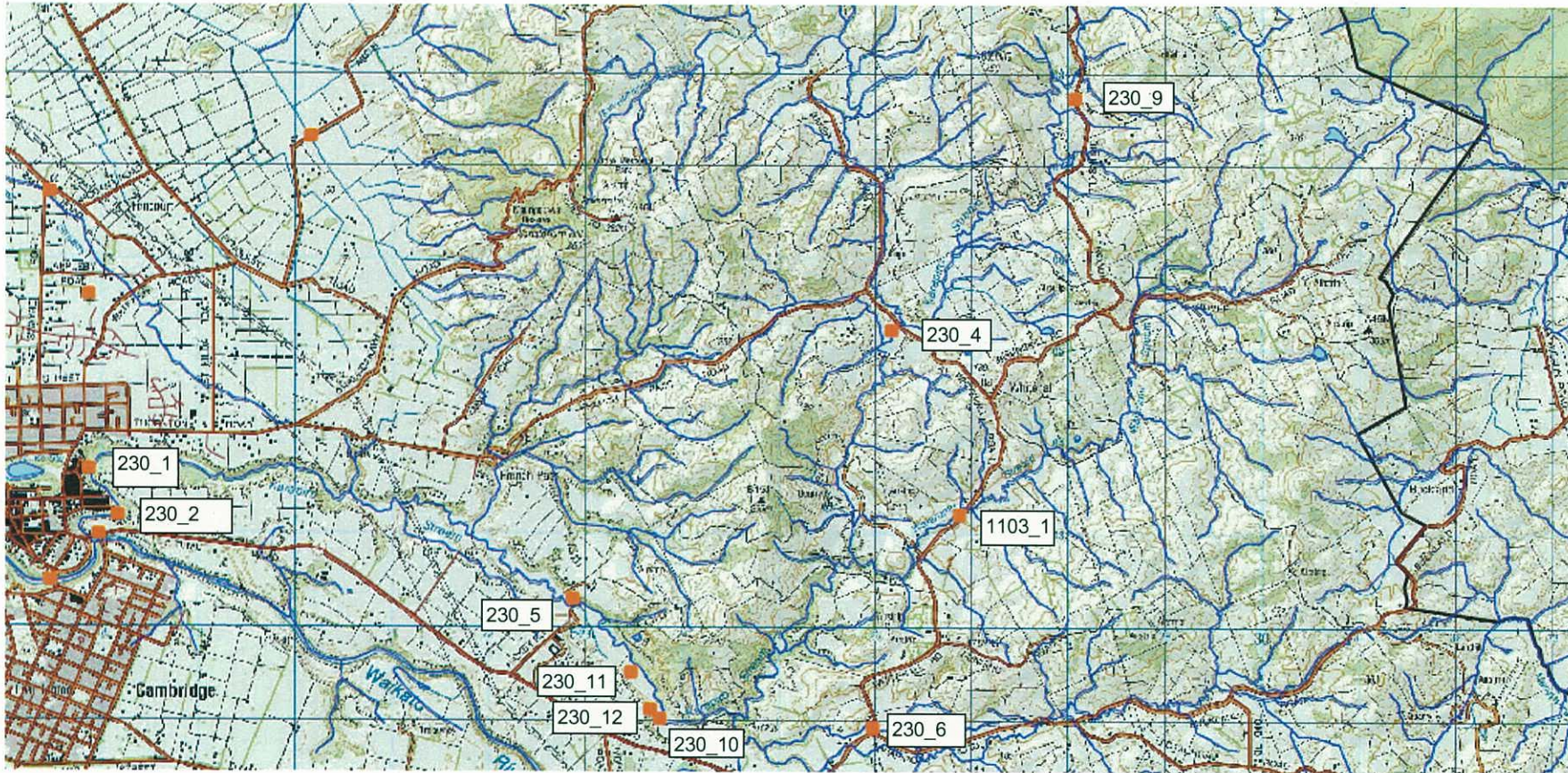


Site:	Location	Stream	Location	Date And Time	Discharge	Catchment Area
230	1	Karapiro Stm	Cambridge	09/01/1986 @ 00:01:00	4.965	
230	2	Karapiro Stm	Cambridge U/S SH1	16/04/1975 @ 00:00:00	0.477	
230	4	Karapiro Stm	French Pass Rd Br	20/12/1982 @ 00:00:00	0.066	
230	5	Karapiro Stm	Hickey Rd Bridge	17/11/1969 @ 00:00:00	0.501	64km2
230	5	Karapiro Stm	Hickey Rd Bridge	12/02/1970 @ 00:00:00	0.147	
230	5	Karapiro Stm	Hickey Rd Bridge	23/02/1973 @ 00:00:00	0.250	
230	5	Karapiro Stm	Hickey Rd Bridge	23/04/1974 @ 00:00:00	0.750	
230	5	Karapiro Stm	Hickey Rd Bridge	09/03/1976 @ 00:00:00	0.254	
230	5	Karapiro Stm	Hickey Rd Bridge	11/02/1977 @ 00:00:00	0.514	
230	5	Karapiro Stm	Hickey Rd Bridge	03/02/1978 @ 00:00:00	0.206	
230	5	Karapiro Stm	Hickey Rd Bridge	20/12/1982 @ 00:00:00	0.207	
230	5	Karapiro Stm	Hickey Rd Bridge	01/12/1983 @ 00:00:00	0.275	
230	5	Karapiro Stm	Hickey Rd Bridge	17/01/1984 @ 00:00:00	0.262	
230	5	Karapiro Stm	Hickey Rd Bridge	23/02/1984 @ 00:00:00	0.271	
230	5	Karapiro Stm	Hickey Rd Bridge	09/03/1984 @ 00:00:00	0.401	
230	5	Karapiro Stm	Hickey Rd Bridge	23/03/1984 @ 00:00:00	0.636	
230	5	Karapiro Stm	Hickey Rd Bridge	07/02/1995 @ 14:25:00	0.279	
230	6	Karapiro Stm	K-Whitehall Rd	20/12/1982 @ 00:00:00	0.014	
230	9	Karapiro Stm	Muirheads Rd	20/12/1982 @ 00:00:00	0.033	
230	10	Karapiro Stm	Middle Location	19/10/1979 @ 10:35:00	0.008	
230	10	Karapiro Stm	Middle Location	19/10/1979 @ 11:10:00	0.034	
230	11	Karapiro Stm	Down Stream Location	19/10/1979 @ 11:55:00	0.002	
230	12	Karapiro Stm	Pumphouse	19/10/1979 @ 11:37:00	0.010	
1103	1	Waiarumu Stm	Whitehall Rd 1st Br	20/12/1982 @ 00:00:00	0.040	

