



**SUBJECT: ALR - Investigation of potential infill sites – [REDACTED]
and Greenway**

To: Chris Murray, A/g Executive Director - City Planning

From: Craig Egle, Principal Officer Design

Date: 6 February, 2012

Purpose

To seek your agreement to engage consultants through a select tender to undertake site investigations of the following sites:

- [REDACTED]
- [REDACTED]
- [REDACTED]
- Block 2, Section 28, Greenway

Background

In November 2011, the Minister agreed to investigations being undertaken on a number of sites that would require a Territory Plan variation to permit residential development.

The four sites listed above are currently vacant grassland areas and have similar physical characteristics.

Following consultation within ESDD and with the Land Development Agency (LDA), the need for a number of site studies has been identified.

The LDA routinely undertake these types of investigation and have provided a basic site investigation brief and recommendations for suitable consultants from which to seek tenders. The LDA also advised that these types of investigations commonly fall within the cost threshold for select tender.

The LDA has recommended the following consultants:

- Site Investigation Report, including infrastructure capacity (SMEC, RD Gossip, and Northrop)
- Planning Study (TEC, Purdon Associate, and CBRE)
- Traffic Impact Study (ISG)

An updated Stormwater Master Plan may also be required. This will be determined following consultation with TAMS. The LDA has recommended Indesco if this study is required.

As the individual contracts are foreseen to be below the \$25,000 threshold, there will be no involvement necessary from shared services (Procurement Solutions), with evidence of quotation and approval proving sufficient.

Consultant Briefs for individual studies are attached.

Issues

Contract Packaging

The sites will be allocated into two study areas, being [REDACTED] and Greenway (one site).

Timing

The Planning Study must be complete prior to commencement of the Traffic Impact Study, providing base development information such as the determination of possible residential density.

Stormwater

An investigation of stormwater may be required following the addition of a new cut-off drain at Mt Ainslie. This is yet to be determined.



Recommendations

It is recommended that you agree to consultants being engaged through a select tender process to undertake the proposed site investigations

Name: Gay Williamson
Title: Manager, Strategic City Planning and Design
Branch: City Planning
Division: Strategic City Planning and Design

Date: 31 January 2012

Action Officer: Craig Egle, Principal Officer Design
Branch: Strategic City Planning and Design
Extension: 51818

From: Walker, Graeme
Sent: Wednesday, 8 February 2012 1:42 PM
To: Heary, Sibone
Subject: RE: Studies on [REDACTED] and Greenway Blocks

Thanks for the information

Graeme

From: Heary, Sibone
Sent: Wednesday, 8 February 2012 1:31 PM
To: Walker, Graeme; Chappell, Hazel
Subject: Studies on [REDACTED] and Greenway Blocks

Hi Hazel and Graeme,

FYI, we have now invited consultants to provide fee proposals for **Site Investigation Studies** and **Planning Studies** on the following blocks:

- BLOCK 2, SECTION 28 GREENWAY
- [REDACTED]
- [REDACTED]
- [REDACTED]

Regards,

Sibone Heary | Project Officer

Phone 02 6207 2634

Strategic City Planning and Design | Environment and Sustainable Development | **ACT Government**

Dame Pattie Menzies House, Challis Street, Dickson | GPO Box 1908 Canberra ACT 2601 | www.actpla.act.gov.au



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MINUTE

Objective Ref: 12/03510

**SUBJECT: ALR - Investigation of potential infill sites – [REDACTED]
and Greenway**

To: Ben Ponton, A/g Deputy Director General – Planning Policy

From: Craig Egle, Principal Officer Design

Date: 6 March 2012

Purpose

To seek your agreement to engage the following consultants (following a select tender process) to undertake investigations on following sites:

[REDACTED]

Greenway site

[REDACTED]

Site Investigation Report – **RD Gossip** (\$26,125)

The total of the four contracts being \$109,879 (incl. GST).

Background

In November 2011, the Minister agreed to investigations being undertaken on a number of potential infill sites that would require a Territory Plan variation to permit residential development.

On 6 February 2012, you agreed to a 'select tender process' to engage consultants to undertake Site Investigation Reports and Planning Studies for the following sites:

- [REDACTED]
- [REDACTED]
- [REDACTED]
- Block 2, Section 28, Greenway

Requests for quotations (RFQ) were sent out to the following firms on 8 February 2012:

- Site Investigation Report, including infrastructure capacity (SMEC, RD Gossip, and Northrop)
- Planning Study (TEC, Purdon Associate, and CBRE)

Fee proposals (inclusive of GST) were received on 23 February 2012 as follows:



Site Investigation Report (Greenway)



- RD Gossin: \$26 125



Following review of the received fee proposals by the project officers (Craig Egle and Sibone Heary) the following recommendations are made:






Greenway Site



Recommendation

Planning Study 

Site Investigation Report - RD Gossip (\$26,125)

Justification




RD Gossip is recommended to undertake the **Site Investigation Report** for Greenway. They provided an extremely thorough fee proposal outlining a more technical, detailed investigation. 


As previously mentioned, individual contracts were foreseen to be below the \$25,000 threshold, however the selected fee proposal for the Site Investigation Report at Greenway has come in at \$26,125 (4.5% above the 'threshold'). The proposal has been discussed with Procurement Solutions who advised that the minor breach could be justified on the basis of timing and limiting unnecessary additional work.

Issues


Procurement Threshold

It is recommended that the engagement of consultants go ahead as suggested to avoid delays associated with the late involvement of procurement solutions. Both consultants (RD Gossip ) have been recommended by LDA, and are known to Strategic City Planning and Design. Their engagement should pose little risk.

Further Studies

Reports are to be completed within 6 weeks of engagement. Following this, an RFQ will be issued for a Traffic Impact Study.

Stormwater

Following consultation with TAMS, an overview of stormwater issues for the  sites has been provided. This information will be supplied to engaged consultants.

Funding

The four consultancies will cost \$109,879 (incl. GST). Funding to cover this amount is available through the Accelerated Land Release budget.

Recommendations

It is recommended that you agree to ESDD engaging:



Greenway site

Planning Study – 
Site Investigation Report - **RD Gossip** (\$26,125)

The total of the four contracts being \$109,879 (incl. GST).

Name: Gay Williamson
Title: Manager, Strategic City Planning and Design
Branch: City Planning
Division: Strategic City Planning and Design
Date: 6 March 2012

Action Officer: Craig Egle, Principal Officer Design
Branch: Strategic City Planning and Design
Extension: 51818

From: Kemp, Ilze
Sent: Wednesday, 4 April 2012 12:14 PM
To: Heary, Sibone
Subject: Evaluation Report - Site Investigation Greenway
Attachments: Evaluation Report - 19518 - Final.doc; Risk Plan and Matrix - 19518 - Final.doc

Hi Sibone

The evaluation plan and risk plan for the Provision of a Site Investigation Report Brief for Block 2, Section 28 Greenway has been reviewed by Shared Services Procurement.

I have attached a copy of the finalised version which is now ready to be printed and signed by you, Craig and the Delegate.

I discussed the delegates signature on the evaluation report with my Assistant Manager and we believe that you will need a delegate with the appropriate delegation in your agency to sign off the evaluation report, as it gives Shared Services Procurement the authority to execute the contract as well as approves the outcome and evaluation by the evaluation team.

Once you have signed the report can you please return a fully signed copy to me for my files.

If you have any questions about this email or the process please don't hesitate to contact me.

Regards

Ilze Kemp

Procurement Officer

Goods & Services Team | Shared Services Procurement

Shared Services | ACT Government

Ph: (02) 6205 4970 Fax: (02) 6207 6500

Email: ilze.kemp@act.gov.au

RISK PLAN AND MATRIX

The Risks should be assessed using the following Consequence and Likelihood Scales and the Risk Analysis Matrix, developed in accordance with Australian Standard AS/NZS ISO 31000:2009.

CONSEQUENCES					
	Insignificant	Minor	Moderate	Major	Catastrophic
General	Negligible impact upon objectives	Minor effects that are easily remedied	Some objectives affected	Some important objectives cannot be achieved	Most objectives cannot be achieved
Community	Injuries or condition not requiring medical attention	Minor injury or First Aid Treatment needed	Serious injury needing hospitalisation, multiple medical treatment cases	Life threatening injuries, irreversible disability	Death/s, multiple life threatening injuries, irreversible disabilities
Property (including intangibles eg IT data & intellectual property)	Slight (non structural) damage or loss of public/private goods, assets and data. Possible small compensation.	Minor (structural) damage or loss and liability for compensation	Significant damage or loss involving possible legal action for compensation	Serious damage or loss requiring operational changes involving legal action for significant compensation.	Extensive damage or loss, Business Continuity Plans activated, very heavy legal and compensation costs.
Financial	Possible unavoidable Expenditure resulting in Budgetary losses of up to 1% (or <\$5K)	Up to 5% of budget (or <\$50K)	Up to 20% of budget (or <500K)	Up to 40% of budget (or <\$5M)	Greater than 40% of budget (or >\$5M)
Environment	Negligible damage and loss of flora and fauna, degradation and/or loss of environmental amenity	Short term effects not affecting ecosystem functioning	Moderate environmental impacts, able to be contained and repaired in medium term	Long term environmental impairment of ecosystem functions	Widespread, long-term environmental impairment of more than one ecosystem
Reputation	Minor adverse local attention, internal review	Attention from local media, scrutiny required by internal committees	Significant media attention, scrutiny required by external committee, Auditor General etc	Intense public, political and media scrutiny, damage to organisation	Assembly inquiry or Commission of inquiry, adverse national media

LIKEHOOD	Event is expected to occur in most circumstances	Almost Certain	<i>Medium</i>	<i>High</i>	<i>High</i>	<i>Very High</i>	<i>Very High</i>	
	Event will probably occur on most circumstances	Likely	<i>Medium</i>	<i>Medium</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>Very High</i>
	Event may occur at some time	Possible	<i>Low</i>	<i>Medium</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>
	Event is not expected to occur	Unlikely	<i>Low</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>	<i>High</i>	<i>High</i>
	Event is likely to occur only in exceptional circumstances	Rare	<i>Low</i>	<i>Low</i>	<i>Medium</i>	<i>Medium</i>	<i>Medium</i>	<i>High</i>
	RISK MATRIX							

Low Risk: Unlikely to require allocation of resources, manage by routine procedures.

Medium Risk: Must be brought to attention of manager, resources required to address risk must be allocated.

High Risk: Senior management action required, risk treatments applied. Responsibility must be specified. Subject to regular monitoring.

Very High Risk: Immediate action required. Senior executive attention needed with action plans and management responsibility specified. All possible treatments to be put in place to reduce risk.

RISK REGISTER

Identify the risks which could affect the successful outcome of the procurement and group by type of risk such as:

1. **Procurement Risks:** e.g. delays, process runs over time, no suitable tenders received, statement of requirements inadequately defined
2. **Contract Risks:** e.g. failure of contractor to meet performance, budgetary or quality standards, contractor becomes insolvent
e.g. poor contract management
3. **External Risk Factors:** e.g. weather delays; adverse economic events- interest rate increases or exchange rate movements.
4. **Project Risks:** e.g. changes in policy directions, change in scope.

