HAWKESBURY CITY COUNCIL

HOBARTVILLE

EVACUATION ROUTE STUDY

August 2008

Bewsher Consulting Pty Ltd

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1. INTRODUCTION

This study is part of the Hawkesbury-Nepean Floodplain Management Strategy. As such it follows on from several key reports commissioned by the NSW State Government and entitled *Achieving a Hawkesbury-Nepean Floodplain Management Strategy* (**Reference 1**) and *Interim Regional Road Evacuation Route Upgrade Plan* (**Reference 2**).

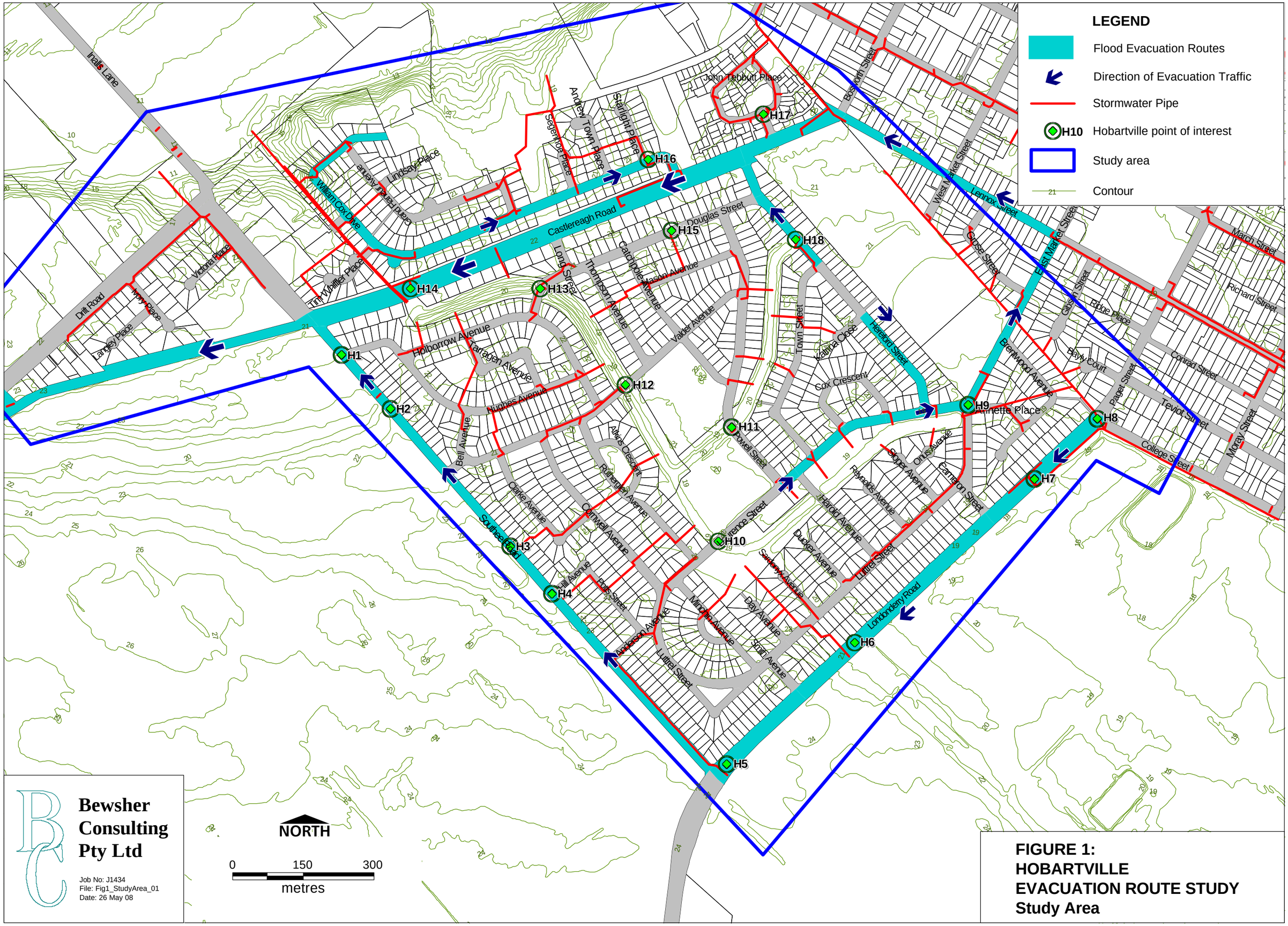
In those studies, a number of population centres were identified as needing improved local evacuation routes to ensure effectiveness of the regional evacuation routes.

One such population centre is Hobartville, which is within the Hawkesbury City Local Government Area (LGA). This report focuses on the assessment of identified local overland flow 'points of interest' as an integral part of the assessment of Hobartville's local flood evacuation route constraints. It will be followed by a subsequent study which will be both evaluating the management options to address the constraints and preparing a plan of management. Both studies are being undertaken by Council as part of Council's preparation of a Local Floodplain Risk Management Plan for Hobartville.

The principal objective of the study is to ensure that the existing local road infrastructure leading out of the flood risk areas allows all affected persons to be safely evacuated to regional flood evacuation routes and then to evacuation centres as described in the SES Hawkesbury-Nepean Flood Emergency Plans. For Hobartville there is one primary State Emergency Service (SES) flood evacuation route, that is, Castlereagh Road; one secondary SES flood evacuation route, that is, Londonderry Road; and a number of local area evacuation routes as shown in **Figure 1**.

The Consultant worked under the guidance of a Technical Working Group (TWG) which comprised representatives from the then Department of Natural Resources (DNR), the SES and Hawkesbury City Council.

This study was funded jointly by the NSW State Government and Hawkesbury City Council under the State Assisted Floodplain Management Program on a 2 (State) to 1 (Council) shared basis.


LEGEND
Flood Evacuation Routes
Direction of Evacuation Traffic
Stormwater Pipe
H10 Hobartville point of interest
Study area
Contour
H1
H2
H3
H4
H5
H6
H7
H8
H9
H10
H11
H12
H13
H14
H15
H16
H17
H18
Castlereagh Road
Londonderry Road
Southee Road
Inalls Lane
Drift Road
Victoria Place
Langley Place
Happy Place
William Cox Drive
Tim Moffitt Place
Lindsay Place
Sandhurst Avenue
Andrew Town Place
Segenhoe Place
Starlight Place
John Tebbutt Place
Douglas Street
Long Street
Thompson Avenue
Campbell Avenue
Mason Avenue
Valder Avenue
Holborrow Avenue
Tarragen Avenue
Hughes Avenue
Bell Avenue
Clarke Avenue
Cornwell Avenue
Rumeregh Avenue
Atkins Crescent
Hill Avenue
Fois Street
Anderson Avenue
Luttrell Street
Minogin Avenue
Dey Avenue
Smith Avenue
Sadleir Avenue
Ducker Avenue
Harold Avenue
Reynolds Avenue
Skuse Avenue
Orus Avenue
Carman Street
Powell Street
Clarence Street
Town Street
Katrina Close
Cox Crescent
Hereford Street
Brentwood Avenue
Annette Place
Bosworth Street
West Market Street
East Market Street
Lennox Street
Skuse Street
Gilson Street
Ridge Place
Bayly Court
Paget Street
Teviot Street
Conrad Street
College Street
Morey Street
March Street
Richard Street
NORTH
0 150 300
metres
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Date: 26 May 08
FIGURE 1:
HOBARTVILLE
EVACUATION ROUTE STUDY
Study Area

2. SCOPE OF WORK

To achieve the overall objective, the commission called for the following tasks to be undertaken:

- Familiarisation with the study area and compilation of sufficient ground and stormwater asset information to suit the study area's flood modelling requirements;
- Public consultation;
- Development of catchment flow (hydrologic) models to assess 20 year average recurrence interval (ARI), 50 year ARI, 100 year ARI, 200 year ARI, 500 year ARI and PMF event flows at all points of interest;
- Development of hydraulic models to assess flood levels and hazard at all points of interest; and
- Preparation of a report documenting the methodology and findings from the investigation.

2.1 FAMILIARISATION AND DATA COLLECTION/REVIEW

Bewsher Consulting had undertaken earlier *Local Hydraulic Specification Studies (LHSS)* which examined local flooding along the various regional evacuation routes (**Reference 3**). One such study included Castlereagh Road west of Hobartville. For this study, the TWG broadly adopted the same flood modelling approaches which had been used in those earlier studies.

The Consultant undertook a number of Hobartville inspections, some of which formally included the TWG members. A key focus of the initial joint inspection was the identification/verification of the points of interest that had previously been identified by the SES and are shown in **Figure** 1. That inspection determined that locations H5 and H6 did not represent 'points of interest' since they did not have a local sag point nor any significant catchment.

Study area photographs were taken by the project surveyors and these are reproduced in **Appendix D**.

Both the SES and Council were approached regarding information about any historical flooding that has been experienced in the Hobartville area and neither organisation held any data.

Council provided design plan information for some of the trunk stormwater pipes in the vicinity of H8 and H9 (and these proved to be helpful in the process of determining what additional field data needed to be collected).

2.2 PUBLIC CONSULTATION

2.2.1 Questionnaire

An essential part of SES's identification of evacuation routes for Hobartville was avoidance of low-lying areas that might have a greater probability of flooding. Given the flood evacuation route focus of this study, the public consultation phase consisted of drainage questionnaires sent to residents who lived in the immediate vicinity of the evacuation routes.

112 questionnaires were delivered by Council and 21 (or 20%) were returned (see **Figure 2**). Of the returned questionnaires seven respondents referred to significant problems while another seven reported only very minor stormwater problems that were not relevant to this study.

The questionnaire and its accompanying letter are reproduced in **Appendix A**.

Since there has been no recent Hawkesbury-Nepean flooding, it is clear that all of the reported study area problems are related to Hobartville runoff issues rather than being "backwater" flooding from the river. While the reports of significant problems - as detailed below – are useful, it is noted that the responses typically did not include specific depth information nor provide accurate dates and hence or otherwise it has not been possible to assign average recurrence intervals to the events.

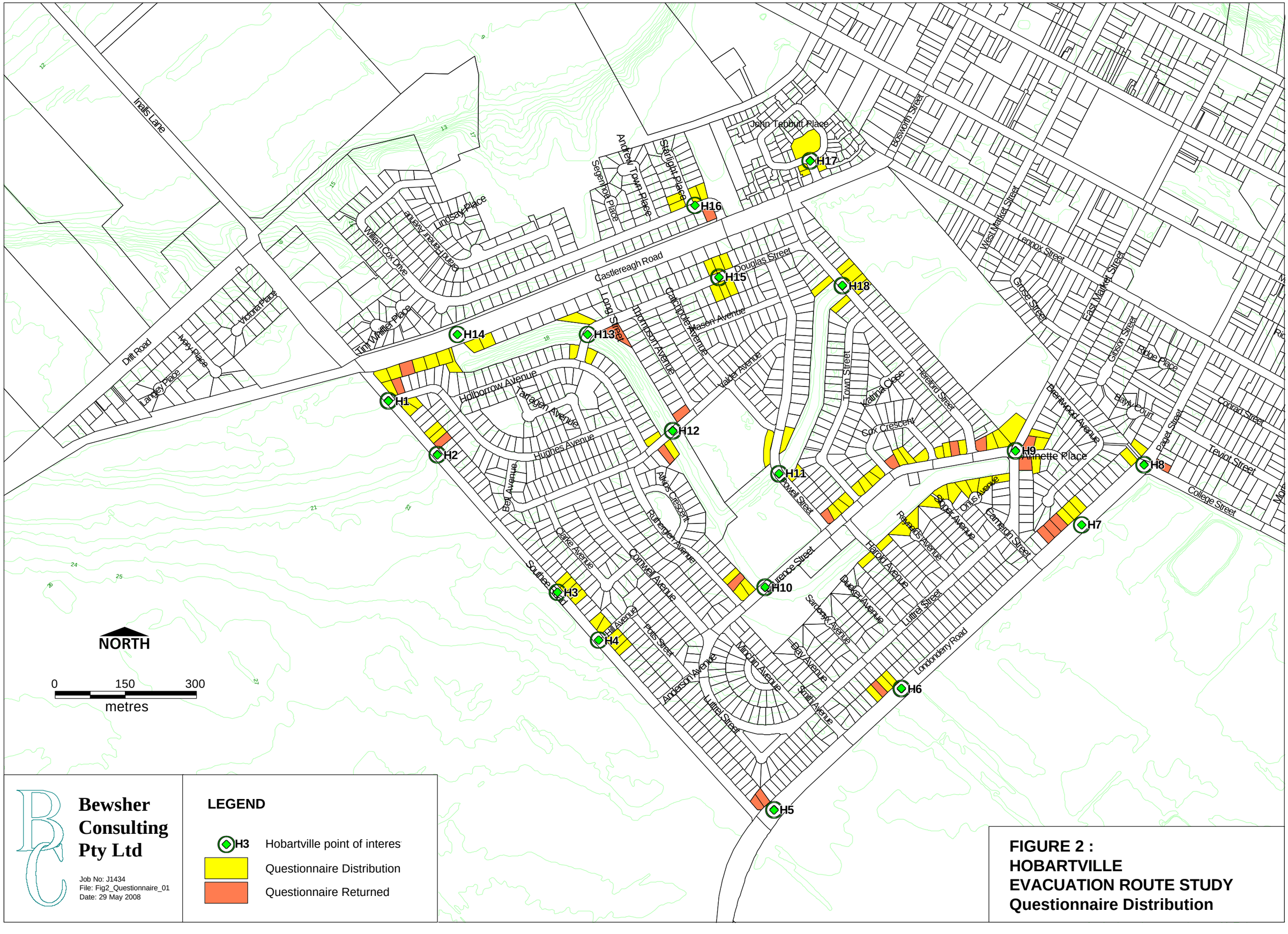
2.2.2 Significant Responses

Londonderry Road low point, east of Cameron Street (H7)

Three residents near the sag point in Londonderry Road located east of the Cameron Street intersection reported instances of local flooding over the period of their residency (which varied between 25 and 30 years). The frequency of problems varied from two, five to "too many to count" but all reported cases of the roadway being untrafficable. This would be consistent with significant depths of water in the adjoining properties which are all lower than the road itself.

While all three reported flooding of their own properties, there were no reports of above floor level flooding.

(It is noted that the flood analysis which is documented in **Section 3** of this report determined that the roadway would be overtopped in all the design flood events, including the smallest modelled (20 year ARI) event, and that the depth of water for this event would typically be of the order of 100mm. While this would normally suggest that motorists could negotiate such minor flooding, it is at odds with local residents' recollections as noted above. This apparent discrepancy is attributed to the fact that



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LEGEND

- H3 Hobartville point of interes
- Questionnaire Distribution
- Questionnaire Returned

FIGURE 2 :
HOBARTVILLE
EVACUATION ROUTE STUDY
Questionnaire Distribution

the adjoining lower lying properties are also flooded and therefore the extent of flooding is more extensive than just the roadway.)

Annette Place/East Market Street low point (H9)

Four respondents referred to problems at this location.

The most detailed comments came from two residents in East Market Street and Luttrell Street whose properties are both adjacent to the roundabout (see **Photo 1**). They had both been resident for over twenty years and both reported problems on a number of occasions over the period of their residency. Both reported many instances of water being so deep that cars could not pass through it.

Photo 1: Sag point location H9 is adjacent to the East Market Street roundabout.

The worst road inundation depth was stated to be 0.45 metres (and as reported in **Section 3** of this report such a depth is slightly less than the 20 year ARI calculated depth).

2.3 MODELLING APPROACH

Since the focus of the study is on flood evacuation issues, the analysis has been based on the assumption that local stormwater pipe systems effectively have no capacity — that is, all runoff remains a surface flow issue. Hence pipe system capacity analysis is not required but rather the total surface flow hydrographs are quantified and their impacts assessed. (The capacity of the Hobartville major swales is a separate issue and hence, as detailed in **Section 2.3.2**, the capacities of trunk pipe systems and culverts are explicitly included in the hydraulic modelling.)

At the beginning of the investigation, it was clear that the various 'points of interest' could be classified into two scenarios as follows:

(a) The first scenario is where the location represents a sag point within the local road system (see **Photo 1**). Since the capacities of local stormwater pipe systems were to be ignored (i.e. be treated as fully blocked), all the sag point catchment's runoff would reach the low point and begin to pond. The depth of ponding would then be a function of the amount of storage that is available at the sag point plus the level at which the ponding is relieved through spill.

The following hydrologic modelling approach was endorsed by the TWG for those 'points of interest' which are associated with such local roadway sag point ponding:

– a separate sub-catchment would be defined for each such sag point. (Where there were one or more 'points of interest' located within a catchment whose overall flows are required to be calculated, e.g. as part of a downstream flood modelling exercise, each sag point sub-catchment would be 'nested' within the larger model);

– the calculated runoff hydrograph for that sub-catchment would be treated as inflow to a 'basin' that would model the sag point ponding. The stage-storage relationship for the basin would be as defined by the field survey team while the discharge relationship would be based on a nominal pipe outlet discharge (to allow the basin to empty) and a weir flow relationship (where the governing weir levels would be extracted from the field survey plans).

(b) The second scenario is where the location is associated with a crossing of an open channel system, as in **Photo 2**. The roadway overtopping regime at these locations would be assessed using (1D) flood modelling software to generate the flood levels along the open channel system and over the crossing. This approach was also endorsed by the TWG.

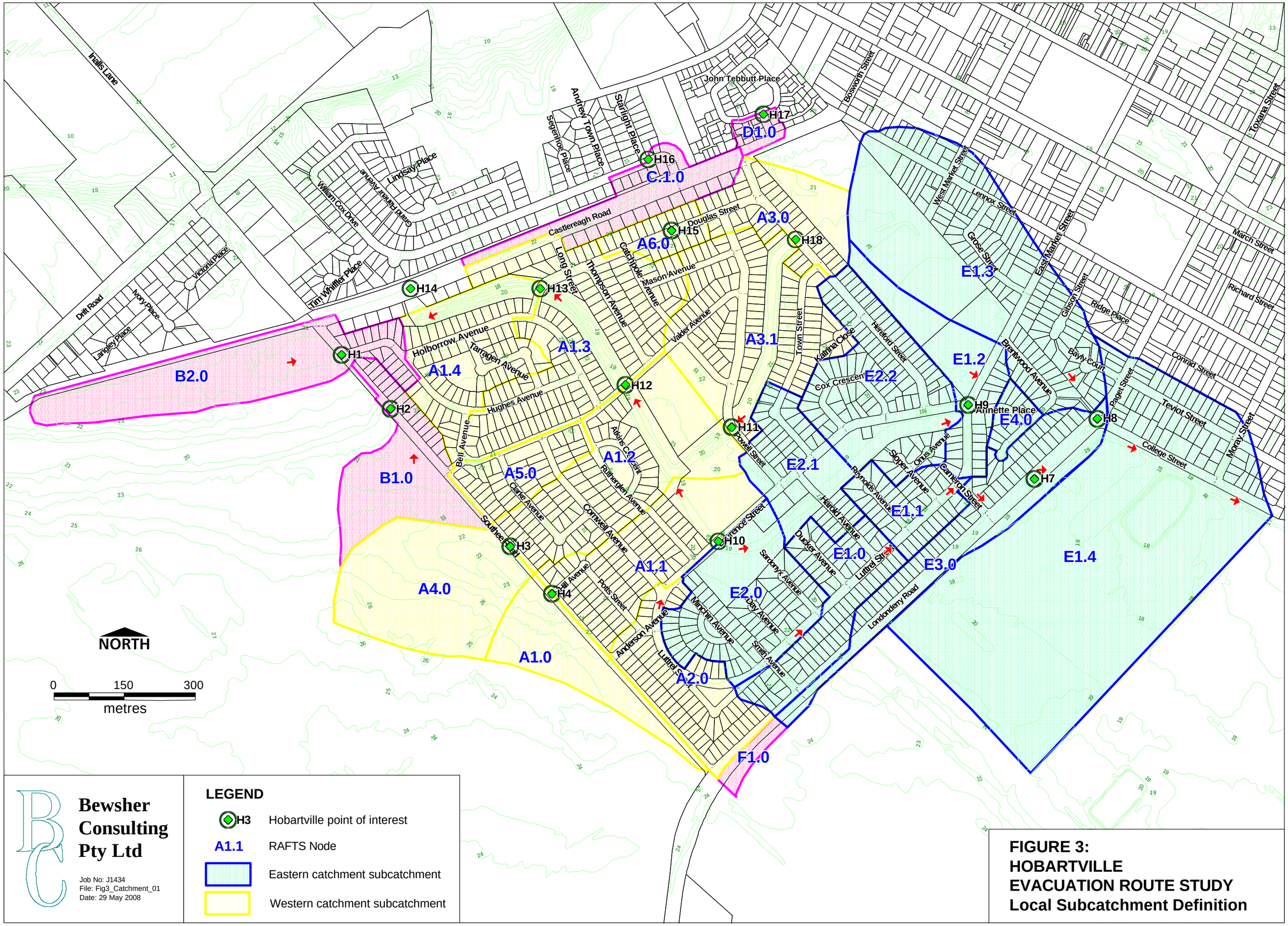
Photo 2: 'Point of interest'(H12) at Valder Avenue

2.3.1 Hydrologic Modelling

Consistent with the approach that had been adopted for earlier LHSS studies, RAFTS hydrologic modelling software was adopted. For this study, RAFTS version 2000 was used.

A RAFTS model was developed to assess the design flows for the 20 year, 50 year, 100 year, 200 year, 500 year and PMF events. **Figure 3,** which defines the network of sub-catchments, shows how that there are two principal catchments draining Hobartville. In this report they are referred to as firstly, the "Western" catchment since the flows exit under the Castlereagh Road in the north-western corner of the study area, and secondly the "Eastern" catchment since the flows pass under Londonderry Road and then are conveyed along an open channel adjacent to College Street in the south-eastern corner of the study area.

Both catchments feature significant swale systems (see **Figure 3**) which share a common upstream end, at Laurence Street (H10). The Western catchment swale conveys flows north from Laurence Street before also receiving the tributary swale flows from the direction of Powell Street. The flows then pass through culverts under Valder Street and Douglas Street before reaching the inlet of twin 1200mm diameter pipes which convey the flows under the Castlereagh Road and the northern portion of Hobartville.



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- H3 — Hobartville point of interest
- A1.1 — RAFTS Node
- Eastern catchment subcatchment
- Western catchment subcatchment

FIGURE 3:
HOBARTVILLE
EVACUATION ROUTE STUDY
Local Subcatchment Definition

The Eastern catchment swale conveys flows through culverts under Harold Street before reaching the inlet of the 750mm diameter pipe at East Market Street. Those piped flows then combine with other trunk system pipe flows before spilling into the open channel adjacent to College Street. (As detailed in **Section 2.3.2**, the capacities of those trunk pipe systems and culverts are explicitly included in the hydraulic modelling.)

The sub-catchments presented in **Figure 3** were assessed by using a combination of as-available contour data (which is included in the figure), first-hand field inspections and additional fieldwork undertaken by the project surveyors both west of Southee Road and south of Londonderry Road.

Table 1 lists the 'existing conditions' sub-catchment details.

TABLE 1: SUB-CATCHMENT DETAILS

Sub-Catchment Id	Sub-Catchment (Hectares)	SUB-CATCHMENT TYPE			RAFTS CATCHMENT DEFINITION	
		Urban (ha)	Urban i.e. parks, etc (ha)	Rural (ha)	Split Catchment 100% Impervious (ha)	Catchment Pervious (with 5% Impervious defn) (ha)
A1.0	4.95	0.00		4.95	N/A	4.95
A1.1	7.48	5.95	1.53		3.27	4.21
A1.2	10.49	7.23	3.26		3.97	6.52
A1.3	12.44	11.46	0.98		6.30	6.14
A1.4	6.79	5.36	1.43		2.95	3.84
A2.0	5.62	5.62			3.09	2.53
A3.0	4.83	4.83			2.66	2.17
A3.1	10.93	9.61	1.32		5.29	5.64
A4.0	9.23	0.00		9.23	N/A	9.23
A5.0	3.09	3.09			1.70	1.39
A6.0	1.71	1.71			0.94	0.77
B1.0	5.87	1.53		4.34	0.84	5.03
B2.0	8.84	2.23		6.61	1.23	7.61
C.1.0	4.11	4.11			2.26	1.85
D1.0	0.72	0.72			0.40	0.32
E1.0	5.42	5.42			2.98	2.44
E1.1	3.17	3.17			1.74	1.43
E1.2	4.84	2.57	2.27		1.42	3.42
E1.3	16.95	13.79	3.16		7.58	9.37
E1.4	33.41	6.11		27.30	3.36	30.05
E2.0	7.75	6.05	1.70		3.33	4.42
E2.1	4.97	4.09	0.88		2.25	2.72
E2.2	8.89	7.84	1.05		4.31	4.58
E3.0	7.30	5.98	1.32		3.29	4.01
E4.0	1.02	1.02			0.56	0.46
Total Area (ha)	190.82			Subtotal	65.71	125.11
	93.72	119.49		Total		190.82

N.B. All urban (developed) areas have a 55% impervious fraction.

Since there was no data to allow the model to be calibrated, the Western and Eastern principal catchment RAFTS flows were compared with Probabilistic Rational Method (PRM) 100 year flow estimates (as per the procedure presented in ARR, **Reference 4**). The details of the PRM flow calculations are presented in **Table 2**.

TABLE 2: PROBABILISTIC RATIONAL METHOD FLOWS

100 YEAR FLOWS				
(Western Catchment)			(Eastern Catchment)	
tc (hours)	0.69		tc (hours)	0.74
tc (min)	41		tc (min)	45
I (mm/hr) for 41minutes	83.0		I (mm/hr) for 45minutes	78.8
Area	77.56	ha	Area	93.72 ha
C_{100}	0.52		C_{100}	0.52
Q	0.278*0.52*83*0.7756		Q	0.278*0.52*78.8*0.9372
	9.31	m^3/s		10.68 m^3/s

Since the Probabilistic Rational Method is used for rural catchment assessments, the RAFTS sub-catchments were adjusted to reflect rural conditions as follows before comparing the resultant 100 year flows with the PRM values:

Catchment	100% pervious
PERN	0.05
Initial Loss	15mm
Continuing Loss	2.5mm/hr

The RAFTS B_x factor was adjusted and the models re-run until there was a 'good' match between the peak runoff responses for the eastern and western sub-catchments and the peak flows presented in **Table 2**. The resultant B_x value was 0.85 (and it is noted that this is very similar to the values derived in earlier LHSS models).

The RAFTS model was adjusted to reflect existing development conditions as per **Table 1**, while the design PERN and loss values are presented in **Table 3**.

TABLE 3: RAFTS MODELLING PARAMETERS

Losses	**5,20,100y (ARI)**	
		PERN
Urban (Pervious)		**0.025**
Initial loss (mm) **Continuing loss (mm/h)**	**10** **2.5**	
Urban (Impervious)		**0.015**
Initial loss (mm) **Continuing loss (mm/h)**	**1.5** **0**	

As shown in **Table 4,** peak flows for a range of storm durations were subsequently calculated for each of the design flood events (and the critical duration event flows are highlighted). The full range of design rainfall IFD data was consistent with that used in an earlier Hawkesbury Council LHSS (**Reference 5**). The table shows that the critical storm duration is typically 90 minutes for the 20 year ARI to 500 year ARI events and 30 minutes for the PMF event.

A full summary of the RAFTS 100 year ARI storm outputs is also reproduced in **Appendix B**.

The stage-storage relationships for each 'point of interest' were provided by the project surveyors for use in RAFTS. The corresponding stage-discharge relationships were derived by Bewsher Consulting using a weir calculation at each sag point's spill control point. Each basin included a low level outlet and since the stormwater pipe system capacities were to be ignored, this consisted of a nominal 100mm diameter pipe.

2.3.2 Hydraulic Modelling

Consistent with the approach that had been adopted in the earlier LHSS assessments, the TWG agreed that (a) HEC-RAS one-dimensional flood modelling software would be appropriate to assess flood levels, etc. at the series of culvert crossings of the trunk swale systems, etc., and (b) the culvert waterways would be assessed under both 0% and 50% blockage regimes.

Once the RAFTS modelling tasks were completed, the task of choosing cross section locations to enter into the HEC-RAS software was undertaken. At first this process was thought to be straightforward and indeed at the commencement of the study, the project surveyors had been briefed on swale cross section locations and the amount of detail that was expected to be needed to assess flood levels as flows passed along the

TABLE 4: SUMMARY OF RAFTS FLOWS (EXISTING CONDITIONS)

20 Yr FLOWS (m3/s)

RAFTS Node	Storm Duration (minutes)								Max
	25	60	90	120	180	360	540	720	
A5.0	0.9	0.9	**1.0**	0.9	0.6	0.4	0.4	0.4	1.0
A6.0	0.5	0.5	**0.6**	0.5	0.4	0.2	0.2	0.2	0.6
H15	0.5	0.5	**0.6**	0.5	0.4	0.2	0.2	0.2	0.6
A3.0	1.3	1.2	**1.4**	1.3	0.9	0.7	0.6	0.6	1.4
H18	1.3	1.2	**1.4**	1.3	0.9	0.7	0.6	0.6	1.4
A3.1	**3.7**	3.2	**3.7**	3.4	2.5	2.1	1.8	1.9	3.7
A4.0	0.5	0.9	1.0	**1.0**	0.9	1.0	0.9	0.9	1.0
A1.0	1.0	1.6	1.6	**1.7**	1.4	1.5	1.3	1.4	1.7
A2.0	1.7	1.6	**1.9**	1.7	1.2	0.8	0.7	0.7	1.9
A1.1	3.5	3.6	**4.3**	4.0	3.3	3.1	2.8	3.0	4.3
A1.2	8.5	8.1	**9.3**	9.0	7.0	6.5	5.7	6.0	9.3
A1.3	10.5	10.4	11.5	**11.5**	8.9	8.3	7.3	7.8	11.5
A1.4	11.4	11.7	12.6	**12.8**	9.7	9.2	8.0	8.5	12.8
B2.0	0.9	1.0	**1.2**	1.1	1.0	1.0	0.9	0.9	1.2
B1.0	0.6	0.7	**0.7**	0.7	0.6	0.7	0.6	0.6	0.7
H1_H2	1.5	1.7	**1.9**	1.8	1.6	1.7	1.4	1.6	1.9
E3.0	1.7	1.6	**1.9**	1.7	1.2	1.0	0.8	0.9	1.9
E4.0	0.3	0.3	**0.3**	0.3	0.2	0.1	0.1	0.1	0.3
E2.0	1.7	1.6	**1.9**	1.7	1.2	1.0	0.9	0.9	1.9
E2.1	2.9	2.7	**3.2**	2.8	2.1	1.7	1.5	1.5	3.2
E2.2	5.2	4.9	**5.6**	5.0	3.7	2.9	2.5	2.6	5.6
E1.0	1.7	1.6	**1.9**	1.7	1.1	0.8	0.7	0.7	1.9
E1.1	2.6	2.5	**2.8**	2.5	1.7	1.2	1.0	1.1	2.8
E1.2	8.6	8.1	**9.4**	8.4	6.0	4.7	4.1	4.2	9.4
H9	8.6	8.1	**9.4**	8.4	6.0	4.7	4.1	4.2	9.4
E1.3	12.7	11.9	**13.6**	12.2	8.6	6.9	6.0	6.3	13.6
H7	14.4	13.5	**15.5**	13.9	9.9	7.9	6.8	7.1	15.5
E1.4	15.8	15.0	**17.1**	15.5	11.2	9.5	8.9	9.5	17.1
C1.0	1.1	1.0	**1.2**	1.1	0.7	0.6	0.5	0.5	1.2
H16	1.1	1.0	**1.2**	1.1	0.7	0.6	0.5	0.5	1.2
D1.0	0.2	0.2	**0.3**	0.2	0.2	0.1	0.1	0.1	0.3
H17	0.2	0.2	**0.3**	0.2	0.2	0.1	0.1	0.1	0.3
F1.0	0.2	0.2	**0.3**	0.2	0.2	0.1	0.1	0.1	0.3

TABLE 4: SUMMARY OF RAFTS FLOWS (EXISTING CONDITIONS)

