

07/06/2019

Ref: SY182476-CL01-1

Mr Byron Williams  
Bloompark Consulting Pty Ltd  
Suite 2.04/41 McLaren Street  
North Sydney NSW 2060

Dear Byron,

**Re: Loreto Kirribilli Innovation Centre  
Brief Stormwater Management Report to Support Section 4.55 Application**

This Stormwater Management Report prepared by Northrop Consulting Engineers (Northrop) provides a comparative review of the revised architectural scheme to support the Section 4.55 application for the development of the Loreto Kirribilli Innovation Centre at 85 Carabella Street, Kirribilli.

This report should be read in conjunction with the previously approved *Stormwater Management Plan – 85 Carabella Street, Kirribilli (Rev 2)* by Henry & Hymas Civil and Structural Engineers dated August 2017 (H&H SWMP) included in Appendix A and Civil Engineering Documentation (Rev 1) by Northrop Consulting Engineers dated 06/06/2019 included in Appendix B.

We note that council policy emphasises the impact of site imperviousness with respect to stormwater runoff: “The amount of stormwater runoff in an area relates directly to intensity of development in that area. The more impervious to stormwater an urban area is, the larger the runoff quantities are and thereafter the impact on the environment.” (*North Sydney Council DCP 2013 - Commercial and Mixed-Use Development, Part B Section 2.6*)

In the context of the proposed development, the revised architectural scheme has no increase on overall site impervious area – consistent with the stormwater approach of the approved stormwater management strategy detailed in the H&H SWMP.

Table 1 below compares the proportion of pervious and impervious areas for the previously approved plans with the proposed S4.55 site.

*Table 1: Post Developed Western Catchments as per approved H&H SWMP (August 2017) and Section 4.55 Application Documentation (June 2019)*

Catchment (Western)	Impervious Area (%)	Pervious Area (%)
H&H SWMP (Approved)	80.3	19.7
S4.55 (Proposed)	77.2	22.8

The revised catchment and impervious areas are included on Civil Engineering Drawings C06.01 and C07.01.

Stormwater models for the proposed stormwater system have been produced in 12d 1D Dynamic Drainage Software (ILSAX) to determine the hydraulic performance of the post development network under a range of flood events (1% and 10% AEP). Rainfall intensity duration and frequency data was adopted from the 2016 version of Australian Rainfall and Runoff. The model adopts the following parameters:

- Paved (impervious) area depression storage = 1mm
- Supplementary area depression storage = 0mm
- Grassed (pervious) area depression storage = 5 mm
- Soil type = 3
- AMC = 3

The proposed system conveys all runoff from the 10% AEP event via an above ground pit and pipe network consistent with North Sydney Council policy. The stormwater results for the minor (10% AEP) and major (1% AEP) storm events are provided on results tables within Civil Engineering drawings C05.91 and C05.92. The design (minor – 10% AEP) event HGL is shown on Civil Engineering stormwater longitudinal sections C05.11, C05.12, C05.13. We note storm events in excess of the 10% AEP event result in safe overland flow through the site (refer Civil Engineering drawing C05.01 and overflow data on C05.92).

The modelling demonstrates compliance with the council guidelines and is consistent with the previously approved SWMP. Similar to the previously approved H&H SWMP, we infer on-site stormwater detention (OSD) is not required for the development

The proposed management of stormwater quality remains consistent with the H&H SWMP.

Noting this, the revised architectural scheme will involve no changes that negatively impact catchment runoff (with respect to stormwater quantity and quality) and the proposed stormwater system remains consistent with the approved H&H SWMP and council stormwater guidelines.

We trust this report satisfies your requirements at this time. Should you have any questions or queries with any item discussed in this letter, feel free to contact the undersigned on (02) 9241 4188.

Yours faithfully,



**Ben Lawrence**

Civil Engineer  
BE Civil & Environmental, Hons1 MIEAust

NORTHROP CONSULTING ENGINEERS PTY LTD

## Appendix A

Stormwater Management Plan – 85 Carabella Street, Kirribilli (Rev 2) by Henry & Hymas Civil and Structural Engineers dated August 2017

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**henry&hymas**



**LORETO KIRRIBILLI**

## **STORMWATER MANAGEMENT PLAN PRIVATE DEVELOPMENT 85 CARABELLA STREET, KIRRIBILLI, NSW**



August 2017

Revision 2

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## 1 INTRODUCTION

### 1.1 General

This Stormwater Management report has been prepared to supplement the proposed Statement Significant Development Application (SSD) to Department of Planning for the development of Lot 200 (DP1166282), located at 85 Carabella Street, Kirribilli. The development will consist of demolition of old buildings, development of various multi storey buildings including site excavations, existing building extensions, development of three vertical connector pods and new external walkways and gardens.

The new buildings will be built over various stages and include:

#### ***Western Precinct***

##### Stage 1

- Demolition of B-Block.
- Site excavation to the existing Gymnasium level.
- Proposed Development of a Seven storey building (2 storeys above ground - Carabella Street ) including external roof terrace. Includes a vertical connector providing accessible access to the Marian Centre, Junior School, Gymnasium and the Centenary Hall.
- Partial demolition of external stairs, landings, walkways and planters between the gymnasium, Centenary Hall and the Junior School.
- New external covered landscaped walkways providing an accessible path of travel to the new development site.
- Extension to the Junior School play terrace.
- Demolition of the northern facade of the Gymnasium.
- New facade to the gymnasium. Extended GF wing to the sports courts and outdoor terrace. Extended Upper level gallery to accommodate staff.

#### ***Northern Precinct***

##### Stage 1

- Partial demolition of external stairs, landings, walkways and planters in between Science and Centenary Hall
- A new five-storey (including basement) vertical connector pod consisting of a lift, stair and lockers.
- New external walkways providing an accessible path of travel between the driveway, Science, Centenary hall, carpark and Elamang Avenue.

#### ***Eastern Precinct***

##### Stage 1

- Partial demolition of external stairs, landings, walkways and planters in between Science and Performing Arts.
- Proposed interim connector pod consisting of accessible ramps, providing an accessible path of travel between Science and Performing Arts.
- Mary Ward - Internal refurbishment to accommodate new flexible learning model.



#### Concept Master Plan

- Proposed development envelope for a six story building. (Height consistent with the existing building) southern precinct

#### Stage 1

- Partial demolition of the eastern Chapel wing.
- Demolition of external stairs and landings in the courtyard.
- Proposed development of a 4 storey vertical connector pod involving the restoration of the east Chapel wing to its original profile on Carabella Street. The connector pod will consist of a lift, learning studios and an external learning terrace. Providing an accessible path of travel between the driveway, Chapel, St Joseph's Block and the courtyard.

#### Concept Master Plan

- Proposed development envelope for a six story building, which will sit two storeys above ground on Carabella Street. (Height will remain consistent with the existing building).

This Stormwater management plan was requested by North Sydney Council as part of the proposed DA.

The following matters have been addressed in this report:

- Stormwater Management
- Water quality
- Water Sensitive Urban Design (SWUD)
- Water quantity
- Sediment & Erosion Control

The purpose of this report is to provide an overview of the stormwater issues that relate to the site and how these issues have been addressed.

## 1.2 The Site and its Context

The proposed development comprises of new buildings, addition of vertical connector pods and external walkways. The site measures 18'300m<sup>2</sup> (approx.1.83 ha) and is located in between Carabella Street and Elamang Avenue. The site is currently fully developed with a number of buildings, open space sport courts and walkways. The whole site currently drains through the existing stormwater system towards which leads towards the western and eastern corner. The whole site is quite steep and is terraced on various levels from south to north. The highest point is on the south-western side (RL 35.69) and the lowest point is in the north-eastern corner (RL 9.14).

As the site currently have falls toward the north at Eleamang Avenue from the site at Carabella Street, it is unlikely that the site is affected by the flood.

