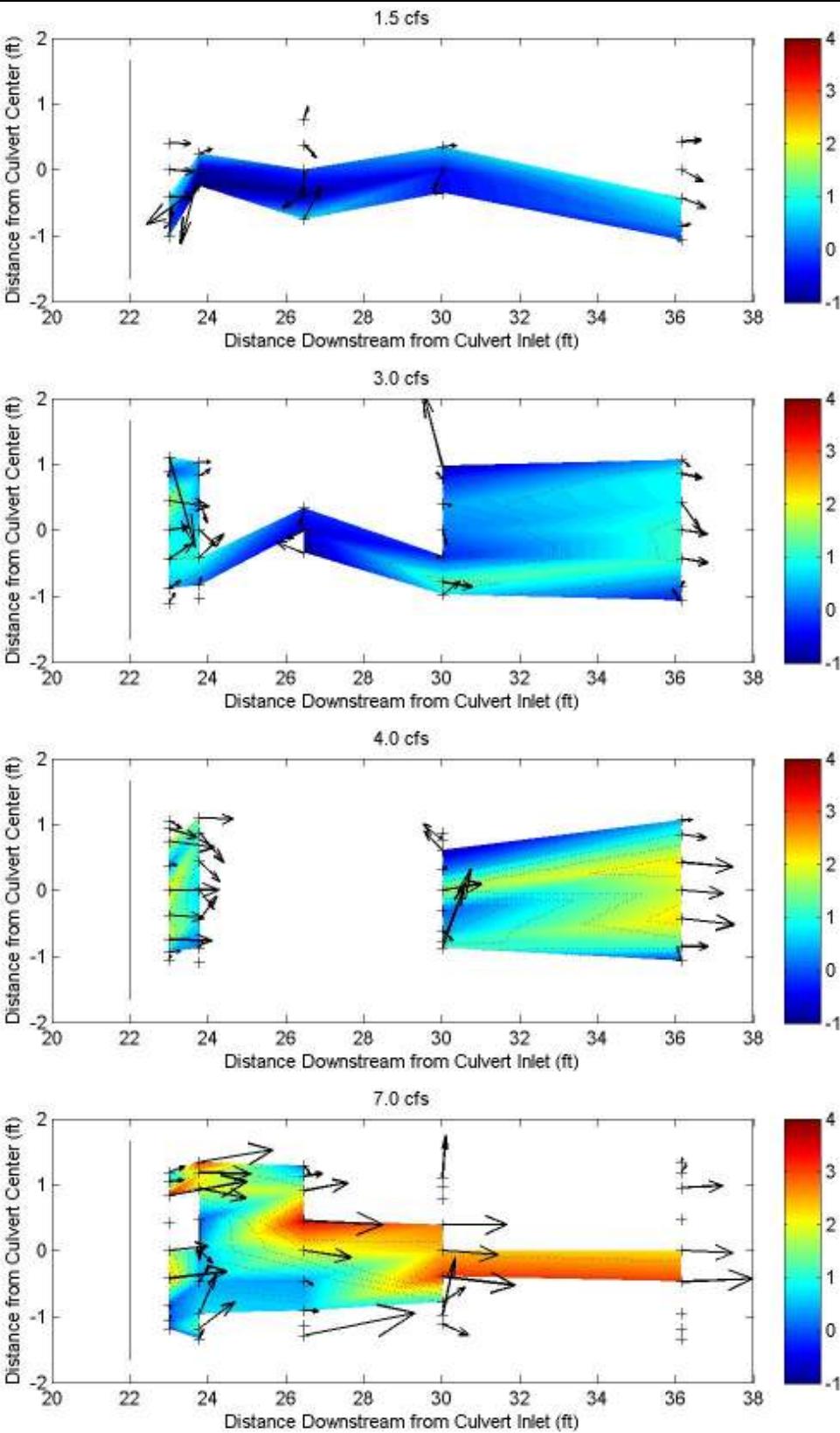
### Sloped-weir Baffles



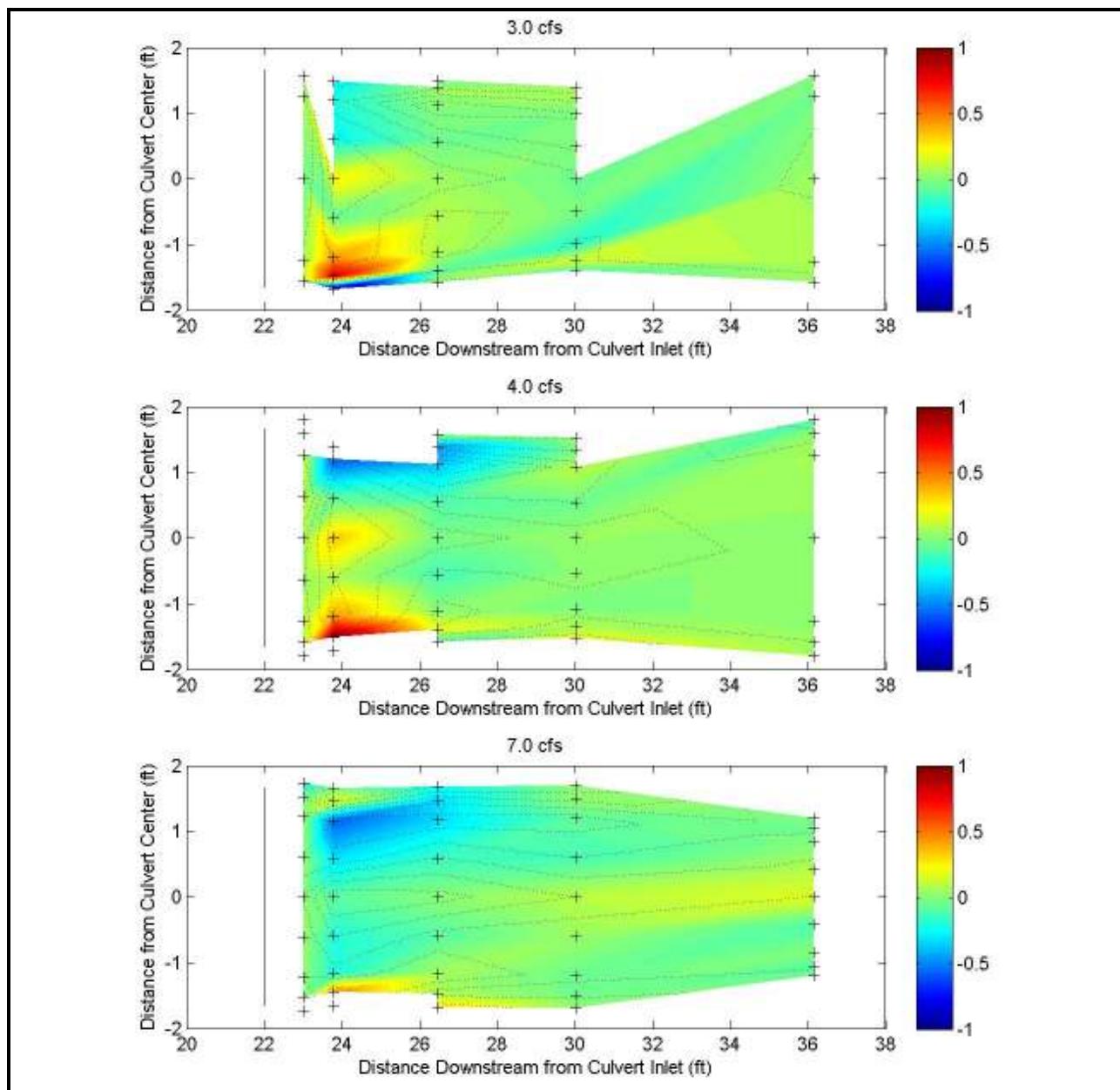
**Fig. C1. Average streamwise velocity (ft/s) for sloped-weir baffles at 1.14% slope (1.5 cfs data would not plot for unknown reasons).**



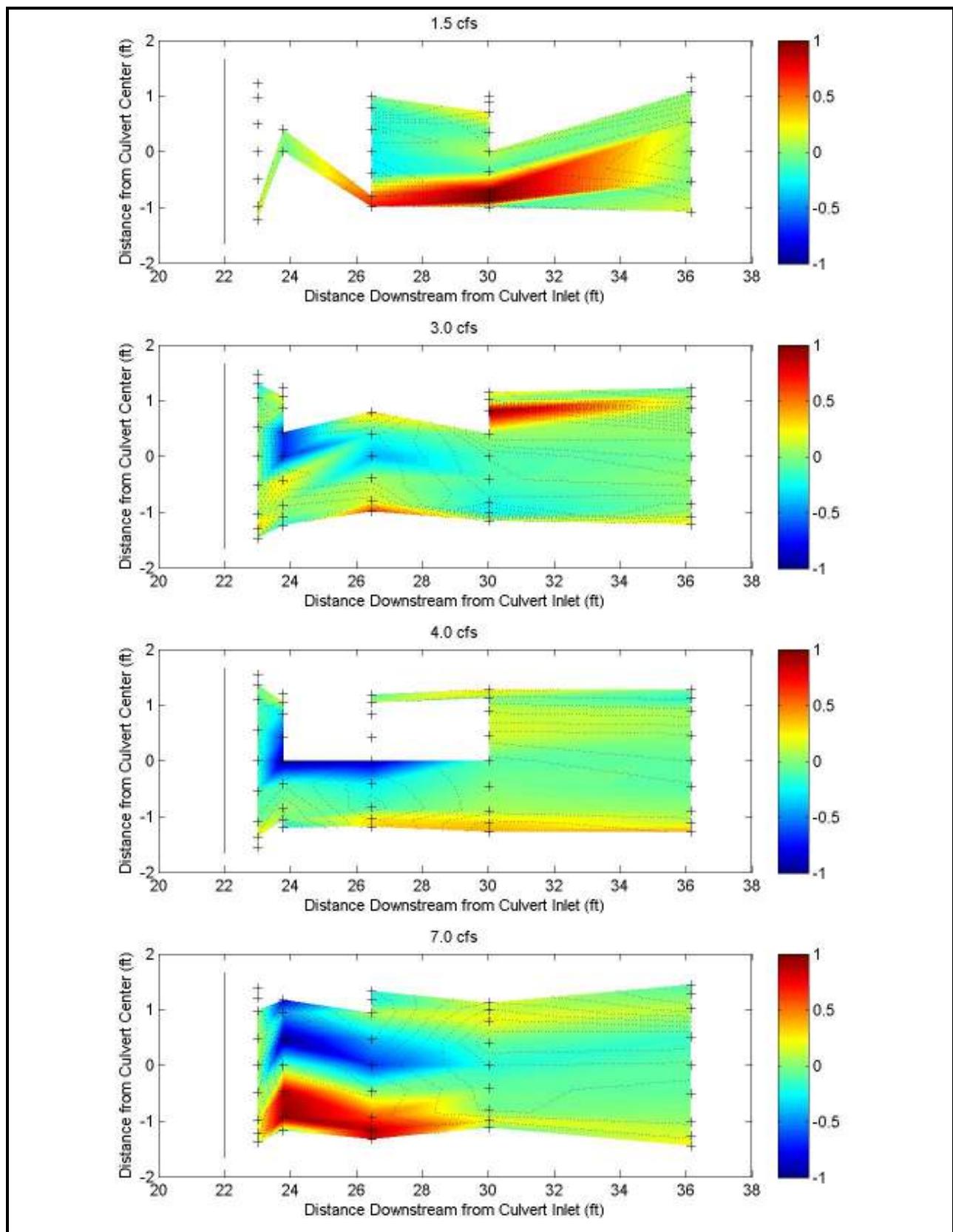
**Fig. C2. Average streamwise velocity (ft/s) for sloped-weir baffles at 3.00% slope.**



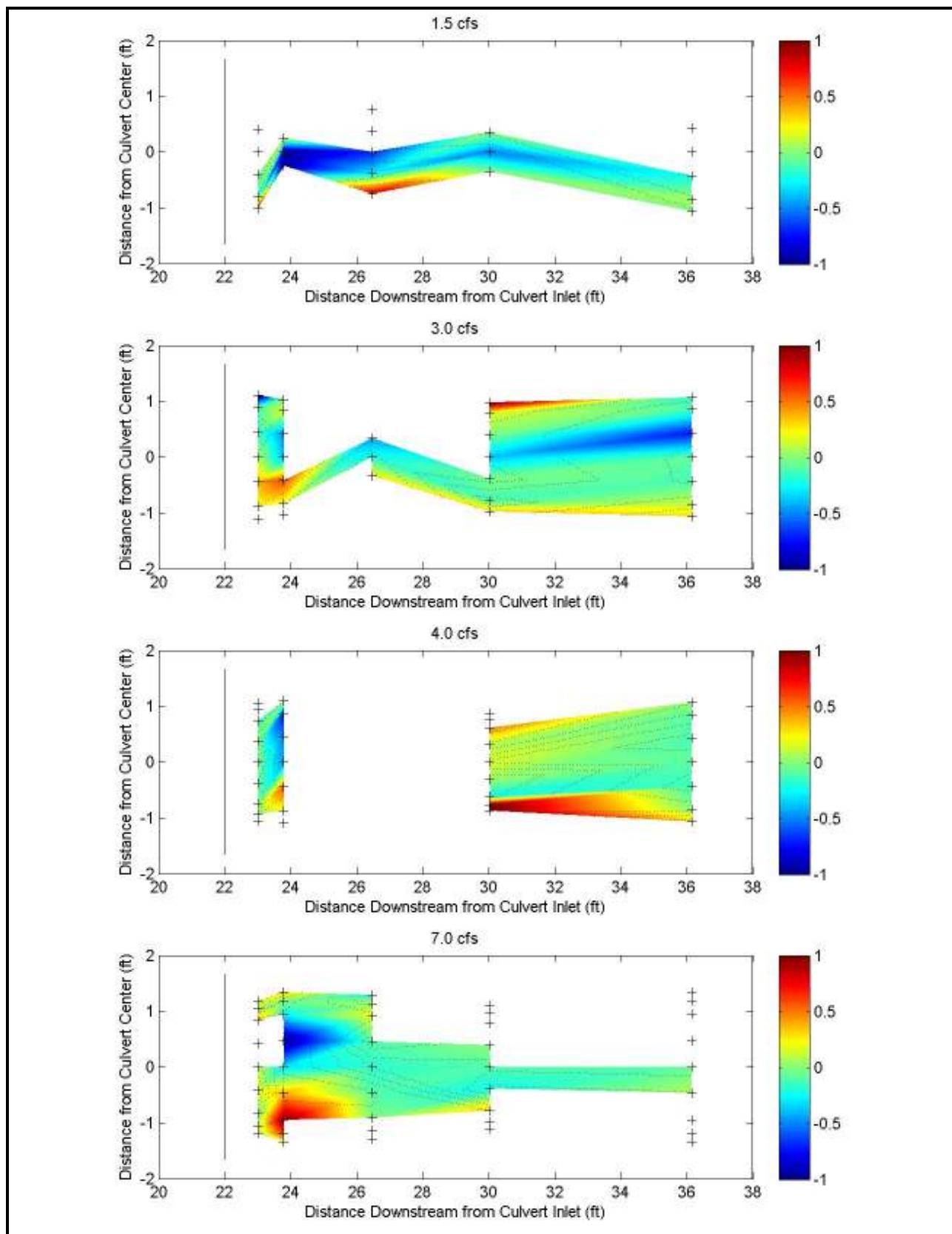
**Fig. C3. Average streamwise velocity (ft/s) for sloped-weir baffles at 4.33% slope.**