Project: Provision of a Site Investigation Report Brief for Block 2, Section 28 Greenway

Prepared by: Ilze Kemp

Date: 26/03/2012

Reviewed by: Sibone Heary

Date: 28/03/2012

Risk No	The Risk (Cause) What can happen and how	Consequence Rating Describe the consequence	Likelihood Rating	Level of Risk Rating ** (refer Matrix)	Risk Priority Ranking	How are Risks to be Managed?	Consequence Rating after Treatment	Likelihood Rating after Treatment	Level of Risk Rating after Treatment
Procurement									
1	Delay in procurement	<i>Moderate</i> Delay in delivery of Project.	<i>Unlikely</i>	Medium	11	Management of the procurement process. Procurement has been made a priority.	<i>Moderate</i>	<i>Rare</i>	Medium
2	Territory does not achieve value for money	<i>Minor</i> Failure to follow procurement guidelines.	<i>Unlikely</i>	Low	9	Follow procurement guidelines and work in close consultation with Shared Services Procurement.	<i>Minor</i>	<i>Rare</i>	Low

3	Shortcomings in Statement of Requirements (SOR) become apparent after Contract executed.	<i>Minor</i> Objectives and intended outcomes of the Service are not achieved, or not completed to standard. Additional work not originally identified as part of Quotation process would lead to increased cost.	<i>Rare</i>	Low	4	SOR thoroughly developed to identify and address any shortcomings. Performance reviews will be conducted as required and there will be sufficient flexibility within the Contract for amendments.	<i>Minor</i>	<i>Unlikely</i>	Low
4	Low quality of Respondents	<i>Minor</i> Delay in implementation and unnecessary period of consolidation	<i>Unlikely</i>	Low	12	Framing the SOR to encourage quality submissions.	<i>Minor</i>	<i>Rare</i>	Low

5	Consultant makes false or misleading claims in quotations, e.g. relating to resource allocation.	<i>Moderate</i> Objective and intended outcomes of the project are not achieved, or not completed to standard. Additional work not originally identified.	<i>Unlikely</i>	Medium	2	This risk is mitigated by thorough evaluation of Responses and good Contract negotiation.	<i>Moderate</i>	<i>Rare</i>	Medium
6	Consultant does not have access to the information required to undertake the Project.	<i>Moderate</i> Territory does not achieve required outcomes.	<i>Unlikely</i>	Medium	10	Consultant will be provided with all necessary Territory information to complete the Project.	<i>Moderate</i>	<i>Rare</i>	Medium
7	Consultant has an inadequate understanding of stakeholder business requirements.	<i>Moderate.</i> SOR supplied to Consultants that is deficient.	<i>Unlikely</i>	Medium	8	Clear SOR contained in quote and further refined during Contract negotiations.	<i>Moderate</i>	<i>Rare</i>	Medium

Project/Contract Management									
8	Unavailability of Consultant to provide required services	<i>Minor</i> Consultant cannot provide required services due to illness or increased time commitments to other clients.	<i>Unlikely</i>	Low	6	An evaluation criterion relates to ability to meet timeframes. Short timeframe for initial project delivery means there is less likelihood of conflicting time requirements with Consultant's other clients.	<i>Minor</i>	<i>Rare</i>	Low
9	Failure of Consultant to provide required expertise to meet the requirements	<i>Moderate</i> Need to engage another Consultant to complete the work.	<i>Unlikely</i>	Medium	7	Establish ESDD Contract Management Procedures that facilitate close monitoring of timeliness and delivery of service.	<i>Moderate</i>	<i>Rare</i>	Medium
10	Breach of Contract terms by Consultant	<i>Moderate</i> Interruption to Contract performance while the breach is investigated / remedied. Investment of	<i>Unlikely</i>	Medium	1	Contractor to be provided with a copy of the executed Contract to facilitate contract management. Implement effective contract management	<i>Moderate</i>	<i>Rare</i>	Medium

		<p>Territory resources in investigating / remedying breach.</p> <p>Possible need to terminate the contract for default resulting in a delay in the delivery of the services. In the event of contract termination unforeseen expense would be incurred.</p>				practices.			
11	<p>Consultant underperforms</p> <p>Services are not provided in accordance with agreed specifications / performance standards</p>	<p><i>Moderate</i></p> <p>Investment of Territory resources in rectifying non-conformance.</p> <p>Where non-conformance cannot be rectified, the objectives of</p>	<i>Unlikely</i>	Medium	5	Implement effective contract management practices.	<i>Moderate</i>	<i>Rare</i>	Medium

		the consultancy will not be met							
12	Contractors become insolvent	<i>Moderate</i> Can approach next best “value for money” Respondent to complete work. If no other appropriate Respondent, then will need to complete new procurement process.	<i>Unlikely</i>	Medium	3	Undertake financial viability check of preferred Respondent.	<i>Minor</i>	<i>Rare</i>	Low
Occupational Health & Safety									
13	Occupational Health & Safety (OH&S)	<i>Minor</i> Consultant doesn't provide a safe working environment.	<i>Unlikely</i>	Low	13	Implement effective contract management practices.	<i>Insignificant</i>	<i>Rare</i>	Low

** Separate Risk Treatment Plan required for 'High' and 'Very High' risks.


From: Egle, Craig
Sent: Tuesday, 6 March 2012 12:14 PM
To: Gianakis, Steven
Cc: Heary, Sibone
Subject: ALR funding for investigations on [REDACTED] and Greenway sites

Steven


As discussed, I seek your confirmation that funding of \$109,879 (incl. GST) is available to undertake studies on the following sites (that would require a Territory Plan variation to permit residential development):

- [REDACTED]
- [REDACTED]
- [REDACTED]
- Block 2, Section 28, Greenway

We have undertaken a select tender process and are recommending the following:



Greenway site

Planning Study – 

Site Investigation Report - **RD Gossip** (\$26,125)

Regards

Craig Egle | Principal Officer - Design

Phone **02 6205 1818** | Mobile 

Strategic City Planning and Design | Environment and Sustainable Development | **ACT Government**

Macarthur House, 12 Wattle Street, Lyneham | GPO Box 1908 Canberra ACT 2601 | www.actpla.act.gov.au

From: Heary, Sibone
Sent: Friday, 8 June 2012 8:52 AM
To: [REDACTED]
Subject: RE: Greenway - SIR

Thanks [REDACTED].

From: [REDACTED]
Sent: Friday, 8 June 2012 8:49 AM
To: Heary, Sibone
Subject: RE: Greenway - SIR

Hi Sibone, sorry about the delay but had some late issues to resolve with the report [REDACTED]. I expect to get the report to you around lunchtime today.

Regards

RD Gossip Pty Ltd
2 Lawry Place
Macquarie ACT 2614 Australia
Phone: [REDACTED] Fax: (02) 6253 1989
E-mail: [REDACTED]

From: Heary, Sibone [mailto:Sibone.Heary@act.gov.au]
Sent: Thursday, 7 June 2012 11:37 AM
To: [REDACTED]
Subject: FW: Greenway - SIR

Hi [REDACTED],
I just called your office to follow up on delivery of the Greenway SIR. We will need to forward the draft to the planning consultant (Purdon) as soon as possible, so that they can continue with their study according to program. We are available to discuss the SIR with yourself, and provide feedback.

Regards,

Sibone Heary | Project Officer

Phone 02 6207 2634

Strategic City Planning and Design | Environment and Sustainable Development | ACT Government

Dame Pattie Menzies House, Challis Street, Dickson | GPO Box 1908 Canberra ACT 2601 | www.actpla.act.gov.au

From: [REDACTED]
Sent: Thursday, 24 May 2012 5:23 PM
To: Heary, Sibone
Subject: RE: Greenway - SIR

Hi Sibone, no there should be no issue as we have the survey and tree report as well as responses from service authorities. We expect to submit a draft report to you early next week and then have some discussions with yourself / Purdon. We should then be able to address any of your comments and resubmit prior to 5/6.

Regards

RD Gossip Pty Ltd
2 Lawry Place
Macquarie ACT 2614 Australia
Phone: [REDACTED] Fax: (02) 6253 1989
E-mail: [REDACTED]

From: Heary, Sibone [<mailto:Sibone.Heary@act.gov.au>]
Sent: Wednesday, 23 May 2012 11:43 AM
To: [REDACTED]
Subject: Greenway - SIR

Hi [REDACTED],
I just called your office to follow up on the progress of the Greenway Site Investigation Report. Again, please advise if there are any issues in relation to timing, and or the provisions on deliverables. We look forward to receiving the draft Report on June 5.

Kind Regards,

Sibone Heary | Project Officer
Phone 02 6207 2634
Strategic City Planning and Design | Environment and Sustainable Development | **ACT Government**
Dame Pattie Menzies House, Challis Street, Dickson | GPO Box 1908 Canberra ACT 2601 | www.actpla.act.gov.au

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Suite 2, Level 1, 243 Northbourne Avenue, Lyneham, ACT 2602
Telephone STD (02) ISD (612) 6234 1900, Facsimile (02) 6234 1966

6th November 2015

The Project Manager
Land Development Agency (LDA) - Chief Minister, Treasury and Economic Development Directorate (EDD)
Level 6 – Transact House
470 Northbourne Avenue
DICKSON ACT 2602

Our ref: Greenway B2 S28 OFS PL V0

Attention: Alice Buck

Overland Flow Study – Greenway Block 2 Section 28

FEE PROPOSAL

Dear Alice,

We refer to your email dated 30/10/2015 containing LDA's request for a fee proposal for undertaking an overland flow study for the above block. This study is to be undertaken in accordance with the scope of works provided by the LDA.

SMEC offers a very strong team, with considerable experience in the delivery of water. The strength of our team emanates from the following factors:

- SMEC's long and successful record in delivering water projects on behalf of ACT Government agencies and private clients;
- SMEC's ability to bring the best resources to each project, to manage multi-disciplinary teams and work seamlessly across disciplines;
- Extensive in-house knowledge and experience which it can bring to bear on this project; and
- Team members having previously been involved in a number of projects that entail work of a similar nature to that requested.

Our fee proposal is appended to this letter.



SMEC HOLDINGS LIMITED
220-226 Sharp Street PO Box 356 COOMA NSW 2630 AUSTRALIA
Tel: ISD (612) STD 6452 0344 Fax: ISD (612) STD (02) 6452 0201

SMEC HOLDINGS LIMITED ACN 057 274 049 SNOWY MOUNTAINS ENGINEERING CORPORATION LIMITED ACN 008 654 224
SMEC AUSTRALIA PTY LIMITED ACN 065 475 149
SMEC INTERNATIONAL PTY LIMITED ACN 065 440 619 SMEC OPERATIONS PTY LIMITED ACN 065 474 428
SMEC SERVICES PTY LIMITED ACN 066 504 792
SMEC VICTORIA PTY LTD ACN 069 699 467 SMEC WEST PTY LTD ACN 070 269 260





We trust the information contained in our proposal is sufficient for you to assess our proposal. If, however, you have any queries or you require any additional information, please feel free to contact me by phone on 6234 1952 or by email at [REDACTED] We look forward to hearing from you.

We thank you for inviting us to provide a fee proposal for the study and we look forward to working with you on this project.

Yours sincerely,



Senior Water Engineer



SMEC HOLDINGS LIMITED
220-226 Sharp Street PO Box 356 COOMA NSW 2630 AUSTRALIA
Tel: ISD (612) STD 6452 0344 Fax: ISD (612) STD (02) 6452 0201

SMEC HOLDINGS LIMITED ACN 057 274 049 SHOWY MOUNTAINS ENGINEERING CORPORATION LIMITED ACN 008 654 224
SMEC AUSTRALIA PTY LIMITED ACN 065 475 149
SMEC INTERNATIONAL PTY LIMITED ACN 065 440 619 SMEC OPERATIONS PTY LIMITED ACN 065 474 426
SMEC SERVICES PTY LIMITED ACN 068 504 702
SMEC VICTORIA PTY LTD ACN 069 609 467 SMEC WEST PTY LTD ACN 070 269 260





GREENWAY – Block 2 Section 28

FEE PROPOSAL – OVERLAND FLOW STUDY

SMEC is pleased to provide this fee proposal for the provision of consultancy services for carrying out an overland flow study for the above block.

The following scope of services applies to this fee proposal in accordance with our understanding of LDA's Brief.

