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C/- Playoust Churcher Architects



# Water and Sewer Servicing Strategy – Proposed Seniors Living, 83 Booralie Road, Terrey Hills, NSW

ENVIRONMENTAL



WATER



WASTEWATER



GEOTECHNICAL



CIVIL



PROJECT  
MANAGEMENT



P1404413JR04V01  
May 2015

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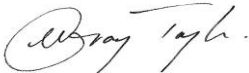
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**All enquiries regarding this project are to be directed to the Project Manager.**

# Contents

<b>1 OVERVIEW.....</b>	<b>5</b>
1.1 Introduction	5
1.2 Proposed Development	5
<b>2 SEWER SERVICING .....</b>	<b>6</b>
2.1 Existing Sewer infrastructure	6
2.2 Sewer Servicing Strategy	6
2.3 Sewage Generation Rate	6
2.4 Concept System Design	7
2.5 Operational Management	8
<b>3 WATER SERVICING .....</b>	<b>10</b>
3.1 Water Servicing Strategy	10
3.2 Water Demand Rates	10
3.2.1 Dwelling Demand	10
3.2.2 Garden and Landscape Demand	11
3.2.3 Total Supply Demand	11
3.2.4 Fire Services Demand	12
3.3 Preliminary System Design	13
3.4 Operational Management	13
<b>4 REFERENCES .....</b>	<b>14</b>
<b>5 ATTACHMENT A – SYDNEY WATER FEASIBILITY LETTER AND STATEMENT OF AVAILABLE PRESSURE AND FLOW .....</b>	<b>15</b>
<b>6 ATTACHMENT B – CONCEPT ENGINEERING PLANS .....</b>	<b>17</b>

# **1 Overview**

## **1.1 Introduction**

Martens and Associates Pty Ltd have been engaged to develop a preliminary water and sewer servicing strategy to support a proposed Seniors living development at 83 Booralie Road, Terry Hills, NSW.

The servicing strategy is based on information provided in a Sydney Water feasibility letter, dated 19<sup>th</sup> December 2014.

## **1.2 Proposed Development**

We understand that the development is to consist of the following key elements:

1. 26 x 3 bedroom senior living units/apartments with a common room on a site area of approximately 1.95 Ha.
2. Internal access from individual garages with street access from Booralie Road.
3. Internal landscaping.
4. Internal site stormwater management system.
5. Pump to sewer arrangement.
6. Water connection point to be upgraded to a larger connection.

## **2 Sewer Servicing**

### **2.1 Existing Sewer infrastructure**

The development is not presently connected to the Sydney Water sewer network.

A sewer main located on the eastern side of Laitoki Road services residential lots east of Laitoki Road. The sewer main is a 150mm diameter vitrified clay (VC) main flowing south joining into a 225mm diameter VC main approximately half way between Nambucca Road and Tooronga Road. Opposite the eastern boundary of the proposed development site, 7 manholes, 2 lampholes and an access chamber are located along the waste water main in Laitoki Road.

### **2.2 Sewer Servicing Strategy**

A Sydney Water Feasibility Letter (December 2014) requires the existing 225mm wastewater main adjacent the development be extended to serve the proposed development. Gravity drainage of site wastewater to this extension (details of which are to be confirmed by Sydney Water) is likely to be unachievable due to levels, therefore a rising main is likely required to connect site wastewater to the Sydney Water main extension subject to Sydney Water's approval and additional requirements at the detailed design stage.

The scope of this sewer strategy includes:

1. Estimate sewage generation rates.
2. Prepare a preliminary system design.
3. Document broad operating requirements.

### **2.3 Sewage Generation Rate**

The proposed senior living units are typically planned for as 0.6 equivalent tenements (ET) with an ET being around 3 equivalent persons (EP). The site would therefore maintain an occupancy rate of 1.8 EP/dwelling. Design peak site population is calculated in Table 1. The design sewer flow rate for the site (PWWF) is calculated to be 212 kL/day.

**Table 1:** Sewage generation and discharge rates.

Element	Value	Units
Units <sup>1</sup>	27	Each
Design Peak Population <sup>1</sup>	48.6	EP
ADWF <sup>2,3</sup>	8.75	kL/day
PDWF <sup>2,3</sup>	0.75	L/s
Design sewer flow <sup>3</sup> (PWWF)	2.45	L/s
Maximum allowable daily pump to sewer <sup>4</sup>	172.8	kL

Notes

- <sup>1</sup>. Based on 26 units (plus 1 x common room) x 1.8 EP/unit.
- <sup>2</sup>. ADWF - Average dry weather flow, PDWF - Peak daily dry weather flow, PWWF – Peak wet weather flow.
- <sup>3</sup>. Based on design flow calculations in accordance with Appendix B, Sewage Code of Australia, 2002, Sydney Water Edition.
- <sup>4</sup>. Based on a maximum flow rate of 2 L/s being a typical Sydney Water requirement.

## 2.4 Concept System Design

The proposed pump to sewer system component design is provided in Table 2 with a plan of the scheme provided in Attachment B. Design specifications are as follows:

1. Gravity drainage of the proposed development to an onsite pumping station, located to the south of the site's developed area in accordance with AS/NZS 3500, (refer to Attachment B). Gravity drainage design is to occur at the detailed design stage.
2. An onsite sewer pumping station discharging to Sydney Water's sewer network at a likely maximum flow rate of 2 L/s. The pumping station is to be fitted with a dual (duty and standby) operation transfer pump (pump type to be confirmed). Connection to Sydney Water's sewer network is to be designed and approved by Sydney Water at the detailed design stage.
3. High level alarms are to be provided on sewer holding tanks.
4. Pump station capacities are provided in Table 2.
5. Final location and the arrangement of sewer and pump station components are to be confirmed during detailed design.
6. Control shed or similar area to contain electrical control boards, maintenance register and ancillary items relating to the pump to sewer system.

7. The rising main from the sewer pump station is likely to consist of a DN63 PE discharge line running parallel with the site boundary, connecting to Sydney Water's waste water network.
8. Extension of Sydney Water's existing sewer waste water network as indicated in Sydney Water's Feasibility letter (Attachment A). Extension requirements to be confirmed by Sydney Water at detailed design stage. Refer to Attachment B for the proposed rising main alignment, venting line and existing Sydney Water manhole locations (no waste water extension shown on plans).
9. Provision of a 3.0m wide access way for a medium rigid vehicle (MRV) for emergency and maintenance access to the sewer pump station and holding tank.

**Table 2:** Pump to sewer system component design.

Element	Value	Units
Operating capacity (4 hrs PDWF)	10.8	kL
Wet weather overflow storage (10 hrs storage) <sup>1</sup>	61.2	kL
Total onsite storage <sup>2</sup>	70.0	kL
Pumping station discharge rate (maximum) <sup>3</sup>	2	L/s

Notes

<sup>1</sup>. Flows generated from ground water infiltration and rainfall inflow over 10hrs.

<sup>2</sup>. Total storage includes 24 hrs of ADWF plus 10hrs of PWWF storage.

<sup>3</sup>. Likely Sydney Water requirement subject to Sydney Water approval.

## 2.5 Operational Management

### 2.5.1.1 Visual Impact

All tanks, pumps, lines and shed will largely be below ground and therefore will have minimal visual impact.

### 2.5.1.2 Noise Considerations

All wastewater transfer pumps will be submersible pumps (ie. operate below water level). Impact assessment for the operation of the pump station is as follows:

1. Pumps will not generate nuisance noise to any nearby buildings due to pumps being submersed and encased in a sealed tank below ground.
2. The pump to sewer system is not expected to generate excessive nuisance noise levels impacting on either proposed dwellings or existing adjacent dwellings along Laitoki Road.



#### *2.5.1.3 Odour Considerations*

A vent with attached odour scrubber is to be located to the south of the site away from dwellings to reduce likelihood of nuisance odours.

#### *2.5.1.4 Emergency Response*

The proposed SPS provides adequate reserve storage volume and therefore time to respond to possible emergencies. Table 2 outlines storage volumes provided.

In the event of equipment failure or extended power failure provision is to be made to allow pump out of the SPS and emergency maintenance. The tank location is to allow for a 3.0m wide access way accommodating a medium rigid vehicle (MRV) for emergency and maintenance purposes.

## **3 Water Servicing**

### **3.1 Water Servicing Strategy**

The existing site is currently serviced with a single 20mm domestic water connection to Sydney Water's network. This connection point is located along the western section of the northern site boundary.

The attached Sydney Water feasibility letter indicates the following:

1. Sydney Water has an existing 200mm water main in Booralie Road.
2. This water main is available for connection.
3. Approval and specifications for a larger water connection to service the proposed development will take place at the detailed design stage.
4. Appropriate backflow prevention is required.

The scope of this strategy for water servicing includes;

1. Determine water demand rates for expected potable, non-potable and fire-fighting demands.
2. Determine the requirements [if any] for augmenting the Sydney Water supply service in order to meet projected demands.
3. Prepare a preliminary system design.
4. Document broad operating requirements.

### **3.2 Water Demand Rates**

#### *3.2.1 Dwelling Demand*

Dwelling water demand is summarised in Table 3.

**Table 3:** Dwelling potable water demand rates.

Element	Value	Units
Average daily demand <sup>1</sup>	2.5	L/ m <sup>2</sup> /day
Gross floor area <sup>2</sup>	4500	m <sup>2</sup>
Number of units <sup>3</sup>	27	No.
Total daily demand per dwelling	417	L/unit/day
Internal dwelling demand <sup>4</sup>	80	%
Annual daily demand per unit (internal use)	333	L/unit/d
Annual daily demand per unit (external use)	83	L/unit/d

Notes

<sup>1</sup>. Based on self-care aged accommodation, Sydney Water (2012).

<sup>2</sup>. Ultimate developed area (approx.).

<sup>3</sup>. Includes all 26 units and allowance for 1 common area.

<sup>4</sup>. Based on 80% of daily dwelling demand.

### 3.2.2 Garden and Landscape Demand

We understand that gardens and site landscaping will consist of the following:

1. Deep soil landscape area of approximately 1.2 Ha, surrounding the developed area (not irrigated).
2. Landscaped areas are likely to be irrigated during the developments life, therefore a 2kL daily site allowance has been made for demand calculations.

### 3.2.3 Total Supply Demand

A 200mm diameter Sydney Water main is available in Booralie Road providing the current site with a domestic supply. This is currently a standard domestic size of 20mm (Sydney Water Feasibility Letter).

A larger connection will be required to service the proposed development. This will involve applying to Sydney Water via Quick Check agent once a hydraulic layout and a list of all fixtures and fittings are known. These details are to be confirmed at the detailed design stage.

Total site water demand is summarised in Table 4.

**Table 4:** Site potable water demand rates.

Element	Value	Units
(A) Daily average dwelling demand (internal) <sup>1</sup>	9.00	KL/day
(B) Daily average dwelling demand (external) <sup>2</sup>	2.25	KL/day
(C) Daily site irrigation allowance	2.0	KL/day
(A)+ (B)+ (C) Daily average site demand	13.25	KL/day
Peak Site Daily Demand <sup>3</sup>	33.1	KL/day
Peak Hourly Demand <sup>4</sup>	1.9	L/s

Notes

<sup>1</sup>. Calculated on 27 units x 333 L/unit/day.

<sup>2</sup>. Calculated on 20% of daily flow.

<sup>3</sup>. Daily average site demand multiplied by peak day factor of 2.5 (WSA, 2002).

<sup>4</sup>. Average hourly demand on peak day multiplied by peak hour factor of 5.0 (WSA, 2002).

Based on Sydney Water Statement of Available Pressure and Flow, dated 06/11/2014 (Attachment A), the site peak hourly water demand of 1.9 L/s is expected to result in an acceptable operating pressure of at least 28m head within Sydney Waters' main. This is to be confirmed at detailed design stage once the hydraulic layout and all fixtures and fittings are determined.

