

# **Annexure "H"**

## **Stormwater Management Assessment**

# Proposed Rezoning of

Lot 36 in DP28024 and Proposed Lot 105  
(Resub Lots 37 & 38 in DP28024)  
Turner Road, Currans Hill

## Stormwater Management Report

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For

**Turner Road Developments & Broome**

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## Annexures

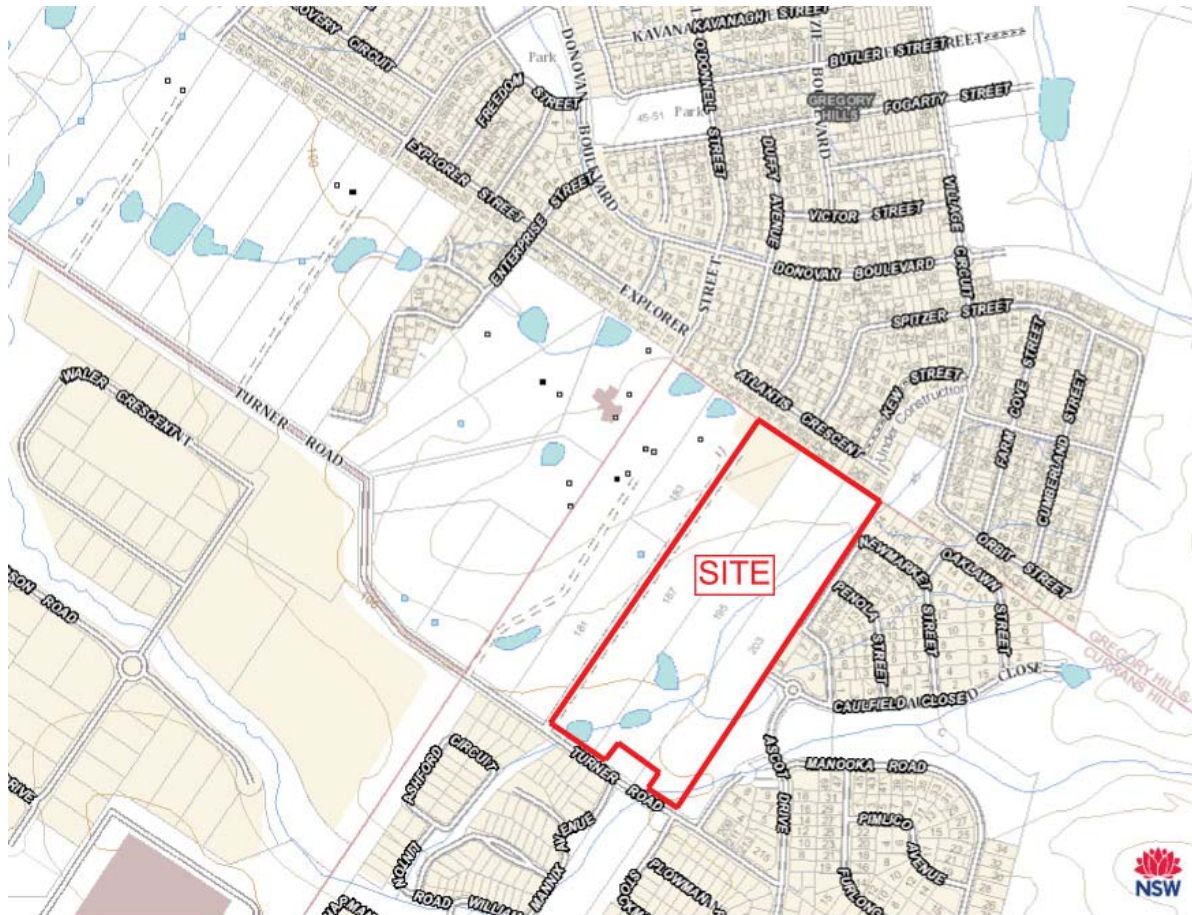
- Annexure A. Preliminary Zoning Plan prepared by JMD Ref: 14194E7 Issue B dated 5th October 2017
- Annexure B. Concept Engineering Plans  
14194E8 – Concept Engineering Plans dated 06-12-2017 - Issue A

- Annexure C. Water Quantity Modelling – XP Rafts Modelling for Existing Conditions
- Annexure D. Water Quantity Modelling – XP Rafts Modelling for the Ultimate Development
- Annexure E. Central Channel Hydraulics – Ultimate Development Conditions
  - E.1 – Hec-Ras Profile Section – Ultimate Development
  - E.2 – Hec-Ras cross sections

# 1. Introduction

JMD has been retained by Turner Road Developments and Broome to prepare a stormwater management report summarising drainage concept and stormwater management in support of a proposed rezoning of Lots 36, 37 & 38 in DP28024 Turner Road, Currans Hill.

Turner Road Developments is the owner of Lots 37 and 38 in DP 28024 while Broome is the owner of Lot 36 in DP 28024. It is proposed that all three (3) lots, known as the “Site” are developed together in a number of stages.



**Figure 1-1: Locality Sketch of the Site**

The site will ultimately be developed for residential housing to the maximum extent permitted by the planning for the site. The rezoning application has been brought about to realign the zoning of the site to be consistent with the proposed trunk drainage facilities for the ultimate development. It is noted that the first stages of the development are not affected by the rezoning and are being developed separately under DA528/2008 & DA525/2017.

While the catchment area of the existing watercourse extending through the site conveys runoff from multiple land holdings, Council have not developed a s94 works concept for the drainage within the site. In the absence of the support of a s94 funded works plan, JMD have developed a trunk drainage scheme for the catchment which will cater for the control of stormwater off the entire catchment and our clients have commenced negotiations with the adjoining land owners for the equitable sharing of development costs associated with the trunk drainage works.

Ultimately it is proposed that a formalised drainage channel trunk drainage system which is compliant with the requirements of the Camden Council Design Specification be constructed through the site.

The current proposal is for the rezoning of the portion of the site surrounding the existing land zoned E2 and its realignment. JMD have established a trunk drainage system that caters for the entire catchment and therefore this rezoning application aims to adjust the boundaries in accordance with the ultimate drainage concept.

This report documents the proposed ultimate trunk drainage components and the design principles used to develop the scheme which supports this application.

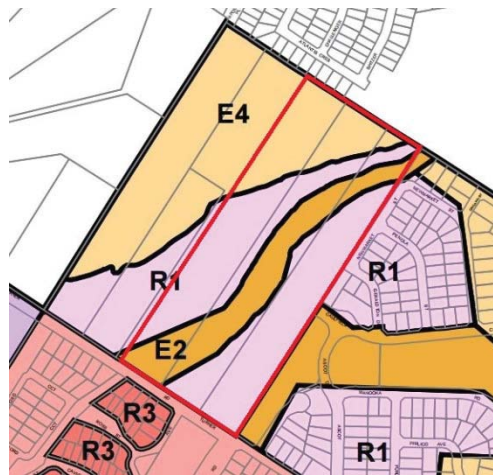
It is proposed that the new drainage corridor will be dedicated to council.

## 2. Background

### 2.1. Site Description

The site is approximately 11.59ha in area and is located on the northern side of Turner Road opposite the intersection of William Mannix Avenue. The site fronts Turner Road (running East-West) and currently has three zonings as described and detailed in Figure 1-1 below:

- the north western corner of the lot is zoned “E4 – Environmental Living”;
- the central portion of the site contains an existing channel and has therefore been zoned “E2 – Environmental Conservation”;
- the remaining portion of the site is zoned “R1 – General Residential”;



**Figure 2-1: Current Zoning**

This rezoning application is being prepared for the site which will define the actual limits of the area zoned “E2 – Environmental Conservation”.

### 2.2. Previous Applications

A portion of the site has already been approved for subdivision. DA582/2008, approved by Camden Council 25 February 2009 (modified 15 June 2015) affects Lots 37 and 38 and will result in the subdivision of those lots to create 4 residential lots (to be known as Lots 101 to 104) fronting Turner Road and 1 residue Lot to be known as Lot 105.

DA525/2017, approved by Camden Council 28 November 2017 affects all lots and will result in the subdivision of those lots in two stages to create 40 residential lots and 2 residue lots.

### **2.3. Existing Conditions**

The subject site in general consists of open pasture with little tree cover. A large dwelling has been constructed at the northern end of Lot 36 in DP 28024. Surrounding this dwelling is a tennis court, sheds and a paved driveway / court area. It is proposed that this dwelling and the surrounding structures, elements etc. will be demolished as part of the previous application (DA525/2017).

The site is affected by an informal gully system which has been significantly altered from a natural creek system to contain a number of dams as a result of past pasture usage of the site. This gully conveys the flows from a catchment area upstream of the site (to the north) measuring some 20.4ha in area. This upstream catchment has in recent years, been developed as part of the Gregory Hills development area and it is understood that the developed flows off that catchment are being collected in a detention system on the upstream property which retards the stormwater flows off the developed catchment such that the peak stormwater flow is reduced to the pre-developed conditions. The final design details of that detention system were not known at the time of the preparation of this report and so for the purposes of this assessment, it has been assumed that the upstream catchment remains in an undeveloped condition.

In addition, to the upstream catchment from Gregory Hills there are two other external catchments that also drain on to the site. These being a portion of the Manooka Valley subdivision east of the subject site and a portion of the existing rural land west of the subject site.

While the western external catchment area contains minor rural dwellings and associated outbuildings, the catchment area to the channel remains largely undeveloped. All flow from this catchment area to the subject site can be considered overland sheet flow.

The eastern external catchment area is different in the fact that it has recently been developed into a residential subdivision. Prior to its development in 2012 it had similar catchment properties as the subject site i.e. rural open pasture. Following the Manooka Valley development, the developed catchment area is captured by street drainage and piped to a raingarden/OSD basin before being discharged into the subject site via a 525mm pipe at ground level.

Downstream of the site, the central creek system discharges to an existing drainage channel which has been constructed in Currans Hill via a number 600mm high concrete culverts totalling 5.4m wide under Turner Road.

The extent of the catchment considered by this study is detailed in the Catchment Plans included with the Concept Engineering Plans located in Annexure B.

### **2.4. Drainage Concepts**

Camden Council have developed a Master Drainage Plan for most development areas in the LGA and then supported that Plan with developer contributions levied pursuant to the Camden s94 Contributions Plan which provides for a level of equity among the properties to be developed in a locality. The s94 Plan provides a vehicle for the funding of local infrastructure required to be constructed as a result of the development of the locality.

Unfortunately the Camden Contributions Plan does not consider the drainage requirements for the development of this catchment. There is therefore no official mechanism for the funding of the trunk drainage works required to be constructed within this site.



JMD have completed a review of the catchment area and assessed the extent of works required to produce a drainage scheme for the site which is compliant with the Camden Council design Specification. These works include the construction of a central channel, road culverts, rain garden and stormwater detention basin together with trunk stormwater pipes to convey flows from upstream properties to the central channel system.

For the purposes of that 'whole of catchment' investigation, it has been assumed that the south-eastern portion of the western external catchment (currently known as Lots 351 and 352 in DP809159 and Lot 34 in DP28024) will be developed for residential development and that the stormwater flows off that land will be directed to the central creek system within the subject site via the future road drainage system. These catchment areas are identified as Catch 1 and Catch 2 in the "Catchment Plan for the Ultimate Development" Drawing. The north-western corner of these parcels is severed from the local catchment by the natural topography of the site. It has been assumed that this northern catchment will drain away from the subject site towards the western Turner Road Precinct drainage system.

The current rezoning proposal seeks to adjust the existing zoning boundaries to allow the Ultimate Drainage Concept described in the catchment plans to be developed.

### 3. Stormwater Quantity Issues

It is understood that all development within the catchment area will need to provide adequate on-site detention such that the discharge from the developed site is less than that which occurs under current conditions.

#### 3.1. Existing Conditions

It is noted that the XP-Rafts model for the existing catchment has been set-up as a snapshot of what the existing flows were prior to the development of the Manooka Valley subdivision and corresponding Raingarden / OSD basin. This modelling also assumes that the Stage 1 & 2 development (DA 525/2017) hasn't been developed yet. Sheet 5 of the concept engineering plans describes the existing catchment areas and flows. These are also detailed below.

**Table 3-1: Existing Catchment Details**

EXISTING CATCHMENT AREA	Area (ha)	% Impervious	Area Impervious (ha)	Area Pervious (ha)	All areas added?
A	7.293	0%	0.0	7.293	Y
B	4.741	9.2%	0.436	4.305	Y
MV**	3.54	0%	0.0	3.54	Y
C	3.596	0%	0.0	3.596	Y
D	0.968	0%	0.0	0.968	Y
E	0.973	0%	0.0	0.973	Y
U/S	20.4	0%	0.0	20.4	Y
TURNER RD***	41.511		0.436	41.075	Y

An XP-Rafts model for the site under current conditions was constructed to establish the base line peak flows off the site against which the developed flows would be compared, this is described in the "Catchment Plan under Existing Conditions". This XP-Rafts file was then adapted to reflect the developed conditions. Loss factors for the models were adopted from Council's design code as listed in Table 3-2 below:-

**Table 3-2: XP-Rafts Loss Factors**

Condition	Loss Factor
Pervious Initial Loss	10mm
Pervious Continuing Loss	3mm/hr
Impervious Loss	1.5mm
Impervious Continuing Loss	0mm/hr
'B' Multiplier	1.0

Roughness factors adopted for the models were 0.06 for existing grassed pervious surfaces, 0.03 for developed grassed pervious surfaces and 0.013 for all impervious surfaces. Each catchment was divided into the different development zones and assigned the appropriate % impervious areas as per Table 3-3 below.

**Table 3-3: Catchment Area Summary**

Catchment type	% Impervious
Residential	75%
Open space areas	5%
Drainage reserve	0%
External Catchment	0%

A summary of the existing peak flows extending through the Turner Road culverts is detailed in Table 3-4.

**Table 3-4: Summary of XP-Rafts Modelling – Existing Conditions**

FLOW IN TURNER ROAD CULVERT***	STORM EVENT					
	2yr peak flow (cum/s)*	5yr peak flow (cum/s)*	10yr peak flow (cum/s)*	20yr peak flow (cum/s)*	50yr peak flow (cum/s)*	100yr peak flow (cum/s)*
EXISTING CATCHMENT	2.224	3.666	4.520	5.740	6.968	7.907

### 3.2. Ultimate Conditions

JMD have prepared the ultimate model for the site using the XP-Rafts computer program. For the purposes of this study, the site has been divided into a number of catchments as detailed in the Catchment Plan for the Ultimate Development (Sheet 6 of the concept engineering plans in Annexure B). The catchment plan details an indicative ultimate development layout based on this rezoning application being lodged with Council. The Catchment Plan for the Ultimate Development has been prepared to provide for the likely maximum development potential on the site and hence the expected “worst case” stormwater outcomes. The layout in the catchment plan is not intended to “fix” any development rights for the site.

In the “Catchment Plan for the Ultimate Development”, Catchments 1 and 2 denote the future development sites to the west of the site. Catchments 3 to 6 cover the proposed development site. Each catchment area has been divided into residential and drainage reserve areas with residential areas assumed to be 75% impervious and drainage reserve areas assumed to be 0% impervious. The upstream (U/S) and Manooka Valley catchments (MV) have been included as detailed in Section 2.4 above.

The same loss factors and percentage impervious attributes detailed in Tables 3-2 and 3-3 were adopted for the Ultimate Development model.

**Table 3-5: Ultimate Catchment Details**

DEVELOPED CATCHMENT AREA	Area (ha)	% Imperv	Area Imperv (ha)	Area Pervious (ha)	All areas added?
1	3.575	75%	2.681	0.894	Y
2	2.403	75%	1.802	0.601	Y
3	1.586	75%	1.190	0.396	Y
4	4.173	75%	3.130	1.043	Y
MV**	3.54	75%	2.655	0.885	Y
5	2.487	75%	1.865	0.622	Y
6	1.681	75%	1.261	0.420	Y
U/S	20.4	0%	0.0	20.4	Y
CULVERT	0.780	0%	0.0	0.780	Y
TURNER RD***	0.882	0%	0.0	0.882	Y
SUM	41.507		14.584	26.923	Y

It is noted that the minor differences in total area is a result of rounding areas. Details of the XP-Rafts modelling and results are detailed in Annexure C of this report and summarised in Table 3-6 below.

**Table 3-6: Summary of XP-Rafts Modelling**

FLOW IN TURNER ROAD CULVERT***	STORM EVENT					
	Dev 2yr peak flow (cum/s)*	Dev 5yr peak flow (cum/s)*	Dev 10yr peak flow (cum/s)*	Dev 20yr peak flow (cum/s)*	Dev 50yr peak flow (cum/s)*	Dev 100yr peak flow (cum/s)*
EXISTING CATCHMENT	2.224	3.666	4.520	5.740	6.968	7.907
ULTIMATE DEVELOPED CATCHMENT	2.121	2.856	3.484	4.804	6.092	7.360
PONDING LEVEL IN TURNER ROAD OSD BASIN	94.287	94.793	94.95	95.124	95.255	95.37

The Ultimate Developed Scenario has been modelled with an on-line detention basin located at the downstream end of the drainage channel immediately upstream of Turner Road. The basin proposed represents a formalisation and widening of the existing channel to form an open basin with flat floor and banks sloping at 1 in 4 (V:H). Where the floor of the basin is not affected by the proposed rain garden, the bed is graded to the primary outlet at 1%. A low mound will be constructed across the base of the basin area immediately downstream of the proposed rain garden to provide the required extended detention in the rain garden. The rain garden and basin walls will be vegetated to improve performance of the rain garden and to reduce maintenance of the banks.

The modelling was carried out for multiple storm durations ranging from 20 minutes to 3 hours for 1 in 2 year Average Recurrence Interval (ARI), 1 in 5 year ARI, 1 in 10 year ARI, 1 in 20 year ARI, 1 in 50 year ARI and 1 in 100 year ARI storm events. The 2 hour event was found to be the critical duration for most models. Flows out of the basin are proposed to be controlled by the construction of discharge control outlets in a retaining wall (control wall) to be constructed immediately upstream of the Turner Road Weir. The proposed control wall and outlet are detailed in the concept engineering plans in Annexure B. As mentioned above, the proposed basin for the ultimate

development includes a rain garden bed in the base to manage water quality issues for the catchment, details regarding the raingarden are included in chapter 5 below.

The proposed depth of ponding in the basin in peak 1 in 100 year ARI storm conditions will be 2.07m. Council's design code requires all basins with a ponding depth in excess of 0.3m to be fenced for safety of the public and so such fencing will be provided to the basin. The proposed 1 in 4 embankment batters then, are not therefore considered to be a significant risk. The basin will be provided with a sealed vehicular access ramp off Turner Road which grades at about 13% and so will provide a pedestrian traversable exit point should such be required during flooding.

## 4. Stormwater Quality Issues

The site is located within the Currans Hill Release Area and as such developments are required to comply with the requirements of Camden Council’s Engineering Design Specification. This document has been in existence for some time and as such only specifies generic water quality objectives. Previous discussions with the officers of Camden Council have revealed that Council acknowledge that the requirements of the Engineering Design Specification are outdated and new developments are now required to satisfy the water quality objectives contained in the Oran Park DCP which are detailed in Table 4-1 below.

**Table 4-1: Oran Park DCP Water Quality Objectives**

	Water Quality (% reduction in pollutant loads)			
	Gross Pollutants	Total Suspended Solids (TSS)	Total Phosphorus (TP)	Total Nitrogen (TN)
Stormwater Management Objective	90	85	65	45

The objectives prescribed represent the reduction in pollutant loads in the developed condition required to be met by a particular development. In accordance with the current requirements of Camden Council, the water quality assessment has been completed by JMD using the MUSIC computer program (version 6.1 build 0.767).

Similarly to the water quantity modelling described in Section 4 of this report, a MUSIC model for each catchment was created adopting the same % impervious details described in Table 3-3. The outputs from these models were then adopted as the base line data against which the effectiveness of the proposed treatment measures would be measured.

Although the project does not lie within an area controlled by Sydney Catchment Authority, that Agency has invested a significant amount of time and effort into the development and use of the MUSIC program and their manual titled “Using MUSIC in Sydney’s Drinking Water Catchment” (The SCA Manual) provides a detailed explanation of the concepts involved in the use of the program. The source and treatment nodes for this assessment have been set up in accordance with the recommendations of the SCA Manual.

The residential source nodes have been established using the % impervious data described above and pollutant loads have been input as described in the SCA Manual. It has been assumed that each dwelling will be supplied with a rainwater collection tank with the collected water being reused for toilet, laundry and hot water (309kL/yr total usage).

### 4.1. Water Quality for Ultimate Development Conditions

It has been assumed that ultimately, all stormwater outlets to the central drainage channel will be screened via a GPT constructed at the outlet prior to discharge and that low flows in the channel will pass through a rain garden to be constructed in the base of the proposed detention basin.

A base model of the developed site with no treatment measures was created to establish the control data. The required treatment objectives were then applied to this control data and the size of the rain garden was adjusted until the resultant pollutant loads from the developed site with treatment

met the target loads. The model indicates that the rain garden for this site is required to be 945sqm in area.

**Table 4-2: Music Modelling Results**

Data	No Treatment	Required % reductions	Target mean annual loads	Treatment - tanks, GPT & Raingarden (945sqm)	% reduction compared to no treatment
Flow (ML/yr)	110			88.4	
Peak Flow (m3/s)	4.76			4.32	
Total Suspended Solids (kg/yr)	1.94E+04	85%	2910	2.75E+03	85.8%
Total Phosphorus (kg/yr)	36.1	65%	12.64	11.9	67.0%
Total Nitrogen (kg/yr)	238	45%	130.90	98.7	58.5%
Gross Pollutants (kg/yr)	3.15E+03	90%	315.00	2.48E+01	99.2%

For the purposes of this assessment, the treatment nodes have been established as follows:-

GPT – Assumed to be Humegard GPT with following treatment capacities as published by the manufacturer.

TSS	41% removal
TP	34% removal
TN	24% removal
GP	90% removal

If at the time of detailed design it is found that a Humegard GPT doesn't meet these requirements, an Ecosol GPT unit will be used as the treatment capacities published by this manufacturer exceed the capacities used in the music modelling.

Pollutant	Removal Rate (%)	Entered Input Value	Entered Output Value
Total Suspended Solids (20 - 2000µm)	55	1000	450
Total Phosphorus	40	1000	600
Total Nitrogen	40	1000	600
Gross Pollutants (>2000µm)	99	1000	10
Heavy Metals	25	n/a	n/a
Total Petroleum/Hydrocarbons ( Dry weather spill situation)	99	n/a	n/a

Table 6 - Ecosol™ Gross Pollutant Trap – High Flow, input and output values

The rain garden adopted for the site has an extended detention depth of 0.3m with 1 in 4 banks, a media (sandy loam) bed area of 945sqm and depth of 0.4m (min hydraulic conductivity of 200mm/hr (modelled as 100mm/hr to allow for degradation of media over time) and a 200mm deep submerged zone with 5% by volume of hardwood chip.

The MUSIC model indicates that the combination of the rain water tanks, gross pollutant traps and rain garden will combine to result in pollutant loads from the site complying with the target objectives.

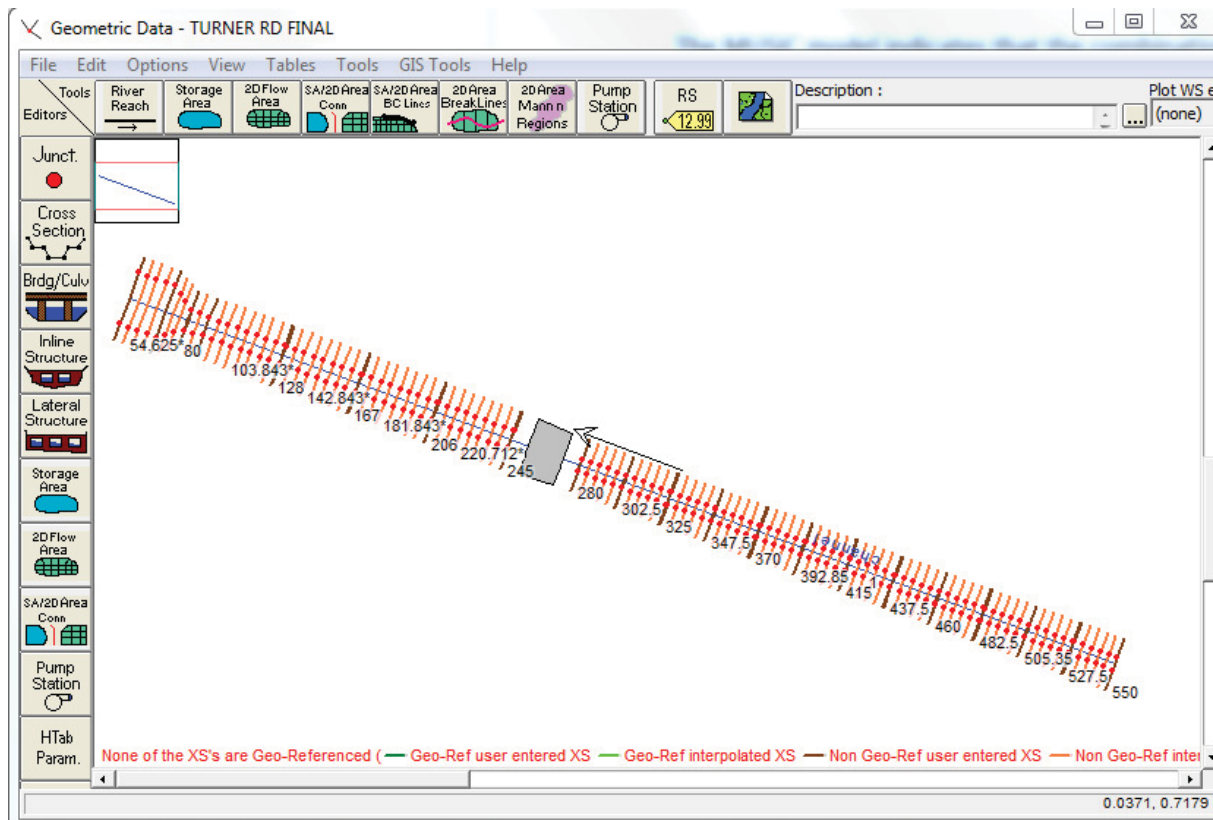
## 5. Main Channel Hydraulics – Ultimate Development Conditions

### 5.1. Ultimate Development

The concept design of the main channel within the site has been modelled using the HEC-Ras hydraulic program. The channel is linear in nature and so the use of this one-dimensional hydraulic program produced by the US Army Corp is considered appropriate.

The channel has been modelled using the flows obtained from the XP-Rafts model and an assumed channel profile based on the site survey data. The site is quite steep in hydraulic terms and it has been determined that a number of drop structures will need to be incorporated in the channel in order to meet the following requirements detailed within Camden Council’s Engineering Design Specification for the channel.

Velocity	<2m/s
Freeboard	0.5m to top of channel
Froude No	<0.8
Min Cross fall	2%



**Figure 5-1: HEC-Ras model of central creek system**

Figure 5-1 depicts the final model adopted for the channel. The river stations used in the model reflect the central channel chainages depicted in the JMD plans.

The Council requirement for the Froude Number to be less than 0.8 resulted in the need to reduce the channel bed slope to approximately 0.65%. The natural grade on the catchment is somewhat steeper than this and so the inclusions of regular stacked rock drop structures in the channel bed will be required. Below Road No. 1 these will be 0.77m high and spaced at about 39m centres and above Road No. 1, the drop structures will be 0.75m high and spaced at about 22.9m centres.



The central channel above Road No. 1 will be 1.5m wide with 1 in 5 batters 0.5m high. The outer banks of the channel (each 9.85m wide) will vary in slope from 6% to 13.65% due to the need to transition between successive drop structures.

The central channel below Road No. 1 will be 6m wide with 1 in 4 batters 0.375m high. The outer banks of the channel (each 10m wide) will vary in slope from 7% to 14.7% due to the need to transition between successive drop structures.

It is understood that the channel will be planted out as riparian land. A roughness factor of 0.03 was adopted for the central channel and 0.05 for the outer banks.

The Road No. 2 culvert has been modelled as twin 3.6m wide by 1.2m high precast concrete box culverts. The design 1 in 100 year ARI flow at the culvert is 3.532cumecs resulting in an average flow per m width of culvert of 0.49m<sup>3</sup>/s. Using these inputs in the nomogram provided in the manual titled "Hydraulics of Precast Concrete Conduits" published by the Concrete Pipe Association of Australasia, the estimated depth of flow through the culverts is approximately 0.37m. Adopting an internal height of the culvert of 1.20m, the freeboard to the soffit of the culvert is calculated as being 1.20-0.37 = 0.83m. Therefore, the 1.2m high culverts provide at least the 0.5m freeboard required by Council. Council's design code requires culverts to be designed for a 50% blockage factor in the 1% AEP (1 in 100 Year ARI) flow. As discussed above, the culvert height is three times as deep as the design depth of flow in the creek to satisfy the 0.5m freeboard requirement. This freeboard provides sufficient flow capacity to also satisfy the blockage factor.

The existing culverts under Turner Road will need to be amplified to provide adequate capacity in accordance with the requirements of Council's code. The total catchment flow under current conditions has been estimated at 7.907cumecs and under the ultimate developed conditions the peak flow is estimated at 7.36cumecs. It is understood that Council has engaged Calibre Consulting to complete the design for the Turner Road upgrades. Council has provided a preliminary copy of these plans which identified that the existing Turner Road culverts will be replaced with twin 2.4m x 1.8m Reinforced Concrete Box Culverts resulting in an average flow per m width of culvert of 1.53m<sup>3</sup>/s (ultimate developed scenario). Using these inputs in the nomogram provided in the manual titled "Hydraulics of Precast Concrete Conduits" published by the Concrete Pipe Association of Australasia, the estimated depth of flow through the culverts is approximately 0.51m. Adopting an internal height of the culvert of 1.80m, the freeboard to the soffit of the culvert is calculated as being 1.80-0.51 = 1.29m. The depth of the culvert is therefore more than three times the depth of flow.

These culverts therefore satisfy the 0.5m freeboard requirement and based on the argument mounted for the Road No.1 culvert above they also satisfy the 50% blockage issue as well.

The design peak flow rate through the Turner Road culverts in the 1 in 5 year event is 2.856cumecs in the Ultimate Development scenario. The average flow per metre width of culvert of 0.595m<sup>3</sup>/s and using these inputs in the nomogram provided in the manual titled "Hydraulics of Precast Concrete Conduits" published by the Concrete Pipe Association of Australasia, the estimated depth of flow through the culverts is less than 0.3m.

With an invert of RL93.00, the top water level at the culvert in the peak 1 in 5 year event is less than 93.30. The primary orifice for the detention basin has an invert level of 93.3 and a centreline RL93.50. Thus the tail water level in the proposed Turner Road culverts do not impact on the operation of the discharge control structure for the basin.

## 6. Erosion and sediment control

During construction of the proposed road and drainage works, sufficient measures will be put in place to ensure that the site is not subject to significant erosion and that the adjoining creek systems are not impacted by the earthworks. All required measures will be installed prior to commencement of works and maintained during construction to ensure their effectiveness. Certain measures will also be implemented as required during the works.

As part of the erosion and sediment control measures it is proposed that a temporary sediment basin be constructed for duration of works. For this purpose, the proposed rain garden structures will be excavated and used as sediment basins then once the upstream catchments have been stabilised, the basins will be emptied and converted to rain gardens.

It is possible that one of the existing dams and existing raingardens constructed under previous DA's to and treat stormwater during construction. All clean water is to be pumped/piped around the construction site to the existing culverts under Turner Road. It is noted that when required, any sediment basins collecting "dirty" water will be flocculated before any basins are pumped dry to be ready to capture the flows from the next storm event.

Post downstream development, mounds / diversion drains will be constructed to divert all dirty water to the raingarden sediment basins. As required, these basins will be flocculated and pumped dry to be ready for the next storm event. A clean water basin will be constructed upstream of the culvert works. All "clean" water from this basin will pumped around the work zone into an existing stabilised section of the downstream gully.

All measures will be maintained on site until the disturbed surfaces have been stabilised to the satisfaction of Camden Council. Once stable, the basins will be removed and the areas affected by the sediment basins restored to design levels.

## 7. Conclusions

JMD has been retained by Turner Road Developments and Broome to prepare an engineering report summarising road design, drainage concept and stormwater management in support of the proposed rezoning of Lots 36, 37 & 38 in DP28024 Turner Road, Currans Hill.

The current proposal is for the rezoning of the subject site only. Ultimately, it is proposed that the site be fully developed in accordance with the planning for the site; however, the residential layout detailed in the catchment plans is not intended to “fix” any development rights for the site. This report details the proposed drainage concepts, analysis and/or design of the ultimate system central channel, OSD basin and raingarden and supports the rezoning proposal.

The site is currently affected by a gully system which conveys stormwater flows from a number of external catchments outside the subject development land. It is proposed that the existing gully be replaced with a constructed channel trunk drainage system located within the adjusted E2 zoning boundaries and compliant with Council’s Design Code requirements.

The construction of this central channel involves significant costs which do not form the part of any s94 Contributions Plan. In the absence of any formal funding arrangement, the developers are endeavouring to negotiate a private funding arrangement between the parties which will benefit from the ultimate drainage system. This arrangement is yet to be finalised.

The total catchment area drained by the creek is approx. 41.51ha in area with the majority of this catchment being external to the subject site. The external catchment to the west of the site will ultimately be developed for residential and drain to the drainage system within the subject site. This land has been allowed for in the proposed design of the central channel, OSD basin and raingarden assuming that the funding arrangement will be finalised. The site is also affected by runoff from an external catchment to the north which has been assessed as being 20.4ha in area and an existing catchment to the east which has been assessed as being 3.54ha in area. As these sites are already developed and have their own OSD systems it is assumed that the existing OSD basins reduce flows back to pre-development conditions.

The stormwater runoff from the site has been modelled by JMD using the XP-Rafts computer program. Various storm durations in the 1 in 2 year ARI, 1 in 5 year ARI, 1 in 10 year ARI, 1 in 20 year ARI, 1 in 50 year ARI and 1 in 100 year ARI storm events were analysed. The modelling results which are detailed in the annexures and summarised in Chapter 3 of this report demonstrate that in the ultimate developed conditions the proposed detention basin will operate to satisfy Council’s on-site detention requirements. Peak flows from the developed site in all ARI events are reduced to less than that which occurs under current site conditions.

The ultimate development of the site will require stormwater flows discharging from the site to be treated and enhanced to ensure that stormwater meets current water quality targets. The target objectives defined in Council’s design code are outdated and so the water quality measures to be incorporated into the development have been designed to meet the water quality objectives outlined in the more recent Oran Park DCP. The proposed water quality measures including the proposed raingarden for the proposed trunk drainage channel meet council’s requirements.