50 Yr FLOWS (m3/s)

RAFTS Node	Storm Duration (minutes)								Max
	25	60	90	120	180	360	540	720	
A5.0	1.0	1.0	**1.2**	1.0	0.7	0.5	0.4	0.4	1.2
A6.0	0.6	0.6	**0.6**	0.6	0.4	0.3	0.2	0.2	0.6
H15	0.6	0.6	**0.6**	0.6	0.4	0.3	0.2	0.2	0.6
A3.0	1.5	1.4	**1.6**	1.4	1.0	0.7	0.7	0.7	1.6
H18	1.5	1.4	**1.6**	1.4	1.0	0.7	0.7	0.7	1.6
A3.1	4.0	3.7	**4.2**	3.9	2.9	2.3	2.0	2.1	4.2
A4.0	0.7	1.2	1.2	**1.3**	1.1	1.1	1.0	1.0	1.3
A1.0	1.4	2.0	2.0	**2.1**	1.7	1.7	1.5	1.6	2.1
A2.0	1.9	1.9	**2.1**	1.9	1.3	0.9	0.8	0.8	2.1
A1.1	4.0	4.3	**5.1**	4.8	3.9	3.6	3.1	3.3	5.1
A1.2	9.4	9.5	**10.9**	10.6	8.2	7.3	6.3	6.7	10.9
A1.3	11.7	12.3	13.4	**13.6**	10.3	9.3	8.2	8.7	13.6
A1.4	13.1	13.8	14.7	**15.0**	11.3	10.2	9.0	9.5	15.0
B2.0	1.0	1.3	**1.4**	1.4	1.1	1.2	1.0	1.1	1.4
B1.0	0.7	0.8	**0.9**	0.9	0.7	0.7	0.6	0.7	0.9
H1_H2	1.7	2.1	**2.3**	2.3	1.9	1.9	1.6	1.8	2.3
E3.0	1.9	1.9	**2.2**	1.9	1.4	1.1	0.9	1.0	2.2
E4.0	0.3	0.3	**0.4**	0.3	0.2	0.2	0.1	0.1	0.4
E2.0	1.9	1.9	**2.2**	1.9	1.4	1.1	1.0	1.0	2.2
E2.1	3.2	3.2	**3.6**	3.2	2.4	1.9	1.6	1.7	3.6
E2.2	5.7	5.7	**6.4**	5.8	4.2	3.2	2.8	2.9	6.4
E1.0	1.9	1.9	**2.1**	1.9	1.3	0.8	0.7	0.7	2.1
E1.1	2.8	2.9	**3.1**	2.9	1.9	1.3	1.2	1.2	3.1
E1.2	9.5	9.4	**10.7**	9.6	6.9	5.2	4.5	4.7	10.7
H9	9.5	9.4	**10.7**	9.6	6.9	5.2	4.5	4.7	10.7
E1.3	13.9	13.7	**15.5**	14.0	9.9	7.6	6.7	7.0	15.5
H7	15.8	15.6	**17.6**	15.9	11.4	8.7	7.6	7.9	17.6
E1.4	17.3	17.4	**19.6**	17.8	12.9	10.7	10.1	10.7	19.6
C1.0	1.2	1.2	**1.3**	1.2	0.8	0.6	0.5	0.6	1.3
H16	1.2	1.2	**1.3**	1.2	0.8	0.6	0.5	0.6	1.3
D1.0	0.3	0.3	**0.3**	0.3	0.2	0.1	0.1	0.1	0.3
H17	0.3	0.3	**0.3**	0.3	0.2	0.1	0.1	0.1	0.3
F1.0	0.3	0.3	**0.3**	0.3	0.2	0.1	0.1	0.1	0.3

TABLE 4: SUMMARY OF RAFTS FLOWS (EXISTING CONDITIONS)

100 Yr FLOWS (m3/s)

RAFTS Node	Storm Duration (minutes)								Max
	25	60	90	120	180	360	540	720	
A5.0	1.2	1.2	**1.3**	1.2	0.8	0.5	0.5	0.5	1.3
A6.0	0.7	0.7	**0.7**	0.7	0.4	0.3	0.3	0.3	0.7
H15	0.7	0.7	**0.7**	0.7	0.4	0.3	0.3	0.3	0.7
A3.0	1.6	1.6	**1.8**	1.6	1.1	0.8	0.8	0.9	1.8
H18	1.6	1.6	**1.8**	1.6	1.1	0.8	0.8	0.9	1.8
A3.1	4.6	4.3	**4.8**	4.5	3.4	2.6	2.3	2.4	4.8
A4.0	0.9	1.4	1.4	**1.5**	1.3	1.2	1.1	1.1	1.5
A1.0	1.7	2.4	2.4	**2.5**	2.0	2.0	1.7	1.8	2.5
A2.0	2.2	2.2	**2.4**	2.2	1.5	1.0	0.9	0.9	2.4
A1.1	4.6	5.0	**6.0**	5.6	4.6	4.0	3.5	3.7	6.0
A1.2	10.8	11.0	**12.6**	12.3	9.5	8.2	7.3	7.6	12.6
A1.3	13.4	14.2	15.5	**15.7**	12.0	10.6	9.3	9.8	15.7
A1.4	14.9	15.9	17.0	**17.2**	13.1	11.6	10.2	10.7	17.2
B2.0	1.2	1.6	**1.7**	1.7	1.4	1.3	1.1	1.2	1.7
B1.0	0.8	1.0	**1.1**	1.0	0.9	0.8	0.7	0.8	1.1
H1_H2	2.0	2.5	**2.8**	2.7	2.2	2.2	1.9	2.0	2.8
E3.0	2.2	2.2	**2.5**	2.2	1.6	1.2	1.1	1.1	2.5
E4.0	0.4	0.4	**0.4**	0.4	0.3	0.2	0.2	0.2	0.4
E2.0	2.2	2.2	**2.5**	2.2	1.6	1.3	1.1	1.1	2.5
E2.1	3.6	3.7	**4.2**	3.7	2.8	2.1	1.8	1.9	4.2
E2.2	6.5	6.5	**7.4**	6.6	4.9	3.6	3.1	3.2	7.4
E1.0	2.2	2.2	**2.4**	2.2	1.4	0.9	0.8	0.8	2.4
E1.1	3.3	3.2	**3.5**	3.2	2.2	1.5	1.3	1.3	3.5
E1.2	10.8	10.9	**12.3**	11.0	8.0	5.8	5.1	5.2	12.3
H9	10.8	10.9	**12.3**	11.0	8.0	5.8	5.1	5.2	12.3
E1.3	15.8	15.8	**17.7**	16.0	11.4	8.6	7.6	7.8	17.7
H7	18.0	18.0	**20.2**	18.2	13.1	9.8	8.6	8.9	20.2
E1.4	19.8	20.0	**22.6**	20.4	14.9	12.3	11.4	12.0	22.6
C1.0	1.4	1.3	**1.5**	1.4	0.9	0.7	0.6	0.6	1.5
H16	1.4	1.3	**1.5**	1.4	0.9	0.7	0.6	0.6	1.5
D1.0	0.3	0.3	**0.3**	0.3	0.2	0.1	0.1	0.1	0.3
H17	0.3	0.3	**0.3**	0.3	0.2	0.1	0.1	0.1	0.3
F1.0	0.3	0.3	**0.3**	0.3	0.2	0.1	0.1	0.1	0.3

TABLE 4: SUMMARY OF RAFTS FLOWS (EXISTING CONDITIONS)

200 Yr FLOWS (m3/s)

RAFTS Node	Storm Duration (minutes)								Max
	25	60	90	120	180	360	540	720	
A5.0	1.3	1.3	**1.4**	1.3	0.9	0.6	0.5	0.5	1.4
A6.0	0.7	0.7	**0.8**	0.7	0.5	0.3	0.3	0.3	0.8
H15	0.7	0.7	**0.8**	0.7	0.5	0.3	0.3	0.3	0.8
A3.0	1.8	1.7	**2.0**	1.8	1.2	0.9	1.0	1.0	2.0
H18	1.8	1.7	**2.0**	1.8	1.2	0.9	1.0	1.0	2.0
A3.1	5.0	4.7	**5.2**	4.9	3.7	2.8	2.6	2.7	5.2
A4.0	1.1	1.6	1.6	**1.6**	1.4	1.4	1.2	1.2	1.6
A1.0	1.9	2.6	2.6	**2.7**	2.2	2.2	1.9	2.0	2.7
A2.0	2.4	2.4	**2.6**	2.4	1.6	1.0	0.9	0.9	2.6
A1.1	5.1	5.5	**6.6**	6.2	5.0	4.4	3.8	4.0	6.6
A1.2	11.8	12.1	**13.9**	13.5	10.5	9.0	8.0	8.3	13.9
A1.3	14.7	15.7	17.1	**17.2**	13.3	11.5	10.2	10.6	17.2
A1.4	16.4	17.5	18.7	**18.9**	14.5	12.7	11.1	11.6	18.9
B2.0	1.4	1.7	**1.9**	1.9	1.5	1.4	1.2	1.3	1.9
B1.0	0.9	1.1	**1.2**	1.2	1.0	0.9	0.8	0.9	1.2
H1_H2	2.3	2.8	**3.1**	3.0	2.5	2.4	2.0	2.2	3.1
E3.0	2.4	2.4	**2.7**	2.4	1.8	1.3	1.2	1.2	2.7
E4.0	0.4	0.4	**0.5**	0.4	0.3	0.2	0.2	0.2	0.5
E2.0	2.4	2.4	**2.7**	2.4	1.8	1.4	1.2	1.2	2.7
E2.1	4.0	4.0	**4.6**	4.1	3.0	2.3	2.0	2.0	4.6
E2.2	7.2	7.1	**8.1**	7.3	5.4	3.9	3.4	3.5	8.1
E1.0	2.4	2.4	**2.6**	2.4	1.5	1.0	0.9	0.9	2.6
E1.1	3.6	3.5	**3.9**	3.5	2.3	1.6	1.4	1.4	3.9
E1.2	11.9	11.9	**13.4**	12.1	8.7	6.3	5.6	5.6	13.4
H9	11.9	11.9	**13.4**	12.1	8.7	6.3	5.6	5.6	13.4
E1.3	17.4	17.2	**19.3**	17.5	12.5	9.4	8.2	8.4	19.3
H7	19.8	19.6	**22.0**	19.9	14.3	10.7	9.4	9.6	22.0
E1.4	21.8	21.8	**24.6**	22.4	16.4	13.5	12.4	12.9	24.6
C1.0	1.5	1.5	**1.7**	1.5	1.0	0.7	0.7	0.7	1.7
H16	1.5	1.5	**1.7**	1.5	1.0	0.7	0.7	0.7	1.7
D1.0	0.4	0.3	**0.4**	0.3	0.2	0.1	0.1	0.1	0.4
H17	0.4	0.3	**0.4**	0.3	0.2	0.1	0.1	0.1	0.4
F1.0	0.3	0.3	**0.3**	0.3	0.2	0.1	0.1	0.1	0.3

TABLE 4: SUMMARY OF RAFTS FLOWS (EXISTING CONDITIONS)

500 Yr FLOWS (m3/s)

RAFTS Node	Storm Duration (minutes)								Max
	25	60	90	120	180	360	540	720	
A5.0	1.5	1.5	**1.6**	1.5	1.0	0.6	0.6	0.6	1.6
A6.0	0.8	0.8	**0.9**	0.8	0.5	0.4	0.3	0.3	0.9
H15	0.8	0.8	**0.9**	0.8	0.5	0.4	0.3	0.3	0.9
A3.0	2.0	2.0	**2.2**	2.0	1.4	1.0	1.1	1.2	2.2
H18	2.0	2.0	**2.2**	2.0	1.4	1.0	1.1	1.2	2.2
A3.1	5.6	5.3	**5.9**	5.6	4.2	3.1	3.0	3.1	5.9
A4.0	1.3	1.9	1.9	**1.9**	1.6	1.5	1.4	1.4	1.9
A1.0	2.3	3.1	3.1	**3.2**	2.6	2.5	2.1	2.2	3.2
A2.0	2.8	2.7	**2.9**	2.7	1.8	1.2	1.0	1.0	2.9
A1.1	5.9	6.4	**7.5**	7.2	5.8	5.0	4.3	4.5	7.5
A1.2	13.5	14.0	**15.9**	15.5	12.1	10.1	9.0	9.4	15.9
A1.3	16.9	18.0	19.6	**19.7**	15.2	13.0	11.5	12.0	19.7
A1.4	18.7	20.1	21.3	**21.6**	16.5	14.2	12.6	13.1	21.6
B2.0	1.6	2.0	**2.2**	2.2	1.8	1.6	1.4	1.5	2.2
B1.0	1.1	1.3	**1.4**	1.4	1.1	1.1	0.9	1.0	1.4
H1_H2	2.7	3.3	**3.6**	3.6	2.9	2.7	2.3	2.4	3.6
E3.0	2.7	2.7	**3.1**	2.8	2.1	1.5	1.3	1.3	3.1
E4.0	0.5	0.5	**0.5**	0.5	0.3	0.2	0.2	0.2	0.5
E2.0	2.7	2.7	**3.1**	2.8	2.1	1.5	1.3	1.4	3.1
E2.1	4.6	4.6	**5.2**	4.7	3.5	2.5	2.2	2.3	5.2
E2.2	8.2	8.2	**9.2**	8.3	6.1	4.4	3.8	3.9	9.2
E1.0	2.7	2.7	**2.9**	2.7	1.7	1.1	1.0	1.0	2.9
E1.1	4.1	4.0	**4.3**	4.0	2.6	1.8	1.6	1.6	4.3
E1.2	13.6	13.6	**15.2**	13.7	10.0	7.1	6.2	6.3	15.2
H9	13.6	13.6	**15.2**	13.7	10.0	7.1	6.2	6.3	15.2
E1.3	19.8	19.7	**22.0**	19.8	14.3	10.5	9.2	9.4	22.0
H7	22.5	22.4	**25.1**	22.6	16.4	12.0	10.5	10.7	25.1
E1.4	24.8	25.0	**28.1**	25.5	18.8	15.2	13.9	14.5	28.1
C1.0	1.7	1.7	**1.9**	1.7	1.2	0.8	0.7	0.7	1.9
H16	1.7	1.7	**1.9**	1.7	1.2	0.8	0.7	0.7	1.9
D1.0	**0.4**	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.4
H17	**0.4**	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.4
F1.0	**0.4**	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.4

TABLE 4: SUMMARY OF RAFTS FLOWS (EXISTING CONDITIONS)

PMF FLOWS (m3/s)

RAFTS Node	Storm Duration (minutes)								Max
	15	30	45	60	90	120	150	180	
A5.0	**6.2**	5.4	4.8	4.5	3.9	3.5	3.1	2.9	6.2
A6.0	**3.4**	3.0	2.6	2.5	2.2	2.0	1.7	1.6	3.4
H15	**3.4**	3.0	2.6	2.5	2.2	2.0	1.7	1.6	3.4
A3.0	8.9	**9.3**	9.2	8.9	7.9	7.4	6.6	6.0	9.3
H18	8.9	**9.3**	9.2	8.9	7.9	7.4	6.6	6.0	9.3
A3.1	23.8	**24.4**	23.7	22.9	20.9	19.4	17.5	16.1	24.4
A4.0	7.8	10.7	**11.1**	11.0	10.4	9.7	8.9	8.2	11.1
A1.0	14.0	17.3	**17.3**	17.1	16.1	15.0	13.7	12.7	17.3
A2.0	**11.2**	9.9	8.7	8.2	7.1	6.4	5.7	5.2	11.2
A1.1	29.3	**32.8**	32.4	32.4	30.8	28.8	26.3	24.5	32.8
A1.2	64.1	**69.6**	69.0	67.5	62.6	59.0	53.8	49.9	69.6
A1.3	81.0	**87.8**	87.4	86.4	79.6	75.5	68.8	63.7	87.8
A1.4	85.4	93.6	**94.2**	93.6	87.2	82.2	75.2	69.7	94.2
B2.0	9.2	**11.5**	11.3	11.1	10.2	9.6	8.7	8.0	11.5
B1.0	5.8	**7.3**	7.3	7.3	6.8	6.3	5.7	5.3	7.3
H1_H2	15.0	**18.8**	18.6	18.3	17.0	15.9	14.4	13.3	18.8
E3.0	**11.1**	10.9	10.6	10.0	9.0	8.2	7.3	6.7	11.1
E4.0	**1.9**	1.7	1.6	1.5	1.3	1.2	1.0	0.9	1.9
E2.0	**11.0**	11.0	10.8	10.5	9.3	8.7	7.8	7.1	11.0
E2.1	**18.7**	18.3	18.1	17.4	15.4	14.3	12.8	11.7	18.7
E2.2	**33.1**	32.1	31.4	29.6	26.5	24.3	21.7	19.9	33.1
E1.0	**11.2**	9.6	8.5	8.0	6.9	6.2	5.5	5.0	11.2
E1.1	**16.6**	14.6	13.2	12.2	10.8	9.8	8.7	7.9	16.6
E1.2	**55.5**	52.3	51.0	48.0	42.9	39.4	35.2	32.3	55.5
H9	**55.5**	52.3	51.0	48.0	42.9	39.4	35.2	32.3	55.5
E1.3	**79.9**	74.5	73.3	71.0	62.9	58.9	53.0	48.7	79.9
H7	**91.0**	85.4	83.9	81.0	71.8	67.1	60.3	55.4	91.0
E1.4	**103.0**	100.5	98.9	99.6	94.4	90.3	83.3	77.7	103.0
C1.0	**7.0**	6.3	6.0	5.7	5.1	4.6	4.1	3.8	7.0
H16	**7.0**	6.3	6.0	5.7	5.1	4.6	4.1	3.8	7.0
D1.0	**1.6**	1.3	1.2	1.1	0.9	0.8	0.7	0.7	1.6
H17	**1.6**	1.3	1.2	1.1	0.9	0.8	0.7	0.7	1.6
F1.0	**1.6**	1.3	1.2	1.1	0.9	0.8	0.7	0.7	1.6

swales and crossed roadways at culvert crossings, etc. However close examination of the field information gathered specifically for the study revealed a number of features that indicated that a one-dimensional modelling approach would be unsatisfactory.

That is, the field survey data (and the subsequently developed contour mapping) showed:

- The Castlereagh Road and Southee Road levels in the vicinity of where the Western catchment flows would potentially spill over those roadways were considerably higher than where the Eastern catchment flows would potentially spill over the Londonderry Road roadway. Since the commission involves the assessment of events as large as 500 year ARI and PMF together with trunk system pipe and culvert blockage conditions of 0% and 50%, such scenarios suggested that it would possible for some Western catchment flood flows to 'spill' into the Eastern catchment;

- At that same north-western corner of the study area, the Southee Road levels were lower than the Castlereagh Road and Hughes Avenue neighbourhood levels. This situation indicated that when the Western catchment trunk swale flood levels exceeded the swale capacity near Castlereagh Road, the excess flows would pass overland towards Southee Road rather than spilling over Castlereagh Road;

- At Hereford Street, at the upstream end of one of the Western catchment swales, there is only a nominal crest in the roadway just south of the swale and thereafter Hereford Street continues to slope in a south-easterly direction. This indicated that some of the Western catchment flows would also spill into the Eastern catchment as soon as the flood level reached that roadway crest level;

- At a number of other locations the urban neighbourhoods adjacent to the trunk swales featured very flat landscapes. This meant that when the swale floodwaters spilt beyond the swale corridors, the resultant overbank flows would not necessarily be conveyed in directions that were parallel to the swale corridor flows. Indeed in several locations — i.e. Hughes Avenue (near Bell Avenue), Thompson Avenue and Luttrell Street — distinct low points existed away from the swale corridors which meant that those areas would serve as flood storage compartments which would only contribute runoff to the swales when the compartments themselves had been filled.

All of the above factors led to the realisation that one-dimensional HEC-RAS modelling would produce an unsatisfactory picture of the study area's flood regime. This finding was discussed with the study's technical committee and it was agreed that two-dimensional modelling software should be used. Details of this modelling are presented in **Section 3**.

3. TWO-DIMENSIONAL FLOOD MODELLING

3.1 TUFLOW SOFTWARE

TUFLOW, an Australian-written 2D floodplain software package, which has been used extensively by a number of specialist consulting companies (including Bewsher Consulting) and also Sydney basin local councils for a range of mainstream and urban area flood studies, was chosen.

The TUFLOW model consists of the following elements:

- a 2D grid (with two metre x two metre grid dimensions) to reflect the topography of the modelling area based on a study-specific DEM; and

- a 1D network (which is embedded in the 2D grid) to define the various swale culvert crossings plus the trunk pipe systems that receive the swale flows.

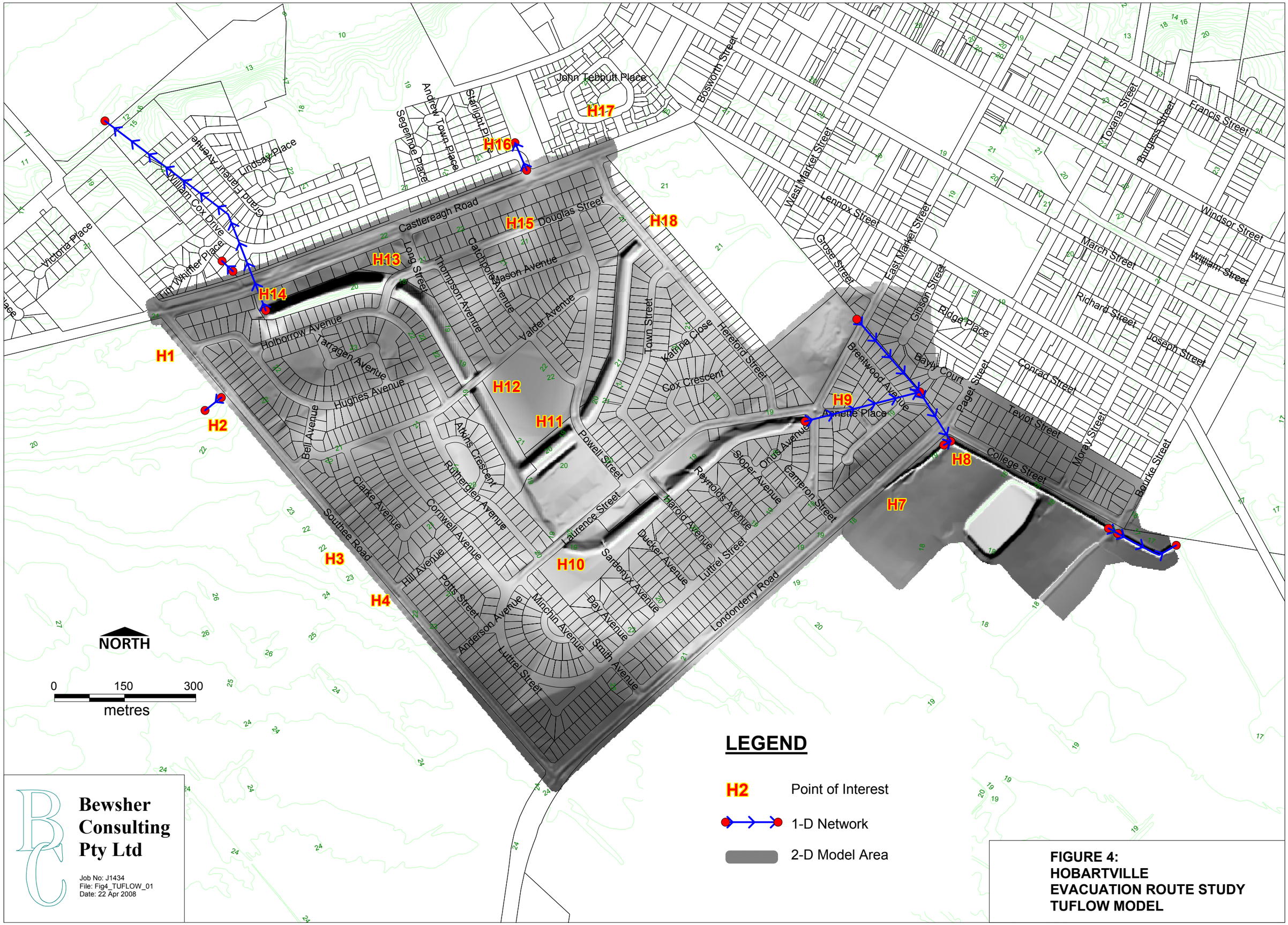
3.2 TUFLOW MODELLING APPROACH

As shown in **Figure 4**, it was agreed that the footprint of the TUFLOW model needed to extend from Castlereagh Road in the north-west corner of the study area, Hereford Street along the eastern edge of the study area, to the intersection of College Street and Bourke Street in the south-eastern corner of the study area and Southee Street along the south-western edge of the study area.

This footprint area means that all of the 'points of interest' bar H16 (at William Cox Drive) and H17 (at John Tebbut Place) have been explicitly included in the TUFLOW model. This means that the RAFTS-based basin storage-modelling approach that was originally proposed for local sag points — as described in **Section 2.3 (a)** — has been superseded by TUFLOW output for all bar two of the 'points of interest'. Hence the RAFTS-based approach has only been preserved for H16 and H17 and those results are presented in **Section 4**.

The focus of the study meant that the development of the TUFLOW model concentrated on the flood regime at each of the 'points of interest' rather than throughout the study area. In particular, this impacted on how the study area's topography was defined away from the 'points of interest' and how flows through urban neighbourhoods were modelled.

As endorsed by the TWG, the project surveyors produced the DEM by combining the initial study area detailed field survey results with additional spot level


H1
H2
H3
H4
H7
H8
H9
H10
H11
H12
H13
H14
H15
H16
H17
H18
Castlereagh Road
Douglas Street
Long Street
Thompson Avenue
Catchpole Avenue
Mason Avenue
Valder Avenue
Holborrow Avenue
Tarragon Avenue
Hughes Avenue
Bell Avenue
Clarke Avenue
Southee Road
Cornwell Avenue
Rutherglen Avenue
Atkins Crescent
Hill Avenue
Ports Street
Anderson Avenue
Minchin Avenue
Luttrel Street
Smith Avenue
Bay Avenue
Sarsenyx Avenue
Laurence Street
Powell Street
Town Street
Katrina Close
Cox Crescent
Hereford Street
Harold Avenue
Duekser Avenue
Reynolds Avenue
Sloper Avenue
Onus Avenue
Cameron Street
Londonderry Road
Annette Place
Brentwood Avenue
Bayly Court
Pagel Street
Ridge Place
Gibson Street
Richard Street
Conrad Street
Joseph Street
Teviot Street
Moray Street
College Street
Bourke Street
West Market Street
East Market Street
Lennox Street
Gross Street
Bosworth Street
John Tebbutt Place
Andrew Town Place
Segenhoe Place
Starlight Place
Lindsay Place
Grand Parade Avenue
William Cox Drive
Tim Wriffer Place
Victoria Place
Toxana Street
Burgess Street
Francis Street
Windsor Street
March Street
William Street
NORTH
0
150
300
metres
LEGEND
Point of Interest
1-D Network
2-D Model Area
Bewsher Consulting Pty Ltd
Job No: J1434
File: Fig4_TUFLOW_01
Date: 22 Apr 2008
FIGURE 4:
HOBARTVILLE
EVACUATION ROUTE STUDY
TUFLOW MODEL

data that was collected in a number of locations (principally along roadways) which had previously not been surveyed. While the DEM provides an accurate picture of ground conditions in the area covered by the initial detailed field survey, in all other areas it is not precisely replicating ground conditions (but importantly for this evacuation route study it is providing a good definition of general slopes and hence potential flowpaths). (It therefore follows that the flood levels computed in those areas beyond the detailed field survey are only indicative and should not be used for other purposes such as the issuing of flood levels or assessing floor level controls.) The extent of the DEM is shown in **Figure 4**.

As surveyed by the project surveyors, the culvert details associated with the various swale crossings plus trunk pipe systems were included in the model.

The typical (and detailed) 2D approach that is used in assessing how much flow can pass through residential properties is to digitise individual building footprints and assign both a very high roughness coefficient for those footprints and a different and lower roughness coefficient for the remainder of the allotments. Since there were insufficient funding to undertake tasks such as these it was agreed that a single roughness coefficient could be adopted for all residential allotments. Two values — based on Mannings coefficients of 0.1 and 1.0 — were initially tested in the TUFLOW model. The TWG endorsed the recommendation to adopt the latter value since it was considered to represent a better composite value for urban neighbourhood flowpaths.

Figure C1 in **Appendix C** defines the adopted roughness coefficients used in various parts of the TUFLOW model.

The various RAFTS sub-catchment flow hydrographs (see **Table 4** for corresponding peak flows) were directly imported into the TUFLOW model. Where sub-catchments included the trunk swale alignments, their hydrographs were imported using 'inflow lines' remote from the swales rather than the more typical modelling approach of adding the inflows to wetted areas (since the latter method would understate the passage of overland flows towards the local swale). Initially the 500 year ARI 90 minute and three hour storm hydrographs were tested in the TUFLOW model. Since the flood levels at the principal evacuation routes and most other 'points of interest' were found to be the same, the 90 minute storm hydrographs were adopted for all design flood events between 20 year ARI and 500 year ARI. The 30 minute storm hydrographs were adopted for the PMF TUFLOW model.

Similar to earlier LHSS investigations, the following approach was adopted for downstream boundary conditions. Where the Hawkesbury-Nepean (H-N) river flood levels dominated they were used as constant tailwater levels. For the study area's 20 year ARI event, a H-N 5 year peak was adopted; for the 50 year ARI event, a H-N 10 year ARI peak was adopted; for the 100 year ARI event, a H-N 20 year ARI peak was adopted; for the 200 year and 500 year events, a H-N 50 year peak was adopted and for the PMF event, a H-N 100 year peak was adopted. Outside of the 'backwater-influenced areas, approximate rating tables were developed using the study's surveyed cross sections, etc.

Table 5 lists the design Hawkesbury-Nepean River flood levels which were supplied by the DNR (from **Reference 1**). The North Richmond values are more appropriate for the Western catchment outlets while the Windsor values are more appropriate for the Eastern catchment outlet since the latter is within Rickabys Creek which joins the Hawkesbury-Nepean River near Windsor.

TABLE 5: HAWKESBURY-NEPEAN RIVER FLOOD LEVELS

ARI (years)	RL at Nth Richmond (m AHD)	RL at Windsor (m AHD)
5	12.5	11.1
10	14.0	12.3
20	15.3	13.7
50	16.4	15.7
100	17.5	17.3
200	18.9	18.7
500	20.4	20.2
PMF	26.5	26.4

The TUFLOW design model results were interrogated to extract typical depth of inundation data at each of the 'points of interest' and details of peak water levels along each of the subject roadways are presented in **Appendix C**. (In some of the **Appendix C** plots it will be seen that occasionally the flood levels plot below the DEM road surface. At those locations there is no flood inundation and the presentation is just a limitation of the spreadsheet-based post-processing of the TUFLOW output.)

3.3 FLOOD MODEL RESULTS

Table 6 summarises the depths at each of the 'points of interest' and the flood regime at each of the locations is documented in the following sections.

3.3.1 Southee Road (H1 and H2)

The H1 catchment lies west of Southee Road and its flows spill onto the roadway after routing through a small farm dam. Detailed survey confirms that Southee Road falls in a southerly direction at this point and so the runoff follows the roadway to the sag point at H2. In the PMF event the southerly flows are increased by spill that has occurred from the main Western catchment swale and reaches Southee Road via Holborrow Avenue and Hughes Avenue. As can be seen in **Table 6**, the flow depths are not significant.

TABLE 6: TUFLOW MODELLED ROADWAY FLOOD DEPTHS (mm)

Point of Interest	Street Location	Trunk Conduit Blockage (%)	DESIGN FLOOD EVENT SERIES					
			20 year ARI	50 year ARI	100 year ARI	200 year ARI	500 year ARI	PMF
H1	Southee Road	0	<100	<100	<100	<100	<100	<100
		50	<100	<100	<100	<100	<100	<100
H2	Southee Road	0	150	150	200	200	200	250
		50	150	150	200	200	200	250
H3	Southee Road	0	150	200	200	200	200	300
		50	150	200	200	200	200	300
H4	Southee Road	0	<100	<100	<100	<100	<100	250
		50	<100	<100	<100	<100	<100	250
H7	Londonderry Road	0	<100	<100	<100	<100	<100	450
		50	<100	<100	<100	<100	<100	500
H8	Paget Street	0	<100	<100	<100	<100	<100	150
		50	<100	<100	<100	<100	<100	150
H9	East Market Street (near Annette Place)	0	550	600	750	800	850	1300
		50	650	750	800	800	850	1300
	East Market Street (Near Brentwood Avenue)	0	300	400	450	500	600	1000
		50	400	500	550	600	650	1000
H10	Laurence Street	0	<100	<100	<100	<100	<100	450
		50	<100	<100	<100	<100	100	500
	Laurence Street (near Hereford St)	0	<100	150	250	250	350	800
		50	200	250	300	350	400	800
H11	Powell Street	0	<100	<100	<100	<100	<100	300
		50	<100	<100	<100	<100	100	350
H12	Valder Avenue	0	<100	<100	<100	<100	<100	450
		50	<100	<100	<100	<100	<100	500
H13	Douglas Street (at swale crossing)	0	0	0	0	0	0	100
		50	0	0	0	0	0	100
H14	Castlereagh Road	0	0	0	0	0	0	0
		50	0	0	0	0	0	0
H15	Douglas Street at sag point	0	700	750	750	800	800	900
		50	700	750	750	800	800	900
H18	Hereford Street	0	150	150	150	200	200	200
		50	150	150	150	200	200	200
	Castlereagh Road (near William Cox Drive)	0	<100	<100	<100	<100	<100	<100
		50	<100	<100	<100	<100	<100	<100
	Harold Avenue (at swale crossing)	0	150	250	300	350	400	700
		50	250	300	350	350	400	700
	Harold Avenue (near Luttrell Street)	0	350	400	400	400	450	650
		50	350	400	400	400	450	650
	Luttrell Street (near Harold Avenue)	0	100	150	150	150	200	400
		50	100	150	150	150	200	400
	Luttrell Street (near Sloper Avenue)	0	250	250	300	300	300	600
		50	250	250	300	300	300	600

Note:
1. Levels are quoted to nearest 50mm.
2. As-modelled depths between 0 & 100mm may actually correspond to larger depths depending on heights of kerbs, etc which are not explicitly reflected in the TUFLOW model.
3. H16 and H17 locations are beyond the TUFLOW modelled area and are derived using the RAFTS model storage modelling approach, see Section 4 and Table 7

The majority of the H2 catchment also lies west of Southee Road and the model predicts that these flows will spill both northwards along Southee Road and into Valder Avenue. Depths of water in Southee Road are calculated to be between 150mm and 200mm and slightly deeper again in the PMF event.

