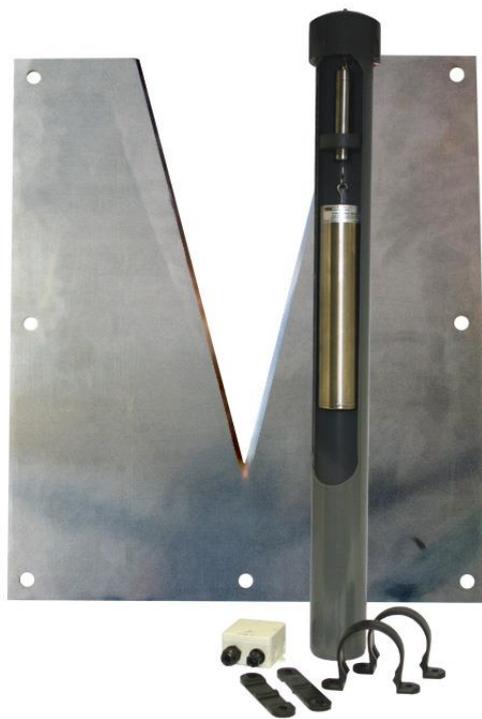


V-Notch Weir
User Manual



Man152	2.0.2	04/08/2014	Chris Spalton	Andy Small	Chris Rasmussen
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Section 2 : Introduction

Soil Instruments V-Notch Weirs are designed in accordance with BS3680:Part 4A:1981, which specifies the method for measurement of water flow in open channels using rectangular and triangular-notch (V-Notch) thin plate weirs.

The discharge over the thin-plate V-Notch Weirs is a function of the head on the weir, the size and shape of the discharge area, and an experimentally determined coefficient, which takes into account the head of the weir, the geometrical properties of the weir and approach channel and the dynamic properties of the water.

Discharge coefficients, which have been extrapolated from the standard, are applicable to water only in the approximate range of temperatures from 5 to 30°C. Using the coefficients for water temperatures several degrees outside this range will result in negligible error except at very small heads.

Section 3 : Equipment Supplied

Construction of the weir channel is the responsibility of the Main Contractor.

Equipment supplied for the V-Notch Weir installation is listed below:

- 2.1 Stainless Steel V-Notch Weir Plate and Fixings.
- 2.2 Removable Zinc Plated Carbon Steel Baffle with bottom, side guides and fixings.
- 2.3 Measuring Scale graduated in centimetres and millimetres.

Section 4 : Installation

Weir discharge is critically influenced by the physical characteristics of the weir and the weir channel. **Ensure that the dimensions of the weir channel comply with the pertinent Assembly/Installation Drawings referenced under Section 4 below.** Thin plate weirs are especially dependent on installation features, which control the velocity distribution in the approach channel and on the construction and maintenance of the weir crest in meticulous conformance with standard specifications.

Thin plate weirs shall be vertical and perpendicular to the walls of the channel, and the intersection of the weir plate with the walls and floor of the channel shall be watertight and firm.

Mark out and position the V-Notch Weir, baffle plate and measuring scale in accordance with the applicable Assembly/Installation Drawing. Ensure that the base of the graduated scale is level with the vertex (bottom of the V-Notch) of the weir plate. This can be done by blocking the weir channel behind the measurement point and filling the chamber with water to the level of the vertex.

Section 5 : Flow Measurement

Discharge of water over the weir is determined using the tables in the appendices. Each appendix pertains to a specific weir/weir channel arrangement as detailed in Assembly/Installation Drawings 2148-035 and 2148-040 (attached).

Discharge rates have been calculated in accordance with Clause 10.5 of the British Standard, which applies the Kindsvater-Shen Formula.

5.01 Accuracy

If great care is exercised in meeting the construction, installation and operational conditions specified, uncertainties (at 95% confidence level) attributable to the coefficients of discharge will be not greater than 1.0% of Full Scale.

5.02 Maintenance

Maintenance of the weir and the weir channel is necessary to ensure accurate measurements.