The flood study shows that the part of the site is flood affected. Flooding is localised and not linked mainstream flooding.

This is in areas particularly where there are pits behind the existing building ( such as behind the Junior School Building in the western precinct). It is understood that these pits and pipes ( less than 450 mm diameter ) are considered as blockages for flood modelling. For this reason it is possible that this is causing to have some flooding in some areas of the site.



However these pipes are connected to the downstream level which is significantly lower than the upstream level. There is also overflow path from the south to the north on the western boundary. As such the site is not affected by mainstream flooding.

In the detailed design stage, we'll ensure that there is sufficient space for the overland flow paths to avoid flooding within the site.



Figure 1: Location of proposed Site at 85 Carabella Street, Kirribilli

## 2 STORMWATER MANAGEMENT

### 2.1 Introduction

#### 2.1.1 Background

Stormwater controls will be implemented that ensure that the proposed development does not adversely impact on the existing stormwater flows and water quality downstream of the site and in the creek.

#### 2.1.2 Key Issues

The key issues and the proposed mitigation measures to be implemented as part of the proposed development are:

- **Stormwater Quantity** - The impervious surfaces (such as roads, roofs, driveways, etc) associated with the development remain roughly the same, therefore it will not result in an increase in peak stormwater flows from the site during storm events. On-site Stormwater Detention (OSD) is not proposed for the development as the area the pervious to impervious ratio remain the same. Furthermore the site is located very close to the harbour. The



distance from the site outlet to the harbour measures approx. 50m. The site stormwater system has been designed to safely convey the flows through the site and within the capacity of the downstream system. The design and operation of the proposed stormwater system is described in Section 2.2 below.

- **Water Quality** - Urban developments have the potential to increase gross pollutants, sediments, hydrocarbons and nutrient concentrations in stormwater runoff.

### **2.1.3 Catchment Description**

The catchment area consists of the site area (approximately 1.82 ha). Currently there are fences on the eastern and western boundaries, so no stormwater should enter the site from these surrounding properties.

Pre-developed catchment:

Catchment of western side: 0.48 ha (27.5% pervious, 72.5% impervious)

Catchment of eastern side: 1.34 ha (18.6% pervious, 81.4% impervious)

Total catchment: 1.82 ha (21.1% pervious, 78.9% impervious)

The current site is urban in character and is terraced. If the site were not terraced the natural fall of the site would be at a slope of 33% (1:3). All overland flow is currently travelling towards the western and eastern corners.

The stormwater drainage system and the respective flows have been modelled in DRAINS to ensure realistic and accurate design.

Post-developed catchment:

Catchment of western side: 0.48 ha (19.7% pervious, 80.3% impervious)

Catchment of eastern side: 1.34 ha (17.7% pervious, 82.3% impervious)

Total catchment: 1.82 ha (18.2% pervious, 81.8% impervious)

### **2.1.4 Existing Drainage System**

The existing site drains towards the western and eastern side of Elamang Street. The stormwater on the western side is collected in a big DN300 pipe that is connected to the side of the Gymnasium building. This pipe drops into the ground (Surface RL 11.20) and from there is connected into the council stormwater system in Elamang Street. The biggest part of the catchment is piped towards the north eastern side, where it is collected in the parking garage in a big DN450 pipe which is connected to a pit in the carpark. From there the water is connected to a GPT which is part of the council Stormwater system leading into the harbour.

The maximum capacity of the receiving DN 300 pipe in on the western side is approximately 0.1m<sup>3</sup>/s.

The maximum capacity of the receiving DN 450 pipe in on the eastern side is approximately 0.4m<sup>3</sup>/s.

There are two rainwater tanks next to the junior School that catch part of the roof water.



### 2.1.5 Proposed Drainage System

The proposed new buildings and remodelled outside areas will all be connected to the existing drainage system of the site. The new site pipe network will be designed to cater for the 20 year ARI storm as a minimum. The system will also be designed in such a way that the 100ARI will be conveyed via piped and overland flow paths. In the event of a total system blockage/failure, site grading is such that overland flow will be directed towards the northern boundary.

All flows were modelled in the DRAINS. All stormwater will be collected in surface inlet pits and discharged directly into the same existing stormwater connections from the site.

Pre-Developed Flows:

Event	Eastern Side Pre-Developed Flow	Western Side Pre-Developed Flow	Total Pre-Developed Flow
	[m <sup>3</sup> /s]	[m <sup>3</sup> /s]	[m <sup>3</sup> /s]
ARI 5	0.195	0.554	0.749
ARI 20	0.268	0.752	1.020
ARI 100	0.321	0.898	1.219

Figure 2: Pre-Developed Site flows based on the pervious/impervious percentages

Upon development of the site, the catchment will remain roughly the same with the pervious to impervious ratio. Refer to plans C250 and C251 for the catchments and the pervious/ impervious percentages.

Post-Developed Flows:

Event	Eastern Side Post-Developed Flow	Western Side Post-Developed Flow	Total Post-Developed Flow
	[m <sup>3</sup> /s]	[m <sup>3</sup> /s]	[m <sup>3</sup> /s]
ARI 5	0.198	0.556	0.754
ARI 20	0.269	0.754	1.023
ARI 100	0.321	0.901	1.122

Figure 3: Post-Developed Site flows based on the pervious/impervious percentages

The flows will only increase very slightly by 0.003-0.005 m<sup>3</sup>/s. Due to the very small increase of flow and the very close proximity of the development to the harbour, an OSD is not justified. For the Pre-developed flows not to exceed the Post-developed flows it is proposed to use rainwater tanks in the appropriate locations and strategic placement of orifice plates in some pits. This will ensure that the only small increase of flow can be compensated for and be reduced to the pre developed flows.

## 2.2 Stormwater Quality

### 2.2.1 Water Quality Requirements

As previously stated, urban developments have the potential to increase gross pollutants, sediments, hydrocarbons and nutrient concentrations in stormwater runoff. To limit the impact on the downstream system, at source water quality treatment measures will be provided. It is proposed that Enviropod pit baskets are to be added to all new pits. Sedimentation and Erosion Control measures during the construction phase of the project will be implemented (Sedimentation basin, Catch drains, hay bales and geotextile filter inlets around pits) to retain the sediments on site during the course of construction.





### 3 CONCLUSIONS

Whilst it is inevitable that the development will have an impact of the existing landform and stormwater runoff characteristics during the earthworks, the land-use and ratio between pervious/impervious will ultimately only increase very slightly. The flows generated by the site increase by a very small amount, which can be catered for by providing rainwater tanks and/ or limiting the flows from site with orifices in some pits. By providing a safe and efficient design, and implementing appropriate measures during construction and operation of the development, it can be ensured that there will be minimal impact on the existing environment as a result of the proposed development. The water quality measures at the source will help to limit the impact on the existing downstream system.