The modelling of water quality measures has been undertaken using the MUSIC computer program. It has been determined that the incorporation of 2500L water tanks and water reuse for toilet, laundry and hot water on each lot, gross pollutant traps on all stormwater discharge points to the central drainage channel and construction of a raingarden complying with the specification in

Chapter 5 of this report with a minimum bed area of 945m<sup>2</sup> will ensure that the water quality outcomes are satisfied for the ultimate development conditions

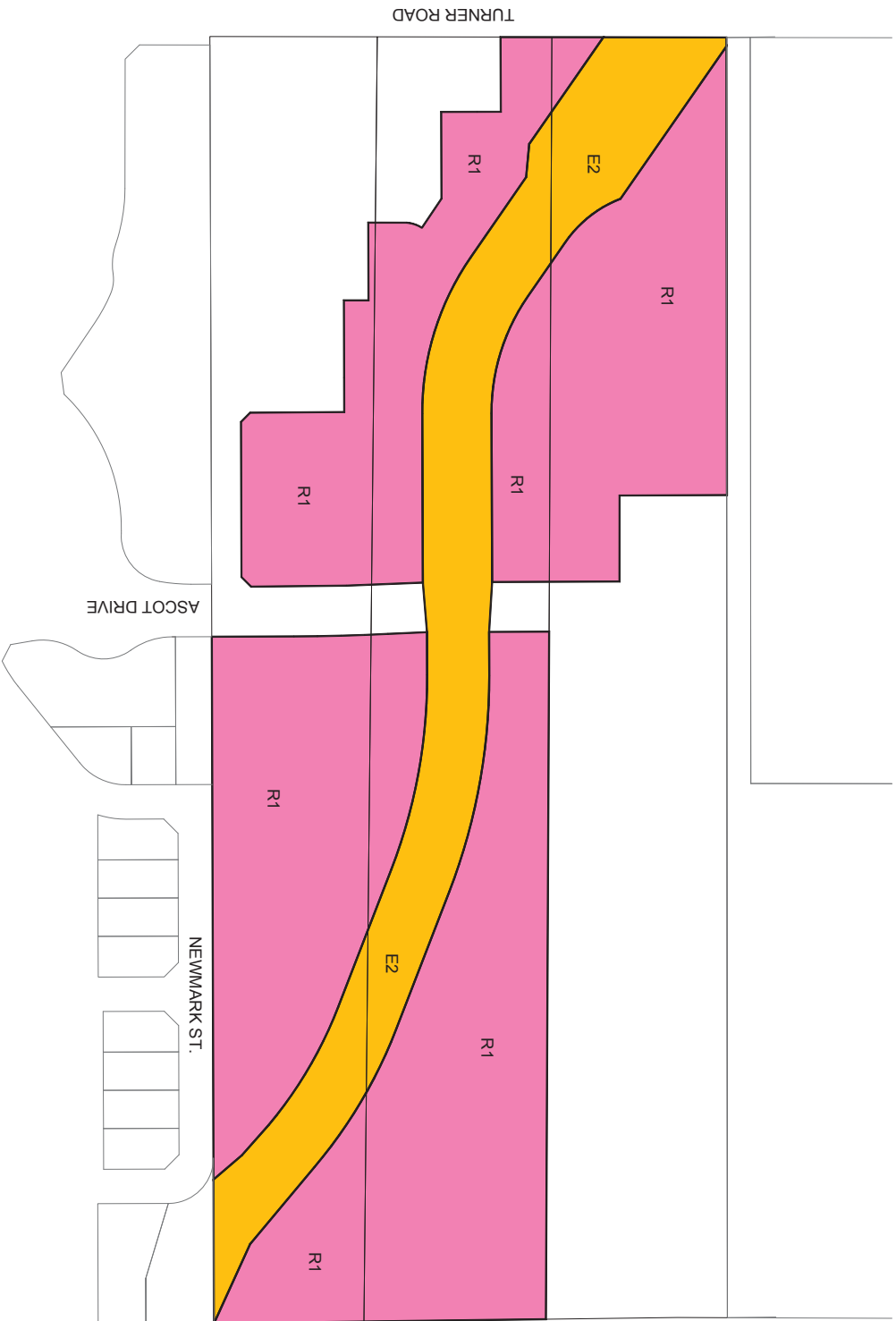
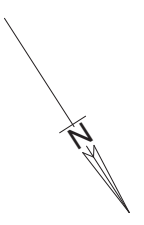
The above measures will act to ensure that the proposed development is compliant with the stormwater outcome objectives identified in the planning documents for the site.

Yours faithfully



.....  
Terry Hams  
BE (Civil) MIE Aust (409949)  
CP Eng

Annexure A – Preliminary Zoning Plan prepared by JMD  
Ref: 14194E7 Issue B



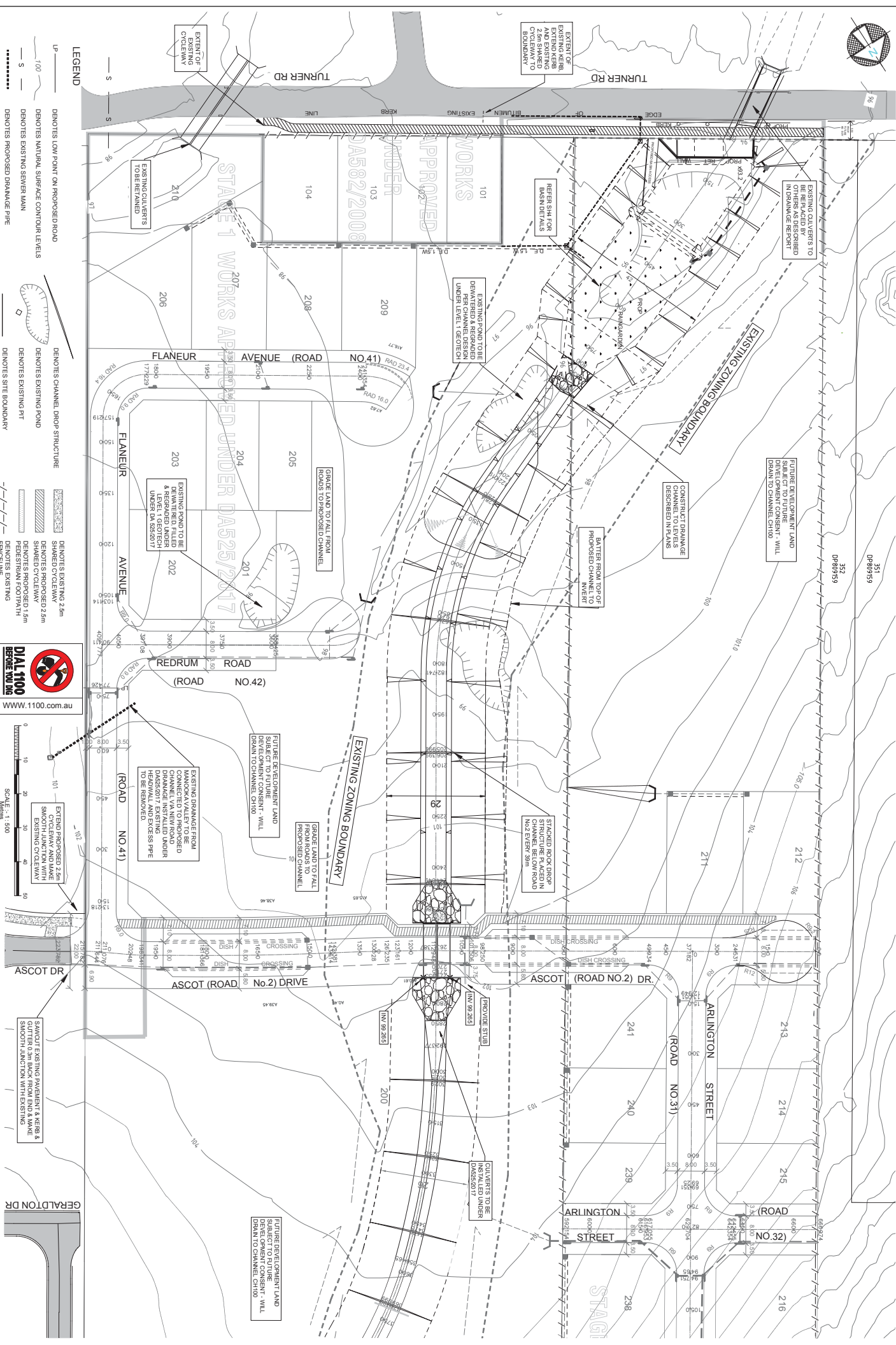
- DENOTES EXTENT OF R1 ZONING
- DENOTES EXTENT OF E2 ZONING
- DENOTES EXTENT OF EXISTING R1 ZONING TO BE MAINTAINED

Issue App	Date	Description	Client	Datum	Origin of Levels	Date of Survey		John M. Daly & Associates PTY LTD Surveying & Mapping Project Management Licensed Water Services Co ordinators 32 Jubilee Street P.O. BOX 25 CAMPBELLTOWN N.S.W. 2550 Ph. (02) 4625 9055 Fax (02) 4628 2013 email: admin@jmd.com.au	Project	Locality	L.C.A.	CAD Ref	Sheet 1 of 2 sheets Ref: <b>14194E7</b>
			TURNER ROAD DEVELOPMENT	AHD	T.H.				187, 195 & 203 TURNER ROAD, CURRANS HILL LOT: 36, 37 & 38 DP: 28024	CURRANS HILL	CAMDEN	S:\DATA\TURNER RD\14194E7\14194E7.ZONING PLAN	
T.H.	05-10-2017	ZONING LIMITS UPDATED	Designed by: T.H.										
T.H.	28-09-2017	ISSUED FOR INFORMATION	Date of Drawing: 28-09-2017 Ratio (A1) : 1:1000										

The ratio shown on this plan relates to the original plan, produced by JMD only. Any photocopying or printing from digital files provided (particularly PDF files) may significantly alter the ratio of the plan.

## Annexure B – Concept Engineering Plans

- 14194E8 – Concept Engineering Plans dated 06-12-2017 – Issue A



**LEGEND**

LP ——— DENOTES LOW POINT ON PROPOSED ROAD

100 ——— DENOTES NATURAL SURFACE CONTOUR LEVELS

— S ——— DENOTES EXISTING SEWER MAIN

..... DENOTES PROPOSED DRAINAGE PIPE

..... DENOTES CHANNEL DROP STRUCTURE

..... DENOTES EXISTING POND

..... DENOTES EXISTING PT

..... DENOTES SITE BOUNDARY

..... DENOTES EXISTING 2.5m SHARED CYCLEWAY

..... DENOTES PROPOSED 2.5m SHARED CYCLEWAY

..... DENOTES EXISTING 1.5m PERESTRAN FOOTPATH

..... DENOTES EXISTING FENCELINE

..... DENOTES EXISTING 2.5m SHARED CYCLEWAY

..... DENOTES PROPOSED 2.5m SHARED CYCLEWAY WITH SMOOTH JUNCTION WITH EXISTING CYCLEWAY

..... EXTEND PROPOSED 2.5m SHARED CYCLEWAY WITH SMOOTH JUNCTION WITH EXISTING CYCLEWAY

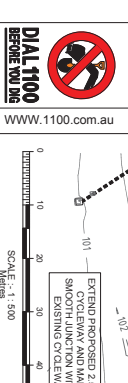
..... SMOOTH EXISTING PAVEMENT & KERB & SMOOTH JUNCTION WITH EXISTING SMOOTH JUNCTION WITH EXISTING

..... DENOTES EXISTING 2.5m SHARED CYCLEWAY

..... DENOTES PROPOSED 2.5m SHARED CYCLEWAY

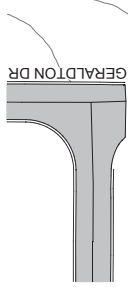
..... DENOTES EXISTING 1.5m PERESTRAN FOOTPATH

..... DENOTES EXISTING FENCELINE



..... EXTEND PROPOSED 2.5m SHARED CYCLEWAY WITH SMOOTH JUNCTION WITH EXISTING CYCLEWAY

..... SMOOTH EXISTING PAVEMENT & KERB & SMOOTH JUNCTION WITH EXISTING SMOOTH JUNCTION WITH EXISTING

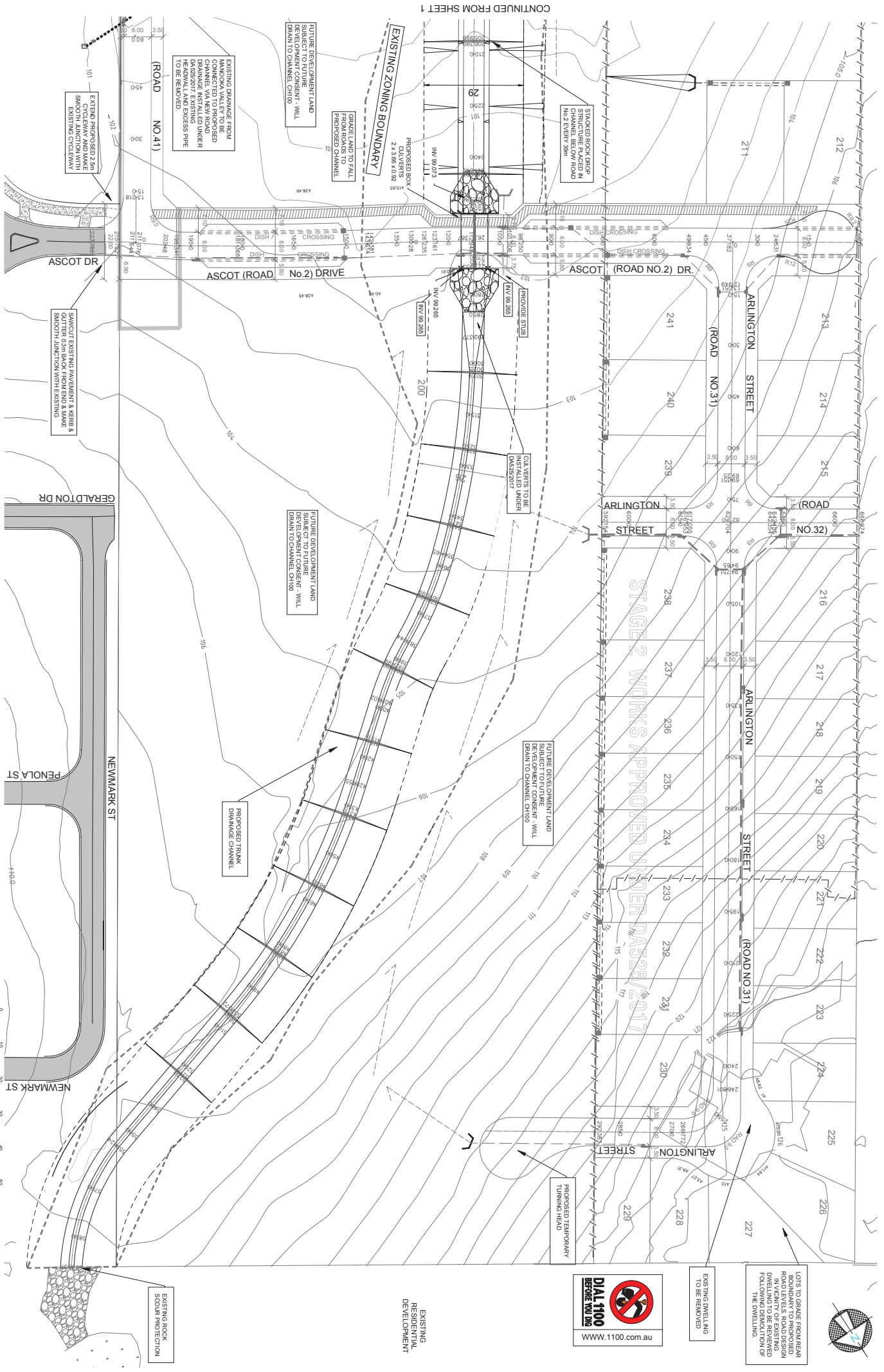


Issue	App	Date	Description
			Client: TURNER ROAD DEVELOPMENT
			Designed By: T.H.
			Date of Drawing: 06-12-2017
			Ratio (A1): 1:500
			Date of Survey:
			Origin of Levels:
			Datum: AHD
John M. Davy & Associates PTY LTD A.B.N. 5805197989 32 Oakvale Street Campbelltown N.S.W. 2560 email: admin@jmd.com.au www.1100.com.au			
Project: 187, 195 & 203 TURNER ROAD, CURRANS HILL LOT 36, 37 & 38 DP. 28024 CONCEPT CIVIL PLAN ULTIMATE DRAINAGE CONCEPT PART A L.C.A.: CAMDEN			
Sheet 1 of 8 Sheets Ref: 141948			Date of Issue: 06-12-2017 Original Issue

CONTINUED ON SHEET 2

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Issue	App	Date	Description
A	T.H.	06-12-2017	ORIGINAL ISSUE

Client:	TURNER ROAD DEVELOPMENT
Designed By:	T.H.
Date of Drawing:	06-12-2017
Ratio (A1):	1:500

Datum:	AHD
Origin of Levels:	
Date of Survey:	

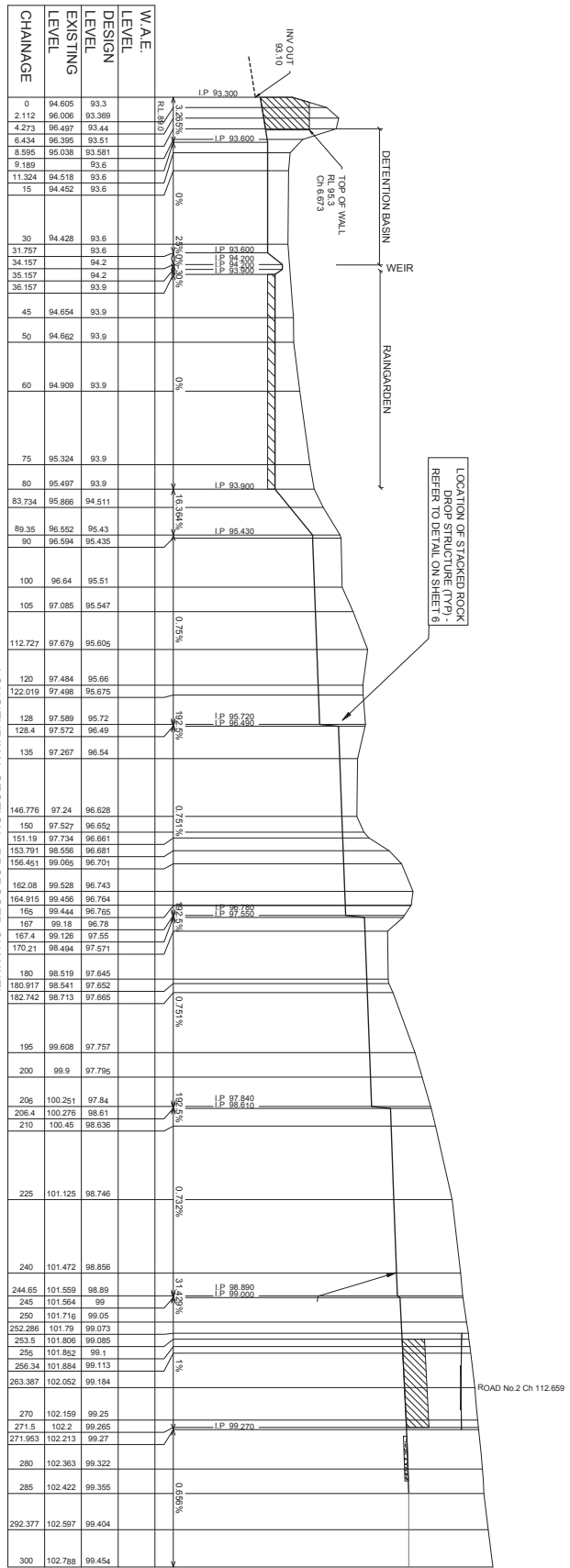
Project:	187, 195 & 203 TURNER ROAD, CURRANS HILL
Locality:	CURRANS HILL
L.C.A.:	CAMDEN

Sheet 2 of 8 Sheets	Ref: 141948
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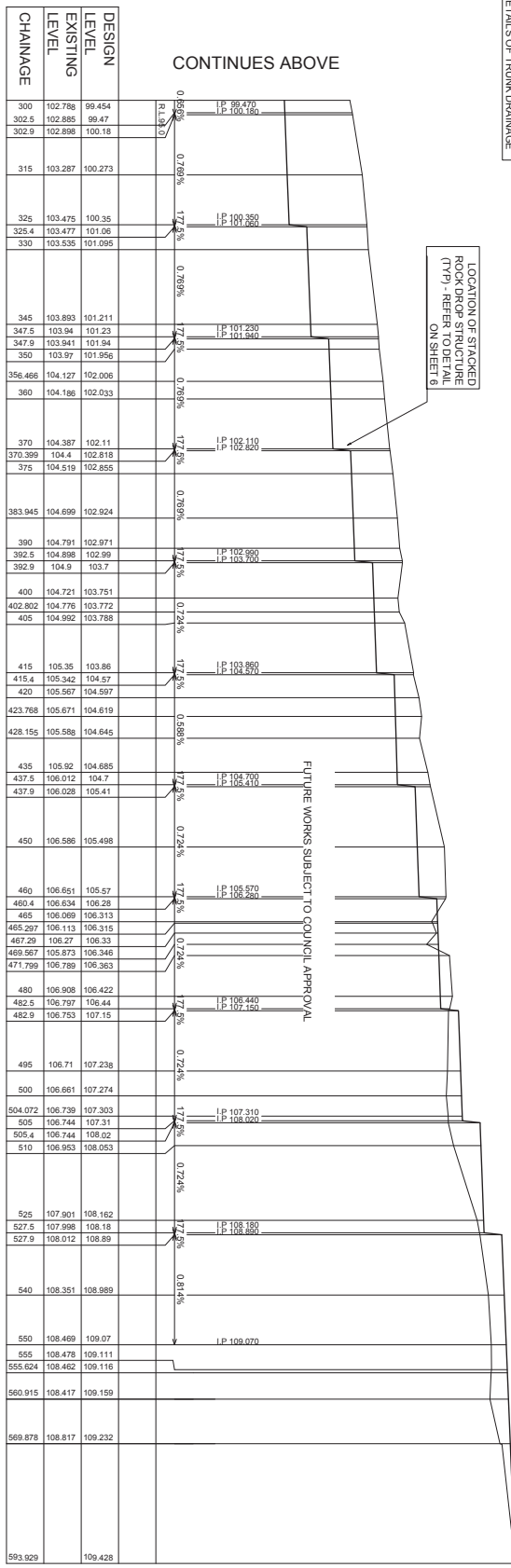
Scale:	1:500
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NOTE:  
REFER DWG - CATCHMENT  
PLAN FOR TYPICAL SECTION  
DETAILS OF TRUNK DRAINAGE

LOCATION OF STACKED  
ROCK DROP STRUCTURE  
(TYP) - REFER TO DETAIL  
ON SHEET 6

LOCATION OF STACKED ROCK  
DROP STRUCTURE (TYP) -  
REFER TO DETAIL ON SHEET 6



Issue App	Date	Description
A	06-12-2017	ORIGINAL ISSUE

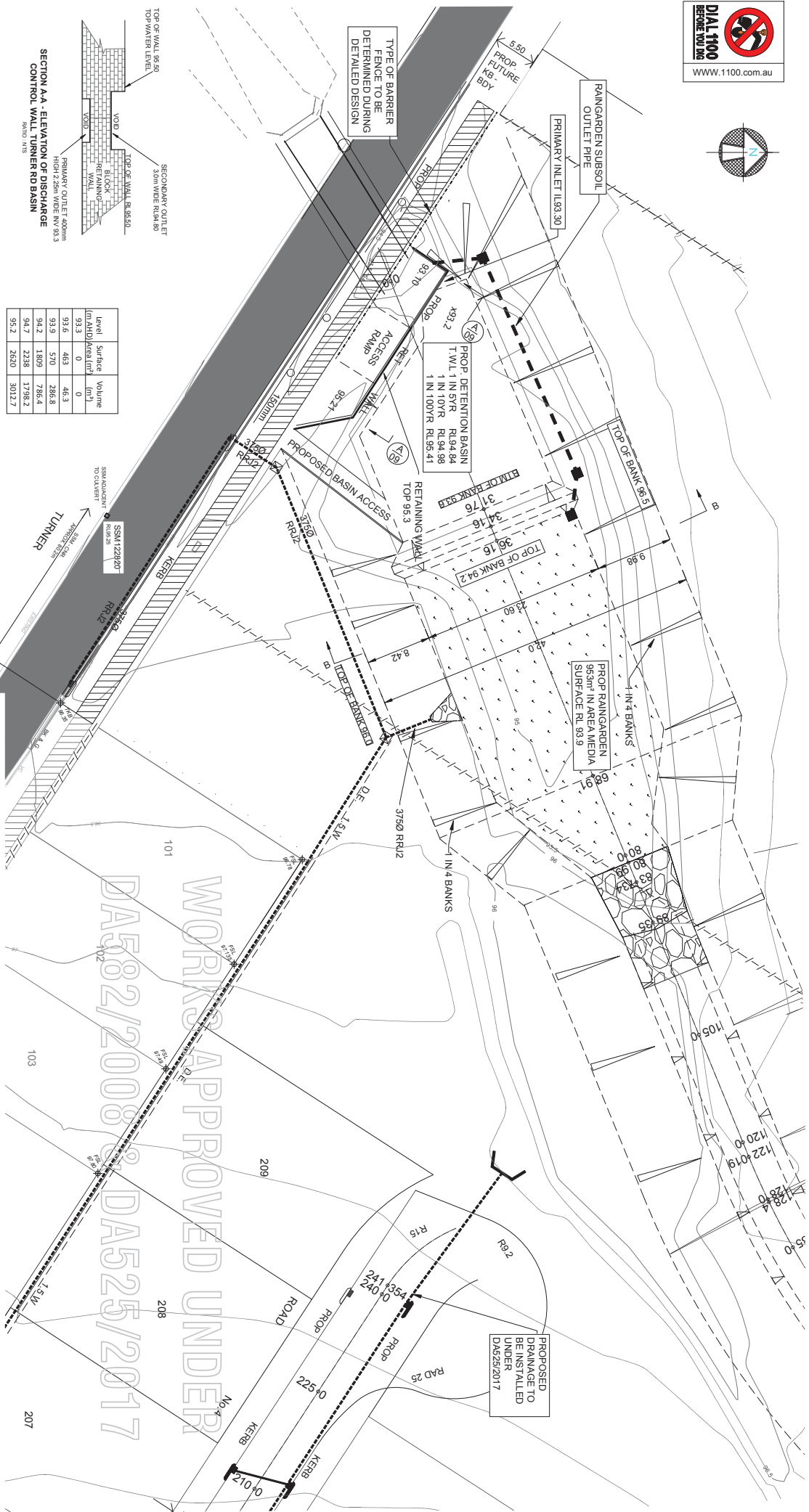
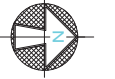
  

Client: TURNER ROAD DEVELOPMENT	Datum: AHJD
Designed by: T.H.	Origin of Levels:
Date of Drawing: 06-12-2017	Date of Survey:
Ratio (A1): 1:500/1:100	

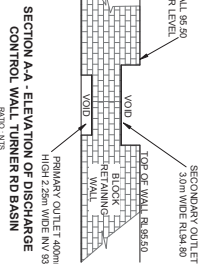
  

John M Doherty & Associates Pty Ltd Engineering & Surveying Licensed Water Service Co ordinators 32 Dalmeida Street Cammerlang NSW A.S.W. 2560 PH: 021 4535 0555 FAX: 021 4628 2013 email: admin@jmd.com.au	Project: <b>187, 195 &amp; 203 TURNER ROAD CURRANS HILL</b> <b>PROPOSED CHANNEL LONGITUDINAL SECTION -</b> <b>ULTIMATE CONCEPT</b>
Locality: CURRANS HILL L.C.A.: CAMDEN CAD Ref: 51044 (DRAFT) / 1194 (TURNER RD) / 1200 (BANK ST) / 1201 (BANK ST) / 1202 (BANK ST) / 1203 (BANK ST) / 1204 (BANK ST) / 1205 (BANK ST) / 1206 (BANK ST) / 1207 (BANK ST) / 1208 (BANK ST) / 1209 (BANK ST) / 1210 (BANK ST) / 1211 (BANK ST) / 1212 (BANK ST) / 1213 (BANK ST) / 1214 (BANK ST) / 1215 (BANK ST) / 1216 (BANK ST) / 1217 (BANK ST) / 1218 (BANK ST) / 1219 (BANK ST) / 1220 (BANK ST) / 1221 (BANK ST) / 1222 (BANK ST) / 1223 (BANK ST) / 1224 (BANK ST) / 1225 (BANK ST) / 1226 (BANK ST) / 1227 (BANK ST) / 1228 (BANK ST) / 1229 (BANK ST) / 1230 (BANK ST) / 1231 (BANK ST) / 1232 (BANK ST) / 1233 (BANK ST) / 1234 (BANK ST) / 1235 (BANK ST) / 1236 (BANK ST) / 1237 (BANK ST) / 1238 (BANK ST) / 1239 (BANK ST) / 1240 (BANK ST) / 1241 (BANK ST) / 1242 (BANK ST) / 1243 (BANK ST) / 1244 (BANK ST) / 1245 (BANK ST) / 1246 (BANK ST) / 1247 (BANK ST) / 1248 (BANK ST) / 1249 (BANK ST) / 1250 (BANK ST) / 1251 (BANK ST) / 1252 (BANK ST) / 1253 (BANK ST) / 1254 (BANK ST) / 1255 (BANK ST) / 1256 (BANK ST) / 1257 (BANK ST) / 1258 (BANK ST) / 1259 (BANK ST) / 1260 (BANK ST) / 1261 (BANK ST) / 1262 (BANK ST) / 1263 (BANK ST) / 1264 (BANK ST) / 1265 (BANK ST) / 1266 (BANK ST) / 1267 (BANK ST) / 1268 (BANK ST) / 1269 (BANK ST) / 1270 (BANK ST) / 1271 (BANK ST) / 1272 (BANK ST) / 1273 (BANK ST) / 1274 (BANK ST) / 1275 (BANK ST) / 1276 (BANK ST) / 1277 (BANK ST) / 1278 (BANK ST) / 1279 (BANK ST) / 1280 (BANK ST) / 1281 (BANK ST) / 1282 (BANK ST) / 1283 (BANK ST) / 1284 (BANK ST) / 1285 (BANK ST) / 1286 (BANK ST) / 1287 (BANK ST) / 1288 (BANK ST) / 1289 (BANK ST) / 1290 (BANK ST) / 1291 (BANK ST) / 1292 (BANK ST) / 1293 (BANK ST) / 1294 (BANK ST) / 1295 (BANK ST) / 1296 (BANK ST) / 1297 (BANK ST) / 1298 (BANK ST) / 1299 (BANK ST) / 1300 (BANK ST)	Scale: 1:100 Scale: 1:500 Scale: 1:500 Scale: 1:500
Sheet 3 of 6 sheets Ref: <b>141948</b>	WWW.1100.COM.AU

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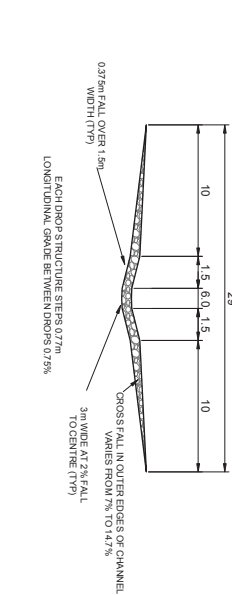
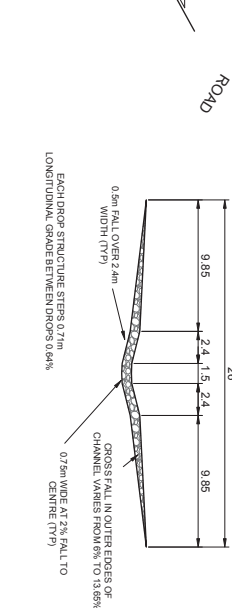
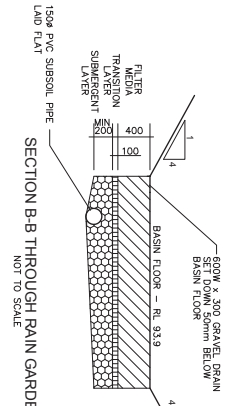
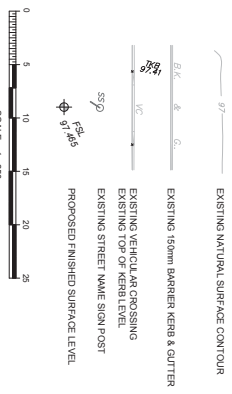


TYPE OF BARRIER FENCE TO BE DETERMINED DURING DETAILED DESIGN



Level (p AHD)	Surface Area (m <sup>2</sup> )	Volume (m <sup>3</sup> )
93.3	0	0
93.6	463	46.3
93.9	570	286.8
94.2	1889	786.4
94.7	2238	1798.2
95.2	2820	3012.7

SUMMARY OF BASIN VOLUMES



Issue No.	Date	Description	Client	Datum	AMHD DEVELOPMENT
1	06-12-2017	ORIGINAL ISSUE	TURNER ROAD DEVELOPMENT	AMHD	
2	06-12-2017		Designed by: T.H.	Origin of levels:	
3	06-12-2017		Date of Drawing: 06-12-2017	Date of Survey:	
4	06-12-2017		Ratio (A1): 1:250		
Surveying Engineering Licensed Water Service Co estimators 32 Balmain Street Cammerlang NSW A.S.W. 2560 email: admin@jmd.com.au			John M. Doherty & Associates Pty Ltd A.B.N. 88091972989 Ph: 021 4525 0555 Fax: 021 4628 2013 email: admin@jmd.com.au		
Project:			187, 198 & 203 TURNER ROAD CURBRANS HILL		
Locality:			CURBRANS HILL		
L.C.A.:			CAMDEN		
CAD Ref:			S:\04\187-198-203 TURNER ROAD CURBRANS HILL\DWG\CONCEPT\CONCEPT.DWG		
Sheet 4 of 6 sheets			Ref: 1419458		

The ratio shown on this plan relates to the original plan, produced by JMD only. Any photocopying or printing from digital files provided (particularly PDF files) may significantly alter the ratio of the plan.