The approach channel and baffle plate shall be kept free from silt, vegetation and obstructions which might have deleterious effects on the flow conditions.

The weir plate shall be kept clean and firmly secured and steps taken to avoid damage to the notch particularly the upstream edges and surfaces.

Figure 1: 15 Litres/Second 28.4° V-Notch Weir Installation Details

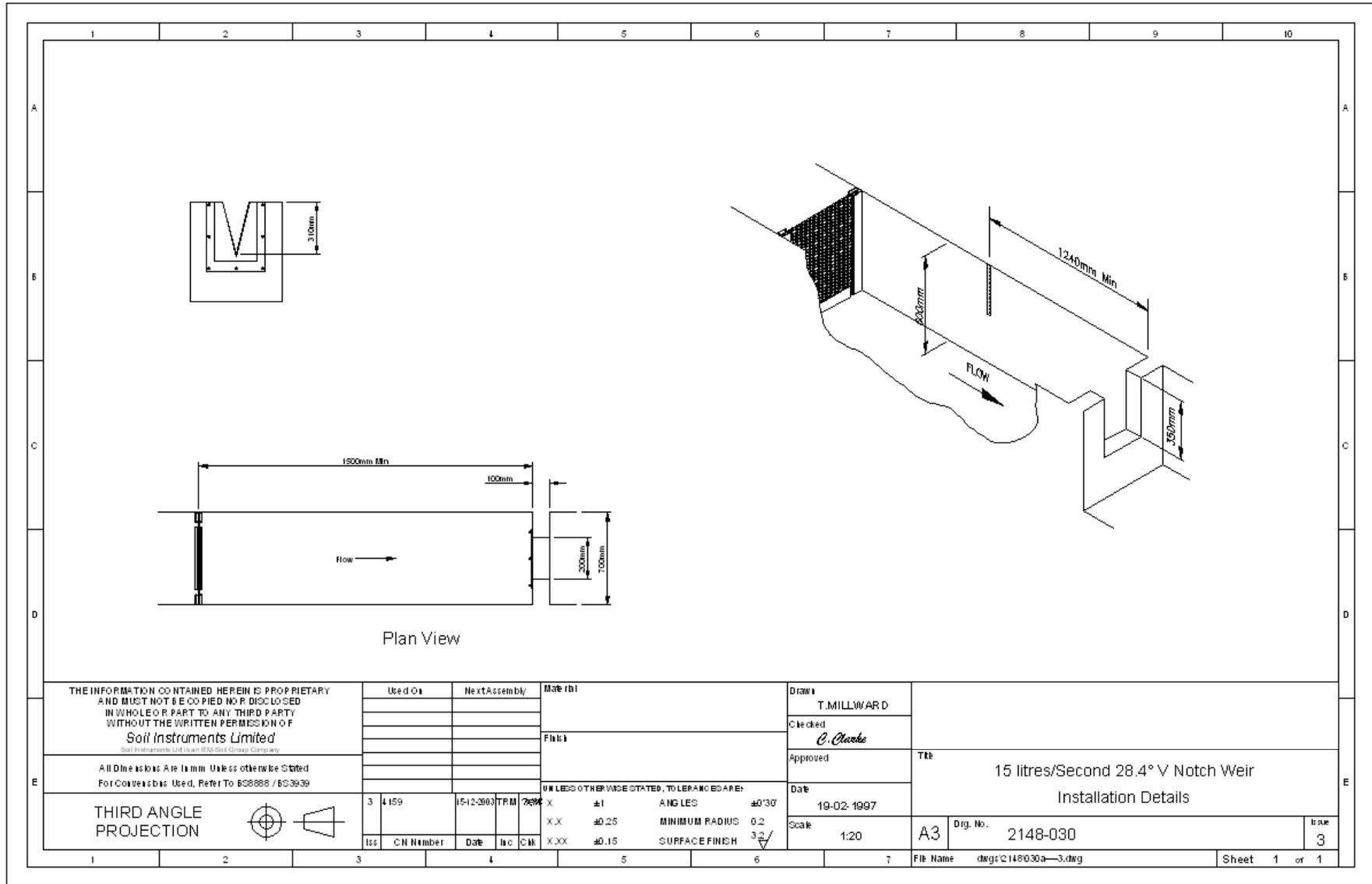


Figure 2: 30 Litres/Second 53.8° V-Notch Weir Installation Details

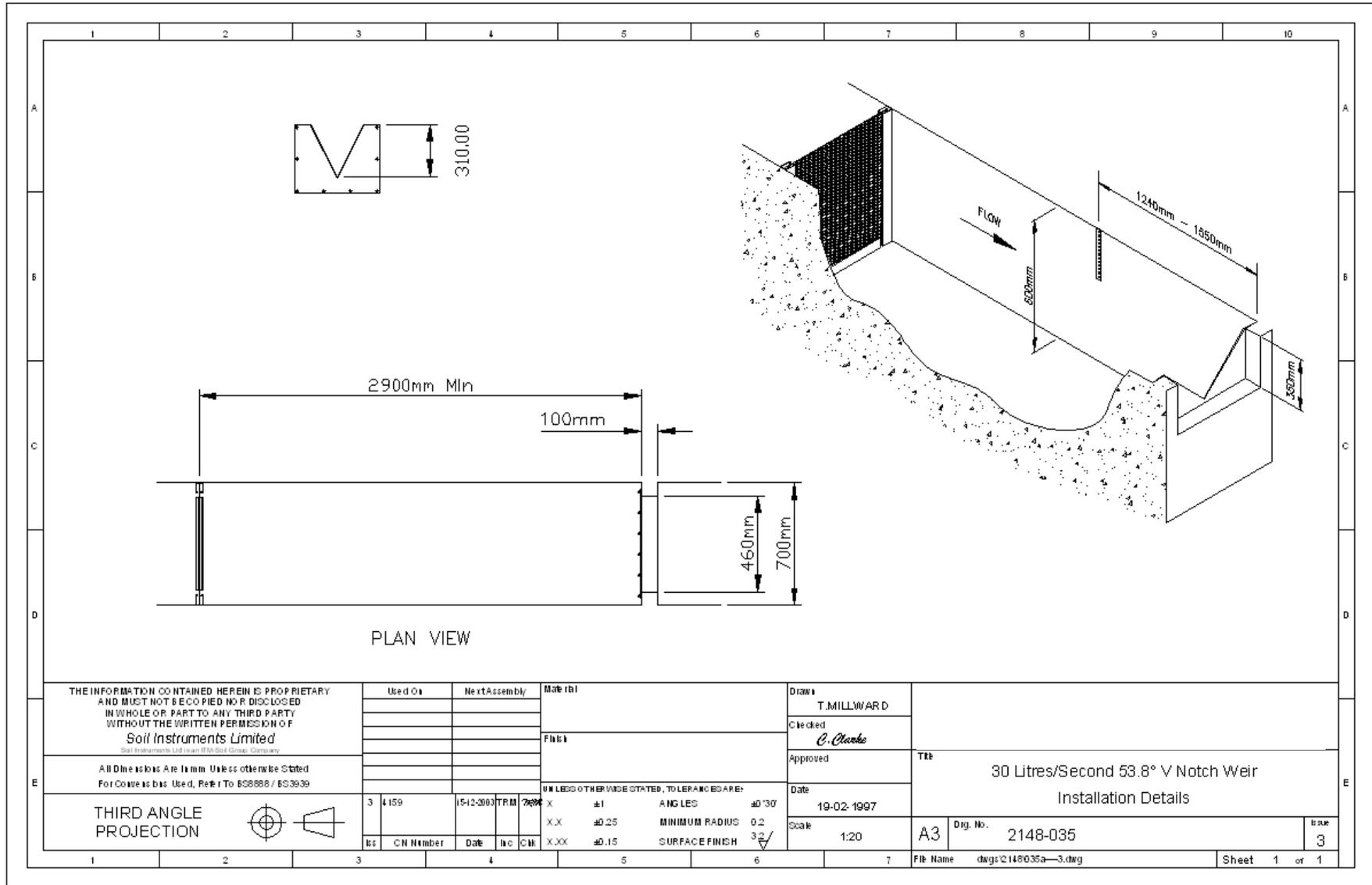