SCOPE OF SERVICES:

- Review reports and other information;
- Site visit/s;
- Hydrologic modelling;
- Hydraulic modelling;
- Overland flow modelling;
- Flood impacts and protection measures
- Cost estimation
- Report preparation

METHODOLOGY:

Based on our understanding of the above Scope of Services, we propose the following methodology for delivering this work:

- **Review reports and other information:** Upon engagement, we will review all reports and other information available to us. A list of items we require from the client will be prepared. We will then organise an inception meeting with the LDA, to discuss their requirements based on our early understanding of the project, and to discuss the information we require from the LDA to undertake the work.
- **Site visits:** We propose to undertake a site visit soon after the inception meeting. We note that the LDA requires at least 48hours notice for site access. Further site visits will be undertaken as and when required. The need for representatives from the LDA to join us on any of our site visits will be discussed and agreed to as required.



SMEC HOLDINGS LIMITED
220-226 Sharp Street PO Box 356 COOMA NSW 2630 AUSTRALIA
Tel: ISD (612) STD 6452 0344 Fax: ISD (612) STD (02) 6452 0201

SMEC HOLDINGS LIMITED ACN 057 274 049 SNOWY MOUNTAINS ENGINEERING CORPORATION LIMITED ACN 008 654 224
SMEC AUSTRALIA PTY LIMITED ACN 085 475 149
SMEC INTERNATIONAL PTY LIMITED ACN 065 440 619 SMEC OPERATIONS PTY LIMITED ACN 065 474 428
SMEC SERVICES PTY LIMITED ACN 086 504 792
SMEC VICTORIA PTY LTD ACN 089 699 467 SMEC WEST PTY LTD ACN 070 289 280



- Hydrologic modelling:** We will utilise 1m contours available for the area to determine the catchments contributing to the two stormwater pipes that go through the block. Hydrology of these catchments --- will be modelled using the XPRafts (XP Software, 2013) software. The model will be run for the minor and major system Average Recurrence Intervals (ARIs) and for a range of storm durations, with model input parameters as recommended in the current TaMS Design Standards for Urban Infrastructure. Computed peak flow rates at critical locations will be compared with previous reported modelling results, where available.
- Hydraulic modelling:** Hydraulic modelling of the existing pipe system will be undertaken using the XP-RatHGL (XP Software, 2013) software to apportion the total flows to pipe and overland flows, at the upstream end of the block. The pipe modelling will extend from the downstream end of the pipe at the Lake, to a distance upstream of the block boundary to be determined once more details of the pipe system become known. Lake water levels will dictate downstream boundary conditions for the modelling. Appropriate blockage factors will be applied to determine the design overland flows.
- Overland flow modelling:** Using the design overland flows determined above, overland flow modelling will be undertaken using the HEC-RAS (ver 4.3.1, US Army Corps of Engineers) software. Cross sections for the modelling will be determined using surveyed topographic data supplemented by 1m contours. Flood extents will be computed and plotted using the topographic information for the site.
- Flood impacts and protection measures:** Based on the flood extents determined above, impacts on the proposed development will be investigated; both velocity and depth will be looked at. If there is any masterplan information available for the site, this information may help in the identification of the impacts. If any impacts are identified, we will investigate options to alleviate these impacts using cost-effective solutions. Feasibility of the options, potential constraints, and the level of protection achievable by the options will be examined. We will endeavour to get some feedback from TaMS on their acceptance of the proposed measures; however, on recent projects they have advised us that they are no longer providing this service to consultants.
- Cost estimation:** Once protection measures have been formulated, indicative costing for the different options will be calculated using the best available costing information from previous similar projects undertaken by SMEC. Rawlinsons Handbook will be referred to where costing information is lacking. Appropriate allowances will be made for contingency, design and documentation.
- Report preparation:** A draft report will initially be prepared which includes background information, details of flow and flood extent calculations, assumptions and approximations made, flood impacts and options for flood protection measures and indicative costing. Flood extent and protection measures will be captured in sketches. As specified in the Brief, the report will cover Block 2A and 2B separately. The draft report will be submitted to the LDA for review. Once review comments are received, we will address these and finalise the report for submission. The final report will include sketches clearly showing the 100 year ARI flood lines.

• **PROJECT TEAM:**

The project team comprises of the following key personnel taking on the roles and responsibilities as defined below:

██████████ is the Project Director who is the SMEC Regional Manager for the ACT. He will ensure that the project manager has all the required resources to deliver the project on time and within budget.

██████████ is the Project Manager with significant experience in hydraulic services masterplanning and detailed design, including a number of urban development projects in the ACT. He will manage the day-to-day activities of the scope covered by this fee proposal and will also oversee the overall delivery of the project.

██████████ has recent experience in hydraulics and utilities design for a number of local projects. ██████████ has considerable experience with drainage design for projects in the ACT and interstate. ██████████ will help with the modelling for the existing and post-development hydrology and hydraulics, under directions from ██████████.

██████████ has considerable experience in cost estimation, tender assessment and construction surveillance. He will undertake the cost estimation for the protection measures.

██████████ has considerable experience in CAD drafting. She will assist in the preparation of the CAD sketches for the report.

PROJECT PROGRAM:

Given below is our tentative program to undertake the work.

Item	Time for completion (from date of acceptance of proposal)
Commence Work	1 week
Review reports/information & Inception meeting	1 week
Existing system – modelling and flood extent	2 weeks
Flood impact and protection measures	3 weeks
Report	3 weeks

The above completion dates are based on the assumption that adequate survey and existing services information will be made available to us. If the available information is inadequate and survey is required, this will impact on the program, possibly by an additional week if there is a quick turnaround in commissioning the work to obtain the additional information.

PROPOSED FEE:

We propose to undertake the works for a lump sum fee of \$14,750 including GST.

Description	Price (\$)
Project Management, Administration and Meetings	
Review Reports/Information	
Site Visit/s	
Hydrologic Modelling	
Hydraulic Modelling	
Overland Flow Modelling	
Flood Impacts and Protection Measures	
Cost Estimation	
Report Preparation	
Overheads and Administration	
Sub-total excluding GST	
GST	
Total (including GST)	
<u>Grand Total (including GST)</u>	<u>14,750</u>

Note: This fee does not include fees for any approvals.

This fee is for undertaking the study with available information, with reasonable assumptions and approximation made. Assumptions and approximations will be detailed in the report.

Survey, potholing, if required, to determine information on existing stormwater infrastructure in the area is not included in the above fee.



Given below is our Schedule of Rates for key staff as per our Panel rates:

No	Name – Role	Fixed rate (Ex GST)
1		
2		
3		
4		
5		



SMEC HOLDINGS LIMITED
220-226 Sharp Street PO Box 356 COOMA NSW 2630 AUSTRALIA
Tel: ISD (612) STD 6452 0344 Fax: ISD (612) STD (02) 6452 0201

SMEC HOLDINGS LIMITED ACN 057 274 049 SNOWY MOUNTAINS ENGINEERING CORPORATION LIMITED ACN 008 654 224
SMEC AUSTRALIA PTY LIMITED ACN 085 475 149
SMEC INTERNATIONAL PTY LIMITED ACN 065 440 619 SMEC OPERATIONS PTY LIMITED ACN 065 474 428
SMEC SERVICES PTY LIMITED ACN 066 504 792
SMEC VICTORIA PTY LTD ACN 059 886 487 SMEC WEST PTY LTD ACN 070 268 260





Given below is our time allocation chart for our team personnel:

	Project Director	Project Manager	Project Engineer	Cost Estimation	CAD							HOURS
1 Project Management	1	2	0	0	0	0	0	0	0	0	0	3
Project Management, Administration and Meetings	1	2										3
2 Review Reports/Information	0	1	6	0	0	0	0	0	0	0	0	7
Review reports		1	4									5
Review other relevant information			2									2
3 Site visit/s	0	3	3	0	0	0	0	0	0	0	0	6
Site visit/s		3	3									6
4 Hydrologic Modelling	0	2	9	0	2	0	0	0	0	0	0	4
Catchment delineation			2		2							4
Hydrologic modelling (pre and post-development)		1	6									
Comparison with previous results		1	1									
5 Hydraulic Modelling	0	2	10	0	0	0	0	0	0	0	0	12
Existing system modelling		1	4									5
Future system modelling		1	6									7
6 Overland Flow Modelling	0	3	10	0	2	0	0	0	0	0	0	15
Existing system modelling		1	4		2							7
Future system with protection measures		2	6									8
7 Flood Impacts and Protection Measures	0	1	10	0	14	0	0	0	0	0	0	25
Flood mapping			4		8							12
Protection measures		1	6		6							13
8 Cost Estimation	0	1	0	4	0	0	0	0	0	0	0	5
Costing		1		4								5
9 Report Preparation	0	3	7	0	0	0	0	0	0	0	0	10
Draft report		2	5									7
Final report		1	2									3
Total Hours	1	18	55	4	18	0	0	0	0	0	0	87



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 SMEC INTERNATIONAL PTY LIMITED ACN 085 440 619 SMEC OPERATIONS PTY LIMITED ACN 065 474 428
 SMEC SERVICES PTY LIMITED ACN 086 504 792
 SMEC VICTORIA PTY LTD ACN 086 699 467 SMEC WEST PTY LTD ACN 070 289 280



From: [REDACTED]
Sent: Wednesday, 2 March 2016 11:19 AM
To: Buck, Alice
Cc: Mundy, Graham; Arul, Adrian
Subject: RE: Flood Study - Fee Proposal Request
Attachments: 3002492.01 Greenway Overland Flow Study v3.pdf

Hi Alice

I have amended the report to address your comment. Please let me know if this is fine.

Regards,

[REDACTED]
SMEC – Australia & New Zealand Division
T +61 2 6234 1952

From: Buck, Alice [mailto:Alice.Buck@act.gov.au]
Sent: Tuesday, 1 March 2016 12:50 PM
To: [REDACTED]
Cc: Mundy, Graham; Arul, Adrian
Subject: RE: Flood Study - Fee Proposal Request

Thanks [REDACTED]

Unless I am missing something I am having trouble correlating the options in the costing table to the options discussed throughout the report – can you please include very clear correlation between page 9 and page 14.

Alice

From: [REDACTED]
Sent: Friday, 19 February 2016 4:43 PM
To: Buck, Alice
Cc: Mundy, Graham; Arul, Adrian
Subject: FW: Flood Study - Fee Proposal Request

Hi Alice

We have now amended our report to address your comments and also improved our report.

1. There is no Figure 1
 - Section 2 incorrectly referred to Figure 1 previously, should have referred to Figure 2. Figures have been changed and added in this version
2. Section 2 Catchment refers to blocks 2A and 2B – this is not shown on a figure. For your information it may be that the block is split into three blocks (as divided by the overland flow paths), can you please adjust the text to reflect this. So 2 A, B and C.
 - LDA Brief showed 2A and 2B. We have now included the figure from LDA Brief - Figure 1.

3. Please show on a figure which flow path is which OFP1 and OFP2
 - Figure 2 now shows OFP1 and OFP2
4. The report doesn't identify the impact on the existing footpath between 2A and 2B. Will we need a new path?
 - Under Section 6 Flood Impacts, we now have a brief discussion on impact on footpath, making it clear that a new path will not be required
5. The conclusion refers to the option to pipe the flow with a swale on the top. Can you please include a section that clearly lists the options, with commentary on pros and cons (including impact on boundaries and hence developable land) and associated costs.
 - Under Section 7 Flood Protection Measures, we have now listed the different options for flood protection for the two paths separately. We have also included hand-drawn sketches to illustrate the options. Advantages of one over the other are also noted.
 - We now have a table with the indicative costing.

Attached please find our final report. Trust the amended version addresses all your comments.

If you have any issues, please feel free to contact me.

Regards,

[Redacted] | Canberra
SMEC – Australia & New Zealand Division
T [Redacted]

From: [Redacted]
Sent: Thursday, 11 February 2016 2:08 PM
To: 'Buck, Alice'
Cc: Arul, Adrian; Mundy, Graham
Subject: RE: Flood Study - Fee Proposal Request

Hi Alice

We will have the final report to you by the 26th February, earlier if possible.