#### 3.2.4 Fire Services Demand

An internal fire hydrant service will be provided to service the proposed development.

Hydrant performance [attack hydrant] specification is 10 L/s at 25 m residual head pressure (ie. 250 KPa) in accordance with AS 2419 (2005). Hydrants should be positioned to ensure that all buildings may be reached by a 10 m jet of water from a 60 m length of hose attached to a hydrant.

The Sydney Water Statement of Available Pressure and Flow indicates an expected water mains pressure at the connection point of:

1. 61m head (maximum pressure)
2. 29m head (minimum pressure)

Based on Sydney Waters' pressure and flow modelling, a single hydrant flowing at 10 L/sec, gives an acceptable pressure head in the main of 27m to 30m. This is to be confirmed at the detailed design stage once the hydraulic layout and all fixtures and fittings (including fire hydrants) are determined. This will ensure adequate Sydney Water mains pressure and internal site pressure and flows are achieved.

### **3.3 Preliminary System Design**

A preliminary water supply scheme will include the following elements:

1. New larger water connection size with provision of appropriate backflow prevention.
2. 100 mm potable and fire supply main(s) to the development.
3. Hydrants serviced from the fire supply main.

### **3.4 Operational Management**

#### *3.4.1.1 Sydney Water Supply*

For the purposes of this report, we have assumed that the connection will be made available from the mains situated within the Booralie Road reserve. There are no significant operational or maintenance issues related to this connection.

#### *3.4.1.2 Hydrants*

Hydrants (and other fire protection systems) are to be serviced in accordance with AS 1851 and manufacturer's specifications.

## 4 References

Australian Standard 2419 (2005) *Fire Hydrant Installations*.

Department of Water and Energy (2008) *NSW Guidelines for Greywater reuse in sewerred, single household residential premises*

Sydney Water (2014), *Feasibility Letter*, 19/12/2014.

Sydney Water (2012) Average Daily Water Use By Property Development Type, viewed 30 November 2012, [http://www.sydneywater.com.au/BuildingDeveloping/SupplierInformation/eDeveloper/Average\\_Daily\\_Water\\_Use\\_Table.pdf](http://www.sydneywater.com.au/BuildingDeveloping/SupplierInformation/eDeveloper/Average_Daily_Water_Use_Table.pdf)

Troy, P., Holloway, D. and Randolph, B. (2005) *Water Use and the Built Environment: Patterns of Water Consumption in Sydney*, University of NSW City Futures Research Centre Research Paper No. 1

Water Services Association of Australia (2002) *Sewerage Code of Australia – Sydney Water Edition Version 3*.

Water Services Association of Australia (2011) *Water supply Code of Australia – Sydney Water Edition Version 3.1*.

**5      Attachment A – Sydney Water Feasibility Letter and  
Statement of Available Pressure and Flow**

Case Number: 143001

19 December 2014

Martens & Associates Pty Ltd  
c/- Qalchek Pty Ltd

### FEASIBILITY LETTER

**Developer:** Martens & Associates Pty Ltd  
**Your reference:** PM 13755  
**Development:** Lot 51 DP651178 83 BOORALIE RD, Terrey Hills  
**Development Description:** Proposed Seniors Living Development consisting of 26 Units and 1 Common room.  
**Your application date:** 12 December 2014

Dear Applicant

This Feasibility Letter (Letter) is a guide only. It provides general information about what Sydney Water's requirements could be if you applied to us for a Section 73 Certificate (Certificate) for your proposed development. **The information is accurate at today's date only.**

If you obtain development consent for that development from your consent authority (this is usually your local Council) they will require you to apply to us for a Section 73 Certificate. You will need to submit a new application (and pay another application fee) to us for that Certificate by using your current or another Water Servicing Coordinator (Coordinator).

Sydney Water will then send you either a:

- Notice of Requirements (Notice) and Developer Works Deed (Deed) or
- Certificate.

These documents will be the definitive statement of Sydney Water's requirements.

There may be changes in Sydney Water's requirements between the issue dates of this Letter and the Notice or Certificate. The changes may be:

- if you change your proposed development eg the development description or the plan/site layout, after today, the requirements in this Letter could change when you submit your new application; and



- if you decide to do your development in stages then you must submit a new application (and pay another application fee) for each stage.

**You have made an application for specific information. Sydney Water's possible requirements are:**

**No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from Sydney Water and to the extent that it is able, Sydney Water limits its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.**

## What You Must Do To Get A Section 73 Certificate In The Future.

To get a Section 73 Certificate you must do the following things. You can also find out about this process by visiting [www.sydneywater.com.au](http://www.sydneywater.com.au) > Plumbing, building & developing > Developing > Land development.

1. **Obtain Development Consent from the consent authority for your development proposal.**
2. **Engage a Water Servicing Coordinator (Coordinator).**

**You must engage your current or another authorised Coordinator** to manage the design and construction of works that you must provide, at your cost, to service your development. If you wish to engage another Coordinator (at any point in this process) you must write and tell Sydney Water.

For a list of authorised Coordinators, either visit [www.sydneywater.com.au](http://www.sydneywater.com.au) > Plumbing, building & developing > Developing > Providers > Lists or call **13 20 92**.

The Coordinator will be your point of contact with Sydney Water. They can answer most questions that you might have about the process and developer charges and can give you a quote or information about costs for services/works (including Sydney Water costs).

### 3. Developer Works Deed

**After** the Coordinator has submitted your new application, they will receive the Sydney Water Notice and Developer Works Deed (Deed). You and your accredited Developer Infrastructure Providers (Providers) will need to sign and lodge both copies of the Deed with your nominated Coordinator. After Sydney Water has signed the documents, one copy will be returned to the Coordinator.

The Deed sets out for this project:

- your responsibilities;
- Sydney Water's responsibilities; and
- the Provider's responsibilities.

**You must do all the things that we ask you to do in that Deed.** This is because your development does not have sewer services and you must construct and pay for the following works extensions under this Deed to provide these services.

**Note:** The Coordinator must be fully authorised by us for the whole time of these agreements.

### 4. Water and Sewer Works

#### 4.1 Water

Your development must have a frontage to a water main that is the right size and can be

used for connection.

Sydney Water has assessed your application and found that:

- The drinking water main available for connection is the 200mm main on the southern side of Booralie Road.

#### 4.2 Sewer

Your development must have a sewer main that is the right size and can be used for connection. That sewer must also have a connection point within your development's boundaries.

Sydney Water has assessed your application and found that:

- **You must construct a waste water main extension off the 225mm wastewater main constructed under WN 307594 to serve your development.**

### 5. Ancillary Matters

#### 5.1 Asset adjustments

After Sydney Water issues this Notice (and more detailed designs are available), Sydney Water may require that the water main/sewer main/stormwater located in the footway/your property needs to be adjusted/deviated. If this happens, you will need to do this work as well as the extension we have detailed above at your cost. The work must meet the conditions of this Notice and you will need to complete it **before we can issue the Certificate**. Sydney Water will need to see the completed designs for the work and we will require you to lodge a security. The security will be refunded once the work is completed.

#### 5.2 Entry onto neighbouring property

If you need to enter a neighbouring property, you must have the written permission of the relevant property owners and tenants. You must use Sydney Water's **Permission to Enter** form(s) for this. You can get copies of these forms from your Coordinator or the Sydney Water website. Your Coordinator can also negotiate on your behalf. Please make sure that you address all the items on the form(s) including payment of compensation and whether there are other ways of designing and constructing that could avoid or reduce their impacts. You will be responsible for all costs of mediation involved in resolving any disputes. Please allow enough time for entry issues to be resolved.

### OTHER THINGS YOU MAY NEED TO DO

Shown below are other things you need to do that are NOT a requirement for the Certificate. They may well be a requirement of Sydney Water in the future because of the impact of your development on our assets. You must read them before you go any further.

#### Stamping and approval of your building plans

Please note that your building plans must be stamped and approved. This can be done at a

Quick Check agency. For an agency list visit [www.sydneywater.com.au](http://www.sydneywater.com.au) > Plumbing, building & developing > Building > Quick Check agents or call 13 20 92.

This is not a requirement of the Certificate but the approval is needed because construction/building works may impact on existing Sydney Water assets (e.g. water and sewer mains). In any case, these works MUST NOT commence until Sydney Water has granted approval.

Your Coordinator can tell you about the approval process including:

- Possible requirements;
- Costs; and
- Timeframes.

**Note: You must obtain our written approval before you do any work on Sydney Water's systems. Sydney Water will take action to have work stopped on the site if you do not have that approval. We will apply Section 44 of the *Sydney Water Act 1994*.**

### **Disused Sewerage Service Sealing**

Please do not forget that you must pay to disconnect all disused private sewerage services and seal them at the point of connection to a Sydney Water sewer main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed drainer. The licensed drainer must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

### **Soffit Requirements**

Please be aware that floor levels must be able to meet Sydney Water's soffit requirements for property connection and drainage.

### **Requirements for Business Customers for Commercial and Industrial Property Developments**

If this property is to be developed for Industrial or Commercial operations, it may need to meet the following requirements:

#### **Trade Wastewater Requirements**

If this development is going to generate trade wastewater, the property owner must submit an application requesting permission to discharge trade wastewater to Sydney Water's sewerage system. You must wait for approval of this permit before any business activities can commence.

The permit application should be emailed to Sydney Water's Business Customer Services at [businesscustomers@sydneywater.com.au](mailto:businesscustomers@sydneywater.com.au)

It is illegal to discharge Trade Wastewater into the Sydney Water sewerage system without permission.

A **Boundary Trap** is required for all developments that discharge trade wastewater where arrestors and special units are installed for trade wastewater pre-treatment.

If the property development is for Industrial operations, the wastewater may discharge into a sewerage area that is subject to wastewater reuse. Find out from Business Customer Services if this is applicable to your development.

### **Backflow Prevention Requirements**

Backflow is when there is unintentional flow of water in the wrong direction from a potentially polluted source into the drinking water supply.

All properties connected to Sydney Water's supply must install a testable **Backflow Prevention Containment Device** appropriate to the property's hazard rating. Property with a high or medium hazard rating must have the backflow prevention containment device tested annually. Properties identified as having a low hazard rating must install a non-testable device, as a minimum.

Separate hydrant and sprinkler fire services on non-residential properties, require the installation of a testable double check detector assembly. The device is to be located at the boundary of the property.

Before you install a backflow prevention device:

1. Get your hydraulic consultant or plumber to check the available water pressure versus the property's required pressure and flow requirements.
2. Conduct a site assessment to confirm the hazard rating of the property and its services. Contact PIAS at NSW Fair Trading on **1300 889 099**.

For installation you will need to engage a licensed plumber with backflow accreditation who can be found on the Sydney Water website:

<http://www.sydneywater.com.au/Plumbing/BackflowPrevention/>

### **Water Efficiency Recommendations**

Water is our most precious resource and every customer can play a role in its conservation. By working together with Sydney Water, business customers are able to reduce their water consumption. This will help your business save money, improve productivity and protect the environment.

Some water efficiency measures that can be easily implemented in your business are:

- Install water efficiency fixtures to help increase your water efficiency, refer to WELS (Water Efficiency Labelling and Standards (WELS) Scheme, <http://www.waterrating.gov.au/>
- Consider installing rainwater tanks to capture rainwater runoff, and reusing it, where cost effective. Refer to <http://www.sydneywater.com.au/Water4Life/InYourBusiness/RWTCalculator.cfm>
- Install water-monitoring devices on your meter to identify water usage patterns and leaks.
- Develop a water efficiency plan for your business.