### 4 REFERENCES

- THE INSTITUTION OF ENGINEERS AUSTRALIA – "Australian Rainfall and Runoff", 1987, 3rd Edition
- INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA QLD Division, Department of Energy and Water Supply – Queensland Urban Drainage Manual, Third Edition 2013-Provisional
- North Sydney Council 2013, "North Sydney Development Control Plan 2013"
- North Sydney Council 2005, 'Performance Guide for Engineering Design & Construction'

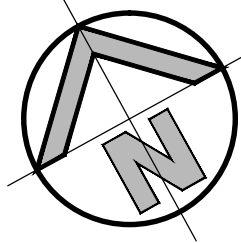


*henry&hymas*









ELAMANG AVENUE

NORTHERN  
CONNECTOR 1

NORTHERN  
CONNECTOR 2

TENNIS COURT  
EXTENTION

JUNIOR SCHOOL

B-BLOCK

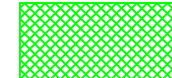

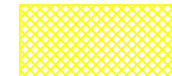


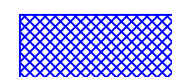

JUNIOR SCHOOL

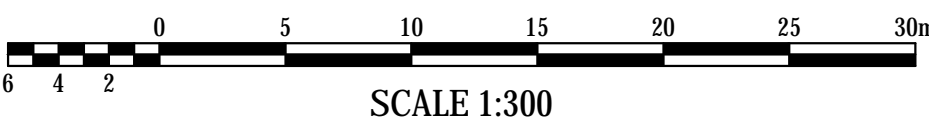
SOUTHERN  
CONNECTOR

CARABELLA STREET

LEGEND

----- EXISTING BOUNDARY

	AREA (m2)	APPROX. VOLUME (m3)
 JUNIOR SCHOOL DEMOLITION	1500	17200
 B-BLOCK DEMOLITION	290	2300
 TENNIS COURT EXTENTION DEMOLITION	130	920
 NORTHERN CONNECTOR 1 DEMOLITION	132	200
 NORTHERN CONNECTOR 2 DEMOLITION	95	100
 SOUTHERN CONNECTOR DEMOLITION	101	1200
 EASTERN BUILDING DEMOLITION	1035	9000



SCALE 1:300

DEMOLITION PLAN  
SCALE:1:300

FOR DA ONLY

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
02	ISSUED FOR DA	DT	SS	2017/07/17					
01	PRELIMINARY	DT	SS	2016/10/21					

Client	LORETO KIRIBILLI
Architect	fjmt
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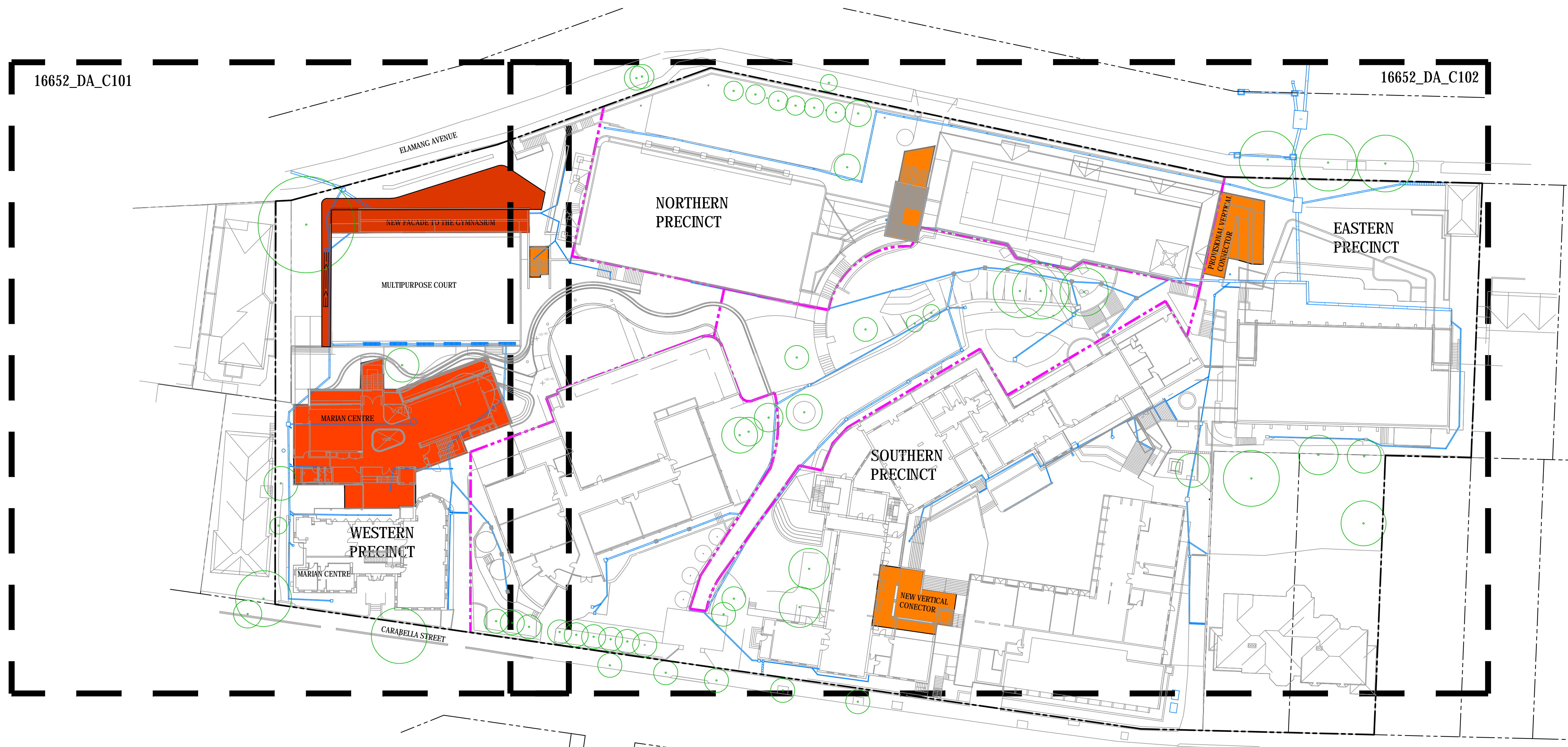
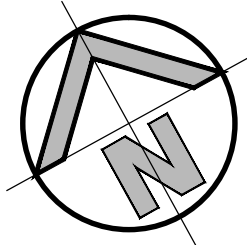
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Project	MASTER PLAN, 85 CARABELLA STREET, KIRIRIBILLI, NSW
Title	DEMOLITION PLAN

Drawn M.CERNA	Designed S.SPIRIG	Date DEC 2016
Checked S.SPIRIG	Approved A.FRANCIS	Scale 1:300 @ A1
Drawing number 16652_DA_C050		Revision 02



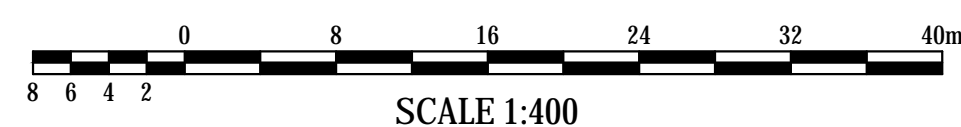


**LEGEND**

- EXISTING BOUNDARY
- EXISTING PITS
- PROPOSED GRATED DRAIN
- EXISTING STORMWATER PIPE
- DP
- PRECINCTS

**GENERAL ARRANGEMENT PLAN**

SCALE:1:400



SCALE 1:400

**FOR DA ONLY**

**SURVEY INFORMATION**

SURVEYED BY:  
HAMMOND SMEALLIE  
& CO PTY LTD  
DATUM AHD

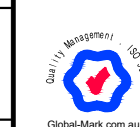
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03	ISSUED FOR DA	DT	SS	2017/07/17					
02	PRELIMINARY	MC	SS	2016/12/21					
01	PRELIMINARY	MC	SS	2016/11/23					