3.3.2 Southee Road (H3 and H4)

The H3 catchment lies west of Southee Road and its flows spill onto the roadway after routing through one or two farm dams. Detailed survey confirms that Southee Road falls in a southerly direction at this point and the runoff both follows the roadway to the sag point at H4 and spills into adjoining properties whose levels are lower than the roadway. The latter flows then cross Clarke Avenue, Cornwall Avenue and Rutherglen Avenue. The typical Southee Road depths of inundation vary between 150mm and 200mm.

The H4 catchment also lies west of Southee Road and the flows spill onto the roadway and are conveyed north to H4 which corresponds to the intersection with Hill Avenue. The depths of water in Southee Road are similar to the H3 regime but are shallower where they 'funnel' into Hill Avenue.

3.3.3 Londonderry Road (H5 and H6)

There are no issues at these two locations since there are no sag points and the flow magnitudes are very small.

3.3.4 Londonderry Road (H7 and H8)

H8 corresponds to a minor sag point in Paget Street just east of its intersection with College Street. Although it is adjacent to where a Council trunk stormwater pipe crosses Paget Street, the flood model predicts that most of the overland flow associated with that pipe's catchment spills in a south-westerly direction towards H7 before reaching Paget Street itself. Consequently as shown in **Table 6** the roadway depths at H8 are not significant.

H7 corresponds to the definitive low point in the Londonderry Road flood evacuation route. While there would be significant depths of inundation in the adjoining low lying properties, the fact that the roadway is higher and that the low point is longitudinally 'flat' means that the depth of roadway inundation is not significant.

3.3.5 East Market Street (H9)

H9 (near Annette Place) consists of the deeper of two distinct sag points in East Market Street (near Annette Place and Brentwood Avenue) and hence there are two sets of flood depths listed in **Table 6**. While each of these has its own stormwater catchment,

the nature of the broad overland flow regime between East Market Street and Londonderry Road is such that the East Market Street area forms a flood storage compartment and so the roadway flood level is constant (as can be seen in the plot reproduced in **Appendix C**). It needs to be noted that since the local DEM coverage does not fully cover the potential eastward extent of inundation, the calculated East Market Street flood levels are probably conservative.

3.3.6 Laurence Street (H10 and near Hereford Street)

H10 corresponds to the sag point where Laurence Street crosses the upstream limit of both the Western and Eastern catchment swales. The roadway is overtopped in all the design events by floodwaters spilling in a southerly direction — that is, Western catchment floodwaters spilling into the Eastern catchment. However apart from the PMF event, the sag point depths are not significant.

As shown in the **Appendix C** plot, west of this sag point Laurence Street serves as a preferential overland flowpath for local runoff (that is, runoff generated by the RAFTS A1 and A2 sub-catchments, see Figure 3) and these roadway depths typically vary between 100 and 200mm but are of the order of 300mm deep in the PMF event.

There are two local sag points in Laurence Street which are located either side of the intersection with Hereford Street. Their depths are very similar and are significant especially in the scenario where the adjacent trunk pipe system at the outlet of the swale is modelled as being 50% blocked. The plot in **Appendix C** shows that there is only a nominal flood slope in this area and hence the area essentially corresponds to a flood storage compartment.

3.3.7 Powell Street (H11)

H11 corresponds to the crossing of the Western catchment tributary swale where flows are travelling in a southerly direction. There are no significant flood depths except in the PMF event when almost all of the length of Powell Street between the swale crossing and Laurence Street is inundated.

3.3.8 Valder Avenue (H12)

H12 corresponds to the crossing of the Western catchment main swale where flows are travelling in a northerly direction. There are no significant flood depths except in the PMF event.

The model also replicates the Valder Avenue flowpath between Rutherglen Avenue and the swale crossing. Those flood depths do not exceed 100mm except in the PMF event.

3.3.9 Douglas Street (H13)

H13 corresponds to the crossing of the Western catchment main swale where flows are travelling in a westerly direction. There is no overtopping in any of the design events, including the PMF. The PMF depth reported in **Table 6** corresponds to the scenario where east of the swale crossing, Douglas Street is providing a spill point for excess runoff ponding in the Thompson Avenue low point area.

3.3.10 Castlereagh Road (H14)

Initially it was thought that the Western Catchment main swale would spill at this location however the field survey and TUFLOW flood modelling shows that this will not occur since the Castlereagh Road levels are high relative to other locations. The flood modelling shows that the floodwaters only spill out of the swale corridor in the PMF event via a defacto flowpath involving Holborrow Avenue, Hughes Avenue and Southee Road (as also described in **Section 3.3.1**).

3.3.11 Douglas Street (H15)

H15 corresponds to a trapped low point in Douglas Street. The overall volume of runoff trapped at this low point is such that there is some spill occurring in a northerly direction towards Castlereagh Road in all the design events.

Not surprisingly — given the difference in elevation between the low point and initial spill — the maximum depths at the trapped low point itself are very significant.

3.3.12 Hereford Street (H18)

H18 corresponds to the local low point in Hereford Street that is adjacent to the start of the Western catchment tributary swale. The ponding at this location varies between 150mm and 200mm.

In the PMF event, Hereford Street itself also serves as an overland flowpath beyond the intersection with Town Street. Since Hereford Street continues to fall towards its intersection with Laurence Street, these Western catchment PMF flows are spilling into the Eastern catchment.

3.3.13 Castlereagh Road

There are very minor flows crossing Castlereagh Road as a result of spill occurring from the direction of Douglas Street (at H15). None of the depths are significant.

3.3.14 Harold Avenue

There are two low points in Harold Avenue and therefore there are two sets of flood depths listed in **Table 6**. The first, which has the lesser flood depths, corresponds to the crossing of the Eastern catchment main swale where flows are travelling in an easterly direction.

The second low point is adjacent to the intersection with Luttrell Street. It lies within the flowpath that sees floodwaters spilling out of the Eastern catchment swale behind Sardonyx Avenue and travelling in an easterly direction towards Londonderry Road (at H7).

Table 6 shows that the depths at both locations are significant.

3.3.15 Luttrell Street

There are a series of low points in Luttrell Street. While these would probably exhibit significant flood depths just due to local catchment runoff, the depths are larger again because of the spill regime that is conveying Eastern catchment swale flows from behind Sardonyx Avenue and travelling in an easterly direction towards Londonderry Road (at H7).

4. RAFTS-BASED FLOOD MODELLING

As detailed in **Section 3.2**, there are two 'points of interest' which lie beyond the limits of the TUFLOW model. These are H16 at William Cox Drive and H17 at John Tebbut Place.

TABLE 7: H16 & H17 SUMMARY

RAFTS Node: **C1.0**
Low Point ID: **H16**
Sag Point Level: 19.90 mAHD
Spill Level: 20.20 mAHD

ARI (Year)	Flow (m3/s)	Flood Level (mAHD)	Depth at Spill Gutter Location (m)
20	1.2	20.47	0.27
50	1.3	20.48	0.28
100	1.5	20.49	0.29
200	1.7	20.50	0.30
500	1.9	20.51	0.31
PMF	7.0	20.63	0.43

RAFTS Node: **D1.0**
Low Point ID: **H17**
Sag Point Level: 20.40 mAHD
Spill Level: 20.57 mAHD

ARI (Year)	Flow (m3/s)	Flood Level (mAHD)	Depth at Spill Gutter Location (m)
20	0.3	20.72	0.15
50	0.3	20.73	0.16
100	0.3	20.74	0.17
200	0.4	20.74	0.17
500	0.4	20.75	0.18
PMF	1.6	20.88	0.31

Table 7 lists the depths of flooding relative to the spill location's lowest elevation (which corresponds to the local gutter invert level at both locations).

At H16, the lowest road centreline level is RL 20.10m; that is, 100mm lower than the spill lowest elevation. Therefore to define the worst road centreline inundation depths at H16, 100mm needs to be added to the **Table 7** final column values.

It is noted that H16 would also receive any floodwaters which spilt across Castlereagh Road (see **Section 3.3.13**) and therefore the depths at H16 would be slightly worse when such spill occurs.

A H17, the catchment peak flows are very small and hence it is not surprising that the flow depths listed in **Table 7** are not significant. The flooding would not inundate the whole roadway width except in the PMF event.

5. CONCLUSIONS

The flood modelling undertaken for this study indicates that whereas the principal flood evacuation routes — being Castlereagh Road and Londonderry Road — would only suffer from relatively minor flooding, there are pockets of significant flooding in the local road network.

If the local road network inundation depths need to be refined, the various inputs that make up the TUFLOW model would need to be re-examined to achieve a greater level of accuracy. Since the next phase will be focussed on the area's overland flow regimes, it is recommended that an enhanced TUFLOW model be developed to assess both the overland flow patterns and to refine the picture of local road network inundation.

6. REFERENCES

1. Hawkesbury-Nepean Flood Management Advisory Committee. (1997). *Achieving a Hawkesbury-Nepean Floodplain Management Strategy*. November.

2. Department of Land and Water Conservation. (2000). *Interim Regional Road Evacuation Route Upgrade Plan*. April.

3. Bewsher Consulting. (2003). *Road Evacuation Route Upgrade Strategy, Local Hydraulic Specification Study*. May. Commissioned by the Department of Sustainable Resources.

4. Institution of Engineers (Aust). (2005). *Australian Rainfall and Runoff.*

5. Bewsher Consulting. (2004). *Thorley Street (Bligh Park) Flood Evacuation Route LHSS*. Commissioned by the Department of Infrastructure, Planning and Natural Resources. September. Bewsher Consulting Job No. J1327.

APPENDIX A

RESIDENT LETTER AND QUESTIONNAIRE

Our Ref: CN 88242, 79346

8 July 2005

Dear Resident,

REQUEST FOR ASSISTANCE REGARDING OVERLAND FLOW STUDY

Council has received funding assistance from the Commonwealth and State Government to undertake an Overland Flow Study for Hobartville and Bligh Park.

This study is the culmination of previous reports undertaken by the NSW State Government entitled "Achieving a Hawkesbury-Nepean Floodplain Management Strategy", 1997 and "Interim Regional Road Evacuation Route Upgrade Plan", 2000.

Key population centres including Richmond (Hobartville) and Bligh Park were identified to have improved evacuation routes. To ensure effectiveness of the regional evacuation routes, local evacuation route constraints need to be investigated.

A study of potential stormwater flooding at a number of low points in Hobartville and Bligh Park is being undertaken and one of those locations is adjacent to your property. The Study is being undertaken by Bewsher Consulting (consulting engineers) on behalf of Council.

It would be of considerable assistance in the assessment of potential flooding if you could share any knowledge you might have of occasions when there has been ponding in the street (and whether or not that ponding has been such that there have also been ponding problems within your property).

To assist with this process, a questionnaire has been prepared and you will find it enclosed with this letter. It would be appreciated if you could complete the questionnaire and return it to Council (using the replied paid envelope supplied) by Wednesday, 20 July 2005.

If you have any queries regarding the study, please do not hesitate to contact either myself on the number listed below or Mr Don Still of Bewsher Consulting (telephone no. 9686 1966).

Yours faithfully

Christopher Amit
Manager Design & Mapping Services

Direct Line : (02) 4560 4508

HAWKESBURY COUNCIL
LOCAL OVERLAND FLOW STUDY
JULY 2005

IMPORTANT QUESTIONNAIRE

Concerning Low Point Flooding in Hobartville

Please complete this questionnaire for the property in which you have an interest.

House No ____ or Lot No. _____ Street Name_____

Name (optional) _____

Name of Business/Organisation (if applicable) _____

PART A: GENERAL INFORMATION

1. Type of development?

(Tick one or more boxes)

a. House ☐
b. Business. ☐
Please indicate type_____
c. Vacant land ☐
d. Other . ☐
Please specify _____
_____

2. Your residential status of the property

a. Owner residing or conducting business at property ☐
b. Tenant only ☐
c. Owner not residing nor conducting business at property ☐
d. Other. Please specify
_____

3. How long have you owned, lived at or conducted business at this property?

a. Less than 1 year ☐
b. 1 year to 5 years ☐
c. 5 years to 20 years ☐
d. More than 20 years ☐
If more than 20 years, how long? (_____Years)

PART B: FLOOD EXPERIENCE

4. Have you ever experienced water ponding in or flowing through the property ?

a. No ☐ (go to Question 7)
b. Yes ☐

If yes, which storms?
a. August 1986 ☐
b. April/May 1988 ☐
February 1990 ☐
d. August 1990 ☐
c. February 1992 ☐
d. Other ☐

If other, please specify the date or dates

5. What was the <u>date of the biggest storm event</u> you have experienced?

In that storm was the property flooded above <u>floor level</u>?

a. No ☐
b. Yes ☐

If yes, what was the depth of the water over the floor?

6. **In the biggest storm, what was the maximum depth of water in the property (as best you can remember)?**

7. **Have you ever observed flooding in the street adjacent to your property?**

a. No ☐ (go to Question 8)
b. Yes ☐

How many times have you observed water in the street?_____

Over how many years have those observations been made?_____

How many of those times was the street so badly flooded that cars could not pass through it?_____

Can you identify the month and year of the worst flooding in the street?_____

8. **This question is a repeat of Question 7 for those persons who are able to provide information for any other street flood problems other than adjacent to their property**

Location? _____ _____

How many times have you observed water in the street? _____ _____

Over how many years have those observations been made? _____ _____

How many of those times was the street so badly flooded that cars could not pass through it? _____ _____

Can you identify the month and year of the worst flooding at the low point? _____ _____

Please place your completed questionnaire in the postage paid envelope provided and return it to Council by Wednesday, 20 July 2005.

No postage stamp is required. If you have misplaced the supplied envelope or wish to send an additional submission the address is:

Reply paid Permit Number 352
FLOOD QUESTIONNAIRE
Bewsher Consulting Pty Ltd
P.O. Box 352,
EPPING NSW 1710

For additional questionnaires or further information, please contact:

Mr Christopher Amit
Hawkesbury City Council
PO Box 146
WINDSOR NSW 2756
Phone: (02) 4560 4444
Facsimile: (02) 4560 4400
E-mail: council@hawkesbury.nsw.gov.au

OR Mr Don Still
Bewsher Consulting Pty Ltd
PO Box 352
EPPING NSW 1710
Phone: (02) 9868 1966
Facsimile: (02) 9868 5759.
E-mail: postmaster@bewsher.com.au

Thank you again for being part of this study

APPENDIX B

RAFTS MODEL OUTPUTS

100 YEAR ARI OUTPUT

HOBARTVILLE RAFTS MODEL

##
Hobartville- 100yr

Results for period from 0: 0.0 1/ 1/1990
                    to 5: 0.0 1/ 1/1990
##

ROUTING INCREMENT (MINS) = 1.00
STORM DURATION (MINS)   = 25.
RETURN PERIOD (YRS)   = 100.
BX   = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2)   = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Catch. Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1 (%)	% Impervious #2 (%)	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	1.191	15.00	2.500
A6.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	0.6617	15.00	0.000
H15	108.30	10.00	0.000	2.500	0.000	34.292	0.000	0.6617	15.00	0.000
A3.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	1.643	15.00	0.000

H18	108.30	10.00	0.000	2.500	0.000	34.292	0.000	1.643	15.00	3.500
A3.1	108.30	10.00	1.500	2.500	0.000	34.292	43.625	4.555	15.00	2.500
A4.0	108.30	10.00	0.000	2.500	0.000	34.292	0.000	0.9123	26.00	.5000
A1.0	108.30	10.00	0.000	2.500	0.000	34.292	0.000	1.686	27.00	3.500
A2.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	2.208	15.00	2.000
A1.1	108.30	10.00	1.500	2.500	0.000	34.292	43.625	4.617	15.00	1.500
A1.2	108.30	10.00	1.500	2.500	0.000	34.292	43.625	10.758	16.00	2.500
A1.3	108.30	10.00	1.500	2.500	0.000	34.292	43.625	13.411	18.00	2.500
A1.4	108.30	10.00	1.500	2.500	0.000	34.292	43.625	14.927	21.00	10.00
B2.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	1.239	15.00	0.000
B1.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	0.7847	15.00	0.000
H1_H2	108.30	10.00	0.000	2.500	0.000	34.292	0.000	2.023	15.00	10.00
E3.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	2.174	15.00	0.000
E4.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	0.3707	15.00	0.000
E2.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	2.160	15.00	0.000
E2.1	108.30	10.00	1.500	2.500	0.000	34.292	43.625	3.644	15.00	0.000
E2.2	108.30	10.00	1.500	2.500	0.000	34.292	43.625	6.505	15.00	0.000
E1.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	2.183	15.00	0.000
E1.1	108.30	10.00	1.500	2.500	0.000	34.292	43.625	3.274	15.00	0.000
E1.2	108.30	10.00	1.500	2.500	0.000	34.292	43.625	10.834	15.00	0.000
H9	108.30	10.00	0.000	2.500	0.000	34.292	0.000	10.834	15.00	0.000
E1.3	108.30	10.00	1.500	2.500	0.000	34.292	43.625	15.836	15.00	0.000
H7	108.30	10.00	0.000	2.500	0.000	34.292	0.000	18.010	15.00	.5000
E1.4	108.30	10.00	1.500	2.500	0.000	34.292	43.625	19.807	16.00	10.00
C1.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	1.397	15.00	0.000
H16	108.30	10.00	0.000	2.500	0.000	34.292	0.000	1.397	15.00	10.00
D1.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	0.3236	15.00	0.000
H17	108.30	10.00	0.000	2.500	0.000	34.292	0.000	0.3236	15.00	10.00
F1.0	108.30	10.00	1.500	2.500	0.000	34.292	43.625	0.3085	15.00	10.00
Arb_Out	108.30	10.00	0.000	2.500	0.000	34.292	0.000	35.983	26.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	15.00	.6617	52.00	.0201	676.47	0.0000	614.45	20.855
H7	15.00	18.01	15.00	17.68	23197.8	0.0000	1875.6	18.328
H16	15.00	1.397	16.00	1.162	1626.7	0.0000	475.90	20.483
H17	15.00	.3236	16.00	.2630	284.43	0.0000	63.396	20.731

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 100yr

Results for period from 0: 0.0 1/ 1/1990
                    to 5: 0.0 1/ 1/1990
##

ROUTING INCREMENT (MINS) =   1.00

STORM DURATION (MINS) = 60.
RETURN PERIOD (YRS) = 100.
BX = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2) = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Catch. Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1 (%)	% Impervious #2 (%)	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak mins	Link Lag mins
A5.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	1.189	25.00	2.500
A6.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	0.6557	25.00	0.000
H15	66.800	10.00	0.000	2.500	0.000	54.758	0.000	0.6557	25.00	0.000
A3.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	1.592	25.00	0.000
H18	66.800	10.00	0.000	2.500	0.000	54.758	0.000	1.592	25.00	3.500
A3.1	66.800	10.00	1.500	2.500	0.000	54.758	65.300	4.255	25.00	2.500
A4.0	66.800	10.00	0.000	2.500	0.000	54.758	0.000	1.417	46.00	.5000
A1.0	66.800	10.00	0.000	2.500	0.000	54.758	0.000	2.351	42.00	3.500
A2.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	2.214	25.00	2.000
A1.1	66.800	10.00	1.500	2.500	0.000	54.758	65.300	5.005	25.00	1.500
A1.2	66.800	10.00	1.500	2.500	0.000	54.758	65.300	10.979	27.00	2.500
A1.3	66.800	10.00	1.500	2.500	0.000	54.758	65.300	14.210	29.00	2.500
A1.4	66.800	10.00	1.500	2.500	0.000	54.758	65.300	15.918	32.00	10.00
B2.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	1.553	40.00	0.000
B1.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	0.9789	45.00	0.000

H1_H2	66.800	10.00	0.000	2.500	0.000	54.758	0.000	2.528	41.00	10.00
E3.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	2.195	25.00	0.000
E4.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	0.3821	25.00	0.000
E2.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	2.192	25.00	0.000
E2.1	66.800	10.00	1.500	2.500	0.000	54.758	65.300	3.674	25.00	0.000
E2.2	66.800	10.00	1.500	2.500	0.000	54.758	65.300	6.528	25.00	0.000
E1.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	2.188	25.00	0.000
E1.1	66.800	10.00	1.500	2.500	0.000	54.758	65.300	3.244	25.00	0.000
E1.2	66.800	10.00	1.500	2.500	0.000	54.758	65.300	10.877	25.00	0.000
H9	66.800	10.00	0.000	2.500	0.000	54.758	0.000	10.877	25.00	0.000
E1.3	66.800	10.00	1.500	2.500	0.000	54.758	65.300	15.772	25.00	0.000
H7	66.800	10.00	0.000	2.500	0.000	54.758	0.000	17.967	25.00	.5000
E1.4	66.800	10.00	1.500	2.500	0.000	54.758	65.300	20.030	26.00	10.00
C1.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	1.340	25.00	0.000
H16	66.800	10.00	0.000	2.500	0.000	54.758	0.000	1.340	25.00	10.00
D1.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	0.3112	25.00	0.000
H17	66.800	10.00	0.000	2.500	0.000	54.758	0.000	0.3112	25.00	10.00
F1.0	66.800	10.00	1.500	2.500	0.000	54.758	65.300	0.3047	25.00	10.00
Arb_Out	66.800	10.00	0.000	2.500	0.000	54.758	0.000	36.331	36.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	25.00	.6557	76.00	.0235	1036.9	0.0000	941.15	21.020
H7	25.00	17.97	25.00	17.67	35944.0	0.0000	1875.2	18.328
H16	25.00	1.340	26.00	1.178	2484.5	0.0000	477.75	20.484
H17	25.00	.3112	26.00	.2654	436.73	0.0000	63.770	20.732

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 100yr

Results for period from 0: 0.0 1/ 1/1990
to 10: 0.0 1/ 1/1990
##

ROUTING INCREMENT (MINS) = 1.00
STORM DURATION (MINS) = 90.
RETURN PERIOD (YRS) = 100.
BX = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2) = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1	Catch. Area #2	Slope #1	Slope #2	% Impervious #1	% Impervious #2	Pern #1	Pern #2	B #1	B #2	Link No.

	(ha)		(%)		(%)						
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity	Init. Loss #1	Init. Loss #2	Cont. Loss #1	Cont. Loss #2	Excess Rain #1	Excess Rain #2	Peak Inflow	Time to Peak	Link Lag
	(mm/h)	(mm)		(mm/h)		(mm)		(m^3/s)		mins
A5.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	1.318	30.00	2.500
A6.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	0.7169	30.00	0.000
H15	52.600	10.00	0.000	2.500	0.000	65.608	0.000	0.7169	30.00	0.000
A3.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	1.779	30.00	0.000
H18	52.600	10.00	0.000	2.500	0.000	65.608	0.000	1.779	30.00	3.500
A3.1	52.600	10.00	1.500	2.500	0.000	65.608	77.400	4.770	30.00	2.500
A4.0	52.600	10.00	0.000	2.500	0.000	65.608	0.000	1.425	53.00	.5000
A1.0	52.600	10.00	0.000	2.500	0.000	65.608	0.000	2.364	44.00	3.500
A2.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	2.416	30.00	2.000
A1.1	52.600	10.00	1.500	2.500	0.000	65.608	77.400	5.950	30.00	1.500
A1.2	52.600	10.00	1.500	2.500	0.000	65.608	77.400	12.571	31.00	2.500
A1.3	52.600	10.00	1.500	2.500	0.000	65.608	77.400	15.539	34.00	2.500
A1.4	52.600	10.00	1.500	2.500	0.000	65.608	77.400	16.967	37.00	10.00
B2.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	1.703	30.00	0.000
B1.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	1.070	30.00	0.000
H1_H2	52.600	10.00	0.000	2.500	0.000	65.608	0.000	2.773	30.00	10.00
E3.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	2.489	30.00	0.000
E4.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	0.4245	30.00	0.000
E2.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	2.484	30.00	0.000
E2.1	52.600	10.00	1.500	2.500	0.000	65.608	77.400	4.186	30.00	0.000
E2.2	52.600	10.00	1.500	2.500	0.000	65.608	77.400	7.433	30.00	0.000
E1.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	2.369	30.00	0.000
E1.1	52.600	10.00	1.500	2.500	0.000	65.608	77.400	3.546	30.00	0.000
E1.2	52.600	10.00	1.500	2.500	0.000	65.608	77.400	12.285	30.00	0.000
H9	52.600	10.00	0.000	2.500	0.000	65.608	0.000	12.285	30.00	0.000
E1.3	52.600	10.00	1.500	2.500	0.000	65.608	77.400	17.748	30.00	0.000

H7	52.600	10.00	0.000	2.500	0.000	65.608	0.000	20.237	30.00	.5000
E1.4	52.600	10.00	1.500	2.500	0.000	65.608	77.400	22.591	31.00	10.00
C1.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	1.500	30.00	0.000
H16	52.600	10.00	0.000	2.500	0.000	65.608	0.000	1.500	30.00	10.00
D1.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	0.3278	30.00	0.000
H17	52.600	10.00	0.000	2.500	0.000	65.608	0.000	0.3278	30.00	10.00
F1.0	52.600	10.00	1.500	2.500	0.000	65.608	77.400	0.3245	30.00	10.00
Arb_Out	52.600	10.00	0.000	2.500	0.000	65.608	0.000	40.191	41.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	30.00	.7169	92.00	.0558	1233.7	0.0000	1069.1	21.075
H7	30.00	20.24	30.00	19.95	42872.9	0.0000	1945.0	18.340
H16	30.00	1.500	31.00	1.341	2958.1	0.0000	495.20	20.494
H17	30.00	.3278	31.00	.2829	519.34	0.0000	66.407	20.736

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 100yr

Results for period from 0: 0.0 1/ 1/1990
                    to 10: 0.0 1/ 1/1990
##

ROUTING INCREMENT (MINS) = 1.00
STORM DURATION (MINS)   = 120.
RETURN PERIOD (YRS)   = 100.
BX   = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2)   = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1	% Impervious #2	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000

A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	1.195	35.00	2.500
A6.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	0.6553	35.00	0.000
H15	44.200	10.00	0.000	2.500	0.000	74.025	0.000	0.6553	35.00	0.000
A3.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	1.608	34.00	0.000
H18	44.200	10.00	0.000	2.500	0.000	74.025	0.000	1.608	34.00	3.500
A3.1	44.200	10.00	1.500	2.500	0.000	74.025	86.900	4.480	36.00	2.500
A4.0	44.200	10.00	0.000	2.500	0.000	74.025	0.000	1.490	60.00	.5000
A1.0	44.200	10.00	0.000	2.500	0.000	74.025	0.000	2.452	49.00	3.500
A2.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	2.208	35.00	2.000
A1.1	44.200	10.00	1.500	2.500	0.000	74.025	86.900	5.604	40.00	1.500
A1.2	44.200	10.00	1.500	2.500	0.000	74.025	86.900	12.320	40.00	2.500
A1.3	44.200	10.00	1.500	2.500	0.000	74.025	86.900	15.680	42.00	2.500
A1.4	44.200	10.00	1.500	2.500	0.000	74.025	86.900	17.217	45.00	10.00
B2.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	1.652	40.00	0.000
B1.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	1.030	40.00	0.000
H1_H2	44.200	10.00	0.000	2.500	0.000	74.025	0.000	2.682	40.00	10.00
E3.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	2.215	35.00	0.000
E4.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	0.3838	35.00	0.000
E2.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	2.216	35.00	0.000
E2.1	44.200	10.00	1.500	2.500	0.000	74.025	86.900	3.717	35.00	0.000
E2.2	44.200	10.00	1.500	2.500	0.000	74.025	86.900	6.605	35.00	0.000
E1.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	2.171	35.00	0.000
E1.1	44.200	10.00	1.500	2.500	0.000	74.025	86.900	3.248	35.00	0.000
E1.2	44.200	10.00	1.500	2.500	0.000	74.025	86.900	10.977	35.00	0.000
H9	44.200	10.00	0.000	2.500	0.000	74.025	0.000	10.977	35.00	0.000
E1.3	44.200	10.00	1.500	2.500	0.000	74.025	86.900	15.960	35.00	0.000
H7	44.200	10.00	0.000	2.500	0.000	74.025	0.000	18.176	35.00	.5000
E1.4	44.200	10.00	1.500	2.500	0.000	74.025	86.900	20.424	36.00	10.00
C1.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	1.362	35.00	0.000
H16	44.200	10.00	0.000	2.500	0.000	74.025	0.000	1.362	35.00	10.00
D1.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	0.3080	35.00	0.000
H17	44.200	10.00	0.000	2.500	0.000	74.025	0.000	0.3080	35.00	10.00
F1.0	44.200	10.00	1.500	2.500	0.000	74.025	86.900	0.3029	35.00	10.00
Arb_Out	44.200	10.00	0.000	2.500	0.000	74.025	0.000	39.234	51.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	35.00	.6553	103.0	.0781	1387.3	0.0000	1103.4	21.090
H7	35.00	18.18	35.00	17.90	48212.7	0.0000	1882.6	18.329
H16	35.00	1.361	37.00	1.197	3335.0	0.0000	479.98	20.485
H17	35.00	.3080	37.00	.2605	583.63	0.0000	63.026	20.731

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 100yr

Results for period from 0: 0.0 1/ 1/1990
to 16:40.0 1/ 1/1990
##

ROUTING INCREMENT (MINS) = 1.00
STORM DURATION (MINS) = 180.
RETURN PERIOD (YRS) = 100.
BX = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2) = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1 (%)	% Impervious #2 (%)	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000

E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	0.7998	45.00	2.500
A6.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	0.4418	45.00	0.000
H15	34.500	10.00	0.000	2.500	0.000	86.750	0.000	0.4418	45.00	0.000
A3.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	1.122	45.00	0.000
H18	34.500	10.00	0.000	2.500	0.000	86.750	0.000	1.122	45.00	3.500
A3.1	34.500	10.00	1.500	2.500	0.000	86.750	102.00	3.356	45.00	2.500
A4.0	34.500	10.00	0.000	2.500	0.000	86.750	0.000	1.271	72.00	.5000
A1.0	34.500	10.00	0.000	2.500	0.000	86.750	0.000	1.974	56.00	3.500
A2.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	1.464	45.00	2.000
A1.1	34.500	10.00	1.500	2.500	0.000	86.750	102.00	4.557	45.00	1.500
A1.2	34.500	10.00	1.500	2.500	0.000	86.750	102.00	9.525	46.00	2.500
A1.3	34.500	10.00	1.500	2.500	0.000	86.750	102.00	11.978	46.00	2.500
A1.4	34.500	10.00	1.500	2.500	0.000	86.750	102.00	13.078	49.00	10.00
B2.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	1.369	45.00	0.000
B1.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	0.8597	45.00	0.000
H1_H2	34.500	10.00	0.000	2.500	0.000	86.750	0.000	2.228	45.00	10.00
E3.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	1.640	45.00	0.000
E4.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	0.2616	45.00	0.000
E2.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	1.646	45.00	0.000
E2.1	34.500	10.00	1.500	2.500	0.000	86.750	102.00	2.777	45.00	0.000
E2.2	34.500	10.00	1.500	2.500	0.000	86.750	102.00	4.881	45.00	0.000
E1.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	1.421	45.00	0.000
E1.1	34.500	10.00	1.500	2.500	0.000	86.750	102.00	2.165	45.00	0.000
E1.2	34.500	10.00	1.500	2.500	0.000	86.750	102.00	7.988	45.00	0.000
H9	34.500	10.00	0.000	2.500	0.000	86.750	0.000	7.988	45.00	0.000
E1.3	34.500	10.00	1.500	2.500	0.000	86.750	102.00	11.434	45.00	0.000
H7	34.500	10.00	0.000	2.500	0.000	86.750	0.000	13.074	45.00	.5000
E1.4	34.500	10.00	1.500	2.500	0.000	86.750	102.00	14.941	46.00	10.00
C1.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	0.9446	45.00	0.000
H16	34.500	10.00	0.000	2.500	0.000	86.750	0.000	0.9446	45.00	10.00
D1.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	0.1905	45.00	0.000
H17	34.500	10.00	0.000	2.500	0.000	86.750	0.000	0.1905	45.00	10.00
F1.0	34.500	10.00	1.500	2.500	0.000	86.750	102.00	0.1917	44.00	10.00
Arb_Out	34.500	10.00	0.000	2.500	0.000	86.750	0.000	30.994	56.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	45.00	.4418	123.0	.1035	1625.4	0.0000	1130.0	21.101
H7	45.00	13.07	45.00	12.93	56534.5	0.0000	1715.7	18.299
H16	45.00	.9446	45.00	.8901	3911.0	0.0000	438.43	20.462
H17	45.00	.1905	45.00	.1856	685.26	0.0000	50.260	20.711

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 100yr

Results for period from 0: 0.0 1/ 1/1990
to 9:20.0 2/ 1/1990
##

ROUTING INCREMENT (MINS) = 2.00
STORM DURATION (MINS) = 360.
RETURN PERIOD (YRS) = 100.
BX = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2) = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1	% Impervious #2	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00