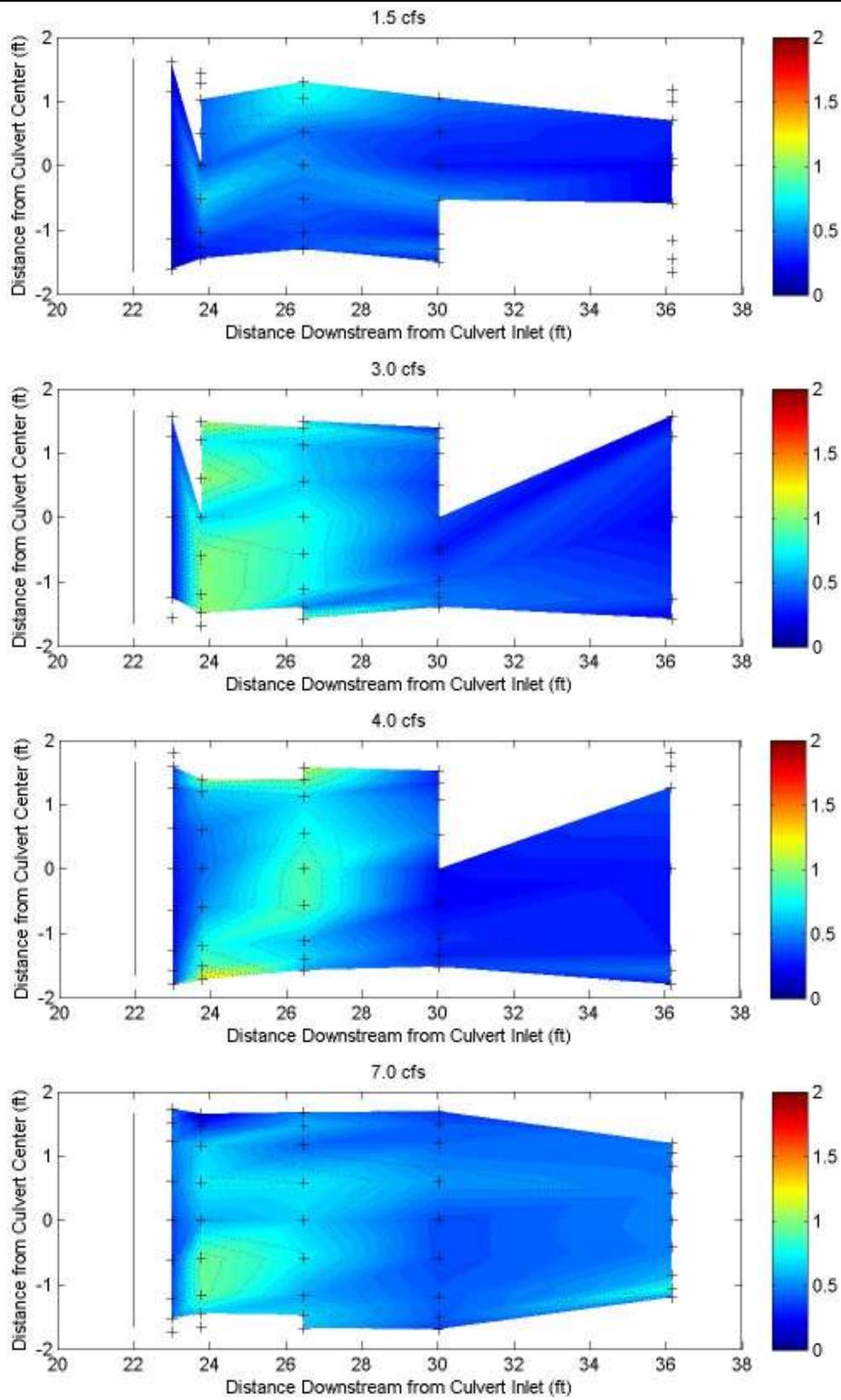
**Fig. C4. Average lateral velocity (ft/s) for sloped-weir baffles at 1.14% slope (1.5 cfs data would not plot for unknown reasons).**



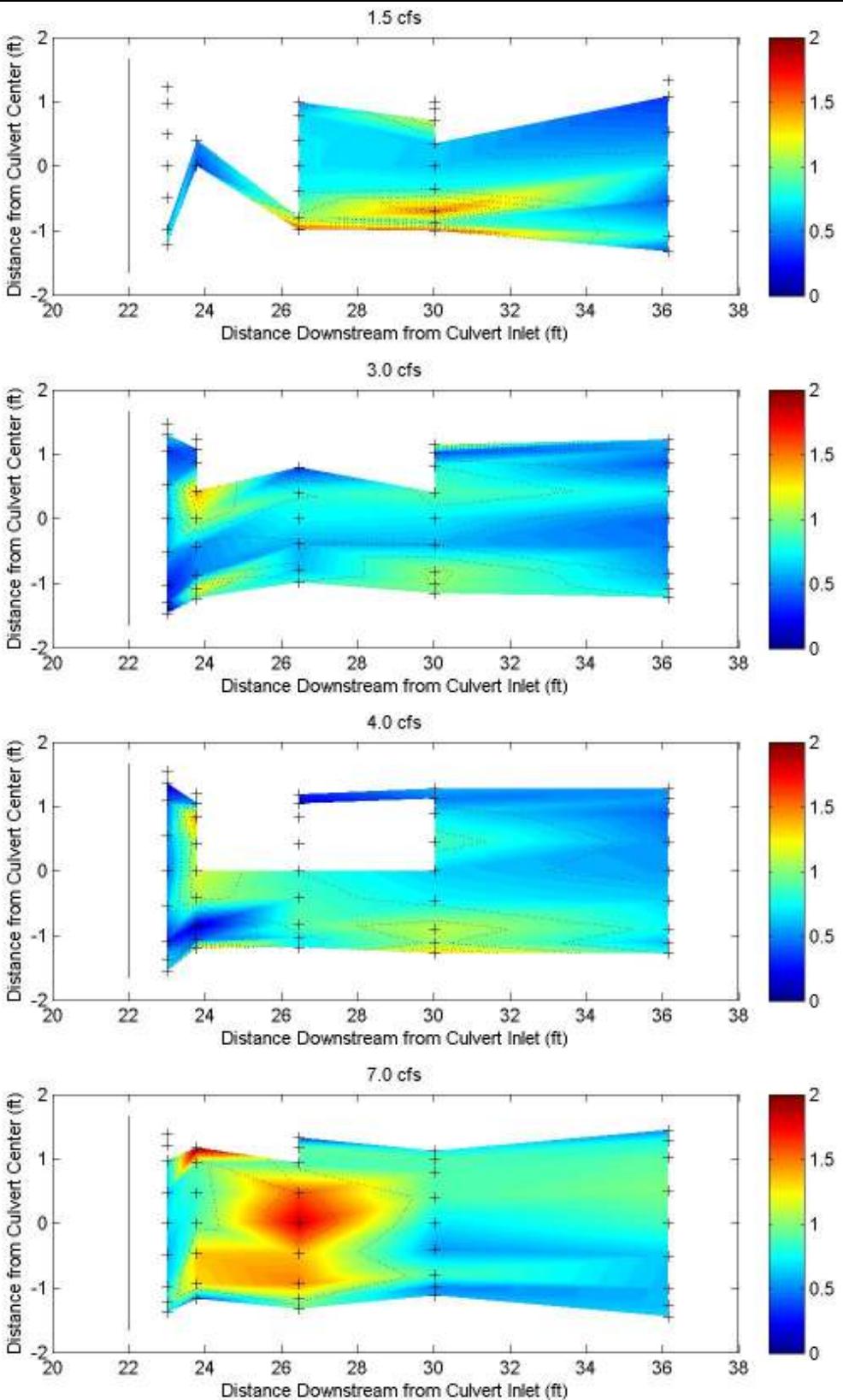
**Fig. C5. Average lateral velocity (ft/s) for sloped-weir baffles at 3.00% slope.**



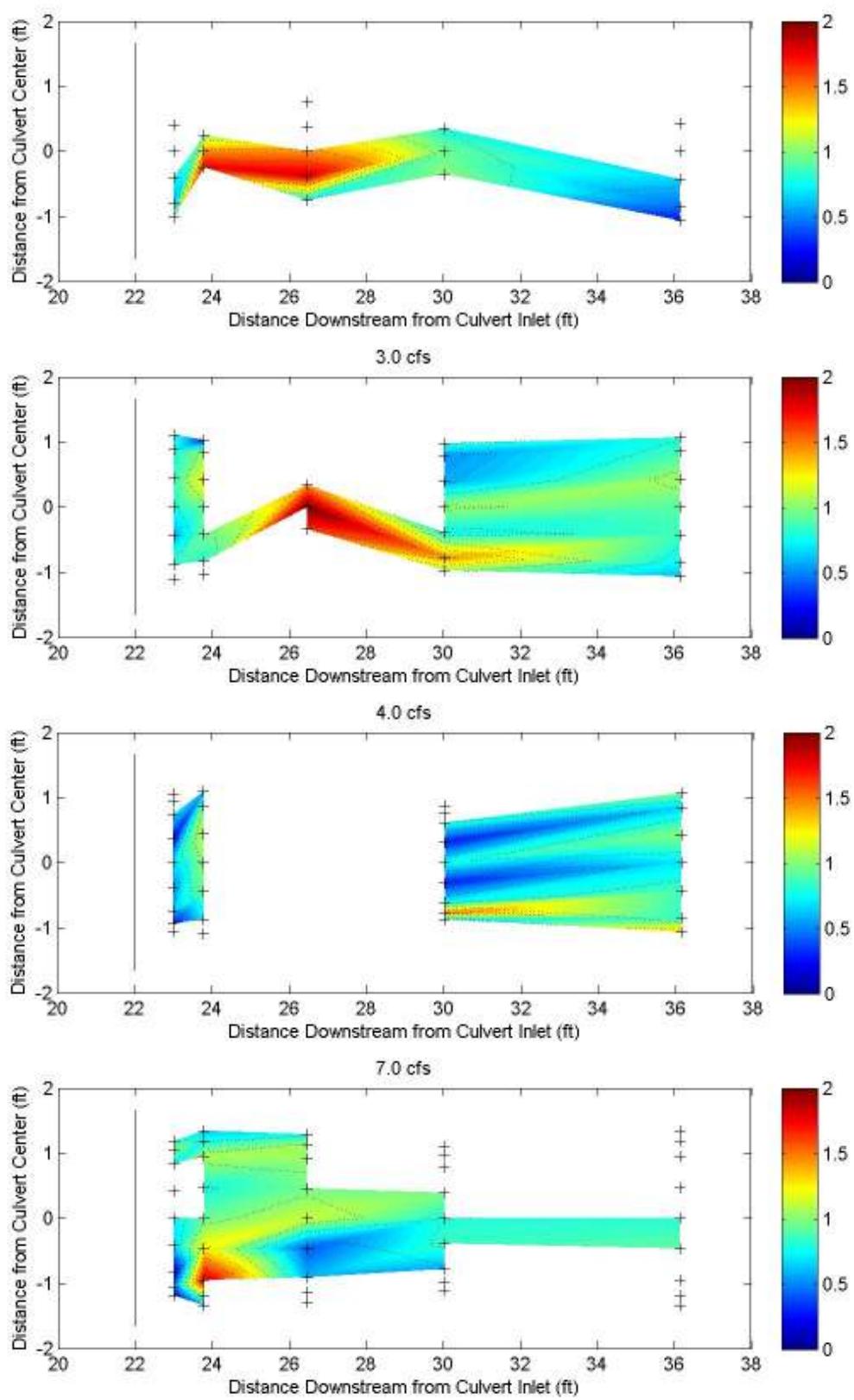
**Fig. C6. Average lateral velocity (ft/s) for sloped-weir baffles at 4.33% slope.**



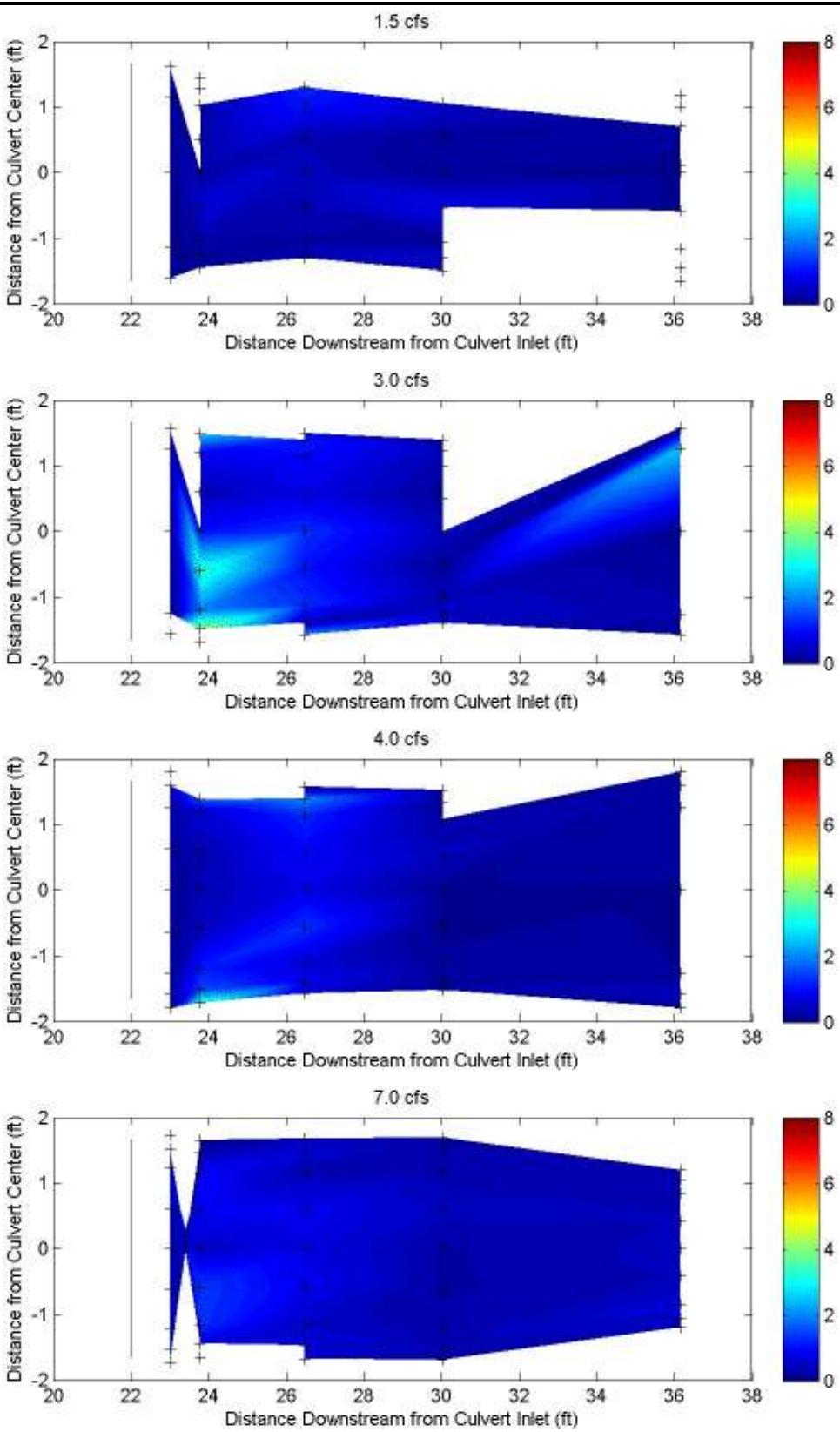
**Fig. C7. Average TI (ft/s) for sloped-weir baffles at 1.14% slope.**