Client  
**LORETO KIRIBILLI**

Architect  
**fjmt**

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Project  
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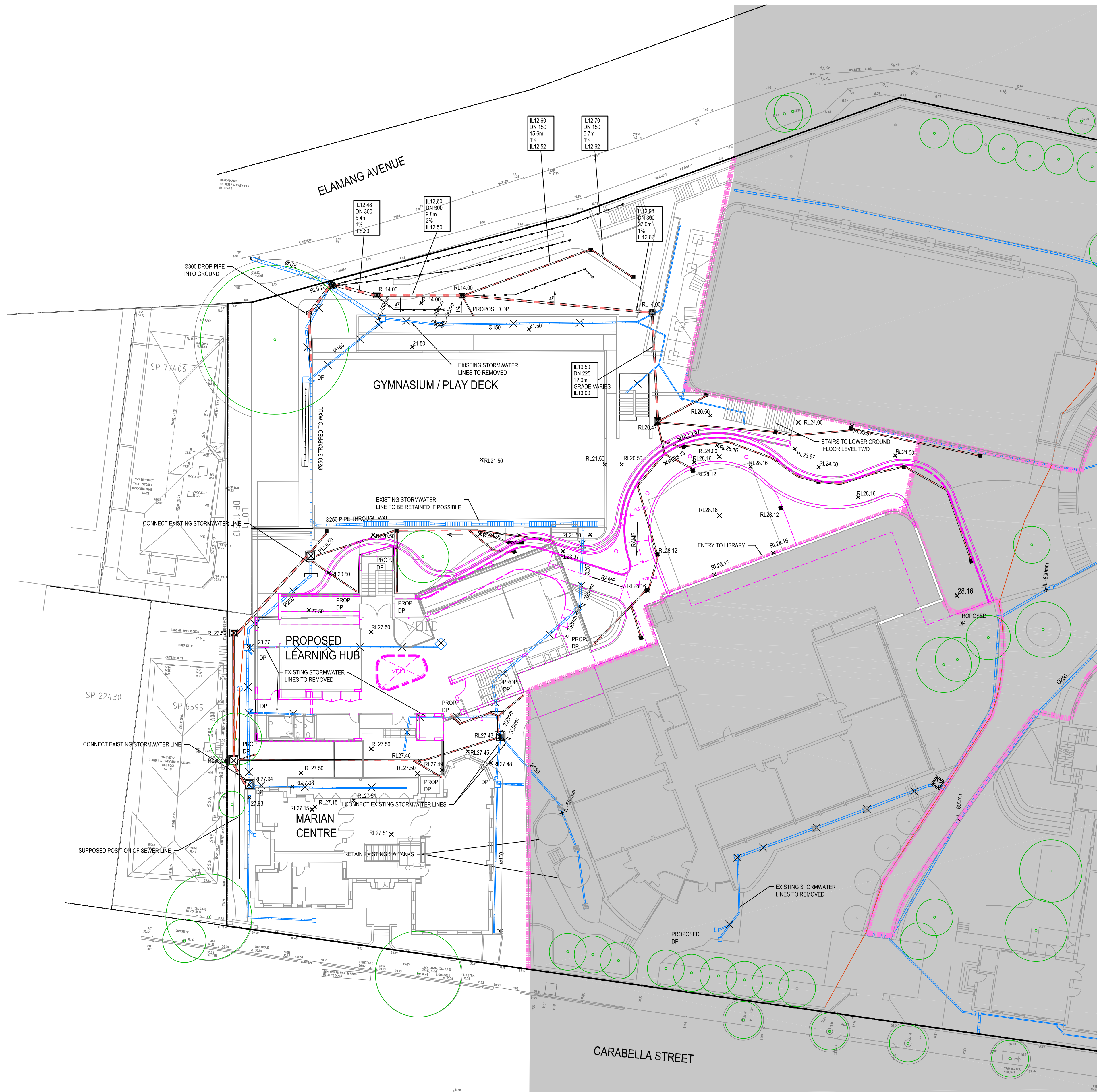
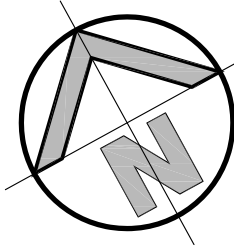
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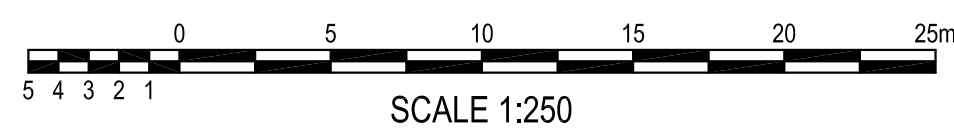
Revision  
**03**





# LEGEND

- EXISTING BOUNDARY
- EXISTING PITS
- PROPOSED GRATED DRAIN
- EXISTING STORMWATER PIPE TO BE REMOVED
- EXISTING STORMWATER PIPE
- PROPOSED STORMWATER PIPE
- DOWN PIPE
- PROPOSED JUNCTION PITS
- PRECINCTS
- EXISTING BOUNDARY



STORMWATER CONCEPT PLAN - STAGE A FINAL, WESTERN PRECINCT  
SCALE: 1:250

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## SURVEY INFORMATION

SURVEYED BY:  
HAMMOND SMEALLIE  
& CO PTY LTD  
DATUM: AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
03	ISSUED FOR DA	MC	SS	2017/07/17					
02	PRELIMINARY	MC	SS	2016/12/21					
01	PRELIMINARY	MC	SS	2016/11/25					

Client  
**LORETO KIRIBILLI**  
Architect  
**fjmt**

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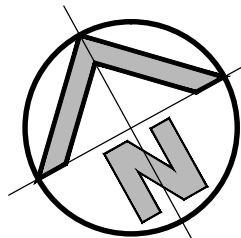
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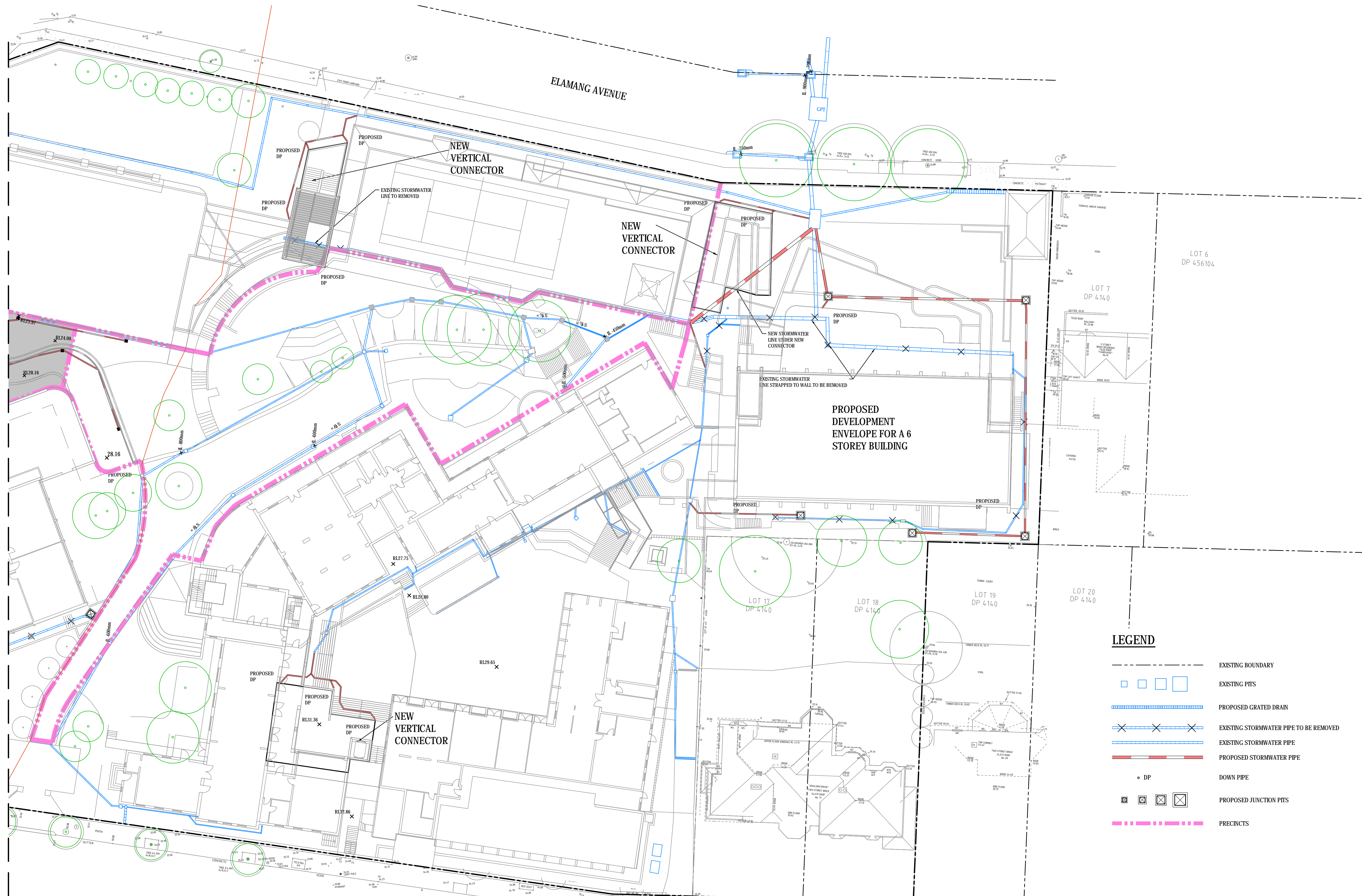
Project  
**MASTER PLAN, 85 CARABELLA STREET,  
KIRIRIBILLI, NSW**  
Title  
**STORMWATER CONCEPT PLAN  
STAGE B FINAL, WESTERN PRECINCT**