Gauged Flow	Gauged Catchment Area	Specific Discharge	Bridge Crossing Catchment	Calculated Flow	
m3/s	km2	m3/s/km2	km2		
0.501	64	0.0078	80	0.6263	
0.147	64	0.0023	80	0.1838	
0.250	64	0.0039	80	0.3125	
0.750	64	0.0117	80	0.9375	
0.254	64	0.0040	80	0.3175	
0.514	64	0.0080	80	0.6425	
0.206	64	0.0032	80	0.2575	
0.207	64	0.0032	80	0.2588	
0.275	64	0.0043	80	0.3438	
0.262	64	0.0041	80	0.3275	
0.271	64	0.0042	80	0.3388	
0.401	64	0.0063	80	0.5013	
0.636	64	0.0099	80	0.7950	
0.279	64	0.0044	80	0.3487	
average=	0.354	64	0.0055	80	0.4422



230_1	S15:281-653	Karapiro Stm @ Cambridge	
230_2	S15:284-648	Karapiro Stm @ Cambridge U/S SH1	
230_11	T15:337-631	Karapiro Stm @ Down Stream Location	
230_4	T15:364-668	Karapiro Stm @ French Pass Rd Br	Whitehall Rd/French Pass Rd Bridge
230_5	T15:331-639	Karapiro Stm @ Hickey Rd Bridge	Hickey Rd Bridge, Cambridge. EW routine water quality site.
230_6	T15:362-625	Karapiro Stm @ K-Whitehall Rd	
230_10	T15:340-626	Karapiro Stm @ Middle Location	
230_9	T15:383-693	Karapiro Stm @ Muirheads Rd	
230_12	T15:339-627	Karapiro Stm @ Pumphouse	
1103_1	T15:371-648	Waiarumu Stm @ Whitehall Rd 1st Br	Karapiro-Whitehall Rd 1st Br as you go up it

TP108 Worksheet 1: Runoff Parameters and Time of Concentration

Project: **Cambridge Bypass**
 Location: **Cambridge**
 Status: **Karapiro Catchment**
At bridge site

Total Area (ha)	8000.0
Pervious Area (ha)	8000.0
Impervious Area	0
Channel ¹ factor C	0.80
Catchment length L	16
Catchment slope Sc	0.016

255m in 16000

1/. Runoff Curve Number (CN) and Initial Abstraction (Ia)

Soil Name and Classific.	Cover description (cover type, treatment and hydrological condition)	Curve number CN*	Area	Product CN x Area
	Impervious areas	98	0	0
	Pervious areas	39	8000.0	312,000
	Total		8000.0	312,000

* from Appendix B

CN (weighted) = $\frac{\text{total CN} \times A}{\text{total area}} = \frac{312,000.0}{8,000.00} = 39.0$

Ia (weighted) = $\frac{\text{pervious a}}{\text{total area}} = \frac{40,000.0}{8,000.00} = 5.0$

2/. Time of Concentration

Runoff Factor = $\frac{\text{CN}}{200 - \text{CN}} = 0.242$

tc = $0.14C \times L^{0.66} \times [\text{CN}/(200 - \text{CN})]^{0.55} \times \text{Sc}^{-0.30} = 5.265$ hrs

SCS Lag for HEC-HMS "t_{tp}" = $2/3 \times \text{tc} = 3.510$ hrs

TP108: Worksheet 2: Graphical Peak Flow Rate

1 Catchment Area (km²) = 80

2 Calc storage, **S** = $25.4 \times [(1000/\text{CN} - 10)] = 397$

educated
Guess

- Annual Recurrence Interval
- 24 hour rainfall depth, P₂₄ (mm)
- Compute c* = $\frac{P_{24} - 2Ia}{P_{24} - 2Ia + 2S}$ mm
- Specific flow rate q* (from Fig. 6.1)
- Peak flow rate, q_p = q*AP₂₄ (m³/sec)
- Runoff depth, Q₂₄ = $\frac{(P_{24} - Ia)^2}{(P_{24} - Ia) + S}$ mm
- Runoff Volume, V₂₄ = $1000 \times Q_{24}A$ (m³)

Storm #1	Storm #2	Storm #4	Storm #5
100	10	2	1
149	92	66.2	40
0.149	0.094	0.066	0.036
0.008	0.006	0.004	0.003
95.4	44.2	21.2	9.6
38.3	15.6	8.2	2.8
3,064,724	1,250,346	653,537	226,704

Karapiro Stream (Using TP108 Data)