**Fig. C8. Average TI (ft/s) for sloped-weir baffles at 3.00% slope.**



**Fig. C9. Average TI (ft/s) for sloped-weir baffles at 4.33% slope.**



**Fig. C10.** Average TKE ( $\text{ft}^2/\text{s}^2$ ) for sloped-weir baffles at 1.14% slope.

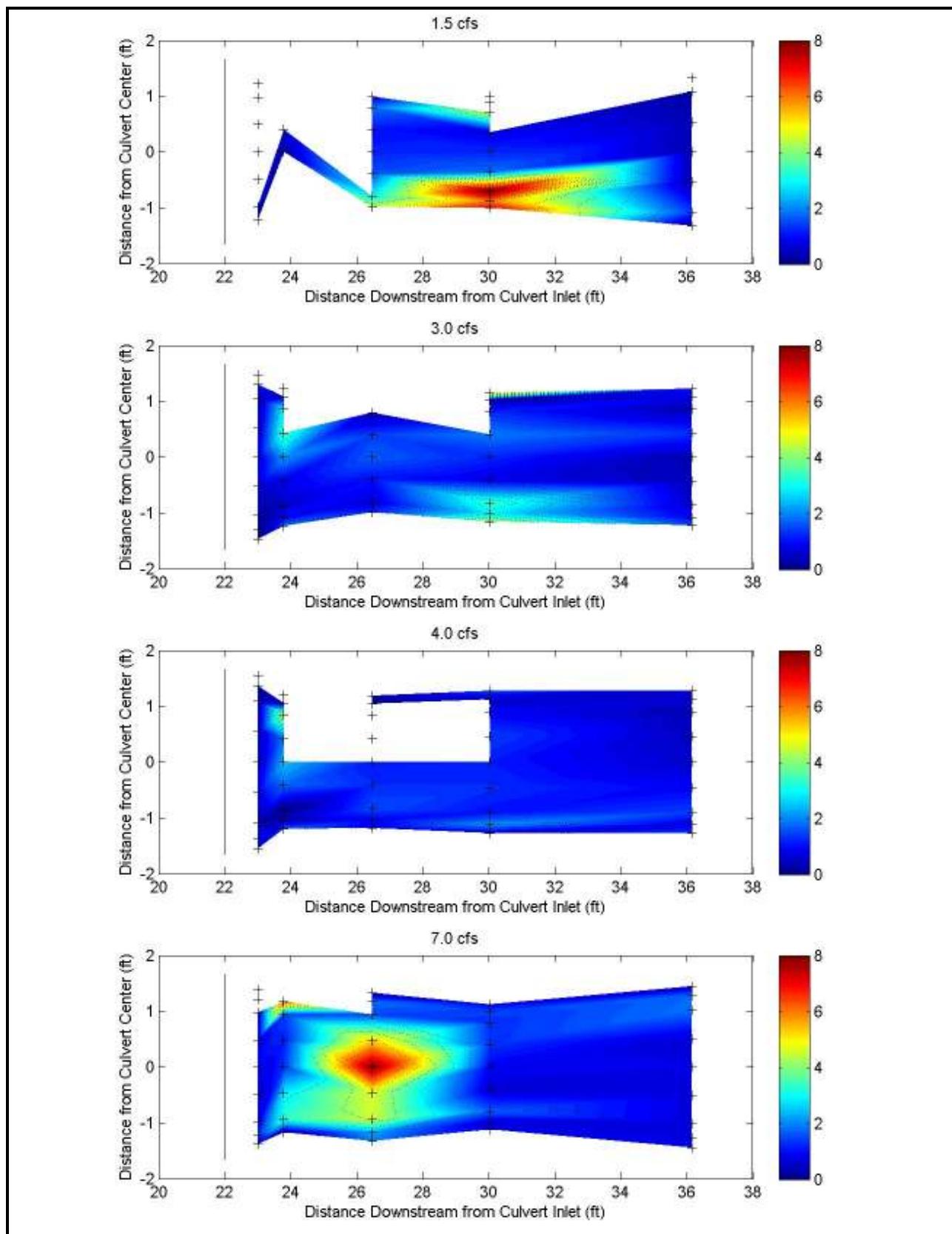
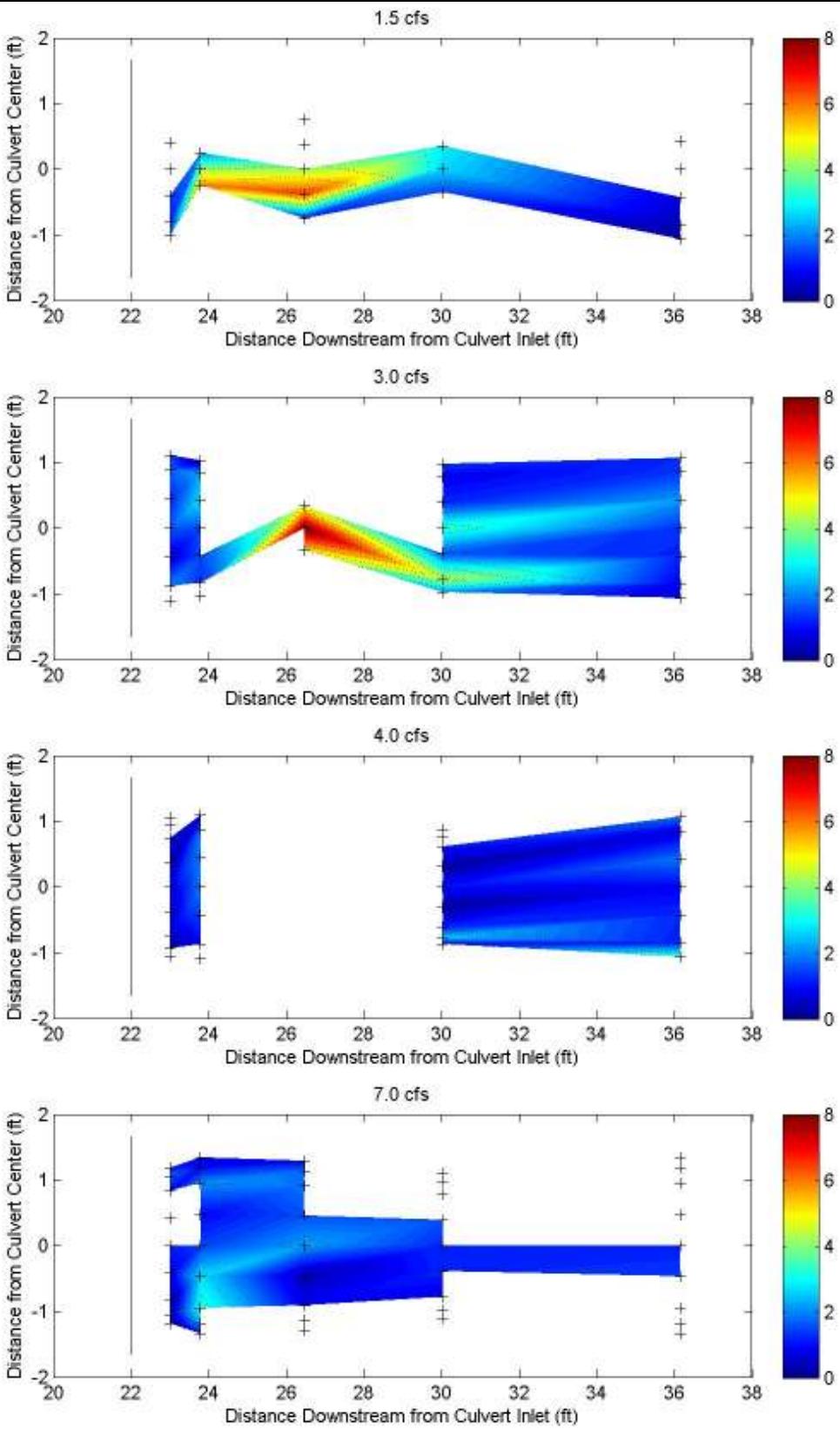


Fig. C11. Average TKE ( $\text{ft}^2/\text{s}^2$ ) for sloped-weir baffles at 3.00% slope.



**Fig. C12.** Average TKE ( $\text{ft}^2/\text{s}^2$ ) for sloped-weir baffles at 4.33% slope.

### Slotted-weir Baffles

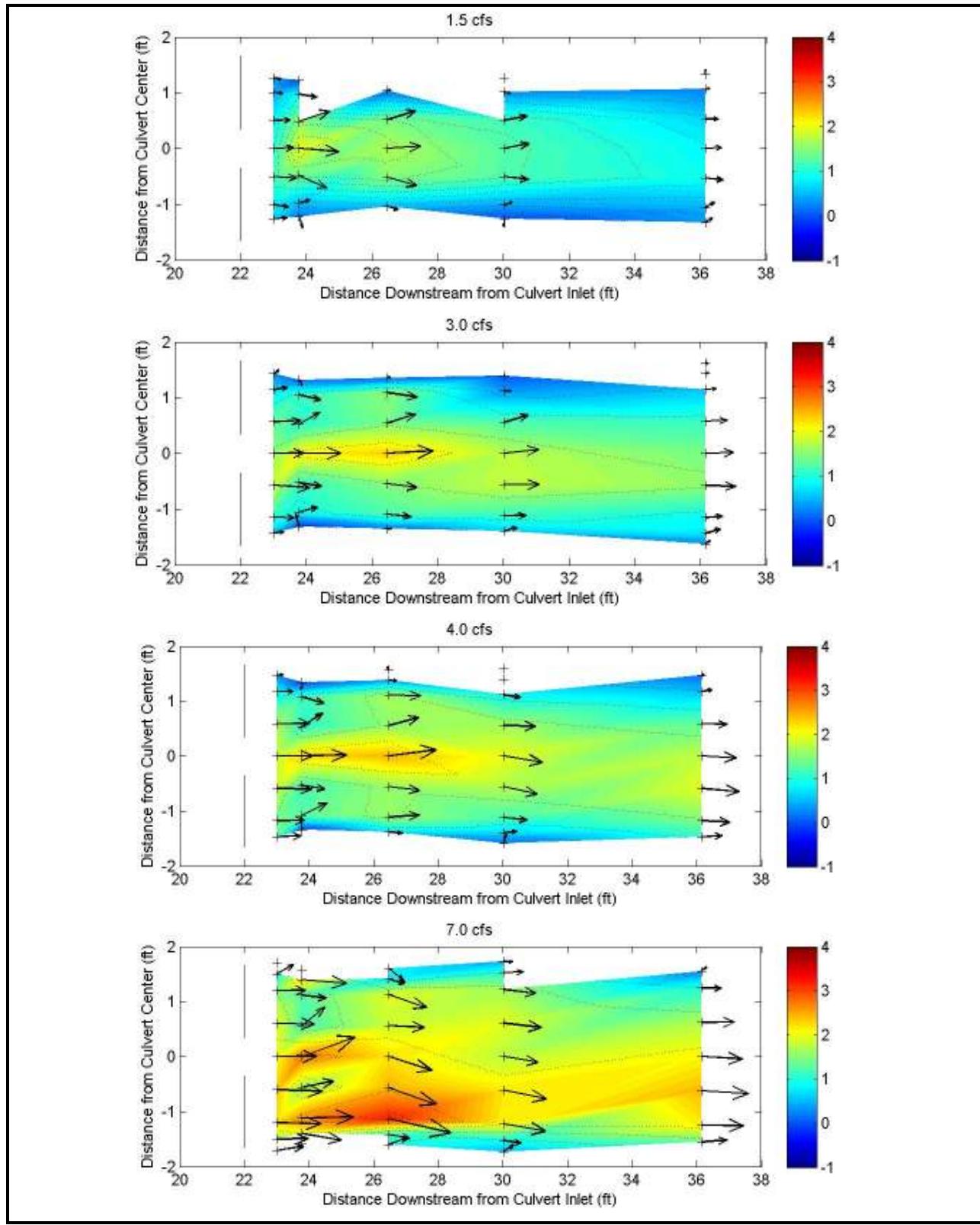
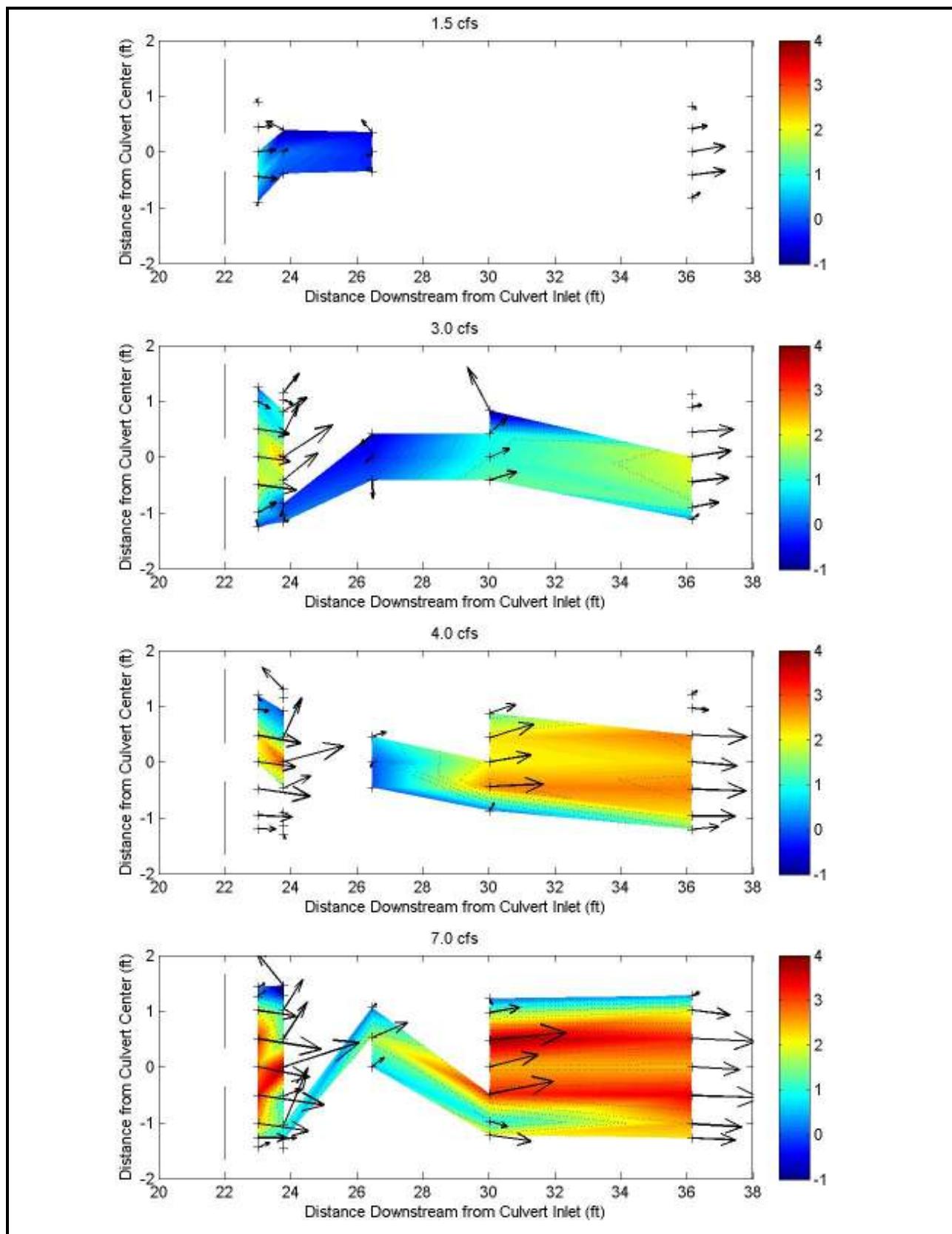