EXISTING CATCHMENT PLAN

LEGEND

- DENOTES EXISTING CATCHMENT BOUNDARY
- DENOTES DEVELOPED CATCHMENT BOUNDARY
- DENOTES STG 1&2 DEVELOPED CATCHMENT BOUNDARY
- DENOTES CATCHMENT LABELS
- - - DENOTES EXISTING SURFACE CONTOURS
- - - DENOTES PROPOSED ROCK RIP RAP SCOUR PROTECTION
- - - DENOTES PROPOSED DIRECTION OF STORMWATER FLOWS
- - - DENOTES EXTENT OF PROPOSED RAIN GARDEN

Issue App	Date	Description	Client	TURNER ROAD DEVELOPMENT	Datum	AHD
T.H.	06-12-2017	ORIGINAL ISSUE	Designed by	T.H.	Origin of Levels	
			Date of Drawing	06-12-2017	Date of Survey	
			Ratio (A1) :	1:1000		
			John M. Daly & Associates PTY LTD Surveying Project Management Licensed Water Services Co ordinators 37 Julebilla Street P.O. BOX 25 CAMPBELLTOWN N.S.W. 2550 Ph: (02) 4625 9555 Fax: (02) 4628 2013 email: admin@jmd.com.au			
			Project : 187, 195 & 203 TURNER ROAD, CURRANS HILL LOT: 36, 37 & 38 DP: 28024 CATCHMENT PLAN UNDER EXISTING CONDITIONS Locality: CURRANS HILL L.C.A. : CAMDEN CAD Ref: S:\DATA\TURNER RD\187-195-203 TURNER RD DEV\EMV.DWG CAD REF-REVISION PLAN SHEET-01			
			Sheet 5 of 6 sheets Ref: 141948			

EXISTING CATCHMENT SUMMARY

EXISTING CATCHMENT AREA	Area (ha)	% Impervious	Area Impervious (ha)	Area Peak Flow added? (ha)	All
A	7.293	0%	0.0	7.293	Y
B	4.741	9.2%	0.436	4.305	Y
C	3.594	0%	0.0	3.594	Y
D	3.596	0%	0.0	3.596	Y
E	0.968	0%	0.0	0.968	Y
U/S	20.4	0%	0.0	20.4	Y
TURNER RD**	41.511		0.436	41.075	Y

EXISTING CATCHMENT HYDRAULIC SUMMARY

FLOW IN TURNER ROAD CULVERT** EXISTING CATCHMENT	STORM EVENT					
	2yr peak flow (cum/s)	5yr peak flow (cum/s)	10yr peak flow (cum/s)	20yr peak flow (cum/s)	50yr peak flow (cum/s)	100yr peak flow (cum/s)
2224	3.866	4.520	5.740	6.988	7.907	

\* PEAK FLOWS FOR THE 2yr, 5yr, 10yr, 20yr, 50yr & 100yr STORM EVENTS HAVE BEEN CALCULATED IN XP PARTS.  
 \*\* THE MANOOKA VALLEY FLOWS ARE BASED ON CATCHMENT AREAS SHOWN IN THE EXISTING CATCHMENT PLAN.  
 \*\*\* TURNER ROAD AREAS ARE A SUM OF ALL OTHER CATCHMENT AREAS. TURNER ROAD PEAK FLOWS ARE BASED ON THE RESULTS OF THE XP PARTS MODELLING AND NOT A SUM OF THE INDIVIDUAL CATCHMENT PEAK FLOWS.

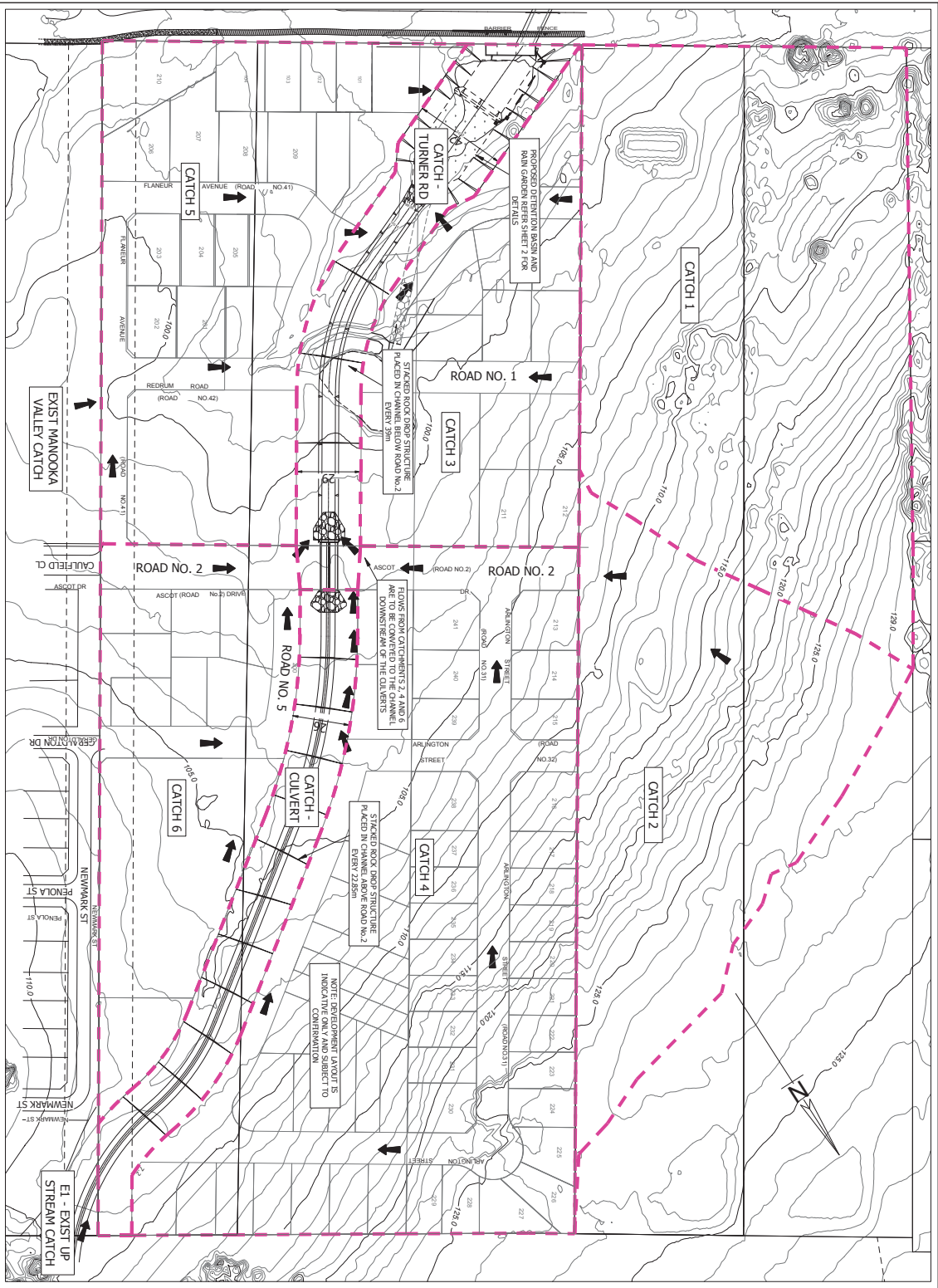
ratio shown on this plan relates to the original plan, produced by JMD only. Any photocopying or printing from digital files provided (particularly PDF files) may significantly alter the ratio of the plan.

### DEVELOPED CATCHMENT SUMMARY

DEVELOPED CATCHMENT AREA	Area Imperv (ha)	% Imperv	Area Imperv (ha)	Area Pervious added?
1	3,575	75%	2,681	0,894
2	2,403	75%	1,802	0,601
3	1,586	75%	1,190	0,396
4	4,173	75%	3,130	1,043
MP	3,34	0%	0	3,34
5	2,487	75%	1,865	0,622
6	1,681	75%	1,261	0,420
US	20.4	0%	0.0	20.4
CULVERT	0.780	0%	0.0	0.780
TURNER RD***	0.882	0%	0.0	0.882
SUM	41,507		11,929	29,578

### HYDRAULIC ANALYSIS SUMMARY

FLOW IN TURNER ROAD CULVERT EXISTING	STORM EVENT				
	Dev 2yr peak flow (cum/s)	Dev 5yr peak flow (cum/s)	Dev 10yr peak flow (cum/s)	Dev 20yr peak flow (cum/s)	Dev 50yr peak flow (cum/s)
2,224	3,666	4,520	5,740	6,968	7,907
DELTA TIME DETERMINED CATCHMENT	2,137	2,686	3,089	5,111	6,445
PONDING LEVEL IN TURNER ROAD OSD BASIN	94.298	94.436	94.979	95.155	95.291
					95.41



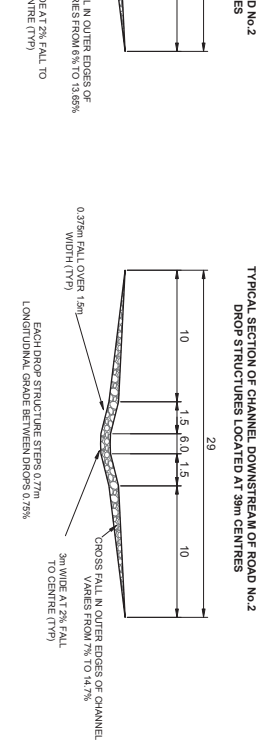
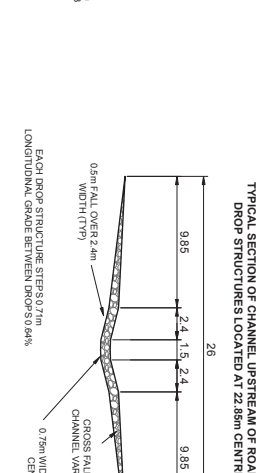
### LEGEND

- DENOTES EXISTING CATCHMENT BOUNDARY
- DENOTES DEVELOPED CATCHMENT BOUNDARY
- DENOTES STG 1&2 DEVELOPED CATCHMENT BOUNDARY
- DENOTES CATCHMENT LABELS
- DENOTES EXISTING SURFACE CONTOURS
- DENOTES PROPOSED ROCK RIP RAP SCOUR PROTECTION
- DENOTES PROPOSED DIRECTION OF STORMWATER FLOWS
- DENOTES EXTENT OF PROPOSED RAIN GARDEN

### CATCHMENT PLAN

SECTION A.A - ELEVATION OF DISCHARGE CONTROL WALL TURNER RD BASIN

TOP OF WALL 95.80  
TOP WATER LEVEL  
SECONDARY OUTLET  
3.0m WIDE RL 94.80  
VOID  
TOP OF WALL 95.80  
BLOCK RETAINING WALL  
VOID  
PRIMARY OUTLET 4.00m HIGH 2.25m WIDE RL 93.3  
ROAD 719.5



Issue App	Date	Description	Client	TURNER ROAD DEVELOPMENT
T.H.	06-12-2017	ORIGINAL ISSUE	Designed by	T.H.
			Date of Drawing	06-12-2017
			Date of Survey	
			Origin of Levels	AHD

Scale (A1) : 1:1000

John M. Daly & Associates PTY LTD  
 37 Lislehale Street  
 CAMPBELLTOWN N.S.W. 2550  
 email: admin@jmd.com.au  
 Ph: (02) 4625 9555  
 Fax: (02) 4628 2013

Project: 187, 196 & 203 TURNER ROAD, CURRANS HILL  
 LOT: 36, 37 & 38 DP: 28024

Locality: CURRANS HILL  
 L.C.A.: CAMDEN

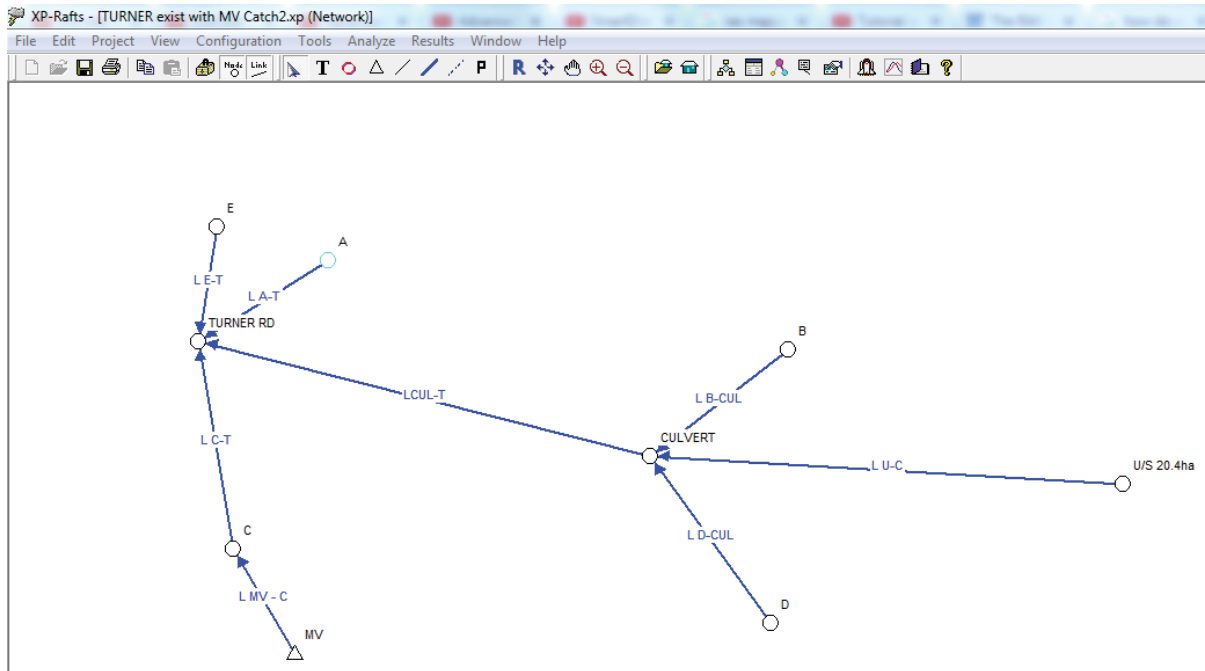
CATCHMENT PLAN FOR THE ULTIMATE DEVELOPMENT

Sheet 6 of 6 Sheets  
 Ref: 141948

The ratio shown on this plan relates to the original plan, produced by JMD only. Any photocopying or printing from digital files provided (particularly PDF files) may significantly alter the ratio of the plan.

# Annexure C - Water Quantity Modelling – XP Rafts Modelling for Existing Conditions

## C.1 – Existing Conditions



**Figure C.1 – Image of XP-Rafts Existing Conditions Model.**

**SubCatchment Data: Node 1 (Subcatchment 1)**

**Rainfall Losses**

- Initial/Continuing Grass
- ARBM

Total Area:

Impervious:  %

Vectored Slope:  %

Mannings 'n':

Use 10 Unequal Sub areas

Use Direct Storage Coefficient

Use non-standard Storage Exponent

Use Baseflow

Local Storm

OK Cancel

**Figure C.2 – Typical node catchment details for existing conditions**

TURNER exist with MV Catch2.out  
Run started at: 30th August 2017 12:53:22

```
#####  
#####  
#####          RUNTIME          RESULTS          #####  
#####          #####          #####          #####  
#####
```

Max. no. of links allowed = 2000  
Max. no. of routng increments allowed = 25000  
Max. no. of rating curve points = 25000  
Max. no. of storm temporal points = 25000  
Max. no. of channel subreaches = 25  
Max link stack level = 25  
Input Version number = 650

LINK MV 1.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3486  
ESTIMATED PEAK FLOW (CUMECS) = 0.11  
ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK C 1.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6995  
ESTIMATED PEAK FLOW (CUMECS) = 0.27  
ESTIMATED TIME TO PEAK (MINS) = 27.00

LINK U/S 20.4ha 2.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.033  
ESTIMATED PEAK FLOW (CUMECS) = 0.41  
ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK B 3.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.5080  
ESTIMATED PEAK FLOW (CUMECS) = 0.21  
ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK D 4.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.9602E-01  
ESTIMATED PEAK FLOW (CUMECS) = 0.05  
ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK CULVERT 2.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.636  
ESTIMATED PEAK FLOW (CUMECS) = 0.62  
ESTIMATED TIME TO PEAK (MINS) = 31.00

TURNER exist with MV Catch2.out  
5.000

LINK A

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.7257  
ESTIMATED PEAK FLOW (CUMECS) = 0.24  
ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.9650E-01  
ESTIMATED PEAK FLOW (CUMECS) = 0.05  
ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.158  
ESTIMATED PEAK FLOW (CUMECS) = 1.15  
ESTIMATED TIME TO PEAK (MINS) = 34.00

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 25.  
RETURN PERIOD (YRS) = 2.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss (mm)		Cont. Loss (mm/h)		Excess Rain (mm)		Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
		#1	#2	#1	#2	#1	#2			
MV	49.364	10.00	0.000	3.000	0.000	9.818	0.000	0.1147	26.00	0.000



TURNER exist with MV Catch2.out

C	49.364	10.00	1.500	3.000	0.000	9.818	19.068	0.2663	27.00	0.000
U/S 20.4ha	49.364	10.00	0.000	3.000	0.000	9.818	0.000	0.4078	26.00	0.000
B	49.364	10.00	1.500	3.000	0.000	9.818	19.068	0.2069	15.00	0.000
D	49.364	10.00	1.500	3.000	0.000	9.818	19.068	0.0525	26.00	0.000
CULVERT	49.364	10.00	0.000	3.000	0.000	9.818	0.000	0.6223	31.00	0.000
A	49.364	10.00	1.500	3.000	0.000	9.818	19.068	0.2414	26.00	0.000
E	49.364	10.00	1.500	3.000	0.000	9.818	19.068	0.0527	26.00	0.000
TURNER RD	49.364	10.00	0.000	3.000	0.000	9.818	0.000	1.147	34.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.417	.0600	0.0387	0.1148	1.0	0.000	0.000	0.000
C	0.582	.0600	0.0641	0.2664	1.0	0.000	0.000	0.000
U/S 20.4ha	0.683	.0600	0.1617	0.4077	1.0	0.000	0.000	0.000
B	0.505	.0600	0.0551	0.1984	1.0	0.000	0.000	0.000
D	0.306	.0600	0.0242	0.0526	1.0	0.000	0.000	0.000
CULVERT	0.785	.0600	0.2047	0.6216	1.0	0.000	0.000	0.000
A	0.560	.0600	0.0605	0.2419	1.0	0.000	0.000	0.000
E	0.668	.0600	0.0773	0.0528	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.7771  
 ESTIMATED PEAK FLOW (CUMECS) = 0.21  
 ESTIMATED TIME TO PEAK (MINS) = 48.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.560  
 ESTIMATED PEAK FLOW (CUMECS) = 0.48  
 ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.410  
 ESTIMATED PEAK FLOW (CUMECS) = 0.98  
 ESTIMATED TIME TO PEAK (MINS) = 60.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.089  
 ESTIMATED PEAK FLOW (CUMECS) = 0.33  
 ESTIMATED TIME TO PEAK (MINS) = 45.00

LINK D 4.000

TURNER exist with MV Catch2.out

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.2105  
 ESTIMATED PEAK FLOW (CUMECS) = 0.09  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 5.709  
 ESTIMATED PEAK FLOW (CUMECS) = 1.27  
 ESTIMATED TIME TO PEAK (MINS) = 59.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.596  
 ESTIMATED PEAK FLOW (CUMECS) = 0.48  
 ESTIMATED TIME TO PEAK (MINS) = 45.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.2116  
 ESTIMATED PEAK FLOW (CUMECS) = 0.09  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 9.077  
 ESTIMATED PEAK FLOW (CUMECS) = 2.16  
 ESTIMATED TIME TO PEAK (MINS) = 49.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 90.  
 RETURN PERIOD (YRS) = 2.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000

TURNER exist with MV Catch2.out

E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV	23.555	10.00	0.000	3.000	0.000	21.682	0.000	0.2149	48.00	0.000
C	23.555	10.00	1.500	3.000	0.000	21.682	33.832	0.4765	46.00	0.000
U/S 20.4ha	23.555	10.00	0.000	3.000	0.000	21.682	0.000	0.9766	60.00	0.000
B	23.555	10.00	1.500	3.000	0.000	21.682	33.832	0.3289	45.00	0.000
D	23.555	10.00	1.500	3.000	0.000	21.682	33.832	0.0891	35.00	0.000
CULVERT	23.555	10.00	0.000	3.000	0.000	21.682	0.000	1.267	59.00	0.000
A	23.555	10.00	1.500	3.000	0.000	21.682	33.832	0.4798	45.00	0.000
E	23.555	10.00	1.500	3.000	0.000	21.682	33.832	0.0896	35.00	0.000
TURNER RD	23.555	10.00	0.000	3.000	0.000	21.682	0.000	2.163	49.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.536	.0600	0.0563	0.2149	1.0	0.000	0.000	0.000
C	0.731	.0600	0.0910	0.4765	1.0	0.000	0.000	0.000
U/S 20.4ha	0.906	.0600	0.2625	0.9757	1.0	0.000	0.000	0.000
B	0.633	.0600	0.0727	0.3290	1.0	0.000	0.000	0.000
D	0.377	.0600	0.0332	0.0890	1.0	0.000	0.000	0.000
CULVERT	0.978	.0600	0.3031	1.266	1.0	0.000	0.000	0.000
A	0.732	.0600	0.0914	0.4794	1.0	0.000	0.000	0.000
E	0.809	.0600	0.1078	0.0895	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.8622  
 ESTIMATED PEAK FLOW (CUMECS) = 0.22  
 ESTIMATED TIME TO PEAK (MINS) = 61.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.743  
 ESTIMATED PEAK FLOW (CUMECS) = 0.48  
 ESTIMATED TIME TO PEAK (MINS) = 53.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.940  
 ESTIMATED PEAK FLOW (CUMECS) = 1.03

TURNER exist with MV Catch2.out  
 ESTIMATED TIME TO PEAK (MINS) = 66.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.212  
 ESTIMATED PEAK FLOW (CUMECS) = 0.33  
 ESTIMATED TIME TO PEAK (MINS) = 51.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.2358  
 ESTIMATED PEAK FLOW (CUMECS) = 0.10  
 ESTIMATED TIME TO PEAK (MINS) = 42.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 6.388  
 ESTIMATED PEAK FLOW (CUMECS) = 1.34  
 ESTIMATED TIME TO PEAK (MINS) = 66.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.772  
 ESTIMATED PEAK FLOW (CUMECS) = 0.48  
 ESTIMATED TIME TO PEAK (MINS) = 52.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.2371  
 ESTIMATED PEAK FLOW (CUMECS) = 0.10  
 ESTIMATED TIME TO PEAK (MINS) = 42.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 10.14  
 ESTIMATED PEAK FLOW (CUMECS) = 2.22  
 ESTIMATED TIME TO PEAK (MINS) = 65.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 120.  
 RETURN PERIOD (YRS) = 2.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		slope		% Impervious		Pern		B		Link No.
	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2	
	(ha)		(% )		(% )						
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001

TURNER exist with MV Catch2.out

U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	0.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV	19.535	10.00	0.000	3.000	0.000	24.320	0.000	0.2200	61.00	0.000
C	19.535	10.00	1.500	3.000	0.000	24.320	37.570	0.4769	53.00	0.000
U/S 20.4ha	19.535	10.00	0.000	3.000	0.000	24.320	0.000	1.033	66.00	0.000
B	19.535	10.00	1.500	3.000	0.000	24.320	37.570	0.3276	51.00	0.000
D	19.535	10.00	1.500	3.000	0.000	24.320	37.570	0.1010	42.00	0.000
CULVERT	19.535	10.00	0.000	3.000	0.000	24.320	0.000	1.338	66.00	0.000
A	19.535	10.00	1.500	3.000	0.000	24.320	37.570	0.4751	52.00	0.000
E	19.535	10.00	1.500	3.000	0.000	24.320	37.570	0.1017	42.00	0.000
TURNER RD	19.535	10.00	0.000	3.000	0.000	24.320	0.000	2.224	65.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.541	.0600	0.0570	0.2200	1.0	0.000	0.000	0.000
C	0.731	.0600	0.0910	0.4770	1.0	0.000	0.000	0.000
U/S 20.4ha	0.915	.0600	0.2719	1.030	1.0	0.000	0.000	0.000
B	0.630	.0600	0.0727	0.3273	1.0	0.000	0.000	0.000
D	0.401	.0600	0.0359	0.1026	1.0	0.000	0.000	0.000
CULVERT	0.992	.0600	0.3125	1.335	1.0	0.000	0.000	0.000
A	0.731	.0600	0.0906	0.4749	1.0	0.000	0.000	0.000
E	0.856	.0600	0.1172	0.1031	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.5560  
 ESTIMATED PEAK FLOW (CUMECS) = 0.20  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

TURNER exist with MV Catch2.out  
1.001

LINK C

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.122  
ESTIMATED PEAK FLOW (CUMECS) = 0.48  
ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.263  
ESTIMATED PEAK FLOW (CUMECS) = 0.82  
ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.7987  
ESTIMATED PEAK FLOW (CUMECS) = 0.36  
ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.1532  
ESTIMATED PEAK FLOW (CUMECS) = 0.11  
ESTIMATED TIME TO PEAK (MINS) = 21.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.215  
ESTIMATED PEAK FLOW (CUMECS) = 1.20  
ESTIMATED TIME TO PEAK (MINS) = 29.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.152  
ESTIMATED PEAK FLOW (CUMECS) = 0.49  
ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.1541  
ESTIMATED PEAK FLOW (CUMECS) = 0.11  
ESTIMATED TIME TO PEAK (MINS) = 21.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 6.644  
ESTIMATED PEAK FLOW (CUMECS) = 2.19  
ESTIMATED TIME TO PEAK (MINS) = 29.00

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 25.  
RETURN PERIOD (YRS) = 5.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
TOTAL OF ALL SUB-AREAS (ha) = 41.51

TURNER exist with MV Catch2.out

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Loss #2	Cont. Loss #1 (mm/h)	Loss #2	Excess Rain #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV	64.073	10.00	0.000	3.000	0.000	15.847	0.000	0.2029	26.00	0.000
C	64.073	10.00	1.500	3.000	0.000	15.847	25.197	0.4795	26.00	0.000
U/S 20.4ha	64.073	10.00	0.000	3.000	0.000	15.847	0.000	0.8221	26.00	0.000
B	64.073	10.00	1.500	3.000	0.000	15.847	25.197	0.3553	15.00	0.000
D	64.073	10.00	1.500	3.000	0.000	15.847	25.197	0.1061	21.00	0.000
CULVERT	64.073	10.00	0.000	3.000	0.000	15.847	0.000	1.198	29.00	0.000
A	64.073	10.00	1.500	3.000	0.000	15.847	25.197	0.4924	26.00	0.000
E	64.073	10.00	1.500	3.000	0.000	15.847	25.197	0.1066	21.00	0.000
TURNER RD	64.073	10.00	0.000	3.000	0.000	15.847	0.000	2.186	29.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.523	.0600	0.0545	0.2032	1.0	0.000	0.000	0.000
C	0.732	.0600	0.0914	0.4796	1.0	0.000	0.000	0.000
U/S 20.4ha	0.857	.0600	0.2391	0.8211	1.0	0.000	0.000	0.000
B	0.638	.0600	0.0762	0.3476	1.0	0.000	0.000	0.000
D	0.405	.0600	0.0369	0.1064	1.0	0.000	0.000	0.000
CULVERT	0.962	.0600	0.2938	1.195	1.0	0.000	0.000	0.000
A	0.737	.0600	0.0930	0.4912	1.0	0.000	0.000	0.000

TURNER exist with MV Catch2.out  
E 0.863 .0600 0.1203 0.1069 1.0 0.000 0.000 0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.139  
ESTIMATED PEAK FLOW (CUMECS) = 0.34  
ESTIMATED TIME TO PEAK (MINS) = 45.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.297  
ESTIMATED PEAK FLOW (CUMECS) = 0.75  
ESTIMATED TIME TO PEAK (MINS) = 41.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 6.575  
ESTIMATED PEAK FLOW (CUMECS) = 1.57  
ESTIMATED TIME TO PEAK (MINS) = 55.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.575  
ESTIMATED PEAK FLOW (CUMECS) = 0.53  
ESTIMATED TIME TO PEAK (MINS) = 39.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3101  
ESTIMATED PEAK FLOW (CUMECS) = 0.15  
ESTIMATED TIME TO PEAK (MINS) = 34.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 8.460  
ESTIMATED PEAK FLOW (CUMECS) = 1.99  
ESTIMATED TIME TO PEAK (MINS) = 49.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.343  
ESTIMATED PEAK FLOW (CUMECS) = 0.77  
ESTIMATED TIME TO PEAK (MINS) = 42.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3118  
ESTIMATED PEAK FLOW (CUMECS) = 0.15  
ESTIMATED TIME TO PEAK (MINS) = 34.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 13.41  
ESTIMATED PEAK FLOW (CUMECS) = 3.51  
ESTIMATED TIME TO PEAK (MINS) = 44.00

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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TURNER exist with MV Catch2.out

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 90.  
 RETURN PERIOD (YRS) = 5.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Loss #2	Cont. Loss #1 (mm/h)	Loss #2	Excess Rain #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
	MV	30.568	10.00	0.000	3.000	0.000	32.052	0.000	0.3429	45.00
C	30.568	10.00	1.500	3.000	0.000	32.052	44.352	0.7519	41.00	0.000
U/S 20.4ha	30.568	10.00	0.000	3.000	0.000	32.052	0.000	1.566	55.00	0.000
B	30.568	10.00	1.500	3.000	0.000	32.052	44.352	0.5335	39.00	0.000
D	30.568	10.00	1.500	3.000	0.000	32.052	44.352	0.1534	34.00	0.000
CULVERT	30.568	10.00	0.000	3.000	0.000	32.052	0.000	1.986	49.00	0.000
A	30.568	10.00	1.500	3.000	0.000	32.052	44.352	0.7736	42.00	0.000
E	30.568	10.00	1.500	3.000	0.000	32.052	44.352	0.1540	34.00	0.000
TURNER RD	30.568	10.00	0.000	3.000	0.000	32.052	0.000	3.511	44.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.642	.0600	0.0746	0.3425	1.0	0.000	0.000	0.000
C	0.874	.0600	0.1195	0.7515	1.0	0.000	0.000	0.000

TURNER exist with MV Catch2.out

U/S 20.4ha	1.03	.0600	0.3406	1.564	1.0	0.000	0.000	0.000
B	0.761	.0600	0.0977	0.5331	1.0	0.000	0.000	0.000
D	0.467	.0600	0.0461	0.1533	1.0	0.000	0.000	0.000
CULVERT	1.11	.0600	0.3859	1.984	1.0	0.000	0.000	0.000
A	0.882	.0600	0.1219	0.7737	1.0	0.000	0.000	0.000
E	0.977	.0600	0.1531	0.1547	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.279  
 ESTIMATED PEAK FLOW (CUMECS) = 0.35  
 ESTIMATED TIME TO PEAK (MINS) = 50.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.577  
 ESTIMATED PEAK FLOW (CUMECS) = 0.80  
 ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 7.330  
 ESTIMATED PEAK FLOW (CUMECS) = 1.64  
 ESTIMATED TIME TO PEAK (MINS) = 65.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.766  
 ESTIMATED PEAK FLOW (CUMECS) = 0.58  
 ESTIMATED TIME TO PEAK (MINS) = 45.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3473  
 ESTIMATED PEAK FLOW (CUMECS) = 0.16  
 ESTIMATED TIME TO PEAK (MINS) = 42.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 9.443  
 ESTIMATED PEAK FLOW (CUMECS) = 2.07  
 ESTIMATED TIME TO PEAK (MINS) = 65.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.621  
 ESTIMATED PEAK FLOW (CUMECS) = 0.80  
 ESTIMATED TIME TO PEAK (MINS) = 48.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3491  
 ESTIMATED PEAK FLOW (CUMECS) = 0.16  
 ESTIMATED TIME TO PEAK (MINS) = 42.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 14.99  
 ESTIMATED PEAK FLOW (CUMECS) = 3.67  
 ESTIMATED TIME TO PEAK (MINS) = 49.00

TURNER exist with MV Catch2.out

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 120.  
 RETURN PERIOD (YRS) = 5.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Loss #2	Cont. Loss #1 (mm/h)	Loss #2	Excess Rain #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
	MV	25.371	10.00	0.000	3.000	0.000	35.842	0.000	0.3491	50.00
C	25.371	10.00	1.500	3.000	0.000	35.842	49.242	0.8015	46.00	0.000
U/S 20.4ha	25.371	10.00	0.000	3.000	0.000	35.842	0.000	1.641	65.00	0.000
B	25.371	10.00	1.500	3.000	0.000	35.842	49.242	0.5817	45.00	0.000
D	25.371	10.00	1.500	3.000	0.000	35.842	49.242	0.1612	42.00	0.000
CULVERT	25.371	10.00	0.000	3.000	0.000	35.842	0.000	2.069	65.00	0.000
A	25.371	10.00	1.500	3.000	0.000	35.842	49.242	0.8006	48.00	0.000
E	25.371	10.00	1.500	3.000	0.000	35.842	49.242	0.1619	42.00	0.000
TURNER RD	25.371	10.00	0.000	3.000	0.000	35.842	0.000	3.666	49.00	0.000

TURNER exist with MV Catch2.out

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.647	.0600	0.0754	0.3491	1.0	0.000	0.000	0.000
C	0.895	.0600	0.1242	0.8007	1.0	0.000	0.000	0.000
U/S 20.4ha	1.05	.0600	0.3484	1.639	1.0	0.000	0.000	0.000
B	0.789	.0600	0.1023	0.5800	1.0	0.000	0.000	0.000
D	0.478	.0600	0.0475	0.1615	1.0	0.000	0.000	0.000
CULVERT	1.13	.0600	0.3938	2.067	1.0	0.000	0.000	0.000
A	0.895	.0600	0.1242	0.8004	1.0	0.000	0.000	0.000
E	0.992	.0600	0.1578	0.1619	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6719  
 ESTIMATED PEAK FLOW (CUMECS) = 0.26  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.362  
 ESTIMATED PEAK FLOW (CUMECS) = 0.62  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.931  
 ESTIMATED PEAK FLOW (CUMECS) = 1.08  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.9464  
 ESTIMATED PEAK FLOW (CUMECS) = 0.45  
 ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.1859  
 ESTIMATED PEAK FLOW (CUMECS) = 0.14  
 ESTIMATED TIME TO PEAK (MINS) = 21.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 5.064  
 ESTIMATED PEAK FLOW (CUMECS) = 1.57  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.401  
 ESTIMATED PEAK FLOW (CUMECS) = 0.64  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK E 6.000

TURNER exist with MV Catch2.out  
 ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.1869  
 ESTIMATED PEAK FLOW (CUMECS) = 0.14  
 ESTIMATED TIME TO PEAK (MINS) = 21.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 8.013  
 ESTIMATED PEAK FLOW (CUMECS) = 2.86  
 ESTIMATED TIME TO PEAK (MINS) = 27.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 25.  
 RETURN PERIOD (YRS) = 10.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2	#1 (%)	#2	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss		Cont. Loss		Excess Rain		Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
		#1 (mm)	#2	#1 (mm/h)	#2	#1 (mm)	#2			
MV	72.056	10.00	0.000	3.000	0.000	19.123	0.000	0.2613	26.00	0.000
C	72.056	10.00	1.500	3.000	0.000	19.123	28.523	0.6223	26.00	0.000
U/S 20.4ha	72.056	10.00	0.000	3.000	0.000	19.123	0.000	1.082	26.00	0.000
B	72.056	10.00	1.500	3.000	0.000	19.123	28.523	0.4496	25.00	0.000
D	72.056	10.00	1.500	3.000	0.000	19.123	28.523	0.1393	21.00	0.000