D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	0.5292	120.0	2.500
A6.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	0.2929	118.0	0.000
H15	22.500	10.00	0.000	2.500	0.000	111.75	0.000	0.2930	118.0	0.000
A3.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	0.8229	120.0	0.000
H18	22.500	10.00	0.000	2.500	0.000	111.75	0.000	0.8229	120.0	3.500
A3.1	22.500	10.00	1.500	2.500	0.000	111.75	133.50	2.581	120.0	2.500
A4.0	22.500	10.00	0.000	2.500	0.000	111.75	0.000	1.236	130.0	.5000
A1.0	22.500	10.00	0.000	2.500	0.000	111.75	0.000	1.974	122.0	3.500
A2.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	0.9634	120.0	2.000
A1.1	22.500	10.00	1.500	2.500	0.000	111.75	133.50	4.040	120.0	1.500
A1.2	22.500	10.00	1.500	2.500	0.000	111.75	133.50	8.191	122.0	2.500
A1.3	22.500	10.00	1.500	2.500	0.000	111.75	133.50	10.558	122.0	2.500
A1.4	22.500	10.00	1.500	2.500	0.000	111.75	133.50	11.576	122.0	10.00
B2.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	1.309	120.0	0.000
B1.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	0.8462	120.0	0.000
H1_H2	22.500	10.00	0.000	2.500	0.000	111.75	0.000	2.155	120.0	10.00
E3.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	1.209	120.0	0.000
E4.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	0.1745	118.0	0.000
E2.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	1.259	120.0	0.000
E2.1	22.500	10.00	1.500	2.500	0.000	111.75	133.50	2.082	120.0	0.000
E2.2	22.500	10.00	1.500	2.500	0.000	111.75	133.50	3.573	120.0	0.000
E1.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	0.9298	120.0	0.000
E1.1	22.500	10.00	1.500	2.500	0.000	111.75	133.50	1.461	120.0	0.000
E1.2	22.500	10.00	1.500	2.500	0.000	111.75	133.50	5.805	120.0	0.000
H9	22.500	10.00	0.000	2.500	0.000	111.75	0.000	5.805	120.0	0.000
E1.3	22.500	10.00	1.500	2.500	0.000	111.75	133.50	8.591	120.0	0.000
H7	22.500	10.00	0.000	2.500	0.000	111.75	0.000	9.800	120.0	.5000
E1.4	22.500	10.00	1.500	2.500	0.000	111.75	133.50	12.254	120.0	10.00
C1.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	0.6843	120.0	0.000
H16	22.500	10.00	0.000	2.500	0.000	111.75	0.000	0.6843	120.0	10.00
D1.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	0.1236	118.0	0.000
H17	22.500	10.00	0.000	2.500	0.000	111.75	0.000	0.1236	118.0	10.00
F1.0	22.500	10.00	1.500	2.500	0.000	111.75	133.50	0.1240	118.0	10.00
Arb_Out	22.500	10.00	0.000	2.500	0.000	111.75	0.000	26.836	130.0	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	118.0	.2930	180.0	.1016	2115.0	0.0000	1127.7	21.101
H7	120.0	9.800	120.0	9.769	73369.7	0.0000	1602.3	18.278
H16	120.0	.6843	120.0	.6715	5083.0	0.0000	399.40	20.441
H17	118.0	.1236	120.0	.1234	891.37	0.0000	40.104	20.690

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

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################################################################################
Hobartville- 100yr

Results for period from  0: 0.0  1/ 1/1990
                    to 18:40.0  3/ 1/1990
################################################################################
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ROUTING INCREMENT (MINS)	=	2.00
STORM DURATION (MINS)	=	540.
RETURN PERIOD (YRS)	=	100.
BX	=	0.8500
TOTAL OF FIRST SUB-AREAS (km2)	=	125.46
TOTAL OF SECOND SUB-AREAS (km2)	=	66.08
TOTAL OF ALL SUB-AREAS (km2)	=	191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Catch. Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1 (%)	% Impervious #2 (%)	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	0.4706	300.0	2.500
A6.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	0.2606	298.0	0.000

H15	17.700	10.00	0.000	2.500	0.000	128.80	0.000	0.2606	298.0	0.000
A3.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	0.8247	300.0	0.000
H18	17.700	10.00	0.000	2.500	0.000	128.80	0.000	0.8247	300.0	3.500
A3.1	17.700	10.00	1.500	2.500	0.000	128.80	157.80	2.329	300.0	2.500
A4.0	17.700	10.00	0.000	2.500	0.000	128.80	0.000	1.111	318.0	.5000
A1.0	17.700	10.00	0.000	2.500	0.000	128.80	0.000	1.741	310.0	3.500
A2.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	0.8557	300.0	2.000
A1.1	17.700	10.00	1.500	2.500	0.000	128.80	157.80	3.531	300.0	1.500
A1.2	17.700	10.00	1.500	2.500	0.000	128.80	157.80	7.255	302.0	2.500
A1.3	17.700	10.00	1.500	2.500	0.000	128.80	157.80	9.313	302.0	2.500
A1.4	17.700	10.00	1.500	2.500	0.000	128.80	157.80	10.184	302.0	10.00
B2.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	1.129	300.0	0.000
B1.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	0.7300	300.0	0.000
H1_H2	17.700	10.00	0.000	2.500	0.000	128.80	0.000	1.859	300.0	10.00
E3.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	1.067	300.0	0.000
E4.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	0.1534	298.0	0.000
E2.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	1.107	300.0	0.000
E2.1	17.700	10.00	1.500	2.500	0.000	128.80	157.80	1.829	300.0	0.000
E2.2	17.700	10.00	1.500	2.500	0.000	128.80	157.80	3.146	300.0	0.000
E1.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	0.8257	300.0	0.000
E1.1	17.700	10.00	1.500	2.500	0.000	128.80	157.80	1.295	300.0	0.000
E1.2	17.700	10.00	1.500	2.500	0.000	128.80	157.80	5.112	300.0	0.000
H9	17.700	10.00	0.000	2.500	0.000	128.80	0.000	5.112	300.0	0.000
E1.3	17.700	10.00	1.500	2.500	0.000	128.80	157.80	7.550	300.0	0.000
H7	17.700	10.00	0.000	2.500	0.000	128.80	0.000	8.617	300.0	.5000
E1.4	17.700	10.00	1.500	2.500	0.000	128.80	157.80	11.389	300.0	10.00
C1.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	0.6031	300.0	0.000
H16	17.700	10.00	0.000	2.500	0.000	128.80	0.000	0.6031	300.0	10.00
D1.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	0.1099	298.0	0.000
H17	17.700	10.00	0.000	2.500	0.000	128.80	0.000	0.1099	298.0	10.00
F1.0	17.700	10.00	1.500	2.500	0.000	128.80	157.80	0.1101	298.0	10.00
Arb_Out	17.700	10.00	0.000	2.500	0.000	128.80	0.000	24.132	310.0	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	298.0	.2606	330.0	.1895	2474.5	0.0000	1208.2	21.131
H7	300.0	8.616	300.0	8.581	85622.6	0.0000	1556.4	18.269
H16	300.0	.6031	300.0	.5874	5949.2	0.0000	380.75	20.431
H17	298.0	.1099	300.0	.1097	1043.0	0.0000	38.237	20.685

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 100yr

Results for period from 0: 0.0 1/ 1/1990
                    to 4: 0.0 5/ 1/1990
##

ROUTING INCREMENT (MINS) = 2.00
STORM DURATION (MINS) = 720.
RETURN PERIOD (YRS) = 100.
BX = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2) = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Catch. Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1 (%)	% Impervious #2 (%)	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	0.4741	420.0	2.500
A6.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	0.2627	418.0	0.000
H15	14.900	10.00	0.000	2.500	0.000	142.02	0.000	0.2627	418.0	0.000
A3.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	0.8842	420.0	0.000
H18	14.900	10.00	0.000	2.500	0.000	142.02	0.000	0.8842	420.0	3.500
A3.1	14.900	10.00	1.500	2.500	0.000	142.02	177.30	2.445	420.0	2.500
A4.0	14.900	10.00	0.000	2.500	0.000	142.02	0.000	1.147	420.0	.5000
A1.0	14.900	10.00	0.000	2.500	0.000	142.02	0.000	1.835	420.0	3.500
A2.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	0.8629	420.0	2.000
A1.1	14.900	10.00	1.500	2.500	0.000	142.02	177.30	3.747	420.0	1.500
A1.2	14.900	10.00	1.500	2.500	0.000	142.02	177.30	7.615	420.0	2.500
A1.3	14.900	10.00	1.500	2.500	0.000	142.02	177.30	9.784	420.0	2.500
A1.4	14.900	10.00	1.500	2.500	0.000	142.02	177.30	10.676	420.0	10.00

B2.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	1.209	420.0	0.000
B1.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	0.7875	420.0	0.000
H1_H2	14.900	10.00	0.000	2.500	0.000	142.02	0.000	1.997	420.0	10.00
E3.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	1.089	420.0	0.000
E4.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	0.1555	418.0	0.000
E2.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	1.140	420.0	0.000
E2.1	14.900	10.00	1.500	2.500	0.000	142.02	177.30	1.879	420.0	0.000
E2.2	14.900	10.00	1.500	2.500	0.000	142.02	177.30	3.219	420.0	0.000
E1.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	0.8326	418.0	0.000
E1.1	14.900	10.00	1.500	2.500	0.000	142.02	177.30	1.310	420.0	0.000
E1.2	14.900	10.00	1.500	2.500	0.000	142.02	177.30	5.228	420.0	0.000
H9	14.900	10.00	0.000	2.500	0.000	142.02	0.000	5.228	420.0	0.000
E1.3	14.900	10.00	1.500	2.500	0.000	142.02	177.30	7.785	420.0	0.000
H7	14.900	10.00	0.000	2.500	0.000	142.02	0.000	8.874	420.0	.5000
E1.4	14.900	10.00	1.500	2.500	0.000	142.02	177.30	11.979	420.0	10.00
C1.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	0.6162	420.0	0.000
H16	14.900	10.00	0.000	2.500	0.000	142.02	0.000	0.6162	420.0	10.00
D1.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	0.1107	418.0	0.000
H17	14.900	10.00	0.000	2.500	0.000	142.02	0.000	0.1107	418.0	10.00
F1.0	14.900	10.00	1.500	2.500	0.000	142.02	177.30	0.1110	418.0	10.00
Arb_Out	14.900	10.00	0.000	2.500	0.000	142.02	0.000	25.479	430.0	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	418.0	.2627	422.0	.1708	2758.8	0.0000	1193.1	21.125
H7	420.0	8.873	420.0	8.853	95294.9	0.0000	1567.4	18.271
H16	420.0	.6162	420.0	.6062	6631.0	0.0000	384.96	20.433
H17	418.0	.1107	420.0	.1106	1163.1	0.0000	38.362	20.685

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

Run completed at: 21st November 2006 17:48:47

500 YEAR ARI OUTPUT

HOBARTVILLE RAFTS MODEL

##
Hobartville- 500yr

Results for period from 0: 0.0 1/ 1/1990
                    to 5: 0.0 1/ 1/1990
##

ROUTING INCREMENT (MINS) = 1.00
STORM DURATION (MINS)   = 25.
RETURN PERIOD (YRS)   = 500.
BX   = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2)   = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Catch. Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1 (%)	% Impervious #2 (%)	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	1.513	15.00	2.500
A6.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	0.8210	15.00	0.000
H15	130.10	10.00	0.000	2.500	0.000	43.375	0.000	0.8210	15.00	0.000
A3.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	2.013	15.00	0.000

H18	130.10	10.00	0.000	2.500	0.000	43.375	0.000	2.013	15.00	3.500
A3.1	130.10	10.00	1.500	2.500	0.000	43.375	52.708	5.617	15.00	2.500
A4.0	130.10	10.00	0.000	2.500	0.000	43.375	0.000	1.260	26.00	.5000
A1.0	130.10	10.00	0.000	2.500	0.000	43.375	0.000	2.317	26.00	3.500
A2.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	2.769	15.00	2.000
A1.1	130.10	10.00	1.500	2.500	0.000	43.375	52.708	5.902	15.00	1.500
A1.2	130.10	10.00	1.500	2.500	0.000	43.375	52.708	13.517	16.00	2.500
A1.3	130.10	10.00	1.500	2.500	0.000	43.375	52.708	16.862	19.00	2.500
A1.4	130.10	10.00	1.500	2.500	0.000	43.375	52.708	18.672	21.00	10.00
B2.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	1.612	15.00	0.000
B1.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	1.051	15.00	0.000
H1_H2	130.10	10.00	0.000	2.500	0.000	43.375	0.000	2.663	15.00	10.00
E3.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	2.740	15.00	0.000
E4.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	0.4790	15.00	0.000
E2.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	2.739	15.00	0.000
E2.1	130.10	10.00	1.500	2.500	0.000	43.375	52.708	4.611	15.00	0.000
E2.2	130.10	10.00	1.500	2.500	0.000	43.375	52.708	8.175	15.00	0.000
E1.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	2.738	15.00	0.000
E1.1	130.10	10.00	1.500	2.500	0.000	43.375	52.708	4.073	15.00	0.000
E1.2	130.10	10.00	1.500	2.500	0.000	43.375	52.708	13.610	15.00	0.000
H9	130.10	10.00	0.000	2.500	0.000	43.375	0.000	13.610	15.00	0.000
E1.3	130.10	10.00	1.500	2.500	0.000	43.375	52.708	19.772	15.00	0.000
H7	130.10	10.00	0.000	2.500	0.000	43.375	0.000	22.511	15.00	.5000
E1.4	130.10	10.00	1.500	2.500	0.000	43.375	52.708	24.812	16.00	10.00
C1.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	1.718	15.00	0.000
H16	130.10	10.00	0.000	2.500	0.000	43.375	0.000	1.718	15.00	10.00
D1.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	0.3976	15.00	0.000
H17	130.10	10.00	0.000	2.500	0.000	43.375	0.000	0.3976	15.00	10.00
F1.0	130.10	10.00	1.500	2.500	0.000	43.375	52.708	0.3887	15.00	10.00
Arb_Out	130.10	10.00	0.000	2.500	0.000	43.375	0.000	45.236	26.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	15.00	.8210	52.00	.0215	830.27	0.0000	763.62	20.935
H7	15.00	22.51	15.00	22.11	28658.6	0.0000	2008.1	18.351
H16	15.00	1.718	16.00	1.541	1999.0	0.0000	514.04	20.503
H17	15.00	.3976	16.00	.3389	349.53	0.0000	74.298	20.748

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 500yr

Results for period from 0: 0.0 1/ 1/1990
to 5: 0.0 1/ 1/1990
##

ROUTING INCREMENT (MINS) = 1.00

STORM DURATION (MINS) = 60.
RETURN PERIOD (YRS) = 500.
BX = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2) = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Catch. Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1 (%)	% Impervious #2 (%)	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	1.505	25.00	2.500
A6.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	0.8072	25.00	0.000
H15	80.000	10.00	0.000	2.500	0.000	67.917	0.000	0.8072	25.00	0.000
A3.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	1.977	25.00	0.000
H18	80.000	10.00	0.000	2.500	0.000	67.917	0.000	1.977	25.00	3.500
A3.1	80.000	10.00	1.500	2.500	0.000	67.917	78.500	5.306	25.00	2.500
A4.0	80.000	10.00	0.000	2.500	0.000	67.917	0.000	1.886	45.00	.5000
A1.0	80.000	10.00	0.000	2.500	0.000	67.917	0.000	3.107	41.00	3.500
A2.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	2.749	25.00	2.000
A1.1	80.000	10.00	1.500	2.500	0.000	67.917	78.500	6.438	25.00	1.500
A1.2	80.000	10.00	1.500	2.500	0.000	67.917	78.500	14.022	28.00	2.500
A1.3	80.000	10.00	1.500	2.500	0.000	67.917	78.500	17.991	29.00	2.500
A1.4	80.000	10.00	1.500	2.500	0.000	67.917	78.500	20.053	32.00	10.00
B2.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	2.048	35.00	0.000
B1.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	1.279	35.00	0.000

H1_H2	80.000	10.00	0.000	2.500	0.000	67.917	0.000	3.327	35.00	10.00
E3.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	2.725	25.00	0.000
E4.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	0.4708	25.00	0.000
E2.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	2.711	25.00	0.000
E2.1	80.000	10.00	1.500	2.500	0.000	67.917	78.500	4.595	25.00	0.000
E2.2	80.000	10.00	1.500	2.500	0.000	67.917	78.500	8.184	25.00	0.000
E1.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	2.706	25.00	0.000
E1.1	80.000	10.00	1.500	2.500	0.000	67.917	78.500	4.012	25.00	0.000
E1.2	80.000	10.00	1.500	2.500	0.000	67.917	78.500	13.623	25.00	0.000
H9	80.000	10.00	0.000	2.500	0.000	67.917	0.000	13.623	25.00	0.000
E1.3	80.000	10.00	1.500	2.500	0.000	67.917	78.500	19.663	25.00	0.000
H7	80.000	10.00	0.000	2.500	0.000	67.917	0.000	22.388	25.00	.5000
E1.4	80.000	10.00	1.500	2.500	0.000	67.917	78.500	25.014	26.00	10.00
C1.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	1.678	25.00	0.000
H16	80.000	10.00	0.000	2.500	0.000	67.917	0.000	1.678	25.00	10.00
D1.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	0.3775	25.00	0.000
H17	80.000	10.00	0.000	2.500	0.000	67.917	0.000	0.3775	25.00	10.00
F1.0	80.000	10.00	1.500	2.500	0.000	67.917	78.500	0.3696	25.00	10.00
Arb_Out	80.000	10.00	0.000	2.500	0.000	67.917	0.000	45.547	36.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	25.00	.8072	62.00	.0807	1260.3	0.0000	1106.1	21.091
H7	25.00	22.39	25.00	22.05	43855.8	0.0000	2006.6	18.351
H16	25.00	1.678	26.00	1.543	3030.4	0.0000	514.21	20.503
H17	25.00	.3775	26.00	.3317	531.52	0.0000	73.461	20.747

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 500yr

Results for period from 0: 0.0 1/ 1/1990
to 10: 0.0 1/ 1/1990
##

ROUTING INCREMENT (MINS) = 1.00
STORM DURATION (MINS) = 90.
RETURN PERIOD (YRS) = 500.
BX = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2) = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1	Catch. Area #2	Slope #1	Slope #2	% Impervious #1	% Impervious #2	Pern #1	Pern #2	B #1	B #2	Link No.

	(ha)		(%)		(%)						
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity	Init. Loss #1	Init. Loss #2	Cont. Loss #1	Cont. Loss #2	Excess Rain #1	Excess Rain #2	Peak Inflow	Time to Peak	Link Lag
	(mm/h)	(mm)		(mm/h)		(mm)		(m^3/s)		mins
A5.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	1.613	30.00	2.500
A6.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	0.8771	30.00	0.000
H15	63.000	10.00	0.000	2.500	0.000	81.167	0.000	0.8771	30.00	0.000
A3.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	2.220	30.00	0.000
H18	63.000	10.00	0.000	2.500	0.000	81.167	0.000	2.220	30.00	3.500
A3.1	63.000	10.00	1.500	2.500	0.000	81.167	93.000	5.923	30.00	2.500
A4.0	63.000	10.00	0.000	2.500	0.000	81.167	0.000	1.879	46.00	.5000
A1.0	63.000	10.00	0.000	2.500	0.000	81.167	0.000	3.105	42.00	3.500
A2.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	2.943	30.00	2.000
A1.1	63.000	10.00	1.500	2.500	0.000	81.167	93.000	7.502	30.00	1.500
A1.2	63.000	10.00	1.500	2.500	0.000	81.167	93.000	15.931	31.00	2.500
A1.3	63.000	10.00	1.500	2.500	0.000	81.167	93.000	19.632	34.00	2.500
A1.4	63.000	10.00	1.500	2.500	0.000	81.167	93.000	21.347	37.00	10.00
B2.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	2.209	30.00	0.000
B1.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	1.409	30.00	0.000
H1_H2	63.000	10.00	0.000	2.500	0.000	81.167	0.000	3.618	30.00	10.00
E3.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	3.096	30.00	0.000
E4.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	0.5145	30.00	0.000
E2.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	3.096	30.00	0.000
E2.1	63.000	10.00	1.500	2.500	0.000	81.167	93.000	5.218	30.00	0.000
E2.2	63.000	10.00	1.500	2.500	0.000	81.167	93.000	9.248	30.00	0.000
E1.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	2.875	30.00	0.000
E1.1	63.000	10.00	1.500	2.500	0.000	81.167	93.000	4.339	30.00	0.000
E1.2	63.000	10.00	1.500	2.500	0.000	81.167	93.000	15.240	30.00	0.000
H9	63.000	10.00	0.000	2.500	0.000	81.167	0.000	15.240	30.00	0.000
E1.3	63.000	10.00	1.500	2.500	0.000	81.167	93.000	21.988	30.00	0.000

H7	63.000	10.00	0.000	2.500	0.000	81.167	0.000	25.084	30.00	.5000
E1.4	63.000	10.00	1.500	2.500	0.000	81.167	93.000	28.132	31.00	10.00
C1.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	1.898	30.00	0.000
H16	63.000	10.00	0.000	2.500	0.000	81.167	0.000	1.898	30.00	10.00
D1.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	0.3952	30.00	0.000
H17	63.000	10.00	0.000	2.500	0.000	81.167	0.000	0.3952	30.00	10.00
F1.0	63.000	10.00	1.500	2.500	0.000	81.167	93.000	0.3881	30.00	10.00
Arb_Out	63.000	10.00	0.000	2.500	0.000	81.167	0.000	50.539	41.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	30.00	.8771	76.00	.1317	1499.9	0.0000	1160.1	21.113
H7	30.00	25.08	30.00	24.74	52238.5	0.0000	2081.7	18.364
H16	30.00	1.898	31.00	1.731	3599.8	0.0000	531.50	20.511
H17	30.00	.3952	30.00	.3488	631.92	0.0000	75.454	20.750

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 500yr

Results for period from 0: 0.0 1/ 1/1990
to 10: 0.0 1/ 1/1990
##

ROUTING INCREMENT (MINS) = 1.00
STORM DURATION (MINS) = 120.
RETURN PERIOD (YRS) = 500.
BX = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2) = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Catch. Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1	% Impervious #2	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002

A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	1.485	35.00	2.500
A6.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	0.7992	35.00	0.000
H15	53.000	10.00	0.000	2.500	0.000	91.500	0.000	0.7992	35.00	0.000
A3.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	2.006	35.00	0.000
H18	53.000	10.00	0.000	2.500	0.000	91.500	0.000	2.006	35.00	3.500
A3.1	53.000	10.00	1.500	2.500	0.000	91.500	104.50	5.589	40.00	2.500
A4.0	53.000	10.00	0.000	2.500	0.000	91.500	0.000	1.908	52.00	.5000
A1.0	53.000	10.00	0.000	2.500	0.000	91.500	0.000	3.239	47.00	3.500
A2.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	2.705	35.00	2.000
A1.1	53.000	10.00	1.500	2.500	0.000	91.500	104.50	7.181	40.00	1.500
A1.2	53.000	10.00	1.500	2.500	0.000	91.500	104.50	15.496	40.00	2.500
A1.3	53.000	10.00	1.500	2.500	0.000	91.500	104.50	19.706	42.00	2.500
A1.4	53.000	10.00	1.500	2.500	0.000	91.500	104.50	21.578	44.00	10.00
B2.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	2.183	40.00	0.000
B1.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	1.369	40.00	0.000
H1_H2	53.000	10.00	0.000	2.500	0.000	91.500	0.000	3.552	40.00	10.00
E3.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	2.782	35.00	0.000
E4.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	0.4724	35.00	0.000
E2.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	2.775	35.00	0.000
E2.1	53.000	10.00	1.500	2.500	0.000	91.500	104.50	4.679	35.00	0.000
E2.2	53.000	10.00	1.500	2.500	0.000	91.500	104.50	8.298	35.00	0.000
E1.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	2.650	35.00	0.000
E1.1	53.000	10.00	1.500	2.500	0.000	91.500	104.50	3.973	35.00	0.000
E1.2	53.000	10.00	1.500	2.500	0.000	91.500	104.50	13.720	35.00	0.000
H9	53.000	10.00	0.000	2.500	0.000	91.500	0.000	13.720	35.00	0.000
E1.3	53.000	10.00	1.500	2.500	0.000	91.500	104.50	19.848	35.00	0.000
H7	53.000	10.00	0.000	2.500	0.000	91.500	0.000	22.630	35.00	.5000
E1.4	53.000	10.00	1.500	2.500	0.000	91.500	104.50	25.503	36.00	10.00
C1.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	1.693	35.00	0.000
H16	53.000	10.00	0.000	2.500	0.000	91.500	0.000	1.693	35.00	10.00
D1.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	0.3694	35.00	0.000
H17	53.000	10.00	0.000	2.500	0.000	91.500	0.000	0.3694	35.00	10.00
F1.0	53.000	10.00	1.500	2.500	0.000	91.500	104.50	0.3625	35.00	10.00
Arb_Out	53.000	10.00	0.000	2.500	0.000	91.500	0.000	49.583	51.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	35.00	.7992	83.00	.1565	1686.5	0.0000	1181.0	21.121
H7	35.00	22.63	35.00	22.31	58811.1	0.0000	2013.8	18.352
H16	35.00	1.692	36.00	1.561	4057.3	0.0000	515.95	20.504
H17	35.00	.3694	36.00	.3198	711.00	0.0000	71.976	20.744

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 500yr

Results for period from 0: 0.0 1/ 1/1990
to 16:40.0 1/ 1/1990
##

ROUTING INCREMENT (MINS) = 1.00
STORM DURATION (MINS) = 180.
RETURN PERIOD (YRS) = 500.
BX = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2) = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Catch. Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1	% Impervious #2	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001

E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	0.9714	45.00	2.500
A6.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	0.5350	45.00	0.000
H15	41.400	10.00	0.000	2.500	0.000	107.41	0.000	0.5351	45.00	0.000
A3.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	1.411	45.00	0.000
H18	41.400	10.00	0.000	2.500	0.000	107.41	0.000	1.411	45.00	3.500
A3.1	41.400	10.00	1.500	2.500	0.000	107.41	122.70	4.213	45.00	2.500
A4.0	41.400	10.00	0.000	2.500	0.000	107.41	0.000	1.596	66.00	.5000
A1.0	41.400	10.00	0.000	2.500	0.000	107.41	0.000	2.565	53.00	3.500
A2.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	1.769	45.00	2.000
A1.1	41.400	10.00	1.500	2.500	0.000	107.41	122.70	5.817	45.00	1.500
A1.2	41.400	10.00	1.500	2.500	0.000	107.41	122.70	12.097	46.00	2.500
A1.3	41.400	10.00	1.500	2.500	0.000	107.41	122.70	15.193	46.00	2.500
A1.4	41.400	10.00	1.500	2.500	0.000	107.41	122.70	16.526	48.00	10.00
B2.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	1.812	45.00	0.000
B1.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	1.136	45.00	0.000
H1_H2	41.400	10.00	0.000	2.500	0.000	107.41	0.000	2.948	45.00	10.00
E3.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	2.070	45.00	0.000
E4.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	0.3169	45.00	0.000
E2.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	2.090	45.00	0.000
E2.1	41.400	10.00	1.500	2.500	0.000	107.41	122.70	3.497	45.00	0.000
E2.2	41.400	10.00	1.500	2.500	0.000	107.41	122.70	6.107	45.00	0.000
E1.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	1.714	45.00	0.000
E1.1	41.400	10.00	1.500	2.500	0.000	107.41	122.70	2.638	45.00	0.000
E1.2	41.400	10.00	1.500	2.500	0.000	107.41	122.70	9.952	45.00	0.000
H9	41.400	10.00	0.000	2.500	0.000	107.41	0.000	9.952	45.00	0.000
E1.3	41.400	10.00	1.500	2.500	0.000	107.41	122.70	14.281	45.00	0.000
H7	41.400	10.00	0.000	2.500	0.000	107.41	0.000	16.350	45.00	.5000
E1.4	41.400	10.00	1.500	2.500	0.000	107.41	122.70	18.839	46.00	10.00
C1.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	1.192	45.00	0.000
H16	41.400	10.00	0.000	2.500	0.000	107.41	0.000	1.192	45.00	10.00
D1.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	0.2295	44.00	0.000
H17	41.400	10.00	0.000	2.500	0.000	107.41	0.000	0.2295	44.00	10.00
F1.0	41.400	10.00	1.500	2.500	0.000	107.41	122.70	0.2303	45.00	10.00
Arb_Out	41.400	10.00	0.000	2.500	0.000	107.41	0.000	39.357	56.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	45.00	.5351	92.00	.1560	1979.7	0.0000	1180.6	21.120
H7	45.00	16.35	45.00	16.19	69023.5	0.0000	1827.4	18.319
H16	45.00	1.192	45.00	1.142	4763.3	0.0000	473.51	20.482
H17	44.00	.2295	45.00	.2270	834.09	0.0000	57.975	20.723

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 500yr

Results for period from 0: 0.0 1/ 1/1990
to 9:20.0 2/ 1/1990
##

ROUTING INCREMENT (MINS) = 2.00
STORM DURATION (MINS) = 360.
RETURN PERIOD (YRS) = 500.
BX = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2) = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Catch. Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1 (%)	% Impervious #2 (%)	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00

H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	0.6396	120.0	2.500
A6.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	0.3541	120.0	0.000
H15	27.100	10.00	0.000	2.500	0.000	139.10	0.000	0.3541	120.0	0.000
A3.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	1.001	120.0	0.000
H18	27.100	10.00	0.000	2.500	0.000	139.10	0.000	1.001	120.0	3.500
A3.1	27.100	10.00	1.500	2.500	0.000	139.10	161.10	3.149	120.0	2.500
A4.0	27.100	10.00	0.000	2.500	0.000	139.10	0.000	1.540	126.0	.5000
A1.0	27.100	10.00	0.000	2.500	0.000	139.10	0.000	2.472	122.0	3.500
A2.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	1.164	118.0	2.000
A1.1	27.100	10.00	1.500	2.500	0.000	139.10	161.10	4.988	120.0	1.500
A1.2	27.100	10.00	1.500	2.500	0.000	139.10	161.10	10.052	122.0	2.500
A1.3	27.100	10.00	1.500	2.500	0.000	139.10	161.10	12.950	120.0	2.500
A1.4	27.100	10.00	1.500	2.500	0.000	139.10	161.10	14.193	122.0	10.00
B2.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	1.619	120.0	0.000
B1.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	1.055	120.0	0.000
H1_H2	27.100	10.00	0.000	2.500	0.000	139.10	0.000	2.674	120.0	10.00
E3.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	1.471	120.0	0.000
E4.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	0.2112	120.0	0.000
E2.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	1.539	120.0	0.000
E2.1	27.100	10.00	1.500	2.500	0.000	139.10	161.10	2.544	120.0	0.000
E2.2	27.100	10.00	1.500	2.500	0.000	139.10	161.10	4.359	120.0	0.000
E1.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	1.123	118.0	0.000
E1.1	27.100	10.00	1.500	2.500	0.000	139.10	161.10	1.768	120.0	0.000
E1.2	27.100	10.00	1.500	2.500	0.000	139.10	161.10	7.068	120.0	0.000
H9	27.100	10.00	0.000	2.500	0.000	139.10	0.000	7.068	120.0	0.000
E1.3	27.100	10.00	1.500	2.500	0.000	139.10	161.10	10.494	120.0	0.000
H7	27.100	10.00	0.000	2.500	0.000	139.10	0.000	11.964	120.0	.5000
E1.4	27.100	10.00	1.500	2.500	0.000	139.10	161.10	15.192	120.0	10.00
C1.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	0.8328	120.0	0.000
H16	27.100	10.00	0.000	2.500	0.000	139.10	0.000	0.8328	120.0	10.00
D1.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	0.1500	114.0	0.000
H17	27.100	10.00	0.000	2.500	0.000	139.10	0.000	0.1500	114.0	10.00
F1.0	27.100	10.00	1.500	2.500	0.000	139.10	161.10	0.1501	118.0	10.00
Arb_Out	27.100	10.00	0.000	2.500	0.000	139.10	0.000	33.117	130.0	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	120.0	.3541	152.0	.1932	2585.2	0.0000	1210.6	21.132
H7	120.0	11.96	120.0	11.93	89928.0	0.0000	1681.0	18.293
H16	120.0	.8328	120.0	.8216	6210.7	0.0000	427.21	20.456
H17	114.0	.1500	120.0	.1493	1089.3	0.0000	43.033	20.700

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

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################################################################################
Hobartville- 500yr

Results for period from  0: 0.0  1/ 1/1990
                    to 18:40.0  3/ 1/1990
################################################################################
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ROUTING INCREMENT (MINS)	=	2.00
STORM DURATION (MINS)	=	540.
RETURN PERIOD (YRS)	=	500.
BX	=	0.8500
TOTAL OF FIRST SUB-AREAS (km2)	=	125.46
TOTAL OF SECOND SUB-AREAS (km2)	=	66.08
TOTAL OF ALL SUB-AREAS (km2)	=	191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Catch. Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1 (%)	% Impervious #2 (%)	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	0.5660	300.0	2.500
A6.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	0.3132	298.0	0.000
H15	21.200	10.00	0.000	2.500	0.000	160.05	0.000	0.3132	298.0	0.000