Figure 3: 65 Litres/Second 90° V-Notch Weir Installation Details

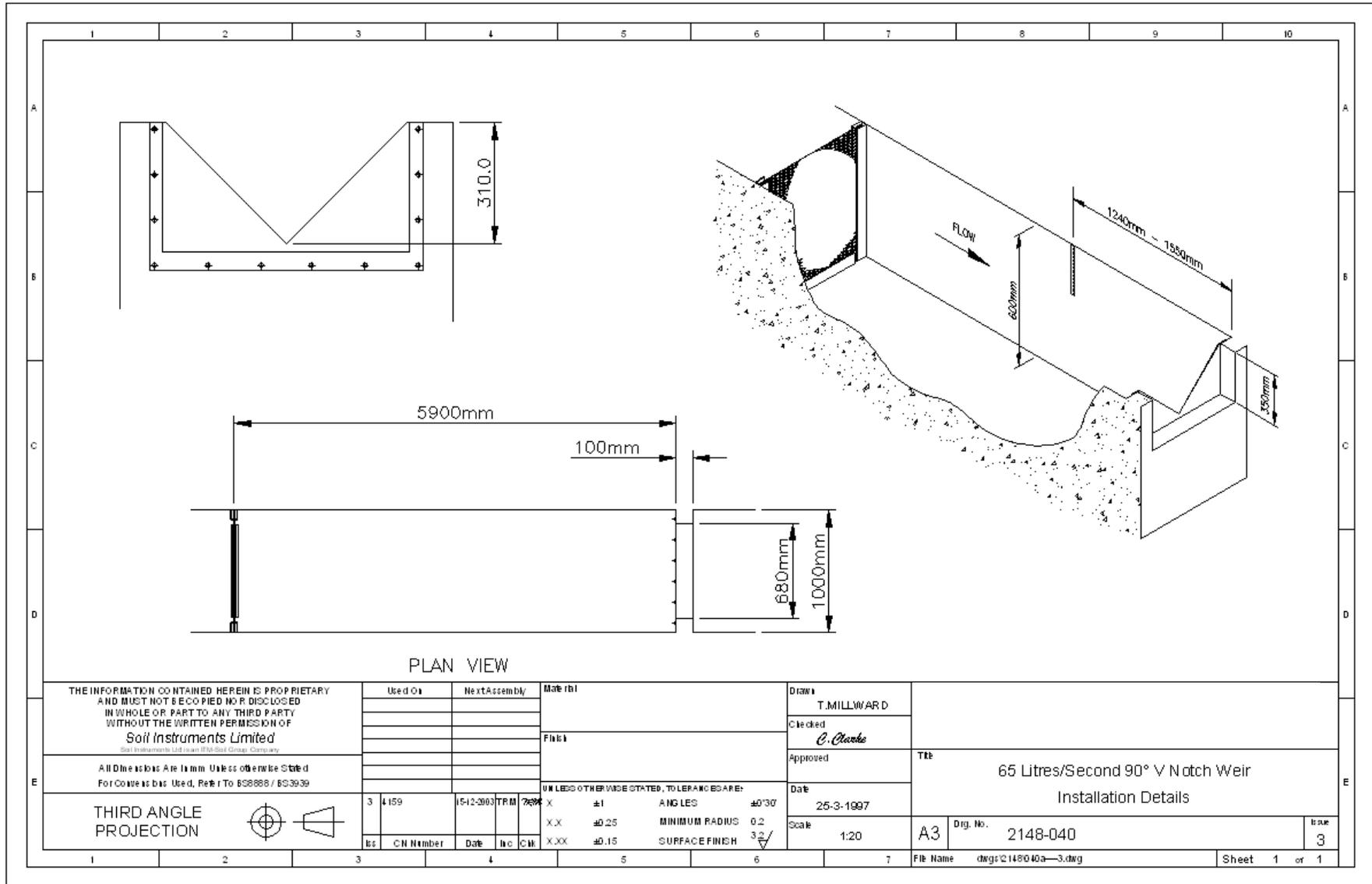
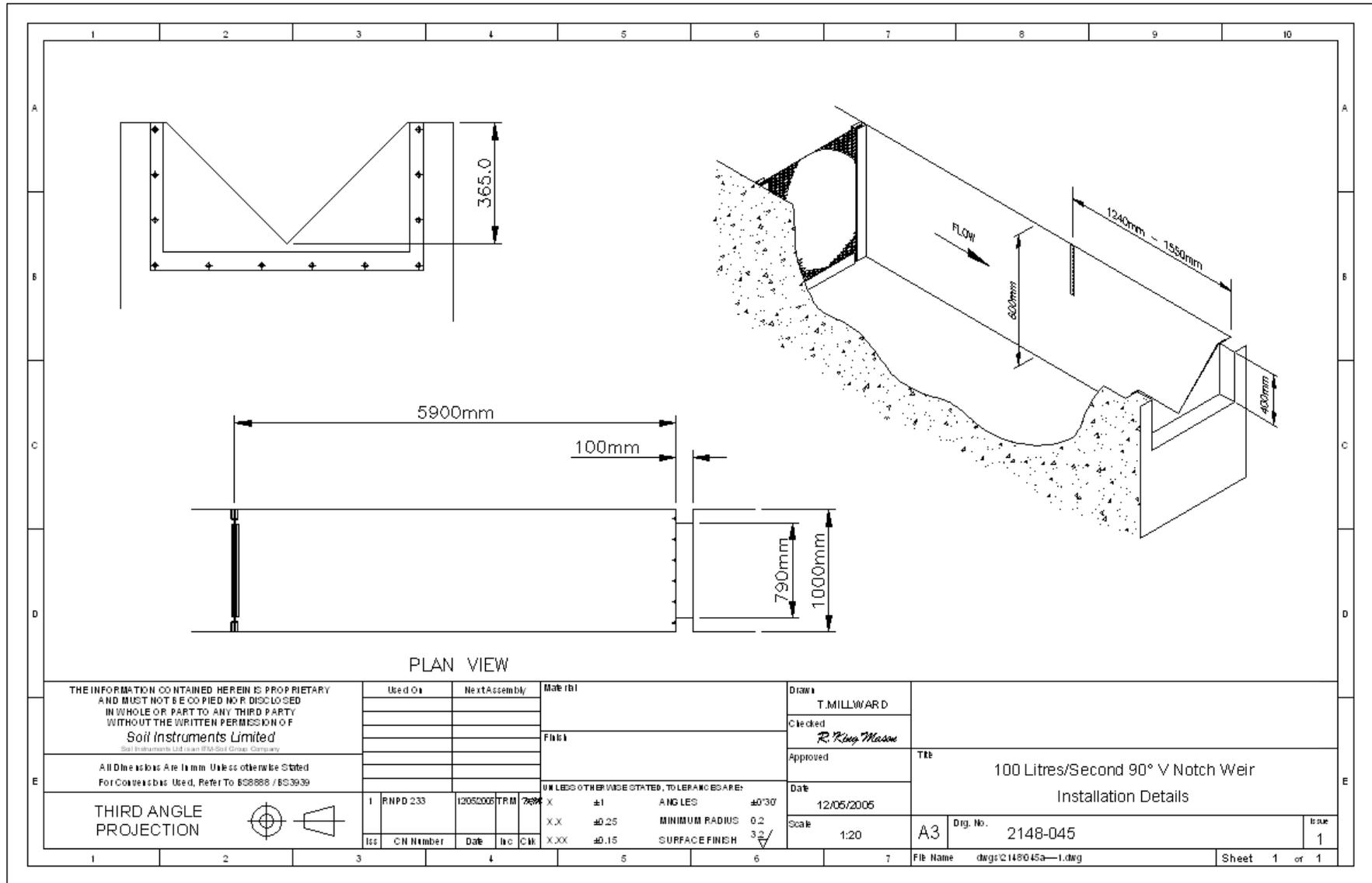