TURNER exist with MV Catch2.out

CULVERT	72.056	10.00	0.000	3.000	0.000	19.123	0.000	1.567	26.00	0.000
A	72.056	10.00	1.500	3.000	0.000	19.123	28.523	0.6377	26.00	0.000
E	72.056	10.00	1.500	3.000	0.000	19.123	28.523	0.1401	21.00	0.000
TURNER RD	72.056	10.00	0.000	3.000	0.000	19.123	0.000	2.858	27.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.579	.0600	0.0633	0.2616	1.0	0.000	0.000	0.000
C	0.808	.0600	0.1070	0.6211	1.0	0.000	0.000	0.000
U/S 20.4ha	0.933	.0600	0.2781	1.081	1.0	0.000	0.000	0.000
B	0.709	.0600	0.0879	0.4465	1.0	0.000	0.000	0.000
D	0.451	.0600	0.0434	0.1394	1.0	0.000	0.000	0.000
CULVERT	1.03	.0600	0.3406	1.559	1.0	0.000	0.000	0.000
A	0.817	.0600	0.1086	0.6373	1.0	0.000	0.000	0.000
E	0.949	.0600	0.1438	0.1409	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.340  
 ESTIMATED PEAK FLOW (CUMECS) = 0.42  
 ESTIMATED TIME TO PEAK (MINS) = 42.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.698  
 ESTIMATED PEAK FLOW (CUMECS) = 0.92  
 ESTIMATED TIME TO PEAK (MINS) = 39.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 7.713  
 ESTIMATED PEAK FLOW (CUMECS) = 1.89  
 ESTIMATED TIME TO PEAK (MINS) = 53.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.836  
 ESTIMATED PEAK FLOW (CUMECS) = 0.67  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3666  
 ESTIMATED PEAK FLOW (CUMECS) = 0.19  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 9.916  
 ESTIMATED PEAK FLOW (CUMECS) = 2.45

TURNER exist with MV Catch2.out  
 ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.755  
 ESTIMATED PEAK FLOW (CUMECS) = 0.94  
 ESTIMATED TIME TO PEAK (MINS) = 40.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3685  
 ESTIMATED PEAK FLOW (CUMECS) = 0.19  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 15.74  
 ESTIMATED PEAK FLOW (CUMECS) = 4.30  
 ESTIMATED TIME TO PEAK (MINS) = 42.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 90.  
 RETURN PERIOD (YRS) = 10.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label Average Intensity Init. #1 Loss #2 Cont. #1 Loss #2 Excess #1 Rain #2 Peak Inflow Time to Link Lag

	TURNER exist with MV Catch2.out									
	(mm/h)	( mm )	(mm/h)	( mm )	(m <sup>3</sup> /s)	Peak	mins			
MV	34.373	10.00	0.000	3.000	0.000	37.710	0.000	0.4194	42.00	0.000
C	34.373	10.00	1.500	3.000	0.000	37.710	50.060	0.9180	39.00	0.000
U/S 20.4ha	34.373	10.00	0.000	3.000	0.000	37.710	0.000	1.885	53.00	0.000
B	34.373	10.00	1.500	3.000	0.000	37.710	50.060	0.6703	30.00	0.000
D	34.373	10.00	1.500	3.000	0.000	37.710	50.060	0.1868	32.00	0.000
CULVERT	34.373	10.00	0.000	3.000	0.000	37.710	0.000	2.447	46.00	0.000
A	34.373	10.00	1.500	3.000	0.000	37.710	50.060	0.9449	40.00	0.000
E	34.373	10.00	1.500	3.000	0.000	37.710	50.060	0.1874	32.00	0.000
TURNER RD	34.373	10.00	0.000	3.000	0.000	37.710	0.000	4.304	42.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT								
Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.694	.0600	0.0844	0.4195	1.0	0.000	0.000	0.000
C	0.942	.0600	0.1352	0.9178	1.0	0.000	0.000	0.000
U/S 20.4ha	1.10	.0600	0.3750	1.885	1.0	0.000	0.000	0.000
B	0.828	.0600	0.1117	0.6648	1.0	0.000	0.000	0.000
D	0.506	.0600	0.0520	0.1873	1.0	0.000	0.000	0.000
CULVERT	1.18	.0600	0.4313	2.445	1.0	0.000	0.000	0.000
A	0.953	.0600	0.1375	0.9452	1.0	0.000	0.000	0.000
E	1.04	.0600	0.1734	0.1878	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.504  
 ESTIMATED PEAK FLOW (CUMECS) = 0.44  
 ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.022  
 ESTIMATED PEAK FLOW (CUMECS) = 1.01  
 ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 8.579  
 ESTIMATED PEAK FLOW (CUMECS) = 1.96  
 ESTIMATED TIME TO PEAK (MINS) = 62.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.062  
 ESTIMATED PEAK FLOW (CUMECS) = 0.70  
 ESTIMATED TIME TO PEAK (MINS) = 45.00



TURNER exist with MV Catch2.out  
4.000

LINK D

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.4085  
ESTIMATED PEAK FLOW (CUMECS) = 0.19  
ESTIMATED TIME TO PEAK (MINS) = 41.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 11.05  
ESTIMATED PEAK FLOW (CUMECS) = 2.51  
ESTIMATED TIME TO PEAK (MINS) = 50.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.070  
ESTIMATED PEAK FLOW (CUMECS) = 0.99  
ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.4107  
ESTIMATED PEAK FLOW (CUMECS) = 0.19  
ESTIMATED TIME TO PEAK (MINS) = 41.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 17.55  
ESTIMATED PEAK FLOW (CUMECS) = 4.52  
ESTIMATED TIME TO PEAK (MINS) = 48.00

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 120.  
RETURN PERIOD (YRS) = 10.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2	
	(ha)		(%)		(%)						
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001

TURNER exist with MV Catch2.out

A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak mins	Link Lag mins
MV	28.541	10.00	0.000	3.000	0.000	42.132	0.000	0.4429	46.00	0.000
C	28.541	10.00	1.500	3.000	0.000	42.132	55.582	1.006	46.00	0.000
U/S 20.4ha	28.541	10.00	0.000	3.000	0.000	42.132	0.000	1.959	62.00	0.000
B	28.541	10.00	1.500	3.000	0.000	42.132	55.582	0.7031	45.00	0.000
D	28.541	10.00	1.500	3.000	0.000	42.132	55.582	0.1933	41.00	0.000
CULVERT	28.541	10.00	0.000	3.000	0.000	42.132	0.000	2.511	50.00	0.000
A	28.541	10.00	1.500	3.000	0.000	42.132	55.582	0.9897	46.00	0.000
E	28.541	10.00	1.500	3.000	0.000	42.132	55.582	0.1941	41.00	0.000
TURNER RD	28.541	10.00	0.000	3.000	0.000	42.132	0.000	4.520	48.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.711	.0600	0.0871	0.4438	1.0	0.000	0.000	0.000
C	0.981	.0600	0.1422	1.006	1.0	0.000	0.000	0.000
U/S 20.4ha	1.11	.0600	0.3828	1.958	1.0	0.000	0.000	0.000
B	0.848	.0600	0.1148	0.7003	1.0	0.000	0.000	0.000
D	0.513	.0600	0.0529	0.1938	1.0	0.000	0.000	0.000
CULVERT	1.19	.0600	0.4375	2.507	1.0	0.000	0.000	0.000
A	0.969	.0600	0.1414	0.9891	1.0	0.000	0.000	0.000
E	1.04	.0600	0.1781	0.1938	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.8448  
 ESTIMATED PEAK FLOW (CUMECS) = 0.36  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.699  
 ESTIMATED PEAK FLOW (CUMECS) = 0.84  
 ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK U/S 20.4ha 2.000

TURNER exist with MV Catch2.out  
 ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.857  
 ESTIMATED PEAK FLOW (CUMECS) = 1.44  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.162  
 ESTIMATED PEAK FLOW (CUMECS) = 0.60  
 ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.2311  
 ESTIMATED PEAK FLOW (CUMECS) = 0.18  
 ESTIMATED TIME TO PEAK (MINS) = 21.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 6.250  
 ESTIMATED PEAK FLOW (CUMECS) = 2.09  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.742  
 ESTIMATED PEAK FLOW (CUMECS) = 0.85  
 ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.2323  
 ESTIMATED PEAK FLOW (CUMECS) = 0.18  
 ESTIMATED TIME TO PEAK (MINS) = 21.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 9.922  
 ESTIMATED PEAK FLOW (CUMECS) = 3.85  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 25.  
 RETURN PERIOD (YRS) = 20.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2	#1 (%)	#2	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000

TURNER exist with MV Catch2.out

C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV	83.043	10.00	0.000	3.000	0.000	23.701	0.000	0.3632	26.00	0.000
C	83.043	10.00	1.500	3.000	0.000	23.701	33.101	0.8448	25.00	0.000
U/S 20.4ha	83.043	10.00	0.000	3.000	0.000	23.701	0.000	1.442	26.00	0.000
B	83.043	10.00	1.500	3.000	0.000	23.701	33.101	0.5997	25.00	0.000
D	83.043	10.00	1.500	3.000	0.000	23.701	33.101	0.1809	21.00	0.000
CULVERT	83.043	10.00	0.000	3.000	0.000	23.701	0.000	2.090	26.00	0.000
A	83.043	10.00	1.500	3.000	0.000	23.701	33.101	0.8534	25.00	0.000
E	83.043	10.00	1.500	3.000	0.000	23.701	33.101	0.1816	21.00	0.000
TURNER RD	83.043	10.00	0.000	3.000	0.000	23.701	0.000	3.848	26.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.655	.0600	0.0773	0.3625	1.0	0.000	0.000	0.000
C	0.913	.0600	0.1281	0.8423	1.0	0.000	0.000	0.000
U/S 20.4ha	1.01	.0600	0.3250	1.439	1.0	0.000	0.000	0.000
B	0.797	.0600	0.1047	0.5994	1.0	0.000	0.000	0.000
D	0.499	.0600	0.0508	0.1808	1.0	0.000	0.000	0.000
CULVERT	1.12	.0600	0.3969	2.084	1.0	0.000	0.000	0.000
A	0.921	.0600	0.1289	0.8552	1.0	0.000	0.000	0.000
E	1.02	.0600	0.1703	0.1814	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.616  
 ESTIMATED PEAK FLOW (CUMECS) = 0.53

TURNER exist with MV Catch2.out  
ESTIMATED TIME TO PEAK (MINS) = 40.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.249  
ESTIMATED PEAK FLOW (CUMECS) = 1.19  
ESTIMATED TIME TO PEAK (MINS) = 37.00

WARNING 12 - DRDH = -ve  
LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 9.321  
ESTIMATED PEAK FLOW (CUMECS) = 2.38  
ESTIMATED TIME TO PEAK (MINS) = 47.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.211  
ESTIMATED PEAK FLOW (CUMECS) = 0.85  
ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.4422  
ESTIMATED PEAK FLOW (CUMECS) = 0.23  
ESTIMATED TIME TO PEAK (MINS) = 31.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 11.97  
ESTIMATED PEAK FLOW (CUMECS) = 3.12  
ESTIMATED TIME TO PEAK (MINS) = 44.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.330  
ESTIMATED PEAK FLOW (CUMECS) = 1.18  
ESTIMATED TIME TO PEAK (MINS) = 39.00

WARNING 12 - DRDH = -ve  
LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.4443  
ESTIMATED PEAK FLOW (CUMECS) = 0.23  
ESTIMATED TIME TO PEAK (MINS) = 31.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 19.00  
ESTIMATED PEAK FLOW (CUMECS) = 5.54  
ESTIMATED TIME TO PEAK (MINS) = 41.00

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 90.  
RETURN PERIOD (YRS) = 20.

TURNER exist with MV Catch2.out

BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV	39.611	10.00	0.000	3.000	0.000	45.517	0.000	0.5339	40.00	0.000
C	39.611	10.00	1.500	3.000	0.000	45.517	57.917	1.186	37.00	0.000
U/S 20.4ha	39.611	10.00	0.000	3.000	0.000	45.517	0.000	2.385	47.00	0.000
B	39.611	10.00	1.500	3.000	0.000	45.517	57.917	0.8535	30.00	0.000
D	39.611	10.00	1.500	3.000	0.000	45.517	57.917	0.2279	31.00	0.000
CULVERT	39.611	10.00	0.000	3.000	0.000	45.517	0.000	3.124	44.00	0.000
A	39.611	10.00	1.500	3.000	0.000	45.517	57.917	1.183	39.00	0.000
E	39.611	10.00	1.500	3.000	0.000	45.517	57.917	0.2286	31.00	0.000
TURNER RD	39.611	10.00	0.000	3.000	0.000	45.517	0.000	5.540	41.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.762	.0600	0.0977	0.5336	1.0	0.000	0.000	0.000
C	0.990	.0600	0.1641	1.184	1.0	0.000	0.000	0.000
U/S 20.4ha	1.17	.0600	0.4250	2.383	1.0	0.000	0.000	0.000
B	0.904	.0600	0.1289	0.8400	1.0	0.000	0.000	0.000
D	0.550	.0600	0.0584	0.2291	1.0	0.000	0.000	0.000

TURNER exist with MV Catch2.out

CULVERT	1.27	.0600	0.4891	3.122	1.0	0.000	0.000	0.000
A	1.00	.0600	0.1625	1.182	1.0	0.000	0.000	0.000
E	1.11	.0600	0.1977	0.2284	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.798  
 ESTIMATED PEAK FLOW (CUMECS) = 0.57  
 ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.626  
 ESTIMATED PEAK FLOW (CUMECS) = 1.26  
 ESTIMATED TIME TO PEAK (MINS) = 45.00

WARNING 12 - DRDH = -ve  
 LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 10.36  
 ESTIMATED PEAK FLOW (CUMECS) = 2.44  
 ESTIMATED TIME TO PEAK (MINS) = 58.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.467  
 ESTIMATED PEAK FLOW (CUMECS) = 0.87  
 ESTIMATED TIME TO PEAK (MINS) = 40.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.4921  
 ESTIMATED PEAK FLOW (CUMECS) = 0.24  
 ESTIMATED TIME TO PEAK (MINS) = 41.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 13.32  
 ESTIMATED PEAK FLOW (CUMECS) = 3.22  
 ESTIMATED TIME TO PEAK (MINS) = 49.00

WARNING 12 - DRDH = -ve  
 LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.715  
 ESTIMATED PEAK FLOW (CUMECS) = 1.26  
 ESTIMATED TIME TO PEAK (MINS) = 46.00

WARNING 12 - DRDH = -ve  
 LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.4946  
 ESTIMATED PEAK FLOW (CUMECS) = 0.24  
 ESTIMATED TIME TO PEAK (MINS) = 41.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 21.16  
 ESTIMATED PEAK FLOW (CUMECS) = 5.74  
 ESTIMATED TIME TO PEAK (MINS) = 49.00

TURNER exist with MV Catch2.out

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 120.  
 RETURN PERIOD (YRS) = 20.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2	#1 (%)	#2	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss (mm)		Cont. Loss (mm/h)		Excess Rain (mm)		Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
		#1	#2	#1	#2	#1	#2			
MV	32.901	10.00	0.000	3.000	0.000	50.753	0.000	0.5680	46.00	0.000
C	32.901	10.00	1.500	3.000	0.000	50.753	64.303	1.261	45.00	0.000
U/S 20.4ha	32.901	10.00	0.000	3.000	0.000	50.753	0.000	2.435	58.00	0.000
B	32.901	10.00	1.500	3.000	0.000	50.753	64.303	0.8740	40.00	0.000
D	32.901	10.00	1.500	3.000	0.000	50.753	64.303	0.2365	41.00	0.000
CULVERT	32.901	10.00	0.000	3.000	0.000	50.753	0.000	3.223	49.00	0.000
A	32.901	10.00	1.500	3.000	0.000	50.753	64.303	1.256	46.00	0.000
E	32.901	10.00	1.500	3.000	0.000	50.753	64.303	0.2375	41.00	0.000
TURNER RD	32.901	10.00	0.000	3.000	0.000	50.753	0.000	5.740	49.00	0.000



Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	TURNER exist with MV Catch2.out Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.781	.0600	0.1012	0.5674	1.0	0.000	0.000	0.000
C	0.987	.0600	0.1734	1.261	1.0	0.000	0.000	0.000
U/S 20.4ha	1.18	.0600	0.4297	2.435	1.0	0.000	0.000	0.000
B	0.924	.0600	0.1313	0.8742	1.0	0.000	0.000	0.000
D	0.554	.0600	0.0598	0.2363	1.0	0.000	0.000	0.000
CULVERT	1.27	.0600	0.4969	3.214	1.0	0.000	0.000	0.000
A	0.994	.0600	0.1719	1.256	1.0	0.000	0.000	0.000
E	1.12	.0600	0.2031	0.2376	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.042  
ESTIMATED PEAK FLOW (CUMECS) = 0.51  
ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.111  
ESTIMATED PEAK FLOW (CUMECS) = 1.15  
ESTIMATED TIME TO PEAK (MINS) = 25.00

WARNING 12 - DRDH = -ve  
LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 6.072  
ESTIMATED PEAK FLOW (CUMECS) = 2.04  
ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.438  
ESTIMATED PEAK FLOW (CUMECS) = 0.81  
ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.2890  
ESTIMATED PEAK FLOW (CUMECS) = 0.22  
ESTIMATED TIME TO PEAK (MINS) = 21.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 7.799  
ESTIMATED PEAK FLOW (CUMECS) = 2.86  
ESTIMATED TIME TO PEAK (MINS) = 28.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.172  
ESTIMATED PEAK FLOW (CUMECS) = 1.15  
ESTIMATED TIME TO PEAK (MINS) = 26.00

WARNING 12 - DRDH = -ve  
LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.2906

TURNER exist with MV Catch2.out  
 ESTIMATED PEAK FLOW (CUMECS) = 0.22  
 ESTIMATED TIME TO PEAK (MINS) = 21.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 12.37  
 ESTIMATED PEAK FLOW (CUMECS) = 5.18  
 ESTIMATED TIME TO PEAK (MINS) = 27.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 25.  
 RETURN PERIOD (YRS) = 50.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Loss #2	Cont. Loss #1 (mm/h)	Loss #2	Excess Rain #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV	97.422	10.00	0.000	3.000	0.000	29.642	0.000	0.5094	26.00	0.000
C	97.422	10.00	1.500	3.000	0.000	29.642	39.092	1.154	25.00	0.000
U/S 20.4ha	97.422	10.00	0.000	3.000	0.000	29.642	0.000	2.036	26.00	0.000
B	97.422	10.00	1.500	3.000	0.000	29.642	39.092	0.8073	25.00	0.000
D	97.422	10.00	1.500	3.000	0.000	29.642	39.092	0.2225	21.00	0.000

TURNER exist with MV Catch2.out

CULVERT	97.422	10.00	0.000	3.000	0.000	29.642	0.000	2.862	28.00	0.000
A	97.422	10.00	1.500	3.000	0.000	29.642	39.092	1.146	26.00	0.000
E	97.422	10.00	1.500	3.000	0.000	29.642	39.092	0.2234	21.00	0.000
TURNER RD	97.422	10.00	0.000	3.000	0.000	29.642	0.000	5.182	27.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.753	.0600	0.0945	0.5104	1.0	0.000	0.000	0.000
C	0.998	.0600	0.1594	1.155	1.0	0.000	0.000	0.000
U/S 20.4ha	1.12	.0600	0.3906	2.030	1.0	0.000	0.000	0.000
B	0.891	.0600	0.1250	0.8016	1.0	0.000	0.000	0.000
D	0.542	.0600	0.0574	0.2222	1.0	0.000	0.000	0.000
CULVERT	1.23	.0600	0.4672	2.854	1.0	0.000	0.000	0.000
A	1.00	.0600	0.1578	1.147	1.0	0.000	0.000	0.000
E	1.10	.0600	0.1953	0.2240	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.978  
 ESTIMATED PEAK FLOW (CUMECS) = 0.66  
 ESTIMATED TIME TO PEAK (MINS) = 39.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.984  
 ESTIMATED PEAK FLOW (CUMECS) = 1.43  
 ESTIMATED TIME TO PEAK (MINS) = 36.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 11.40  
 ESTIMATED PEAK FLOW (CUMECS) = 2.92  
 ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.690  
 ESTIMATED PEAK FLOW (CUMECS) = 1.03  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.5411  
 ESTIMATED PEAK FLOW (CUMECS) = 0.26  
 ESTIMATED TIME TO PEAK (MINS) = 31.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 14.63  
 ESTIMATED PEAK FLOW (CUMECS) = 3.79  
 ESTIMATED TIME TO PEAK (MINS) = 44.00

TURNER exist with MV Catch2.out

LINK A 5.000  
 ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.055  
 ESTIMATED PEAK FLOW (CUMECS) = 1.42  
 ESTIMATED TIME TO PEAK (MINS) = 38.00

LINK E 6.000  
 ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.5439  
 ESTIMATED PEAK FLOW (CUMECS) = 0.27  
 ESTIMATED TIME TO PEAK (MINS) = 31.00

LINK TURNER RD 1.002  
 ESTIMATED VOLUME (CU METRES\*10\*\*3) = 23.21  
 ESTIMATED PEAK FLOW (CUMECS) = 6.65  
 ESTIMATED TIME TO PEAK (MINS) = 40.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 90.  
 RETURN PERIOD (YRS) = 50.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss #1 #2 ( mm )	Cont. Loss #1 #2 (mm/h)	Excess Rain #1 #2 ( mm )	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
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TURNER exist with MV Catch2.out

MV	46.466	10.00	0.000	3.000	0.000	55.749	0.000	0.6551	39.00	0.000
C	46.466	10.00	1.500	3.000	0.000	55.749	68.199	1.432	36.00	0.000
U/S 20.4ha	46.466	10.00	0.000	3.000	0.000	55.749	0.000	2.921	46.00	0.000
B	46.466	10.00	1.500	3.000	0.000	55.749	68.199	1.030	30.00	0.000
D	46.466	10.00	1.500	3.000	0.000	55.749	68.199	0.2643	31.00	0.000
CULVERT	46.466	10.00	0.000	3.000	0.000	55.749	0.000	3.785	44.00	0.000
A	46.466	10.00	1.500	3.000	0.000	55.749	68.199	1.416	38.00	0.000
E	46.466	10.00	1.500	3.000	0.000	55.749	68.199	0.2655	31.00	0.000
TURNER RD	46.466	10.00	0.000	3.000	0.000	55.749	0.000	6.647	40.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.828	.0600	0.1102	0.6551	1.0	0.000	0.000	0.000
C	0.992	.0600	0.1906	1.432	1.0	0.000	0.000	0.000
U/S 20.4ha	1.24	.0600	0.4719	2.919	1.0	0.000	0.000	0.000
B	0.980	.0600	0.1445	1.022	1.0	0.000	0.000	0.000
D	0.583	.0600	0.0637	0.2652	1.0	0.000	0.000	0.000
CULVERT	1.06	.0600	0.5969	3.784	1.0	0.000	0.000	0.000
A	0.992	.0600	0.1891	1.416	1.0	0.000	0.000	0.000
E	1.16	.0600	0.2188	0.2647	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.200  
 ESTIMATED PEAK FLOW (CUMECS) = 0.68  
 ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.434  
 ESTIMATED PEAK FLOW (CUMECS) = 1.50  
 ESTIMATED TIME TO PEAK (MINS) = 44.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 12.69  
 ESTIMATED PEAK FLOW (CUMECS) = 2.95  
 ESTIMATED TIME TO PEAK (MINS) = 58.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.014  
 ESTIMATED PEAK FLOW (CUMECS) = 1.08  
 ESTIMATED TIME TO PEAK (MINS) = 40.00

LINK D 4.000

TURNER exist with MV Catch2.out

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6011  
 ESTIMATED PEAK FLOW (CUMECS) = 0.27  
 ESTIMATED TIME TO PEAK (MINS) = 41.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 16.31  
 ESTIMATED PEAK FLOW (CUMECS) = 3.89  
 ESTIMATED TIME TO PEAK (MINS) = 49.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.539  
 ESTIMATED PEAK FLOW (CUMECS) = 1.50  
 ESTIMATED TIME TO PEAK (MINS) = 45.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6044  
 ESTIMATED PEAK FLOW (CUMECS) = 0.27  
 ESTIMATED TIME TO PEAK (MINS) = 41.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 25.89  
 ESTIMATED PEAK FLOW (CUMECS) = 6.97  
 ESTIMATED TIME TO PEAK (MINS) = 47.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 120.  
 RETURN PERIOD (YRS) = 50.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S	20.4ha	20.400	0.000	6.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000

TURNER exist with MV Catch2.out

E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV	38.609	10.00	0.000	3.000	0.000	62.068	0.000	0.6834	46.00	0.000
C	38.609	10.00	1.500	3.000	0.000	62.068	75.718	1.502	44.00	0.000
U/S 20.4ha	38.609	10.00	0.000	3.000	0.000	62.068	0.000	2.950	58.00	0.000
B	38.609	10.00	1.500	3.000	0.000	62.068	75.718	1.083	40.00	0.000
D	38.609	10.00	1.500	3.000	0.000	62.068	75.718	0.2730	41.00	0.000
CULVERT	38.609	10.00	0.000	3.000	0.000	62.068	0.000	3.894	49.00	0.000
A	38.609	10.00	1.500	3.000	0.000	62.068	75.718	1.503	45.00	0.000
E	38.609	10.00	1.500	3.000	0.000	62.068	75.718	0.2744	41.00	0.000
TURNER RD	38.609	10.00	0.000	3.000	0.000	62.068	0.000	6.968	47.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.839	.0600	0.1133	0.6834	1.0	0.000	0.000	0.000
C	0.996	.0600	0.1969	1.502	1.0	0.000	0.000	0.000
U/S 20.4ha	1.25	.0600	0.4750	2.950	1.0	0.000	0.000	0.000
B	1.00	.0600	0.1492	1.079	1.0	0.000	0.000	0.000
D	0.585	.0600	0.0652	0.2726	1.0	0.000	0.000	0.000
CULVERT	1.06	.0600	0.6031	3.893	1.0	0.000	0.000	0.000
A	0.995	.0600	0.1969	1.501	1.0	0.000	0.000	0.000
E	1.18	.0600	0.2234	0.2753	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.213  
 ESTIMATED PEAK FLOW (CUMECS) = 0.62  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.444  
 ESTIMATED PEAK FLOW (CUMECS) = 1.38  
 ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 6.924

TURNER exist with MV Catch2.out  
 ESTIMATED PEAK FLOW (CUMECS) = 2.39  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.658  
 ESTIMATED PEAK FLOW (CUMECS) = 0.96  
 ESTIMATED TIME TO PEAK (MINS) = 24.00

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3341  
 ESTIMATED PEAK FLOW (CUMECS) = 0.26  
 ESTIMATED TIME TO PEAK (MINS) = 20.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 8.916  
 ESTIMATED PEAK FLOW (CUMECS) = 3.39  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

WARNING 12 - DRDH = -ve

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.507  
 ESTIMATED PEAK FLOW (CUMECS) = 1.37  
 ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3358  
 ESTIMATED PEAK FLOW (CUMECS) = 0.26  
 ESTIMATED TIME TO PEAK (MINS) = 20.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 14.20  
 ESTIMATED PEAK FLOW (CUMECS) = 6.06  
 ESTIMATED TIME TO PEAK (MINS) = 27.00

#####  
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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

#####  
 #####

ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 25.  
 RETURN PERIOD (YRS) = 100.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2	#1 (%)	#2	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000



TURNER exist with MV Catch2.out

C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV	108.36	10.00	0.000	3.000	0.000	34.151	0.000	0.6154	26.00	0.000
C	108.36	10.00	1.500	3.000	0.000	34.151	43.651	1.383	25.00	0.000
U/S 20.4ha	108.36	10.00	0.000	3.000	0.000	34.151	0.000	2.390	26.00	0.000
B	108.36	10.00	1.500	3.000	0.000	34.151	43.651	0.9604	24.00	0.000
D	108.36	10.00	1.500	3.000	0.000	34.151	43.651	0.2618	20.00	0.000
CULVERT	108.36	10.00	0.000	3.000	0.000	34.151	0.000	3.390	26.00	0.000
A	108.36	10.00	1.500	3.000	0.000	34.151	43.651	1.373	25.00	0.000
E	108.36	10.00	1.500	3.000	0.000	34.151	43.651	0.2630	20.00	0.000
TURNER RD	108.36	10.00	0.000	3.000	0.000	34.151	0.000	6.062	27.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.808	.0600	0.1063	0.6167	1.0	0.000	0.000	0.000
C	0.988	.0600	0.1859	1.380	1.0	0.000	0.000	0.000
U/S 20.4ha	1.17	.0600	0.4250	2.383	1.0	0.000	0.000	0.000
B	0.963	.0600	0.1383	0.9612	1.0	0.000	0.000	0.000
D	0.576	.0600	0.0637	0.2618	1.0	0.000	0.000	0.000
CULVERT	1.07	.0600	0.5625	3.357	1.0	0.000	0.000	0.000
A	0.989	.0600	0.1852	1.373	1.0	0.000	0.000	0.000
E	1.16	.0600	0.2172	0.2633	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.259  
 ESTIMATED PEAK FLOW (CUMECs) = 0.77

TURNER exist with MV Catch2.out  
ESTIMATED TIME TO PEAK (MINS) = 38.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.549  
ESTIMATED PEAK FLOW (CUMECS) = 1.68  
ESTIMATED TIME TO PEAK (MINS) = 34.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 12.98  
ESTIMATED PEAK FLOW (CUMECS) = 3.42  
ESTIMATED TIME TO PEAK (MINS) = 46.00

WARNING 12 - DRDH = -ve  
LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.073  
ESTIMATED PEAK FLOW (CUMECS) = 1.24  
ESTIMATED TIME TO PEAK (MINS) = 30.00

WARNING 12 - DRDH = -ve  
LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6141  
ESTIMATED PEAK FLOW (CUMECS) = 0.31  
ESTIMATED TIME TO PEAK (MINS) = 31.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 16.66  
ESTIMATED PEAK FLOW (CUMECS) = 4.33  
ESTIMATED TIME TO PEAK (MINS) = 45.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.644  
ESTIMATED PEAK FLOW (CUMECS) = 1.66  
ESTIMATED TIME TO PEAK (MINS) = 36.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6174  
ESTIMATED PEAK FLOW (CUMECS) = 0.31  
ESTIMATED TIME TO PEAK (MINS) = 31.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 26.47  
ESTIMATED PEAK FLOW (CUMECS) = 7.60  
ESTIMATED TIME TO PEAK (MINS) = 40.00

#####  
#####

Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

#####  
#####

ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 90.  
RETURN PERIOD (YRS) = 100.