Drawn M.CERNA	Designed S.SPIRIG	Date NOV 2016
Checked S.SPIRIG	Approved A.FRANCIS	Scale 1:250 @ A1
Drawing number <b>16652_DA_C101</b>		Revision <b>03</b>





FOR CONTINUATION REFER TO DWG. 16552\_CC\_C101



### LEGEND

- EXISTING BOUNDARY
- EXISTING PITS
- PROPOSED GRATED DRAIN
- EXISTING STORMWATER PIPE TO BE REMOVED
- EXISTING STORMWATER PIPE
- PROPOSED STORMWATER PIPE
- DOWN PIPE
- PROPOSED JUNCTION PITS
- PRECINCTS

**STORMWATER CONCEPT PLAN - STAGE B FINAL**  
1:250

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**SURVEY INFORMATION**  
SURVEYED BY:  
HAMMOND SMEALLIE  
& CO PTY LTD  
DATUM: AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
03	ISSUED FOR DA	MC	SS	2017/07/17					
02	PRELIMINARY	MC	SS	2016/12/21					
01	PRELIMINARY	MC	SS	2016/11/25					

Client  
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Architect  
**fjmt**  
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Project  
**MASTER PLAN, CARABELLA STREET, KIRIBILLI, NSW**  
Title  
**STORMWATER CONCEPT PLAN STAGE B FINAL**

Drawn M.CERNA	Designed S.SPIRIG	Date NOV 2016
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Drawing number <b>16652_DA_C102</b>		Revision <b>03</b>



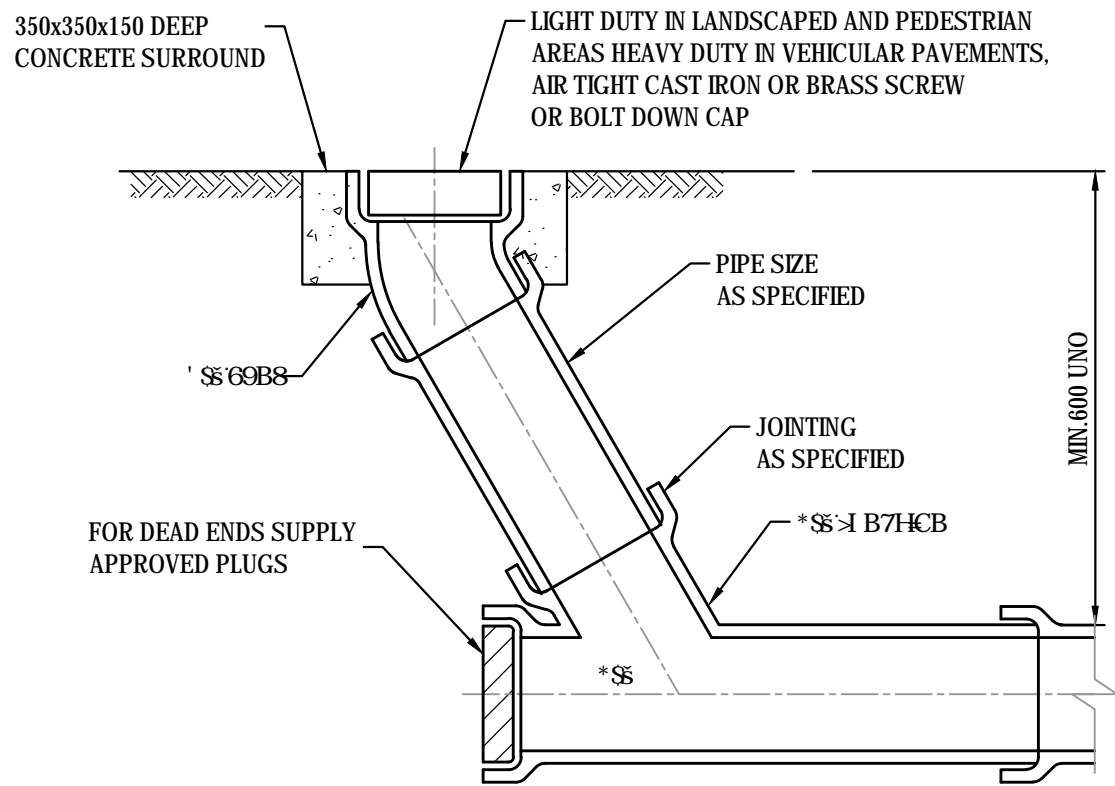
FACTORS RESPONSIBILITY TO SELECT PIT CHAMBER SIZE WITH REGARDS TO PIPE SIZE, DEPTH TO INVERT AND SKEW ANGLE. REFER SKETCHES BELOW.

## 2 PIT SIZE & DEPTH REQUIREMENTS

H = 0-900mm - AxB = 600x600mm  
H = 900-1200mm - AxB = 900x600mm  
H = >1200mm - AxB = 900x900mm

PLAN

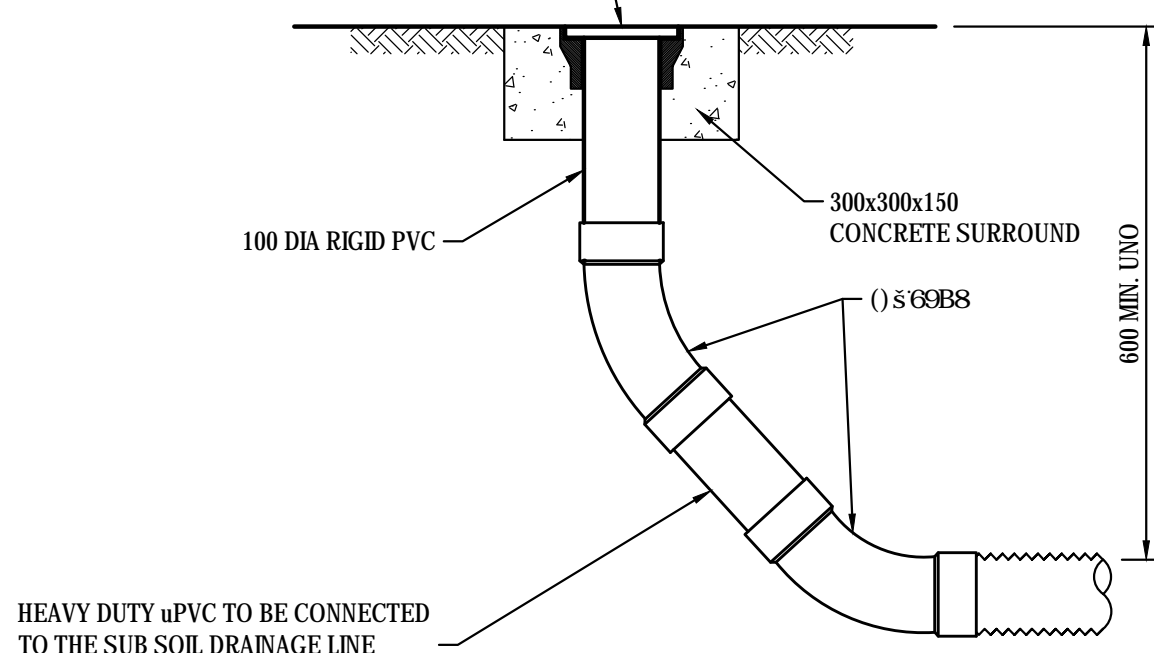
### ③ PIT CHAMBER FOR SIDE ENTRY ON SKEW