Figure 4: 100 Litres/Second 90° V-Notch Weir Installation Details



Appendix A. Flows for Weir angles 90, 53 & 28 degrees

Head cm	Discharge l/s			Head cm	Discharge l/s		
	100 l/s 65 l/s 90° V Notch	30 l/s 53° V Notch	15 l/s 28° V Notch		100 l/s 65 l/s 90° V Notch	30 l/s 53° V Notch	15 l/s 28° V Notch
6.0	1.2	0.6	0.3	14.0	10.3	5.2	2.7
6.1	1.3	0.7	0.3	14.1	10.5	5.3	2.7
6.2	1.3	0.7	0.4	14.2	10.7	5.4	2.8
6.3	1.4	0.7	0.4	14.3	10.9	5.5	2.8
6.4	1.5	0.7	0.4	14.4	11.0	5.6	2.9
6.5	1.5	0.8	0.4	14.5	11.2	5.7	2.9
6.6	1.6	0.8	0.4	14.6	11.4	5.8	3.0
6.7	1.6	0.8	0.4	14.7	11.6	5.9	3.0
6.8	1.7	0.9	0.4	14.8	11.8	6.0	3.1
6.9	1.8	0.9	0.5	14.9	12.0	6.1	3.1
7.0	1.8	0.9	0.5	15.0	12.2	6.2	3.2
7.1	1.9	1.0	0.5	15.1	12.4	6.3	3.2
7.2	2.0	1.0	0.5	15.2	12.6	6.4	3.3
7.3	2.0	1.0	0.5	15.3	12.8	6.5	3.4
7.4	2.1	1.1	0.5	15.4	13.1	6.6	3.4
7.5	2.2	1.1	0.6	15.5	13.3	6.7	3.5
7.6	2.2	1.1	0.6	15.6	13.5	6.8	3.5
7.7	2.3	1.2	0.6	15.7	13.7	6.9	3.6
7.8	2.4	1.2	0.6	15.8	13.9	7.0	3.6
7.9	2.5	1.2	0.6	15.9	14.1	7.1	3.7
8.0	2.5	1.3	0.7	16.0	14.4	7.3	3.8
8.1	2.6	1.3	0.7	16.1	14.6	7.4	3.8
8.2	2.7	1.4	0.7	16.2	14.8	7.5	3.9
8.3	2.8	1.4	0.7	16.3	15.1	7.6	3.9
8.4	2.9	1.4	0.7	16.4	15.3	7.7	4.0
8.5	3.0	1.5	0.8	16.5	15.5	7.8	4.1
8.6	3.0	1.5	0.8	16.6	15.8	8.0	4.1
8.7	3.1	1.6	0.8	16.7	16.0	8.1	4.2
8.8	3.2	1.6	0.8	16.8	16.2	8.2	4.2
8.9	3.3	1.7	0.9	16.9	16.5	8.3	4.3
9.0	3.4	1.7	0.9	17.0	16.7	8.4	4.4
9.1	3.5	1.8	0.9	17.1	17.0	8.6	4.4
9.2	3.6	1.8	0.9	17.2	17.2	8.7	4.5
9.3	3.7	1.9	1.0	17.3	17.5	8.8	4.6
9.4	3.8	1.9	1.0	17.4	17.7	8.9	4.6
9.5	3.9	2.0	1.0	17.5	18.0	9.1	4.7
9.6	4.0	2.0	1.0	17.6	18.2	9.2	4.8
9.7	4.1	2.1	1.1	17.7	18.5	9.3	4.8
9.8	4.2	2.1	1.1	17.8	18.8	9.5	4.9
9.9	4.3	2.2	1.1	17.9	19.0	9.6	5.0
10.0	4.4	2.2	1.2	18.0	19.3	9.7	5.0
10.1	4.5	2.3	1.2	18.1	19.6	9.9	5.1
10.2	4.7	2.4	1.2	18.2	19.8	10.0	5.2
10.3	4.8	2.4	1.2	18.3	20.1	10.1	5.2