TURNER exist with MV Catch2.out

BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV	51.681	10.00	0.000	3.000	0.000	63.572	0.000	0.7675	38.00	0.000
C	51.681	10.00	1.500	3.000	0.000	63.572	76.022	1.680	34.00	0.000
U/S 20.4ha	51.681	10.00	0.000	3.000	0.000	63.572	0.000	3.416	46.00	0.000
B	51.681	10.00	1.500	3.000	0.000	63.572	76.022	1.242	30.00	0.000
D	51.681	10.00	1.500	3.000	0.000	63.572	76.022	0.3051	31.00	0.000
CULVERT	51.681	10.00	0.000	3.000	0.000	63.572	0.000	4.335	45.00	0.000
A	51.681	10.00	1.500	3.000	0.000	63.572	76.022	1.665	36.00	0.000
E	51.681	10.00	1.500	3.000	0.000	63.572	76.022	0.3066	31.00	0.000
TURNER RD	51.681	10.00	0.000	3.000	0.000	63.572	0.000	7.601	40.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV	0.881	.0600	0.1211	0.7675	1.0	0.000	0.000	0.000
C	0.998	.0600	0.2125	1.680	1.0	0.000	0.000	0.000
U/S 20.4ha	1.06	.0600	0.5688	3.407	1.0	0.000	0.000	0.000
B	0.987	.0600	0.1703	1.233	1.0	0.000	0.000	0.000
D	0.614	.0600	0.0695	0.3052	1.0	0.000	0.000	0.000

TURNER exist with MV Catch2.out

CULVERT	1.11	.0600	0.6219	4.332	1.0	0.000	0.000	0.000
A	1.00	.0600	0.2109	1.665	1.0	0.000	0.000	0.000
E	1.21	.0600	0.2406	0.3063	1.0	0.000	0.000	0.000

LINK MV 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.504  
 ESTIMATED PEAK FLOW (CUMECS) = 0.80  
 ESTIMATED TIME TO PEAK (MINS) = 45.00

LINK C 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 5.040  
 ESTIMATED PEAK FLOW (CUMECS) = 1.76  
 ESTIMATED TIME TO PEAK (MINS) = 42.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 14.45  
 ESTIMATED PEAK FLOW (CUMECS) = 3.43  
 ESTIMATED TIME TO PEAK (MINS) = 53.00

WARNING 12 - DRDH = -ve

LINK B 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.415  
 ESTIMATED PEAK FLOW (CUMECS) = 1.26  
 ESTIMATED TIME TO PEAK (MINS) = 40.00

WARNING 12 - DRDH = -ve

LINK D 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6843  
 ESTIMATED PEAK FLOW (CUMECS) = 0.31  
 ESTIMATED TIME TO PEAK (MINS) = 41.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 18.55  
 ESTIMATED PEAK FLOW (CUMECS) = 4.47  
 ESTIMATED TIME TO PEAK (MINS) = 49.00

LINK A 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 5.172  
 ESTIMATED PEAK FLOW (CUMECS) = 1.76  
 ESTIMATED TIME TO PEAK (MINS) = 44.00

LINK E 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6877  
 ESTIMATED PEAK FLOW (CUMECS) = 0.31  
 ESTIMATED TIME TO PEAK (MINS) = 41.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 29.45  
 ESTIMATED PEAK FLOW (CUMECS) = 7.91  
 ESTIMATED TIME TO PEAK (MINS) = 47.00

#####

TURNER exist with MV Catch2.out

#####

Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

#####  
#####

ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 120.  
RETURN PERIOD (YRS) = 100.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 41.08  
TOTAL OF SECOND SUB-AREAS (ha) = 0.44  
TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
C	3.596	.00001	8.000	5.000	0.000	100.0	.060	.013	.0346	0.000	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
B	4.305	0.4360	8.000	8.000	0.000	100.0	.060	.013	.0380	.0003	3.000
D	0.9680	.00001	8.000	5.000	0.000	100.0	.060	.013	.0175	0.000	4.000
CULVERT	.00001	0.000	2.800	0.000	0.000	0.000	.060	0.00	0.000	0.000	2.001
A	7.293	.00001	8.000	5.000	0.000	100.0	.060	.013	.0500	0.000	5.000
E	0.9730	.00001	8.000	.0010	0.000	0.000	.060	.025	.0176	.0021	6.000
TURNER RD	.00001	0.000	2.500	0.000	0.000	0.000	.060	0.00	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss		Cont. Loss		Excess Rain		Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
		#1 (mm)	#2	#1 (mm/h)	#2	#1 (mm)	#2			
MV	42.954	10.00	0.000	3.000	0.000	70.657	0.000	0.8019	45.00	0.000
C	42.954	10.00	1.500	3.000	0.000	70.657	84.407	1.759	42.00	0.000
U/S 20.4ha	42.954	10.00	0.000	3.000	0.000	70.657	0.000	3.431	53.00	0.000
B	42.954	10.00	1.500	3.000	0.000	70.657	84.407	1.263	40.00	0.000
D	42.954	10.00	1.500	3.000	0.000	70.657	84.407	0.3097	41.00	0.000
CULVERT	42.954	10.00	0.000	3.000	0.000	70.657	0.000	4.467	49.00	0.000
A	42.954	10.00	1.500	3.000	0.000	70.657	84.407	1.761	44.00	0.000
E	42.954	10.00	1.500	3.000	0.000	70.657	84.407	0.3109	41.00	0.000
TURNER RD	42.954	10.00	0.000	3.000	0.000	70.657	0.000	7.907	47.00	0.000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT  
Link Ave. Ave. Flow Max. No. Pipe Pipe Pipe

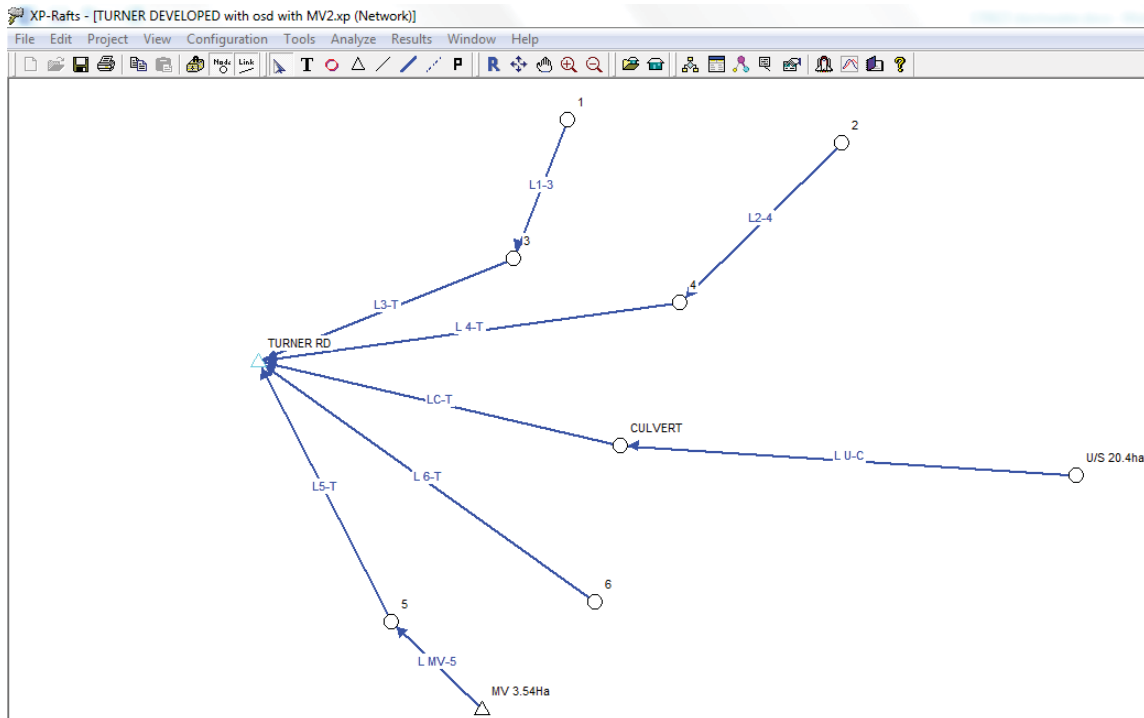
Label	Vel. (m/s)	Rough. (n)	Depth (m)	Flow (m <sup>3</sup> /s)	TURNER exist with MV of Pipes	Catch2.out Dia. (m)	Slope (%)	Flow (m <sup>3</sup> /s)
MV	0.895	.0600	0.1242	0.8009	1.0	0.000	0.000	0.000
C	1.00	.0600	0.2180	1.760	1.0	0.000	0.000	0.000
U/S 20.4ha	1.06	.0600	0.5688	3.426	1.0	0.000	0.000	0.000
B	0.980	.0600	0.1734	1.253	1.0	0.000	0.000	0.000
D	0.618	.0600	0.0703	0.3104	1.0	0.000	0.000	0.000
CULVERT	1.12	.0600	0.6281	4.463	1.0	0.000	0.000	0.000
A	1.00	.0600	0.2188	1.761	1.0	0.000	0.000	0.000
E	1.23	.0600	0.2422	0.3119	1.0	0.000	0.000	0.000

Run completed at: 30th August 2017 12:53:28

mik open 0

# Annexure D - Water Quantity Modelling – XP Rafts Modelling for the Ultimate Development

## D.2 – Developed Conditions



**Figure D.1 – Image of XP-Rafts Ultimate Developed Conditions Model.**

SubCatchment Data: Node 6 (Subcatchment 2)	
<b>Rainfall Losses</b>	
<input checked="" type="radio"/> Initial/Continuing	Pavement
<input type="radio"/> ARBM	
Total Area	1.261
Impervious	100 %
Vectored Slope	8 %
Mannings 'n'	0.013
<input type="checkbox"/> Use 10 UnEqual Sub areas	
<input type="checkbox"/> Use Direct Storage Coefficient	
<input type="checkbox"/> Use non-standard Storage Exponent	
<input type="checkbox"/> Use Baseflow	

**Figure D.2 – Typical node catchment details for the Ultimate Developed Conditions**

TURNER DEVELOPED with osd with MV2.out  
Run started at: 24th October 2017 7:10:52

```
#####  
#####  
#####          RUNTIME          RESULTS          #####  
#####          #####          #####          #####  
#####
```

Max. no. of links allowed = 2000  
Max. no. of routng increments allowed = 25000  
Max. no. of rating curve points = 25000  
Max. no. of storm temporal points = 25000  
Max. no. of channel subreaches = 25  
Max link stack level = 25  
Input Version number = 650

LINK MV 3.54ha	1.000		
ESTIMATED VOLUME (CU METRES*10**3) =		0.3486	
ESTIMATED PEAK FLOW (CUMECS) =		0.11	
ESTIMATED TIME TO PEAK (MINS) =		26.00	
LINK 5	1.001		
ESTIMATED VOLUME (CU METRES*10**3) =		0.7657	
ESTIMATED PEAK FLOW (CUMECS) =		0.58	
ESTIMATED TIME TO PEAK (MINS) =		15.00	
LINK U/S 20.4ha	2.000		
ESTIMATED VOLUME (CU METRES*10**3) =		2.033	
ESTIMATED PEAK FLOW (CUMECS) =		0.41	
ESTIMATED TIME TO PEAK (MINS) =		26.00	
LINK CULVERT	2.001		
ESTIMATED VOLUME (CU METRES*10**3) =		2.109	
ESTIMATED PEAK FLOW (CUMECS) =		0.45	
ESTIMATED TIME TO PEAK (MINS) =		29.00	
LINK 1	3.000		
ESTIMATED VOLUME (CU METRES*10**3) =		0.5982	
ESTIMATED PEAK FLOW (CUMECS) =		0.77	
ESTIMATED TIME TO PEAK (MINS) =		15.00	
LINK 3	3.001		
ESTIMATED VOLUME (CU METRES*10**3) =		0.8643	
ESTIMATED PEAK FLOW (CUMECS) =		1.14	
ESTIMATED TIME TO PEAK (MINS) =		15.00	



TURNER DEVELOPED with osd with MV2.out

LINK 6

4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.2820  
 ESTIMATED PEAK FLOW (CUMECS) = 0.37  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 2

5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.4027  
 ESTIMATED PEAK FLOW (CUMECS) = 0.52  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 4

5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.100  
 ESTIMATED PEAK FLOW (CUMECS) = 1.43  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK TURNER RD

1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 5.208  
 ESTIMATED PEAK FLOW (CUMECS) = 3.34  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

#####  
 #####

Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

#####  
 #####

ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 25.  
 RETURN PERIOD (YRS) = 2.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001

TURNER DEVELOPED with osd with MV2.out

TURNER RD 0.8820 0.000 2.500 0.000 0.000 0.000 .030 0.00 0.0175 0.000 1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV 3.54ha	49.364	10.00	0.000	3.000	0.000	9.818	0.000	0.1147	26.00	0.000
5	49.364	10.00	1.500	3.000	0.000	9.818	19.068	0.5755	15.00	0.000
U/S 20.4ha	49.364	10.00	0.000	3.000	0.000	9.818	0.000	0.4078	26.00	0.000
CULVERT	49.364	10.00	0.000	3.000	0.000	9.818	0.000	0.4491	29.00	0.000
1	49.364	10.00	1.500	3.000	0.000	9.818	19.068	0.7732	15.00	0.000
3	49.364	10.00	1.500	3.000	0.000	9.818	19.068	1.140	15.00	0.000
6	49.364	10.00	1.500	3.000	0.000	9.818	19.068	0.3719	15.00	0.000
2	49.364	10.00	1.500	3.000	0.000	9.818	19.068	0.5225	15.00	0.000
4	49.364	10.00	1.500	3.000	0.000	9.818	19.068	1.434	15.00	0.000
TURNER RD	49.364	10.00	0.000	3.000	0.000	9.818	0.000	3.338	15.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	----- vol. Avail	Basin vol. Used	----- Stage Used
TURNER RD	15.00	3.337	19.00	1.955	5208.2	0.0000	739.28	94.172

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54ha	0.767	.0600	0.2734	0.1147	1.0	0.000	0.000	0.000
5	2.00	.0130	0.0406	0.5783	1.0	0.000	0.000	0.000
U/S 20.4ha	1.08	.0300	0.1086	0.4080	1.0	0.000	0.000	0.000
CULVERT	1.11	.0300	0.1148	0.4475	1.0	0.000	0.000	0.000
1	2.28	.0130	0.0484	0.7880	1.0	0.000	0.000	0.000
3	2.56	.0130	0.0613	1.122	1.0	0.000	0.000	0.000
6	0.553	.0600	0.0922	0.3612	1.0	0.000	0.000	0.000
2	1.96	.0130	0.0383	0.5344	1.0	0.000	0.000	0.000
4	0.924	.0600	0.2094	1.374	1.0	0.000	0.000	0.000

TURNER DEVELOPED with osd with MV2.out

LINK MV 3.54ha            1.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) =            0.7771  
ESTIMATED PEAK FLOW            (CUMECS) =            0.21  
ESTIMATED TIME TO PEAK            (MINS) =            48.00

LINK 5                    1.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) =            1.543  
ESTIMATED PEAK FLOW            (CUMECS) =            0.67  
ESTIMATED TIME TO PEAK            (MINS) =            30.00

LINK U/S 20.4ha            2.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) =            4.410  
ESTIMATED PEAK FLOW            (CUMECS) =            0.98  
ESTIMATED TIME TO PEAK            (MINS) =            60.00

LINK CULVERT            2.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) =            4.579  
ESTIMATED PEAK FLOW            (CUMECS) =            1.01  
ESTIMATED TIME TO PEAK            (MINS) =            62.00

LINK 1                    3.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) =            1.100  
ESTIMATED PEAK FLOW            (CUMECS) =            0.81  
ESTIMATED TIME TO PEAK            (MINS) =            30.00

LINK 3                    3.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) =            1.588  
ESTIMATED PEAK FLOW            (CUMECS) =            1.18  
ESTIMATED TIME TO PEAK            (MINS) =            30.00

LINK 6                    4.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) =            0.5176  
ESTIMATED PEAK FLOW            (CUMECS) =            0.38  
ESTIMATED TIME TO PEAK            (MINS) =            30.00

LINK 2                    5.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) =            0.7400  
ESTIMATED PEAK FLOW            (CUMECS) =            0.55  
ESTIMATED TIME TO PEAK            (MINS) =            30.00

LINK 4                    5.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) =            2.025  
ESTIMATED PEAK FLOW            (CUMECS) =            1.51  
ESTIMATED TIME TO PEAK            (MINS) =            30.00

LINK TURNER RD            1.002  
ESTIMATED VOLUME (CU METRES\*10\*\*3) =            10.44  
ESTIMATED PEAK FLOW            (CUMECS) =            3.65  
ESTIMATED TIME TO PEAK            (MINS) =            30.00

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TURNER DEVELOPED with osd with MV2.out

Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 90.  
RETURN PERIOD (YRS) = 2.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss		Cont. Loss		Excess Rain		Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
		#1 (mm)	#2	#1 (mm/h)	#2	#1 (mm)	#2			
MV 3.54Ha	23.555	10.00	0.000	3.000	0.000	21.682	0.000	0.2149	48.00	0.000
5	23.555	10.00	1.500	3.000	0.000	21.682	33.832	0.6722	30.00	0.000
U/S 20.4ha	23.555	10.00	0.000	3.000	0.000	21.682	0.000	0.9766	60.00	0.000
CULVERT	23.555	10.00	0.000	3.000	0.000	21.682	0.000	1.010	62.00	0.000
1	23.555	10.00	1.500	3.000	0.000	21.682	33.832	0.8133	30.00	0.000
3	23.555	10.00	1.500	3.000	0.000	21.682	33.832	1.175	30.00	0.000
6	23.555	10.00	1.500	3.000	0.000	21.682	33.832	0.3820	30.00	0.000
2	23.555	10.00	1.500	3.000	0.000	21.682	33.832	0.5542	30.00	0.000
4	23.555	10.00	1.500	3.000	0.000	21.682	33.832	1.506	30.00	0.000
TURNER RD	23.555	10.00	0.000	3.000	0.000	21.682	0.000	3.652	30.00	0.000

TURNER DEVELOPED with osd with MV2.out  
SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	----- Vol. Avail	Basin Vol. Used	----- Stage Used
TURNER RD	30.00	3.652	41.00	2.077	10443.4	0.0000	900.91	94.257

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54ha	0.894	.0600	0.4219	0.2149	1.0	0.000	0.000	0.000
5	2.14	.0130	0.0445	0.6798	1.0	0.000	0.000	0.000
U/S 20.4ha	1.45	.0300	0.1789	0.9764	1.0	0.000	0.000	0.000
CULVERT	1.47	.0300	0.1820	1.010	1.0	0.000	0.000	0.000
1	2.29	.0130	0.0500	0.8156	1.0	0.000	0.000	0.000
3	2.61	.0130	0.0625	1.166	1.0	0.000	0.000	0.000
6	0.559	.0600	0.0938	0.3718	1.0	0.000	0.000	0.000
2	1.98	.0130	0.0398	0.5620	1.0	0.000	0.000	0.000
4	0.925	.0600	0.2156	1.417	1.0	0.000	0.000	0.000

LINK MV 3.54ha                    1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) =                    0.8622  
 ESTIMATED PEAK FLOW (CUMECS) =                    0.22  
 ESTIMATED TIME TO PEAK (MINS) =                    61.00

LINK 5                                    1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) =                    1.714  
 ESTIMATED PEAK FLOW (CUMECS) =                    0.55  
 ESTIMATED TIME TO PEAK (MINS) =                    35.00

LINK U/S 20.4ha                    2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) =                    4.940  
 ESTIMATED PEAK FLOW (CUMECS) =                    1.03  
 ESTIMATED TIME TO PEAK (MINS) =                    66.00

LINK CULVERT                            2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) =                    5.130  
 ESTIMATED PEAK FLOW (CUMECS) =                    1.07  
 ESTIMATED TIME TO PEAK (MINS) =                    68.00

LINK 1                                    3.000

TURNER DEVELOPED with osd with MV2.out

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.225  
 ESTIMATED PEAK FLOW (CUMECS) = 0.73  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.768  
 ESTIMATED PEAK FLOW (CUMECS) = 1.05  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.5757  
 ESTIMATED PEAK FLOW (CUMECS) = 0.35  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.8230  
 ESTIMATED PEAK FLOW (CUMECS) = 0.50  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.253  
 ESTIMATED PEAK FLOW (CUMECS) = 1.35  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 11.66  
 ESTIMATED PEAK FLOW (CUMECS) = 3.22  
 ESTIMATED TIME TO PEAK (MINS) = 39.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 120.  
 RETURN PERIOD (YRS) = 2.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001

TURNER DEVELOPED with osd with MV2.out

1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV 3.54Ha	19.535	10.00	0.000	3.000	0.000	24.320	0.000	0.2200	61.00	0.000
5	19.535	10.00	1.500	3.000	0.000	24.320	37.570	0.5455	35.00	0.000
U/S 20.4ha	19.535	10.00	0.000	3.000	0.000	24.320	0.000	1.033	66.00	0.000
CULVERT	19.535	10.00	0.000	3.000	0.000	24.320	0.000	1.070	68.00	0.000
1	19.535	10.00	1.500	3.000	0.000	24.320	37.570	0.7336	32.00	0.000
3	19.535	10.00	1.500	3.000	0.000	24.320	37.570	1.053	35.00	0.000
6	19.535	10.00	1.500	3.000	0.000	24.320	37.570	0.3478	32.00	0.000
2	19.535	10.00	1.500	3.000	0.000	24.320	37.570	0.4973	32.00	0.000
4	19.535	10.00	1.500	3.000	0.000	24.320	37.570	1.351	35.00	0.000
TURNER RD	19.535	10.00	0.000	3.000	0.000	24.320	0.000	3.215	39.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	Vol. Avail	Basin Vol. Used	Stage Used
TURNER RD	39.00	3.215	47.00	2.137	11656.0	0.0000	985.62	94.298

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54Ha	0.893	.0600	0.4313	0.2200	1.0	0.000	0.000	0.000
5	1.98	.0130	0.0395	0.5562	1.0	0.000	0.000	0.000
U/S 20.4ha	1.48	.0300	0.1844	1.032	1.0	0.000	0.000	0.000
CULVERT	1.49	.0300	0.1883	1.069	1.0	0.000	0.000	0.000

TURNER DEVELOPED with osd with MV2.out

1	2.18	.0130	0.0471	0.7321	1.0	0.000	0.000	0.000
3	2.54	.0130	0.0586	1.064	1.0	0.000	0.000	0.000
6	0.531	.0600	0.0883	0.3324	1.0	0.000	0.000	0.000
2	1.86	.0130	0.0373	0.4938	1.0	0.000	0.000	0.000
4	0.919	.0600	0.2016	1.316	1.0	0.000	0.000	0.000

LINK MV 3.54ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.5560  
 ESTIMATED PEAK FLOW (CUMECS) = 0.20  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.125  
 ESTIMATED PEAK FLOW (CUMECS) = 0.86  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.263  
 ESTIMATED PEAK FLOW (CUMECS) = 0.82  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.385  
 ESTIMATED PEAK FLOW (CUMECS) = 0.88  
 ESTIMATED TIME TO PEAK (MINS) = 28.00

LINK 1 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.8181  
 ESTIMATED PEAK FLOW (CUMECS) = 1.09  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.181  
 ESTIMATED PEAK FLOW (CUMECS) = 1.59  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3845  
 ESTIMATED PEAK FLOW (CUMECS) = 0.52  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.5499  
 ESTIMATED PEAK FLOW (CUMECS) = 0.75  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.504  
 ESTIMATED PEAK FLOW (CUMECS) = 2.01  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK TURNER RD 1.002



TURNER DEVELOPED with osd with MV2.out

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 7.720  
 ESTIMATED PEAK FLOW (CUMECS) = 4.75  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 25.  
 RETURN PERIOD (YRS) = 5.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2	#1 (%)	#2	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss		Cont. Loss		Excess Rain		Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
		#1 (mm)	#2	#1 (mm/h)	#2	#1 (mm)	#2			
MV 3.54Ha	64.073	10.00	0.000	3.000	0.000	15.847	0.000	0.2029	26.00	0.000
5	64.073	10.00	1.500	3.000	0.000	15.847	25.197	0.8564	15.00	0.000
U/S 20.4ha	64.073	10.00	0.000	3.000	0.000	15.847	0.000	0.8221	26.00	0.000
CULVERT	64.073	10.00	0.000	3.000	0.000	15.847	0.000	0.8827	28.00	0.000
1	64.073	10.00	1.500	3.000	0.000	15.847	25.197	1.087	15.00	0.000
3	64.073	10.00	1.500	3.000	0.000	15.847	25.197	1.594	15.00	0.000

TURNER DEVELOPED with osd with MV2.out

6	64.073	10.00	1.500	3.000	0.000	15.847	25.197	0.5223	15.00	0.000
2	64.073	10.00	1.500	3.000	0.000	15.847	25.197	0.7507	15.00	0.000
4	64.073	10.00	1.500	3.000	0.000	15.847	25.197	2.015	15.00	0.000
TURNER RD	64.073	10.00	0.000	3.000	0.000	15.847	0.000	4.752	15.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	Vol. Avail	Basin Vol. Used	Stage Used
TURNER RD	15.00	4.751	23.00	2.394	7719.7	0.0000	1397.4	94.502

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54ha	0.880	.0600	0.4062	0.2028	1.0	0.000	0.000	0.000
5	2.31	.0130	0.0516	0.8516	1.0	0.000	0.000	0.000
U/S 20.4ha	1.36	.0300	0.1625	0.8215	1.0	0.000	0.000	0.000
CULVERT	1.40	.0300	0.1688	0.8811	1.0	0.000	0.000	0.000
1	2.58	.0130	0.0598	1.103	1.0	0.000	0.000	0.000
3	2.96	.0130	0.0750	1.588	1.0	0.000	0.000	0.000
6	0.647	.0600	0.1133	0.5200	1.0	0.000	0.000	0.000
2	2.22	.0130	0.0477	0.7542	1.0	0.000	0.000	0.000
4	1.12	.0600	0.2578	2.064	1.0	0.000	0.000	0.000

LINK MV 3.54ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.139  
 ESTIMATED PEAK FLOW (CUMECS) = 0.34  
 ESTIMATED TIME TO PEAK (MINS) = 45.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.166  
 ESTIMATED PEAK FLOW (CUMECS) = 0.97  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 6.575  
 ESTIMATED PEAK FLOW (CUMECS) = 1.57

TURNER DEVELOPED with osd with MV2.out  
ESTIMATED TIME TO PEAK (MINS) = 55.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 6.826  
ESTIMATED PEAK FLOW (CUMECS) = 1.62  
ESTIMATED TIME TO PEAK (MINS) = 57.00

LINK 1 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.476  
ESTIMATED PEAK FLOW (CUMECS) = 1.08  
ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.130  
ESTIMATED PEAK FLOW (CUMECS) = 1.57  
ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6938  
ESTIMATED PEAK FLOW (CUMECS) = 0.52  
ESTIMATED TIME TO PEAK (MINS) = 29.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.9913  
ESTIMATED PEAK FLOW (CUMECS) = 0.74  
ESTIMATED TIME TO PEAK (MINS) = 27.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.714  
ESTIMATED PEAK FLOW (CUMECS) = 1.99  
ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 14.81  
ESTIMATED PEAK FLOW (CUMECS) = 5.41  
ESTIMATED TIME TO PEAK (MINS) = 30.00

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 90.  
RETURN PERIOD (YRS) = 5.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA  
Link Catch. Area slope % Impervious Pern B Link  
Page 12

Label	TURNER DEVELOPED with osd with MV2.out										
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	No.
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV 3.54Ha	30.568	10.00	0.000	3.000	0.000	32.052	0.000	0.3429	45.00	0.000
5	30.568	10.00	1.500	3.000	0.000	32.052	44.352	0.9711	30.00	0.000
U/S 20.4ha	30.568	10.00	0.000	3.000	0.000	32.052	0.000	1.566	55.00	0.000
CULVERT	30.568	10.00	0.000	3.000	0.000	32.052	0.000	1.615	57.00	0.000
1	30.568	10.00	1.500	3.000	0.000	32.052	44.352	1.076	30.00	0.000
3	30.568	10.00	1.500	3.000	0.000	32.052	44.352	1.573	30.00	0.000
6	30.568	10.00	1.500	3.000	0.000	32.052	44.352	0.5173	29.00	0.000
2	30.568	10.00	1.500	3.000	0.000	32.052	44.352	0.7390	27.00	0.000
4	30.568	10.00	1.500	3.000	0.000	32.052	44.352	1.992	30.00	0.000
TURNER RD	30.568	10.00	0.000	3.000	0.000	32.052	0.000	5.408	30.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	----- Vol. Avail	Basin Vol. Used	----- Stage Used
TURNER RD	30.00	5.408	58.00	2.861	14814.7	0.0000	2029.8	94.795

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

TURNER DEVELOPED with osd with MV2.out

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54ha	0.986	.0600	0.5844	0.3427	1.0	0.000	0.000	0.000
5	2.45	.0130	0.0557	0.9732	1.0	0.000	0.000	0.000
U/S 20.4ha	1.68	.0300	0.2328	1.565	1.0	0.000	0.000	0.000
CULVERT	1.70	.0300	0.2375	1.615	1.0	0.000	0.000	0.000
1	2.57	.0130	0.0594	1.089	1.0	0.000	0.000	0.000
3	2.96	.0130	0.0742	1.574	1.0	0.000	0.000	0.000
6	0.648	.0600	0.1125	0.5166	1.0	0.000	0.000	0.000
2	2.21	.0130	0.0473	0.7464	1.0	0.000	0.000	0.000
4	1.12	.0600	0.2563	2.049	1.0	0.000	0.000	0.000

LINK MV 3.54ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.279  
 ESTIMATED PEAK FLOW (CUMECS) = 0.35  
 ESTIMATED TIME TO PEAK (MINS) = 50.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.420  
 ESTIMATED PEAK FLOW (CUMECS) = 0.84  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 7.330  
 ESTIMATED PEAK FLOW (CUMECS) = 1.64  
 ESTIMATED TIME TO PEAK (MINS) = 65.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 7.609  
 ESTIMATED PEAK FLOW (CUMECS) = 1.69  
 ESTIMATED TIME TO PEAK (MINS) = 66.00

LINK 1 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.641  
 ESTIMATED PEAK FLOW (CUMECS) = 1.00  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.369  
 ESTIMATED PEAK FLOW (CUMECS) = 1.46  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.7712  
 ESTIMATED PEAK FLOW (CUMECS) = 0.48  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.103

TURNER DEVELOPED with osd with MV2.out  
 ESTIMATED PEAK FLOW (CUMECS) = 0.68  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.017  
 ESTIMATED PEAK FLOW (CUMECS) = 1.85  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 16.50  
 ESTIMATED PEAK FLOW (CUMECS) = 4.73  
 ESTIMATED TIME TO PEAK (MINS) = 38.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 120.  
 RETURN PERIOD (YRS) = 5.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2	#1 (%)	#2	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Loss #2	Cont. Loss #1 (mm/h)	Loss #2	Excess Rain #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV 3.54Ha	25.371	10.00	0.000	3.000	0.000	35.842	0.000	0.3491	50.00	0.000

TURNER DEVELOPED with osd with MV2.out

5	25.371	10.00	1.500	3.000	0.000	35.842	49.242	0.8422	35.00	0.000
U/S 20.4ha	25.371	10.00	0.000	3.000	0.000	35.842	0.000	1.641	65.00	0.000
CULVERT	25.371	10.00	0.000	3.000	0.000	35.842	0.000	1.690	66.00	0.000
1	25.371	10.00	1.500	3.000	0.000	35.842	49.242	0.9988	35.00	0.000
3	25.371	10.00	1.500	3.000	0.000	35.842	49.242	1.458	35.00	0.000
6	25.371	10.00	1.500	3.000	0.000	35.842	49.242	0.4763	32.00	0.000
2	25.371	10.00	1.500	3.000	0.000	35.842	49.242	0.6776	32.00	0.000
4	25.371	10.00	1.500	3.000	0.000	35.842	49.242	1.853	35.00	0.000
TURNER RD	25.371	10.00	0.000	3.000	0.000	35.842	0.000	4.729	38.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	----- Vol. Avail	Basin Vol. Used	----- Stage Used
TURNER RD	38.00	4.728	67.00	2.966	16502.9	0.0000	2129.6	94.836

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54Ha	0.986	.0600	0.5938	0.3490	1.0	0.000	0.000	0.000
5	2.35	.0130	0.0512	0.8577	1.0	0.000	0.000	0.000
U/S 20.4ha	1.71	.0300	0.2391	1.640	1.0	0.000	0.000	0.000
CULVERT	1.73	.0300	0.2430	1.690	1.0	0.000	0.000	0.000
1	2.51	.0130	0.0566	1.017	1.0	0.000	0.000	0.000
3	2.85	.0130	0.0711	1.451	1.0	0.000	0.000	0.000
6	0.620	.0600	0.1070	0.4703	1.0	0.000	0.000	0.000
2	2.19	.0130	0.0449	0.7019	1.0	0.000	0.000	0.000
4	1.06	.0600	0.2445	1.843	1.0	0.000	0.000	0.000

LINK MV 3.54Ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6719  
 ESTIMATED PEAK FLOW (CUMECS) = 0.26  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

TURNER DEVELOPED with osd with MV2.out

LINK 5 1.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.323  
ESTIMATED PEAK FLOW (CUMECS) = 1.01  
ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK U/S 20.4ha 2.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.931  
ESTIMATED PEAK FLOW (CUMECS) = 1.08  
ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK CULVERT 2.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.081  
ESTIMATED PEAK FLOW (CUMECS) = 1.15  
ESTIMATED TIME TO PEAK (MINS) = 28.00

LINK 1 3.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.9368  
ESTIMATED PEAK FLOW (CUMECS) = 1.25  
ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 3 3.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.352  
ESTIMATED PEAK FLOW (CUMECS) = 1.83  
ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 6 4.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.4401  
ESTIMATED PEAK FLOW (CUMECS) = 0.61  
ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 2 5.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6293  
ESTIMATED PEAK FLOW (CUMECS) = 0.86  
ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 4 5.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.722  
ESTIMATED PEAK FLOW (CUMECS) = 2.32  
ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK TURNER RD 1.002  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 9.089  
ESTIMATED PEAK FLOW (CUMECS) = 5.67  
ESTIMATED TIME TO PEAK (MINS) = 15.00

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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TURNER DEVELOPED with osd with MV2.out

STORM DURATION (MINS) = 25.  
 RETURN PERIOD (YRS) = 10.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss		Cont. Loss		Excess Rain		Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
		#1 (mm)	#2	#1 (mm/h)	#2	#1 (mm)	#2			
MV 3.54Ha	72.056	10.00	0.000	3.000	0.000	19.123	0.000	0.2613	26.00	0.000
5	72.056	10.00	1.500	3.000	0.000	19.123	28.523	1.010	15.00	0.000
U/S 20.4ha	72.056	10.00	0.000	3.000	0.000	19.123	0.000	1.082	26.00	0.000
CULVERT	72.056	10.00	0.000	3.000	0.000	19.123	0.000	1.148	28.00	0.000
1	72.056	10.00	1.500	3.000	0.000	19.123	28.523	1.252	15.00	0.000
3	72.056	10.00	1.500	3.000	0.000	19.123	28.523	1.835	15.00	0.000
6	72.056	10.00	1.500	3.000	0.000	19.123	28.523	0.6086	15.00	0.000
2	72.056	10.00	1.500	3.000	0.000	19.123	28.523	0.8584	15.00	0.000
4	72.056	10.00	1.500	3.000	0.000	19.123	28.523	2.324	15.00	0.000
TURNER RD	72.056	10.00	0.000	3.000	0.000	19.123	0.000	5.666	15.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	Basin		
						Vol. Avail	Vol. Used	Stage Used
TURNER RD	15.00	5.666	25.00	2.690	9089.0	0.0000	1865.4	94.728

SUMMARY OF BASIN OUTLET RESULTS

TURNER DEVELOPED with osd with MV2.out

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54ha	0.930	.0600	0.4844	0.2609	1.0	0.000	0.000	0.000
5	2.48	.0130	0.0570	1.010	1.0	0.000	0.000	0.000
U/S 20.4ha	1.50	.0300	0.1891	1.081	1.0	0.000	0.000	0.000
CULVERT	1.52	.0300	0.1961	1.147	1.0	0.000	0.000	0.000
1	2.71	.0130	0.0648	1.256	1.0	0.000	0.000	0.000
3	3.14	.0130	0.0816	1.836	1.0	0.000	0.000	0.000
6	0.665	.0600	0.1242	0.5862	1.0	0.000	0.000	0.000
2	2.37	.0130	0.0516	0.8719	1.0	0.000	0.000	0.000
4	1.17	.0600	0.2813	2.359	1.0	0.000	0.000	0.000

LINK MV 3.54ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.340  
 ESTIMATED PEAK FLOW (CUMECS) = 0.42  
 ESTIMATED TIME TO PEAK (MINS) = 42.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.507  
 ESTIMATED PEAK FLOW (CUMECS) = 1.13  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 7.713  
 ESTIMATED PEAK FLOW (CUMECS) = 1.89  
 ESTIMATED TIME TO PEAK (MINS) = 53.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 8.007  
 ESTIMATED PEAK FLOW (CUMECS) = 1.95  
 ESTIMATED TIME TO PEAK (MINS) = 49.00

LINK 1 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.679  
 ESTIMATED PEAK FLOW (CUMECS) = 1.21  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.424  
 ESTIMATED PEAK FLOW (CUMECS) = 1.78  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

TURNER DEVELOPED with osd with MV2.out

LINK 6 4.000  
 ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.7894  
 ESTIMATED PEAK FLOW (CUMECS) = 0.59  
 ESTIMATED TIME TO PEAK (MINS) = 27.00

LINK 2 5.000  
 ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.128  
 ESTIMATED PEAK FLOW (CUMECS) = 0.83  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK 4 5.001  
 ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.088  
 ESTIMATED PEAK FLOW (CUMECS) = 2.25  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK TURNER RD 1.002  
 ESTIMATED VOLUME (CU METRES\*10\*\*3) = 17.15  
 ESTIMATED PEAK FLOW (CUMECS) = 6.36  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 90.  
 RETURN PERIOD (YRS) = 10.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

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.
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001

TURNER DEVELOPED with osd with MV2.out

TURNER RD 0.8820 0.000 2.500 0.000 0.000 0.000 .030 0.00 .0175 0.000 1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2 (mm)	Cont. #1 (mm/h)	Loss #2 (mm/h)	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV 3.54Ha	34.373	10.00	0.000	3.000	0.000	37.710	0.000	0.4194	42.00	0.000
5	34.373	10.00	1.500	3.000	0.000	37.710	50.060	1.133	30.00	0.000
U/S 20.4ha	34.373	10.00	0.000	3.000	0.000	37.710	0.000	1.885	53.00	0.000
CULVERT	34.373	10.00	0.000	3.000	0.000	37.710	0.000	1.947	49.00	0.000
1	34.373	10.00	1.500	3.000	0.000	37.710	50.060	1.211	30.00	0.000
3	34.373	10.00	1.500	3.000	0.000	37.710	50.060	1.780	30.00	0.000
6	34.373	10.00	1.500	3.000	0.000	37.710	50.060	0.5889	27.00	0.000
2	34.373	10.00	1.500	3.000	0.000	37.710	50.060	0.8272	30.00	0.000
4	34.373	10.00	1.500	3.000	0.000	37.710	50.060	2.248	30.00	0.000
TURNER RD	34.373	10.00	0.000	3.000	0.000	37.710	0.000	6.364	30.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	Vol. Avail	Basin Vol. Used	Stage Used
TURNER RD	30.00	6.364	44.00	3.607	17149.6	0.0000	2445.6	94.967