FC88-B; DC-BH5H\* \$Š fFD&amp;f

SCALE 1:10

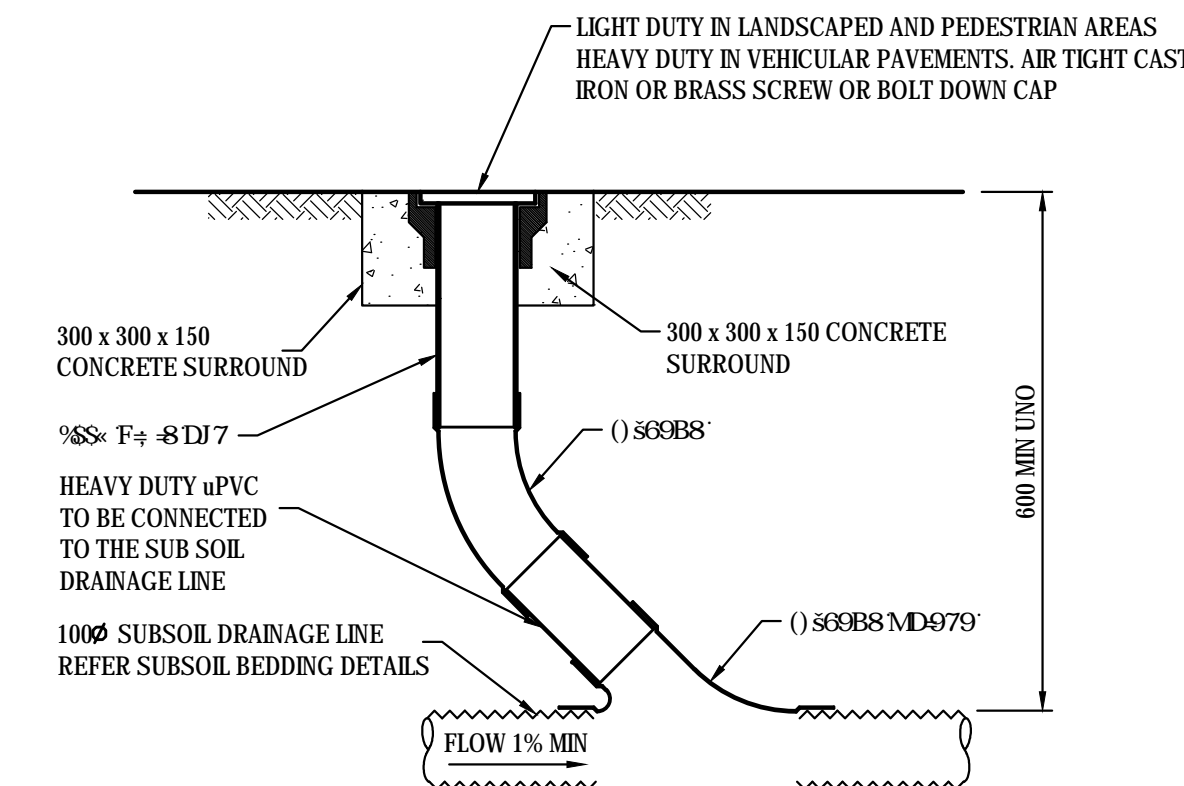
LIGHT DUTY IN LANDSCAPED AND PEDESTRIAN  
AREAS HEAVY DUTY IN VEHICULAR PAVEMENTS.  
AIR TIGHT CAST IRON OR BRASS SCREW OR BOLT  
DOWN CAP.



### FLUSHING POINT (FP)

SCALE 1:10

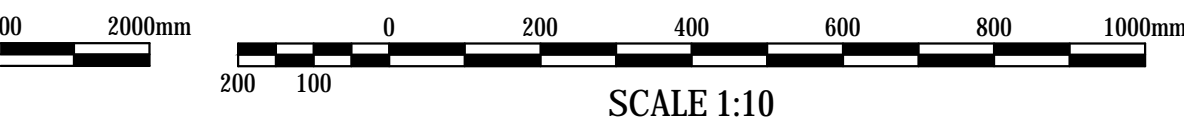
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



### INTERMEDIATE RISER (IR)

SCALE 1:10

NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



	MC	SS	2017/07/17					
	SS	NH	2016/12/21					
	SS	NH	2016/11/21					
AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE

Architect  
**fjmt**

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Title  
POST-CATCHMENT PLAN

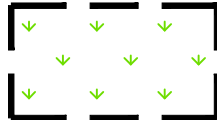
Date  
NOVEMBER 2016


Scale  
1:400 @ A1


16652 DA C200

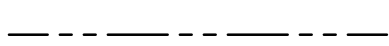
03




 @5B8G75DBR 5F95.% \$a 1'&1  
 PERVIOUS


 <5F8G4B88 5F95.% \$a 1'&1  
 IMPERVIOUS


 FCC: 5F95. 204 \$a 1 (" "h  
 IMPERVIOUS


 EXISTING BOUNDARY



 CATCHMENT BOUNDARY

Diagram illustrating the classification of a catchment boundary. The diagram shows three types of boundaries:

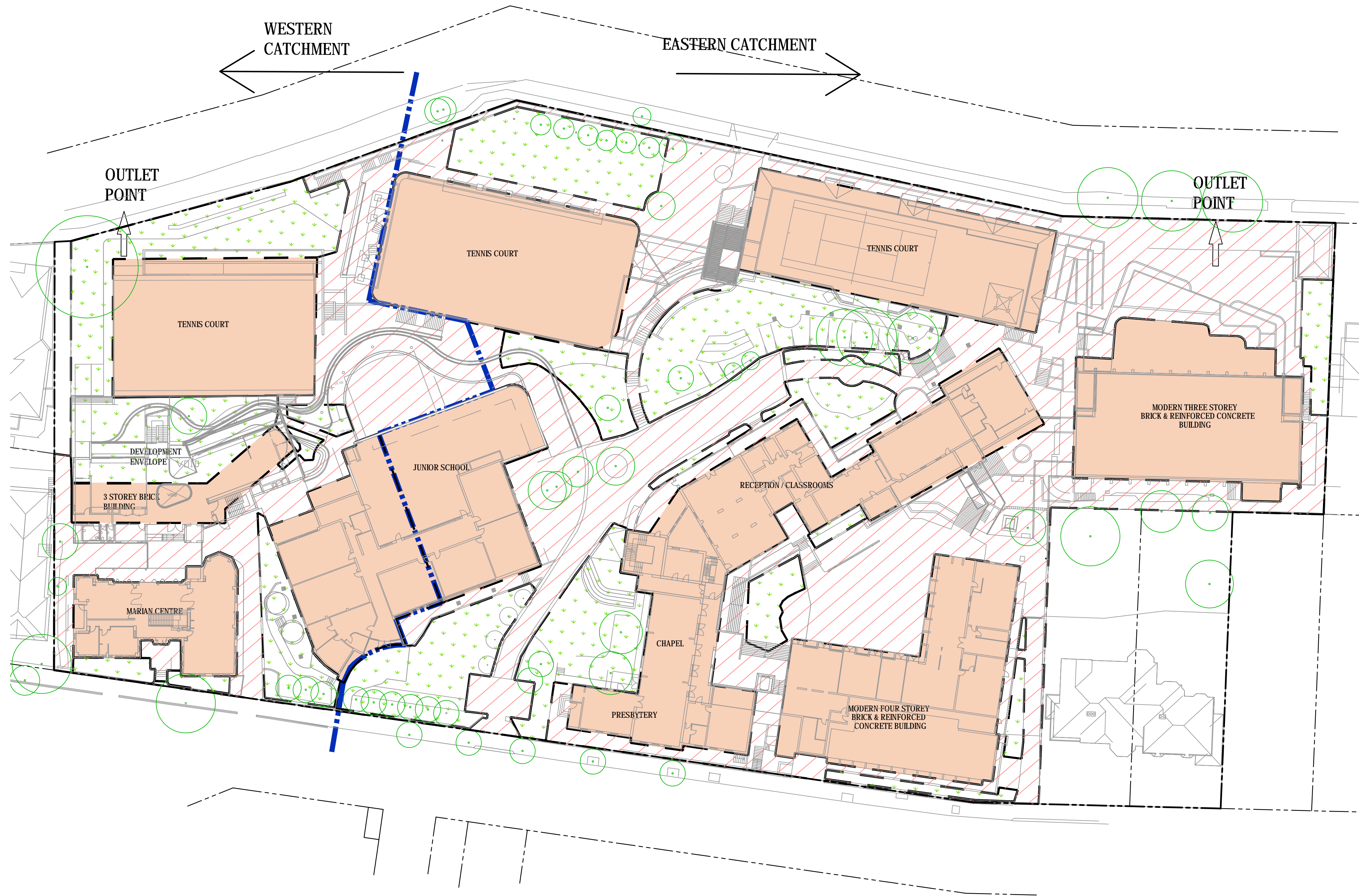
- PERVIOUS:** A dashed line with green arrows pointing outwards.
- IMPERVIOUS:** A dashed line with red diagonal lines.
- IMPERVIOUS:** A solid orange rectangle.