Regards,

[Redacted] | Canberra
SMEC – Australia & New Zealand Division
T [Redacted]

From: Buck, Alice [<mailto:Alice.Buck@act.gov.au>]
Sent: Tuesday, 9 February 2016 11:04 AM
To: [Redacted]

Cc: Arul, Adrian; Mundy, Graham
Subject: RE: Flood Study - Fee Proposal Request

Thanks [REDACTED],

Comments on the report as below:

1. There is no Figure 1
2. Section 2 Catchment refers to blocks 2A and 2B – this is not shown on a figure. For your information it may be that the block is split into three blocks (as divided by the overland flow paths), can you please adjust the text to reflect this. So 2 A, B and C.
3. Please show on a figure which flow path is which OFP1 and OFP2
4. The report doesn't identify the impact on the existing footpath between 2A and 2B. Will we need a new path?
5. The conclusion refers to the option to pipe the flow with a swale on the top. Can you please include a section that clearly lists the options, with commentary on pros and cons (including impact on boundaries and hence developable land) and associated costs.

Once you've reviewed these, can you please confirm when we can expect to have the final report.

Thanks again,

Alice

From: [REDACTED]
Sent: Friday, 5 February 2016 1:15 PM
To: Buck, Alice
Subject: FW: Flood Study - Fee Proposal Request

Hi Alice

Attached please find our first invoice for this project. A project budget summary is attached separately.

We are awaiting your comments on our final draft report. Once we receive your comments we will finalise the report.

Regards,

[REDACTED] | Canberra
SMEC – Australia & New Zealand Division
T [REDACTED]

From: [REDACTED]
Sent: Wednesday, 27 January 2016 5:10 PM
To: Buck, Alice (Alice.Buck@act.gov.au)
Subject: FW: Flood Study - Fee Proposal Request

Hi Alice

Attached please find our final draft report.

The costing is very basic at this stage. Once we receive your comments on the draft we will address them and then update the costing.

Feel free to contact me should you have any queries.

Regards,

[redacted] | Canberra
SMEC – Australia & New Zealand Division
T [redacted]

From: [redacted]
Sent: Wednesday, 20 January 2016 8:58 AM
To: 'Buck, Alice'
Subject: RE: Flood Study - Fee Proposal Request

Hi Alice

We will try and finish it as quickly as we can, definitely well in time before your 28th meeting, noting that the 26th is a public holiday.

Regs,

[redacted] | Canberra
SMEC – Australia & New Zealand Division
T [redacted]

From: Buck, Alice [<mailto:Alice.Buck@act.gov.au>]
Sent: Tuesday, 19 January 2016 8:56 AM
To: [redacted]
Subject: RE: Flood Study - Fee Proposal Request

Thanks for the update Antony.

Please note that we have a meeting on 28 Jan for which we will need to understand the impacts / protection measures required across the whole site.

Alice

From: [redacted]
Sent: Thursday, 14 January 2016 5:24 PM
To: Buck, Alice
Subject: FW: Flood Study - Fee Proposal Request

Hi Alice

Sorry, it's taking a bit longer than I thought. The protection measures for the first path are proving to be a bit difficult – this is time consuming as it needs to be done on a trial-and-error basis.

In the meantime, I am sending you the work completed to date which gives you an idea of the extent of flooding – this is a preliminary draft and is for information only. Once the first path is completed, I'll update this report and submit to you as a draft report and we can finalise it addressing LDA comments.

Regards,

[redacted] | Canberra
SMEC – Australia & New Zealand Division
T [redacted]

From: [redacted]
Sent: Wednesday, 6 January 2016 3:39 PM
To: 'Buck, Alice'
Subject: RE: Flood Study - Fee Proposal Request

Hi Alice.

We received survey end of Nov, and have completed tasks up to overland flow modelling, which is currently being finalised.

Flood impacts and protection measures, cost estimation and report preparation are to follow. Based on current progress, I hope to be able to give you a draft report early next week.

Regards,

[redacted] | Canberra
SMEC – Australia & New Zealand Division
T [redacted]

From: Buck, Alice [<mailto:Alice.Buck@act.gov.au>]
Sent: Wednesday, 6 January 2016 9:24 AM
To: [redacted]
Subject: RE: Flood Study - Fee Proposal Request

Hi [redacted],

How are you tracking on this work?

Alice

From: [redacted]
Sent: Monday, 23 November 2015 2:36 PM
To: Buck, Alice
Cc: Mundy, Graham
Subject: RE: Flood Study - Fee Proposal Request

Hi Alice

Just to let you know that survey is being undertaken today finishing Wednesday.

Thanks

[redacted] | Canberra
SMEC – Australia & New Zealand Division
T [redacted]

From: Buck, Alice [<mailto:Alice.Buck@act.gov.au>]
Sent: Thursday, 19 November 2015 2:56 PM
To: [redacted]
Cc: Mundy, Graham
Subject: RE: Flood Study - Fee Proposal Request

Hi [redacted]

I confirm that the LDA would like to proceed with this work, as per your proposal dated 6th Nov 2015 (attached) and your email below in respect to the survey (area referenced also attached).

I understand the total, including the survey, will be \$18,380 incl GST.

As discussed, can you please confirm your program for this work, noting that we would ideally like to have a draft report by Christmas.

Thanks,

Alice

From: [REDACTED]
Sent: Wednesday, 11 November 2015 5:29 PM
To: Buck, Alice
Subject: RE: Flood Study - Fee Proposal Request

Hi Alice

I met the surveyor on site to discuss our survey needs.

The fee to undertake survey of the two hatched areas, to a level of detail suitable for the proposed hydraulic modelling is **\$3,630 including GST**.

Regards,

[REDACTED] | Canberra
SMEC – Australia & New Zealand Division
T [REDACTED]

From: Buck, Alice [<mailto:Alice.Buck@act.gov.au>]
Sent: Wednesday, 11 November 2015 11:11 AM
To: [REDACTED]
Subject: RE: Flood Study - Fee Proposal Request

Hi [REDACTED],

I'd like a formal price please.

I'm happy for the survey to include the additional area that you have highlighted.

Please ensure the surveyor and anyone else attending site is aware of the strict confidentiality requirements in the Brief and Panel Deed Clause 10.

Many thanks,

Alice

From: [REDACTED]
Sent: Monday, 9 November 2015 3:13 PM
To: Buck, Alice
Subject: RE: Flood Study - Fee Proposal Request

Hi Alice

I am wondering whether what I gave you on Friday was good enough or whether you require a formal fee for the survey. If you need a formal fee please advise as I will need to meet the surveyor on site.

Regards,

[redacted] | Canberra
SMEC – Australia & New Zealand Division
T [redacted]

From: [redacted]
Sent: Friday, 6 November 2015 5:09 PM
To: Buck, Alice (Alice.Buck@act.gov.au)
Subject: FW: Flood Study - Fee Proposal Request

Hi again Alice

However, I believe we will also need to survey the pink highlighted area in the attachment.

My guesstimate is that it will cost about \$3k to do both.

Thanks

[redacted] | Canberra
SMEC – Australia & New Zealand Division
T +61 2 6234 1952

From: [redacted]
Sent: Friday, 6 November 2015 4:56 PM
To: 'Buck, Alice'
Subject: RE: Flood Study - Fee Proposal Request

Hi Alice

I am trying to get a feel for the cost from the surveyor, but it is taking a bit of time.

My guess is that the survey of the highlighted area (including drafting) will cost about \$2,000.

Thanks

[redacted] | Canberra
SMEC – Australia & New Zealand Division
T [redacted]

From: Buck, Alice [<mailto:Alice.Buck@act.gov.au>]
Sent: Friday, 6 November 2015 3:39 PM
To: [redacted]
Subject: RE: Flood Study - Fee Proposal Request

Thanks [redacted],

As discussed, can you please confirm the additional cost to first complete a survey for the area shown on the attached to inform this work.

At this stage, I don't believe the LDA has this information.

Alice

From: [redacted]
Sent: Friday, 6 November 2015 12:11 PM

To: Buck, Alice
Subject: FW: Flood Study - Fee Proposal Request

Hi Alice

Attached please find our fee proposal for the Greenway Flood Study. Given our current commitments, we may be able to complete the study within three weeks, provided there is adequate information available, particularly on the stormwater infrastructure in the area, to undertake the work. This is partly because of SMEC's involvement in the Isabella Weir Upgrade project, and the resulting familiarity with a number of aspects of the ponds/lakes in the area.

We look forward to a productive collaboration on this project.

Regards,

[Redacted] | Canberra
SMEC – Australia & New Zealand Division
T [Redacted]

From: [Redacted]
Sent: Monday, 2 November 2015 5:02 PM
To: 'Buck, Alice'
Cc: Mundy, Graham
Subject: RE: Flood Study - Fee Proposal Request

Hi Alice

This is to confirm receipt of your email. Thank you for inviting us to quote on this. We would like to advise you that we will be providing you with a fee proposal, within one week as specified.

Regards,

[Redacted] | Canberra
SMEC – Australia & New Zealand Division
T [Redacted]

From: Buck, Alice [<mailto:Alice.Buck@act.gov.au>]
Sent: Friday, 30 October 2015 2:22 PM
To: [Redacted]
Cc: Mundy, Graham
Subject: Flood Study - Fee Proposal Request

Hi [Redacted],

As discussed by phone, please see attached brief for a flood study that we'd like you to provide a fee proposal for.

As mentioned, we have nominated that this must be completed within four weeks, however we'd like your fee proposal to confirm what the earliest possible submission could be.

Thanks,

Alice Buck
Project Manager (Consultant)

Land Development Agency | Chief Minister, Treasury and Economic Development Directorate | ACT Government
☎ 02 6207 3359 | ✉ alice.buck@act.gov.au | Ground Floor, 470 Northbourne Avenue Dickson ACT 2602

Please note, I am only in the office Wednesday to Friday.



Overland Flow Study
Greenway Block 2 Section 28
Project No: 3002492

STUDY REPORT

For: LAND DEVELOPMENT AGENCY (LDA)

MARCH 2016

Project Name:	Greenway Overland Flow Study
Project Number:	3002492
Report for:	Land Development Agency

PREPARATION, REVIEW AND AUTHORISATION

Revision #	Date	Prepared by
00	14.01.2016	
01	27.01.2016	
02	19.02.2016	
03	02.03.2016	

ISSUE REGISTER

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SMEC COMPANY DETAILS

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Suite 2, Level 1, 243 Northbourne Avenue, Lyneham, ACT 2602

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Fax: (02) 6234 1966

Email: [REDACTED]

www.smec.com

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1 BACKGROUND

Block 2 Section 28 Greenway is located within an open space area along the eastern foreshore of Lake Tuggeranong. The site is bounded by Mortimer Lewis Drive on the west and south, by Block 9 Section 29 on the north, and by Drakeford Drive on the east.

As per the Brief provided to SMEC by the Land Development Agency (LDA), the LDA is considering the option to split this block into two blocks, into future Block 2A and future Block 2B, as shown in Figure 1.

The LDA identified the need for an overland flow study to determine the 100-year flow, to assess any flood impacts on the site, and describe any works required for the protection of the two future blocks.

SMEC Australia was commissioned by the LDA to undertake an overland flow study for the whole of Block 2 Section 28.