It is cheaper to install water efficiency appliances while you are developing than retrofitting them later.

### Contingency Plan Recommendations

Under Sydney Water's [customer contract](#) Sydney Water aims to provide Business Customers with a continuous supply of clean water at a minimum pressure of 15meters head at the main tap. This is equivalent to 146.8kpa or 21.29psi to meet reasonable business usage needs.

Sometimes Sydney Water may need to interrupt, postpone or limit the supply of water services to your property for maintenance or other reasons. These interruptions can be planned or unplanned.

Water supply is critical to some businesses and Sydney Water will treat vulnerable customers, such as hospitals, as a high priority.

Have you thought about a **contingency plan** for your business? Your Business Customer Representative will help you to develop a plan that is tailored to your business and minimises productivity losses in the event of a water service disruption.

For further information please visit the Sydney Water website at: <http://www.sydneywater.com.au/OurSystemsandOperations/TradeWaste/> or contact Business Customer Services on **1300 985 227** or [businesscustomers@sydneywater.com.au](mailto:businesscustomers@sydneywater.com.au)

### Fire Fighting

Definition of fire fighting systems is the responsibility of the developer and is not part of the Section 73 process. It is recommended that a consultant should advise the developer regarding the fire fighting flow of the development and the ability of Sydney Water's system to provide that flow in an emergency. Sydney Water's Operating Licence directs that Sydney Water's mains are only required to provide domestic supply at a minimum pressure of 15 m head.

A report supplying modelled pressures called the Statement of Available pressure can be purchased through any Quick Check agent and may be of some assistance when defining the fire fighting system. The Statement of Available pressure, may advise flow limits that relate to system capacity or diameter of the main and pressure limits according to pressure management initiatives. If mains are required for fire fighting purposes, the mains shall be arranged through the water main extension process and not the Section 73 process.

### Large Water Service Connection

A water main are available to provide your development with a domestic supply. The size of your development means that you will need a connection larger than the standard domestic 20 mm size.

To get approval for your connection, you will need to lodge an application with a Quick Check Agent. You, or your hydraulic consultant, may need to supply the following:

A plan of the hydraulic layout;  
A list of all the fixtures/fittings within the property;  
A copy of the fireflow pressure inquiry issued by Sydney Water;  
A pump application form (if a pump is required);  
All pump details (if a pump is required).

You will have to pay an application fee.

Sydney Water does not consider whether a water main is adequate for fire fighting purposes for your development. We cannot guarantee that this water supply will meet your Council's fire fighting requirements. The Council and your hydraulic consultant can help.

### **Disused Water Service Sealing**

You must pay to disconnect all disused private water services and seal them at the point of connection to a Sydney Water water main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed plumber. The licensed plumber must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

### **Other fees and requirements**

The requirements in this Notice relate to your Certificate application only. Sydney Water may be involved with other aspects of your development and there may be other fees or requirements. These include:

- plumbing and drainage inspection costs;
- the installation of backflow prevention devices;
- trade waste requirements;
- large water connections and
  - council fire fighting requirements. (It will help you to know what the fire fighting requirements are for your development as soon as possible. Your hydraulic consultant can help you here.)

**No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from Sydney Water and to the extent that it is able, Sydney Water limits its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.**

---

**END**

## Statement of Available Pressure and Flow

**Martens & Associates Pty Ltd**  
**6/37 Leighton Place**  
**Hornsby, 2077**

**Attention: Martens & Associates Pty Ltd**

**Date: 06/11/2014**

**Pressure & Flow Application Number: 8933793**

**Your Pressure Inquiry Dated: Thu October 23 2014**

**Property Address: 83 Booralie Rd Terrey Hills 2084**

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

### ASSUMED CONNECTION DETAILS

Street Name: Booralie Rd	Side of Street: South
Distance & Direction from Nearest Cross Street	40 metres West from Laitoki Rd
Approximate Ground Level (AHD):	198 metres
Nominal Size of Water Main (DN):	200 mm

### EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	61 metre head
Minimum Pressure	29 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	29
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5 10 15	31 30 30
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5 10 15	28 27 26
Maximum Permissible Flow	18	25

**(Please refer to reverse side for Notes)**

**For any further inquiries regarding this application please email :**

**[connections@sydneywater.com.au](mailto:connections@sydneywater.com.au)**



## General Notes

This report is provided on the understanding that (i) the applicant has fully and correctly supplied the information necessary to produce and deliver the report and (ii) the following information is to be read and understood in conjunction with the results provided.

1. Under its Act and Operating Licence, Sydney Water is not required to design the water supply specifically for fire fighting. The applicant is therefore required to ensure that the actual performance of a fire fighting system, drawing water from the supply, satisfies the fire fighting requirements.
2. Due to short-term unavoidable operational incidents, such as main breaks, the regular supply and pressure may not be available all of the time.
3. To improve supply and/or water quality in the water supply system, limited areas are occasionally removed from the primary water supply zone and put onto another zone for short periods or even indefinitely. This could affect the supply pressures and flows given in this letter. This ongoing possibility of supply zone changes etc, means that the validity of this report is limited to one (1) year from the date of issue. It is the property owner's responsibility to periodically reassess the capability of the hydraulic systems of the building to determine whether they continue to meet their original design requirements.
4. Sydney Water will provide a pressure report to applicants regardless of whether there is or will be an approved connection. Apparent suitable pressures are not in any way an indication that a connection would be approved without developer funded improvements to the water supply system. These improvements are implemented under the Sydney Water 'Urban Development Process'.
5. Pumps that are to be directly connected to the water supply require approval of both the pump and the connection. Applications are lodged through Quick Check Agents (List available on Sydney Water Website - [www.sydneywater.com.au](http://www.sydneywater.com.au)). Where possible, on-site recycling tanks are recommended for pump testing to reduce water waste and allow higher pump test rates.
6. Periodic testing of boosted fire fighting installations is a requirement of the Australian Standards. To avoid the risk of a possible 'breach' of the Operating Licence, flows generated during testing of fire fighting installations are to be limited so that the pressure in Sydney Water's System is not reduced below 15 metres. Pumps that can cause a breach of the Operating Licence anywhere in the supply zone during testing will not be approved. This requirement should be carefully considered for installed pumps that can be tested to 150% of rated flow.

## Notes on Models

1. Calibrated computer models are used to simulate maximum demand conditions experienced in each supply zone. Results have not been determined by customised field measurement and testing at the particular location of the application.
2. Regular updates of the models are conducted to account for issues such as urban consolidation, demand management or zone change.
3. Demand factors are selected to suit the type of fire-fighting installation. Factor 1 indicates pressures due to system demands as required under Australian Standards for fire hydrant installations. Factor 2 indicates pressures due to peak system demands.
4. When fire-fighting flows are included in the report, they are added to the applicable demand factor at the nominated location during a customised model run for a single fire. If adjacent properties become involved with a coincident fire, the pressures quoted may be substantially reduced.
5. Modelling of the requested fire fighting flows may indicate that local system capacity is exceeded and that negative pressures may occur in the supply system. Due to the risk of water contamination and the endangering of public health, Sydney Water reserves the right to refuse or limit the amount of flow requested in the report and, as a consequence, limit the size of connection and/or pump.
6. The pressures indicated by the modelling, at the specified location, are provided without consideration of pressure losses due to the connection method to Sydney Water's mains.

## **6      Attachment B – Concept Engineering Plans**

83 BOORALIE ROAD, TERRY HILLS  
STORMWATER CONCEPT PLAN

PLAN NO.

D100	COVER SHEET
D110	PRE - DEVELOPMENT LAYOUT
D120	POST - DEVELOPMENT LAYOUT
D125	PIT SCHEDULE
D150	TYPICAL DETAIL - OSD TANK & OUTLET TO CREEK
D170	CONCEPT SITE SEDIMENT AND EROSION CONTROL PLAN
D175	SECP SPECIFICATIONS

REV.	DESCRIPTION	DATE	ISSUED	BAR SCALE  <
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BAR SCALE
0 8 16 24 32 40
UNITS - METRES
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REVIEWED: GT/DM	HORIZONTAL RATIO: 1:400	83 BOORALIE ROAD, TERRY HILLS
PAPER SIZE: A1	VERTICAL RATIO: 1:400	THIS PLAN MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED BY PRINCIPAL CERTIFYING AUTHORITY All measurements in mm unless otherwise specified

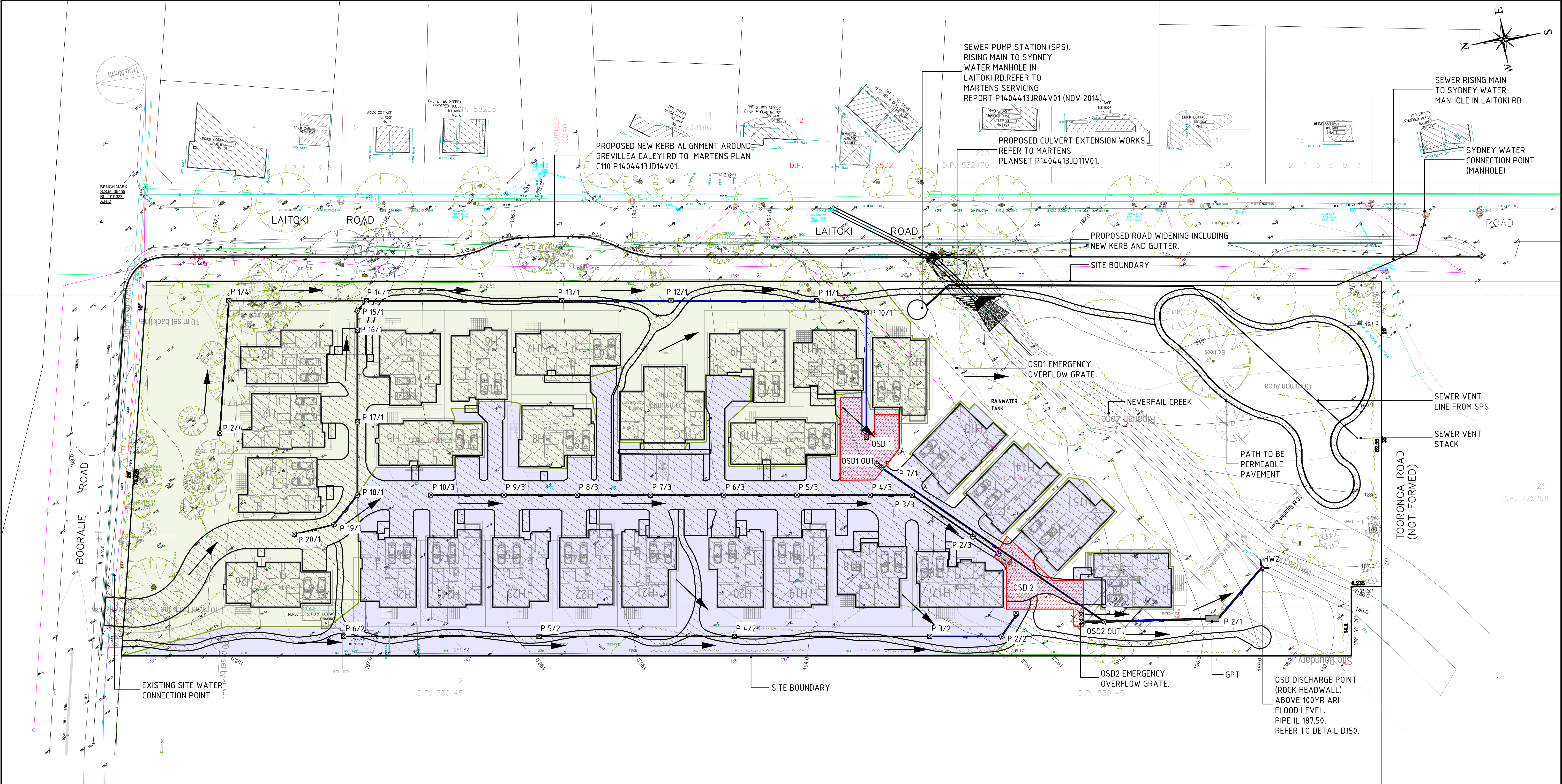


**Consulting Engineers**  
Environment  
Water  
Geotechnical  
Civil

Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767  
Email: [mail@martens.com.au](mailto:mail@martens.com.au) Internet: <http://www.martens.com.au>

TITLE: PRE - DEVELOPMENT LAYOUT				DRAWING ID: D110
PROJECT MANAGER: GT	PROJECT NO.: P1404413	FILE: JD06V02	REVISION: B	





KEY:

SITE BOUNDARY

OSD 1

OSD 2

OSD BYPASS

IMPERVIOUS AREA

SURFACE DRAINAGE (PIT/PIPE)  
REFER TO PIT SCHEDULE D125.