Fig. C13. Average streamwise velocity (ft/s) for slotted-weir baffles at 1.14% slope.



**Fig. C14. Average streamwise velocity (ft/s) for slotted-weir baffles at 3.00% slope.**

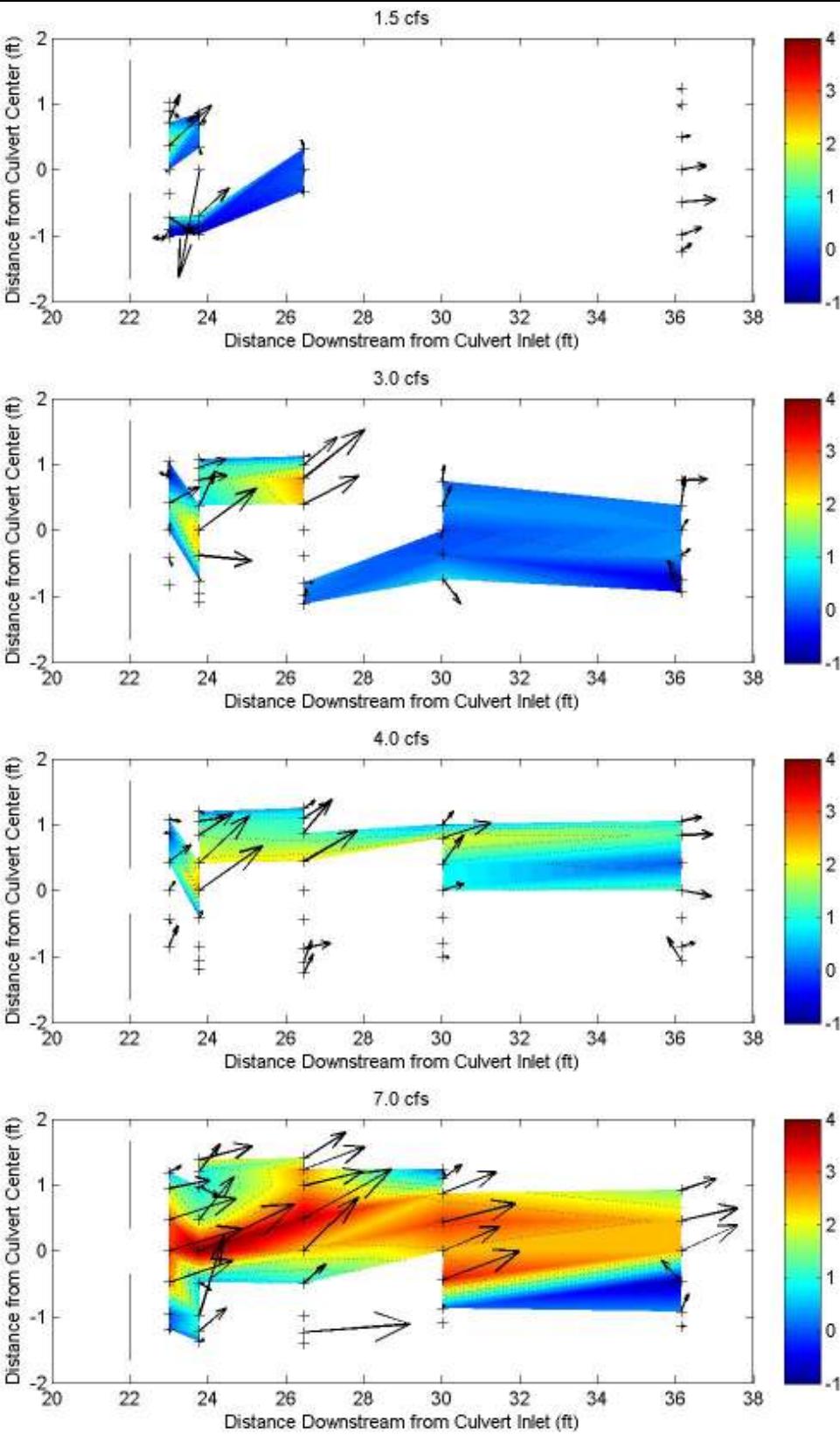


Fig. C15. Average streamwise velocity (ft/s) for slotted-weir baffles at 4.33% slope.

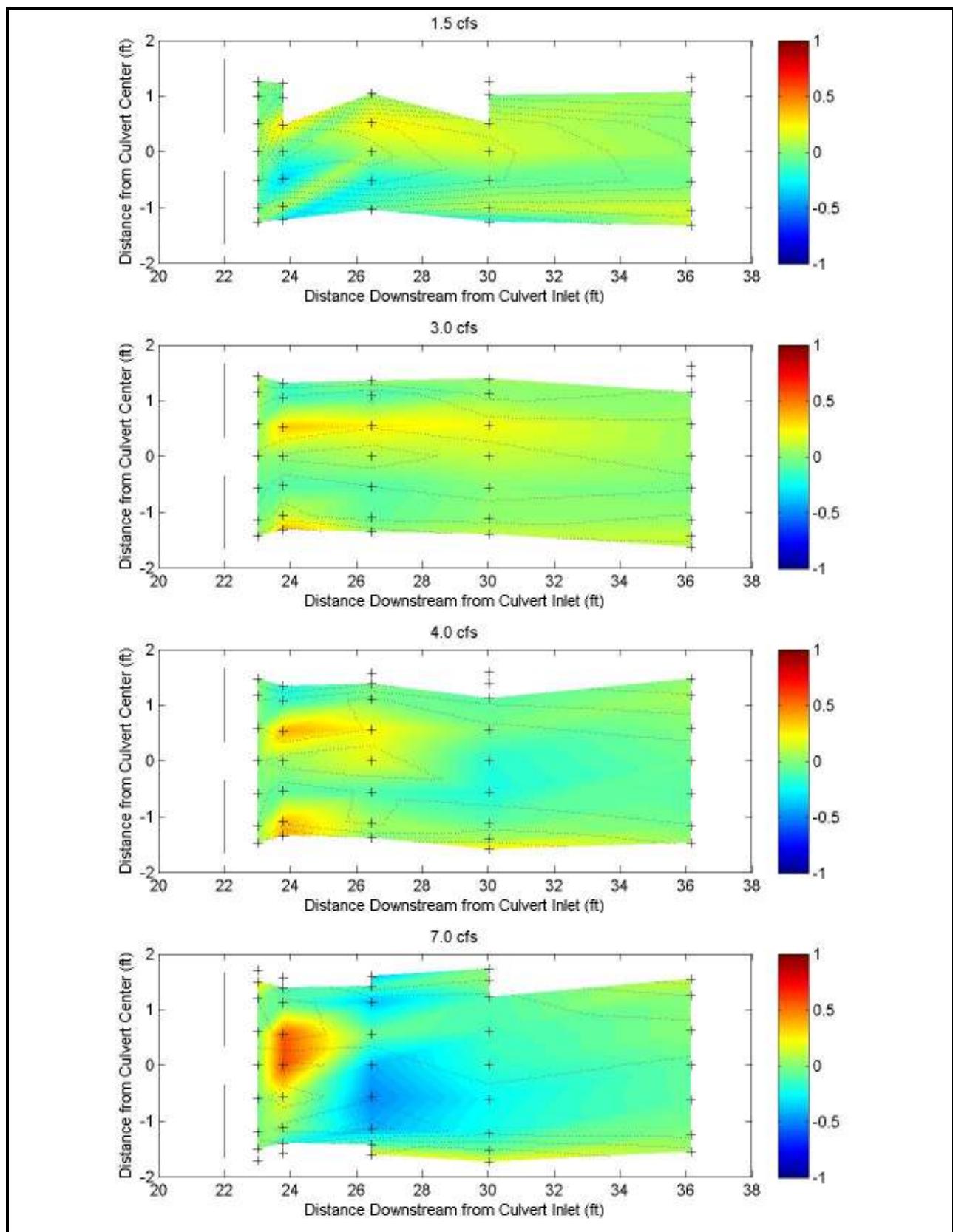


Fig. C16. Average lateral velocity (ft/s) for slotted-weir baffles at 1.14% slope.

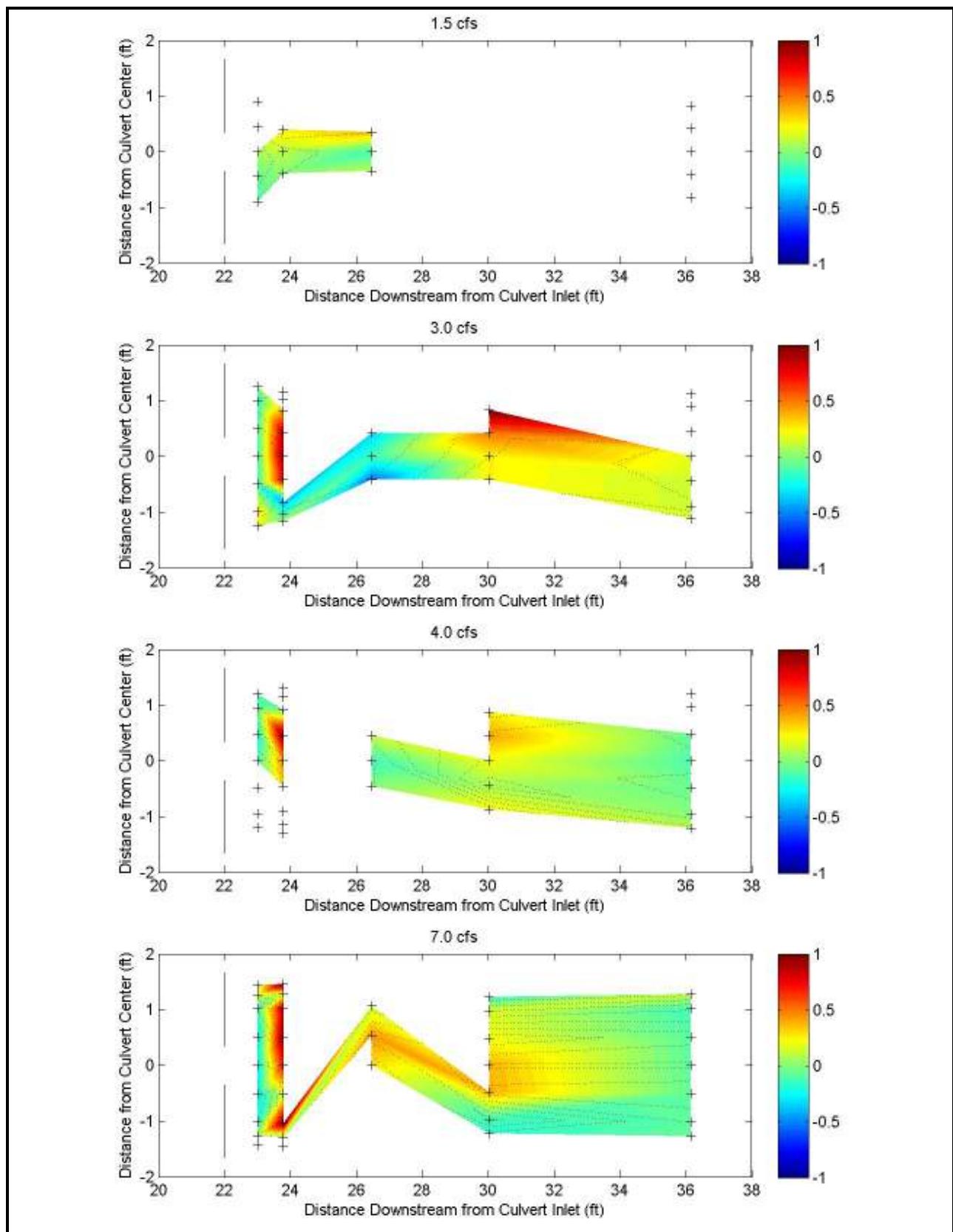


Fig. C17. Average lateral velocity (ft/s) for slotted-weir baffles at 3.00% slope.