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54Ha	1.02	.0600	0.6719	0.4195	1.0	0.000	0.000	0.000
5	2.60	.0130	0.0609	1.134	1.0	0.000	0.000	0.000
U/S 20.4ha	1.79	.0300	0.2578	1.885	1.0	0.000	0.000	0.000
CULVERT	1.80	.0300	0.2625	1.947	1.0	0.000	0.000	0.000
1	2.71	.0130	0.0637	1.235	1.0	0.000	0.000	0.000
3	3.11	.0130	0.0801	1.784	1.0	0.000	0.000	0.000
6	0.666	.0600	0.1219	0.5755	1.0	0.000	0.000	0.000
2	2.34	.0130	0.0506	0.8429	1.0	0.000	0.000	0.000

4 1.17 .0600 0.2750 2.295 1.0 0.000 0.000 0.000

TURNER DEVELOPED with osd with MV2.out

LINK MV 3.54ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.504  
ESTIMATED PEAK FLOW (CUMECS) = 0.44  
ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.801  
ESTIMATED PEAK FLOW (CUMECS) = 0.99  
ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 8.579  
ESTIMATED PEAK FLOW (CUMECS) = 1.96  
ESTIMATED TIME TO PEAK (MINS) = 62.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 8.908  
ESTIMATED PEAK FLOW (CUMECS) = 2.02  
ESTIMATED TIME TO PEAK (MINS) = 63.00

LINK 1 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.867  
ESTIMATED PEAK FLOW (CUMECS) = 1.15  
ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.695  
ESTIMATED PEAK FLOW (CUMECS) = 1.67  
ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.8777  
ESTIMATED PEAK FLOW (CUMECS) = 0.55  
ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.255  
ESTIMATED PEAK FLOW (CUMECS) = 0.78  
ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.433  
ESTIMATED PEAK FLOW (CUMECS) = 2.10  
ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 19.09  
ESTIMATED PEAK FLOW (CUMECS) = 5.55  
ESTIMATED TIME TO PEAK (MINS) = 40.00

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TURNER DEVELOPED with osd with MV2.out

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 120.  
RETURN PERIOD (YRS) = 10.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss		Cont. Loss		Excess Rain		Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
		#1 (mm)	#2	#1 (mm/h)	#2	#1 (mm)	#2			
MV 3.54Ha	28.541	10.00	0.000	3.000	0.000	42.132	0.000	0.4429	46.00	0.000
5	28.541	10.00	1.500	3.000	0.000	42.132	55.582	0.9857	35.00	0.000
U/S 20.4ha	28.541	10.00	0.000	3.000	0.000	42.132	0.000	1.959	62.00	0.000
CULVERT	28.541	10.00	0.000	3.000	0.000	42.132	0.000	2.018	63.00	0.000
1	28.541	10.00	1.500	3.000	0.000	42.132	55.582	1.150	32.00	0.000
3	28.541	10.00	1.500	3.000	0.000	42.132	55.582	1.669	35.00	0.000
6	28.541	10.00	1.500	3.000	0.000	42.132	55.582	0.5467	32.00	0.000
2	28.541	10.00	1.500	3.000	0.000	42.132	55.582	0.7819	32.00	0.000
4	28.541	10.00	1.500	3.000	0.000	42.132	55.582	2.101	35.00	0.000
TURNER RD	28.541	10.00	0.000	3.000	0.000	42.132	0.000	5.547	40.00	0.000

TURNER DEVELOPED with osd with MV2.out

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	Vol. Avail	Basin Vol. Used	Stage Used
TURNER RD	40.00	5.546	49.00	3.699	19088.5	0.0000	2476.9	94.979

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54ha	1.03	.0600	0.7000	0.4432	1.0	0.000	0.000	0.000
5	2.49	.0130	0.0563	1.001	1.0	0.000	0.000	0.000
U/S 20.4ha	1.80	.0300	0.2641	1.958	1.0	0.000	0.000	0.000
CULVERT	1.82	.0300	0.2680	2.018	1.0	0.000	0.000	0.000
1	2.63	.0130	0.0617	1.160	1.0	0.000	0.000	0.000
3	3.03	.0130	0.0770	1.667	1.0	0.000	0.000	0.000
6	0.647	.0600	0.1164	0.5340	1.0	0.000	0.000	0.000
2	2.27	.0130	0.0488	0.7908	1.0	0.000	0.000	0.000
4	1.11	.0600	0.2641	2.095	1.0	0.000	0.000	0.000

LINK MV 3.54ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.8448  
 ESTIMATED PEAK FLOW (CUMECS) = 0.36  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.608  
 ESTIMATED PEAK FLOW (CUMECS) = 1.22  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.857  
 ESTIMATED PEAK FLOW (CUMECS) = 1.44  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 5.042  
 ESTIMATED PEAK FLOW (CUMECS) = 1.51  
 ESTIMATED TIME TO PEAK (MINS) = 28.00

LINK 1 3.000

TURNER DEVELOPED with osd with MV2.out

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.101  
 ESTIMATED PEAK FLOW (CUMECS) = 1.48  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.589  
 ESTIMATED PEAK FLOW (CUMECS) = 2.18  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.5172  
 ESTIMATED PEAK FLOW (CUMECS) = 0.72  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.7389  
 ESTIMATED PEAK FLOW (CUMECS) = 1.01  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.023  
 ESTIMATED PEAK FLOW (CUMECS) = 2.73  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 10.99  
 ESTIMATED PEAK FLOW (CUMECS) = 6.91  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 25.  
 RETURN PERIOD (YRS) = 20.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area (ha)	Area #1	Area #2	Slope #1 (%)	Slope #2 (%)	% Impervious #1 (%)	% Impervious #2 (%)	Pern #1	Pern #2	B #1	B #2	Link No.
MV 3.54Ha	3.540	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001



TURNER DEVELOPED with osd with MV2.out

1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2 (mm)	Cont. #1 (mm/h)	Loss #2 (mm/h)	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV 3.54ha	83.043	10.00	0.000	3.000	0.000	23.701	0.000	0.3632	26.00	0.000
5	83.043	10.00	1.500	3.000	0.000	23.701	33.101	1.220	15.00	0.000
U/S 20.4ha	83.043	10.00	0.000	3.000	0.000	23.701	0.000	1.442	26.00	0.000
CULVERT	83.043	10.00	0.000	3.000	0.000	23.701	0.000	1.513	28.00	0.000
1	83.043	10.00	1.500	3.000	0.000	23.701	33.101	1.480	15.00	0.000
3	83.043	10.00	1.500	3.000	0.000	23.701	33.101	2.176	15.00	0.000
6	83.043	10.00	1.500	3.000	0.000	23.701	33.101	0.7186	15.00	0.000
2	83.043	10.00	1.500	3.000	0.000	23.701	33.101	1.007	15.00	0.000
4	83.043	10.00	1.500	3.000	0.000	23.701	33.101	2.729	15.00	0.000
TURNER RD	83.043	10.00	0.000	3.000	0.000	23.701	0.000	6.914	15.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	----- Vol. Avail	Basin Vol. Used	----- Stage Used
TURNER RD	15.00	6.913	24.00	3.489	10988.9	0.0000	2406.1	94.950

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54ha	0.996	.0600	0.6094	0.3633	1.0	0.000	0.000	0.000
5	2.67	.0130	0.0639	1.219	1.0	0.000	0.000	0.000
U/S 20.4ha	1.65	.0300	0.2219	1.441	1.0	0.000	0.000	0.000

	TURNER DEVELOPED with osd with MV2.out							
CULVERT	1.67	.0300	0.2281	1.512	1.0	0.000	0.000	0.000
1	2.91	.0130	0.0719	1.497	1.0	0.000	0.000	0.000
3	3.33	.0130	0.0906	2.162	1.0	0.000	0.000	0.000
6	0.717	.0600	0.1375	0.6994	1.0	0.000	0.000	0.000
2	2.51	.0130	0.0570	1.021	1.0	0.000	0.000	0.000
4	1.24	.0600	0.3094	2.737	1.0	0.000	0.000	0.000

LINK MV 3.54ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.616  
 ESTIMATED PEAK FLOW (CUMECS) = 0.53  
 ESTIMATED TIME TO PEAK (MINS) = 40.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.980  
 ESTIMATED PEAK FLOW (CUMECS) = 1.38  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 9.321  
 ESTIMATED PEAK FLOW (CUMECS) = 2.38  
 ESTIMATED TIME TO PEAK (MINS) = 47.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 9.677  
 ESTIMATED PEAK FLOW (CUMECS) = 2.46  
 ESTIMATED TIME TO PEAK (MINS) = 48.00

LINK 1 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.959  
 ESTIMATED PEAK FLOW (CUMECS) = 1.41  
 ESTIMATED TIME TO PEAK (MINS) = 27.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.828  
 ESTIMATED PEAK FLOW (CUMECS) = 2.06  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.9216  
 ESTIMATED PEAK FLOW (CUMECS) = 0.68  
 ESTIMATED TIME TO PEAK (MINS) = 27.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.317  
 ESTIMATED PEAK FLOW (CUMECS) = 0.95  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.603  
 ESTIMATED PEAK FLOW (CUMECS) = 2.60  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

TURNER DEVELOPED with osd with MV2.out  
1.002

LINK TURNER RD

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 20.41  
 ESTIMATED PEAK FLOW (CUMECS) = 7.72  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 90.  
 RETURN PERIOD (YRS) = 20.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity	Init. #1	Loss #2	Cont. #1	Loss #2	Excess #1	Rain #2	Peak Inflow	Time to Peak	Link Lag
	(mm/h)	( mm )	( mm/h)	( mm/h)	( mm )	( mm )	( m^3/s)	Peak	mins	mins
MV 3.54Ha	39.611	10.00	0.000	3.000	0.000	45.517	0.000	0.5339	40.00	0.000
5	39.611	10.00	1.500	3.000	0.000	45.517	57.917	1.376	30.00	0.000
U/S 20.4ha	39.611	10.00	0.000	3.000	0.000	45.517	0.000	2.385	47.00	0.000
CULVERT	39.611	10.00	0.000	3.000	0.000	45.517	0.000	2.459	48.00	0.000
1	39.611	10.00	1.500	3.000	0.000	45.517	57.917	1.405	27.00	0.000
3	39.611	10.00	1.500	3.000	0.000	45.517	57.917	2.063	30.00	0.000

TURNER DEVELOPED with osd with MV2.out

6	39.611	10.00	1.500	3.000	0.000	45.517	57.917	0.6842	27.00	0.000
2	39.611	10.00	1.500	3.000	0.000	45.517	57.917	0.9541	30.00	0.000
4	39.611	10.00	1.500	3.000	0.000	45.517	57.917	2.601	30.00	0.000
TURNER RD	39.611	10.00	0.000	3.000	0.000	45.517	0.000	7.719	30.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	----- Vol. Avail	Basin Vol. Used	----- Stage Used
TURNER RD	30.00	7.719	38.00	4.823	20411.1	0.0000	2832.7	95.126

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54Ha	1.07	.0600	0.7938	0.5338	1.0	0.000	0.000	0.000
5	2.80	.0130	0.0688	1.375	1.0	0.000	0.000	0.000
U/S 20.4ha	1.92	.0300	0.2938	2.385	1.0	0.000	0.000	0.000
CULVERT	1.93	.0300	0.2984	2.458	1.0	0.000	0.000	0.000
1	2.89	.0130	0.0695	1.435	1.0	0.000	0.000	0.000
3	3.30	.0130	0.0875	2.068	1.0	0.000	0.000	0.000
6	0.704	.0600	0.1328	0.6638	1.0	0.000	0.000	0.000
2	2.47	.0130	0.0551	0.9727	1.0	0.000	0.000	0.000
4	1.22	.0600	0.3016	2.626	1.0	0.000	0.000	0.000

LINK MV 3.54Ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.798  
 ESTIMATED PEAK FLOW (CUMECS) = 0.57  
 ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.313  
 ESTIMATED PEAK FLOW (CUMECS) = 1.18  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 10.36

TURNER DEVELOPED with osd with MV2.out

ESTIMATED PEAK FLOW (CUMECS) = 2.44  
 ESTIMATED TIME TO PEAK (MINS) = 58.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 10.76  
 ESTIMATED PEAK FLOW (CUMECS) = 2.51  
 ESTIMATED TIME TO PEAK (MINS) = 60.00

LINK 1 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.178  
 ESTIMATED PEAK FLOW (CUMECS) = 1.33  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.144  
 ESTIMATED PEAK FLOW (CUMECS) = 1.93  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.024  
 ESTIMATED PEAK FLOW (CUMECS) = 0.64  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.463  
 ESTIMATED PEAK FLOW (CUMECS) = 0.92  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.005  
 ESTIMATED PEAK FLOW (CUMECS) = 2.43  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 22.70  
 ESTIMATED PEAK FLOW (CUMECS) = 6.71  
 ESTIMATED TIME TO PEAK (MINS) = 40.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 120.  
 RETURN PERIOD (YRS) = 20.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

TURNER DEVELOPED with osd with MV2.out

Link Label	Catch. #1 (ha)	Area #2	Slope (%)		% Impervious (%)		Pern		B		Link No.
			#1	#2	#1	#2	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss (mm)		Cont. Loss (mm/h)		Excess Rain (mm)		Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
		#1	#2	#1	#2	#1	#2			
MV 3.54Ha	32.901	10.00	0.000	3.000	0.000	50.753	0.000	0.5680	46.00	0.000
5	32.901	10.00	1.500	3.000	0.000	50.753	64.303	1.179	35.00	0.000
U/S 20.4ha	32.901	10.00	0.000	3.000	0.000	50.753	0.000	2.435	58.00	0.000
CULVERT	32.901	10.00	0.000	3.000	0.000	50.753	0.000	2.505	60.00	0.000
1	32.901	10.00	1.500	3.000	0.000	50.753	64.303	1.331	32.00	0.000
3	32.901	10.00	1.500	3.000	0.000	50.753	64.303	1.931	35.00	0.000
6	32.901	10.00	1.500	3.000	0.000	50.753	64.303	0.6432	32.00	0.000
2	32.901	10.00	1.500	3.000	0.000	50.753	64.303	0.9153	32.00	0.000
4	32.901	10.00	1.500	3.000	0.000	50.753	64.303	2.431	35.00	0.000
TURNER RD	32.901	10.00	0.000	3.000	0.000	50.753	0.000	6.711	40.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	Basin		
						Vol. Avail	Vol. Used	Stage Used
TURNER RD	40.00	6.711	46.00	5.110	22696.3	0.0000	2903.9	95.155

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

TURNER DEVELOPED with osd with MV2.out

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54Ha	1.09	.0600	0.8250	0.5679	1.0	0.000	0.000	0.000
5	2.67	.0130	0.0625	1.191	1.0	0.000	0.000	0.000
U/S 20.4ha	1.93	.0300	0.2969	2.435	1.0	0.000	0.000	0.000
CULVERT	1.95	.0300	0.3016	2.505	1.0	0.000	0.000	0.000
1	2.80	.0130	0.0672	1.347	1.0	0.000	0.000	0.000
3	3.20	.0130	0.0844	1.934	1.0	0.000	0.000	0.000
6	0.684	.0600	0.1281	0.6213	1.0	0.000	0.000	0.000
2	2.39	.0130	0.0537	0.9162	1.0	0.000	0.000	0.000
4	1.17	.0600	0.2891	2.421	1.0	0.000	0.000	0.000

LINK MV 3.54Ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.042  
 ESTIMATED PEAK FLOW (CUMECS) = 0.51  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.954  
 ESTIMATED PEAK FLOW (CUMECS) = 1.34  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 6.072  
 ESTIMATED PEAK FLOW (CUMECS) = 2.04  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 6.303  
 ESTIMATED PEAK FLOW (CUMECS) = 2.15  
 ESTIMATED TIME TO PEAK (MINS) = 28.00

LINK 1 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.315  
 ESTIMATED PEAK FLOW (CUMECS) = 1.59  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.897  
 ESTIMATED PEAK FLOW (CUMECS) = 2.34  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6175  
 ESTIMATED PEAK FLOW (CUMECS) = 0.77  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 2 5.000

TURNER DEVELOPED with osd with MV2.out  
 ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.8835  
 ESTIMATED PEAK FLOW (CUMECS) = 1.08  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.418  
 ESTIMATED PEAK FLOW (CUMECS) = 2.95  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 13.45  
 ESTIMATED PEAK FLOW (CUMECS) = 7.77  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 25.  
 RETURN PERIOD (YRS) = 50.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Loss #2	Cont. Loss #1 (mm/h)	Loss #2	Excess Rain #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV 3.54Ha	97.422	10.00	0.000	3.000	0.000	29.642	0.000	0.5094	26.00	0.000



TURNER DEVELOPED with osd with MV2.out

5	97.422	10.00	1.500	3.000	0.000	29.642	39.092	1.341	15.00	0.000
U/S 20.4ha	97.422	10.00	0.000	3.000	0.000	29.642	0.000	2.036	26.00	0.000
CULVERT	97.422	10.00	0.000	3.000	0.000	29.642	0.000	2.147	28.00	0.000
1	97.422	10.00	1.500	3.000	0.000	29.642	39.092	1.587	15.00	0.000
3	97.422	10.00	1.500	3.000	0.000	29.642	39.092	2.344	15.00	0.000
6	97.422	10.00	1.500	3.000	0.000	29.642	39.092	0.7701	15.00	0.000
2	97.422	10.00	1.500	3.000	0.000	29.642	39.092	1.083	15.00	0.000
4	97.422	10.00	1.500	3.000	0.000	29.642	39.092	2.949	15.00	0.000
TURNER RD	97.422	10.00	0.000	3.000	0.000	29.642	0.000	7.771	15.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	Vol. Avail	Basin Vol. Used	Stage Used
TURNER RD	15.00	7.771	25.00	4.765	13453.4	0.0000	2818.3	95.120

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54Ha	1.06	.0600	0.7688	0.5104	1.0	0.000	0.000	0.000
5	2.79	.0130	0.0676	1.346	1.0	0.000	0.000	0.000
U/S 20.4ha	1.83	.0300	0.2688	2.036	1.0	0.000	0.000	0.000
CULVERT	1.86	.0300	0.2766	2.149	1.0	0.000	0.000	0.000
1	3.01	.0130	0.0750	1.615	1.0	0.000	0.000	0.000
3	3.42	.0130	0.0945	2.318	1.0	0.000	0.000	0.000
6	0.794	.0600	0.1430	0.8053	1.0	0.000	0.000	0.000
2	2.61	.0130	0.0594	1.107	1.0	0.000	0.000	0.000
4	1.26	.0600	0.3250	2.934	1.0	0.000	0.000	0.000

LINK MV 3.54Ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.978  
 ESTIMATED PEAK FLOW (CUMECS) = 0.66  
 ESTIMATED TIME TO PEAK (MINS) = 39.00

TURNER DEVELOPED with osd with MV2.out

LINK 5 1.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.596  
ESTIMATED PEAK FLOW (CUMECS) = 1.59  
ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK U/S 20.4ha 2.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 11.40  
ESTIMATED PEAK FLOW (CUMECS) = 2.92  
ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK CULVERT 2.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 11.83  
ESTIMATED PEAK FLOW (CUMECS) = 3.01  
ESTIMATED TIME TO PEAK (MINS) = 48.00

LINK 1 3.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.326  
ESTIMATED PEAK FLOW (CUMECS) = 1.54  
ESTIMATED TIME TO PEAK (MINS) = 27.00

LINK 3 3.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.359  
ESTIMATED PEAK FLOW (CUMECS) = 2.26  
ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK 6 4.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.094  
ESTIMATED PEAK FLOW (CUMECS) = 0.74  
ESTIMATED TIME TO PEAK (MINS) = 27.00

LINK 2 5.000  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.564  
ESTIMATED PEAK FLOW (CUMECS) = 1.04  
ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK 4 5.001  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.279  
ESTIMATED PEAK FLOW (CUMECS) = 2.84  
ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK TURNER RD 1.002  
ESTIMATED VOLUME (CU METRES\*10\*\*3) = 24.65  
ESTIMATED PEAK FLOW (CUMECS) = 8.86  
ESTIMATED TIME TO PEAK (MINS) = 30.00

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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TURNER DEVELOPED with osd with MV2.out

ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 90.  
 RETURN PERIOD (YRS) = 50.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss		Cont. Loss		Excess Rain		Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
		#1 (mm)	#2	#1 (mm/h)	#2	#1 (mm)	#2			
MV 3.54Ha	46.466	10.00	0.000	3.000	0.000	55.749	0.000	0.6551	39.00	0.000
5	46.466	10.00	1.500	3.000	0.000	55.749	68.199	1.593	30.00	0.000
U/S 20.4ha	46.466	10.00	0.000	3.000	0.000	55.749	0.000	2.921	46.00	0.000
CULVERT	46.466	10.00	0.000	3.000	0.000	55.749	0.000	3.006	48.00	0.000
1	46.466	10.00	1.500	3.000	0.000	55.749	68.199	1.536	27.00	0.000
3	46.466	10.00	1.500	3.000	0.000	55.749	68.199	2.257	30.00	0.000
6	46.466	10.00	1.500	3.000	0.000	55.749	68.199	0.7381	27.00	0.000
2	46.466	10.00	1.500	3.000	0.000	55.749	68.199	1.039	30.00	0.000
4	46.466	10.00	1.500	3.000	0.000	55.749	68.199	2.844	30.00	0.000
TURNER RD	46.466	10.00	0.000	3.000	0.000	55.749	0.000	8.860	30.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	Basin		
						----- Vol. Avail	----- Vol. Used	----- Stage Used
TURNER RD	30.00	8.860	35.00	6.215	24654.5	0.0000	3177.4	95.268

TURNER DEVELOPED with osd with MV2.out  
SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54ha	1.11	.0600	0.9094	0.6551	1.0	0.000	0.000	0.000
5	2.96	.0130	0.0750	1.590	1.0	0.000	0.000	0.000
U/S 20.4ha	2.03	.0300	0.3281	2.922	1.0	0.000	0.000	0.000
CULVERT	2.05	.0300	0.3328	3.005	1.0	0.000	0.000	0.000
1	2.99	.0130	0.0734	1.569	1.0	0.000	0.000	0.000
3	3.41	.0130	0.0922	2.255	1.0	0.000	0.000	0.000
6	0.788	.0600	0.1391	0.7777	1.0	0.000	0.000	0.000
2	2.57	.0130	0.0578	1.060	1.0	0.000	0.000	0.000
4	1.25	.0600	0.3187	2.849	1.0	0.000	0.000	0.000

LINK MV 3.54ha                    1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) =                    2.200  
ESTIMATED PEAK FLOW (CUMECS) =                    0.68  
ESTIMATED TIME TO PEAK (MINS) =                    46.00

LINK 5                                    1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) =                    3.999  
ESTIMATED PEAK FLOW (CUMECS) =                    1.38  
ESTIMATED TIME TO PEAK (MINS) =                    40.00

LINK U/S 20.4ha                    2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) =                    12.69  
ESTIMATED PEAK FLOW (CUMECS) =                    2.95  
ESTIMATED TIME TO PEAK (MINS) =                    58.00

LINK CULVERT                            2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) =                    13.18  
ESTIMATED PEAK FLOW (CUMECS) =                    3.03  
ESTIMATED TIME TO PEAK (MINS) =                    59.00

LINK 1                                    3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) =                    2.583  
ESTIMATED PEAK FLOW (CUMECS) =                    1.46  
ESTIMATED TIME TO PEAK (MINS) =                    32.00

LINK 3                                    3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) =                    3.730  
ESTIMATED PEAK FLOW (CUMECS) =                    2.11

TURNER DEVELOPED with osd with MV2.out  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.215  
 ESTIMATED PEAK FLOW (CUMECS) = 0.71  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.737  
 ESTIMATED PEAK FLOW (CUMECS) = 0.99  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.755  
 ESTIMATED PEAK FLOW (CUMECS) = 2.66  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 27.43  
 ESTIMATED PEAK FLOW (CUMECS) = 7.91  
 ESTIMATED TIME TO PEAK (MINS) = 40.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 120.  
 RETURN PERIOD (YRS) = 50.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2	#1 (%)	#2	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000

TURNER DEVELOPED with osd with MV2.out

4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2 (mm)	Cont. #1 (mm/h)	Loss #2 (mm/h)	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV 3.54Ha	38.609	10.00	0.000	3.000	0.000	62.068	0.000	0.6834	46.00	0.000
5	38.609	10.00	1.500	3.000	0.000	62.068	75.718	1.378	40.00	0.000
U/S 20.4ha	38.609	10.00	0.000	3.000	0.000	62.068	0.000	2.950	58.00	0.000
CULVERT	38.609	10.00	0.000	3.000	0.000	62.068	0.000	3.032	59.00	0.000
1	38.609	10.00	1.500	3.000	0.000	62.068	75.718	1.455	32.00	0.000
3	38.609	10.00	1.500	3.000	0.000	62.068	75.718	2.114	35.00	0.000
6	38.609	10.00	1.500	3.000	0.000	62.068	75.718	0.7112	32.00	0.000
2	38.609	10.00	1.500	3.000	0.000	62.068	75.718	0.9913	32.00	0.000
4	38.609	10.00	1.500	3.000	0.000	62.068	75.718	2.660	35.00	0.000
TURNER RD	38.609	10.00	0.000	3.000	0.000	62.068	0.000	7.908	40.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	Vol. Avail	Basin Vol. Used	Stage Used
TURNER RD	40.00	7.907	44.00	6.445	27428.7	0.0000	3234.4	95.291

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54Ha	1.12	.0600	0.9375	0.6837	1.0	0.000	0.000	0.000
5	2.78	.0130	0.0688	1.369	1.0	0.000	0.000	0.000
U/S 20.4ha	2.04	.0300	0.3297	2.951	1.0	0.000	0.000	0.000
CULVERT	2.06	.0300	0.3344	3.031	1.0	0.000	0.000	0.000
1	2.90	.0130	0.0711	1.475	1.0	0.000	0.000	0.000
3	3.31	.0130	0.0891	2.111	1.0	0.000	0.000	0.000
6	0.707	.0600	0.1359	0.6817	1.0	0.000	0.000	0.000
2	2.50	.0130	0.0563	1.003	1.0	0.000	0.000	0.000

TURNER DEVELOPED with osd with MV2.out

4 1.21 .0600 0.3063 2.643 1.0 0.000 0.000 0.000

LINK MV 3.54ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.213  
 ESTIMATED PEAK FLOW (CUMECS) = 0.62  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.240  
 ESTIMATED PEAK FLOW (CUMECS) = 1.56  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 6.924  
 ESTIMATED PEAK FLOW (CUMECS) = 2.39  
 ESTIMATED TIME TO PEAK (MINS) = 26.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 7.190  
 ESTIMATED PEAK FLOW (CUMECS) = 2.52  
 ESTIMATED TIME TO PEAK (MINS) = 28.00

LINK 1 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.475  
 ESTIMATED PEAK FLOW (CUMECS) = 1.78  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.130  
 ESTIMATED PEAK FLOW (CUMECS) = 2.63  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.6941  
 ESTIMATED PEAK FLOW (CUMECS) = 0.86  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.9925  
 ESTIMATED PEAK FLOW (CUMECS) = 1.21  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.715  
 ESTIMATED PEAK FLOW (CUMECS) = 3.33  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 15.27  
 ESTIMATED PEAK FLOW (CUMECS) = 8.97  
 ESTIMATED TIME TO PEAK (MINS) = 15.00

TURNER DEVELOPED with osd with MV2.out

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 25.  
RETURN PERIOD (YRS) = 100.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2	#1 (%)	#2	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss		Cont. Loss		Excess Rain		Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
		#1 (mm)	#2	#1 (mm/h)	#2	#1 (mm)	#2			
MV 3.54Ha	108.36	10.00	0.000	3.000	0.000	34.151	0.000	0.6154	26.00	0.000
5	108.36	10.00	1.500	3.000	0.000	34.151	43.651	1.562	15.00	0.000
U/S 20.4ha	108.36	10.00	0.000	3.000	0.000	34.151	0.000	2.390	26.00	0.000
CULVERT	108.36	10.00	0.000	3.000	0.000	34.151	0.000	2.520	28.00	0.000
1	108.36	10.00	1.500	3.000	0.000	34.151	43.651	1.783	15.00	0.000
3	108.36	10.00	1.500	3.000	0.000	34.151	43.651	2.627	15.00	0.000
6	108.36	10.00	1.500	3.000	0.000	34.151	43.651	0.8619	15.00	0.000
2	108.36	10.00	1.500	3.000	0.000	34.151	43.651	1.212	15.00	0.000
4	108.36	10.00	1.500	3.000	0.000	34.151	43.651	3.327	15.00	0.000
TURNER RD	108.36	10.00	0.000	3.000	0.000	34.151	0.000	8.966	15.00	0.000



TURNER DEVELOPED with osd with MV2.out

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	----- Vol. Avail	Basin Vol. Used	----- Stage Used
TURNER RD	15.00	8.965	23.00	5.761	15271.5	0.0000	3065.0	95.222

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54Ha	1.10	.0600	0.8719	0.6166	1.0	0.000	0.000	0.000
5	2.95	.0130	0.0742	1.569	1.0	0.000	0.000	0.000
U/S 20.4ha	1.92	.0300	0.2938	2.390	1.0	0.000	0.000	0.000
CULVERT	1.94	.0300	0.3031	2.519	1.0	0.000	0.000	0.000
1	3.16	.0130	0.0801	1.812	1.0	0.000	0.000	0.000
3	3.59	.0130	0.1012	2.606	1.0	0.000	0.000	0.000
6	0.822	.0600	0.1531	0.8933	1.0	0.000	0.000	0.000
2	2.74	.0130	0.0637	1.247	1.0	0.000	0.000	0.000
4	1.31	.0600	0.3500	3.274	1.0	0.000	0.000	0.000

LINK MV 3.54Ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.259  
 ESTIMATED PEAK FLOW (CUMECS) = 0.77  
 ESTIMATED TIME TO PEAK (MINS) = 38.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.072  
 ESTIMATED PEAK FLOW (CUMECS) = 1.82  
 ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 12.98  
 ESTIMATED PEAK FLOW (CUMECS) = 3.42  
 ESTIMATED TIME TO PEAK (MINS) = 46.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 13.47  
 ESTIMATED PEAK FLOW (CUMECS) = 3.52  
 ESTIMATED TIME TO PEAK (MINS) = 47.00

TURNER DEVELOPED with osd with MV2.out  
3.000

LINK 1

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.607  
ESTIMATED PEAK FLOW (CUMECS) = 1.71  
ESTIMATED TIME TO PEAK (MINS) = 27.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.764  
ESTIMATED PEAK FLOW (CUMECS) = 2.52  
ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.225  
ESTIMATED PEAK FLOW (CUMECS) = 0.82  
ESTIMATED TIME TO PEAK (MINS) = 27.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.752  
ESTIMATED PEAK FLOW (CUMECS) = 1.16  
ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.794  
ESTIMATED PEAK FLOW (CUMECS) = 3.18  
ESTIMATED TIME TO PEAK (MINS) = 30.00

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 27.89  
ESTIMATED PEAK FLOW (CUMECS) = 10.17  
ESTIMATED TIME TO PEAK (MINS) = 30.00

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Results for period from 12: 0.0 23/ 5/2006  
to 3: 0.0 24/ 5/2006

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#####

ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 90.  
RETURN PERIOD (YRS) = 100.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2	
MV 3.54ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
u/s 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000

TURNER DEVELOPED with osd with MV2.out

CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV 3.54Ha	51.681	10.00	0.000	3.000	0.000	63.572	0.000	0.7675	38.00	0.000
5	51.681	10.00	1.500	3.000	0.000	63.572	76.022	1.824	30.00	0.000
U/S 20.4ha	51.681	10.00	0.000	3.000	0.000	63.572	0.000	3.416	46.00	0.000
CULVERT	51.681	10.00	0.000	3.000	0.000	63.572	0.000	3.516	47.00	0.000
1	51.681	10.00	1.500	3.000	0.000	63.572	76.022	1.714	27.00	0.000
3	51.681	10.00	1.500	3.000	0.000	63.572	76.022	2.521	30.00	0.000
6	51.681	10.00	1.500	3.000	0.000	63.572	76.022	0.8175	27.00	0.000
2	51.681	10.00	1.500	3.000	0.000	63.572	76.022	1.155	30.00	0.000
4	51.681	10.00	1.500	3.000	0.000	63.572	76.022	3.175	30.00	0.000
TURNER RD	51.681	10.00	0.000	3.000	0.000	63.572	0.000	10.169	30.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	Basin Vol. Avail	Basin Vol. Used	Stage Used
TURNER RD	30.00	10.17	34.00	7.697	27888.4	0.0000	3496.3	95.399

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54Ha	1.14	.0600	1.013	0.7676	1.0	0.000	0.000	0.000
5	3.14	.0130	0.0813	1.828	1.0	0.000	0.000	0.000
U/S 20.4ha	2.13	.0300	0.3563	3.415	1.0	0.000	0.000	0.000

TURNER DEVELOPED with osd with MV2.out

CULVERT	2.15	.0300	0.3625	3.514	1.0	0.000	0.000	0.000
1	3.13	.0130	0.0781	1.751	1.0	0.000	0.000	0.000
3	3.55	.0130	0.0988	2.521	1.0	0.000	0.000	0.000
6	0.814	.0600	0.1484	0.8570	1.0	0.000	0.000	0.000
2	2.69	.0130	0.0617	1.184	1.0	0.000	0.000	0.000
4	1.29	.0600	0.3406	3.145	1.0	0.000	0.000	0.000

LINK MV 3.54ha 1.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.504  
 ESTIMATED PEAK FLOW (CUMECS) = 0.80  
 ESTIMATED TIME TO PEAK (MINS) = 45.00

LINK 5 1.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.517  
 ESTIMATED PEAK FLOW (CUMECS) = 1.59  
 ESTIMATED TIME TO PEAK (MINS) = 40.00

LINK U/S 20.4ha 2.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 14.45  
 ESTIMATED PEAK FLOW (CUMECS) = 3.43  
 ESTIMATED TIME TO PEAK (MINS) = 53.00

LINK CULVERT 2.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 15.00  
 ESTIMATED PEAK FLOW (CUMECS) = 3.53  
 ESTIMATED TIME TO PEAK (MINS) = 52.00

LINK 1 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.895  
 ESTIMATED PEAK FLOW (CUMECS) = 1.62  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 3 3.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 4.179  
 ESTIMATED PEAK FLOW (CUMECS) = 2.36  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

LINK 6 4.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.361  
 ESTIMATED PEAK FLOW (CUMECS) = 0.79  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 2 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.946  
 ESTIMATED PEAK FLOW (CUMECS) = 1.10  
 ESTIMATED TIME TO PEAK (MINS) = 32.00

LINK 4 5.001

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 5.324  
 ESTIMATED PEAK FLOW (CUMECS) = 2.97  
 ESTIMATED TIME TO PEAK (MINS) = 35.00

TURNER DEVELOPED with osd with MV2.out

LINK TURNER RD 1.002

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 31.00  
 ESTIMATED PEAK FLOW (CUMECS) = 9.08  
 ESTIMATED TIME TO PEAK (MINS) = 40.00

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Results for period from 12: 0.0 23/ 5/2006  
 to 3: 0.0 24/ 5/2006