10.4	4.9	2.5	1.3	18.4	20.4	10.3	5.3
10.5	5.0	2.5	1.3	18.5	20.7	10.4	5.4
10.6	5.1	2.6	1.3	18.6	20.9	10.6	5.5
10.7	5.3	2.7	1.4	18.7	21.2	10.7	5.5
10.8	5.4	2.7	1.4	18.8	21.5	10.9	5.6
10.9	5.5	2.8	1.4	18.9	21.8	11.0	5.7
11.0	5.6	2.8	1.5	19.0	22.1	11.1	5.8
11.1	5.8	2.9	1.5	19.1	22.4	11.3	5.8
11.2	5.9	3.0	1.5	19.2	22.7	11.4	5.9
11.3	6.0	3.0	1.6	19.3	23.0	11.6	6.0
11.4	6.2	3.1	1.6	19.4	23.3	11.7	6.1
11.5	6.3	3.2	1.6	19.5	23.6	11.9	6.2
11.6	6.4	3.2	1.7	19.6	23.9	12.0	6.2
11.7	6.6	3.3	1.7	19.7	24.2	12.2	6.3
11.8	6.7	3.4	1.8	19.8	24.5	12.4	6.4
11.9	6.9	3.5	1.8	19.9	24.8	12.5	6.5
12.0	7.0	3.5	1.8	20.0	25.1	12.7	6.6
12.1	7.1	3.6	1.9	20.1	25.4	12.8	6.6
12.2	7.3	3.7	1.9	20.2	25.7	13.0	6.7
12.3	7.4	3.8	1.9	20.3	26.1	13.1	6.8
12.4	7.6	3.8	2.0	20.4	26.4	13.3	6.9
12.5	7.8	3.9	2.0	20.5	26.7	13.5	7.0
12.6	7.9	4.0	2.1	20.6	27.0	13.6	7.1
12.7	8.1	4.1	2.1	20.7	27.4	13.8	7.1
12.8	8.2	4.2	2.1	20.8	27.7	14.0	7.2
12.9	8.4	4.2	2.2	20.9	28.0	14.1	7.3
13.0	8.6	4.3	2.2	21.0	28.4	14.3	7.4
13.1	8.7	4.4	2.3	21.1	28.7	14.5	7.5
13.2	8.9	4.5	2.3	21.2	29.0	14.7	7.6
13.3	9.1	4.6	2.4	21.3	29.4	14.8	7.7
13.4	9.2	4.7	2.4	21.4	29.7	15.0	7.8
13.5	9.4	4.7	2.5	21.5	30.1	15.2	7.9
13.6	9.6	4.8	2.5	21.6	30.4	15.4	7.9
13.7	9.7	4.9	2.5	21.7	30.8	15.5	8.0
13.8	9.9	5.0	2.6	21.8	31.1	15.7	8.1
13.9	10.1	5.1	2.6	21.9	31.5	15.9	8.2