OVERLAND FLOW PATH (UP TO 1% AEP)

OSD TANK (MASONRY)

GPT (ECOSOL RSF 4000 OR EQUIVALENT)


STORMWATER NOTES:

OSD VOLUME:  
OSD1 (EAST) = 417 m<sup>3</sup>  
OSD (WEST) = 317 m<sup>3</sup>  
TOTAL OSD = 734 m<sup>3</sup>

ROOF WATER TO RAINWATER TANKS AS REQUIRED BY BASIX.

ALL RAINWATER TANKS OVERFLOW TO OSD TANKS.


DETAILED DESIGN TO BE CONFIRMED AT CC STAGE.

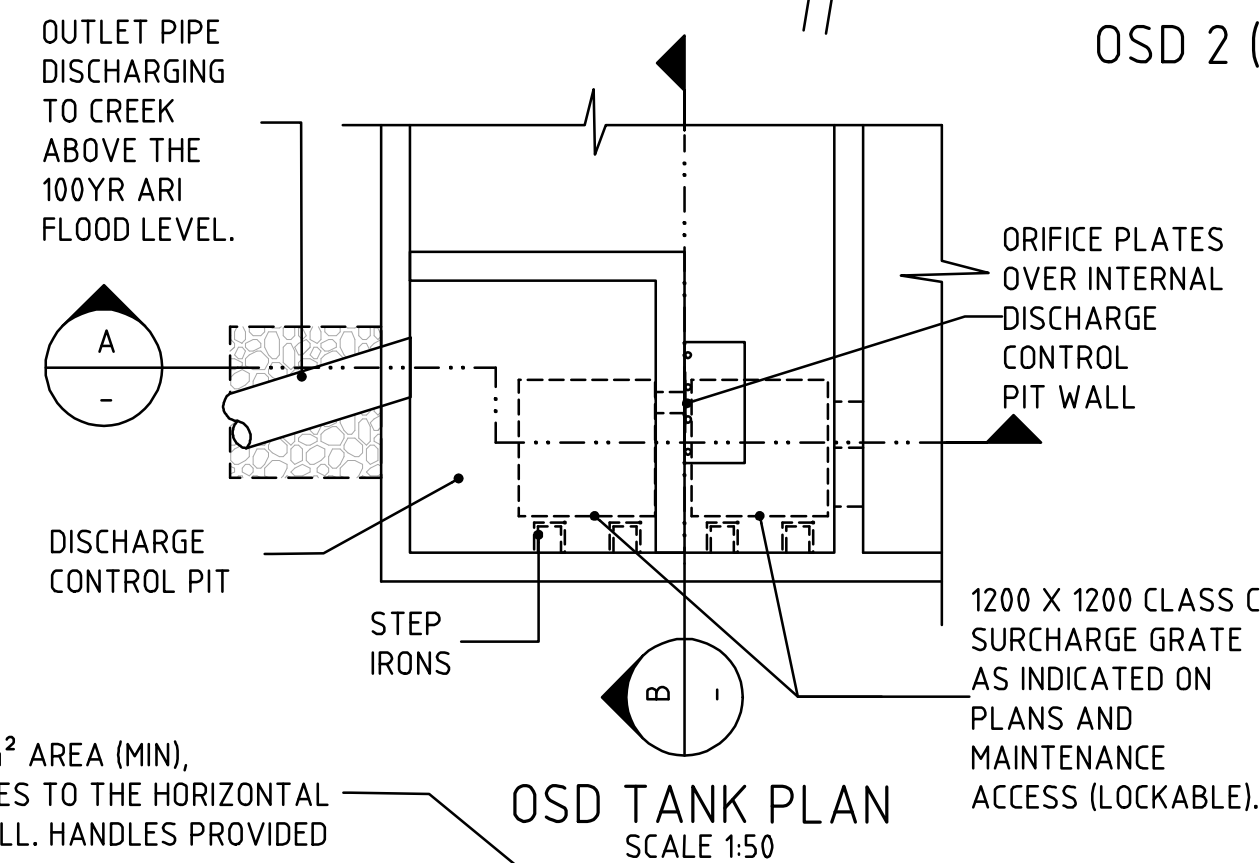
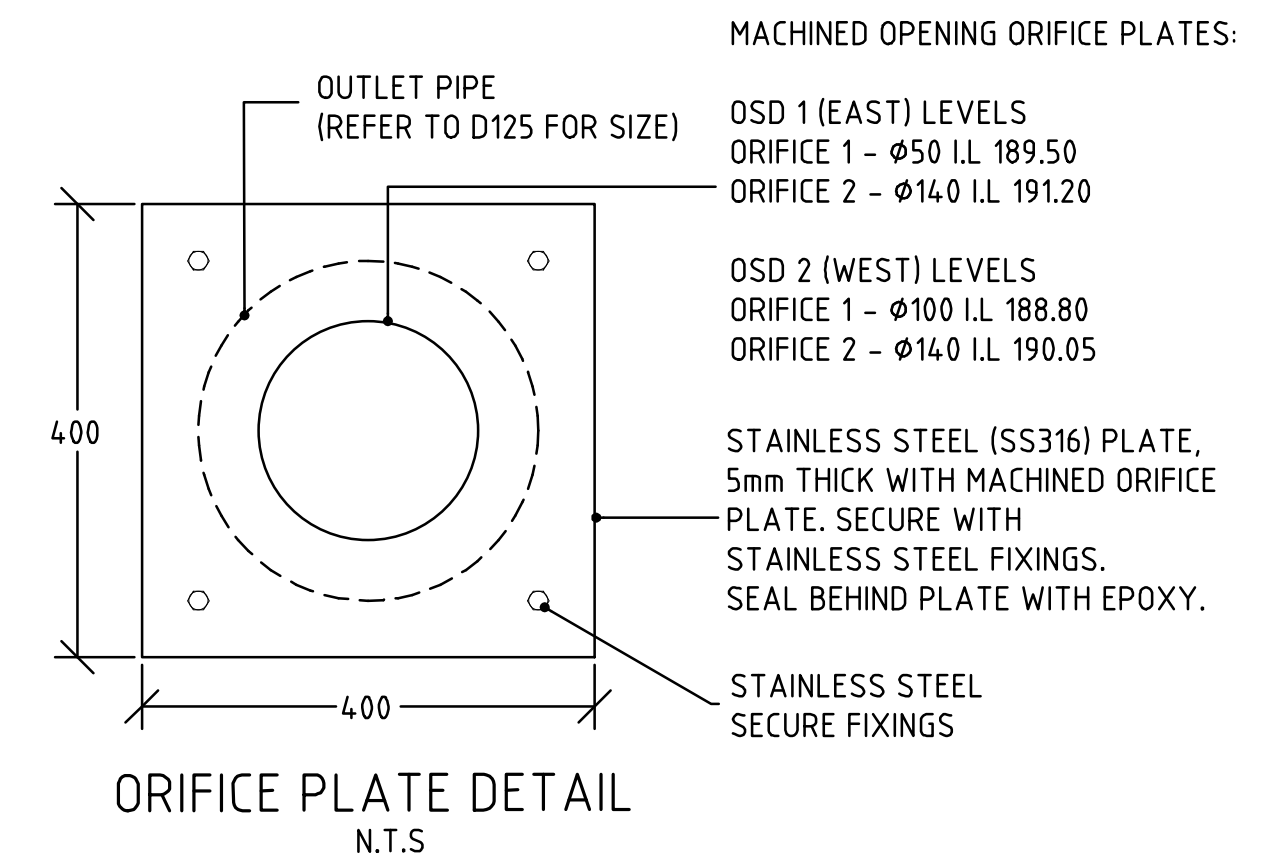
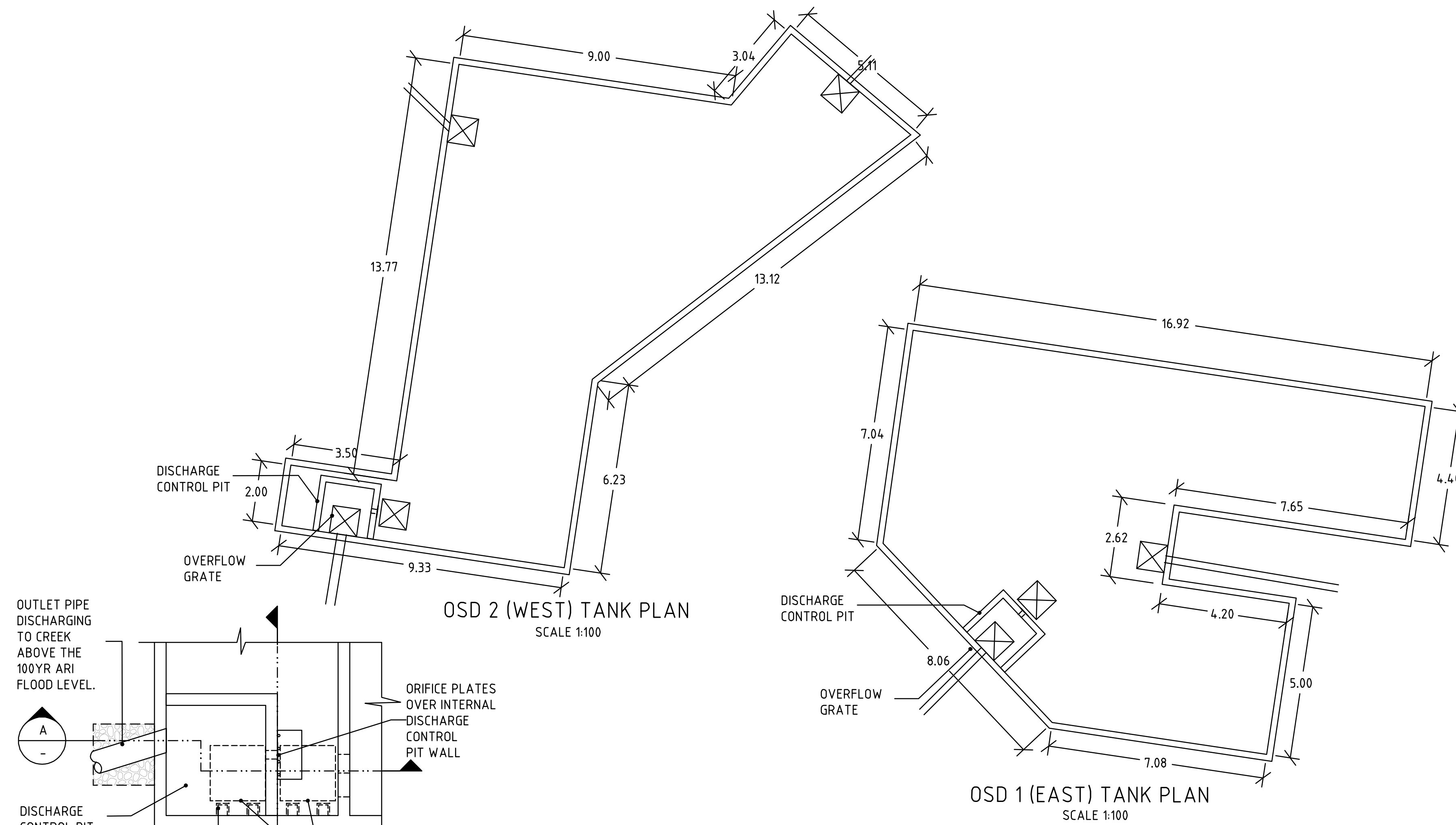
REV.	DESCRIPTION	DATE	ISSUED	BAR SCALE	DESIGNED: TH	DATUM: mAHD	CLIENT / PROJECT	<div><div><b>Consulting Engineers</b> <i>Environment Water Geotechnical Civil</i></div></div> <div>Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 Email: <a href="mailto:mail@martens.com.au">mail@martens.com.au</a> Internet: <a href="http://www.martens.com.au">http://www.martens.com.au</a></div>	TITLE:			DRAWING ID:	
A	FOR CLIENT REVIEW	01.12.2014	TH	<div><div><div><div>0</div><div>8</div><div>16</div><div>24</div><div>32</div><div>40</div></div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div><div>UNITS - METRES</div></div><div>(C) Copyright Martens &amp; Associates Pty Ltd This drawing must not be reproduced in whole or part without prior written consent of Martens &amp; Associates Pty Ltd</div></div>	REVIEWED: GT/DM	HORIZONTAL RATIO: 1:400	83 BOORALIE ROAD, TERRY HILLS		POST - DEVELOPMENT LAYOUT			<b>D120</b>	
B	FOR DA	04.02.2015	TH		PAPER SIZE: A1	VERTICAL RATIO: 1:400			PROJECT MANAGER: GT	PROJECT NO.: P1404413	FILE: JD06V02		REVISION: B