A3.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	1.123	300.0	0.000
H18	21.200	10.00	0.000	2.500	0.000	160.05	0.000	1.123	300.0	3.500
A3.1	21.200	10.00	1.500	2.500	0.000	160.05	189.30	2.977	300.0	2.500
A4.0	21.200	10.00	0.000	2.500	0.000	160.05	0.000	1.363	316.0	.5000
A1.0	21.200	10.00	0.000	2.500	0.000	160.05	0.000	2.140	308.0	3.500
A2.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	1.030	300.0	2.000
A1.1	21.200	10.00	1.500	2.500	0.000	160.05	189.30	4.315	300.0	1.500
A1.2	21.200	10.00	1.500	2.500	0.000	160.05	189.30	8.996	302.0	2.500
A1.3	21.200	10.00	1.500	2.500	0.000	160.05	189.30	11.518	302.0	2.500
A1.4	21.200	10.00	1.500	2.500	0.000	160.05	189.30	12.575	302.0	10.00
B2.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	1.389	300.0	0.000
B1.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	0.8995	300.0	0.000
H1_H2	21.200	10.00	0.000	2.500	0.000	160.05	0.000	2.289	300.0	10.00
E3.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	1.290	300.0	0.000
E4.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	0.1864	300.0	0.000
E2.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	1.343	300.0	0.000
E2.1	21.200	10.00	1.500	2.500	0.000	160.05	189.30	2.225	300.0	0.000
E2.2	21.200	10.00	1.500	2.500	0.000	160.05	189.30	3.819	300.0	0.000
E1.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	0.9938	300.0	0.000
E1.1	21.200	10.00	1.500	2.500	0.000	160.05	189.30	1.561	300.0	0.000
E1.2	21.200	10.00	1.500	2.500	0.000	160.05	189.30	6.202	300.0	0.000
H9	21.200	10.00	0.000	2.500	0.000	160.05	0.000	6.202	300.0	0.000
E1.3	21.200	10.00	1.500	2.500	0.000	160.05	189.30	9.171	300.0	0.000
H7	21.200	10.00	0.000	2.500	0.000	160.05	0.000	10.461	300.0	.5000
E1.4	21.200	10.00	1.500	2.500	0.000	160.05	189.30	13.864	300.0	10.00
C1.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	0.7304	300.0	0.000
H16	21.200	10.00	0.000	2.500	0.000	160.05	0.000	0.7304	300.0	10.00
D1.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	0.1323	298.0	0.000
H17	21.200	10.00	0.000	2.500	0.000	160.05	0.000	0.1323	298.0	10.00
F1.0	21.200	10.00	1.500	2.500	0.000	160.05	189.30	0.1326	298.0	10.00
Arb_Out	21.200	10.00	0.000	2.500	0.000	160.05	0.000	29.587	310.0	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	298.0	.3132	302.0	.2740	3010.9	0.0000	1261.9	21.151
H7	300.0	10.46	300.0	10.42	104550.	0.0000	1627.3	18.282
H16	300.0	.7304	300.0	.7169	7237.9	0.0000	408.28	20.446
H17	298.0	.1323	300.0	.1319	1269.3	0.0000	41.262	20.694

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

##
Hobartville- 500yr

Results for period from 0: 0.0 1/ 1/1990
to 4: 0.0 5/ 1/1990
##

ROUTING INCREMENT (MINS) = 2.00
STORM DURATION (MINS) = 720.
RETURN PERIOD (YRS) = 500.
BX = 0.8500
TOTAL OF FIRST SUB-AREAS (km2) = 125.46
TOTAL OF SECOND SUB-AREAS (km2) = 66.08
TOTAL OF ALL SUB-AREAS (km2) = 191.54

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Catch. Area #2 (ha)	Slope #1 (%)	Slope #2 (%)	% Impervious #1 (%)	% Impervious #2 (%)	Pern #1	Pern #2	B #1	B #2	Link No.
A5.0	1.390	1.700	1.100	1.100	5.000	100.0	.025	.015	.0201	.0016	1.000
A6.0	0.7700	0.9400	.8000	.8000	5.000	100.0	.025	.015	.0173	.0014	2.000
H15	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.001
A3.0	2.170	2.660	.5000	.5000	5.000	100.0	.025	.015	.0376	.0030	2.002
H18	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	2.003
A3.1	5.640	5.290	.6000	.6000	5.000	100.0	.025	.015	.0564	.0039	2.004
A4.0	9.230	0.000	1.100	0.000	5.000	0.000	.050	0.00	.0897	0.000	3.000
A1.0	4.950	0.000	1.700	0.000	5.000	0.000	.050	0.00	.0522	0.000	3.001
A2.0	2.530	3.090	1.500	1.500	5.000	100.0	.025	.015	.0235	.0019	4.000
A1.1	4.210	3.270	1.000	1.000	5.000	100.0	.025	.015	.0375	.0023	3.002
A1.2	6.520	3.970	.6000	.6000	5.000	100.0	.025	.015	.0608	.0033	2.005
A1.3	6.140	6.300	.5000	.5000	5.000	100.0	.025	.015	.0645	.0047	1.001
A1.4	3.840	2.950	1.900	1.900	5.000	100.0	.025	.015	.0260	.0016	1.002
B2.0	7.610	1.230	1.500	1.500	5.000	100.0	.050	.015	.0695	.0012	5.000
B1.0	5.030	0.8400	1.100	1.100	5.000	100.0	.050	.015	.0654	.0011	6.000
H1_H2	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	5.001
E3.0	4.010	3.290	.7000	.7000	5.000	100.0	.025	.015	.0437	.0028	7.000
E4.0	0.4600	0.5600	.5000	.5000	5.000	100.0	.025	.015	.0168	.0013	8.000
E2.0	4.420	3.330	.6000	.6000	5.000	100.0	.025	.015	.0497	.0031	9.000
E2.1	2.720	2.250	.6000	.6000	5.000	100.0	.025	.015	.0386	.0025	9.001
E2.2	4.580	4.310	.9000	.9000	5.000	100.0	.025	.015	.0413	.0029	9.002
E1.0	2.440	2.980	1.700	1.700	5.000	100.0	.025	.015	.0217	.0017	10.00
E1.1	1.430	1.740	.5000	.5000	5.000	100.0	.025	.015	.0303	.0024	10.00
E1.2	3.420	1.420	.5000	.5000	5.000	100.0	.025	.015	.0476	.0021	9.003
H9	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	9.004
E1.3	9.370	7.580	.5000	.5000	5.000	100.0	.025	.015	.0804	.0051	8.001
H7	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	7.001
E1.4	30.050	3.360	.5000	.5000	5.000	100.0	.050	.015	.2456	.0034	7.002
C1.0	1.850	2.260	.5000	.5000	5.000	100.0	.025	.015	.0346	.0027	11.00
H16	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	11.00
D1.0	0.3200	0.4000	1.000	1.000	5.000	100.0	.025	.015	.0098	.0008	12.00
H17	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	12.00
F1.0	0.3620	0.3620	1.000	1.000	5.000	100.0	.025	.015	.0105	.0007	13.00
Arb_Out	.00001	0.000	.0010	0.000	0.000	0.000	.025	0.00	.0017	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Init. Loss #2 (mm)	Cont. Loss #1 (mm/h)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Excess Rain #2 (mm)	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
A5.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	0.5688	420.0	2.500
A6.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	0.3148	420.0	0.000
H15	17.800	10.00	0.000	2.500	0.000	175.87	0.000	0.3148	420.0	0.000
A3.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	1.159	420.0	0.000
H18	17.800	10.00	0.000	2.500	0.000	175.87	0.000	1.159	420.0	3.500
A3.1	17.800	10.00	1.500	2.500	0.000	175.87	212.10	3.074	420.0	2.500
A4.0	17.800	10.00	0.000	2.500	0.000	175.87	0.000	1.408	420.0	.5000
A1.0	17.800	10.00	0.000	2.500	0.000	175.87	0.000	2.247	420.0	3.500
A2.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	1.035	420.0	2.000
A1.1	17.800	10.00	1.500	2.500	0.000	175.87	212.10	4.544	420.0	1.500
A1.2	17.800	10.00	1.500	2.500	0.000	175.87	212.10	9.356	420.0	2.500
A1.3	17.800	10.00	1.500	2.500	0.000	175.87	212.10	11.988	420.0	2.500
A1.4	17.800	10.00	1.500	2.500	0.000	175.87	212.10	13.075	420.0	10.00
B2.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	1.470	420.0	0.000

B1.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	0.9607	420.0	0.000
H1_H2	17.800	10.00	0.000	2.500	0.000	175.87	0.000	2.431	420.0	10.00
E3.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	1.312	420.0	0.000
E4.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	0.1876	420.0	0.000
E2.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	1.375	420.0	0.000
E2.1	17.800	10.00	1.500	2.500	0.000	175.87	212.10	2.272	420.0	0.000
E2.2	17.800	10.00	1.500	2.500	0.000	175.87	212.10	3.886	420.0	0.000
E1.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	0.9989	420.0	0.000
E1.1	17.800	10.00	1.500	2.500	0.000	175.87	212.10	1.574	420.0	0.000
E1.2	17.800	10.00	1.500	2.500	0.000	175.87	212.10	6.304	420.0	0.000
H9	17.800	10.00	0.000	2.500	0.000	175.87	0.000	6.304	420.0	0.000
E1.3	17.800	10.00	1.500	2.500	0.000	175.87	212.10	9.397	420.0	0.000
H7	17.800	10.00	0.000	2.500	0.000	175.87	0.000	10.709	420.0	.5000
E1.4	17.800	10.00	1.500	2.500	0.000	175.87	212.10	14.542	420.0	10.00
C1.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	0.7427	420.0	0.000
H16	17.800	10.00	0.000	2.500	0.000	175.87	0.000	0.7427	420.0	10.00
D1.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	0.1329	418.0	0.000
H17	17.800	10.00	0.000	2.500	0.000	175.87	0.000	0.1329	418.0	10.00
F1.0	17.800	10.00	1.500	2.500	0.000	175.87	212.10	0.1332	418.0	10.00
Arb_Out	17.800	10.00	0.000	2.500	0.000	175.87	0.000	31.047	430.0	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	Basin Vol. Avail	Basin Vol. Used	Basin Stage Used
H15	420.0	.3148	420.0	.2883	3345.6	0.0000	1269.1	21.154
H7	420.0	10.71	420.0	10.68	115975.	0.0000	1637.2	18.284
H16	420.0	.7427	420.0	.7331	8046.0	0.0000	411.46	20.447
H17	418.0	.1329	420.0	.1326	1410.7	0.0000	41.360	20.694

SUMMARY OF BASIN OUTLET RESULTS

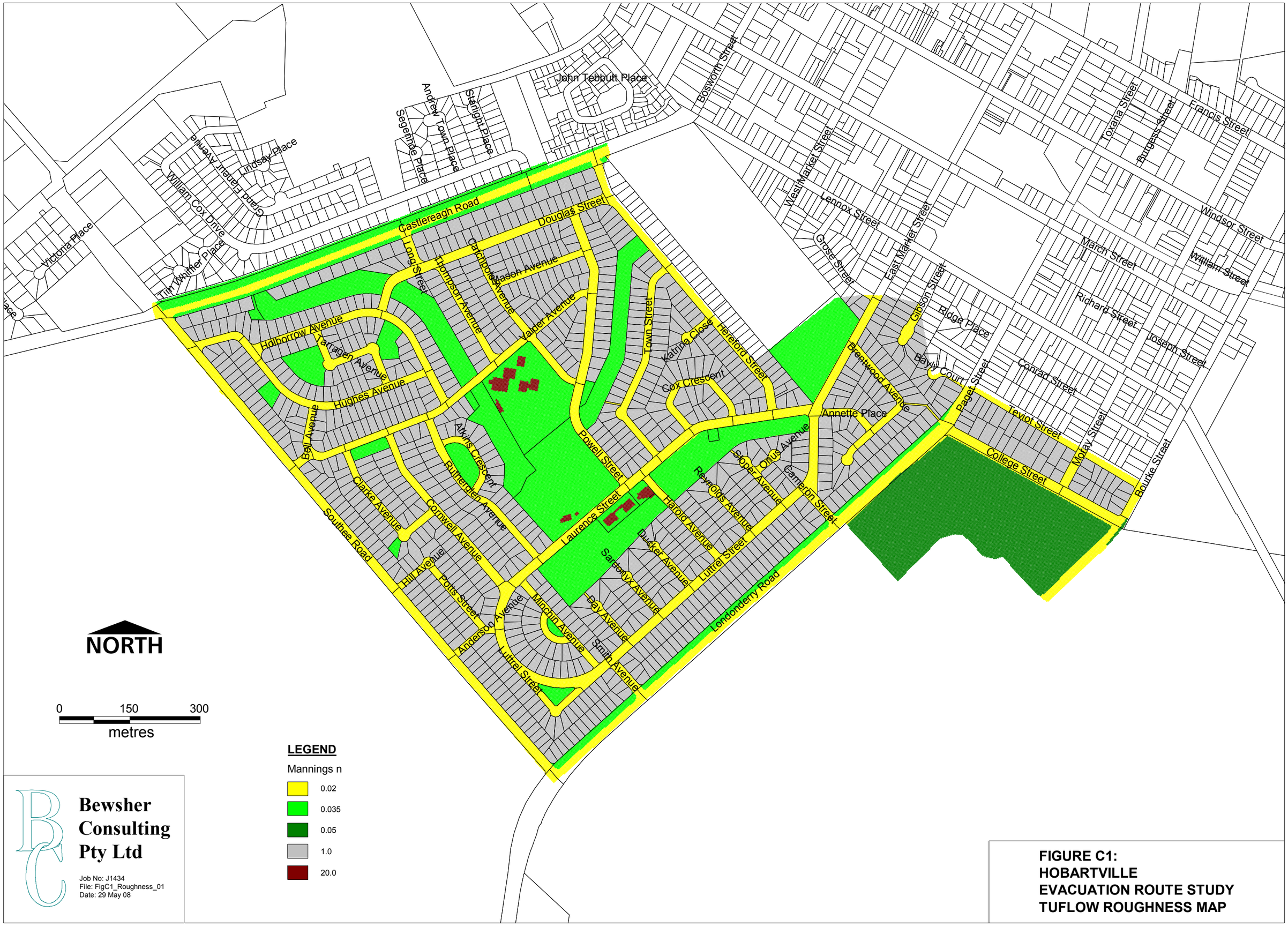
Link Label	No. of	S/D Factor (m)	Dia (m)	Width (m)	Pipe Length (m)	Pipe Slope (%)
H15	1.0		.1000	0.000	0.5000	0.2000
H7	1.0		.1000	0.000	0.5000	0.2000
H16	1.0		.1000	0.000	0.5000	0.2000
H17	1.0		.1000	0.000	0.5000	0.2000

Run completed at: 21st November 2006 17:31:46

APPENDIX C

TUFLOW MODEL HYDRAULIC ROUGHNESS DETAILS AND ROADWAY FLOOD PROFILES

(In some of the flood profile plots it will be seen that occasionally the flood levels plot below the DEM road surface. At those locations there is no flood inundation and the presentation is just a limitation of the spreadsheet-based post-processing of the TUFLOW output.)


John Tebbutt Place
Andrew Town Place
Starlight Place
Segenhoe Place
Lindsay Place
Grand Parade Avenue
William Cox Drive
Tim Whitmer Place
Victoria Place
Castlereagh Road
Douglas Street
Long Street
Thompson Avenue
Campbell Avenue
Mason Avenue
Vader Avenue
Holborrow Avenue
Tarragen Avenue
Hughes Avenue
Bell Avenue
Clarke Avenue
Southee Road
Atkins Crescent
Rutherglen Avenue
Cornwell Avenue
Hill Avenue
Potts Street
Anderson Avenue
Luttrell Street
Minnohm Avenue
Smith Avenue
Bay Avenue
Sarsenyx Avenue
Ducker Avenue
Laurence Street
Powell Street
Town Street
Katrina Close
Cox Crescent
Hereford Street
Harold Avenue
Reynolds Avenue
Sloper Avenue
Omus Avenue
Cameron Street
Londonderry Road
Luttrell Street
Annette Place
Brentwood Avenue
Gibson Street
Ridge Place
Bayly Court
Paget Street
Teviot Street
College Street
Conrad Street
Joseph Street
Richard Street
March Street
Windsor Street
William Street
Francis Street
Burgess Street
Toxana Street
Bourke Street
Moray Street
Bosworth Street
West Market Street
East Market Street
Lennox Street
Grose Street
NORTH
0
150
300
metres
LEGEND
Mannings n
0.02
0.035
0.05
1.0
20.0
Bewsher Consulting Pty Ltd
Job No: J1434
File: FigC1_Roughness_01
Date: 29 May 08
FIGURE C1:
HOBARTVILLE
EVACUATION ROUTE STUDY
TUFLOW ROUGHNESS MAP

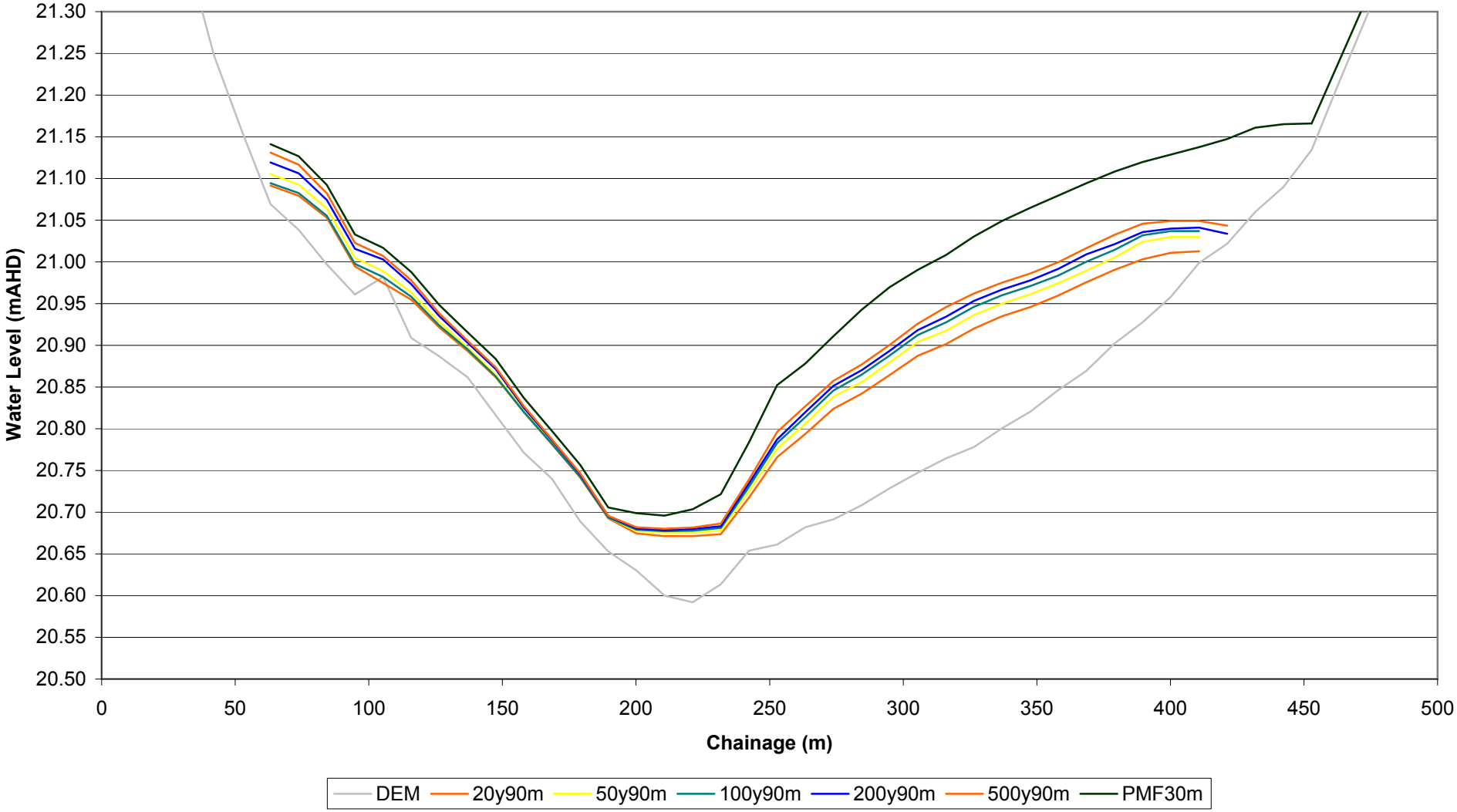
Bewsher Consulting Pty Ltd

Job No: J1434
File: FigC2_Profile_01
Date: 29 May 08

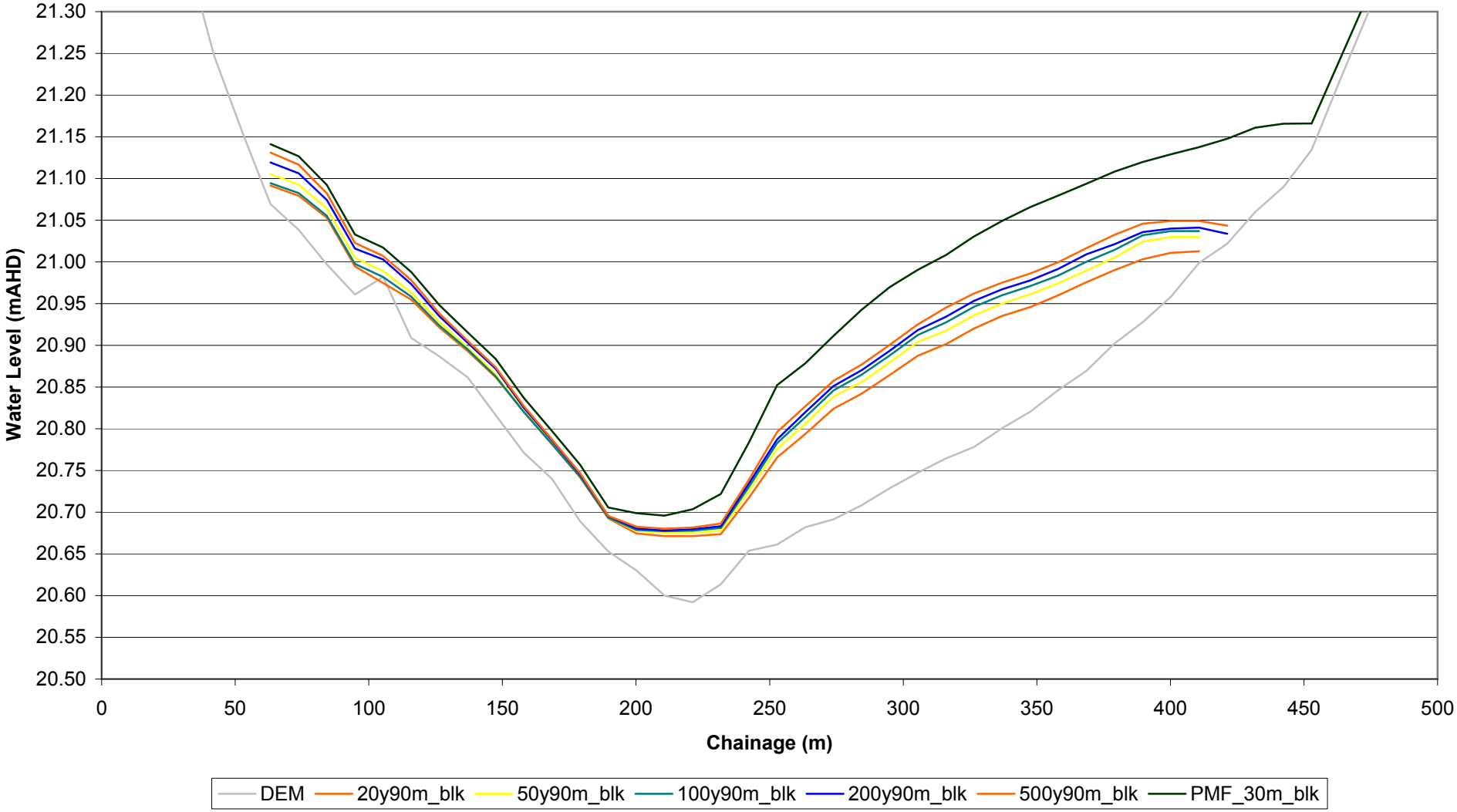
FIGURE C2:
HOBARTVILLE
EVACUATION ROUTE STUDY
ROADWAY SECTIONS KEY PLAN

SOUTHEE ROAD
(H1 AND H2)

PROFILE - SOUTHEE_ST_1-2

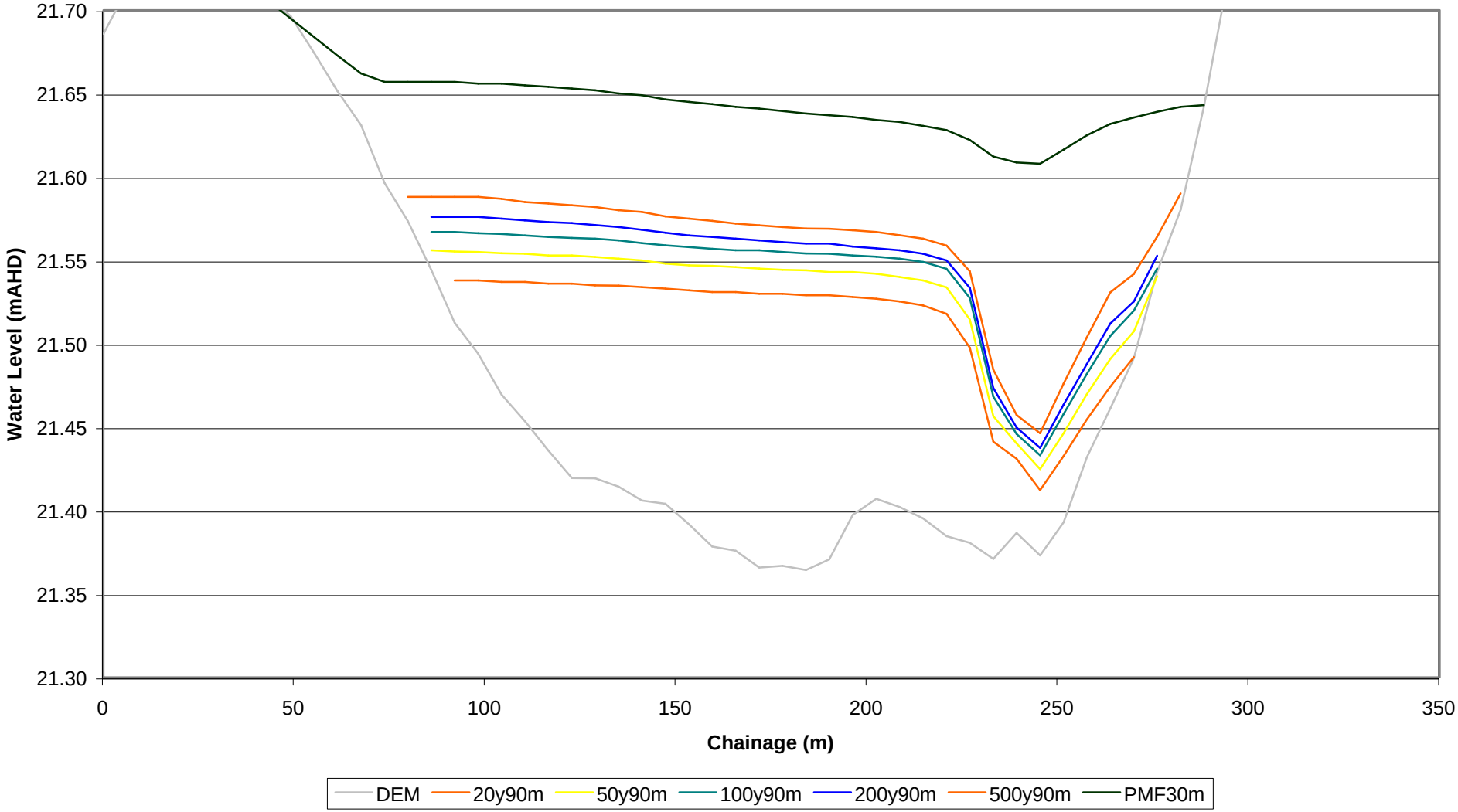


PROFILE - SOUTHEE_ST_1-2

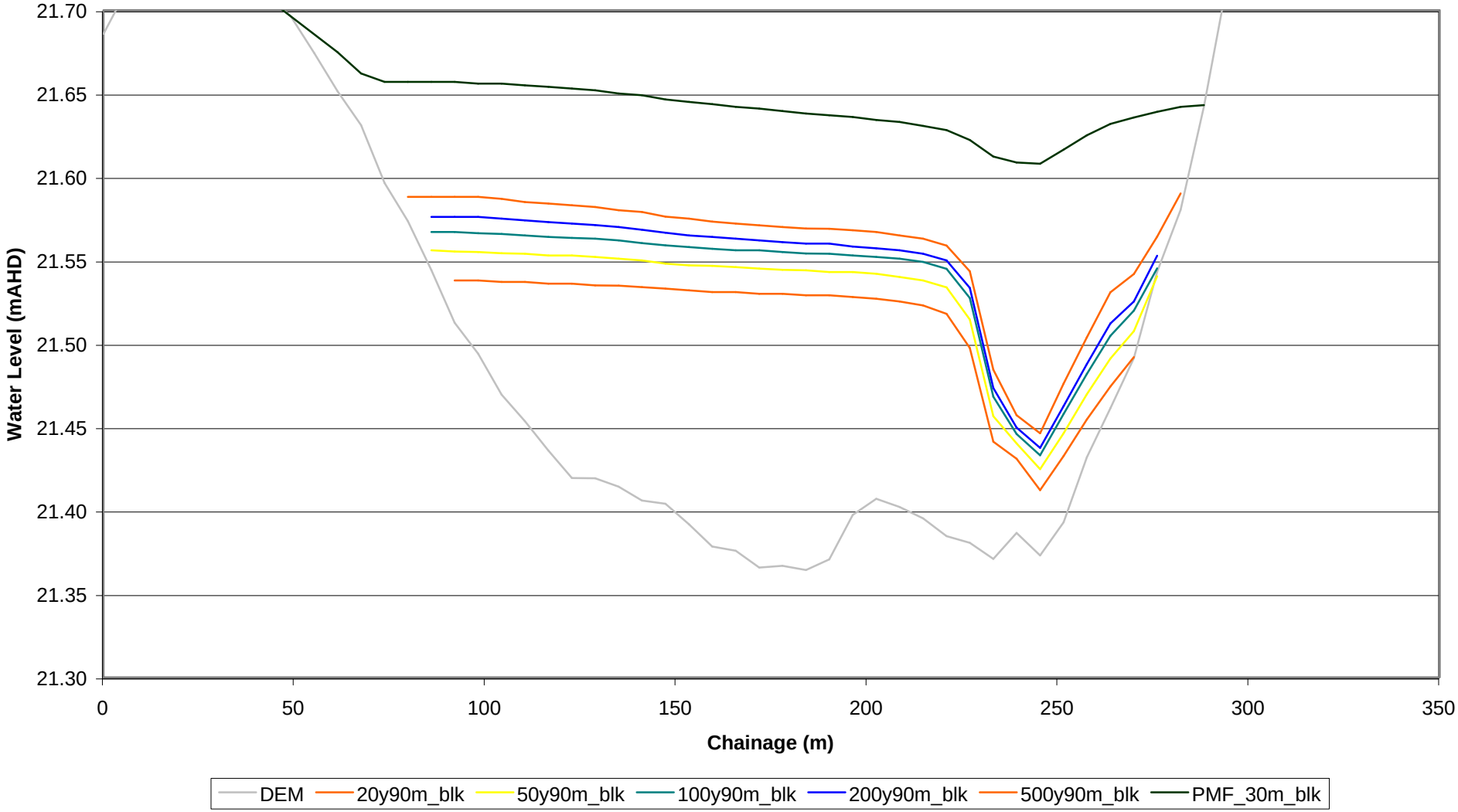


SOUTHEE ROAD
(H3 AND H4)