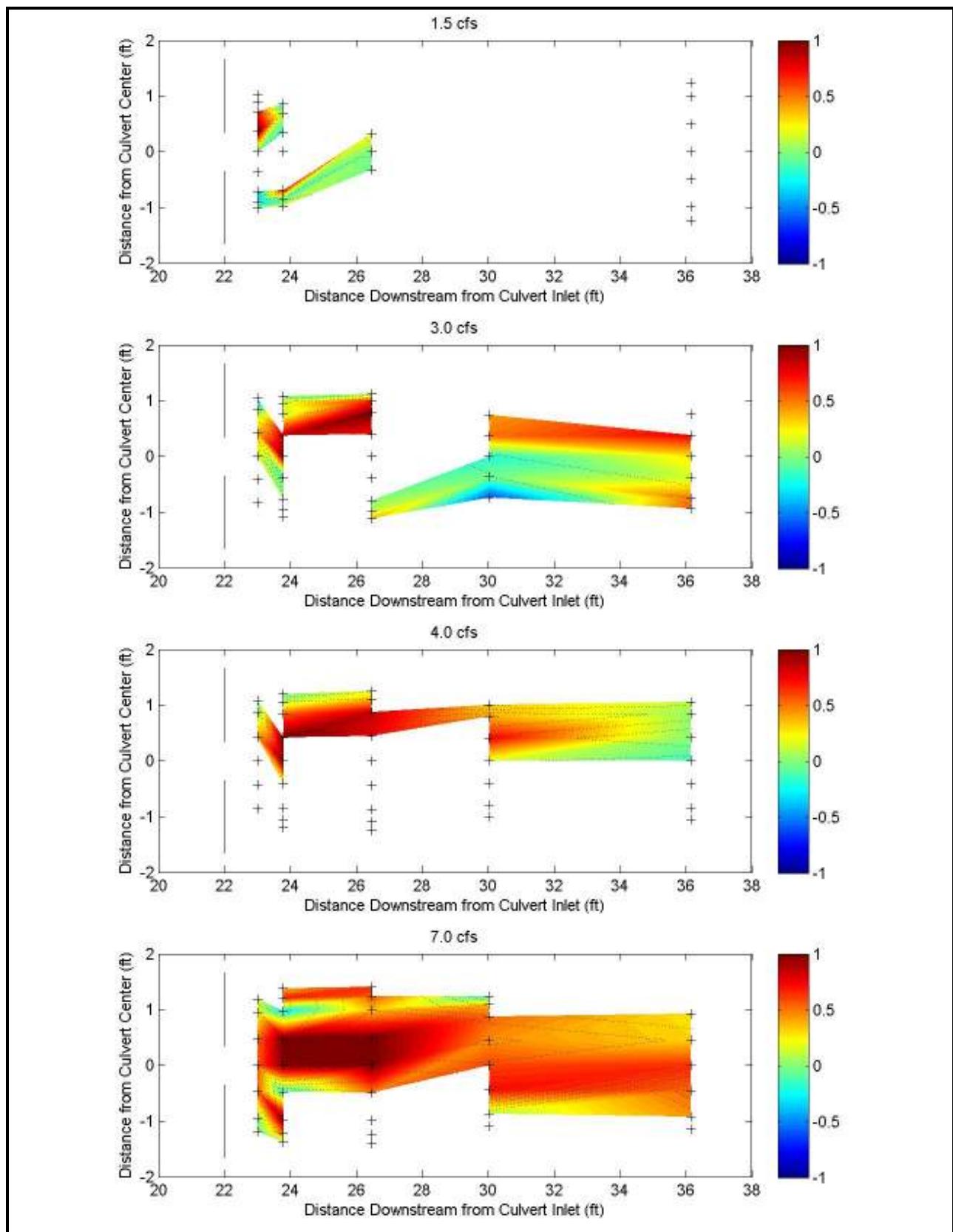
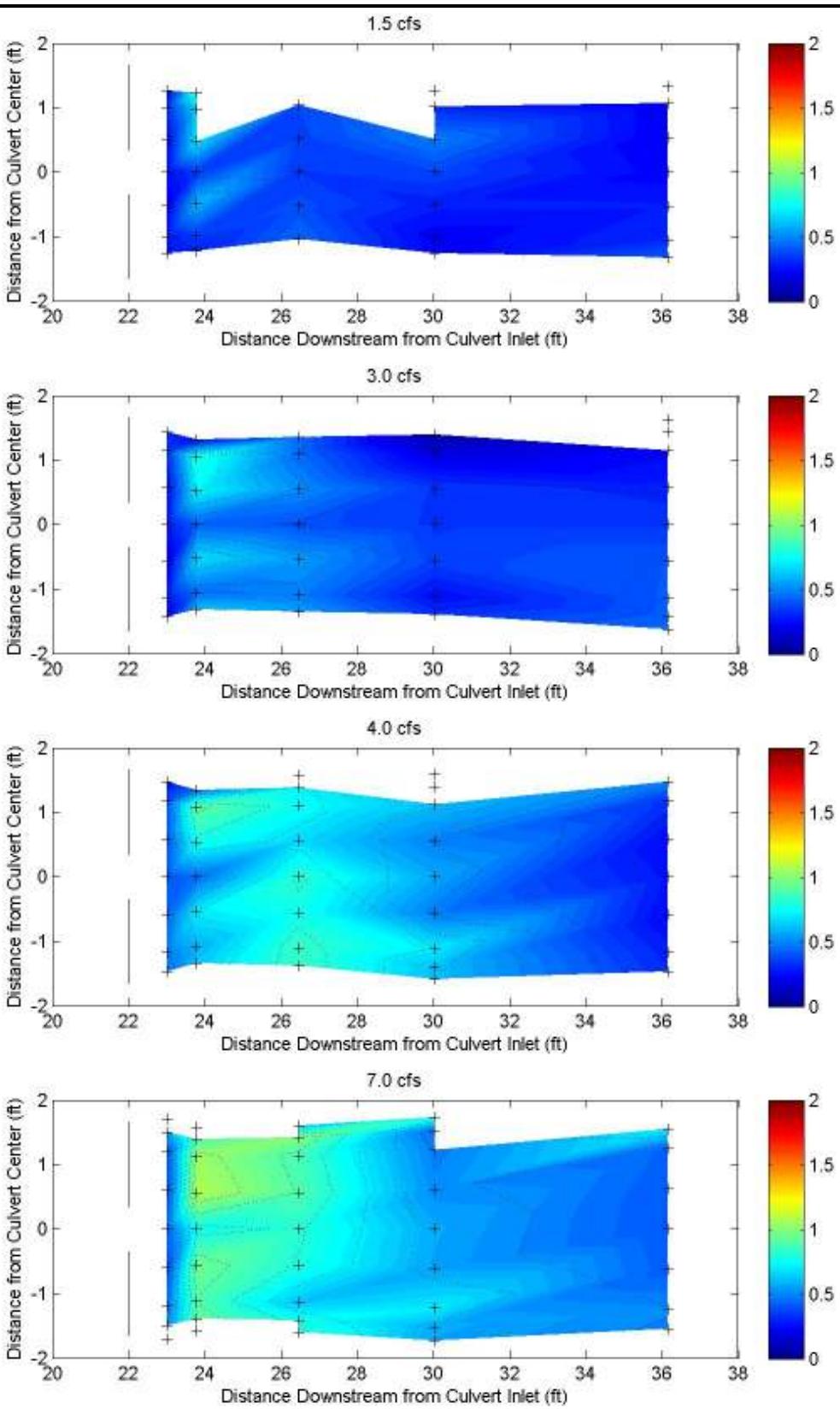
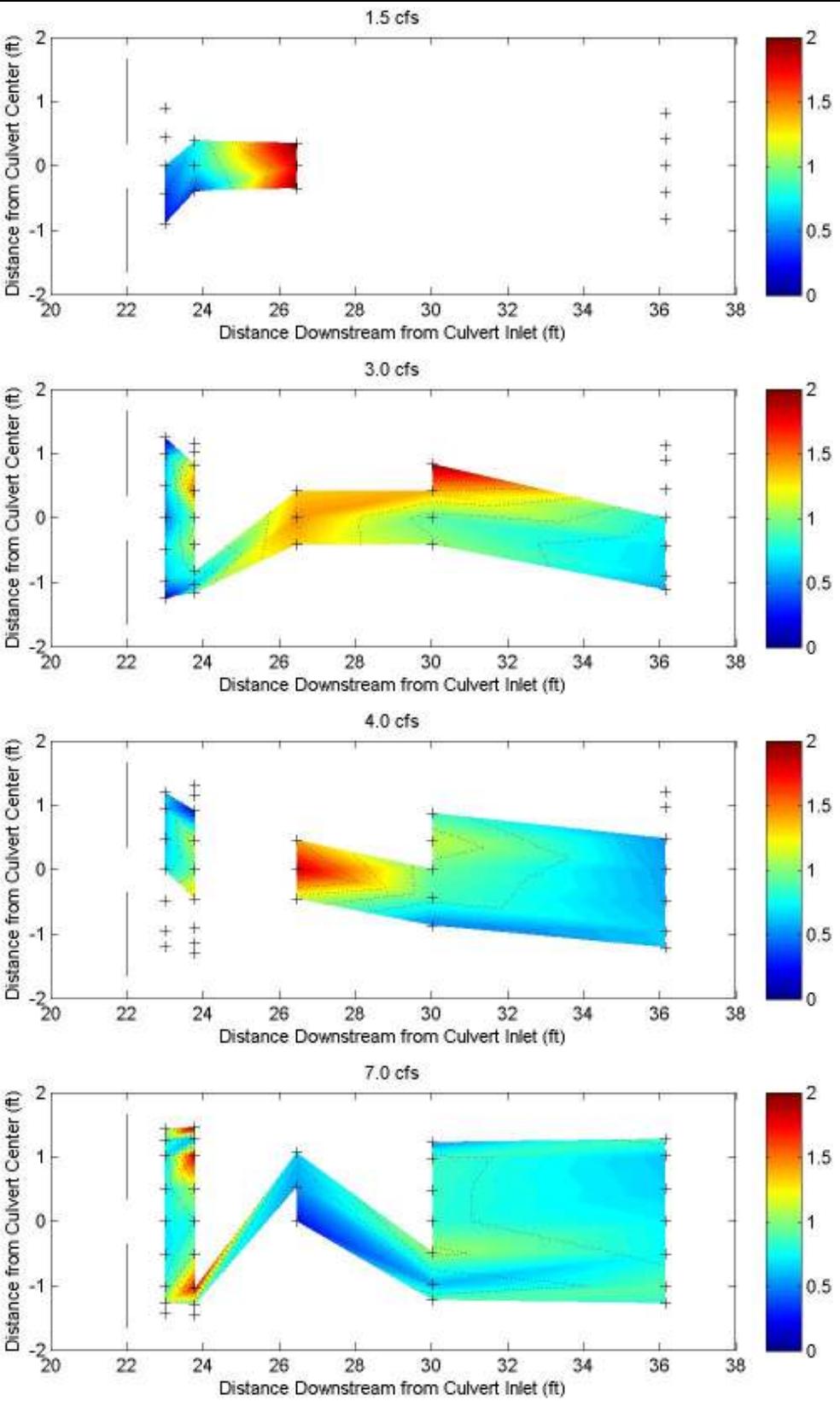


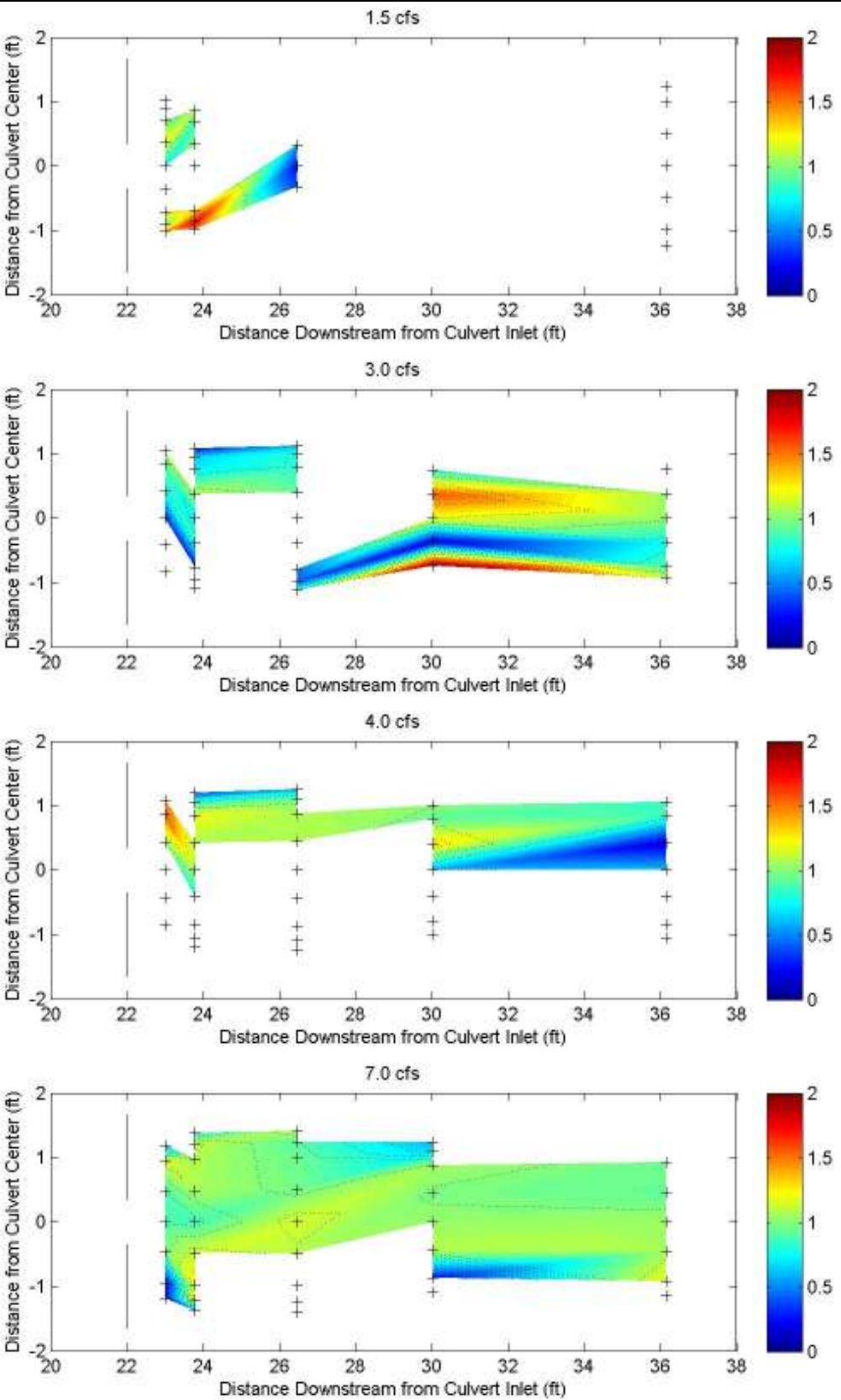
Fig. C18. Average lateral velocity (ft/s) for slotted-weir baffles at 4.33% slope.