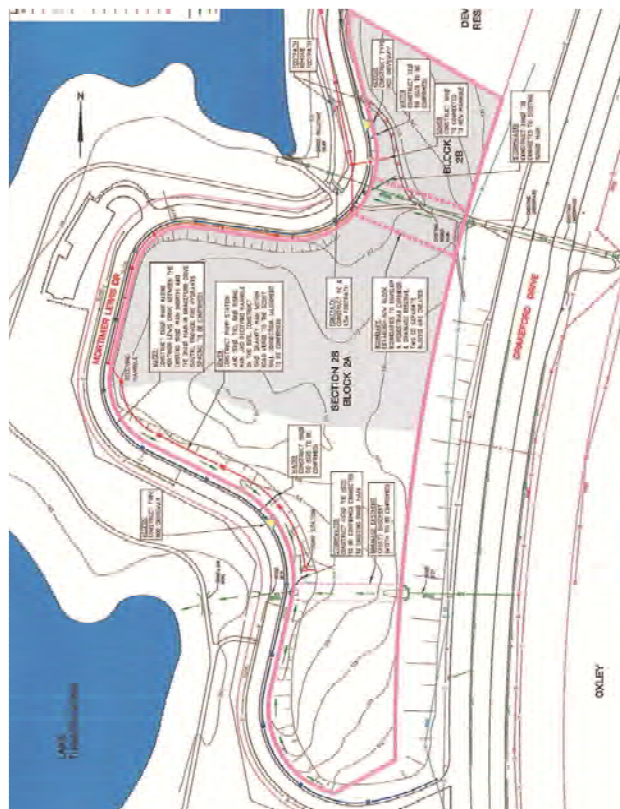


Figure 1. Blocks 2A and 2B Section 28 Greenway as shown in the LDA Brief

2 CATCHMENT

There are two overland flow paths traversing Block 2 Section 28 – one between the two future LDA Blocks 2A and 2B (overland flow path 1, OFP1), and one within the future Block 2A (overland flow path 2, OFP2). The overland flow paths are shown in Figure 2.

The catchment contributing to these overland flow paths has been determined using detailed survey and 1m contours, for the site and its catchment. The catchment contributing to the two overland flow paths is given in Figure 3. The total catchment for the two overland flow paths covers an area of approximately 30 ha, extending from the lake foreshore to Oxley Hill.

User Input Title

Notes:

1: 3,000



DISCLAIMER

The map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current or otherwise reliable.

25-Jan-2016

Page 1 of 1



ACT
Government



Figure 2. Overland Flow Paths OFP1 and OFP2 (aerial image sourced from ACTmap)

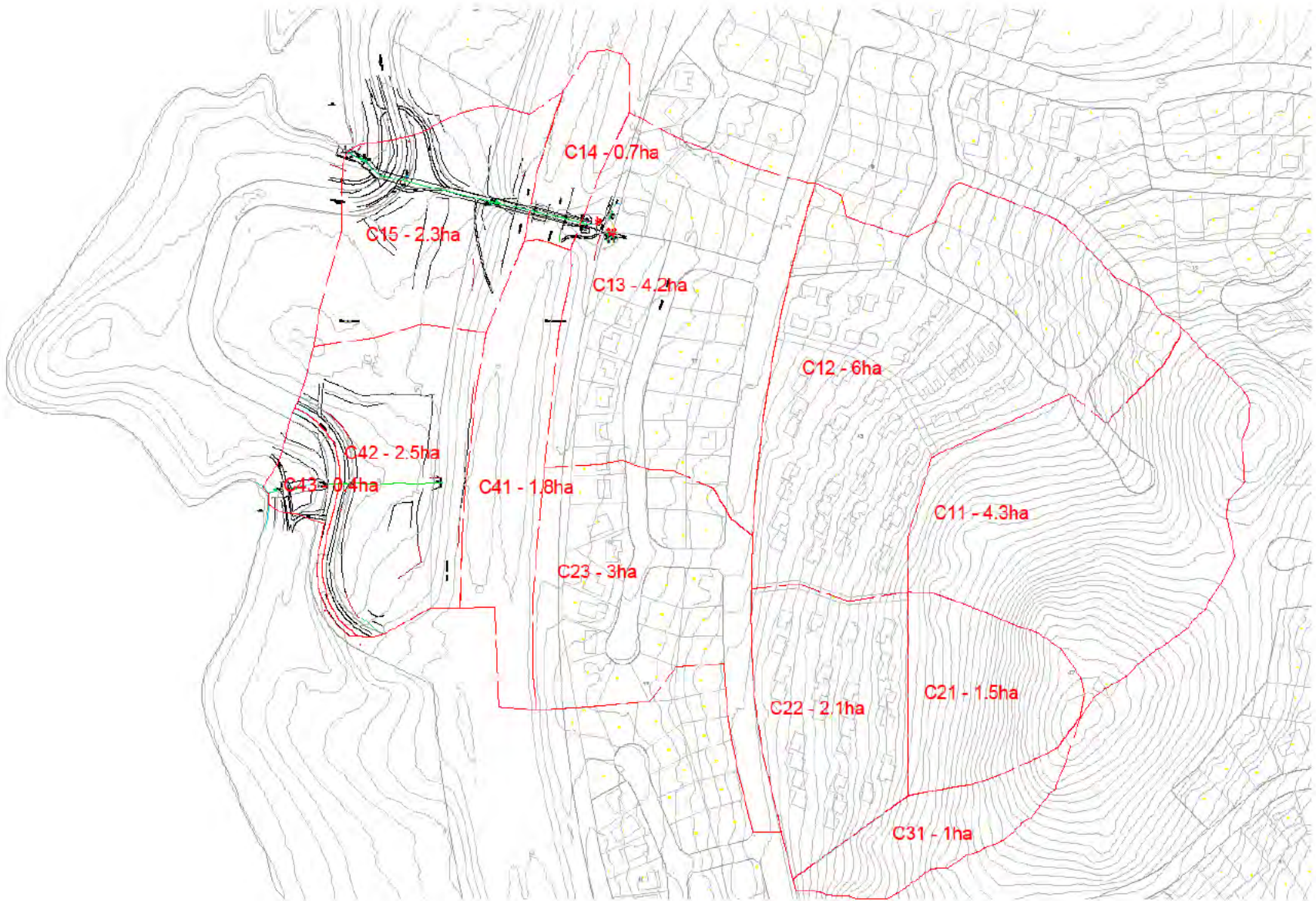


Figure 3. Catchment Contributing to Block 2 Section 28 Greenway

3 HYDROLOGY

The hydrology of the catchment contributing to the two overland flow paths was modelled using the XP-Rafts (XP Software, 2013) software. Model inputs were based on current Territory and Municipal Services (TaMS) Design Standards for Urban Infrastructure (DSUI), ACTMAPi aerial imagery, 1m contours and detailed survey data. The subject site was included in its post-development state for this purpose.

The model was run for 2, 5, 20 and 100 year Average Recurrence Intervals (ARIs), for durations ranging from 10 minutes to 72 hours.

4 HYDRAULICS

1.1 PIPE HYDRAULICS

There is an existing underground pipe/culvert system within OFF1, which extends from the lake edge into the upstream catchment. Hydraulics of the main trunk of this pipe system, including the 2400x900 box culvert (see Figure 4), was modelled using the XP-RatHGL (XP Software, 2003) software. This box culvert spans over about a 110m distance, from immediately downstream of the Drakeford Drive northbound bridge embankment, to downstream of the lakeside footpath (to the west of Mortimer Lewis Drive). Pipe and pit details were input to the model based on detailed survey information. Inflows to the pipe system were derived from the hydrologic model outputs.

The model was run for the 2, 5, 20 and 100 year ARI events. Lake water levels for the 5 and 100 year ARI events were derived from the stage-discharge relationship for the Tuggeranong Lake Weir, corresponding to estimated peak Lake Tuggeranong outflows, both given in a report for the Tuggeranong Creek catchment (GHD, 2013). The 2 and 20 year ARI lake water levels were approximated from the 5 and 100 year lake water levels. These lake water levels were used as the downstream boundary conditions for the relevant ARIs in the hydraulic modelling.

1.2 OVERLAND FLOW

Water levels in the two overland flow paths for the 100 year ARI event, OFF1 and OFF2, were determined using the HEC-RAS program (US Army Corps of Engineers, 2010). Flow path cross-sections were derived from a 3-dimensional model of the topographic survey of the site.

Gap flows were calculated for OFF1, based on the calculated 100 year ARI pipe flow and surface flow, and making allowance for blockages as per the TaMS - DSUI. These gap flows were input to the HEC-RAS model for OFF1. The bridges under the southbound and northbound carriageways were also included in the HEC-RAS model.

100 year ARI flows determined by the hydrologic model were directly used in the HEC-RAS model for OFF2. The 900 dia culvert under Mortimer Lewis Drive and the 1200x600 box culvert under the lakeside footpath (see Figure 5) were included in the model.

The model was run for the 2, 5, 20 and 100 year ARI events. Downstream boundary condition was the lake water levels for the four ARIs discussed above. The upstream boundary condition was assumed to be normal flow.

5 RESULTS AND DISCUSSION

Peak flows computed at critical locations by the hydrologic model are given in Table 1 below.

Table 1. Peak Flows (2, 5 and 100 Year ARI) Computed by the Hydrologic Model

Node (Refer Figure 3)	2, 5 and 100 year ARI Peak Flow (m ³ /s)
C13	1.8, 2.8, 6.2
C15	2.2, 3.2, 6.9
C41	0.14, 0.2, 0.35
C43	0.6, 0.9, 1.6

Pipe hydraulic modelling results showed that the 2400x900 box culvert in the OFP1 catchment has a capacity approximately equal to the 2 year ARI flow. The 900dia pipe culvert across Mortimer Lewis Drive, in the OFP2 catchment, has a >5 year ARI capacity.

100 year ARI gap flows, calculated for OFP1 allowing for blockage as described in Section 4, are given below in Table 2. Note that there were only minor differences between the gap flows calculated over the length of the overland flow path. The calculated gap flow is therefore assumed constant over the length of OFP1. For OFP2, the gap flow is equal to the calculated total flow.

Table 2. Computed 100 year ARI Gap Flows

Node	100 year ARI Peak Overland (gap) Flow (m ³ /s)
OFP1	5.6
OFP2	1.6

6 FLOOD IMPACTS

The 100-year ARI flood extents determined by the HEC-RAS model for the two paths are given in Figures 4 and 5.

The results show that there will be significant flooding immediately upstream of Mortimer Lewis Drive on both flow paths, in a 100 year ARI event.

At OFP1, for events larger than the 2 year ARI event, Mortimer Lewis Drive and the lakeside footpath, and most of the southern and northern footpaths, will be overtopped.

At OFP2, for events larger than a 20-year ARI event, Mortimer Lewis Drive will be overtopped.

Based on the above, the overland flow along OFP1 will need to be managed to confine the flooding within a drainage reserve created between future blocks 2A and 2B. Transverse drainage across Mortimer Lewis Drive will also require augmentation to prevent overtopping of the road. Overland flow along OFP2 will preferably be managed to confine the flooding within a new easement to be created within the block. This would require the flow to be conveyed in a pipe 675mm in diameter or smaller, with no or minimal residual overland flow. In the event that the overland flow cannot be managed within an easement, a drainage reserve will be required, forcing Block 2A to be broken into two blocks separated by the new drainage reserve. Existing transverse drainage by the 900dia culvert across Mortimer Lewis Drive will also require augmentation to prevent overtopping of the road.

The TaMS DSUI requires that footpaths and cycleways are above the 2 year ARI flood level. At OFP1, as the 2400x900 box culvert has approximately the 2 year ARI capacity, no stormwater augmentation is required to protect the existing lakeside footpath or the southern footpath. As the culvert capacity is close to the 2 year ARI flow, this will need to be closely examined during detailed design, to ensure the capacity does not fall below the 2 year ARI flow.

AT OFP2, as the 1200x600 box culvert across the footpath has a >5 year ARI capacity, no stormwater augmentation will be required to protect the lakeside footpath.

It should be noted in this context that a drainage reserve will need to be created for the existing 2400x900 box culvert. The alignment of this box culvert will need to be correctly determined for this purpose. It would therefore be beneficial to align the overland flow path to suit the drainage reserve, noting that the cover over the culvert may present constraints. The footpath also may be aligned to suit the drainage reserve, to optimise the developable area.