PROFILE - SOUTHEE_ST_3

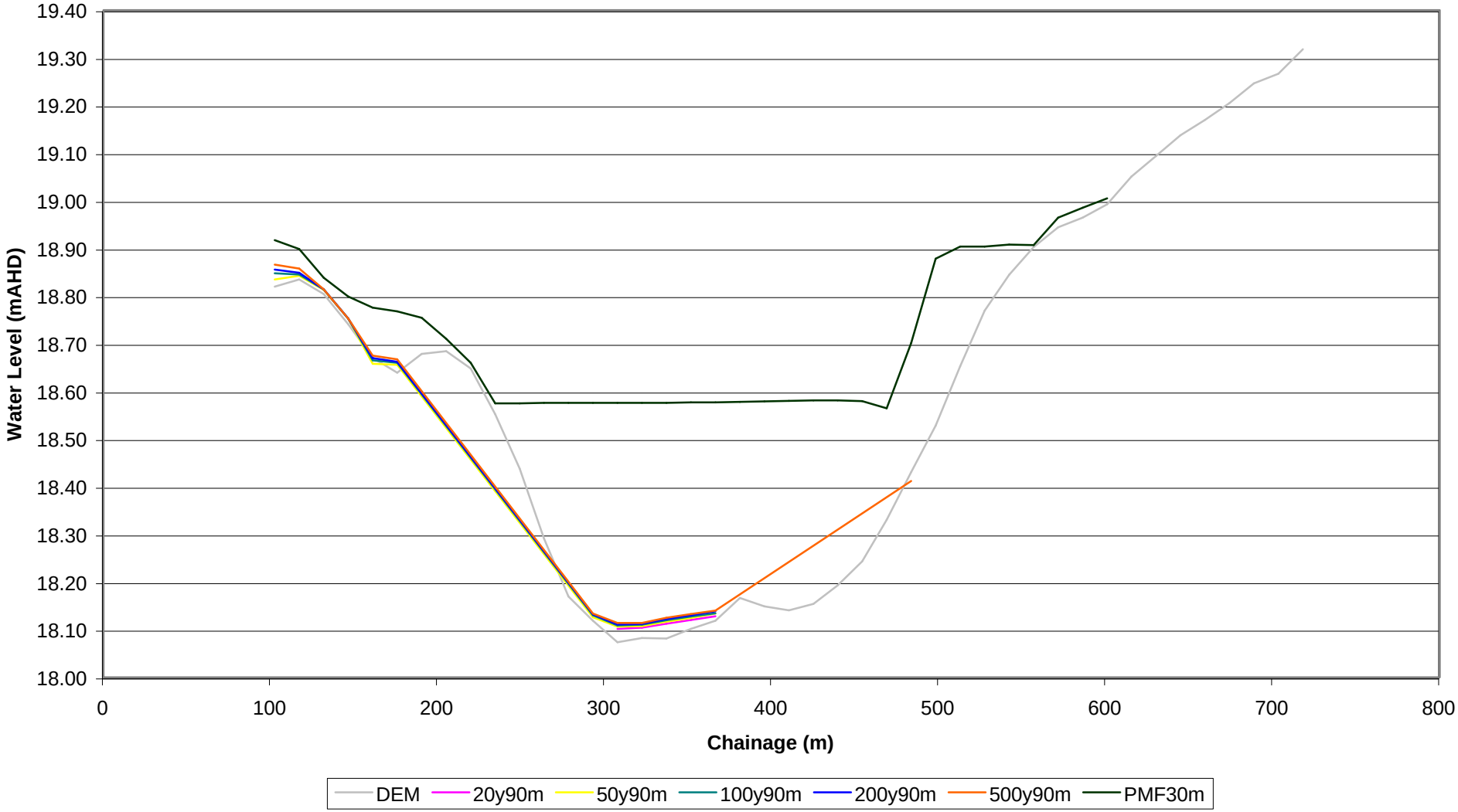


PROFILE - SOUTHEE_ST_3

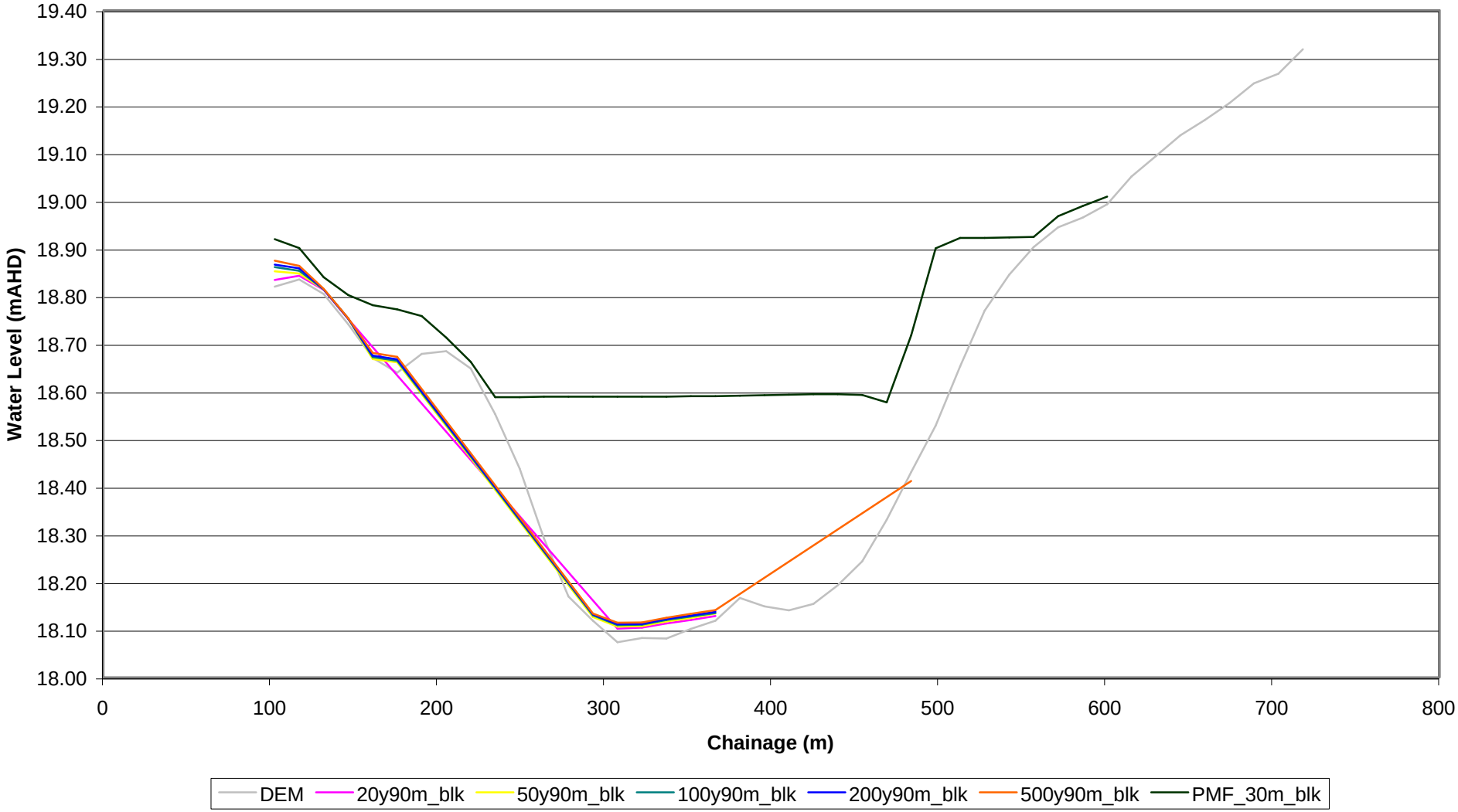


LONDONDERRY ROAD
(H7 AND H8)

PROFILE - PAGET_ST_1-3

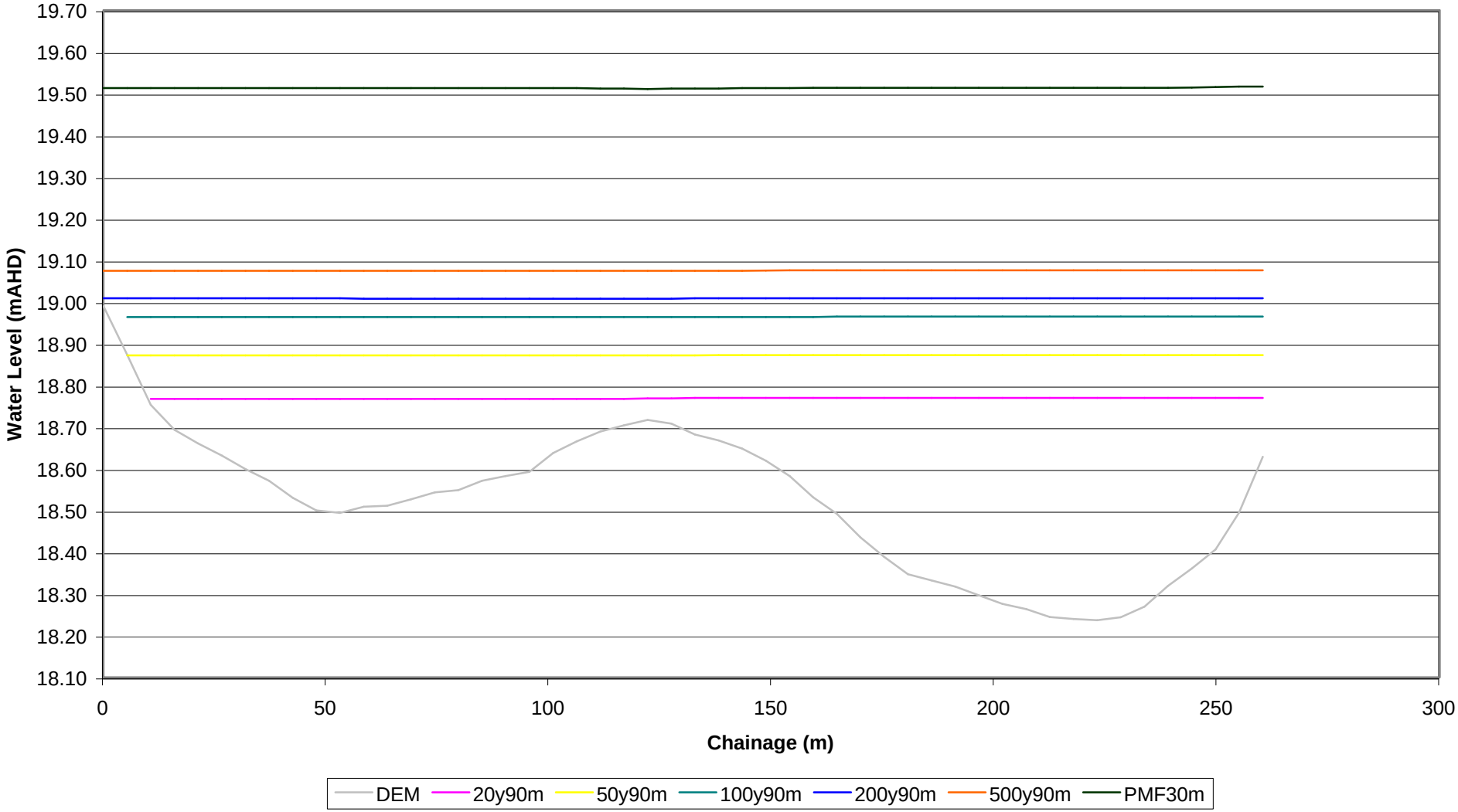


PROFILE - PAGET_ST_1-3

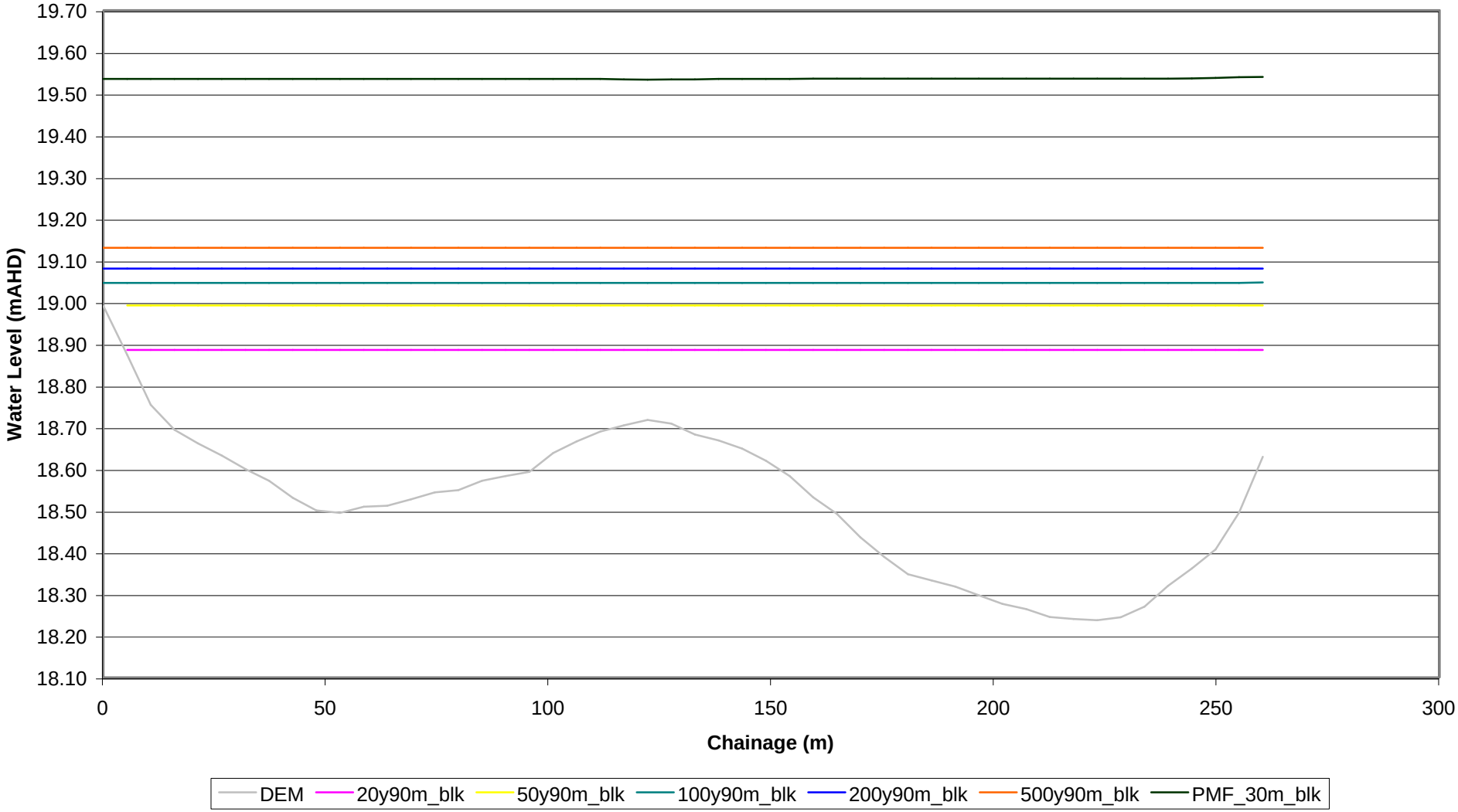


EAST MARKET STREET
(H9)

PROFILE - EAST_MARKET_ST_1

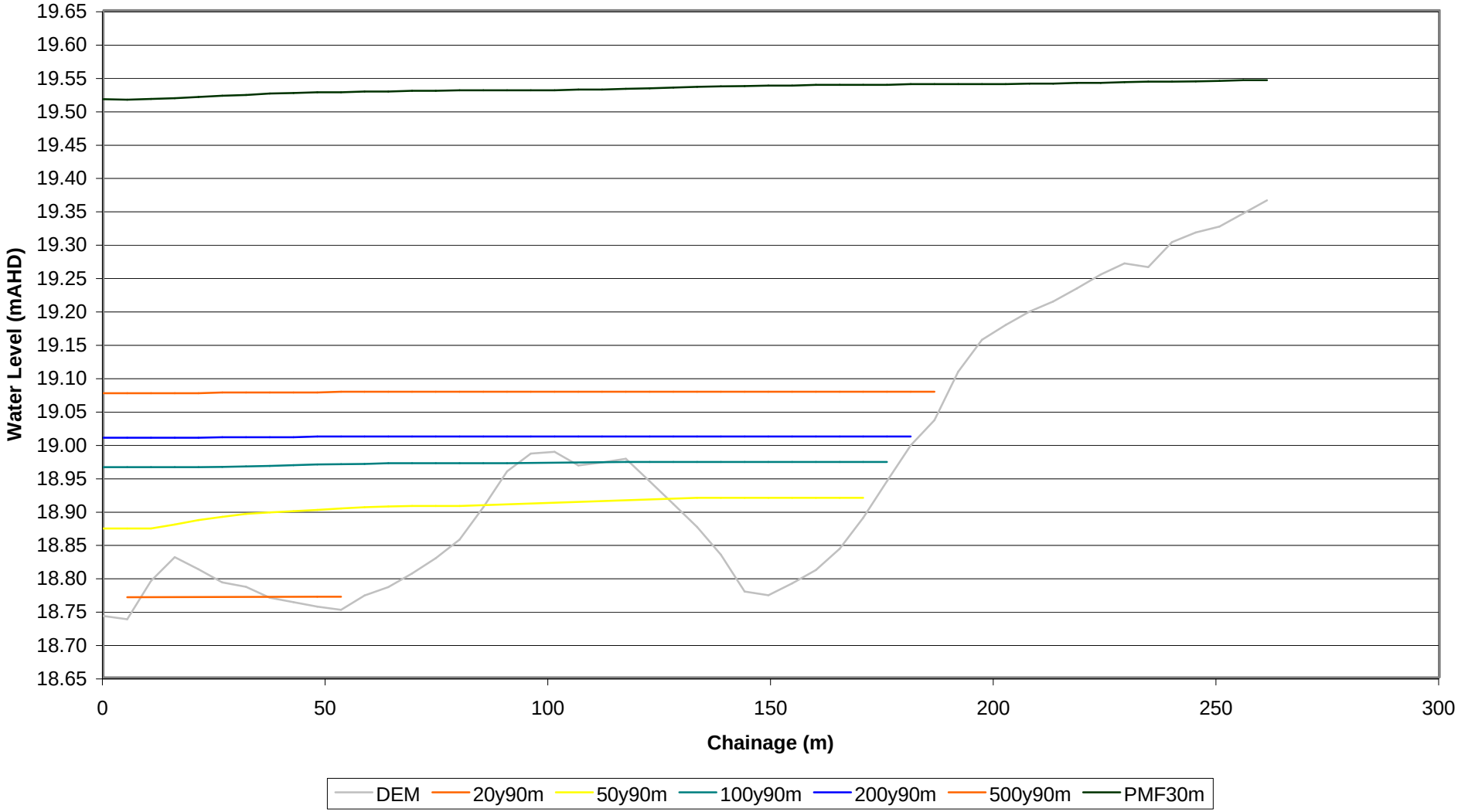


PROFILE - EAST_MARKET_ST_1

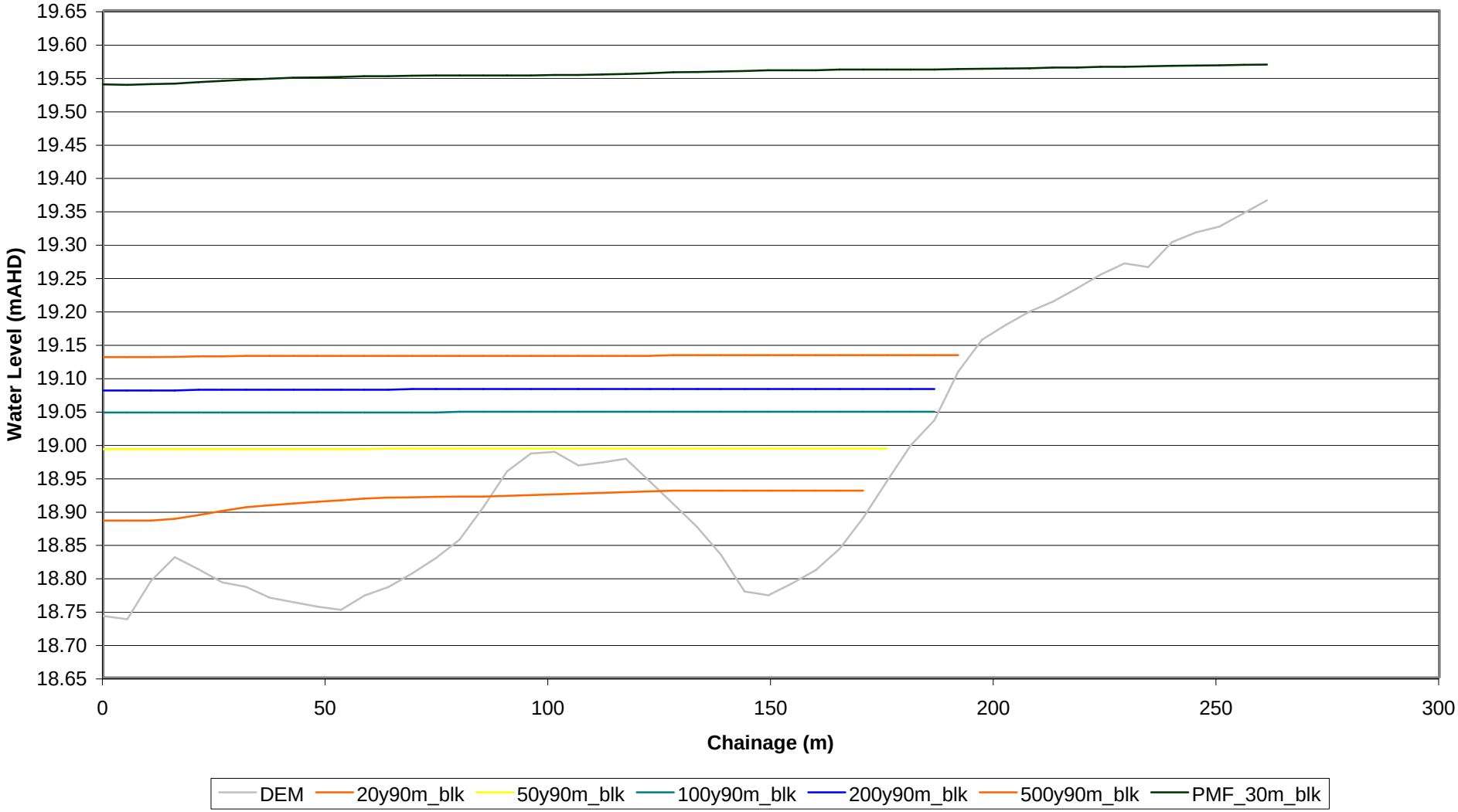


LAURENCE STREET
(H10 AND OTHER LOW POINTS)