**Fig. C19. Average TI (ft/s) for slotted-weir baffles at 1.14% slope.**



**Fig. C20. Average TI (ft/s) for slotted-weir baffles at 3.00% slope.**



**Fig. C21. Average TI (ft/s) for slotted-weir baffles at 4.33% slope.**

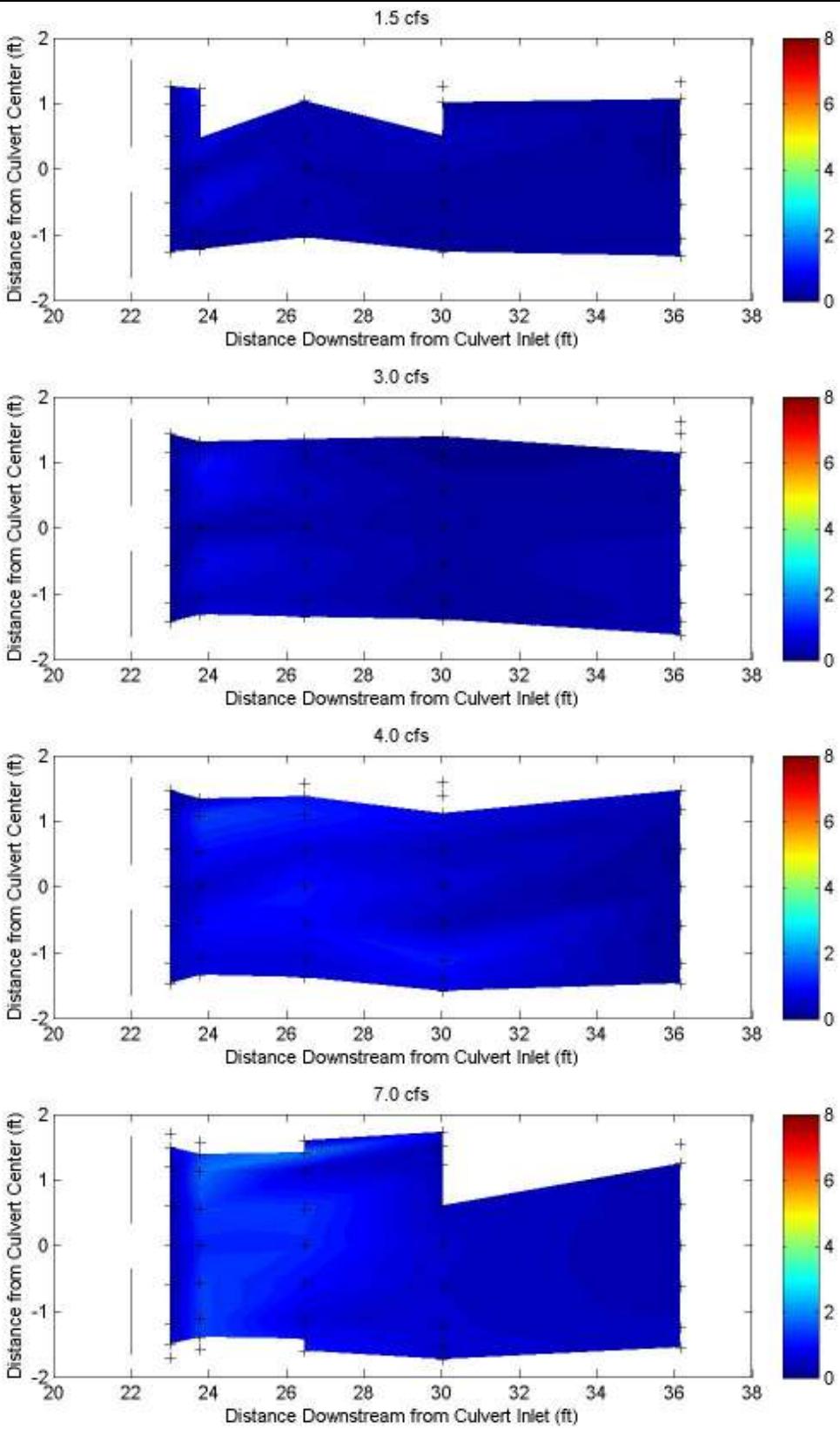


Fig. C22. Average TKE ( $\text{ft}^2/\text{s}^2$ ) for slotted-weir baffles at 1.14% slope.

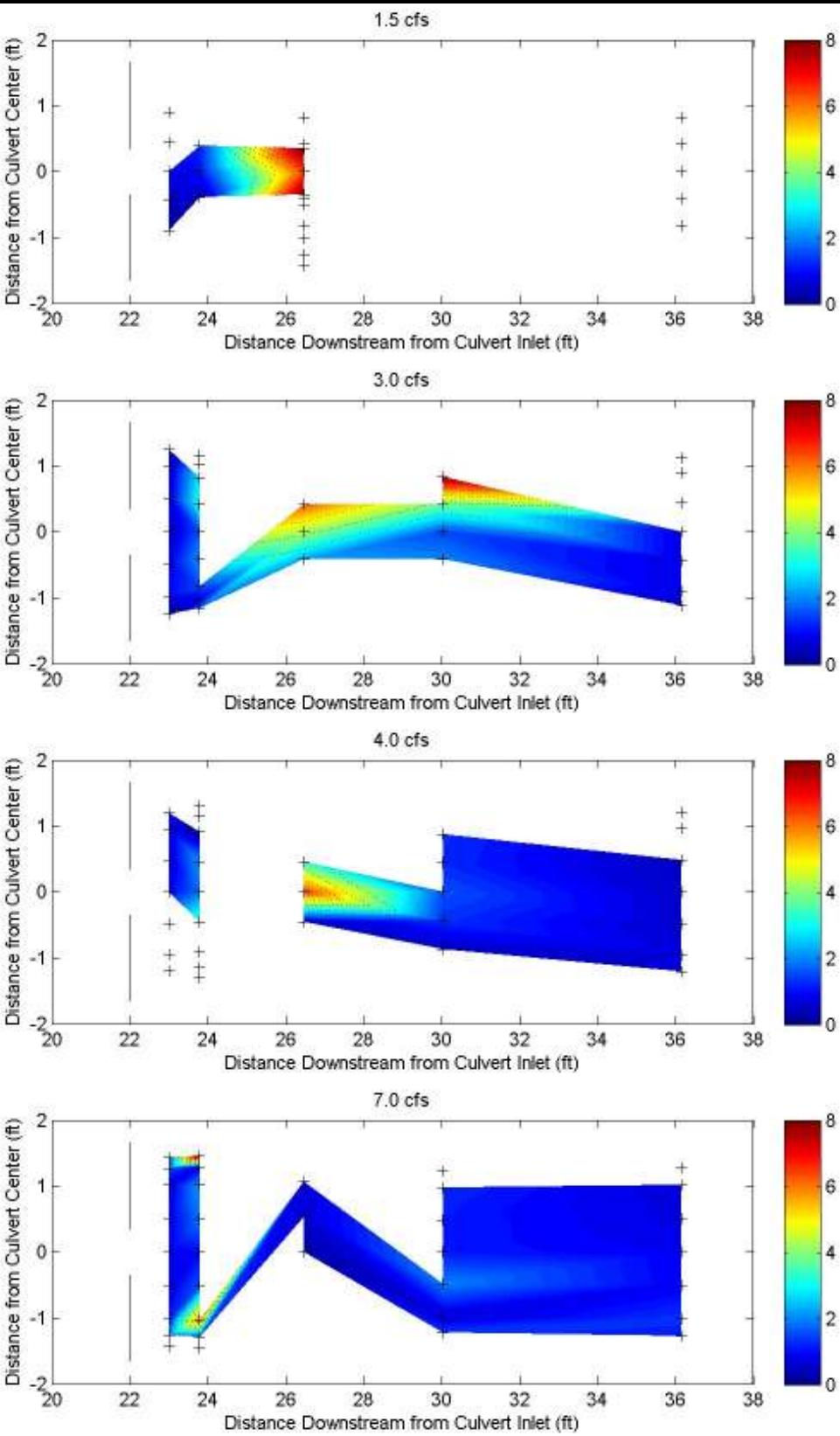


Fig. C23. Average TKE ( $\text{ft}^2/\text{s}^2$ ) for slotted-weir baffles at 3.00% slope.

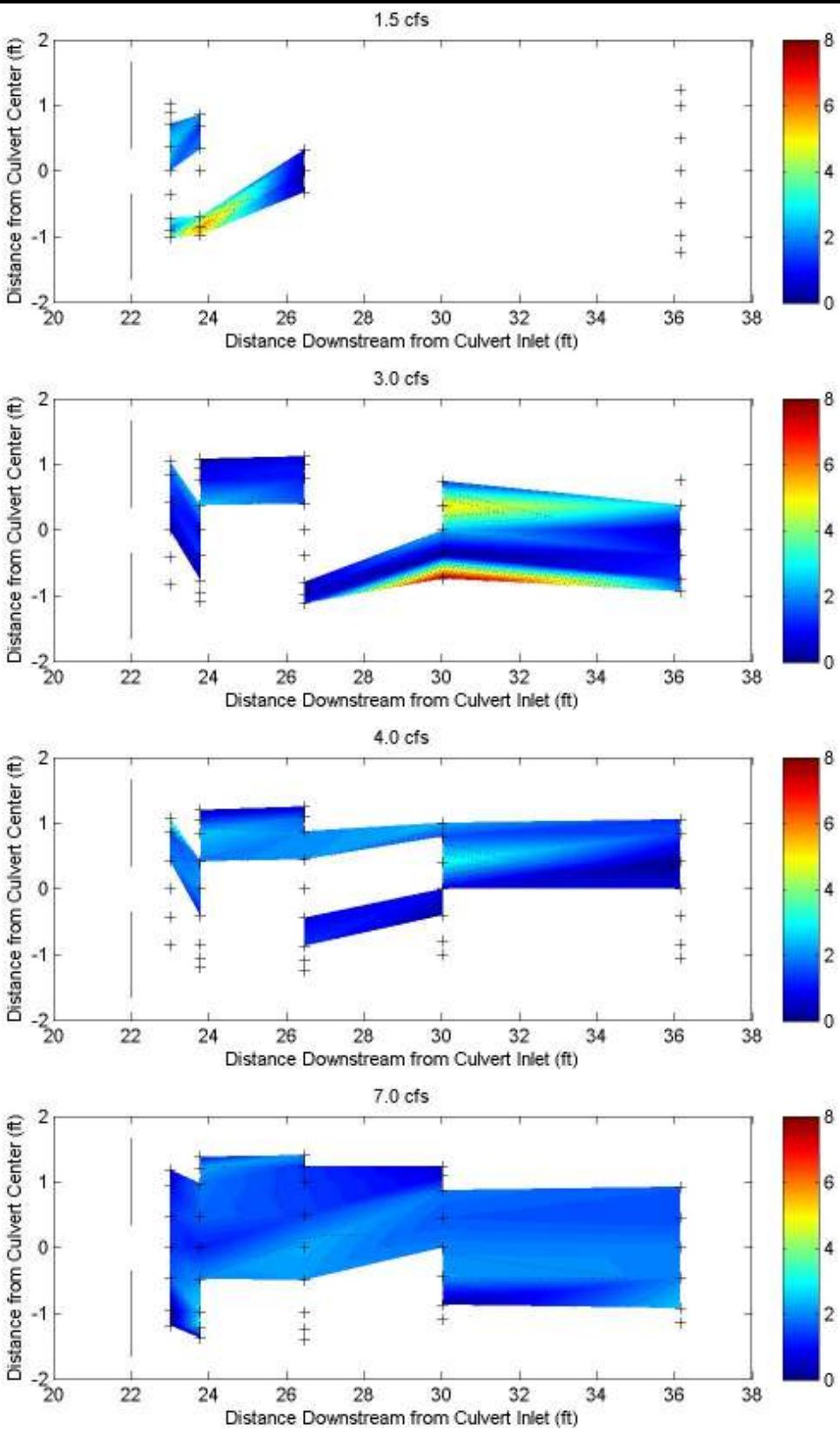


Fig. C24. Average TKE ( $\text{ft}^2/\text{s}^2$ ) for slotted-weir baffles at 4.33% slope.

## APPENDIX D—DIMENSIONLESS DISCHARGE COMPARISON

Numerous experimental studies have been performed on culverts with various baffle types, and flow equations have been developed to predict the flow depth for any given discharge, culvert diameter, or slope. Based on experimental observations, a relationship was developed between the dimensionless discharge,  $Q_*$ , and the relative depth of the flow,  $y_0/D$  (Rajaratnam et al. 1988). The relations take the form  $Q_* = Q / \sqrt{gS_0D^5} = C(y_0 / D)^n$ , where  $Q$  is the flow rate,  $g$  is the acceleration due to gravity,  $S_0$  is the culvert slope  $C$  is a coefficient,  $y_0$  is the characteristic flow depth,  $D$  is the culvert diameter, and  $n$  is a exponent. Below are comparisons between results from this experiment and dimensionless discharge equations published for similar baffle types.

### Sloped-weir Baffles

Rajaratnam and Katopodis (1990) showed that in a culvert fitted with weir baffles the dimensionless discharge can be described with the following equation:

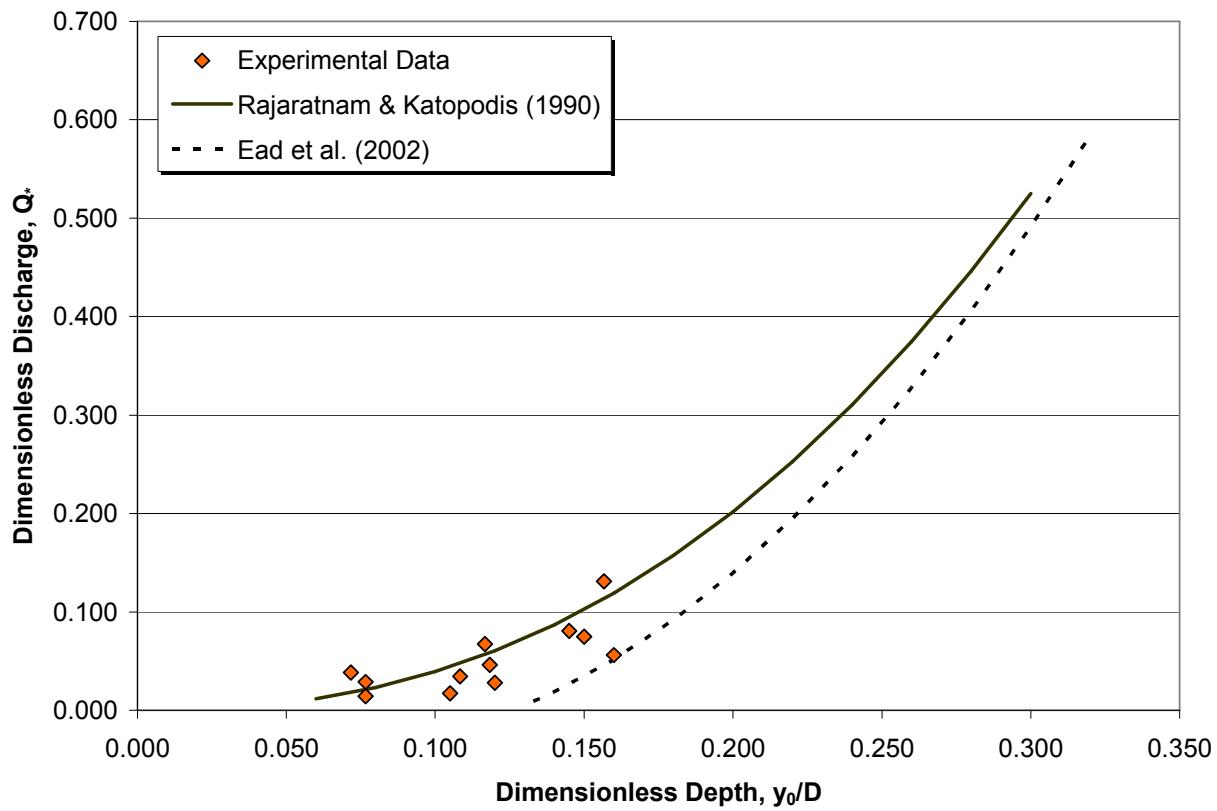
$$Q_* = 9.0(y_0 / D)^{2.36} \quad (\text{D1})$$

Equation (C1) was developed for horizontally level baffles, a baffle height to culvert diameter ( $h/D$ ) ratio of 0.10, a baffle spacing length to culvert diameter ( $L/D$ ) ratio of 1.2. The sloped-weir baffles used in this study were set at a 4 degree angle from the horizontal,  $h/D$  equaled 0.09, and  $L/D$  equaled 2.5.