Below these are two horizontal lines:

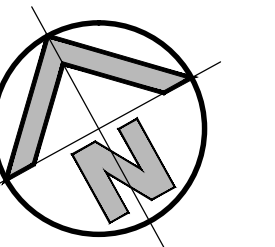
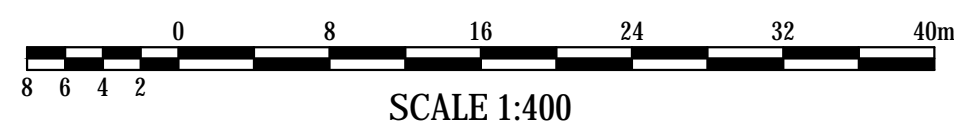
- EXISTING BOUNDARY:** A dashed line.
- CATCHMENT BOUNDARY:** A solid blue line.

HCH5@D9FJ-CI G', (Sa'1'2%)  
(LANDSCAPING AREAS)


HCH5@AD9FJ-CI G%' Sa'1+', "1  
(ROOF & HARDSTAND AREAS)



SCALE:1:400



**FOR DA ONLY**

												Client		Project		Drawn		Designed		Date			
												LORETO KIRRIBILLI		Level 5, 79 Victoria Avenue Chatswood NSW 2067		MASTER PLAN, 85 CARABELLA STREET, KIRRIBILLI, NSW		M.CERNA		S.SPIRIG		NOV 2016	
												Architect		Telephone +61 2 9417 8400 Facsimile +61 2 9417 8337				Checked		Approved		Scale	
												fjmt		Email email@hiconsult.com.au Web www.henryandhymas.com.au				S.SPIRIG		A.FRANCIS		1:400 @ A1	
03	ISSUED FOR DA			MC	SS	2017/07/17						Title		Drawing number				Revision					
02	PREDIMINARY			MC	SS	2016/12/21						STORMWATER PRE-CATCHMENT PLAN		16652_DA_C250				03					
01	PREDIMINARY			MC	SS	2016/11/25																	
REVISION		AMENDMENT		DRAWN		DESIGNED		DATE		REVISION		AMENDMENT		DRAWN		DESIGNED		DATE					



K9GDFB75H7<A9BH5F95.(, &\$'a

95GDFB75H7<A9BH5F95.%) \$a

@5B8G75DB: 5F95.%) \$a 1%'a  
PERVIOUS

<5F8GFB8 5F95.%) \$a 1%'a  
IMPERVIOUS

FCC: 5F95. & \$a 1%'a  
IMPERVIOUS

EXISTING BOUNDARY

CATCHMENT BOUNDARY

@5B8G75DB: 5F95. & \*\$a 1%'a  
PERVIOUS

<5F8GFB8 5F95. (+\*\$a 1%'a  
IMPERVIOUS

FCC: 5F95. \* & \$a 1%'a  
IMPERVIOUS

EXISTING BOUNDARY

CATCHMENT BOUNDARY

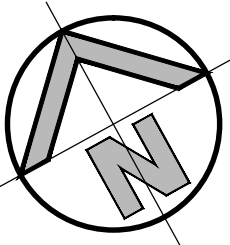
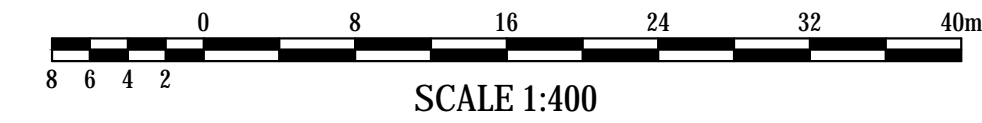


HCF5@75H7<A9BH5F95.%)% \$a



HCF5@DEFJ-CI G: '' % \$a 1%'a  
(LANDSCAPING AREA)

HCF5@ADFJ-CI G: % , \*\$a 1%'a  
(ROOF + HARDSTAND AREA)

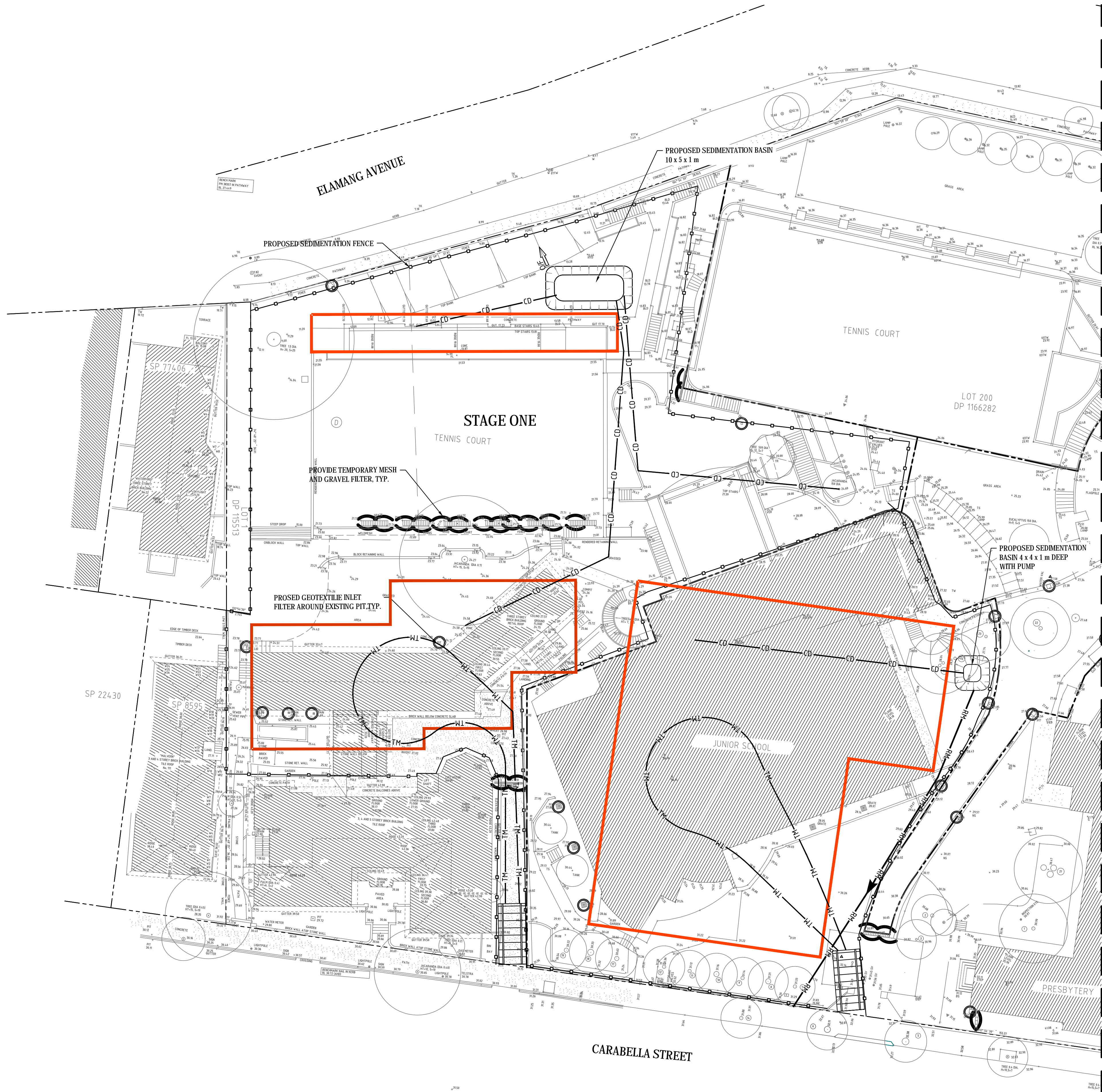
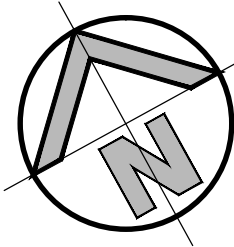
STORMWATER POST-CATCHMENT PLAN  
SCALE:1:400