#####  
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ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 120.  
 RETURN PERIOD (YRS) = 100.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 29.58  
 TOTAL OF SECOND SUB-AREAS (ha) = 11.93  
 TOTAL OF ALL SUB-AREAS (ha) = 41.51

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area		Slope		% Impervious		Pern		B		Link No.
	#1 (ha)	#2	#1 (%)	#2 (%)	#1 (%)	#2 (%)	#1	#2	#1	#2	
MV 3.54Ha	3.540	0.000	5.000	0.000	0.000	0.000	.060	0.00	.0434	0.000	1.000
5	0.6220	1.865	5.000	5.000	0.000	100.0	.030	.013	.0103	.0008	1.001
U/S 20.4ha	20.400	0.000	6.000	0.000	0.000	0.000	.060	0.00	.0986	0.000	2.000
CULVERT	0.7800	0.000	2.800	0.000	0.000	0.000	.030	0.00	.0155	0.000	2.001
1	0.8940	2.681	8.000	8.000	0.000	100.0	.030	.013	.0098	.0008	3.000
3	0.3960	1.190	8.000	8.000	0.000	100.0	.030	.013	.0064	.0005	3.001
6	0.4200	1.261	8.000	8.000	0.000	100.0	.030	.013	.0066	.0005	4.000
2	0.6010	1.802	8.000	8.000	0.000	100.0	.030	.013	.0080	.0007	5.000
4	1.043	3.130	8.000	8.000	0.000	100.0	.030	.013	.0107	.0009	5.001
TURNER RD	0.8820	0.000	2.500	0.000	0.000	0.000	.030	0.00	.0175	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Loss #2	Cont. Loss #1 (mm/h)	Loss #2	Excess Rain #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
MV 3.54Ha	42.954	10.00	0.000	3.000	0.000	70.657	0.000	0.8019	45.00	0.000
5	42.954	10.00	1.500	3.000	0.000	70.657	84.407	1.587	40.00	0.000
U/S 20.4ha	42.954	10.00	0.000	3.000	0.000	70.657	0.000	3.431	53.00	0.000
CULVERT	42.954	10.00	0.000	3.000	0.000	70.657	0.000	3.532	52.00	0.000
1	42.954	10.00	1.500	3.000	0.000	70.657	84.407	1.624	32.00	0.000

TURNER DEVELOPED with osd with MV2.out

3	42.954	10.00	1.500	3.000	0.000	70.657	84.407	2.358	35.00	0.000
6	42.954	10.00	1.500	3.000	0.000	70.657	84.407	0.7899	32.00	0.000
2	42.954	10.00	1.500	3.000	0.000	70.657	84.407	1.102	32.00	0.000
4	42.954	10.00	1.500	3.000	0.000	70.657	84.407	2.966	35.00	0.000
TURNER RD	42.954	10.00	0.000	3.000	0.000	70.657	0.000	9.079	40.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	Vol. Avail	Basin Vol. Used	Stage Used
TURNER RD	40.00	9.079	43.00	7.810	31004.7	0.0000	3519.5	95.409

SUMMARY OF BASIN OUTLET RESULTS

Link Label	No. of	S/D Factor (m)	Dia (m)	width (m)	Pipe Length (m)	Pipe Slope (%)
TURNER RD	1.0	1.000		0.000	20.000	0.2000

SUMMARY OF CHANNEL/FLOODWAY DATA AND RESULT

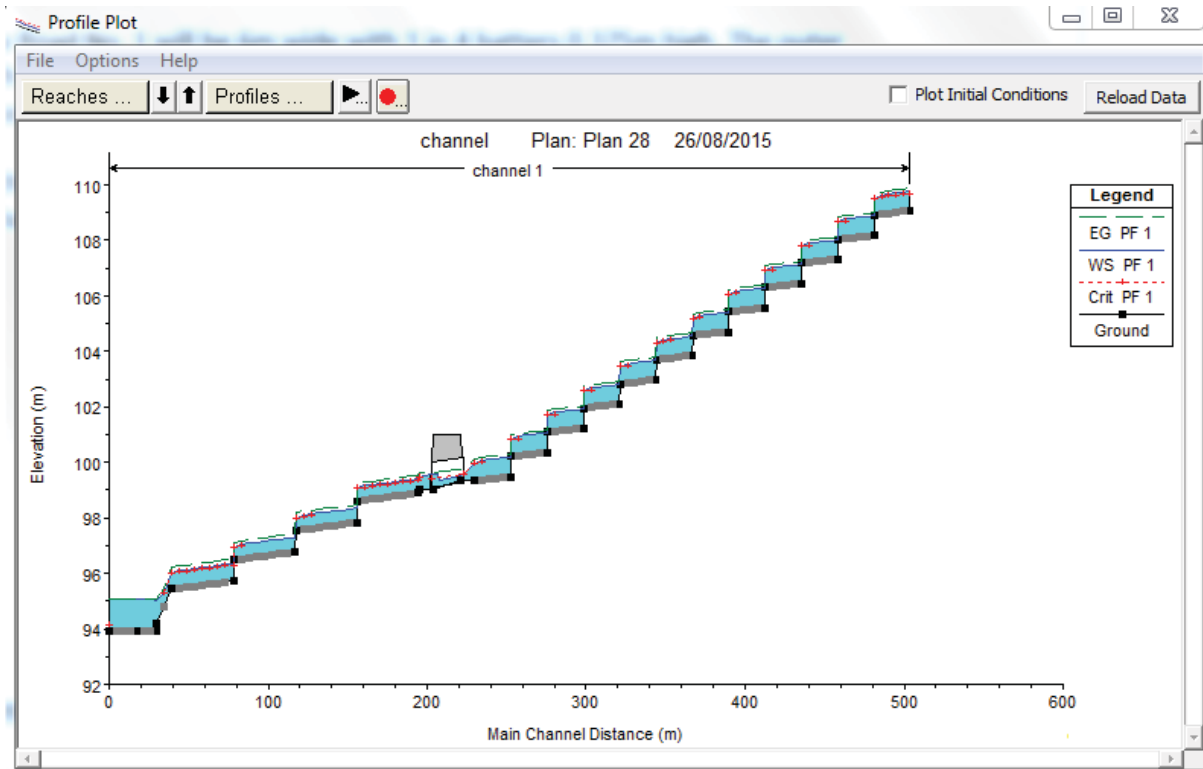
Link Label	Ave. Vel. (m/s)	Ave. Rough. (n)	Flow Depth (m)	Max. Flow (m <sup>3</sup> /s)	No. of Pipes	Pipe Dia. (m)	Pipe Slope (%)	Pipe Flow (m <sup>3</sup> /s)
MV 3.54Ha	1.16	.0600	1.038	0.8010	1.0	0.000	0.000	0.000
5	2.96	.0130	0.0746	1.583	1.0	0.000	0.000	0.000
U/S 20.4ha	2.14	.0300	0.3563	3.430	1.0	0.000	0.000	0.000
CULVERT	2.16	.0300	0.3625	3.532	1.0	0.000	0.000	0.000
1	3.03	.0130	0.0758	1.644	1.0	0.000	0.000	0.000
3	3.47	.0130	0.0949	2.361	1.0	0.000	0.000	0.000
6	0.749	.0600	0.1453	0.7721	1.0	0.000	0.000	0.000
2	2.61	.0130	0.0602	1.120	1.0	0.000	0.000	0.000
4	1.26	.0600	0.3266	2.939	1.0	0.000	0.000	0.000

Run completed at: 24th October 2017 7:10:58

mik open 0

# Annexure E – Central Channel Hydraulics – Ultimate Development Conditions

## E.1 – Hec-Ras Profile Section – Ultimate Development



**Figure E.1 – profile plot of main channel**

**Table E.1 – HEC Ras flow output**

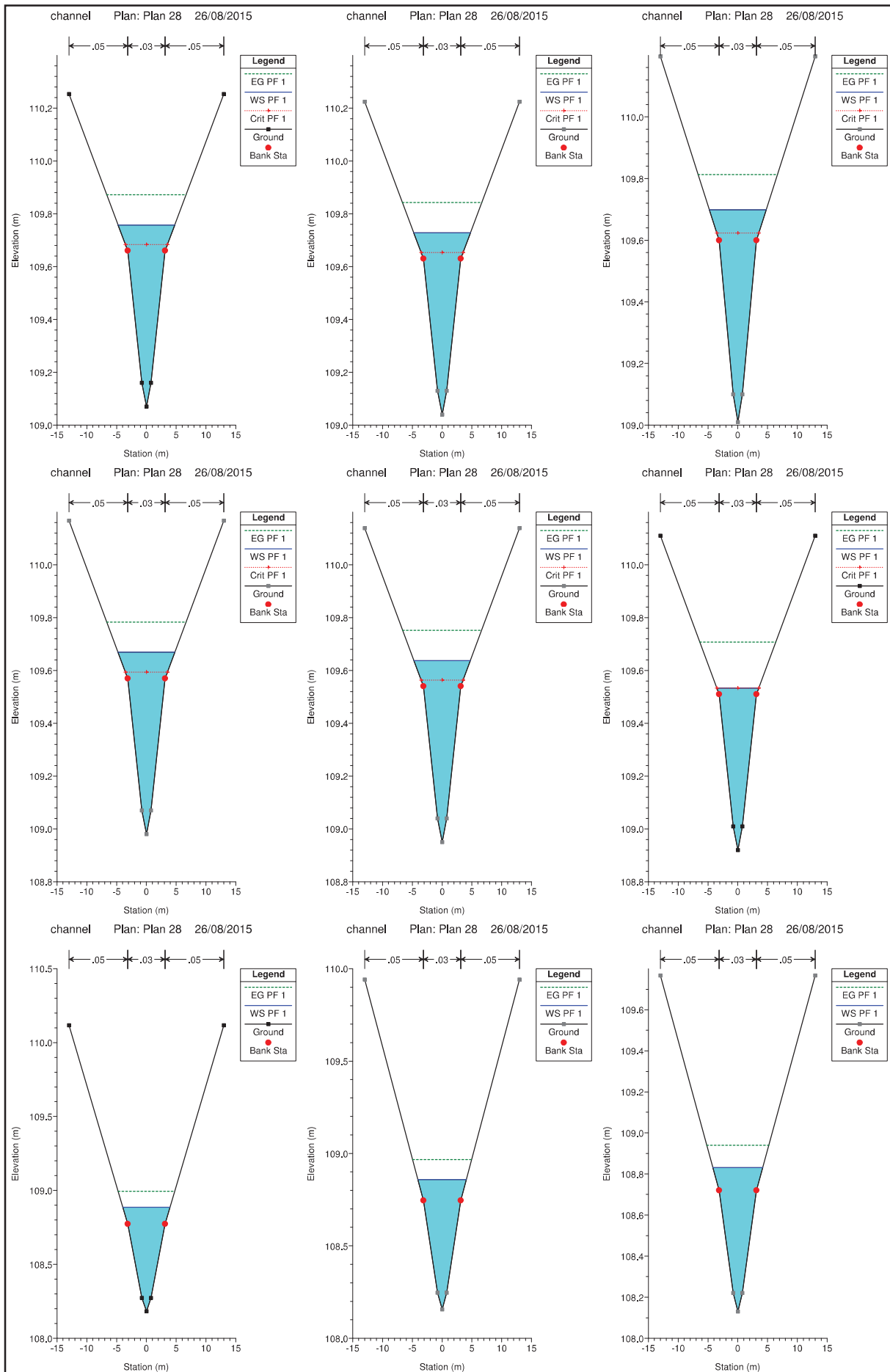
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Frd#
1	550	PF 1	4.00	109.07	109.76	109.68	109.87	0.006701	1.51	2.79	9.54	0.74
1	545.57*	PF 1	4.00	109.04	109.73	109.65	109.84	0.006661	1.50	2.80	9.56	0.74
1	541.14*	PF 1	4.00	109.01	109.70	109.62	109.81	0.006644	1.50	2.80	9.56	0.74
1	536.71*	PF 1	4.00	108.98	109.67	109.59	109.78	0.006599	1.50	2.81	9.58	0.74
1	532.28*	PF 1	4.00	108.95	109.64	109.56	109.75	0.006729	1.51	2.78	9.49	0.75
1	527.85	PF 1	4.00	108.92	109.53	109.53	109.71	0.013065	1.85	2.17	7.07	1.01
1	527.5	PF 1	4.00	108.18	108.89		108.99	0.005994	1.46	2.82	7.95	0.71
1	523.07*	PF 1	4.00	108.16	108.86		108.97	0.005977	1.46	2.83	8.16	0.71
1	518.64*	PF 1	4.00	108.13	108.83		108.94	0.006031	1.46	2.84	8.40	0.71
1	514.21*	PF 1	4.00	108.10	108.80		108.91	0.006034	1.46	2.85	8.74	0.71
1	509.78*	PF 1	4.00	108.08	108.77	108.69	108.88	0.006413	1.49	2.81	9.02	0.73
1	505.35	PF 1	4.00	108.05	108.66	108.66	108.84	0.013068	1.85	2.17	7.07	1.01
1	505	PF 1	4.00	107.31	108.02		108.12	0.005989	1.46	2.82	7.95	0.71
1	500.57*	PF 1	4.00	107.29	107.99		108.10	0.005970	1.46	2.83	8.16	0.71
1	496.14*	PF 1	4.00	107.26	107.96		108.07	0.006036	1.46	2.84	8.39	0.71
1	491.71*	PF 1	4.00	107.23	107.93		108.04	0.006037	1.46	2.85	8.74	0.71
1	487.28*	PF 1	4.00	107.21	107.90	107.82	108.01	0.006404	1.49	2.81	9.02	0.73
1	482.85	PF 1	4.00	107.18	107.79	107.79	107.97	0.013063	1.85	2.17	7.07	1.01
1	482.5	PF 1	4.00	106.44	107.15		107.25	0.005996	1.46	2.82	7.95	0.71
1	478.07*	PF 1	4.00	106.42	107.12		107.23	0.005980	1.46	2.83	8.16	0.71
1	473.64*	PF 1	4.00	106.39	107.09		107.20	0.006038	1.46	2.84	8.40	0.71
1	469.21*	PF 1	4.00	106.36	107.06		107.17	0.006039	1.46	2.85	8.73	0.71

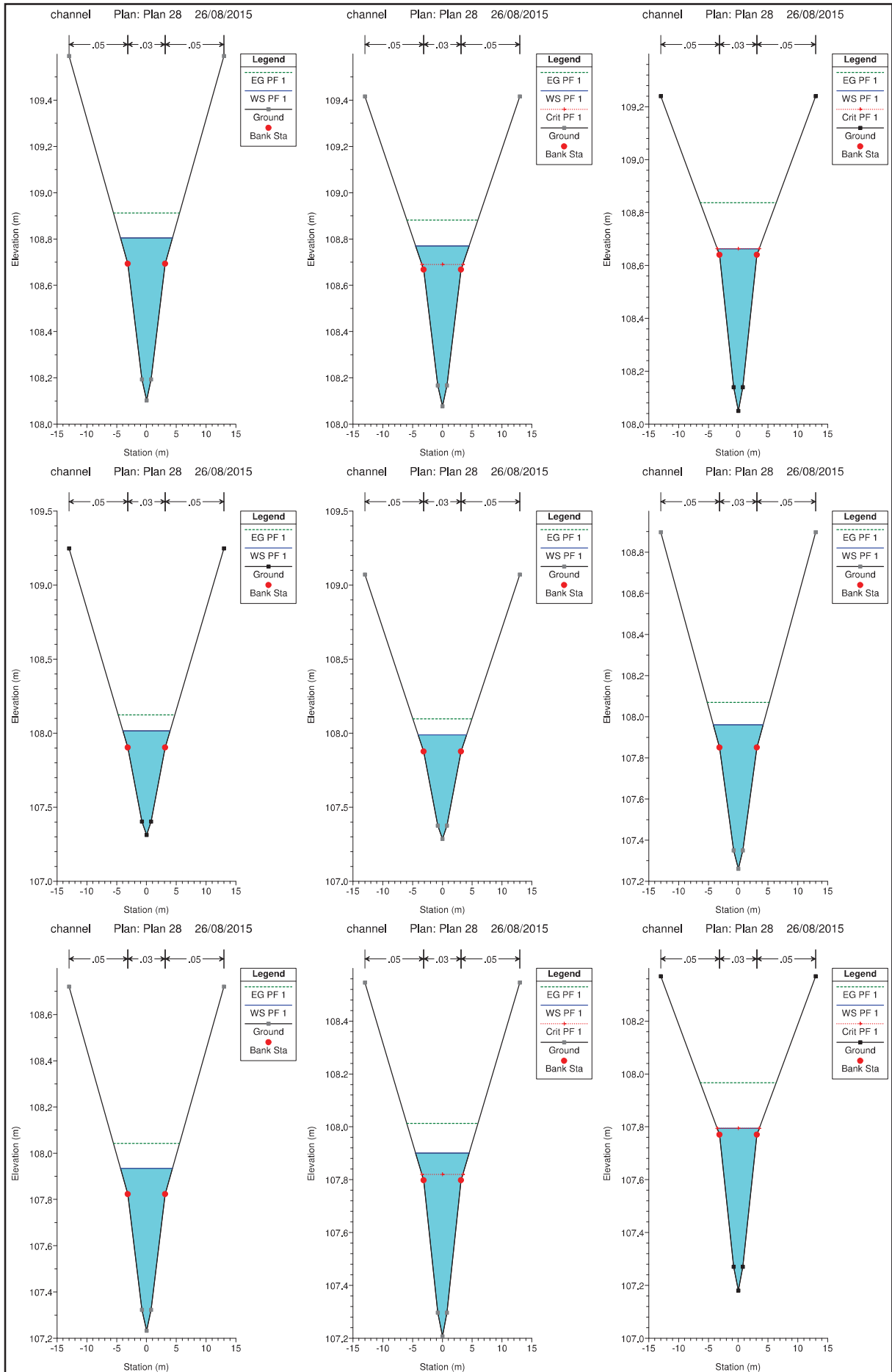
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Frd#
1	464.78*	PF 1	4.00	106.34	107.03	106.95	107.14	0.006408	1.49	2.81	9.02	0.73
1	460.35	PF 1	4.00	106.31	106.92	106.92	107.10	0.013054	1.85	2.17	7.07	1.01
1	460	PF 1	4.00	105.57	106.28		106.38	0.005992	1.46	2.82	7.95	0.71
1	455.57*	PF 1	4.00	105.55	106.25		106.36	0.005976	1.46	2.83	8.16	0.71
1	451.14*	PF 1	4.00	105.52	106.22		106.33	0.006041	1.46	2.83	8.39	0.71
1	446.71*	PF 1	4.00	105.49	106.19		106.30	0.006034	1.46	2.85	8.74	0.71
1	442.28*	PF 1	4.00	105.47	106.16	106.08	106.27	0.006413	1.49	2.81	9.02	0.73
1	437.85	PF 1	4.00	105.44	106.05	106.05	106.23	0.013068	1.85	2.17	7.07	1.01
1	437.5	PF 1	4.00	104.70	105.41		105.51	0.006001	1.46	2.82	7.95	0.71
1	433.07*	PF 1	4.00	104.68	105.38		105.49	0.005986	1.46	2.83	8.15	0.71
1	428.64*	PF 1	4.00	104.65	105.35		105.46	0.006062	1.46	2.83	8.38	0.71
1	424.21*	PF 1	4.00	104.62	105.32		105.43	0.006072	1.46	2.85	8.72	0.71
1	419.78*	PF 1	4.00	104.60	105.29	105.21	105.40	0.006375	1.48	2.81	9.03	0.73
1	415.35	PF 1	4.00	104.57	105.18	105.18	105.36	0.013064	1.85	2.17	7.07	1.01
1	415	PF 1	4.00	103.86	104.54		104.67	0.007271	1.55	2.63	7.60	0.77
1	410.57*	PF 1	4.00	103.83	104.51		104.63	0.007223	1.54	2.65	7.77	0.77
1	406.14*	PF 1	4.00	103.80	104.48		104.60	0.007169	1.54	2.66	8.00	0.77
1	401.71*	PF 1	4.00	103.77	104.45	104.38	104.57	0.007076	1.53	2.69	8.31	0.76
1	397.28*	PF 1	4.00	103.73	104.42	104.35	104.53	0.007042	1.53	2.71	8.72	0.76
1	392.85	PF 1	4.00	103.70	104.31	104.31	104.49	0.013065	1.85	2.17	7.07	1.01
1	392.5	PF 1	4.00	102.99	103.67		103.79	0.006955	1.53	2.68	7.68	0.76
1	388.07*	PF 1	4.00	102.96	103.64		103.76	0.006958	1.53	2.68	7.85	0.76
1	383.64*	PF 1	4.00	102.92	103.61		103.73	0.006884	1.52	2.70	8.09	0.75
1	379.21*	PF 1	4.00	102.89	103.58		103.70	0.006863	1.52	2.72	8.39	0.75
1	374.78*	PF 1	4.00	102.86	103.55	103.47	103.66	0.006816	1.52	2.74	8.82	0.75
1	370.35	PF 1	4.00	102.83	103.44	103.44	103.62	0.013068	1.85	2.17	7.07	1.01
1	370	PF 1	4.00	102.11	102.80		102.91	0.006636	1.51	2.72	7.76	0.74
1	365.57*	PF 1	4.00	102.08	102.77		102.88	0.006605	1.50	2.73	7.95	0.74
1	361.14*	PF 1	4.00	102.05	102.74		102.85	0.006565	1.50	2.75	8.20	0.74
1	356.71*	PF 1	4.00	102.02	102.71		102.82	0.006608	1.50	2.76	8.49	0.74
1	352.28*	PF 1	4.00	101.99	102.68	102.60	102.79	0.006714	1.51	2.76	8.87	0.75
1	347.85	PF 1	4.00	101.96	102.57	102.57	102.75	0.013064	1.85	2.17	7.07	1.01
1	347.5	PF 1	4.00	101.23	101.93		102.04	0.006313	1.48	2.77	7.86	0.72
1	343.07*	PF 1	4.00	101.20	101.90		102.01	0.006345	1.48	2.77	8.03	0.73
1	338.64*	PF 1	4.00	101.18	101.87		101.98	0.006368	1.49	2.78	8.27	0.73
1	334.21*	PF 1	4.00	101.15	101.84		101.95	0.006318	1.48	2.80	8.61	0.73
1	329.78*	PF 1	4.00	101.12	101.81	101.73	101.92	0.006512	1.49	2.79	8.96	0.74
1	325.35	PF 1	4.00	101.09	101.70	101.70	101.88	0.013064	1.85	2.17	7.07	1.01
1	325	PF 1	4.00	100.35	101.06		101.16	0.005992	1.46	2.82	7.95	0.71
1	320.57*	PF 1	4.00	100.33	101.03		101.14	0.005977	1.46	2.83	8.16	0.71
1	316.14*	PF 1	4.00	100.30	101.00		101.11	0.006044	1.46	2.83	8.39	0.71
1	311.71*	PF 1	4.00	100.27	100.97		101.08	0.006039	1.46	2.85	8.74	0.71
1	307.28*	PF 1	4.00	100.25	100.94	100.86	101.05	0.006422	1.49	2.81	9.01	0.73
1	302.85	PF 1	4.00	100.22	100.83	100.83	101.01	0.013068	1.85	2.17	7.07	1.01
1	302.5	PF 1	4.00	99.48	100.18		100.29	0.005698	1.44	2.87	8.04	0.69
1	298.*	PF 1	4.00	99.45	100.16		100.26	0.005733	1.44	2.88	8.25	0.69
1	293.5*	PF 1	4.00	99.43	100.13		100.24	0.005781	1.44	2.88	8.50	0.70
1	289.*	PF 1	4.00	99.40	100.10		100.21	0.005858	1.45	2.89	8.82	0.70
1	284.5*	PF 1	4.00	99.37	100.07	99.99	100.18	0.006217	1.47	2.84	9.12	0.72
1	280	PF 1	4.00	99.35	99.96	99.96	100.14	0.012899	1.84	2.18	7.11	1.00
1	262.5											
1	245	PF 1	5.90	99.00	99.45	99.45	99.63	0.012510	1.85	3.21	10.35	0.99
1	244.65	PF 1	5.90	98.89	99.41	99.34	99.53	0.007265	1.57	3.86	11.79	0.78
1	239.862*	PF 1	5.90	98.85	99.37	99.31	99.50	0.007250	1.57	3.86	11.80	0.78
1	235.075*	PF 1	5.90	98.82	99.34	99.27	99.46	0.007224	1.57	3.86	11.83	0.78
1	230.287*	PF 1	5.90	98.79	99.30	99.24	99.43	0.007202	1.57	3.87	11.85	0.78
1	225.5*	PF 1	5.90	98.75	99.27	99.20	99.39	0.007155	1.56	3.88	11.88	0.77
1	220.712*	PF 1	5.90	98.71	99.24	99.17	99.36	0.007089	1.56	3.89	11.93	0.77
1	215.925*	PF 1	5.90	98.68	99.20	99.13	99.32	0.007000	1.55	3.91	11.99	0.77
1	211.137*	PF 1	5.90	98.64	99.17	99.10	99.29	0.006985	1.55	3.91	12.00	0.76
1	206.35	PF 1	5.90	98.61	99.06	99.06	99.24	0.012743	1.86	3.17	9.66	1.00
1	206	PF 1	5.90	97.84	98.35		98.48	0.007480	1.59	3.76	10.27	0.79
1	201.168*	PF 1	5.90	97.80	98.32		98.45	0.007484	1.59	3.77	10.36	0.79
1	196.337*	PF 1	5.90	97.77	98.28		98.41	0.007425	1.58	3.78	10.48	0.79
1	191.506*	PF 1	5.90	97.73	98.25		98.37	0.007413	1.58	3.79	10.60	0.79
1	186.675*	PF 1	5.90	97.70	98.21		98.34	0.007391	1.58	3.80	10.75	0.78
1	181.843*	PF 1	5.90	97.66	98.18		98.30	0.007343	1.58	3.81	10.94	0.78
1	177.012*	PF 1	5.90	97.62	98.14	98.08	98.27	0.007286	1.57	3.83	11.18	0.78



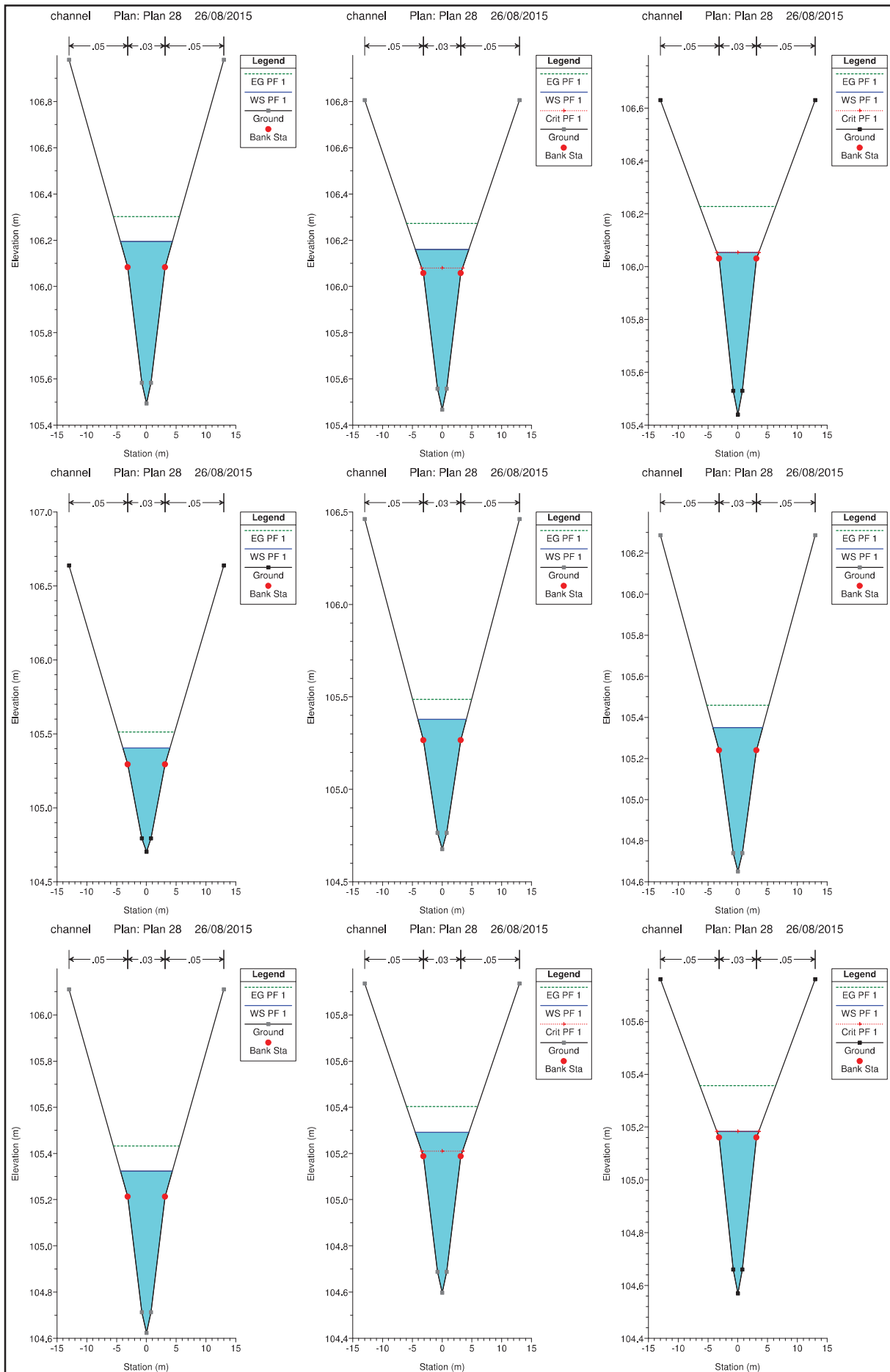
1	172.181*	PF 1	5.90	97.59	98.11	98.04	98.23	0.007080	1.56	3.88	11.57	0.77
1	167.35	PF 1	5.90	97.55	98.00	98.00	98.18	0.012749	1.86	3.17	9.67	1.00
1	167	PF 1	5.90	96.78	97.30		97.42	0.007466	1.59	3.77	10.28	0.79
1	162.168*	PF 1	5.90	96.74	97.26		97.39	0.007455	1.58	3.77	10.35	0.79
1	157.337*	PF 1	5.90	96.71	97.22		97.35	0.007459	1.59	3.77	10.43	0.79
1	152.506*	PF 1	5.90	96.67	97.19		97.31	0.007383	1.58	3.79	10.56	0.78
1	147.675*	PF 1	5.90	96.64	97.15		97.28	0.007350	1.58	3.80	10.68	0.78
1	142.843*	PF 1	5.90	96.60	97.12		97.24	0.007304	1.57	3.81	10.83	0.78
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Frd#
1	138.012*	PF 1	5.90	96.56	97.08		97.21	0.007241	1.57	3.83	11.01	0.78
1	133.181*	PF 1	5.90	96.53	97.05	96.98	97.17	0.007125	1.56	3.86	11.26	0.77
1	128.35	PF 1	5.90	96.49	96.94	96.94	97.12	0.012745	1.86	3.17	9.57	1.00
1	128	PF 1	8.90	95.72	96.35	96.29	96.52	0.007563	1.87	4.98	11.83	0.83
1	123.168*	PF 1	8.90	95.68	96.31	96.26	96.49	0.007587	1.87	4.99	12.00	0.83
1	118.337*	PF 1	8.90	95.65	96.27	96.22	96.45	0.007526	1.87	5.02	12.21	0.82
1	113.506*	PF 1	8.90	95.61	96.24	96.18	96.41	0.007522	1.86	5.04	12.44	0.82
1	108.675*	PF 1	8.90	95.57	96.20	96.15	96.38	0.007499	1.86	5.07	12.73	0.82
1	103.843*	PF 1	8.90	95.54	96.17	96.11	96.34	0.007463	1.86	5.10	13.07	0.82
1	99.0125*	PF 1	8.90	95.50	96.13	96.08	96.30	0.007366	1.85	5.16	13.51	0.81
1	94.1812*	PF 1	8.90	95.47	96.10	96.04	96.26	0.007224	1.84	5.24	14.08	0.81
1	89.35	PF 1	8.90	95.43	96.01	96.01	96.22	0.010345	2.05	4.59	13.22	0.95
1	84.675*	PF 1	8.90	94.82	95.28	95.28	95.48	0.010931	2.01	4.72	13.01	0.97
1	80	PF 1	8.90	94.20	95.03		95.07	0.000949	0.91	11.55	17.24	0.32
1	79.84	PF 1	8.90	93.90	95.04		95.06	0.000378	0.69	14.88	17.32	0.21
1	76.06*	PF 1	8.90	93.90	95.05		95.06	0.000180	0.48	20.23	21.67	0.14
1	72.28*	PF 1	8.90	93.90	95.05		95.06	0.000105	0.36	25.63	25.97	0.11
1	68.5	PF 1	8.90	93.90	95.05		95.06	0.000068	0.29	31.12	30.26	0.09
1	63.875*	PF 1	8.90	93.90	95.05		95.06	0.000068	0.29	31.11	30.26	0.09
1	59.25*	PF 1	8.90	93.90	95.05		95.06	0.000068	0.29	31.10	30.26	0.09
1	54.625*	PF 1	8.90	93.90	95.05		95.05	0.000068	0.29	31.09	30.26	0.09
1	50	PF 1	8.90	93.90	95.05	94.13	95.05	0.000068	0.29	31.08	30.25	0.09