PIT SCHEDULE

PIT NAME	PIT TYPE	EASTING	NORTHING	INLET DIA	U/S INV LEV	OUTLET DIA	D/S INV LEV	PIT GRATE RL	DEPTH
HW2	OUTLET HEADWALL	334959.10	6271826.48	300	187.50			188.50	1.06
OSD 2 OUT	OSD OUTLET	334953.35	6271863.91		188.80	300	188.80	191.97	3.17
OSD1 OUT	OSD OUTLET	334993.54	6271900.36		189.50	225	189.50	192.89	3.39
P 1/2	GSIP 600x600	334956.37	6271877.58	225	192.03	225	192.01	192.72	0.71
P 1/4	GSIP 600x600	335044.23	6272027.76	150	196.49	150	196.47	197.09	0.62
P 10/1	JP 600x600	TBC	TBC	225	TBC	TBC	TBC	TBC	TBC
P 10/3	GSIP 600x600	334998.76	6271992.74			150	195.18	195.80	0.62
P 11/1	GSIP 600x600	335026.48	6271908.70	225	192.18	225	192.14	192.86	0.72
P 12/1	GSIP 600x600	335030.88	6271938.20	225	193.36	225	193.34	194.04	0.70
P 13/1	GSIP 600x600	335034.16	6271960.31	225	194.24	225	194.22	194.92	0.70
P 14/1	GSIP 600x600	335040.06	6271999.87	225	195.71	225	195.69	196.50	0.81
P 14/1	GSIP 600x600	335040.06	6271999.87	150	195.90			196.50	0.81
P 15/1	GSIP 600x600	335038.36	6272002.00	225	195.76	225	195.74	196.54	0.80
P 16/1	GSIP 600x600	335034.41	6272002.58	225	195.82	225	195.80	196.54	0.74
P 17/1	GSIP 600x600	335015.81	6272005.36	225	196.02	225	196.00	196.73	0.72
P 18/1	GSIP 600x600	335000.98	6272007.58	225	196.19	225	196.17	196.88	0.70
P 19/1	GSIP 600x600	334995.70	6272013.24	150	196.43	225	196.34	197.03	0.70
P 2/1	GPT	334949.96	6271836.96	300	188.60	300	188.58	189.54	0.96
P 2/2	GSIP 600x600	334952.90	6271881.40	225	192.12	225	192.10	192.80	0.70
P 2/3	GSIP 600x600	334973.98	6271884.18	150	191.55	150	191.53	192.25	0.72
P 2/4	GSIP 600x600	335017.71	6272033.57			150	196.89	197.50	0.61
P 20/1	GSIP 600x600	334994.95	6272021.57			150	196.59	197.20	0.62
P 3/1	GSIP 600x600	334952.80	6271860.12	225	188.90	300	188.70	192.08	3.38
P 3/1	GSIP 600x600	334952.80	6271860.12	300	188.80			192.08	3.38
P 3/2	GSIP 600x600	334955.07	6271895.93	150	192.66	225	192.56	193.26	0.70
P 3/3	GSIP 600x600	334984.22	6271895.21	225	191.72	150	191.70	192.40	0.70
P 4/2	GSIP 600x600	334960.96	6271935.49	150	193.91	150	193.89	194.51	0.62
P 4/3	GSIP 600x600	334985.49	6271903.72	225	192.02	225	192.00	192.70	0.70
P 5/2	GSIP 600x600	334966.86	6271975.06	150	195.15	150	195.13	195.75	0.62
P 5/3	GSIP 600x600	334987.71	6271918.56	225	192.54	225	192.52	193.21	0.70
P 6/2	GSIP 600x600	334972.76	6272014.62			150	196.38	197.00	0.62
P 6/3	GSIP 600x600	334989.92	6271933.40	225	193.05	225	193.03	193.73	0.70
P 7/1	GSIP 600x600	334989.98	6271899.87	225	189.46	225	189.44	192.69	3.25
P 7/3	GSIP 600x600	334992.13	6271948.23	225	193.57	225	193.55	194.25	0.70
P 8/3	GSIP 600x600	334994.34	6271963.07	225	194.09	225	194.07	194.77	0.70
P 9/3	GSIP 600x600	334996.55	6271977.90	150	194.68	225	194.59	195.28	0.70

REV.	DESCRIPTION	DATE	ISSUED	BAR SCALE	DESIGNED: TH	DATUM: mAHD	CLIENT / PROJECT  83 BOORALIE ROAD, TERRY HILLS	<div><div>Consulting Engineers Environment Water Geotechnical Civil</div></div> <div>Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 Email: <a href="mailto:mail@martens.com.au">mail@martens.com.au</a> Internet: <a href="http://www.martens.com.au">http://www.martens.com.au</a></div>	TITLE:  PIT SCHEDULE			DRAWING ID:  D125
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								PROJECT MANAGER: GT	PROJECT NO.: P1404413	FILE: JD06V02	REVISION: B	

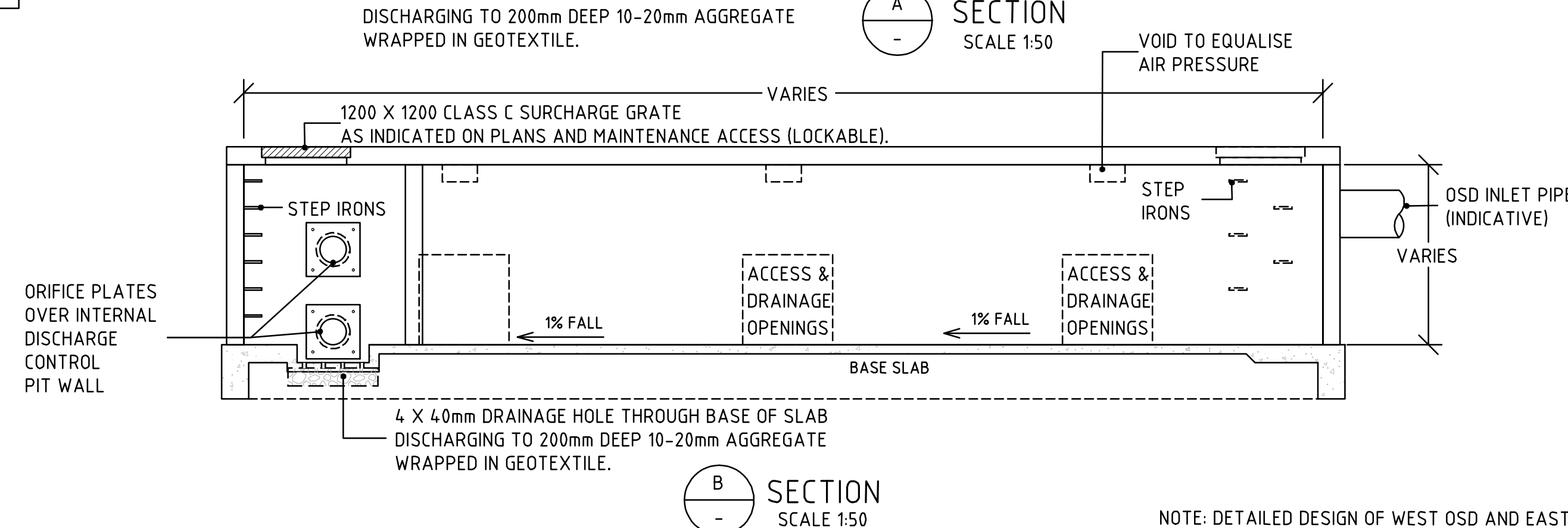
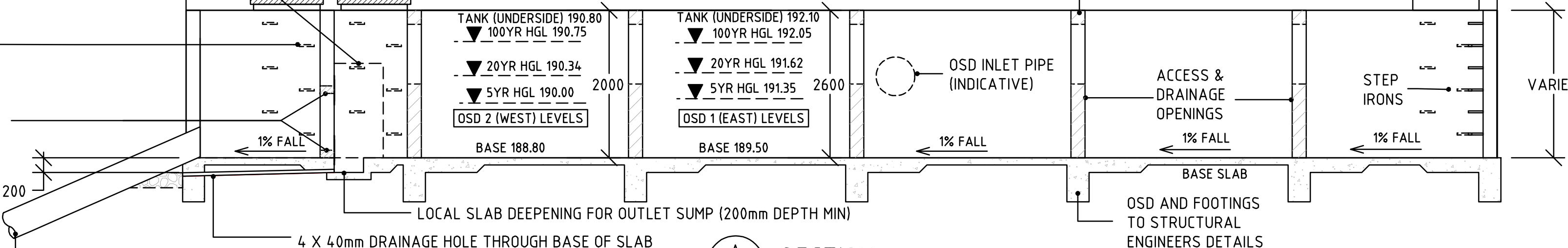


WELDLOK F40/203 GRID MESH OVER ORIFICE OUTLETS WITH 1.4m<sup>2</sup> AREA (MIN), PLACED NO LESS THAN 60 DEGREES TO THE HORIZONTAL SECURELY FIXED TO THE OSD WALL. HANDLES PROVIDED FOR EASE OF MAINTENANCE.