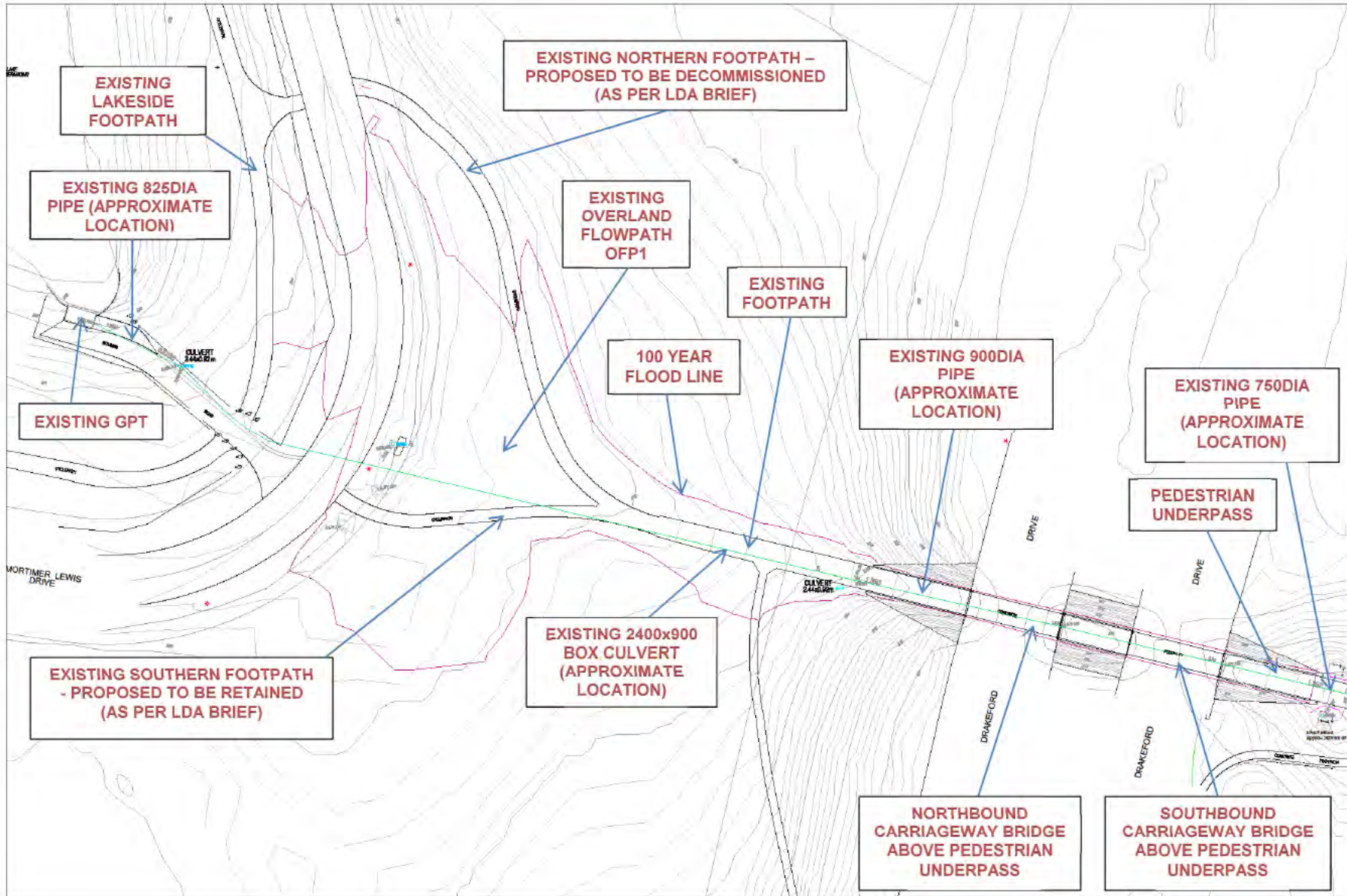


Figure 4. 100 year ARI Flood Extents for OFP1

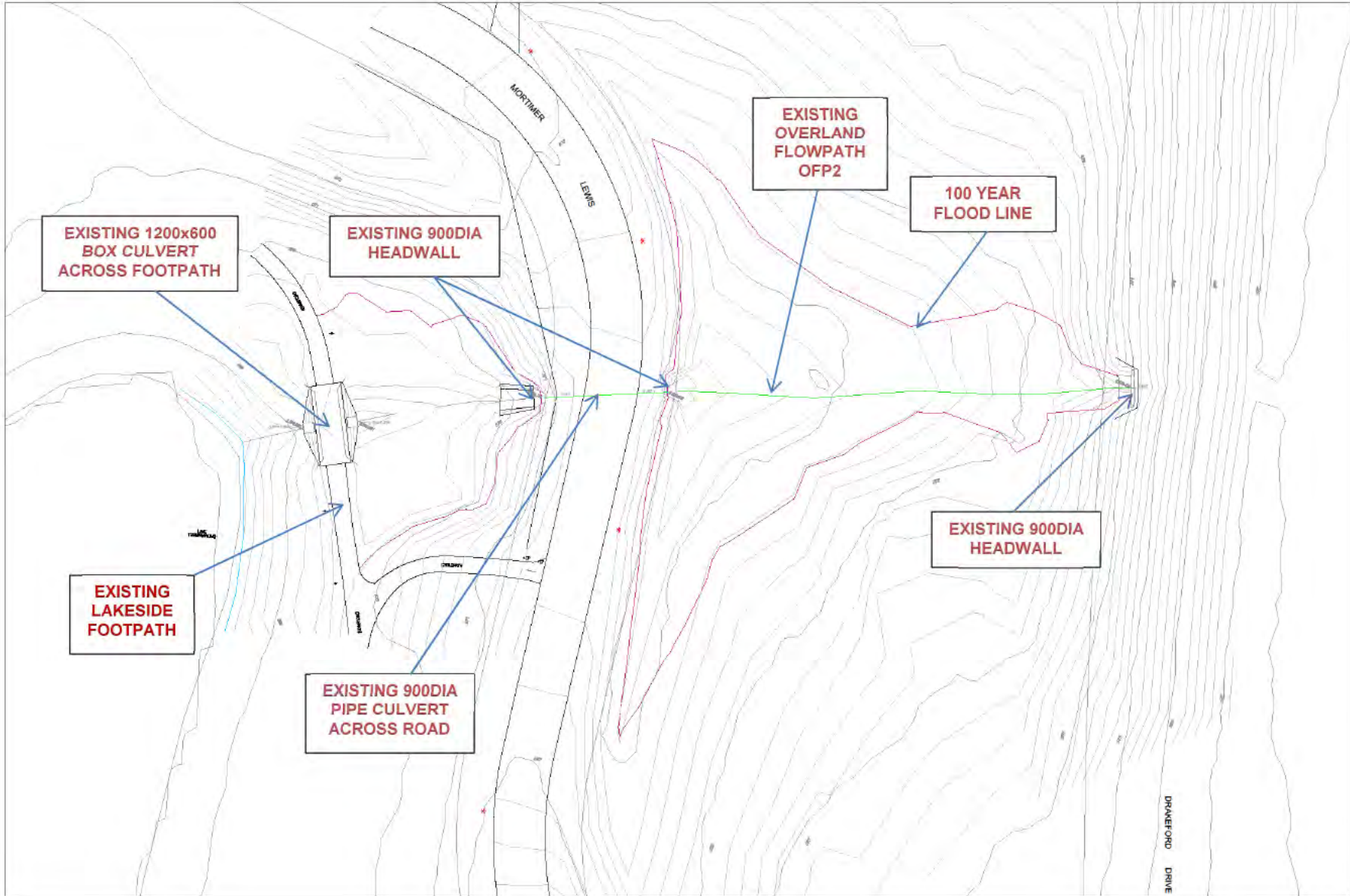


Figure 5. 100 year ARI Flood Extents for OFP2

7 FLOOD PROTECTION MEASURES

It is difficult to clearly define flood protection measures for the future development of Block 2, without having details of the nature of the future development. Flood protection measures have therefore been developed based on a general concept on possible future development of the site. The general assumption underlying the development of these protection measures is that the site is filled to certain RLs along its boundary with the future OFPs. This RL generally corresponds to the 100 year ARI flood level plus a 300mm freeboard. A channel is to be introduced outside the boundary to convey the gap flow. Alternatively, it can be conveyed by a pipe less than 675 dia in size accommodated within a drainage easement.

For OFP1, the following flood protection options may be considered:

Option 1

- Culvert: A 3000x900 box culvert across Mortimer Lewis Drive with a downstream tailout drain and a small culvert across the lakeside footpath (to prevent ponding upstream of the path), and
- Concrete Channel: A 6.3m wide, 525 deep channel (required reserve width = 10m).

Option 2

- Culvert: A 3000x900 box culvert across Mortimer Lewis Drive with a downstream tailout drain and a small culvert across the lakeside footpath (to prevent ponding upstream of the path), and
- Grassed Channel: A 7.6m wide, 700mm deep channel (required reserve width = 10m).

For OFP2, the following flood protection options may be considered:

Option 1

- Culvert: An additional 900 dia pipe culvert across Mortimer Lewis Drive, and
- Concrete Channel: A 4.2m wide 350mm deep channel (required reserve width = 8m).

Option 2

- Culvert: An additional 900 dia pipe culvert across Mortimer Lewis Drive, and
- Grassed Channel: A 5.2m wide 400mm deep channel (required reserve width = 8m).

Option 3

- Culvert: An additional 900 dia pipe culvert across Mortimer Lewis Drive, and
- Pipe and Swale: A 675dia pipe from the Drakeford Drive downstream headwall to the Mortimer Lewis Drive upstream headwall, within a new 3m wide drainage easement. A stormwater structure will be required at each end of this pipe, and a manhole will be required at an intermediate location. A grass swale will be required above the 675dia pipe, with a width of 2.4m, to carry 0.7 m³/s. Combining the pipe and the swale width requirements, an easement width of 4m would be adequate.

The reserve widths quoted above have been rounded to the nearest metre, and are based on conceptual measures only. Actual reserve width requirements may differ from the widths quoted here and will become clear only during detailed design.

The above protection measures would give 100 year ARI capacity through the site and across Mortimer Lewis Drive. Simple sketches showing the channel/pipe arrangements discussed above are given in Figure 6. A snapshot of the flood protection measures for OFP1 and OFP2 is given in Figures 7 and 8 respectively.

Feasibility of any of the protection measures described above will be dependent on the actual development of the site and detailed information on the existing infrastructure in and around the site. When more

definitive details of the future development become available, additional investigations such as potholing and geotechnical investigation are to be conducted, as required, and the protection measures detailed herein are to be reviewed and finalised.

It should also be noted that the flood protection measures are likely to necessitate filling on the development blocks, and roadworks (kerbing, minor regrading) may become necessary. Due to the interrelationships between design elements of the blocks, and the flood protection measures discussed herein, it will be critical to optimise the design of the flood protection measures to suit the development intentions of the site.

In comparing the protection measures discussed above, a grassed channel would generally be preferred over a concrete channel, as it would give better Water Sensitive Urban Design (WSUD) outcomes, as long as the invert levels of the new design elements are compatible with the existing stormwater invert levels. For OFP2, the pipe and swale option is recommended, as it would obviate the need to subdivide Block 2A further, as long as this proposal is acceptable to the approving authorities.