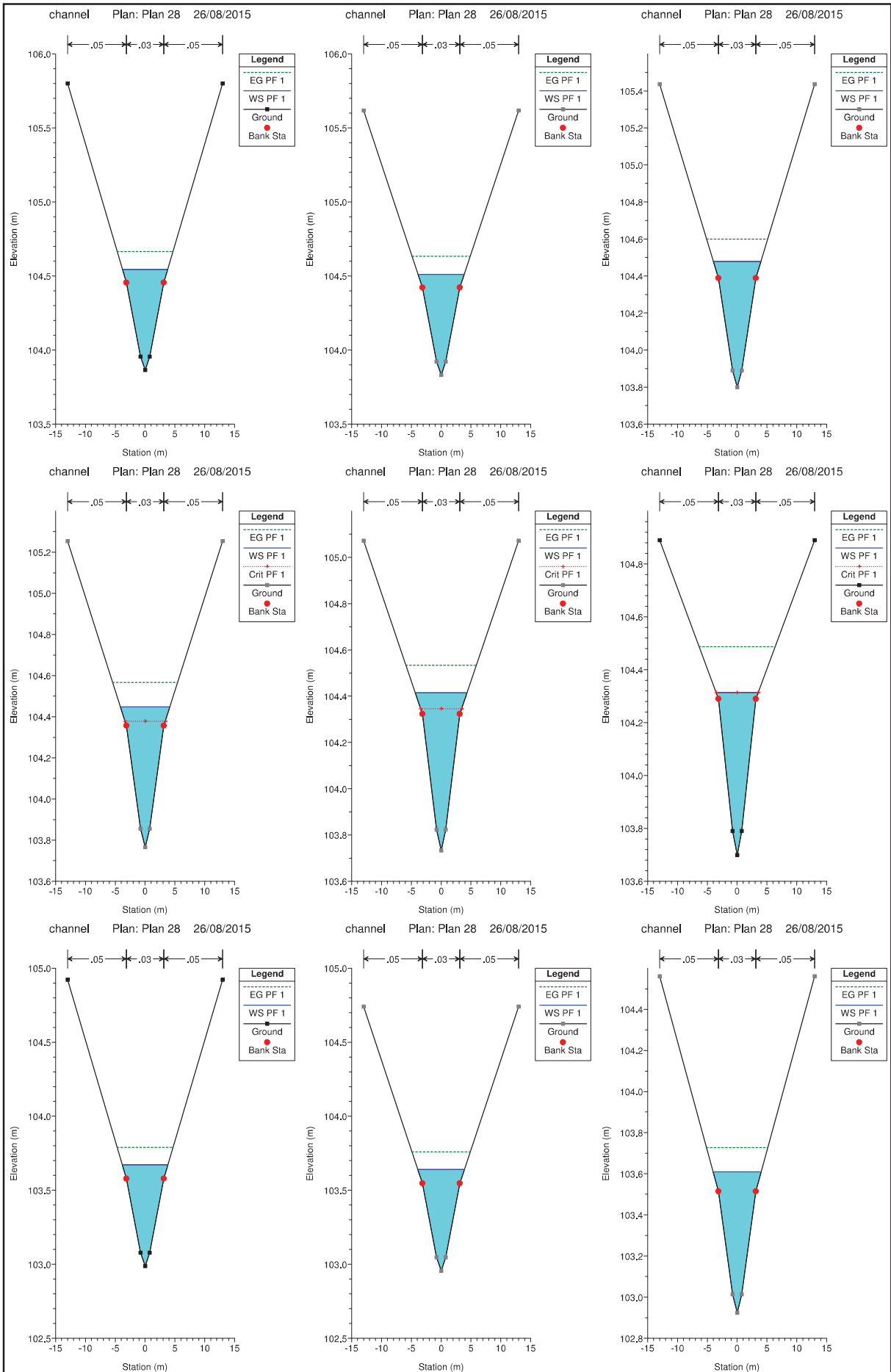
## E.2 – Hec-Ras cross sections

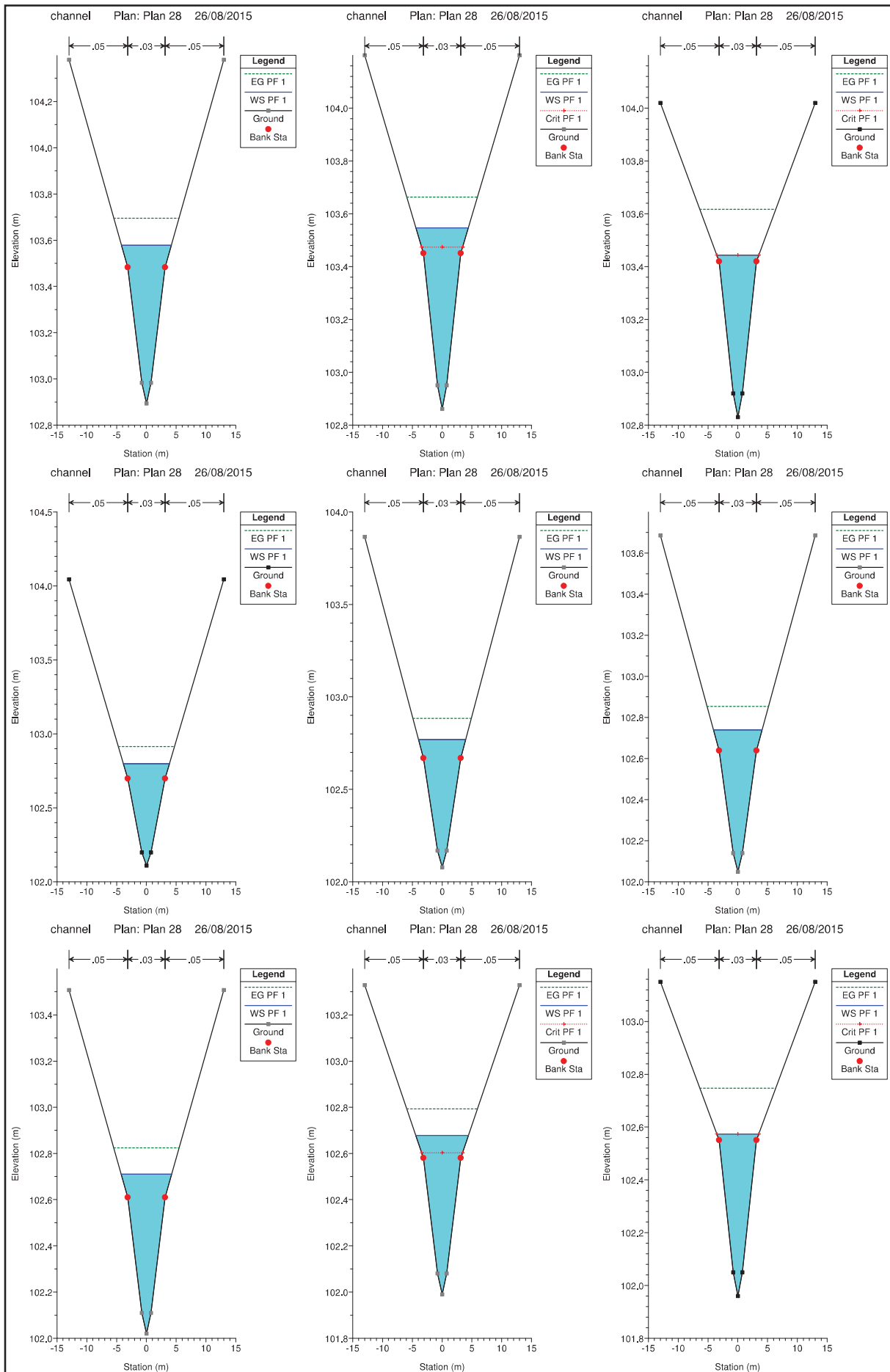




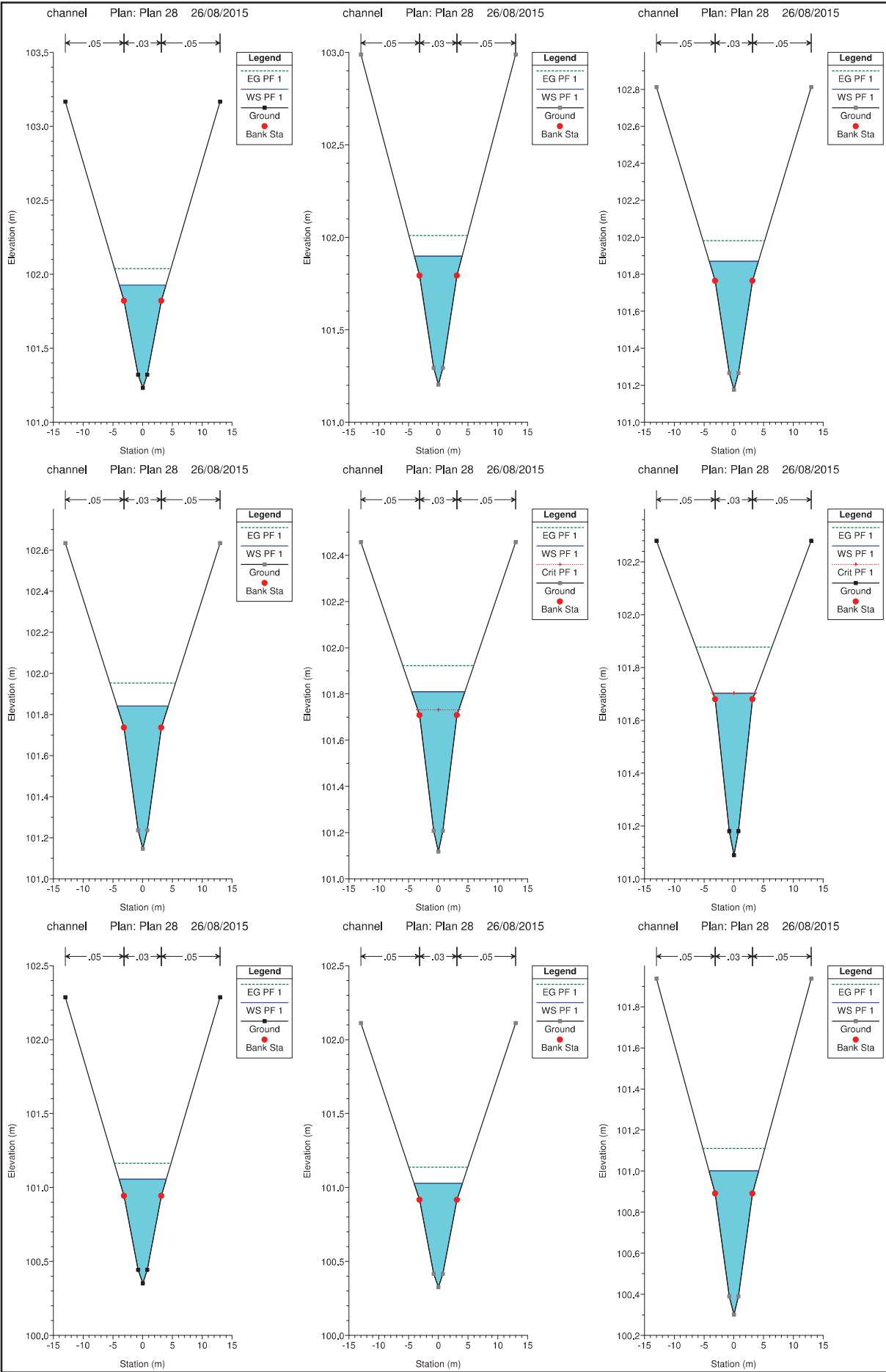


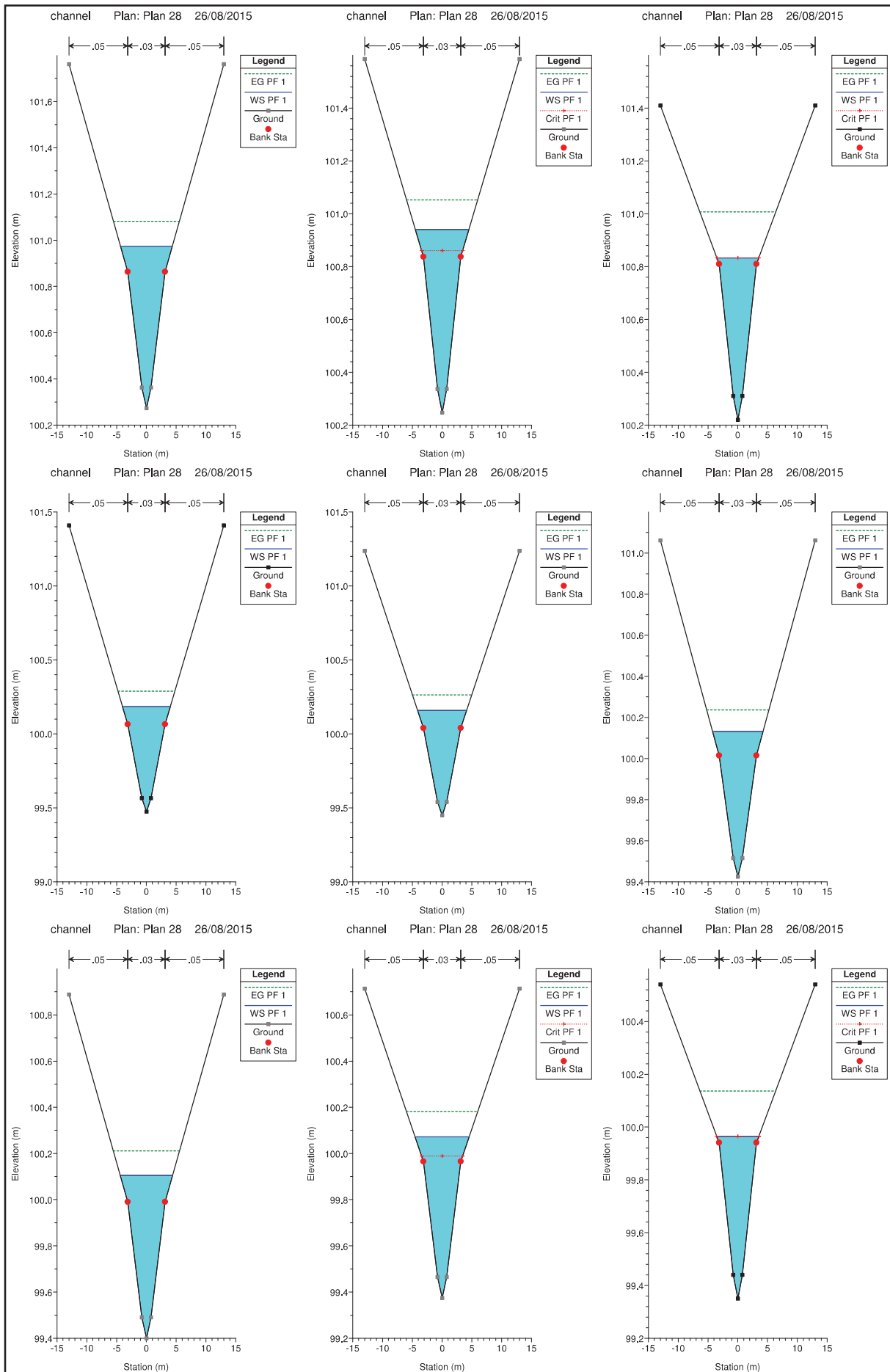


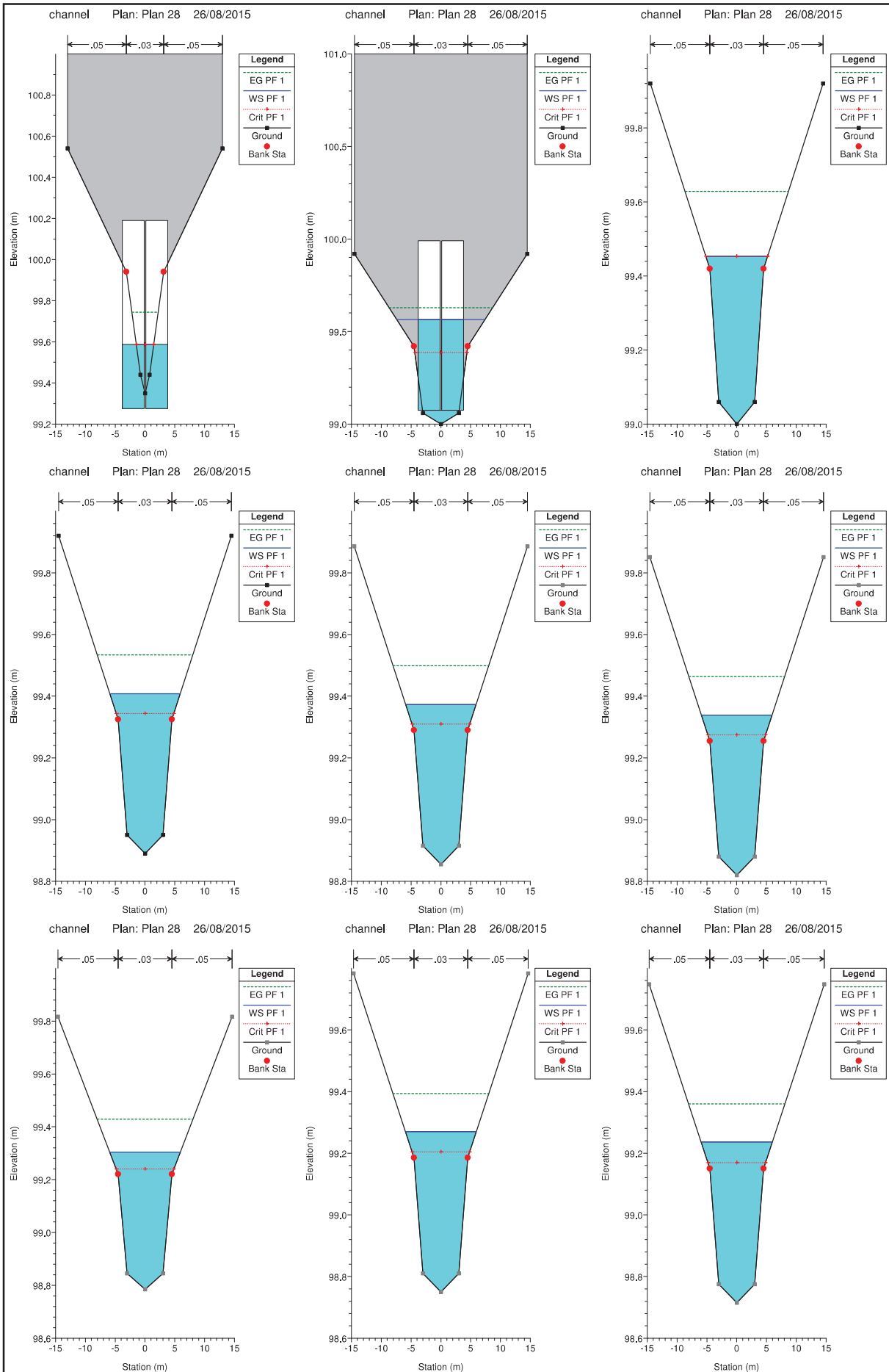


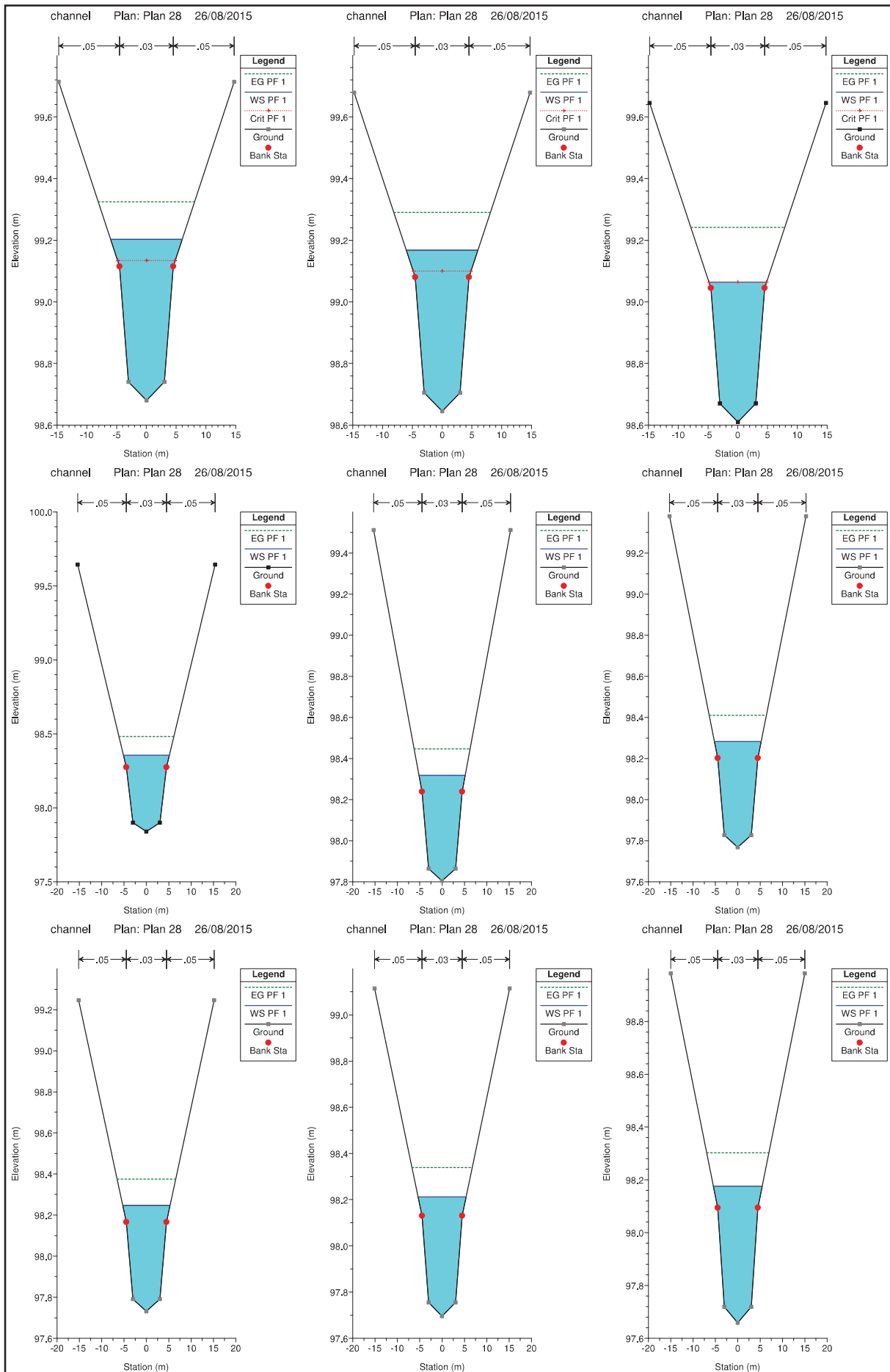


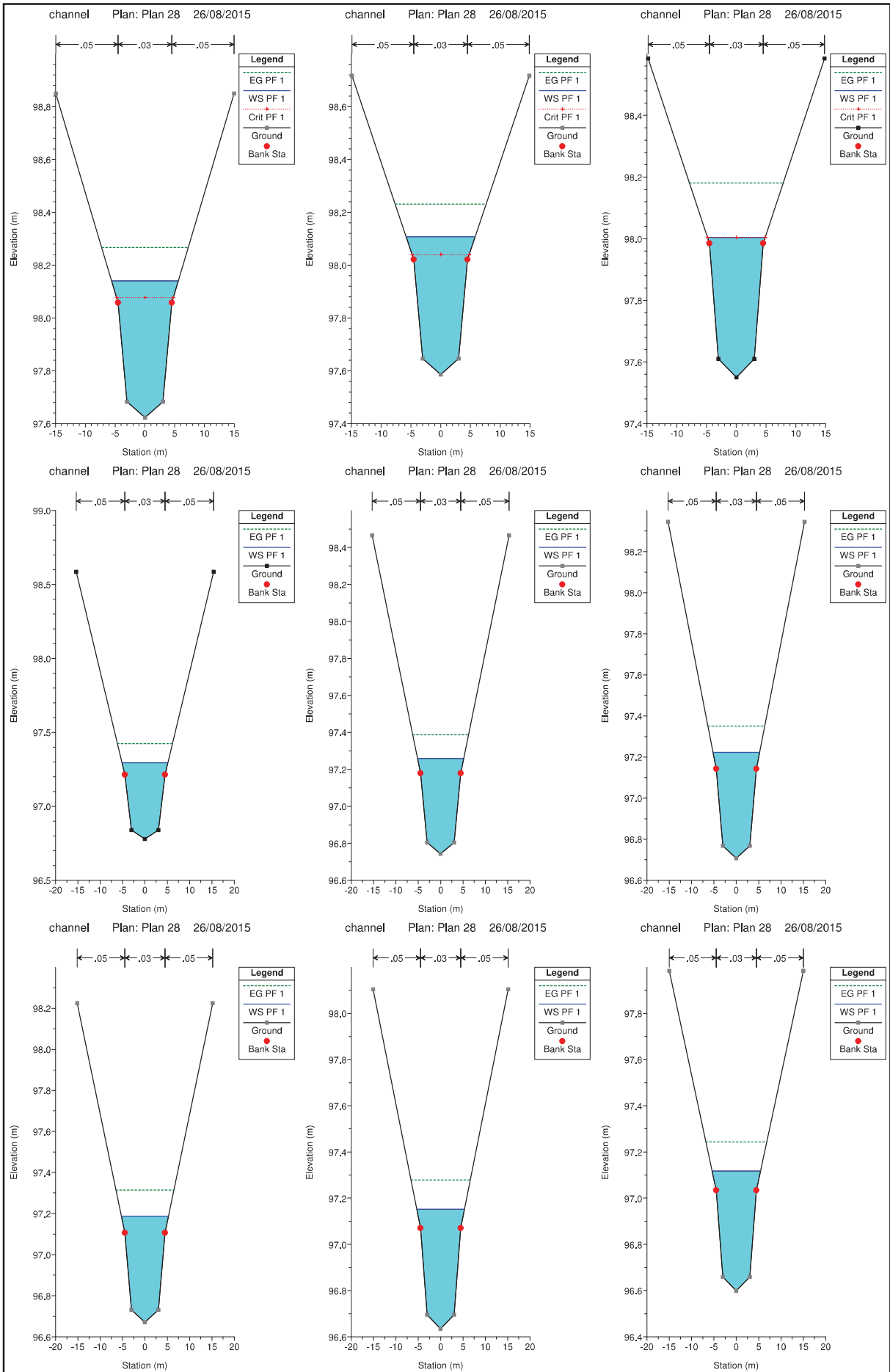


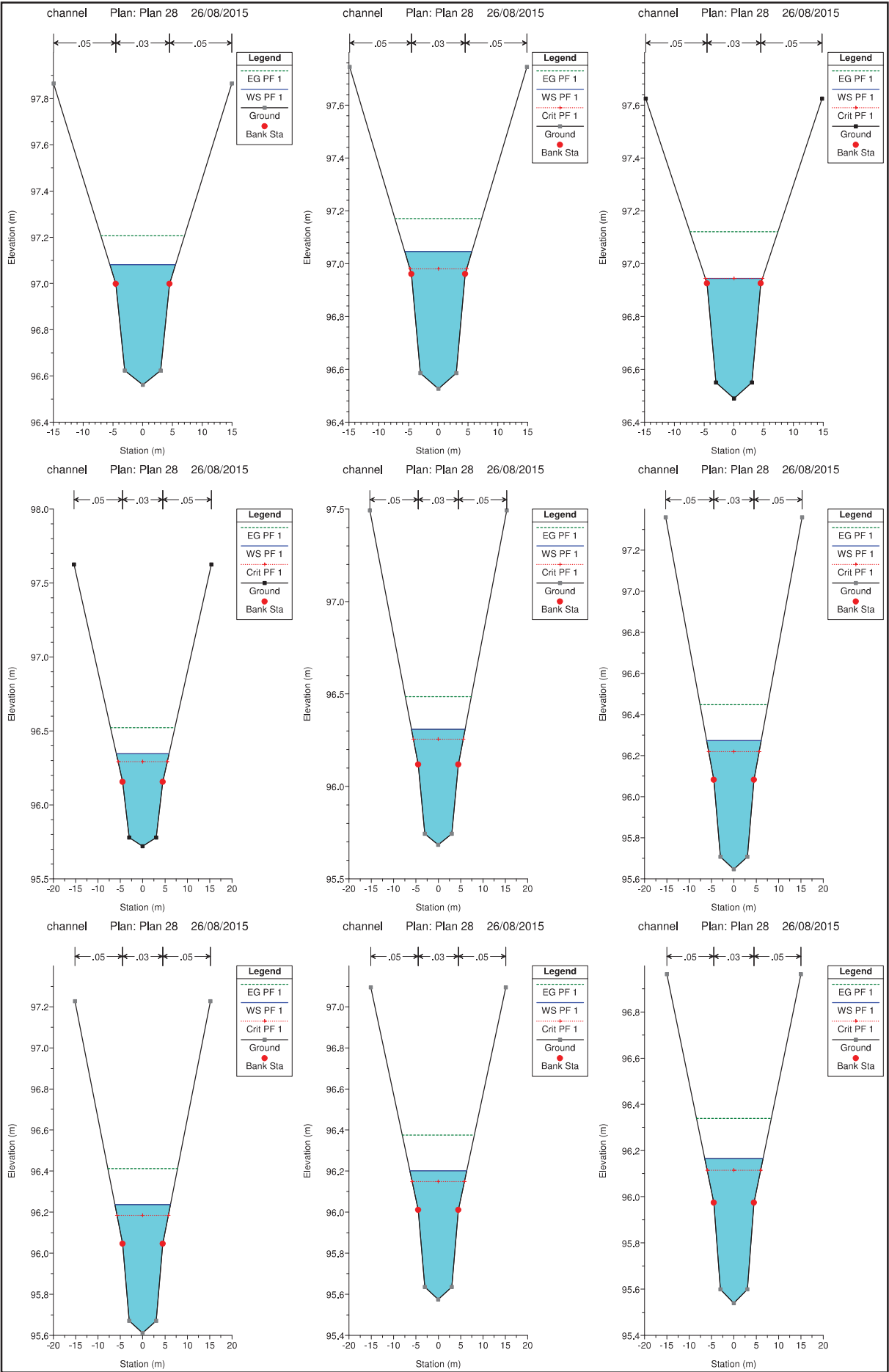


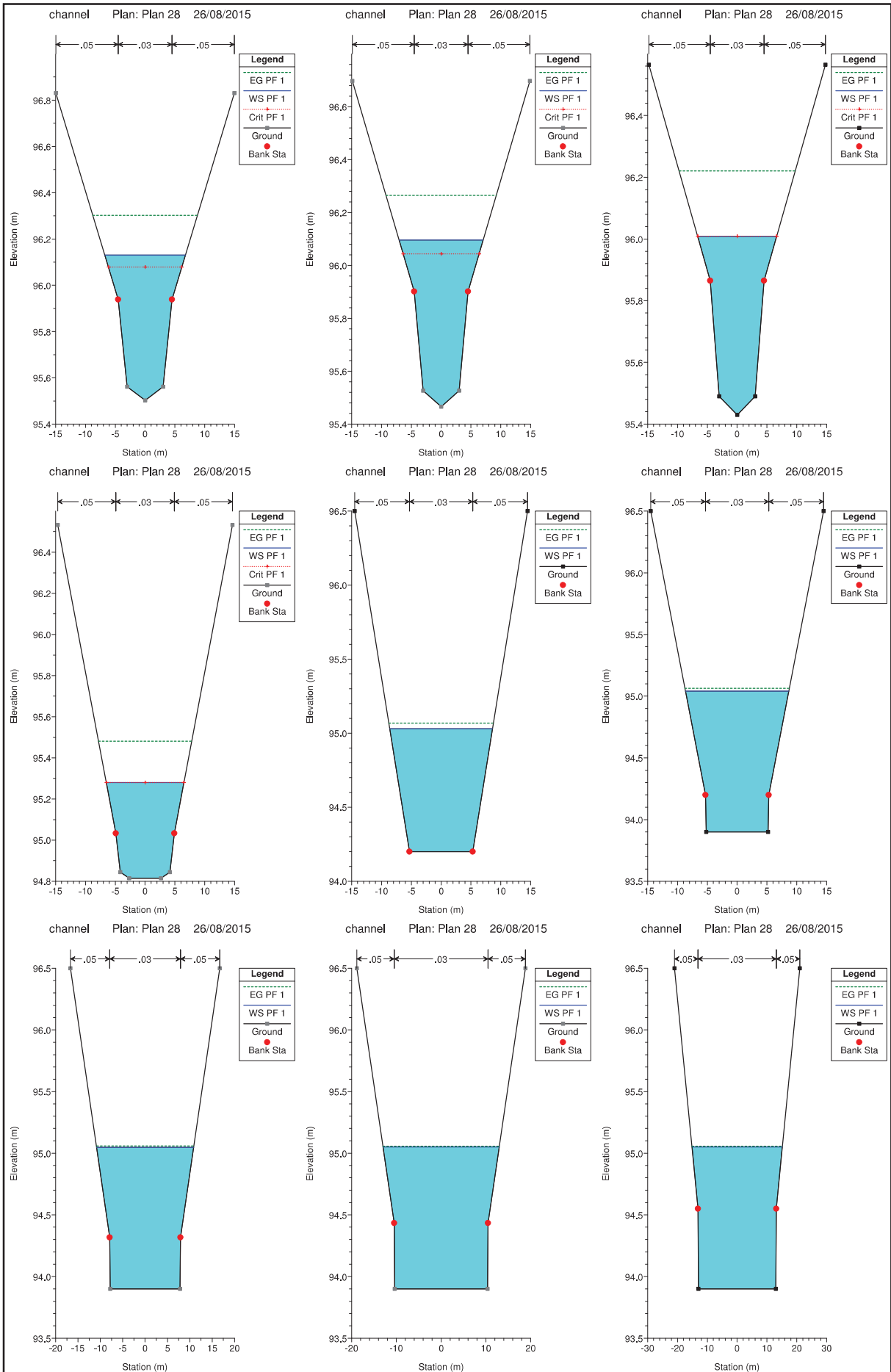




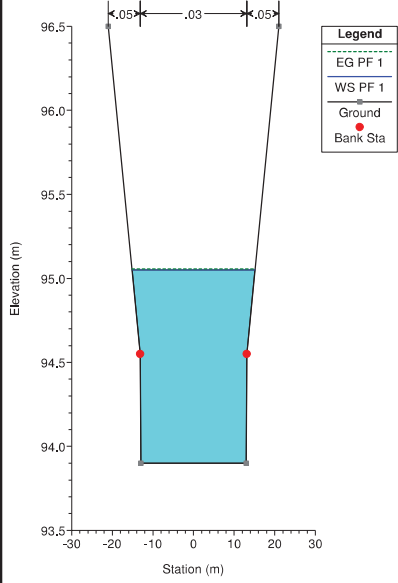




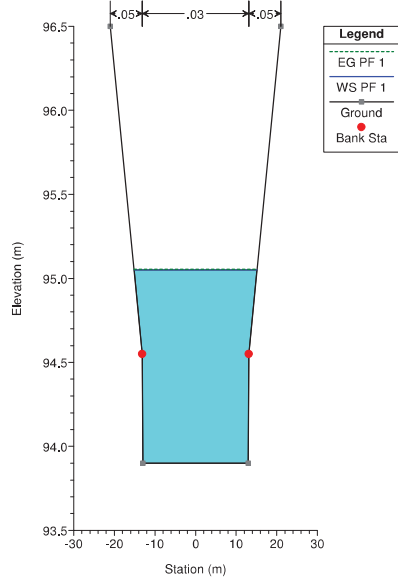




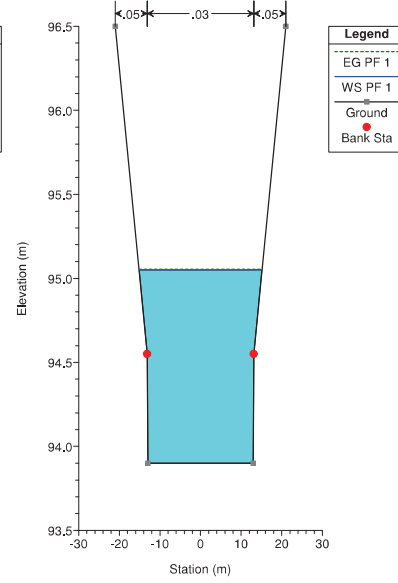
channel Plan: Plan 28 26/08/2015



channel Plan: Plan 28 26/08/2015



channel Plan: Plan 28 26/08/2015



channel Plan: Plan 28 26/08/2015