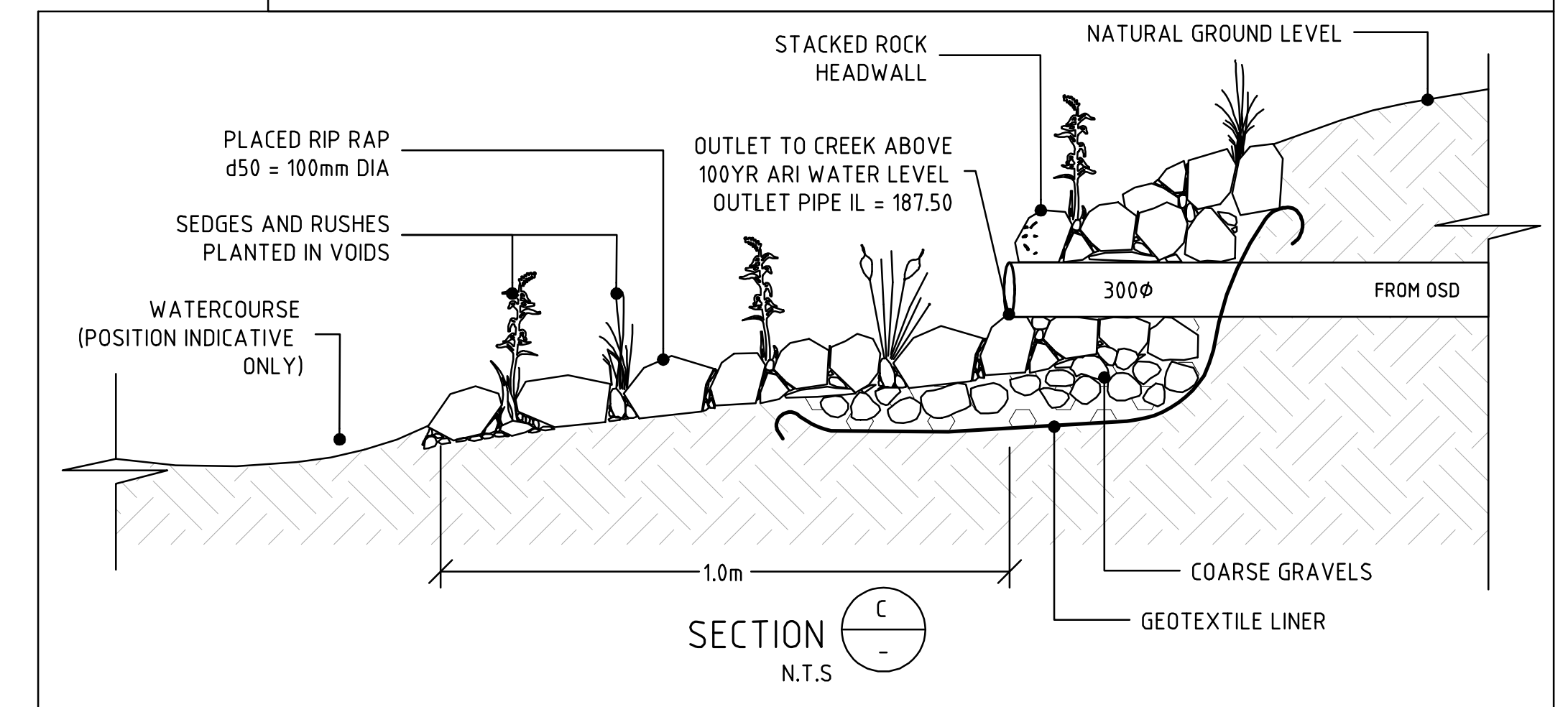
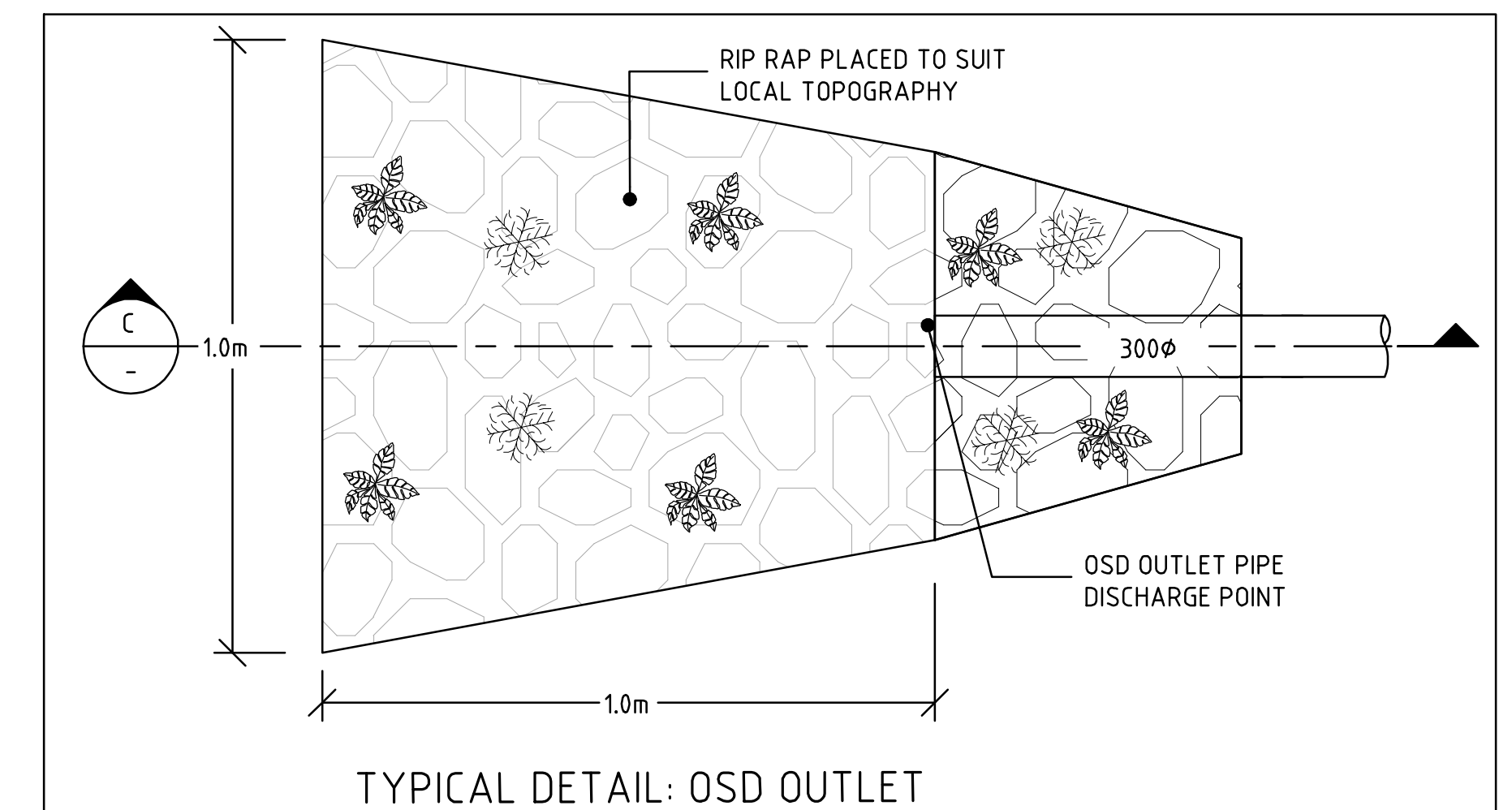
STAGGERED STEP IRONS AT 300 MM CENTRES ON WALL ADJACENT TO TANK INLET ACCESS

ORIFICE PLATES OVER INTERNAL DISCHARGE CONTROL PIT WALL

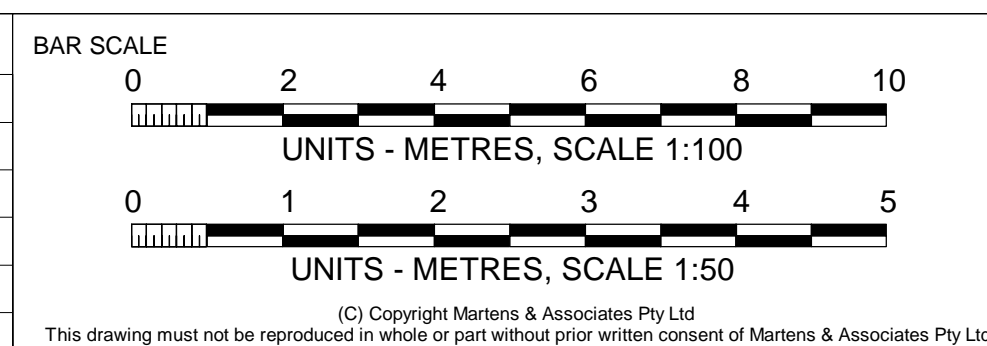
300Ø OUTLET PIPE DISCHARGING TO CREEK ABOVE THE 100YR ARI FLOOD LEVEL.



NOTE: DETAILED DESIGN OF WEST OSD AND EAST OSD TANKS TO BE PROVIDED AT CC STAGE.



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PAPER SIZE: A1	VERTICAL RATIO: AS SHOWN	THIS PLAN MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED BY PRINCIPAL CERTIFYING AUTHORITY All measurements in mm unless otherwise specified

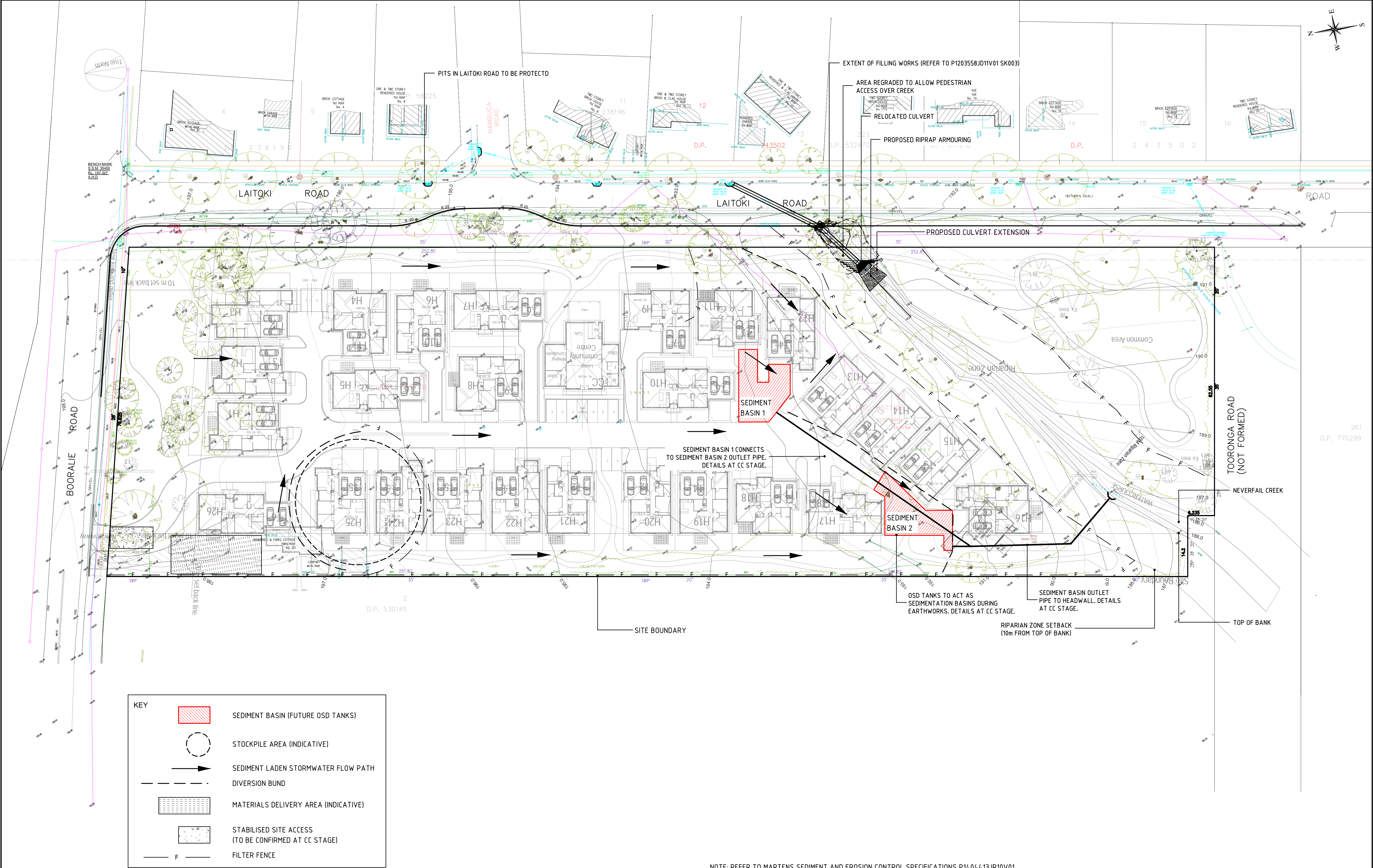
**martens**  
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Water  
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Civil