Head cm	Discharge I/s			Head cm	Discharge I/s		
	100 I/s 65 I/s 90° V Notch	30 I/s 53° V Notch	15 I/s 28° V Notch		100 I/s 65 I/s 90° V Notch	30 I/s 53° V Notch	15 I/s 28° V Notch
22.0	31.9	16.1	8.3	29.0	63.6		
22.1	32.2	16.3	8.4	29.1	64.1		
22.2	32.6	16.4	8.5	29.2	64.7		
22.3	33.0	16.6	8.6	29.3	65.2		
22.4	33.3	16.8	8.7	29.4	65.8		
22.5	33.7	17.0	8.8	29.5	66.3		
22.6	34.1	17.2	8.9	29.6	66.9		
22.7	34.5	17.4	9.0	29.7	67.5		
22.8	34.8	17.6	9.1	29.8	68.0		
22.9	35.2	17.8	9.2	29.9	68.6		
23.0	35.6	18.0	9.3	30.0	69.2		
23.1	36.0	18.2	9.4	30.1	69.8		
23.2	36.4	18.4	9.5	30.2	70.3		
23.3	36.8	18.6	9.6	30.3	70.9		
23.4	37.2	18.8	9.7	30.4	71.5		
23.5	37.6	19.0	9.8	30.5	72.1		
23.6	38.0	19.2	9.9	30.6	72.7		
23.7	38.4	19.4	10.0	30.7	73.3		
23.8	38.8	19.6	10.1	30.8	73.9		
23.9	39.2	19.8	10.2	30.9	74.5		
24.0	39.6	20.0	10.3	31.0	75.1		
24.1	40.0	20.2	10.4	31.1	75.7		
24.2	40.4	20.4	10.6	31.2	76.3		
24.3	40.8	20.6	10.7	31.3	76.9		
24.4	41.3	20.8	10.8	31.4	77.5		
24.5	41.7	21.0	10.9	31.5	78.2		
24.6	42.1	21.3	11.0	31.6	78.8		
24.7	42.6	21.5	11.1	31.7	79.4		
24.8	43.0	21.7	11.2	31.8	80.0		
24.9	43.4	21.9	11.3	31.9	80.7		
25.0	43.9	22.1	11.4	32.0	81.3		
25.1	44.3	22.4	11.6	32.1	81.9		
25.2	44.7	22.6	11.7	32.2	82.6		
25.3	45.2	22.8	11.8	32.3	83.2		
25.4	45.6	23.0	11.9	32.4	83.9		
25.5	46.1	23.3	12.0	32.5	84.5		
25.6	46.5	23.5	12.1	32.6	85.2		
25.7	47.0	23.7	12.3	32.7	85.8		
25.8	47.4	23.9	12.4	32.8	86.5		
25.9	47.9	24.2	12.5	32.9	87.1		
26.0	48.4	24.4	12.6	33.0	87.8		
26.1	48.8	24.6	12.7	33.1	88.5		
26.2	49.3	24.9	12.9	33.2	89.1		
26.3	49.8	25.1	13.0	33.3	89.8		
26.4	50.3	25.4	13.1	33.4	90.5		
26.5	50.7	25.6	13.2	33.5	91.2		
26.6	51.2	25.8	13.4	33.6	91.8		
26.7	51.7	26.1	13.5	33.7	92.5		

26.8	52.2	26.3	13.6	33.8	93.2		
26.9	52.7	26.6	13.7	33.9	93.9		
27.0	53.2	26.8	13.9	34.0	94.6		
27.1	53.7	27.1	14.0	34.1	95.3		
27.2	54.1	27.3	14.1	34.2	96.0		
27.3	54.6	27.6	14.3	34.3	96.7		
27.4	55.1	27.8	14.4	34.4	97.4		
27.5	55.7	28.1	14.5	34.5	98.1		
27.6	56.2	28.3	14.7	34.6	98.8		
27.7	56.7	28.6	14.8	34.7	99.5		
27.8	57.2	28.9	14.9	34.8	100.3		
27.9	57.7	29.1	15.1	34.9	101.0		
28.0	58.2	29.4					
28.1	58.7	29.6					
28.2	59.3	29.9					
28.3	59.8	30.2					
28.4	60.3						
28.5	60.9						
28.6	61.4						
28.7	61.9						
28.8	62.5						
28.9	63.0						



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