Project GREENWAY P:2 S28 OVERLAND FLOW

Project No. 3002492

Construction Item CHANNEL/SWALE TYPICAL SECTIONS

Detail

Checked By

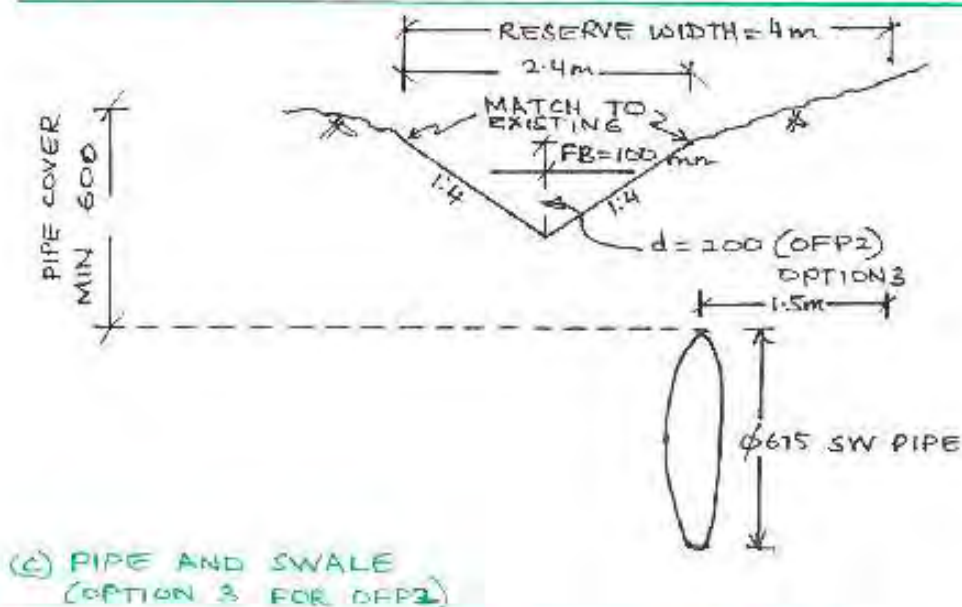
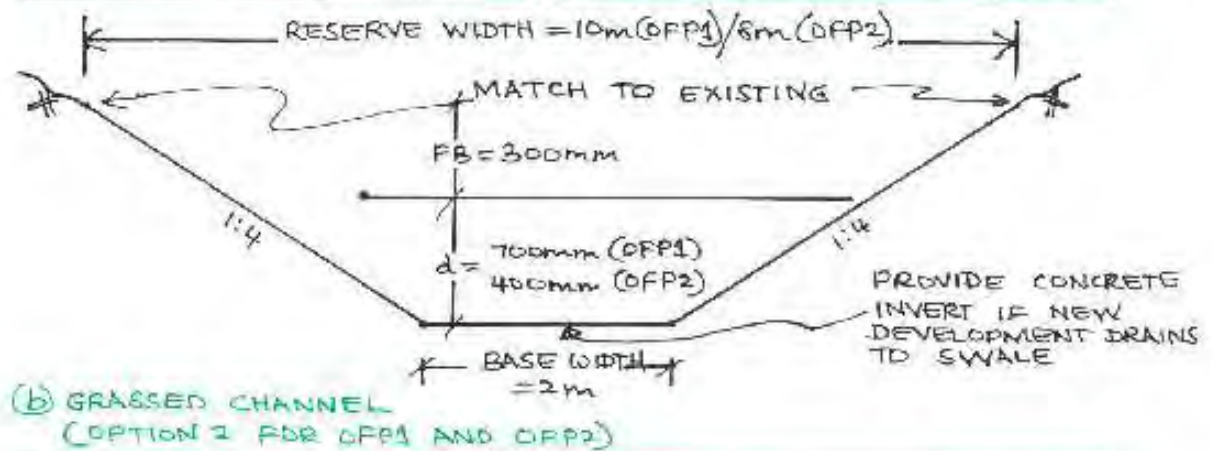
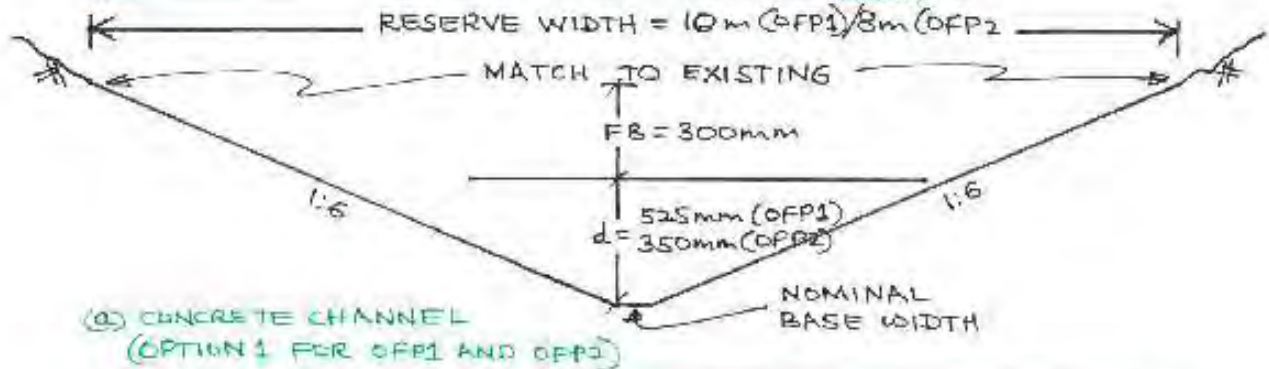


Figure 6. Sketches showing channel/swale typical cross-sections
 (a) Concrete Channel, (b) Grassed Channel, and (c) Pipe and Swale
 Note: Sketches are not to scale and are for illustration only