Ead et al. (2002) performed a comprehensive analysis of studies conducted with baffles in culverts, and developed the following equation to describe the mean dimensionless discharge for any baffle type with  $h/D$  equal to 0.10:

$$Q_* = 9.39(y_0 / D)^2 - 1.18(y_0 / D) \quad (\text{D2})$$

A comparison of the dimensionless discharge obtained using sloped-weir baffles to equations (C1) and (C2) is shown in Fig. C1. Values for  $y_0$  were collected in the center of the culvert 2.46 m downstream from the central baffle. The experimental data fits well with the equation developed by Rajaratnam and Katopodis (1990) even though the  $L/D$  for this experiment was two times greater than the  $L/D$  used by Rajaratnam and Katopodis. Also, the sloped nature of the baffles did not have a large impact on the dimensionless discharge. The Ead et al. (2002) equation was less accurate at predicting the dimensionless discharge for sloped-weir baffles, which was expected since the equation represents a mean-fitting curve to more than one baffle type.



**Fig. D1. Comparison of dimensionless discharge for sloped-weir baffles.**

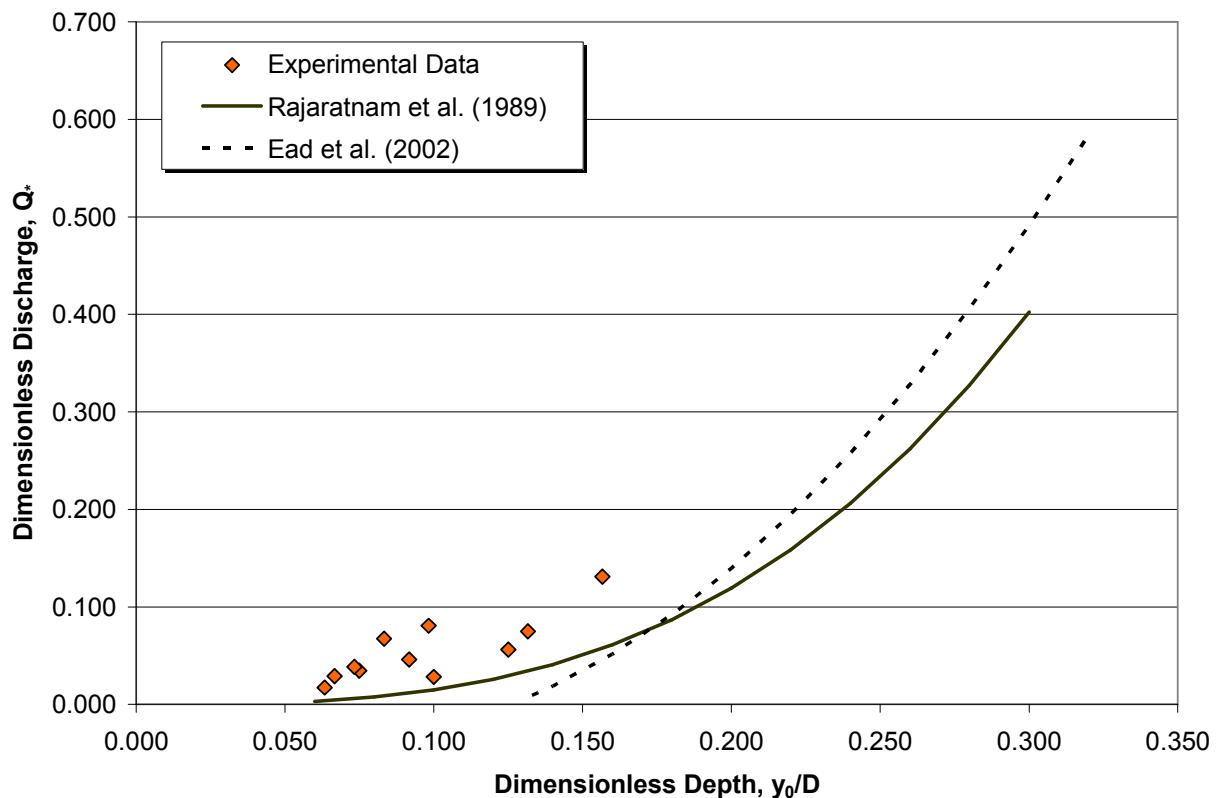
### Slotted-weir Baffles

Rajaratman et al. (1989) developed a dimensionless discharge equation for slotted-weir baffles:

$$Q_* = 14.9(y_0 / D)^{3.0} \quad (\text{D3})$$

Equation (C3) was developed with  $h/D$  equal to 0.10,  $L/D$  equal to 1.2, and  $b_0/D$  equal to 0.10, where  $b_0$  is the slot width. This experiment with slotted-weir baffles had  $h/D$  equal to 0.09,  $L/D$  equal to 2.5, and  $b_0/D$  equal to 0.10.

A comparison of the dimensionless discharge obtained using slotted-weir baffles in this experiment to equations (C2) and (C3) is shown in Fig. C2. The equation developed by Rajaratnam et al. (1989) fits the experimental data best, although all the experiment produced greater dimensionless discharges for a given  $y_0/D$  than equations (C2) and (C3) predict. Because the baffle spacing in this experiment is more than two times greater than the conditions in which equation (C3) was developed, smaller flow depths occurred resulting in smaller  $y_0/D$  values for a given  $Q_*$ . The Ead et al. (2002) equation did not fit the experimental data well.



**Fig. D2. Comparison of dimensionless discharge for slotted-weir baffles.**

## References

- Ead, S. A., Rajaratnam, N., and Katopodis, C. (2002). "Generalized Study of Hydraulics of Culvert Fishways." *Journal of Hydraulic Engineering*, 128(11), 1018-1022.
- Rajaratnam, N., Katopodis, C., and McQuitty, N. (1989). "Hydraulics of culvert fishways II: slotted-weir culvert fishways." *Canadian Journal of Civil Engineering*, 16(3), 375-383.
- Rajaratnam, N., and Katopodis, C. (1990). "Hydraulics of culvert fishways III: weir baffle culvert fishways." *Canadian Journal of Civil Engineering*, 17(4), 558-568.

## APPENDIX E—MATLAB CODE

Following is the MATLAB code used for creating contour plots for velocities, TKE and TI.

### Velocity Contour Plots

```
%%This .m file imports data from an Excel spreadsheet and creates
%%the matrices for the x-locations along the length of the culvert,
%%adjusted lateral distances (looking upstream), and the velocity
%%components.

clear all;

%Specify the directory in which the Excel file is in:
direct='C:\Documents and Settings\Owner\My Documents\Thesis\Albrook
Tests\Processed Data (2)\Sloped-weir Baffles\1.14%\4.0 cfs';

%Specify the Excel file name:
filename='Velocity Profiles (4 cfs).xls';

%Combine the directory and file name:
full_directory=[direct '\'' filename'];

%Display the Excel directory and filename to the user:
disp(['Reading the following Excel file: ' full_directory])

%Specify the sheet name:
sheet='ALL XS (2)';

%Specify the data range that MATLAB will read from the specified sheet:
data_range='B5:DD50';

%Create an array by reading in the specified data range:
DATA= xlsread(full_directory, sheet, data_range);

%Separate the data range into components:
lateral1=DATA(:,5);           %Creates matrix of the adjusted lateral positions
lateral2=DATA(:,23);
lateral3=DATA(:,41);
lateral4=DATA(:,59);
lateral5=DATA(:,77);
%lateral6=DATA(:,95);
average_vx1=DATA(:,8); %Creates matrix of vertically averaged Vx values
average_vx2=DATA(:,26);
average_vx3=DATA(:,44);
average_vx4=DATA(:,62);
average_vx5=DATA(:,80);
%average_vx6=DATA(:,98); %Creates matrix of vertically averaged Vy values
average_vy1=DATA(:,11);
average_vy2=DATA(:,29);
average_vy3=DATA(:,47);
average_vy4=DATA(:,65);
```

```

average_vy5=DATA(:,83);
%average_vy6=DATA(:,101); %Creates matrix of vertically averaged Vz values
average_vz1=DATA(:,14);
average_vz2=DATA(:,32);
average_vz3=DATA(:,50);
average_vz4=DATA(:,68);
average_vz5=DATA(:,86);
%average_vz6=DATA(:,104);
average_vmean1=DATA(:,16); %Creates matrix of vertically averaged mean
velocity values
average_vmean2=DATA(:,34);
average_vmean3=DATA(:,52);
average_vmean4=DATA(:,70);
average_vmean5=DATA(:,88);
%average_vmean6=DATA(:,106);

%Combine the lateral and velocity matrices:
combine1=[lateral1, average_vx1, average_vy1, average_vz1, average_vmean1];
combine2=[lateral2, average_vx2, average_vy2, average_vz2, average_vmean2];
combine3=[lateral3, average_vx3, average_vy3, average_vz3, average_vmean3];
combine4=[lateral4, average_vx4, average_vy4, average_vz4, average_vmean4];
combine5=[lateral5, average_vx5, average_vy5, average_vz5, average_vmean5];
%combine6=[lateral6, average_vx6, average_vy6, average_vz5, average_vmean6];

%Cut out the rows with repeated adjusted lateral values for each cross
%section represented by "combine" matrices.
for b=1:5
    for ii=1:length(combine1) %Cross section 1
        if ii==length(combine1)
            break;
        elseif ii>length(combine1)
            break;
        elseif combine1(ii+1,1)==combine1(ii,1)
            combine1(ii+1,:)=[];
        end
    end
end

for b=1:5
    for ii=1:length(combine2) %Cross section 2
        if ii==length(combine2)
            break;
        elseif ii>length(combine2)
            break;
        elseif combine2(ii+1,1)==combine2(ii,1)
            combine2(ii+1,:)=[];
        end
    end
end

for b=1:5
    for ii=1:length(combine3) %Cross section 3
        if ii==length(combine3)
            break;
        elseif ii>length(combine3)
            break;
    end

```

```

        elseif combine3(ii+1,1)==combine3(ii,1)
            combine3(ii+1,:)=[];
        end
    end
end

for b=1:5
    for ii=1:length(combine4)           %Cross section 4
        if ii==length(combine4)
            break;
        elseif ii>length(combine4)
            break;
        elseif combine4(ii+1,1)==combine4(ii,1)
            combine4(ii+1,:)=[];
        end
    end
end

for b=1:5
    for ii=1:length(combine5)           %Cross section 5
        if ii==length(combine5)
            break;
        elseif ii>length(combine5)
            break;
        elseif combine5(ii+1,1)==combine5(ii,1)
            combine5(ii+1,:)=[];
        end
    end
end

%for b=1:5
%    for ii=1:length(combine6)           %Cross section 6
%        if ii==length(combine6)
%            break;
%        elseif ii>length(combine6)
%            break;
%        elseif combine6(ii+1,1)==combine6(ii,1)
%            combine6(ii+1,:)=[];
%        end
%    end
%end

%Make each "combine" matrix the same size:
c=length(combine1);
d=length(combine2);
e=length(combine3);           %Finds the length of each "combine" matrix
f=length(combine4);
g=length(combine5);
%h=length(combine6);

k=[c d e f g];
minimum=min(k);           %Finds the required length for all matrices

for rr=1:length(combine1)           %Cross section 1
    if length(combine1)>minimum
        combine1(minimum+1,:)=[];

```

```

        end
    end

for rr=1:length(combine2)           %Cross section 2
    if length(combine2)>minimum
        combine2(minimum+1,:)=[];
    end
end

for rr=1:length(combine3)           %Cross section 3
    if length(combine3)>minimum
        combine3(minimum+1,:)=[];
    end
end

for rr=1:length(combine4)           %Cross section 4
    if length(combine4)>minimum
        combine4(minimum+1,:)=[];
    end
end

for rr=1:length(combine5)           %Cross section 5
    if length(combine5)>minimum
        combine5(minimum+1,:)=[];
    end
end

%for rr=1:length(combine6)           %Cross section 6
%    if length(combine6)>minimum
%        combine6(minimum+1,:)=[];
%    end
%end

%Put all the columns from the "combine" matrices that represent the
%adjusted lateral distances into the same matrix:
Lateral=[combine1(:,1) combine2(:,1) combine3(:,1) combine4(:,1)
combine5(:,1)];

%Put all the columns from the "combine" matrices that represent the
%vertically averaged Vx values into the same matrix:

Vx=[combine1(:,2) combine2(:,2) combine3(:,2) combine4(:,2) combine5(:,2)];

%Put all the columns from the "combine" matrices that represent the
%vertically averaged Vy values into the same matrix:

Vy=[combine1(:,3) combine2(:,3) combine3(:,3) combine4(:,3) combine5(:,3)];

%Put all the columns from the "combine" matrices that represent the
%vertically averaged Vz values into the same matrix:

Vz=[combine1(:,4) combine2(:,4) combine3(:,4) combine4(:,4) combine5(:,4)];

%Put all the columns from the "combine" matrices that represent the