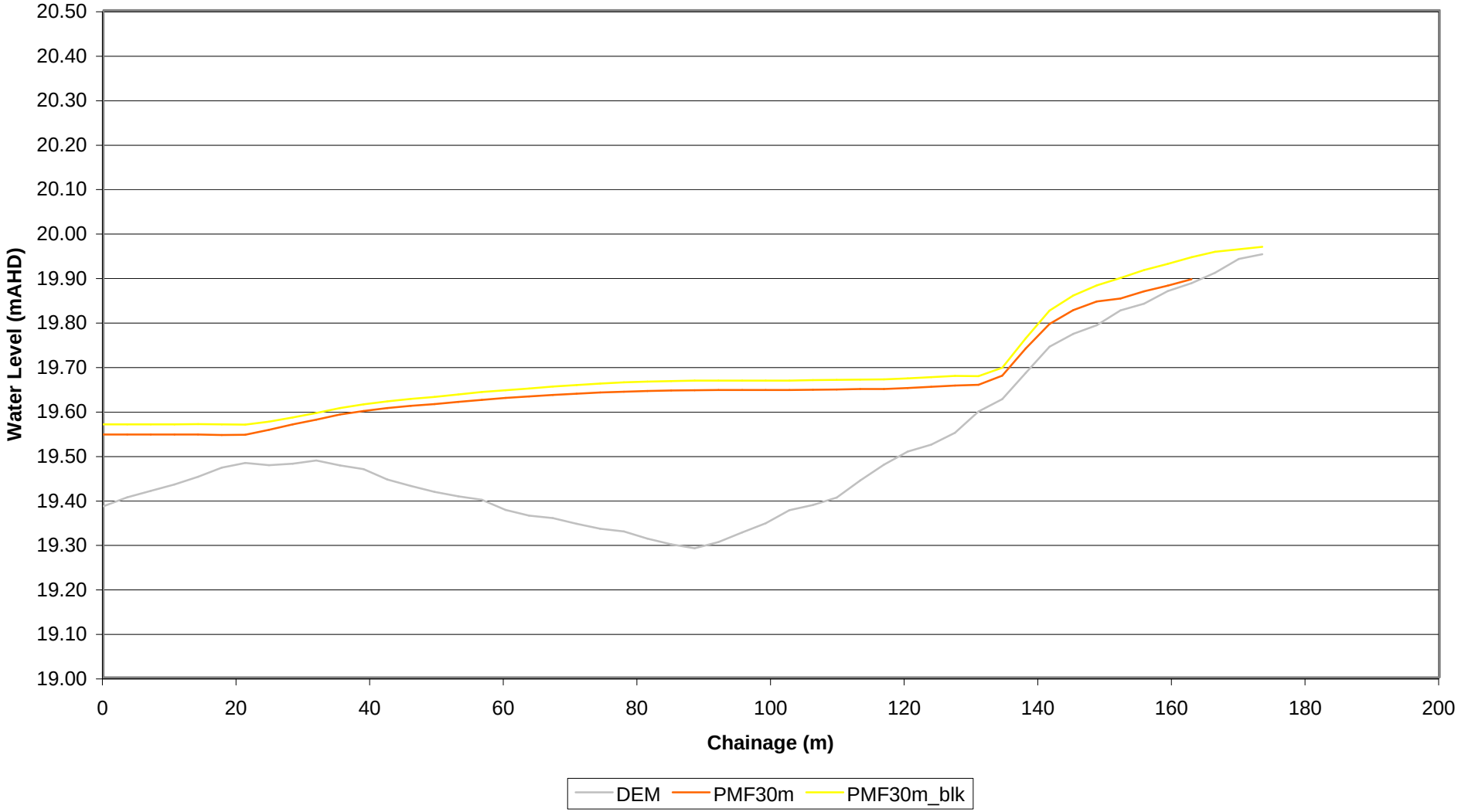
PROFILE - LAURENCE_ST_1-2.csv



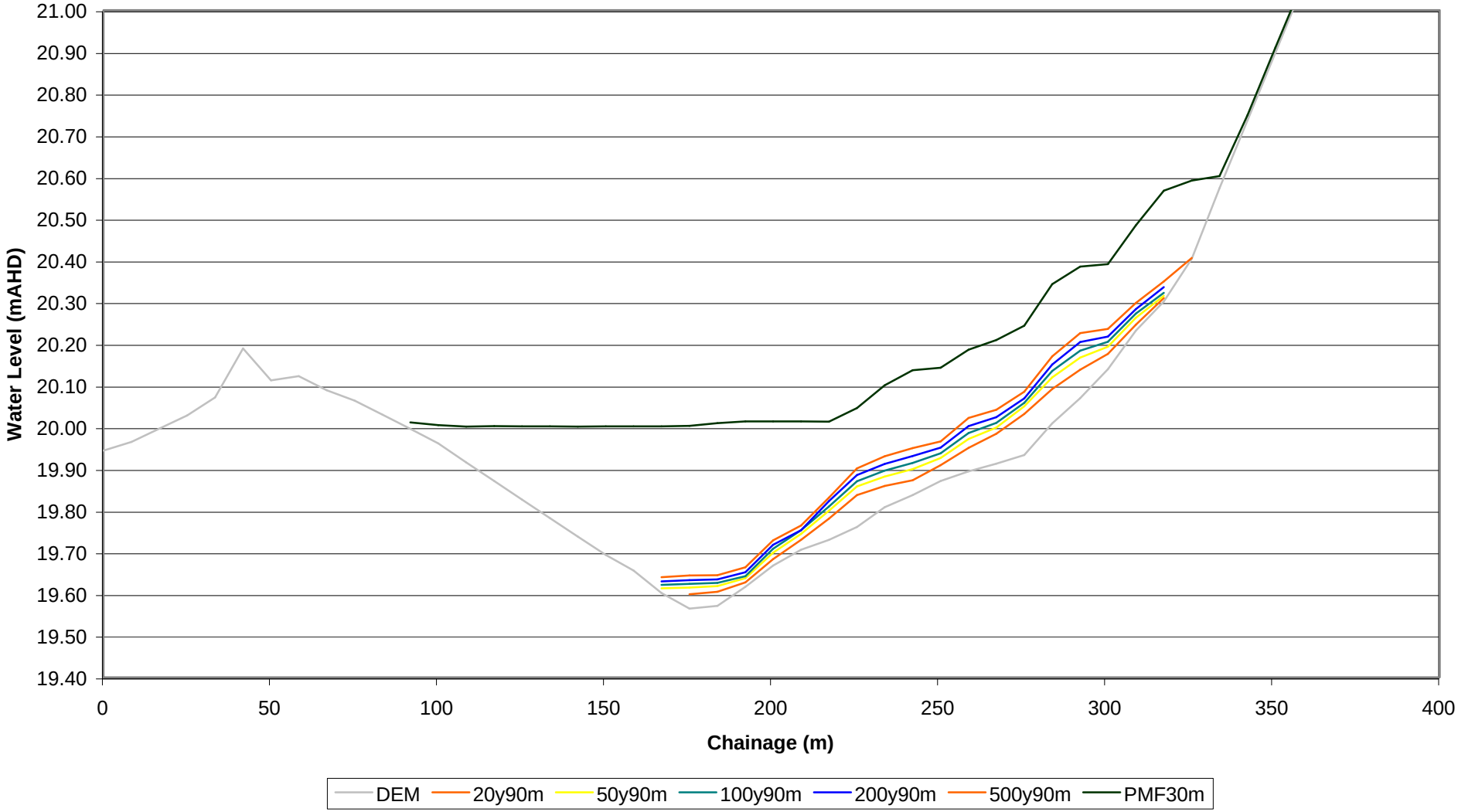
PROFILE - LAURENCE_ST_1-2.csv



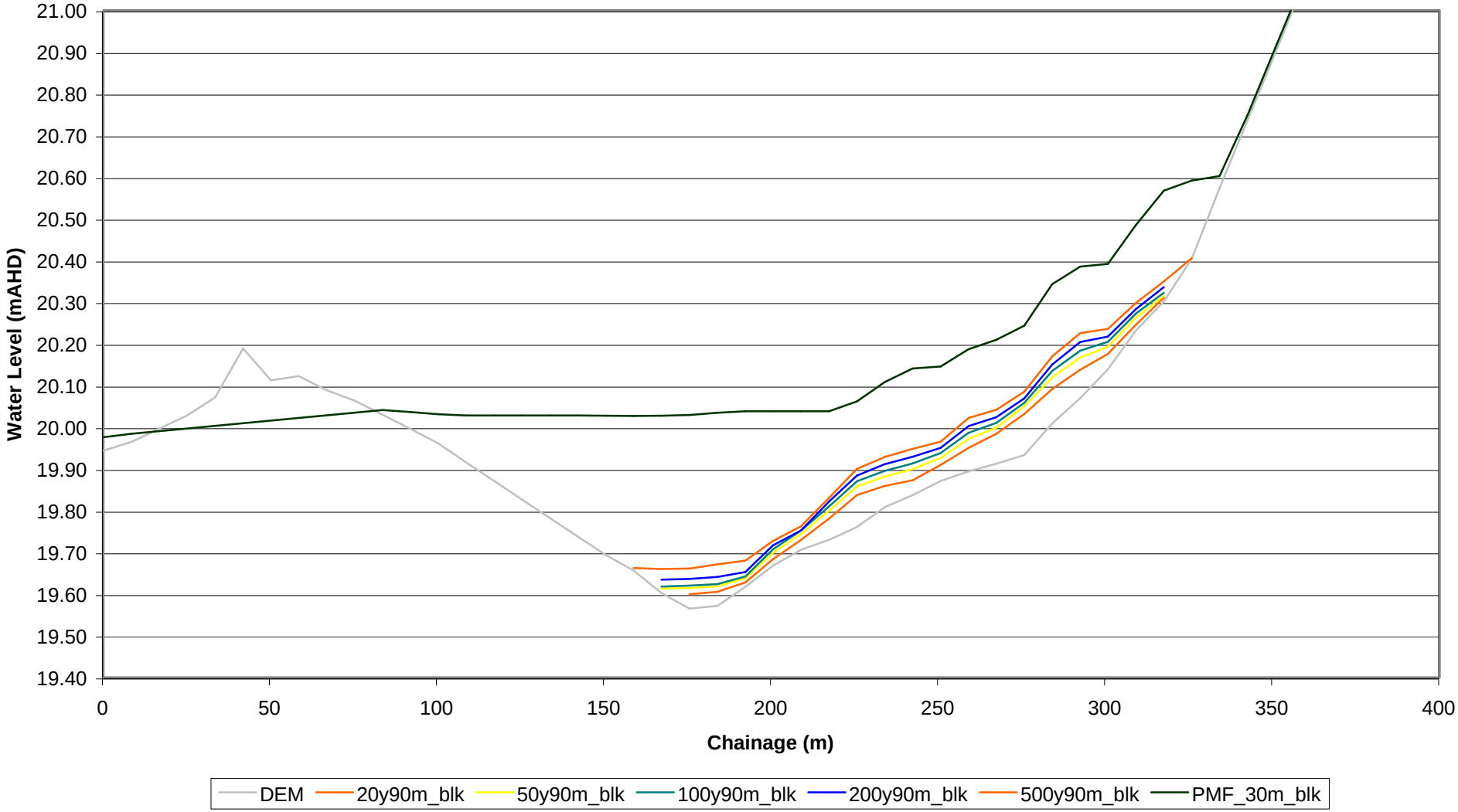
PROFILE - LAURENCE_ST_3-4



PROFILE - LAURENCE_ST_5-7

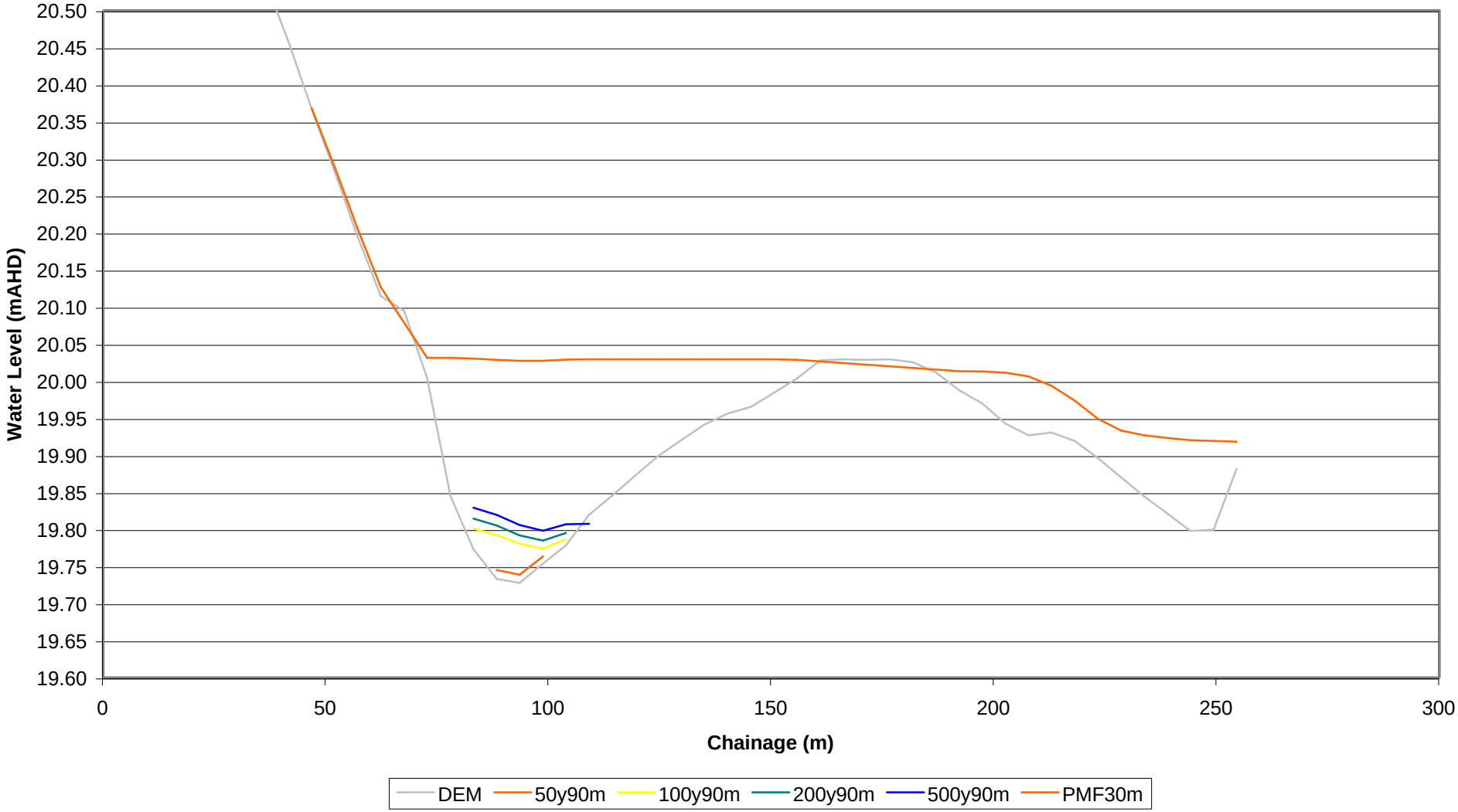


PROFILE - LAURENCE_ST_5-7

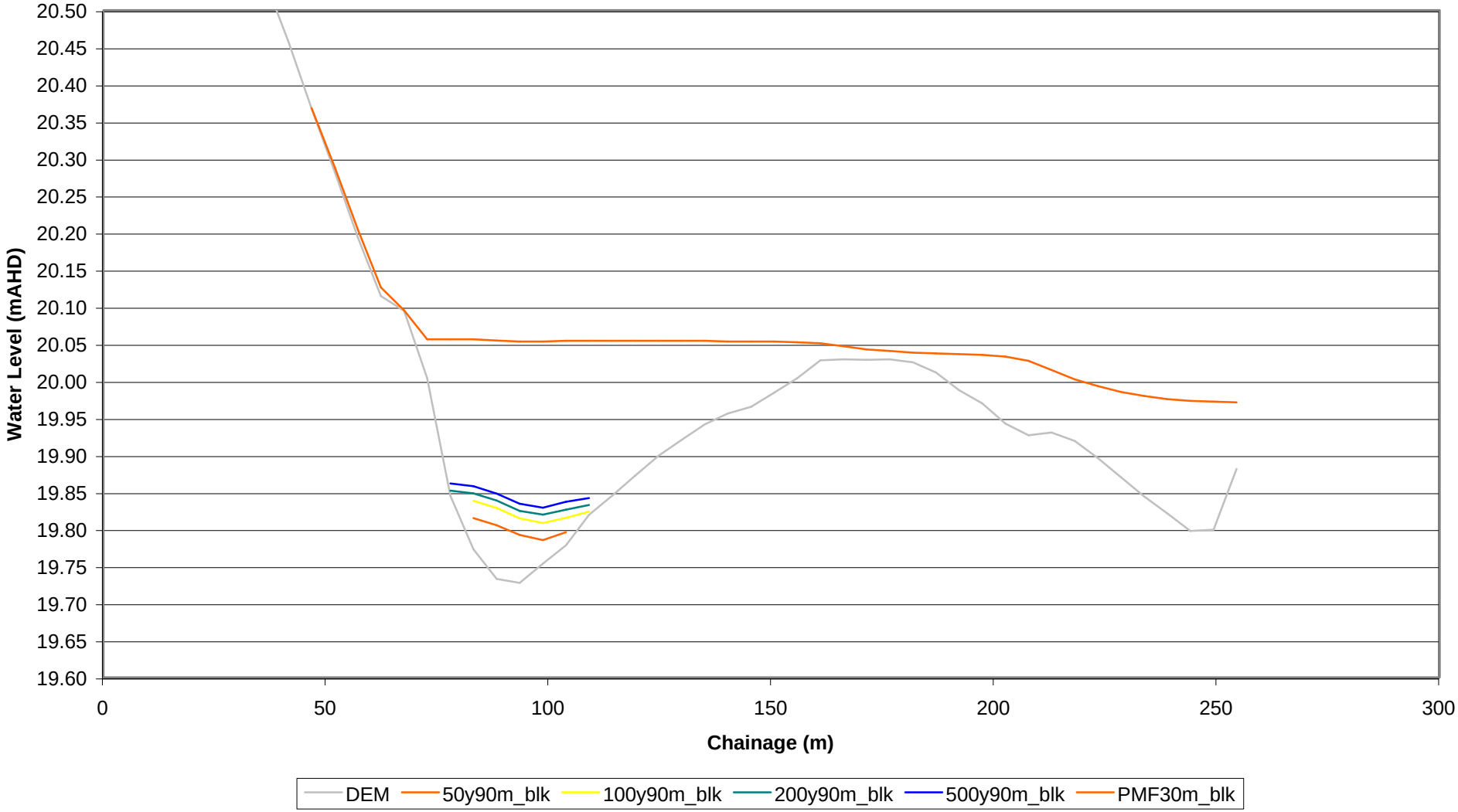


POWELL STREET
(H11)

PROFILE - POWELL_ST_1



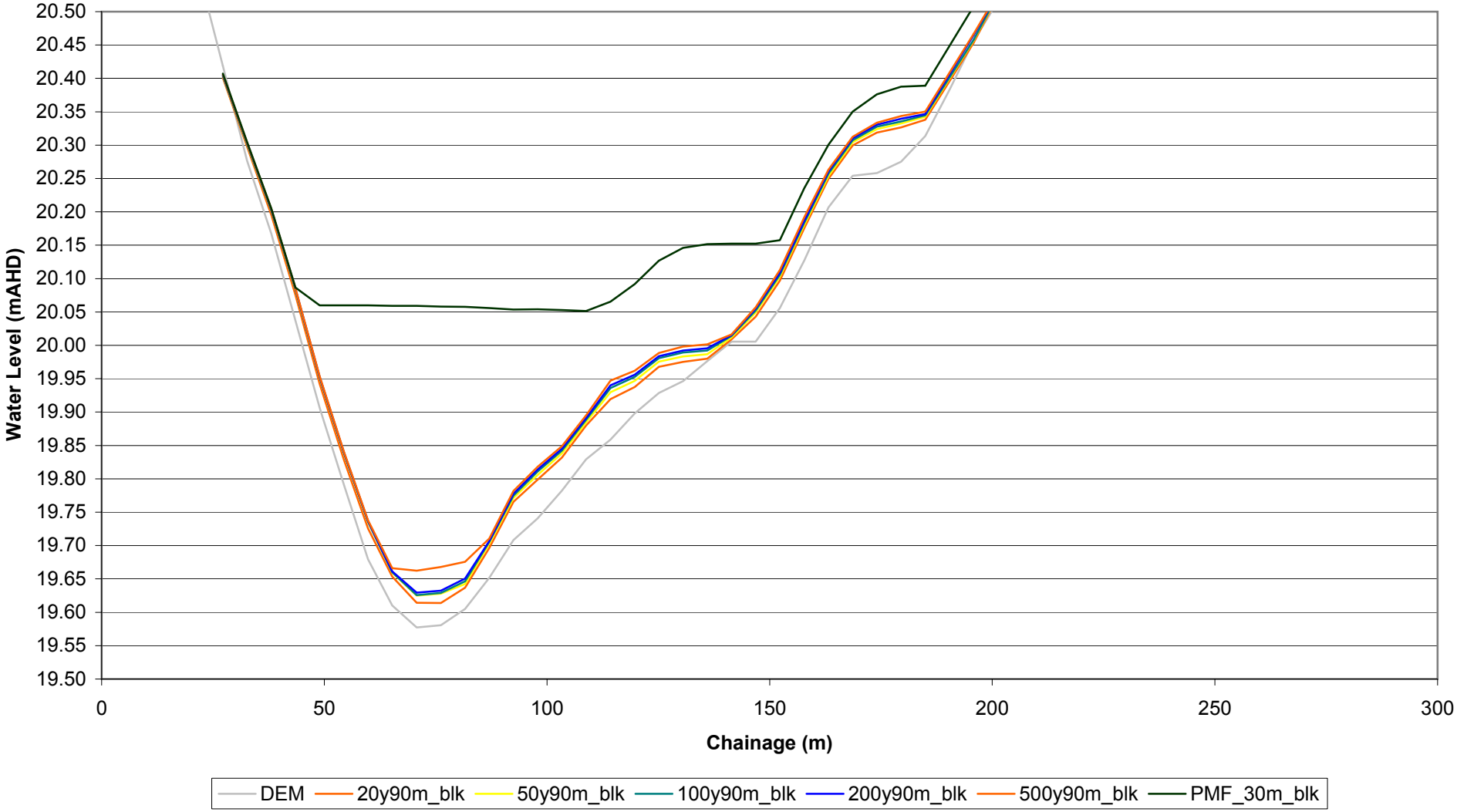
PROFILE - POWELL_ST_1



VALDER AVENUE
(H12)

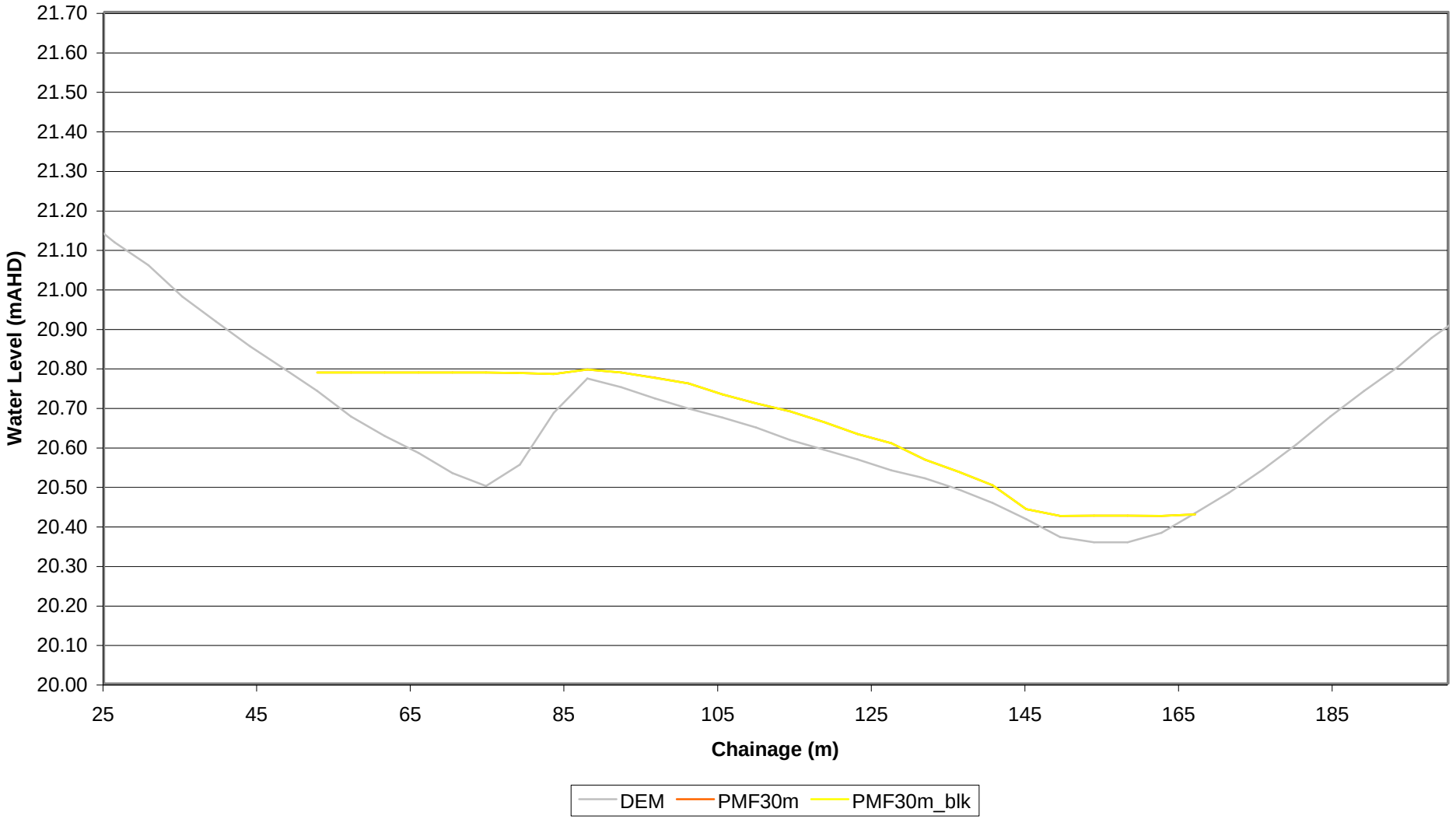
PROFILE - VALDER_AV_1-2

PROFILE - VALDER_AV_1-2



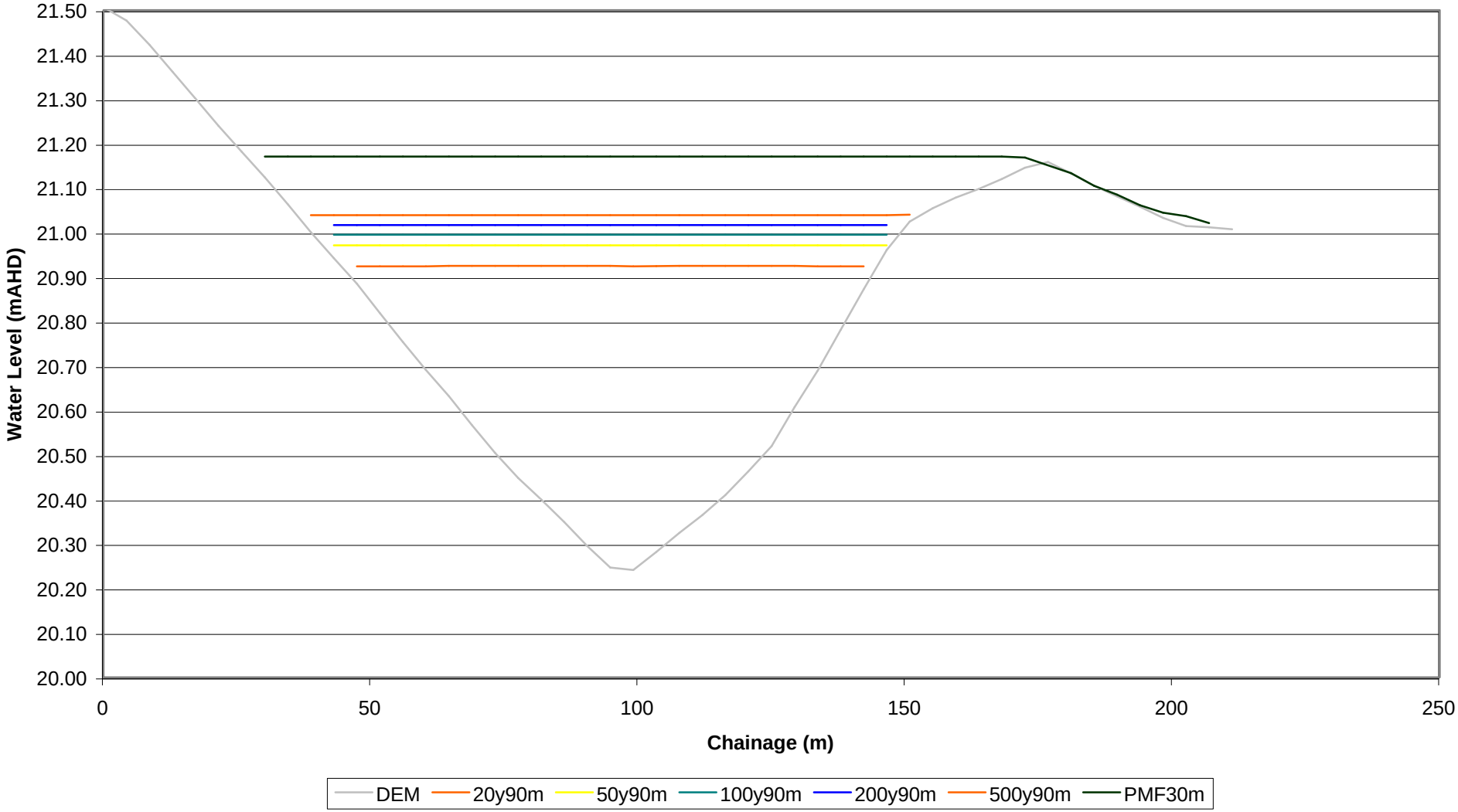
DOUGLAS STREET
(H13)

PROFILE - Douglas_St_2

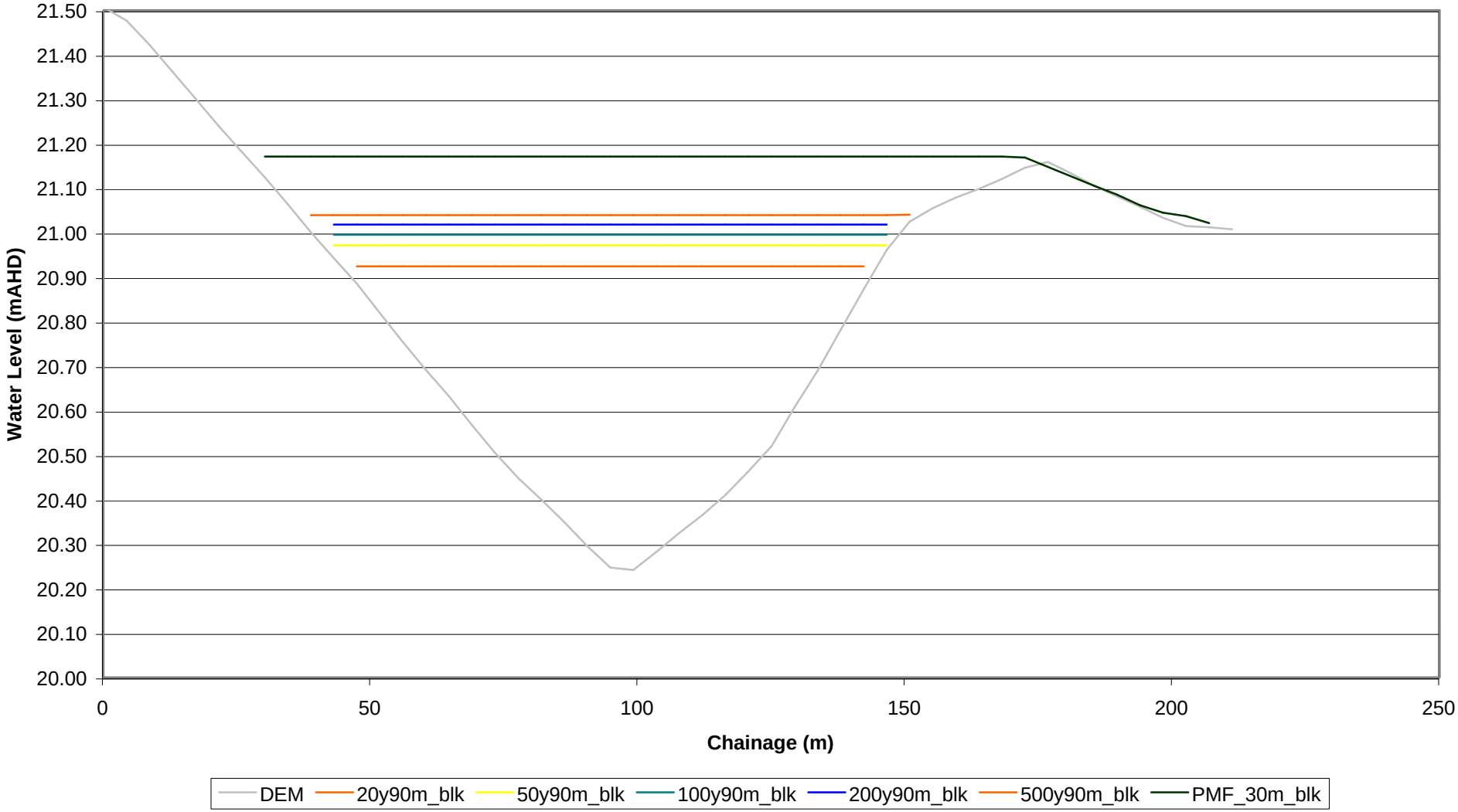


DOUGLAS STREET
(H15)

PROFILE - DOUGLAS_ST_1

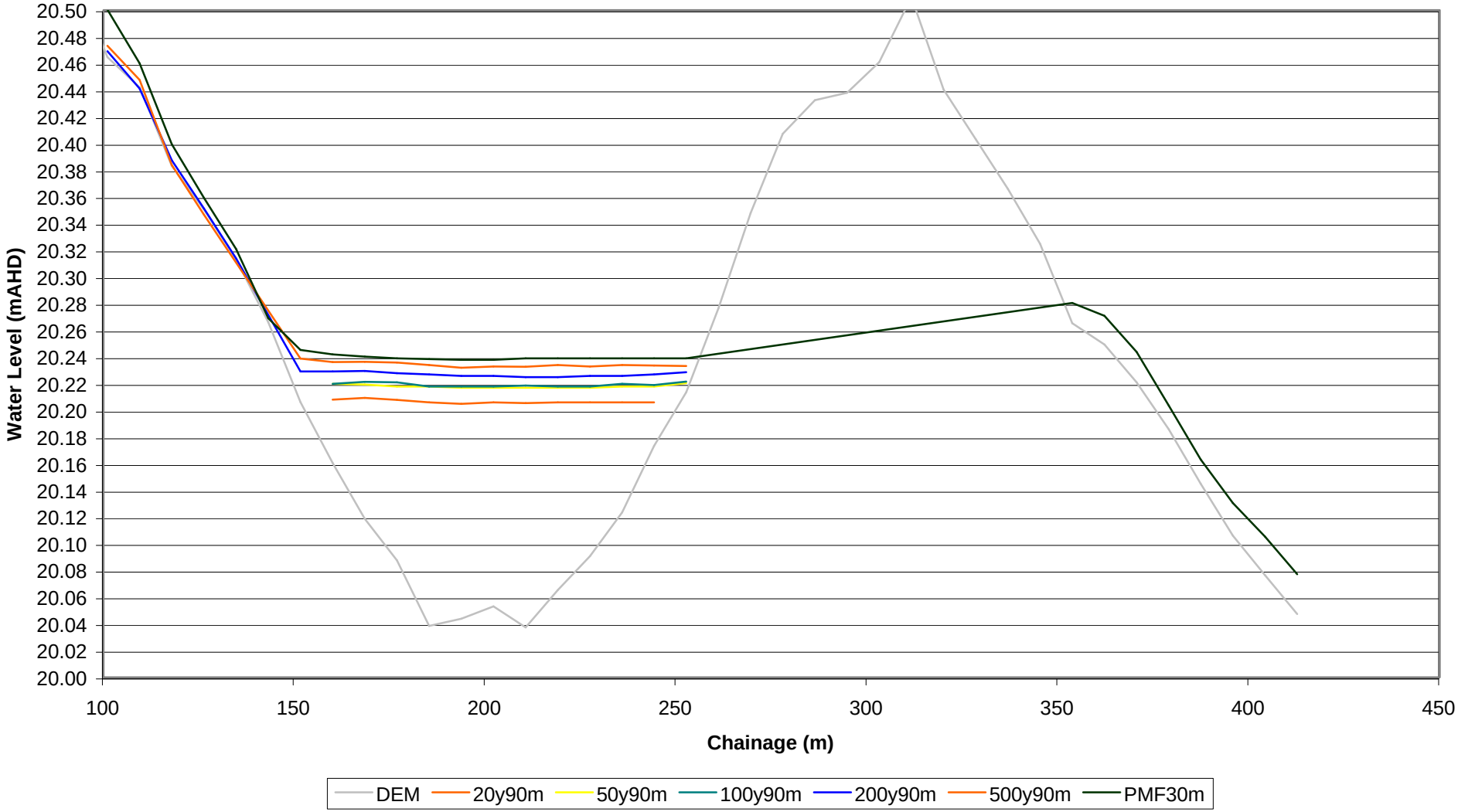


PROFILE - DOUGLAS_ST_1

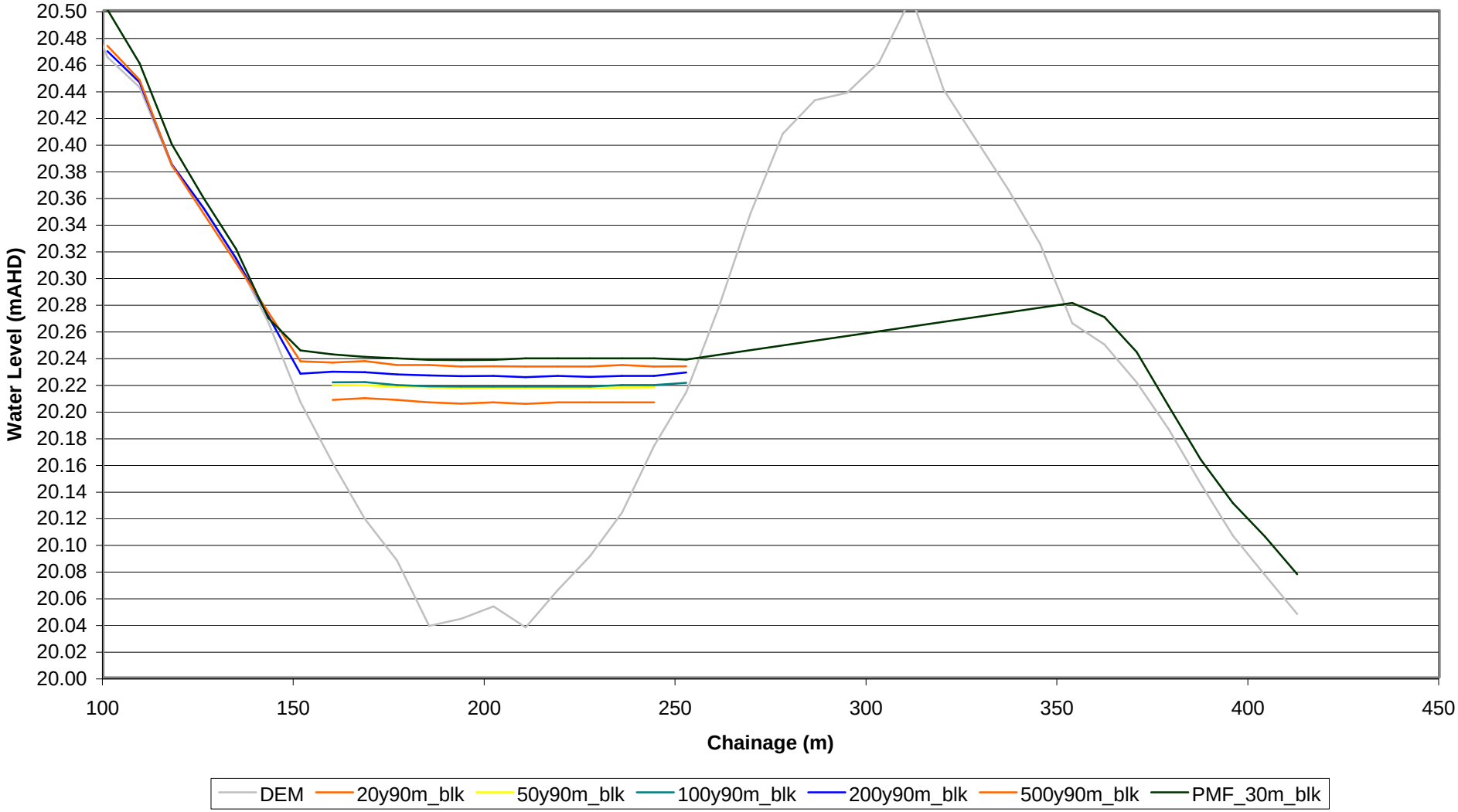


HEREFORD STREET
(H18)