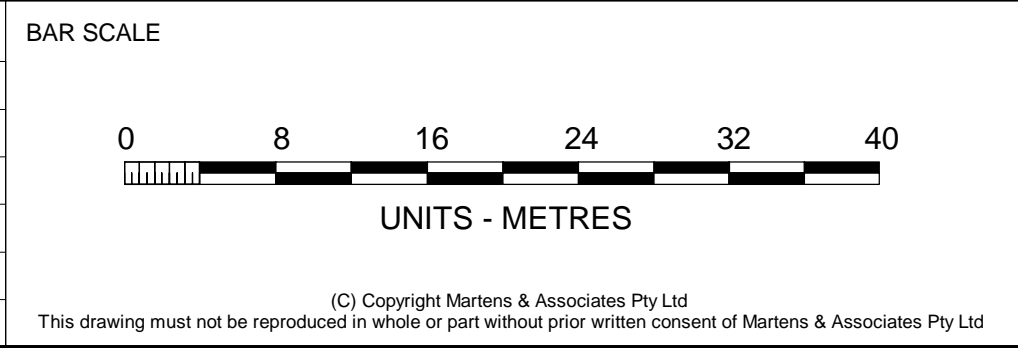
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767  
Email: [mail@martens.com.au](mailto:mail@martens.com.au) Internet: <http://www.martens.com.au>

TITLE:  TYPICAL DETAIL - OSD TANK			DRAWING ID:  D150
PROJECT MANAGER: GT	PROJECT NO.: P1404413	FILE: JD06V02	REVISION: B





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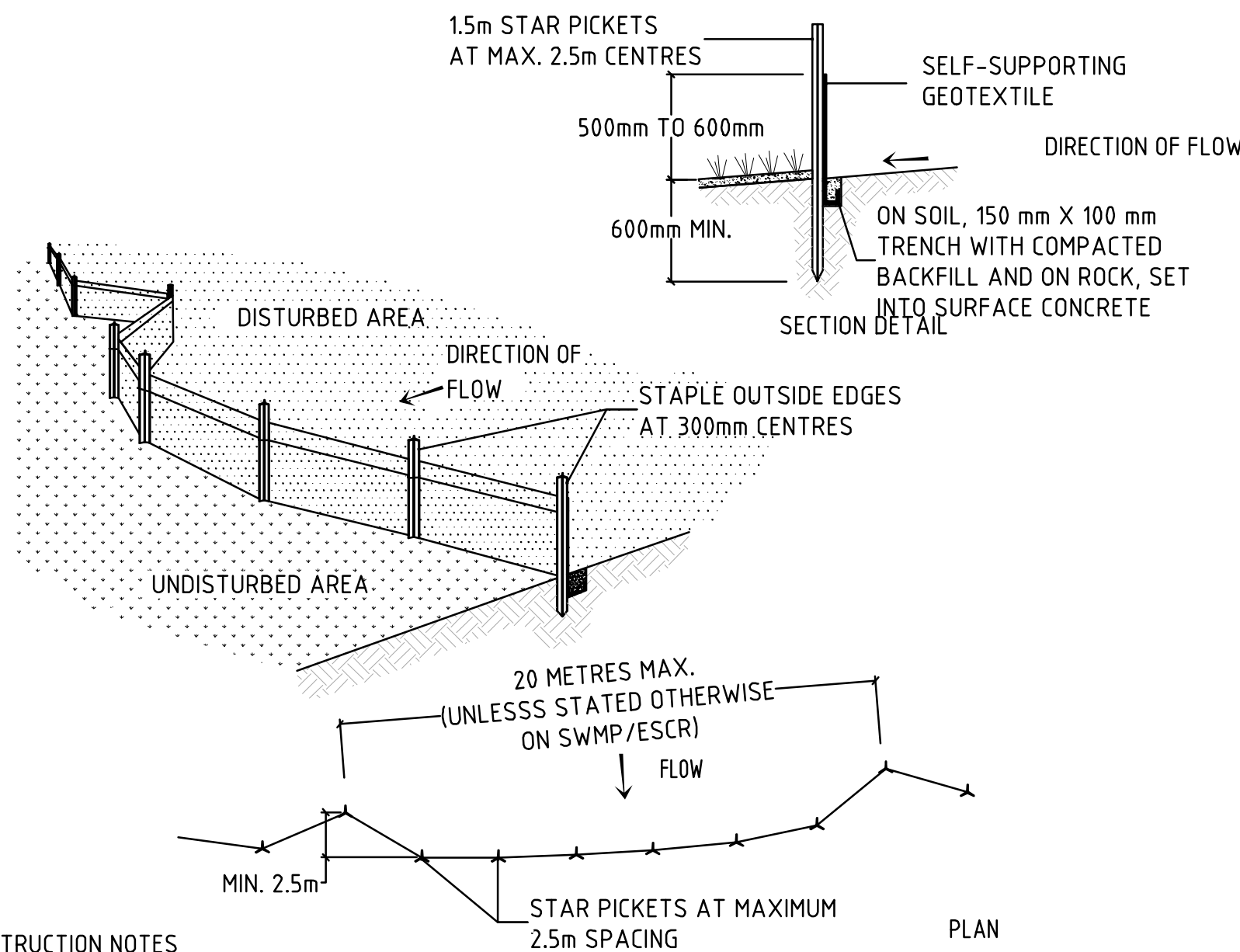
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**Consulting Engineers**  
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Water  
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Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767  
Email: [mail@martens.com.au](mailto:mail@martens.com.au) Internet: <http://www.martens.com.au>

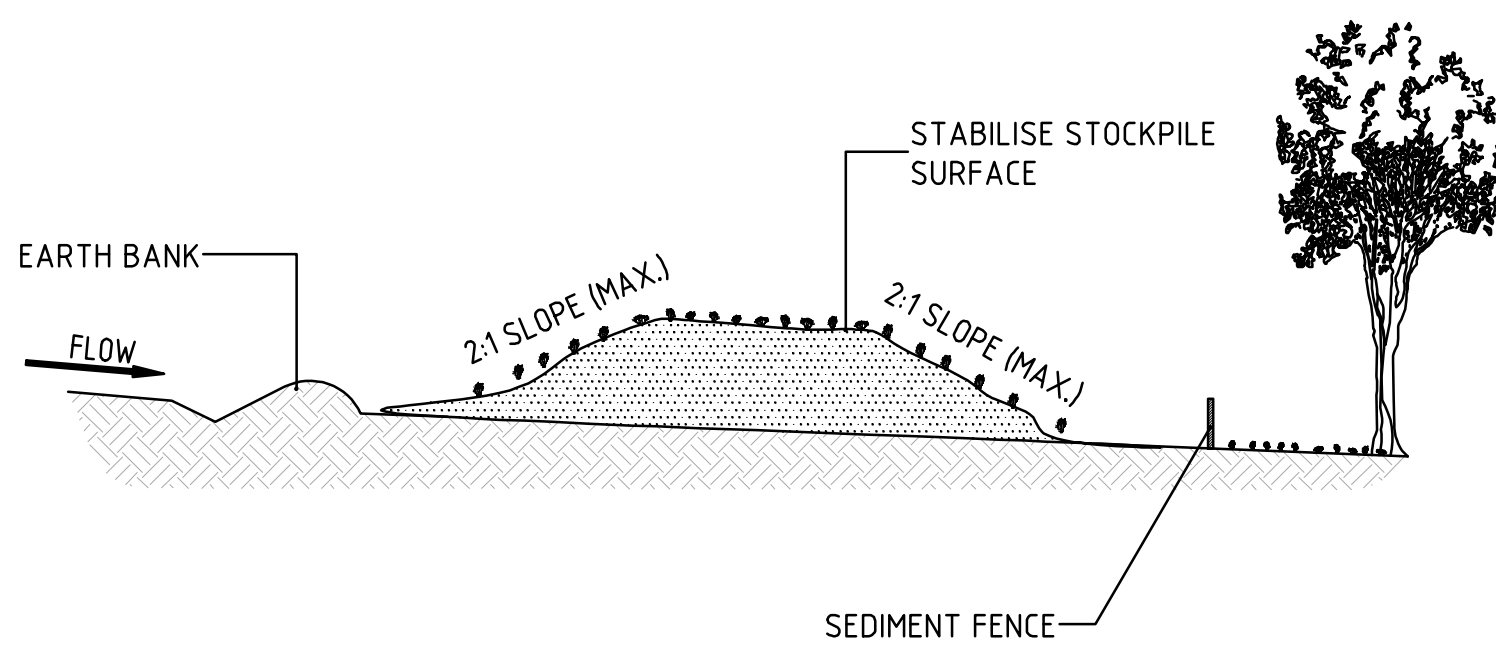
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PROJECT MANAGER: GT	PROJECT NO.: P1404413	FILE: JD06V02
REVISION: B		





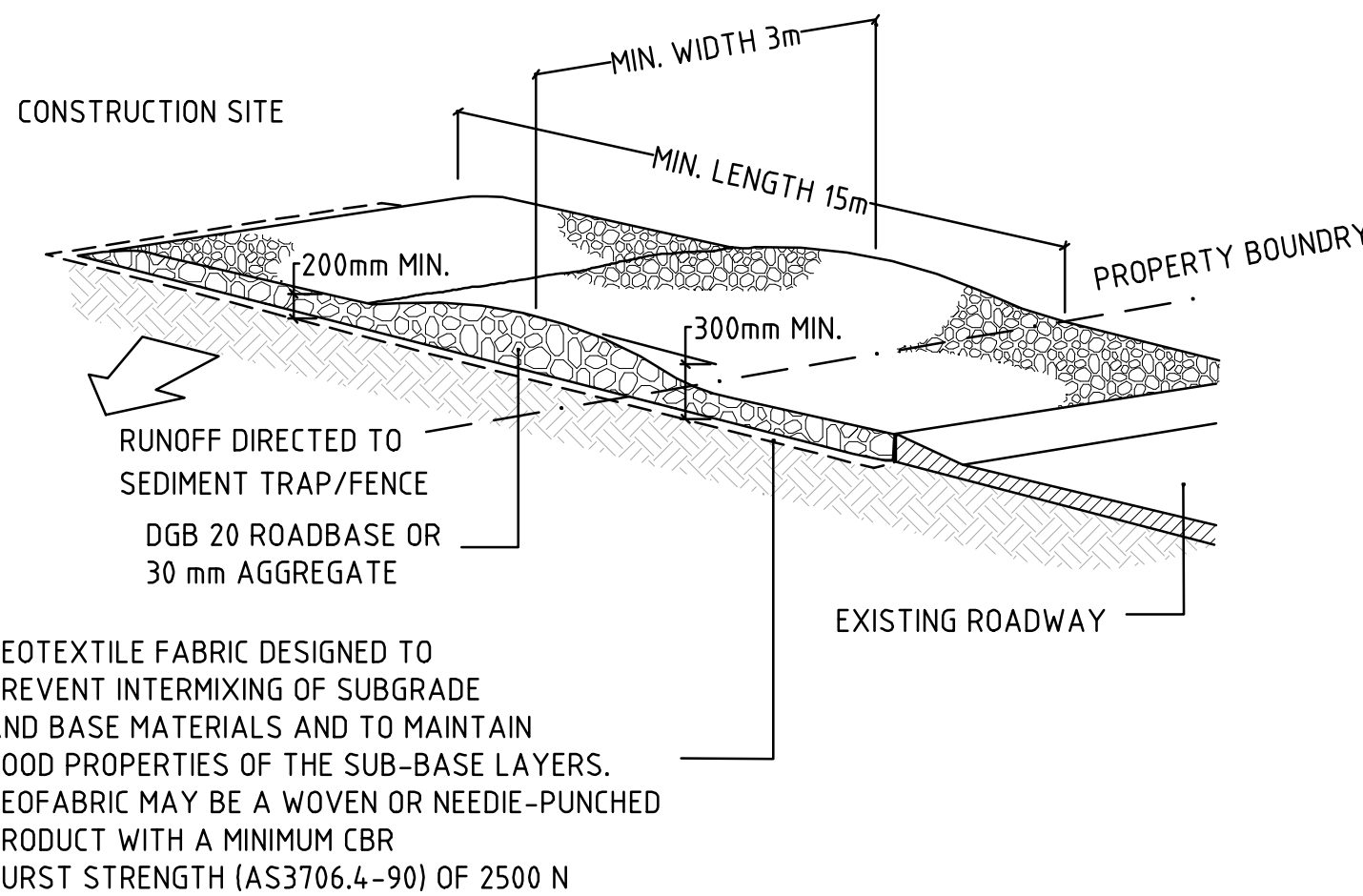
- CONSTRUCTION NOTES
1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
  2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
  3. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
  4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
  5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
  6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE

SEDIMENT FENCE SD 6-8



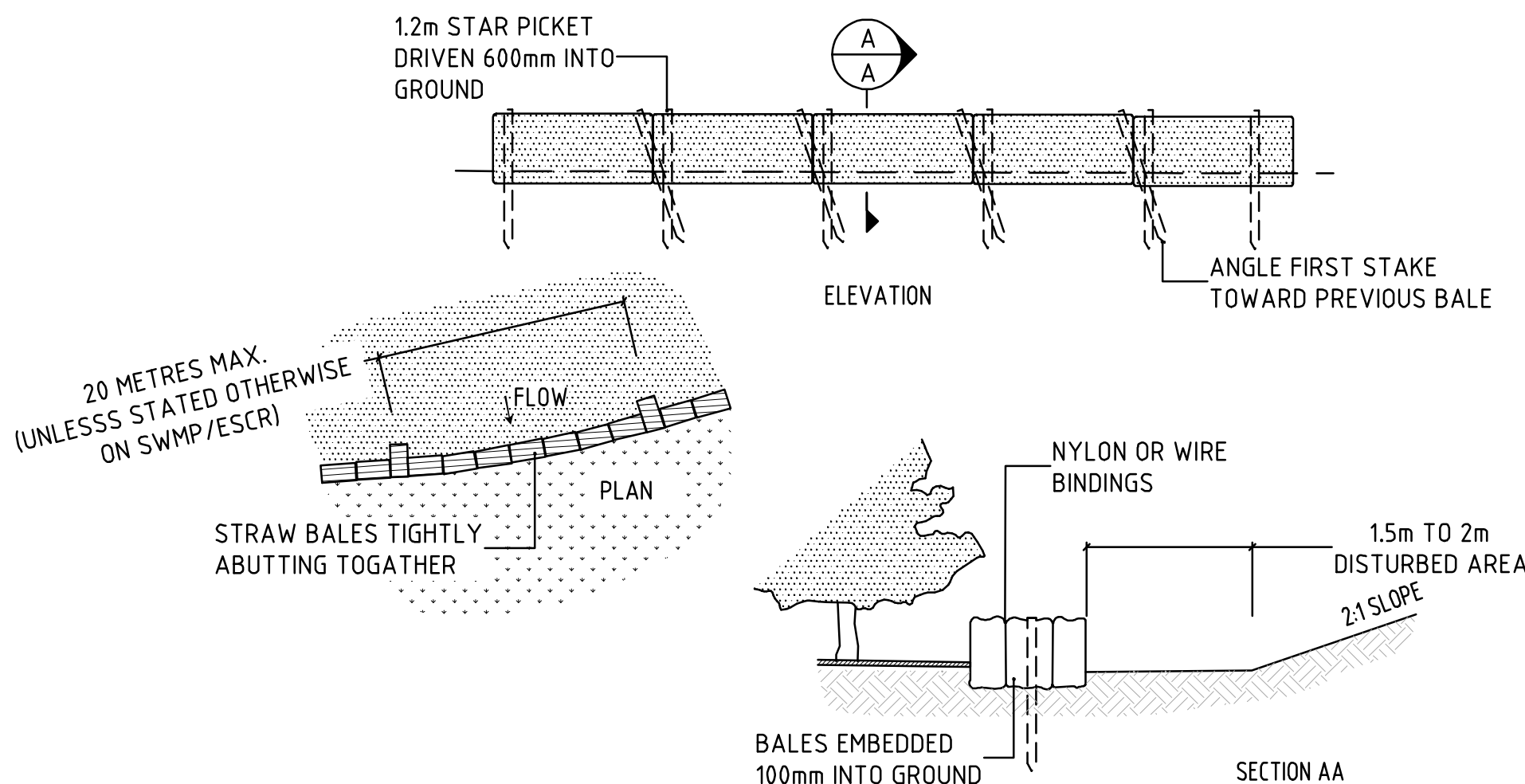
- CONSTRUCTION NOTES
1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
  2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
  3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
  4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
  5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2 METRES DOWNSLOPE.

STOCKPILES SD 4-1



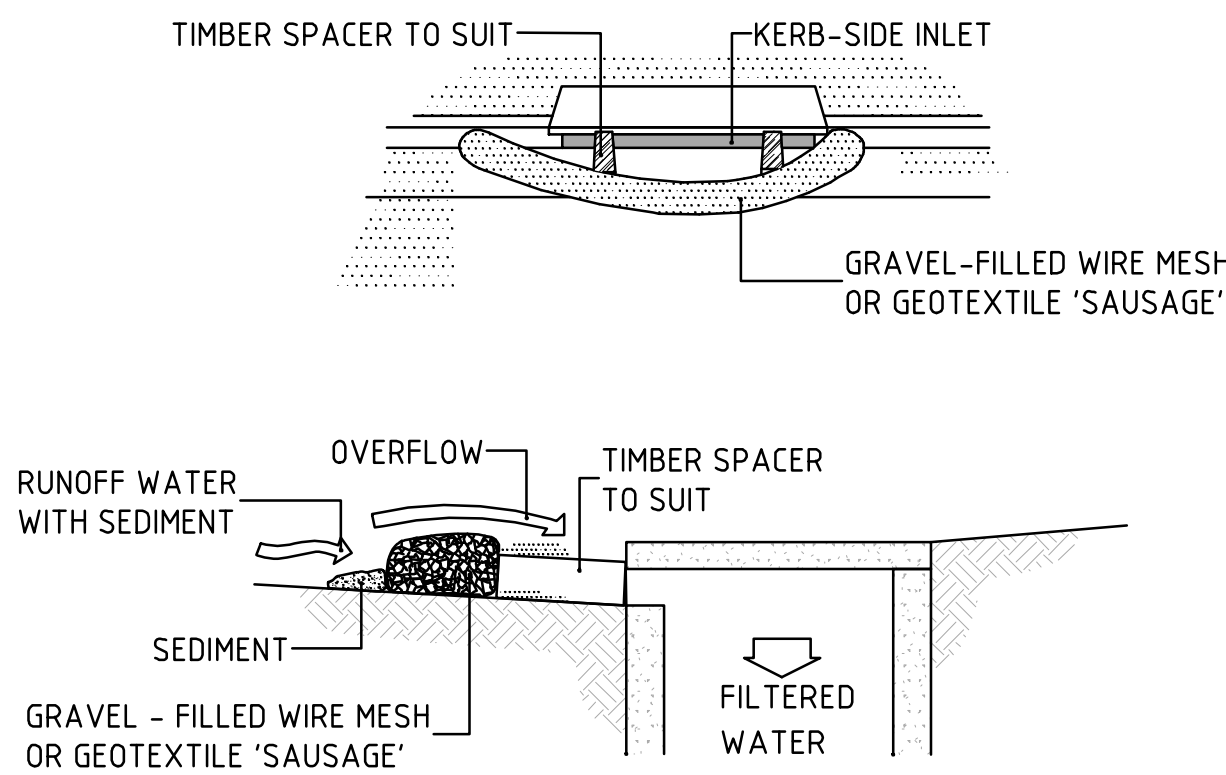
- CONSTRUCTION NOTES
1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
  2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
  3. CONSTRUCT A 200-mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30-mm AGGREGATE.
  4. ENSURE THE STRUCTURE IS ATLEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
  5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE

STABILISED SITE ACCESS SD 6-14



- CONSTRUCTION NOTES
1. CONSTRUCT THE STRAW BALE FILTER AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE.
  2. PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS ARE TO BE PLACED PARALLEL TO GROUND.
  3. ENSURE THAT THE MAXIMUM HEIGHT OF THE FILTER IS ONE BAILE.
  4. EMBED EACH BAILE IN THE GROUND 75 MM TO 100 MM AND ANCHOR WITH TWO 1.2 METRE STAR PICKETS OR STAKES. ANGLE THE FIRST STAR PICKET OR STAKE IN EACH BAILE TOWARDS THE PREVIOUSLY LAID BAILE. DRIVE THEM 600 MM INTO THE GROUND AND, IF POSSIBLE, FLUSH WITH THE TOP OF THE BAILES. WHERE STAR PACKETS ARE USED AND THEY PROTRUDE ABOVE THE BAILES, ENSURE THEY ARE FITTED WITH SAFETY CAPS.
  5. WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWNSLOPE FROM A DISTURBED BATTER, ENSURE THE BAILES ARE PLACED 1 TO 2 METRES DOWNSLOPE FROM THE TOE.
  6. ESTABLISH A MAINTENANCE PROGRAM THAT ENSURES THE INTEGRITY OF THE BAILES IS RETAINED - THEY COULD REQUIRE REPLACEMENT EACH TWO TO FOUR MONTHS.

STRAW BALE FILTER SD 6-7



NOTE: THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN AN APPROVED SWMP/ESCP.

- CONSTRUCTION NOTES
1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
  2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
  3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150 mm HIGH X 400mm WIDE.
  4. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
  5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
  6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

MESH AND GRAVEL INLET FILTER SD 6-11

REV.	DESCRIPTION	DATE	ISSUED	BAR SCALE
A	FOR CLIENT REVIEW	01.12.2014	TH	<div>(C) Copyright Martens &amp; Associates Pty Ltd</div> <div>This drawing must not be reproduced in whole or part without prior written consent of Martens &amp; Associates Pty Ltd</div>
B	FOR DA	04.02.2015	TH	

DESIGNED: TH	DATUM: mAHD	CLIENT / PROJECT
REVIEWED: GT/DM	HORIZONTAL RATIO: NTS	83 BOORALIE ROAD, TERRY HILLS
PAPER SIZE: A1	VERTICAL RATIO: NTS	THIS PLAN MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED BY PRINCIPAL CERTIFYING AUTHORITY All measurements in mm unless otherwise specified

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TITLE:  SECP SPECIFICATIONS				DRAWING ID:  <b>D175</b>
PROJECT MANAGER: GT	PROJECT NO.: P1404413	FILE: JD06V02	REVISION: B	