```

```

%vertically averaged Vmean values into the same matrix:

Vmean=[combine1(:,5) combine2(:,5) combine3(:,5) combine4(:,5)
combine5(:,5)];

%Create the x location matrix. The x-locations are fixed for all test
%conditions. There are 6 cross sections, with the axis origin starting
%at the culvert inlet.
x_location=[23.01 23.79 26.47 30.03, 36.15];
X=repmat(x_location,minimum,1);

%%This .m file plots the Velocity surface profiles

%Baffle location:
x_baffle=22.00;
y_baffle=-1.65:0.001:1.65;
%y_baffle1=-1.65:0.001:-.35;
%y_baffle2=0.35:0.001:1.65;

%Plotting the vertically averaged Vx values:
subplot(2,1,1)
pcolor(X,Lateral,Vx), shading interp
hold on
contour(X,Lateral,Vx,:k')

%Plotting the baffles:
plot(x_baffle,y_baffle,'k','linewidth',50);
%plot(x_baffle,y_baffle1,'k','linewidth',100);
%plot(x_baffle,y_baffle2,'k','linewidth',100);

%Plotting the measurement locations:
plot(X,Lateral,'+k');

%Quivers
scale=.75;
hq=quiver(X,Lateral,Vx*scale,Vy*scale,0);
set(hq,'color','k','linewidth',1.25)

%Colorbar information
%load('BWR_colormap','mycmap');
%set(gcf,'Colormap',mycmap);
caxis([-1 3]);
colorbar
axis([20 38 -2 2])
xlabel('Distance Downstream from Culvert Inlet (ft)')
ylabel('Distance from Culvert Center (ft)')
title('Vertically Averaged Vx Values (ft^2/s^2)')

%Plotting the vertically average Vy values:
subplot(2,1,2)
pcolor(X,Lateral,Vy), shading interp
hold on
contour(X,Lateral,Vx,:k')

```

```

%Plotting the baffles:
plot(x_baffle,y_baffle,'k','linewidth',50);
%plot(x_baffle,y_baffle1,'k','linewidth',100);
%plot(x_baffle,y_baffle2,'k','linewidth',100);

%Plotting the measurement locations:
plot(X,Lateral,'+k');

%Quivers
%scale=.75;
%hq=quiver(X,Lateral,Vx*scale,Vy*scale,0);
%set(hq,'color','k','linewidth',1.25)

%Colorbar information
%load('MyColormaps','mycmap');
%set(gcf,'Colormap',mycmap);
caxis([-1 1]);
colorbar
axis([20 38 -2 2])
xlabel('Distance Downstream from Culvert Inlet (ft)')
ylabel('Distance from Culvert Center (ft)')
title('Vertically Averaged Vy Values (ft^2/s^2)')

%Print the figure to a file for later use:
%print -djpeg TI_slotted_70_433

```

## TI Contour Plots

```

%%This .m file imports data from an Excel spreadsheet and creates
%%the matrices for the x-locations along the length of the culvert,
%%adjusted lateral distances (looking upstream), and the vertically
%%averaged mean TI values.

clear all;

%Specify the directory in which the Excel file is in:
direct='C:\Documents and Settings\Owner\My Documents\Thesis\Albrook
Tests\Processed Data (2)\Slotted-weir Baffles\4.33%\7.0 cfs';

%Specify the Excel file name:
filename='TI Profiles (7 cfs).xls';

%Combine the directory and file name:
full_directory=[direct '\'' filename];

%Display the Excel directory and filename to the user:
disp(['Reading the following Excel file: ' full_directory])

%Specify the sheet name:
sheet='ALL XS (2)';

%Specify the data range that MATLAB will read from the specified sheet:

```

```

data_range='B5:CX50';

%Create an array by reading in the specified data range:
DATA= xlsread(full_directory, sheet, data_range);

%Separate the data range into components:
lateral1=DATA(:,6); %Creates matrix of the adjusted lateral positions
lateral2=DATA(:,23);
lateral3=DATA(:,40);
lateral4=DATA(:,57);
lateral5=DATA(:,74);

average_ti1=DATA(:,16); %Creates matrix of vertically averaged TI values
average_ti2=DATA(:,33);
average_ti3=DATA(:,50);
average_ti4=DATA(:,67);
average_ti5=DATA(:,84);

%Combine the lateral and ti matrices:
%Lateral=[lateral1, lateral2, lateral3, lateral4, lateral5, lateral6];
%Average_tke=[average_tke1, average_tke2, average_tke3, average_tke4,
average_tke5, average_tke6];
%Combine=[Lateral, Average_tke];
combine1=[lateral1, average_ti1];
combine2=[lateral2, average_ti2];
combine3=[lateral3, average_ti3];
combine4=[lateral4, average_ti4];
combine5=[lateral5, average_ti5];

%Cut out the rows with repeated adjusted lateral values for each cross
%section, represented by "combine" matrices.
for b=1:5
    for ii=1:length(combine1) %Cross section 1
        if ii==length(combine1)
            break;
        elseif ii>length(combine1)
            break;
        elseif combine1(ii+1,1)==combine1(ii,1)
            combine1(ii+1,:)=[];
        end
    end
end

for b=1:5
    for ii=1:length(combine2) %Cross section 2
        if ii==length(combine2)
            break;
        elseif ii>length(combine2)
            break;
        elseif combine2(ii+1,1)==combine2(ii,1)
            combine2(ii+1,:)=[];
        end
    end
end

```

```

end

for b=1:5
    for ii=1:length(combine3)           %Cross section 3
        if ii==length(combine3)
            break;
        elseif ii>length(combine3)
            break;
        elseif combine3(ii+1,1)==combine3(ii,1)
            combine3(ii+1,:)=[];
        end
    end
end

for b=1:5
    for ii=1:length(combine4)           %Cross section 4
        if ii==length(combine4)
            break;
        elseif ii>length(combine4)
            break;
        elseif combine4(ii+1,1)==combine4(ii,1)
            combine4(ii+1,:)=[];
        end
    end
end

for b=1:5
    for ii=1:length(combine5)           %Cross section 5
        if ii==length(combine5)
            break;
        elseif ii>length(combine5)
            break;
        elseif combine5(ii+1,1)==combine5(ii,1)
            combine5(ii+1,:)=[];
        end
    end
end

%Make each "combine" matrix the same size:
c=length(combine1);
d=length(combine2);
e=length(combine3);           %Finds the length of each "combine" matrix
f=length(combine4);
g=length(combine5);

k=[c d e f g];
minimum=min(k);           %Finds the required length for all matrices

for rr=1:length(combine1)           %Cross section 1
    if length(combine1)>minimum
        combine1(minimum+1,:)=[];
    end
end

```

```

for rr=1:length(combine2)           %Cross section 2
    if length(combine2)>minimum
        combine2(minimum+1,:)=[];
    end
end

for rr=1:length(combine3)           %Cross section 3
    if length(combine3)>minimum
        combine3(minimum+1,:)=[];
    end
end

for rr=1:length(combine4)           %Cross section 4
    if length(combine4)>minimum
        combine4(minimum+1,:)=[];
    end
end

for rr=1:length(combine5)           %Cross section 5
    if length(combine5)>minimum
        combine5(minimum+1,:)=[];
    end
end

%Put all the columns from the "combine" matrices that represent the
%adjusted lateral distances into the same matrix:
Lateral=[combine1(:,1) combine2(:,1) combine3(:,1) combine4(:,1)
combine5(:,1)];

%Put all the columns from the "combine" matrices that represent the
%vertically averaged ti values into the same matrix:
TI=[combine1(:,2) combine2(:,2) combine3(:,2) combine4(:,2) combine5(:,2)];

%Create the x location matrix. The x-locations are fixed for all test
%conditions. There are 6 cross sections, with the axis origin starting
%at the culvert inlet.
x_location=[23.01 23.79 26.47 30.03 36.15];
X=repmat(x_location,minimum,1);

%%This .m file plots the TI surface profiles

%Baffle location:
x_baffle=22.00;
%y_baffle=-1.65:0.001:1.65;
y_baffle1=-1.65:0.001:-.35;
y_baffle2=0.35:0.001:1.65;

%Plotting the vertically averaged TI values:
subplot(2,1,1)
pcolor(X,Lateral,TI), shading interp
hold on

```

```

contour(X,Lateral,TI,:k')

%Plotting the baffles:
plot(x_baffle,y_baffle,'k','linewidth',50);
plot(x_baffle,y_baffle1,'k','linewidth',100);
plot(x_baffle,y_baffle2,'k','linewidth',100);

%Plotting the measurement locations:
plot(X,Lateral,'+k');

%Colorbar information
%load('MyColormaps','mycmap');
%set(gcf,'Colormap',mycmap);
caxis([0 2]);
colorbar
axis([20 38 -2 2])
xlabel('Distance Downstream from Culvert Inlet (ft)')
ylabel('Distance from Culvert Center (ft)')
title('Vertically Averaged TI Values (ft^2/s^2)')

%Print the figure to a file for later use:
print -djpeg TI_slotted_70_433

```

## TKE Contour Plots

%%This .m file imports data from an Excel spreadsheet and creates %%the matrices for the x-locations along the length of the culvert, %%adjusted lateral distances (looking upstream), and the vertically %%averaged TKE values.

```

clear all;

%Specify the directory in which the Excel file is in:
direct='C:\Documents and Settings\Owner\My Documents\Thesis\Albrook
Tests\Processed Data (2)\Slotted-weir Baffles\4.33%\7.0 cfs';

%Specify the Excel file name:
filename='TKE Profiles (7 cfs).xls';

%Combine the directory and file name:
full_directory=[direct '\' filename];

%Display the Excel directory and filename to the user:
disp(['Reading the following Excel file: ' full_directory])

%Specify the sheet name:
sheet='ALL XS (2)';

%Specify the data range that MATLAB will read from the specified sheet:
data_range='B5:BN50';

%Create an array by reading in the specified data range:
DATA= xlsread(full_directory, sheet, data_range);

```

```

%Separate the data range into components:
lateral1=DATA(:,6); %Creates matrix of the adjusted lateral positions
lateral2=DATA(:,17);
lateral3=DATA(:,28);
lateral4=DATA(:,39);
lateral5=DATA(:,50);

average_tke1=DATA(:,10); %Creates matrix of vertically averaged TKE values
average_tke2=DATA(:,21);
average_tke3=DATA(:,32);
average_tke4=DATA(:,43);
average_tke5=DATA(:,54);

%Combine the lateral and tke matrices:
%Lateral=[lateral1, lateral2, lateral3, lateral4, lateral5, lateral6];
%Average_tke=[average_tke1, average_tke2, average_tke3, average_tke4,
%average_tke5, average_tke6];
%Combine=[Lateral, Average_tke];
combine1=[lateral1, average_tke1];
combine2=[lateral2, average_tke2];
combine3=[lateral3, average_tke3];
combine4=[lateral4, average_tke4];
combine5=[lateral5, average_tke5];

%Cut out the rows with repeated adjusted lateral values for each cross
%section, represented by "combine" matrices.
for b=1:5
    for ii=1:length(combine1) %Cross section 1
        if ii==length(combine1)
            break;
        elseif ii>length(combine1)
            break;
        elseif combine1(ii+1,1)==combine1(ii,1)
            combine1(ii+1,:)=[];
        end
    end
end

for b=1:5
    for ii=1:length(combine2) %Cross section 2
        if ii==length(combine2)
            break;
        elseif ii>length(combine2)
            break;
        elseif combine2(ii+1,1)==combine2(ii,1)
            combine2(ii+1,:)=[];
        end
    end
end

for b=1:5
    for ii=1:length(combine3) %Cross section 3

```

```

        if ii==length(combine3)
            break;
        elseif ii>length(combine3)
            break;
        elseif combine3(ii+1,1)==combine3(ii,1)
            combine3(ii+1,:)=[];
        end
    end
end

for b=1:5
    for ii=1:length(combine4) %Cross section 4
        if ii==length(combine4)
            break;
        elseif ii>length(combine4)
            break;
        elseif combine4(ii+1,1)==combine4(ii,1)
            combine4(ii+1,:)=[];
        end
    end
end

for b=1:5
    for ii=1:length(combine5) %Cross section 5
        if ii==length(combine5)
            break;
        elseif ii>length(combine5)
            break;
        elseif combine5(ii+1,1)==combine5(ii,1)
            combine5(ii+1,:)=[];
        end
    end
end

%Make each "combine" matrix the same size:
c=length(combine1);
d=length(combine2);
e=length(combine3); %Finds the length of each "combine" matrix
f=length(combine4);
g=length(combine5);

k=[c d e f g];
minimum=min(k); %Finds the required length for all matrices

for rr=1:length(combine1) %Cross section 1
    if length(combine1)>minimum
        combine1(minimum+1,:)=[];
    end
end

for rr=1:length(combine2) %Cross section 2
    if length(combine2)>minimum
        combine2(minimum+1,:)=[];
    end

```

```

end

for rr=1:length(combine3)           %Cross section 3
    if length(combine3)>minimum
        combine3(minimum+1,:)=[];
    end
end

for rr=1:length(combine4)           %Cross section 4
    if length(combine4)>minimum
        combine4(minimum+1,:)=[];
    end
end

for rr=1:length(combine5)           %Cross section 5
    if length(combine5)>minimum
        combine5(minimum+1,:)=[];
    end
end

%Put all the columns from the "combine" matrices that represent the
%adjusted lateral distances into the same matrix:
Lateral=[combine1(:,1) combine2(:,1) combine3(:,1) combine4(:,1)
combine5(:,1)];

%Put all the columns from the "combine" matrices that represent the
%vertically averaged tke values into the same matrix:

TKE=[combine1(:,2) combine2(:,2) combine3(:,2) combine4(:,2) combine5(:,2)];

%Create the x location matrix. The x-locations are fixed for all test
%conditions. There are 6 cross sections, with the axis origin starting
%at the culvert inlet.
x_location=[23.01 23.79 26.47 30.03 36.15];
X=repmat(x_location,minimum,1);

%%This .m file plots the TKE surface profiles

%Baffle location:
x_baffle=22.00;
%y_baffle=-1.65:0.001:1.65;
y_baffle1=-1.65:0.001:-.35;
y_baffle2=0.35:0.001:1.65;

%Plotting the vertically averaged TKE values:
subplot(2,1,1)
pcolor(X,Lateral,TKE), shading interp
hold on
contour(X,Lateral,TKE,'k')

%Plotting the baffles:
%plot(x_baffle,y_baffle,'k','linewidth',100);
plot(x_baffle,y_baffle1,'k','linewidth',100);

```

```

plot(x_baffle,y_baffle2,'k','linewidth',100);

%Plotting the measurement locations:
plot(X,Lateral,'+k');

%Colorbar information
%load('MyColormaps','mycmap');
%set(gcf,'Colormap',mycmap);
caxis([0 8]);
colorbar
axis([20 38 -2 2])
xlabel('Distance Downstream from Culvert Inlet (ft)')
ylabel('Distance from Culvert Center (ft)')
title('Vertically Averaged TKE Values (ft^2/s^2)')

%Print the figure to a file for later use:
print -djpeg TKE_slotted_70_433

```