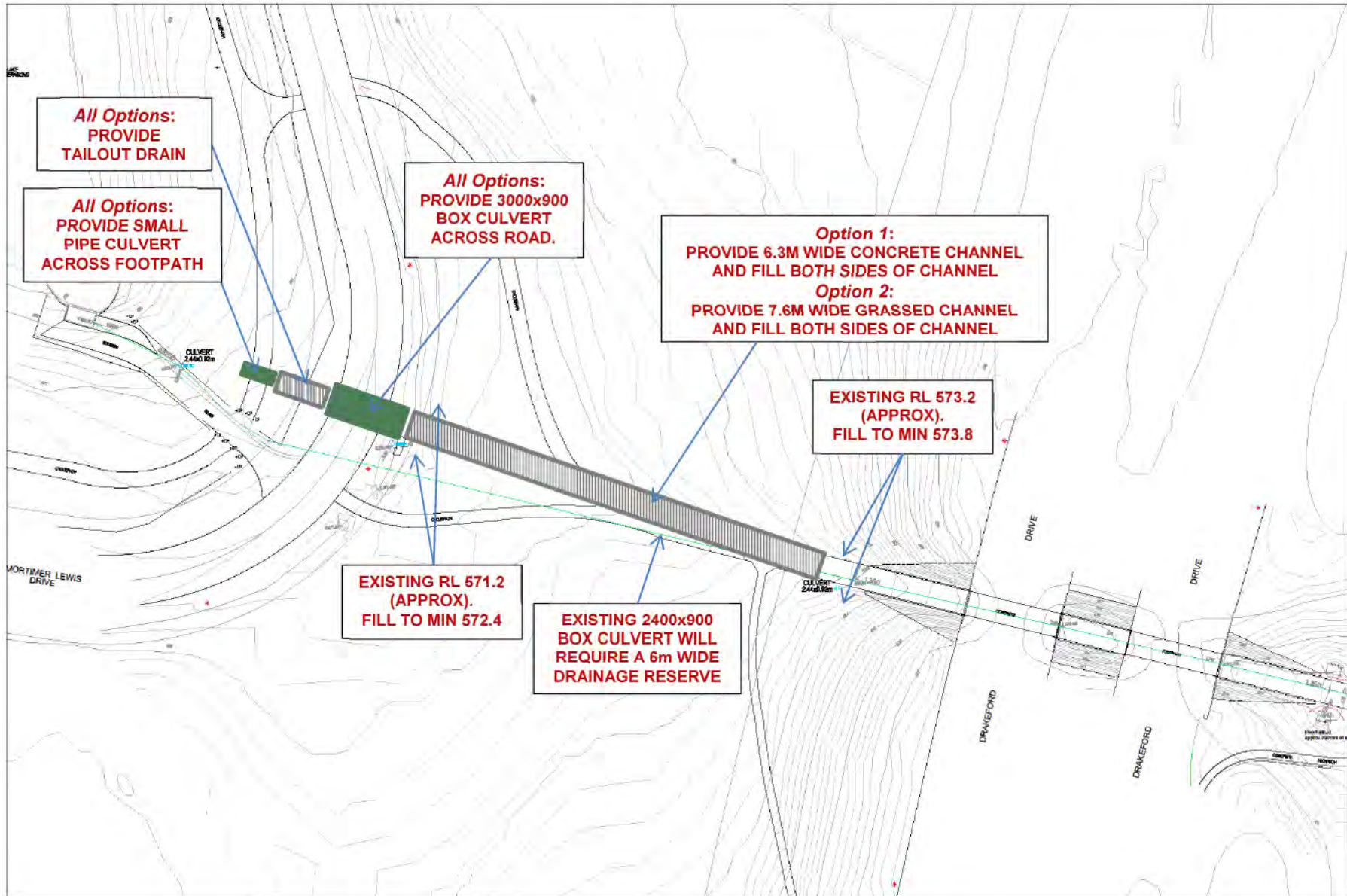


Figure 7. 100 year ARI Flood Protection Measures (not drawn to scale) for OFP1

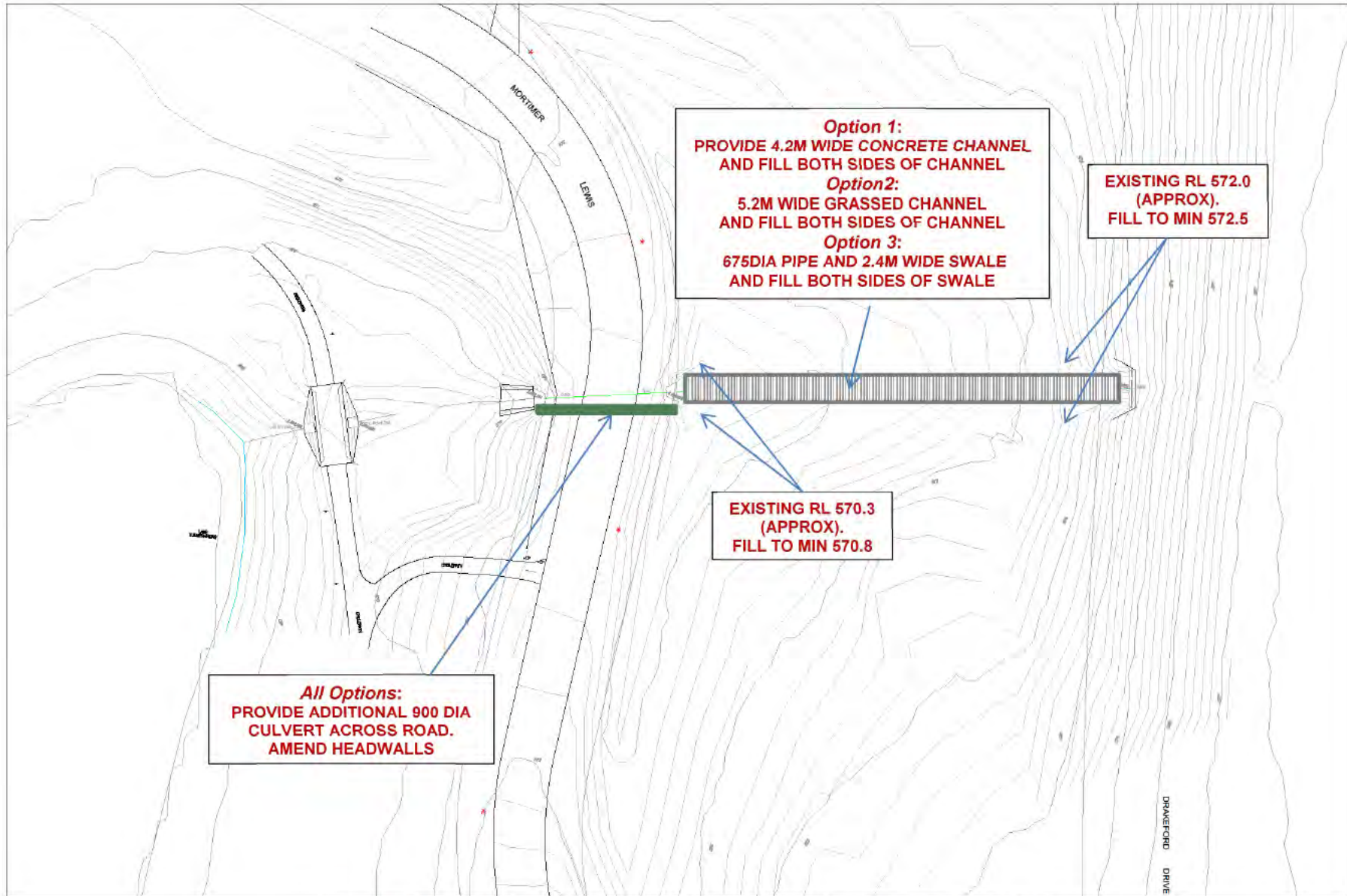


Figure 8. 100 year ARI Flood Protection Measures (not drawn to scale) for OFP2

8 OTHER ISSUES

The 2013 hydrology report noted that for Sunny Day Isabella Weir Spillway Breach, Sunny Day Isabella Weir Embankment Breach and for Sunny Day Cascade Spillway Failure of Isabella Weir and Tuggeranong Weir, the site will not be flooded. However, it was reported that the site would be flooded in a Probable Maximum Flood (PMF) event, as shown in Figure 9 below. The PMF flood level in Tuggeranong Lake is approximately 574.5.

It should be noted here that the TaMS DSUI requires that dwellings shall be above the 100-year ARI flood level. However, the development of the site could potentially have an impact on the Consequence Assessment for Isabella Pond, Tuggeranong Pond and Tuggeranong Lake.

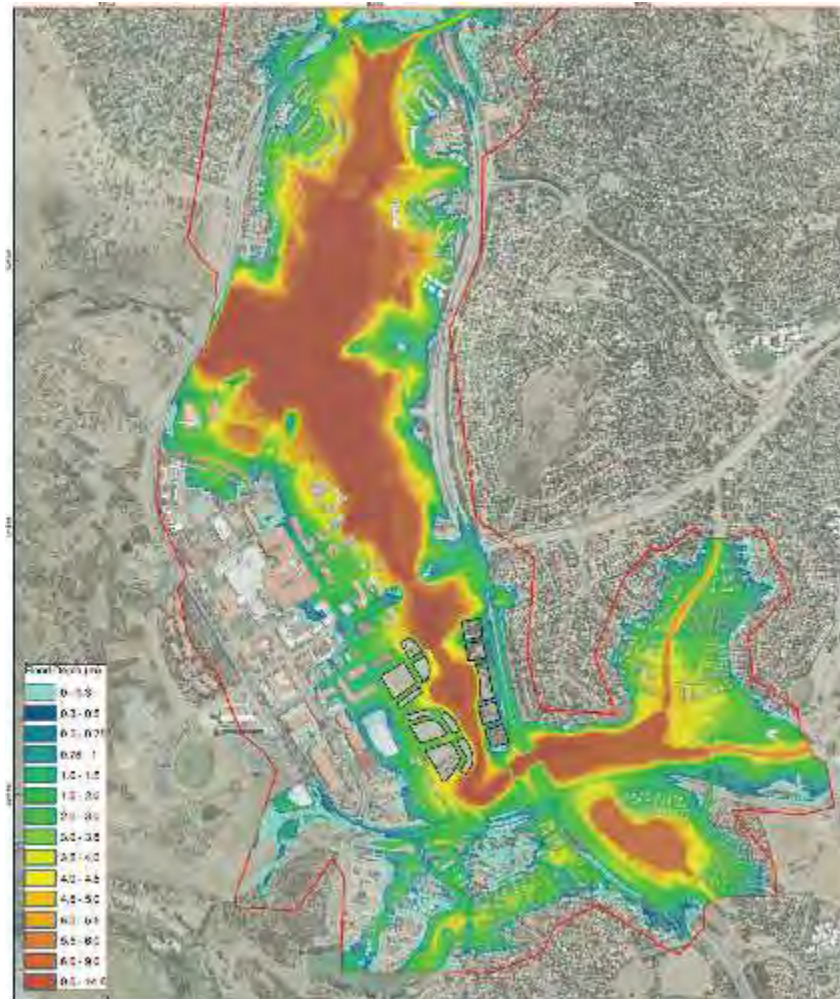


Figure 9. PMF Without any Dam/Weir Breach (Extracted from GHD, 2013)

9 INDICATIVE COSTING

Our indicative costs for undertaking the protection options for OFP1 and OFP2 are summarised below in tables 3 and 4 respectively. These costs include consultancy, contingencies and GST. These cost estimates do not include the cost of any fill required for the blocks. Actual costs can vary considerably depending on the final design of the services.

Table 3. Indicative Costing for Protection Options for OFP1

ITEM	Option 1	Option 2
Box Culvert across Road		
Small Culvert across Footpath		
Tailout Drain		
Reinstatement		
Concrete Channel		
Grassed Channel		
Total	\$350,000	\$275,000

Table 3. Indicative Costing for Protection Options for OFP2

ITEM	Option 1	Option 2	Option 3
Additional Pipe Culvert across Road			
Reinstatement			
Concrete Channel			
Grassed Channel			
Pipe			
Grassed Swale			
Total	\$150,000	\$90,000	\$105,000

10 CONCLUSION

An overland flow study has been undertaken for Block 2 Section 28 in Greenway which shows that parts of future blocks 2A and 2B will be inundated in a 100 year ARI event.

Protection measures have been conceptualised based on a general appreciation of the possible future development of the site. Options for protection of the site from flooding include concrete or grassed channel for managing the overland flow, culverts across Mortimer Lewis Drive to prevent overtopping of the road, pipe within an easement with a swale on top etc. Filling on either side of the channels will also be required. Feasibility of these options will be dependent on the specific development intentions for this site. Once specific details of the future development of the site become known, these protection measures will need to be reviewed and finalised to achieve the best design outcome for the site. It will also be necessary to discuss the protection measures with the approving and maintaining agencies to get their agreement during detailed design.

11 REFERENCES

GHD, February 2013. Tuggeranong Creek Hydrology and Dam Break Study – Draft Final Report.

Territory and Municipal Services (TaMS), Edition 1 Revision 4. Design Standards for Urban Infrastructure (DSUI)

From: [REDACTED]
Sent: Thursday, 23 February 2012 2:48 PM
To: Heary, Sibone
Cc: [REDACTED]
Subject: RE: Invitation for submission of Fee Proposal - Site Investigation Report Brief - Greenway
Attachments: Greenway B2S28 SIR Fee Proposal.pdf

Hi Sibone,

Please find attached our fee proposal for this Site Investigation Report.

Note that the Survey fee is slightly higher than usual due to the large number of trees the surveyor will need to locate and measure on the block.

Feel free to give me a call if you want to discuss.

Kind regards

[REDACTED] | **Project Engineer**
SMEC Australia Pty Ltd
Suite 2, Level 1, 243 Northbourne Ave, Lyneham ACT 2602
T [REDACTED] | F +61 2 6234 1966
[REDACTED] | www.smec.com

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From: Heary, Sibone [mailto:Sibone.Heary@act.gov.au]
Sent: Wednesday, 8 February 2012 1:03 PM
To: [REDACTED]
Subject: Invitation for submission of Fee Proposal - Site Investigation Report Brief - Greenway

Dear [REDACTED],

The Environment and Sustainable Development Directorate (ESDD) invites you to submit a fee proposal to carry out a site investigation at the following location as per the attached brief:

- BLOCK 2, SECTION 28 GREENWAY

This site is being investigated for possible residential development. A Territory Plan variation would be required to permit this use.

A copy of the brief, an example cover sheet, and the format for vegetation assessment are attached for your information and use.

Note that an electronic copy and one hard copy of the completed documents in a draft form should be submitted for feedback prior to finalisation of the report. For the final submission, an electronic copy of the document along with two colour paper copies are required.

A fee proposal via return email is requested by COB **Thursday 23 February 2012**. If successful you must be available to commence work immediately following ESDD's acceptance of your proposal. The Site Investigation Report should be completed **within 6 weeks of our acceptance of your proposal**.

I look forward to your response.

Regards,

Sibone Heary | Project Officer

Phone 02 6207 2634

Strategic City Planning and Design | Environment and Sustainable Development | **ACT Government**

Dame Pattie Menzies House, Challis Street, Dickson | GPO Box 1908 Canberra ACT 2601 | www.actpla.act.gov.au

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Suite 2, Level 1, 243 Northbourne Avenue, Lyneham, ACT 2602
 Telephone STD (02) ISD (612) 6234 1900, Facsimile (02) 6234 1966

23 February 2012

Land Development Agency
 Level 7 TransACT House
 470 Northbourne Avenue
 DICKSON ACT 2606

Our ref: File 3002299/Watson

Attention: Sibone Heary

Dear Sibone,

SITE INVESTIGATION REPORT – BLOCK 2 SECTION 28 GREENWAY
Fee Proposal

Pursuant to your recent request, we thank you for this opportunity to submit a fee proposal for the above subject Site Investigation Report.

Please refer to the following table presenting our fee requirements for this Site Investigation Report, as per your advice and the LDA "Site Investigation - Standard Brief."

Table 1: Lump sum fee

SERVICE DESCRIPTION	FEE
Site Investigation Report This includes civil engineering assessment, investigation of utilities/services, researching of on-site fill records, description of existing overland flooding/stormwater system, cost estimation and site visits. Also including meetings, client liaison, liaison with service/utility authorities and stakeholder coordination	
Survey Tree Survey and services identification including stormwater facilities identification (including mirroring all pits to ensure accuracy)	
Tree Assessment	
Administration and Disbursement Costs	
TOTAL FEE (Excluding GST)	
GST	
TOTAL AMOUNT (Including GST)	



SMEC HOLDINGS LIMITED
 220-226 Sharp Street PO Box 356 COOMA NSW 2630 AUSTRALIA
 Tel: ISD (612) STD 6452 0344 Fax: ISD (612) STD (02) 6452 0201

 SMEC HOLDINGS LIMITED ACN 057 274 049 SNOWY MOUNTAINS ENGINEERING CORPORATION LIMITED ACN 008 654 224
 SMEC AUSTRALIA PTY LIMITED ACN 065 475 149
 SMEC INTERNATIONAL PTY LIMITED ACN 065 440 619 SMEC OPERATIONS PTY LIMITED ACN 065 474 428
 SMEC SERVICES PTY LIMITED ACN 066 504 792
 SMEC VICTORIA PTY LTD ACN 069 699 467 SMEC WEST PTY LTD ACN 070 269 260



Table 2 below shows a schedule of our hourly rates applicable to key staff personnel, to complement this fee proposal in the event further work is requested by LDA during the project.

Table 2: Schedule of hourly rates

PERSONNEL TEAM ROLE	HOURLY RATE
OTHER COSTS	RATE
Additional hard copies of report - cost per coloured copy	

Fee Explanations:

1. Scope is in accordance with the LDA Site Investigation – Standard Brief.

SMEC is able to deliver the investigation report within 6 weeks of acceptance of our fee by the LDA. We will advise the LDA of any required extension of time caused by reasons beyond our control. We will undertake this project in accordance with the LDA Provision of Civil Engineering Services Panel for Site Preparation.

Please do not hesitate to contact the undersigned should you have any queries.

Regards,



Project Engineer

Telephone: [Redacted]

Email: [Redacted]