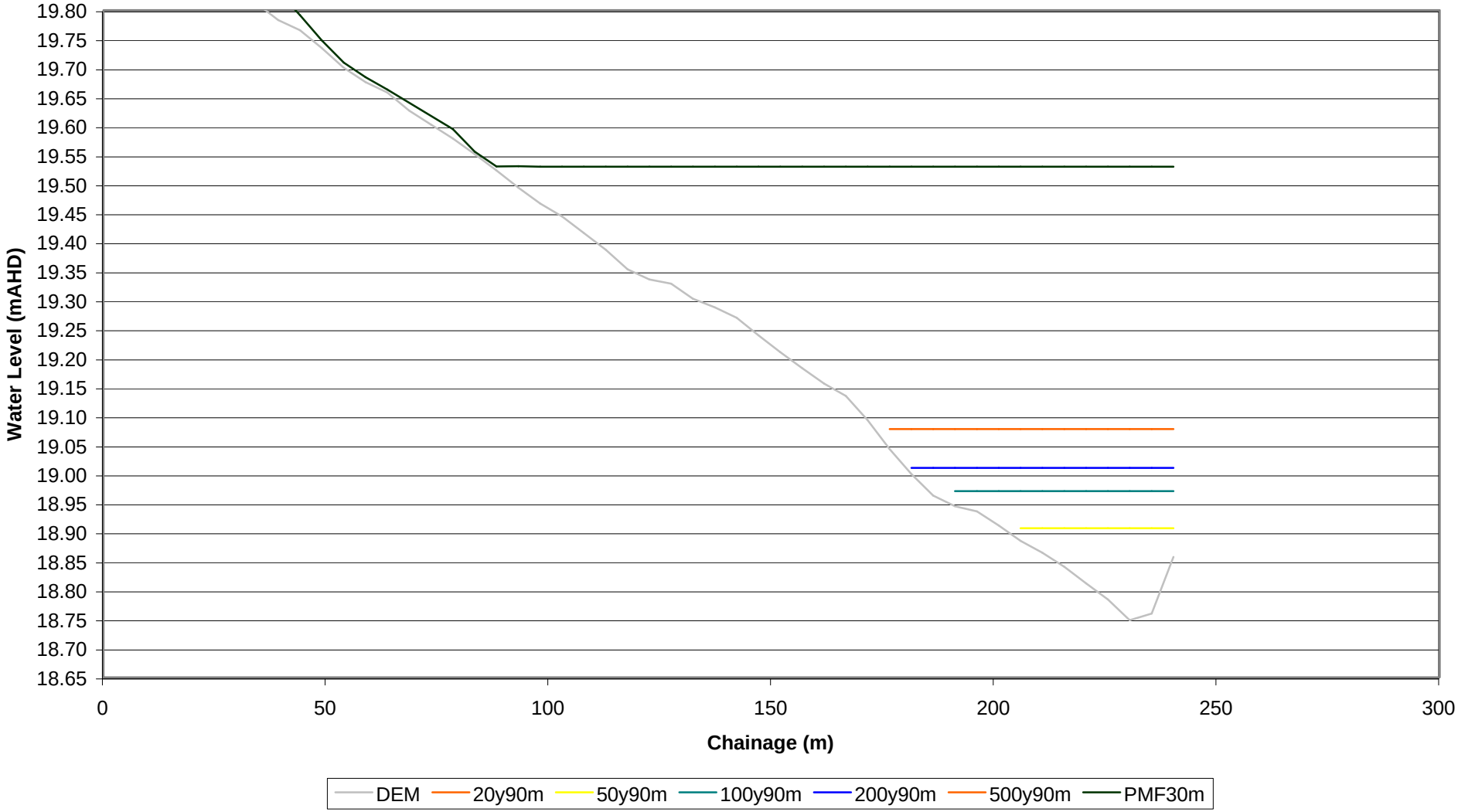
PROFILE - HEREFORD_ST_1-3



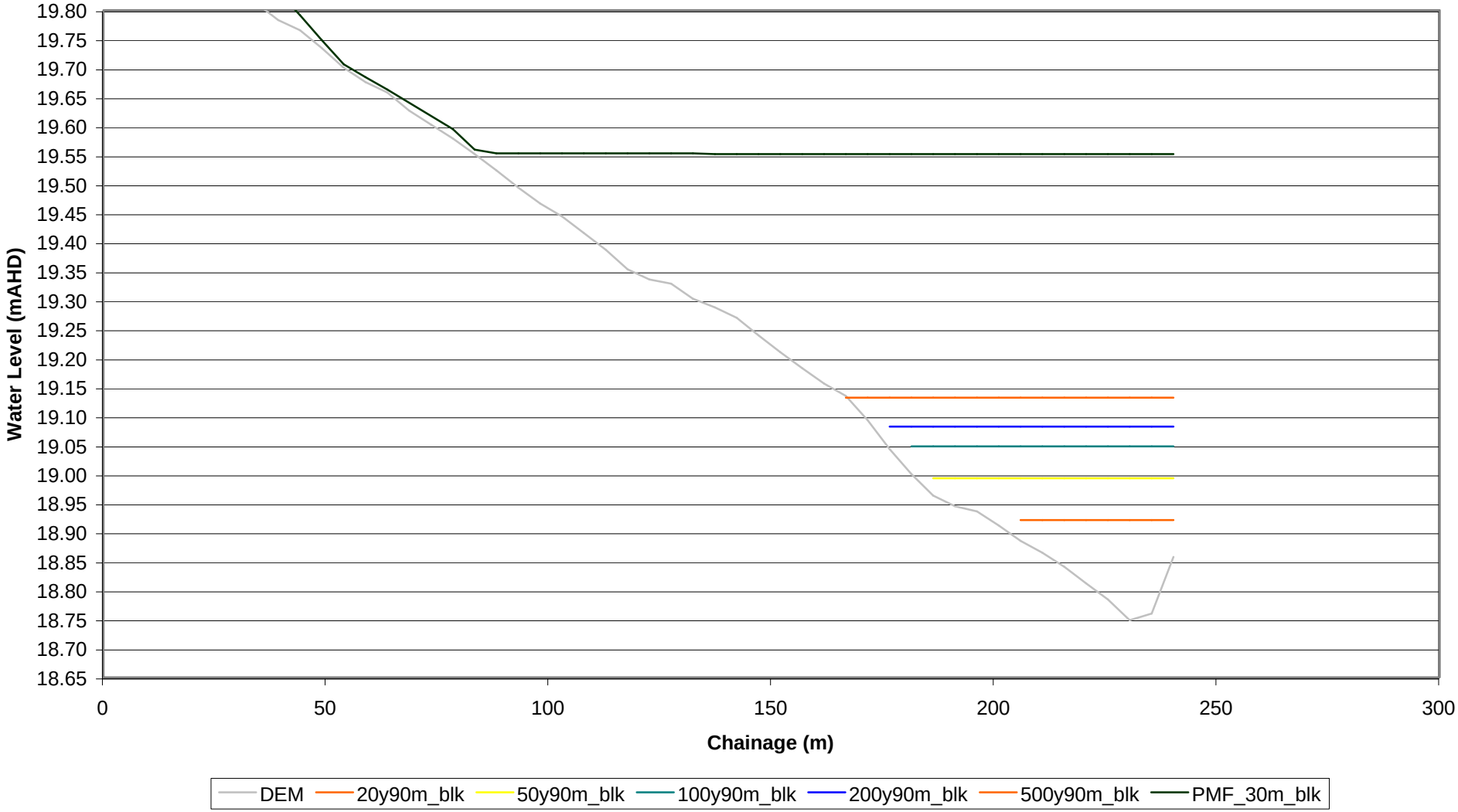
PROFILE - HEREFORD_ST_1-3



PROFILE - HEREFORD_ST_4-6

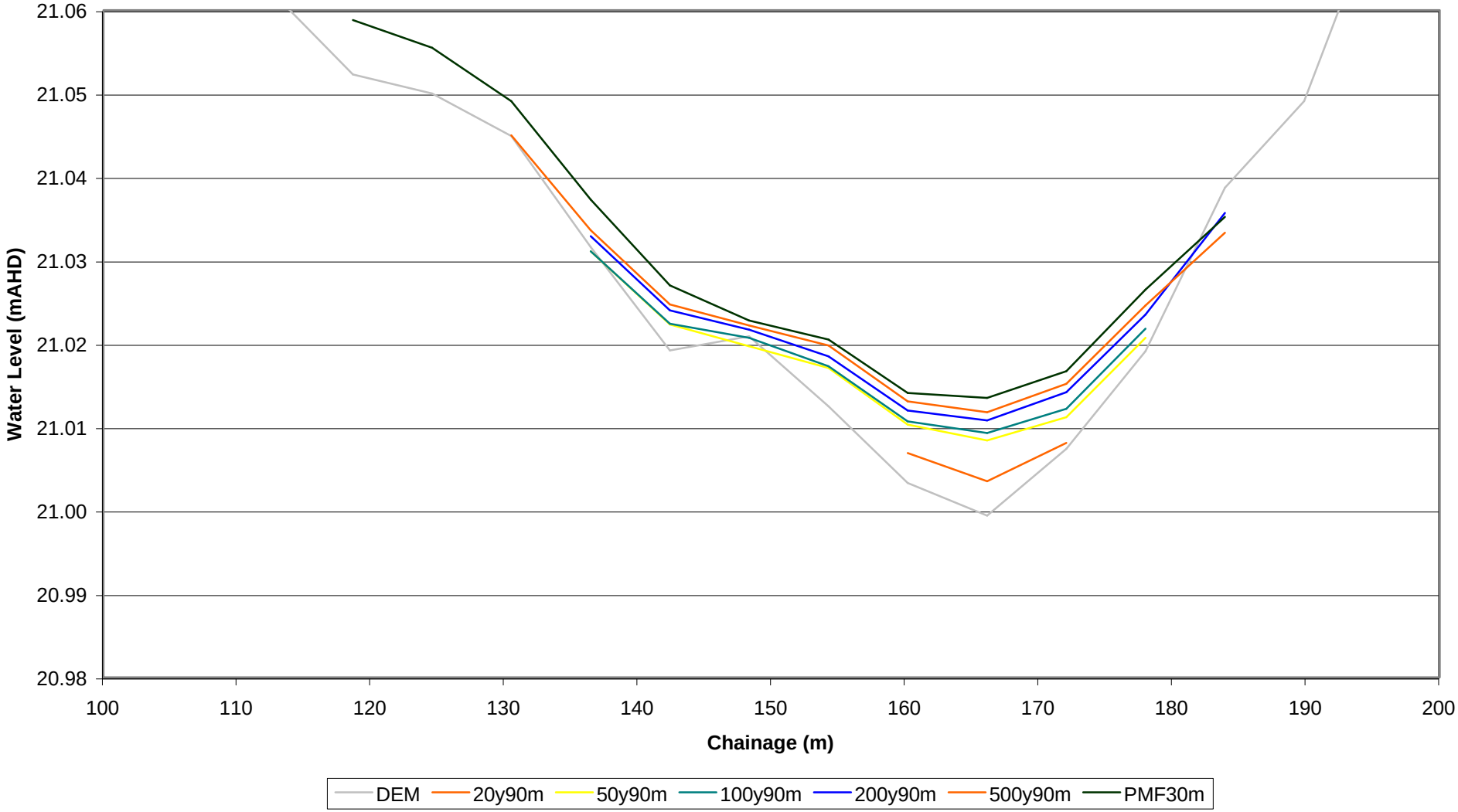


PROFILE - HEREFORD_ST_4-6

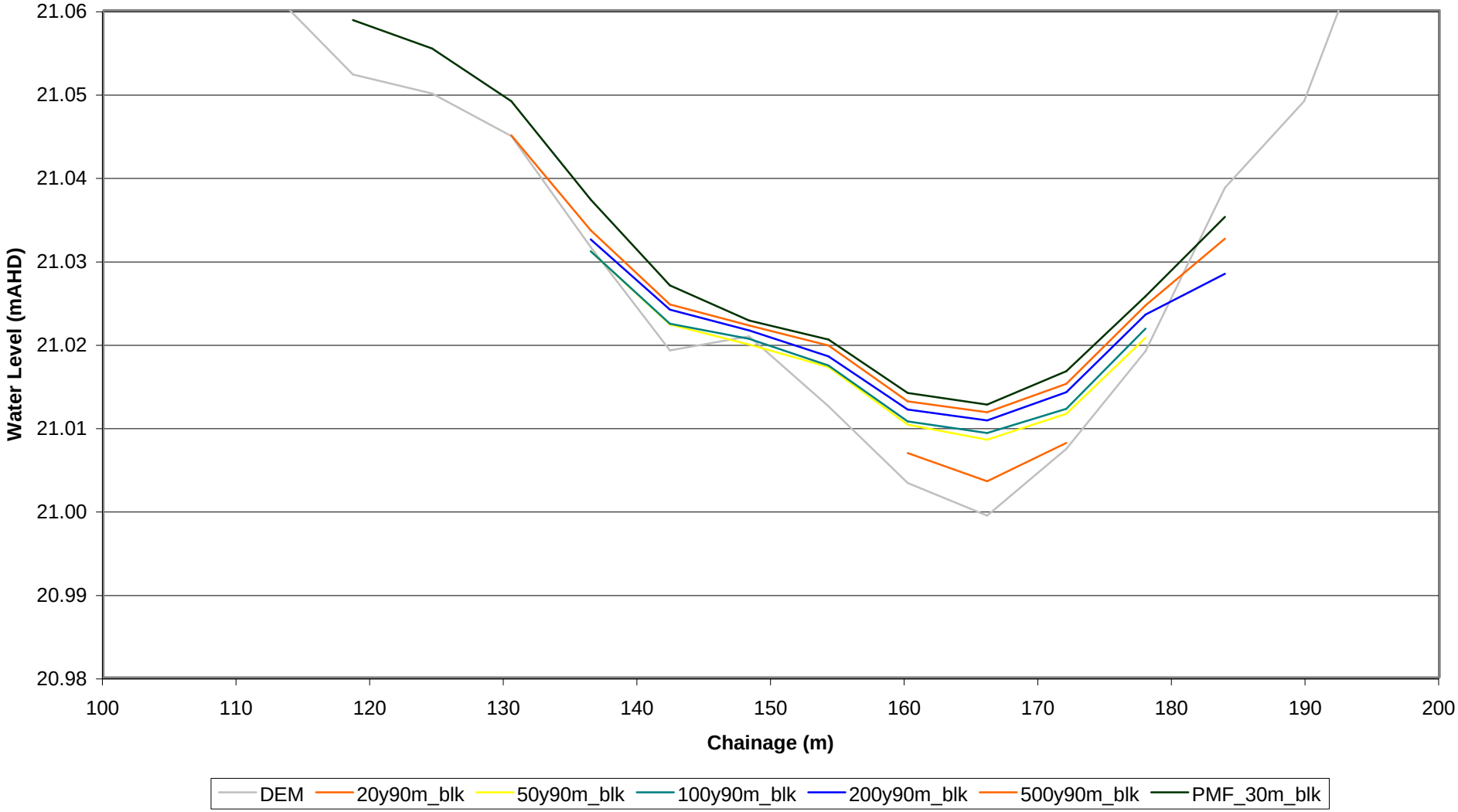


CASTLEREAGH ROAD
(NEAR WILLIAM COX DRIVE)

PROFILE - CASTLEREAGH_RD_1

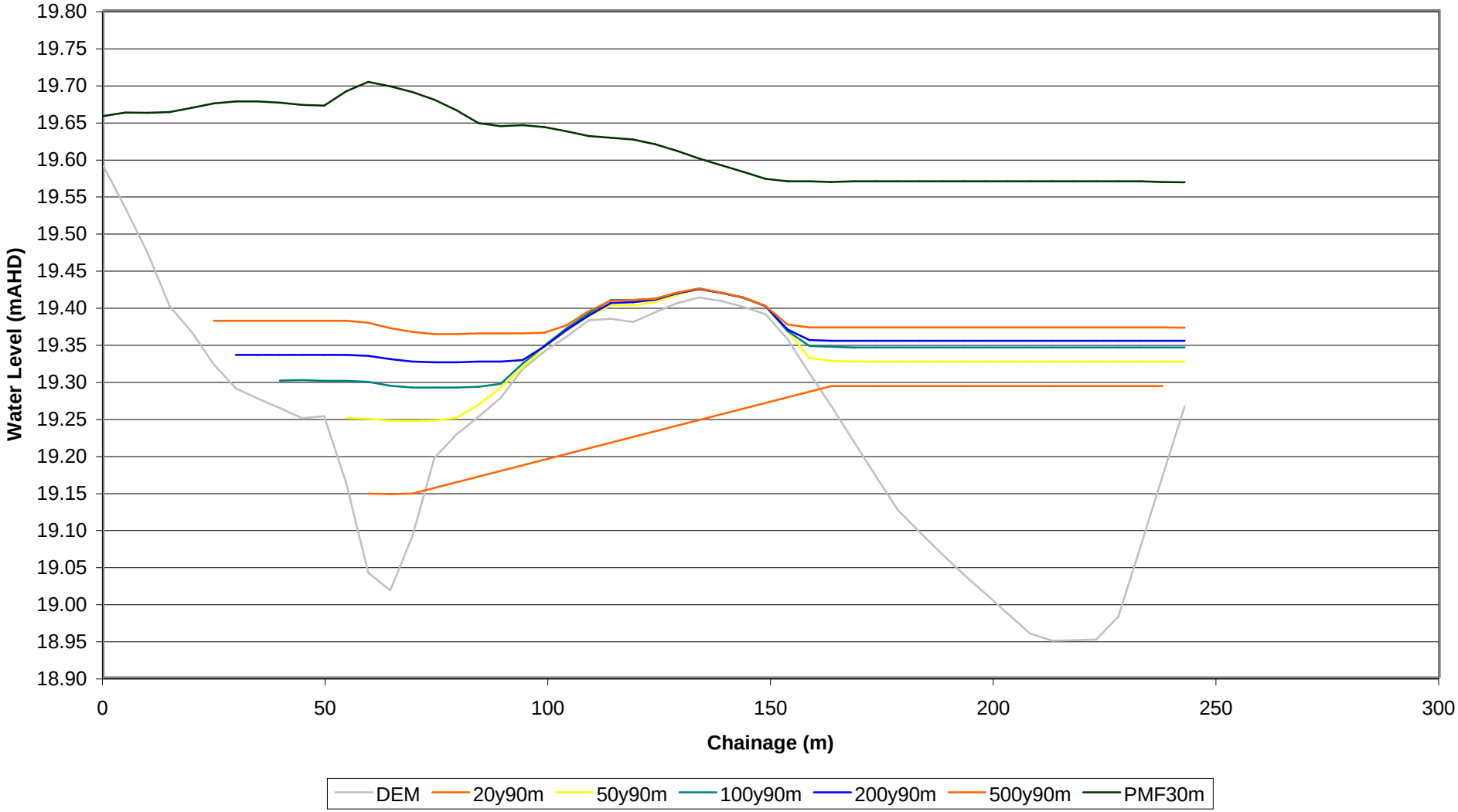


PROFILE - CASTLEREAGH_RD_1

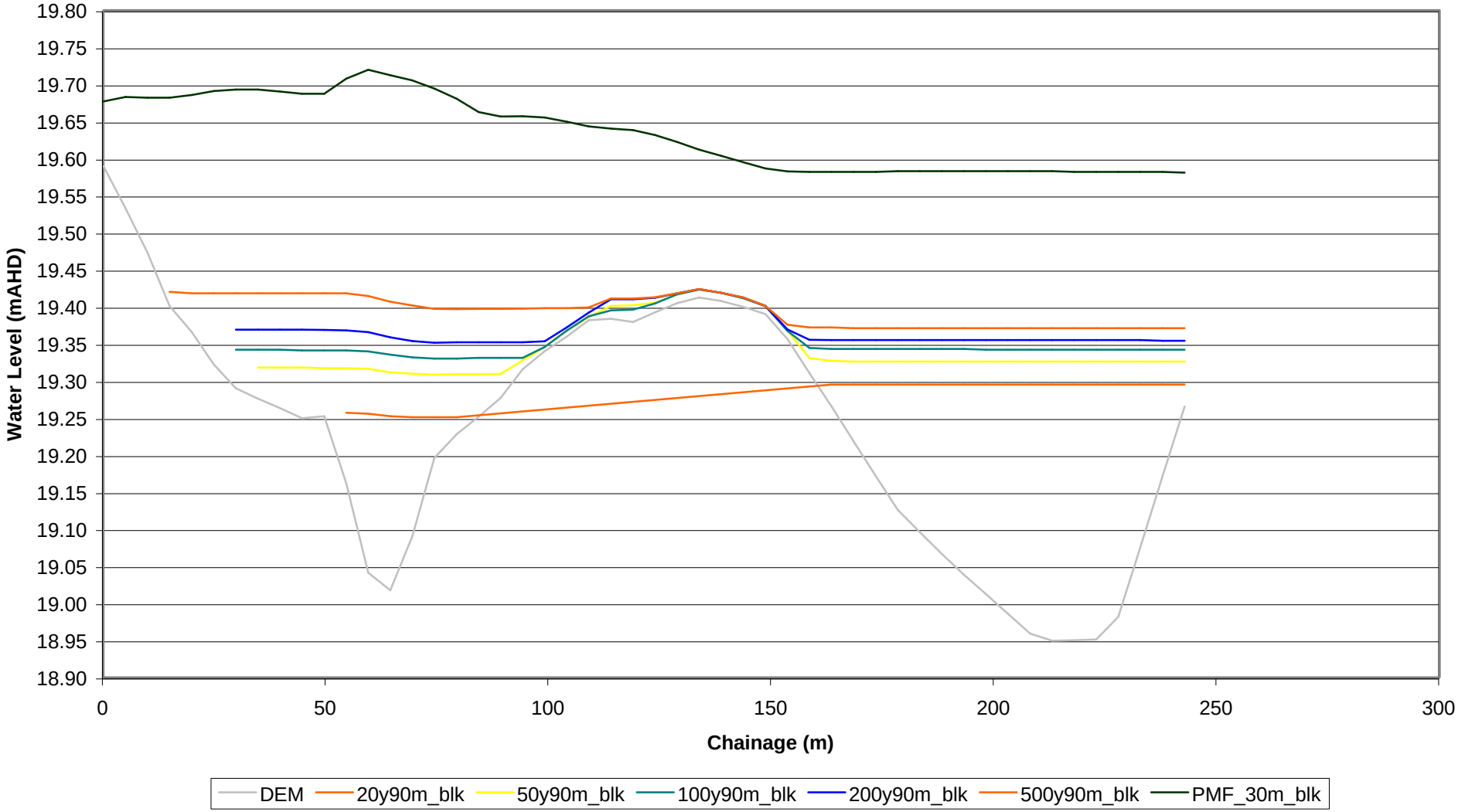


HAROLD AVENUE

PROFILE - HAROLD_ST_1

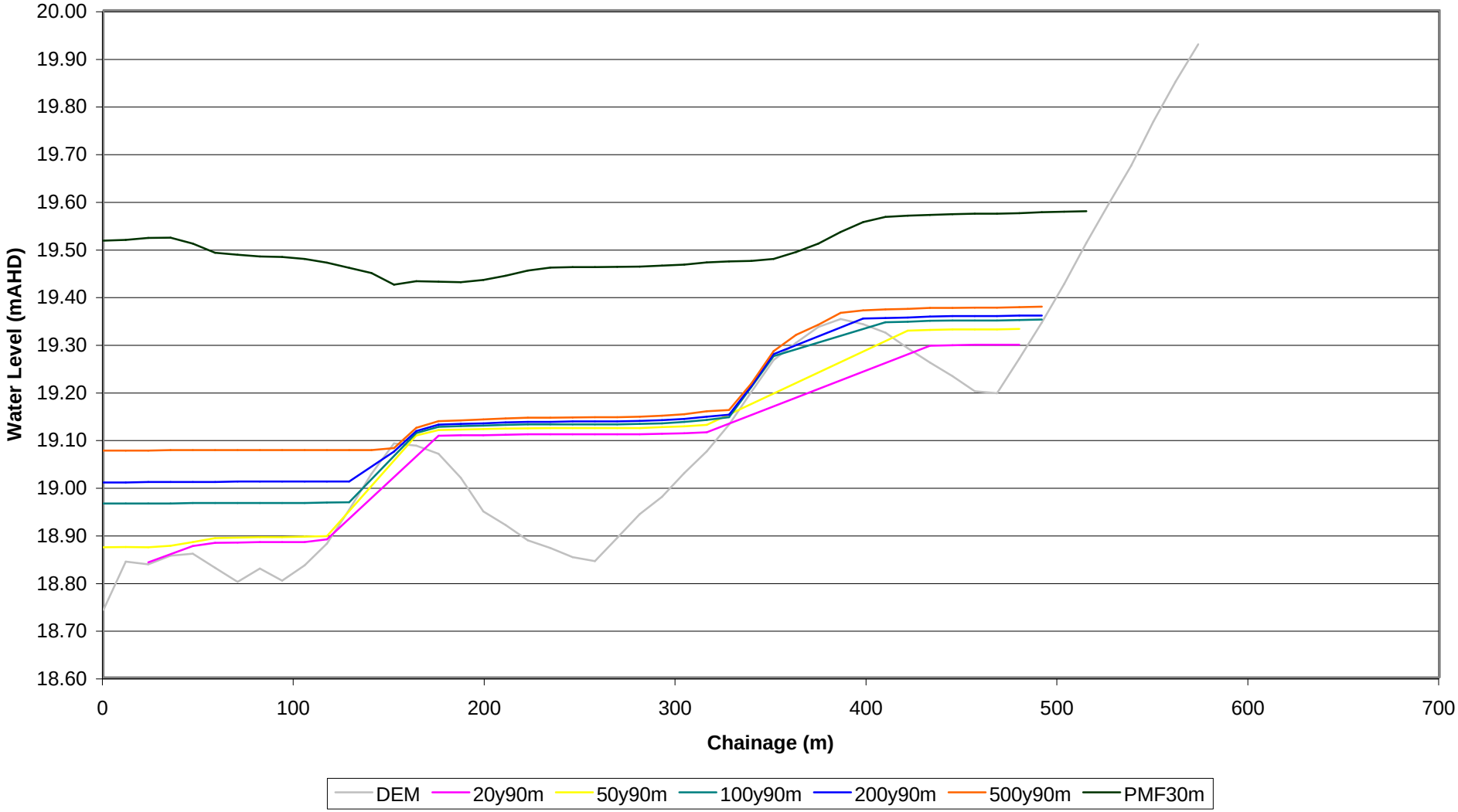


PROFILE - HAROLD_ST_1

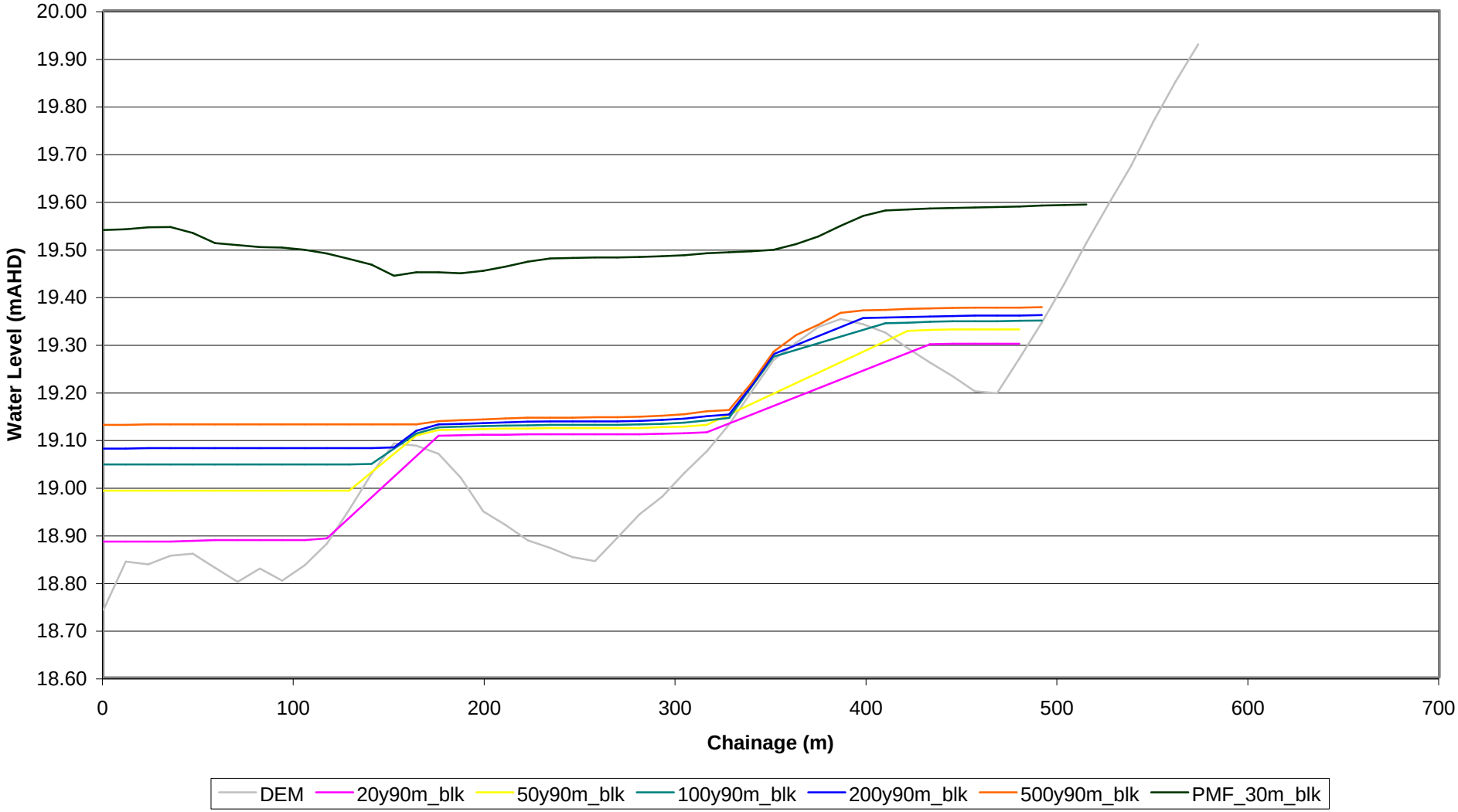


LUTTRELL STREET

PROFILE - LUTTREL_ST_1-3.csv



PROFILE - LUTTREL_ST_1-3.csv



APPENDIX D

STUDY AREA PHOTOGRAPHS

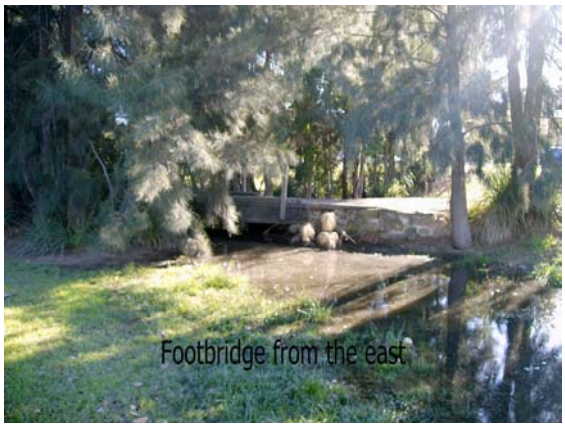

Annette Pl from East Market St


West along the waterway
from East Market St


North along East Market St


Culvert under East Market St


South along East Market St


Footbridge from the east


West along Laurence St


Footbridge from the west


West from Cross section 36


Footbridge from Cross section 39


Sydney Water Site on Laurence St


Footbridge from west

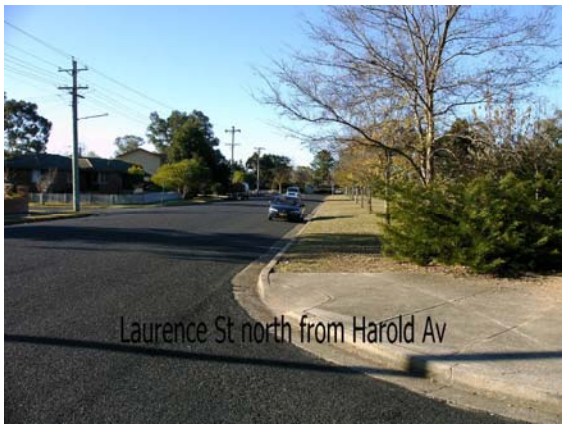

South from Sydney Water Site


Footbridge from Cross section 40


Waterway South from Sydney Water Site


Waterway south from footbridge


Culvert North side of Harold St

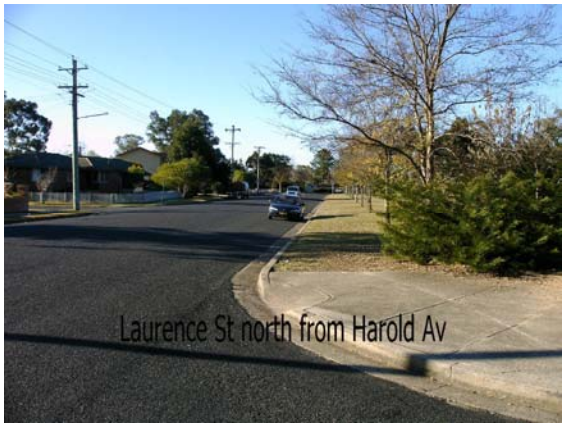

Laurence St north from Harold Av


Culvert Southside of Harold Av


Laurence St south from Harold Av


Harold St from Laurence St


Daycare Centre from Laurence St


Laurence St north from Harold Av


South along Laurence St


Car Park Enterance From Laurence St

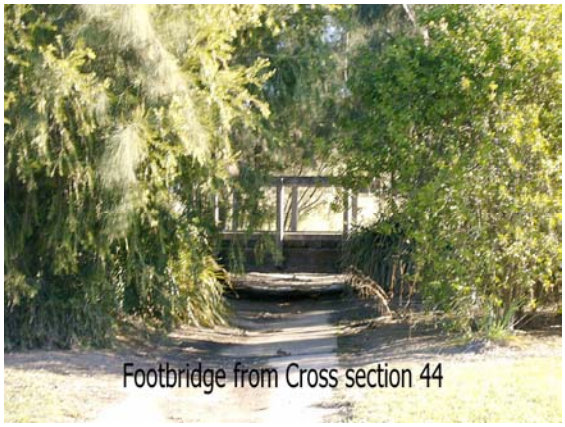

Footbridge from south


Waterway South from Harold St


Waterway south from Footbridge


Car Park at rear of Shopping Centre


Laurence St culvert East side


Footbridge from Cross section 44


Laurence St south from culvert


Laurence St north from culvert


Waterway west from Cross section 49


Laurence St culvert west side


Junction of Waterways


Waterway from Laurence St


North towards Powell St


Tamplin Field from cross section 49


Culvert southside of Powell St


North along Powell St


South from Hereford St


South along Powell St


Culvert at Hereford St


Culvert northside Powell St


South along Hereford St


North from Powell St


North along Hereford St


Douglas St from Hereford St


Waterway south from Valder St


East along Douglas St from site


East along Valder St


West along Douglas St from site


50
West along Valder St


Culvert Southside Valder St


North from Valder St


Culvert Northside of Valder St


Culvert West side of Douglas St


South along Douglas St towards HolborroeAv


Waterway west of Douglas St


North along Douglas St


End of Waterway at Castlereagh Rd


Culvert East side of Douglas St


Culvert under Castlereagh Rd


West towards Castlereagh Rd


North along Castlereagh Rd

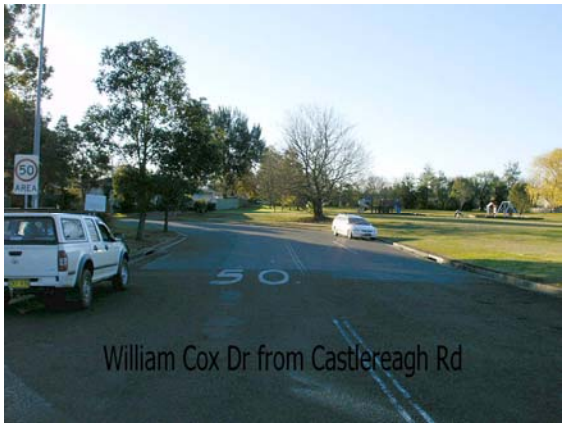

South along Castlereagh Rd


North from William Cox Dr


Looking across Castleagh Rd


South from William Cox Dr


Looking south towards Waterway


50
AREA
50
William Cox Dr from Castlereagh Rd


West along William Cox Dr


John Tebbut Pl west from intersection


North from John tebbut Pl


John Tebbut Pl looking towards Castlereagh Rd


Castlereagh Rd South from John Tebbut Pl


Dam and Catchment at H1


John tebbut Pl East from intersection


Southee Rd from Castlereagh Rd


Outlet at H2


Southee Rd at H4


Southee St at H2


Londerry Rd north at H5


Dam and catchment at H3


SoutheeRd from Londonderry Rd


Inlet H4


Inlet H5


Londonderry Rd south from Southee Rd


Inlet H7


Londonderry Rd north from H6


Outlet H7


Inlet H6


Intersection of Colledge St and Londonerry Rd


Londonderry Rd north from H6


Colledge St from Londonerry Rd


Drainage Channel from Londonderry Rd


University enterance


Channel upstream of Bourke St


Channel downstream of Bourke St