FOR DA ONLY

<div><div><div>SURVEY INFORMATION</div><div>SURVEYED BY: HAMMOND SMEALLIE &amp; CO PTY LTD DATUM: AHD</div></div></div>										<div><div>Client</div><div>LORETO KIRRIBILLI</div><div>Architect</div><div>fjmt</div></div>										<div><div>Level 5, 79 Victoria Avenue Chatswood NSW 2067</div><div><div>Telephone +61 2 9417 8400 Facsimile +61 2 9417 8337 Email email@hhconsult.com.au Web www.henryandhymas.com.au</div></div></div>										<div><div><div>henry&amp;hymas</div></div></div>										<div><div>Project</div><div>MASTER PLAN, CARABELLA STREET, KIRRIBILLI, NSW</div><div>Title</div><div>STORMWATER POST-CATCHMENT PLAN</div></div>										<div><div><div><div>Drawn M.CERNA</div><div>Checked S.SPIRIG</div></div><div><div>Designed S.SPIRIG</div><div>Approved A.FRANCIS</div></div><div><div>Date NOVEMBER 2016</div><div>Scale 1:400 @ A1</div></div></div><div><div>Drawing number</div><div>16652_DA_C251</div><div>Revision</div><div>03</div></div></div>																			
<table><tr><th>REVISION</th><th>AMENDMENT</th><th>DRAWN</th><th>DESIGNED</th><th>DATE</th><th>REVISION</th><th>AMENDMENT</th><th>DRAWN</th><th>DESIGNED</th><th>DATE</th></tr><tr><td>03</td><td>ISSUED FOR DA</td><td>MC</td><td>SS</td><td>2017/07/17</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>02</td><td>PRELIMINARY</td><td>MC</td><td>SS</td><td>2016/12/21</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>01</td><td>PRELIMINARY</td><td>MC</td><td>SS</td><td>2016/11/25</td><td></td><td></td><td></td><td></td><td></td></tr></table>										REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	03	ISSUED FOR DA	MC	SS	2017/07/17						02	PRELIMINARY	MC	SS	2016/12/21						01	PRELIMINARY	MC	SS	2016/11/25						<div><div>This drawing and design remains the property of Henry &amp; Hymas and may not be copied in whole or in part without the prior written approval of Henry &amp; Hymas.</div></div>																			
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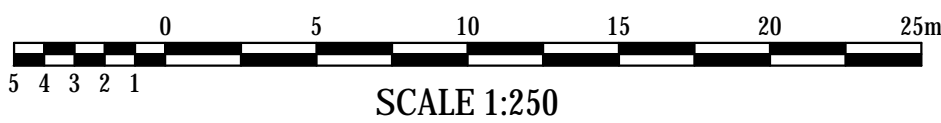


LEGEND

- TM TM TRAFFIC MANOEUVRING
- CD CD TRAFFIC MANOEUVRING
- RM RM RISING MAIN
- PROPOSED SEDIMENTATION FENCE
- PROPOSED VEHICLE SHAKER GRID
- PROPOSED STOCKPILE LOCATION
- PROPOSED MESH & GRAVEL INLET FILTER
- PROPOSED GEOTEXTILE INLET FILTER

SEDIMENT & EROSION CONTROL NOTES

- ALL SEDIMENT CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH RESPECTIVE COUNCIL SPECIFICATIONS AND LANDCOM'S 'SOIL AND CONSTRUCTION' MANUAL.
- ALL PERIMETER & SILTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TO, OR AS THE FIRST STEP IN EARTH WORKS AND/OR CLEARING.
- THE SEDIMENT & EROSION CONTROL PLAN MAY REQUIRE FUTURE ADJUSTMENT TO REFLECT CONSTRUCTION STAGING. IT IS ALSO THE CONTRACTORS RESPONSIBILITY TO PREPARE THEIR OWN SEDIMENT AND EROSION CONTROL PLAN WHICH SUITS THE DESIGNED CONSTRUCTION STAGING.
- FILTRATION BUFFER ZONES ARE TO BE FENCED OFF AND ACCESS PROHIBITED TO ALL PLANT AND MACHINERY.
- ALL TEMPORARY EARTH BERMS, DIVERSIONS & SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED & MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
- ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING. TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE LOCATION.
- ALL TOPSOIL IS TO BE STOCKPILED ON SITE FOR REUSE (AWAY FROM TREES AND DRAINAGE LINES). MEASURES SHALL BE APPLIED TO PREVENT EROSION OF THE STOCKPILES.
- ALL EARTHWORK AREAS SHALL BE ROLLED EACH EVENING TO SEAL THE EARTHWORKS.
- ALL FILLS ARE TO BE LEFT WITH A LIP AT THE TOP OF THE SLOPE AT THE END. ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND STRAW MULCHED WITHIN 14 DAYS OF COMPLETION OF FORMATION U.N.O. BY LANDSCAPE ARCHITECTS.
- UPON COMPLETION OF ALL EARTHWORKS OR AS DIRECTED BY COUNCIL, SOIL CONSERVATION TREATMENTS SHALL BE APPLIED SO AS TO RENDER AREAS THAT HAVE BEEN DISTURBED, EROSION PROOF WITHIN 14 DAYS.
- EROSION AND SILT PROTECTION MEASURES ARE TO BE MAINTAINED AT ALL TIMES.



SEDIMENT EROSION CONTROL PLAN

SCALE 1:250

FOR DA ONLY

SURVEY INFORMATION

SURVEYED BY:  
HAMMOND SMEALLIE  
& CO PTY LTD  
DATE: AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
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01	PRELIMINARY	MC	SS	2016/12/15					

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Project  
MASTER PLAN, CARABELLA STREET,  
KIRIBILLI, NSW

Title  
SEDIMENT EROSION CONTROL PLAN  
SHEET 1 OF 3

Drawn  
M.CERNA  
Designed  
S.SPIRIG  
Checked  
S.SPIRIG  
Approved  
A.FRANCIS

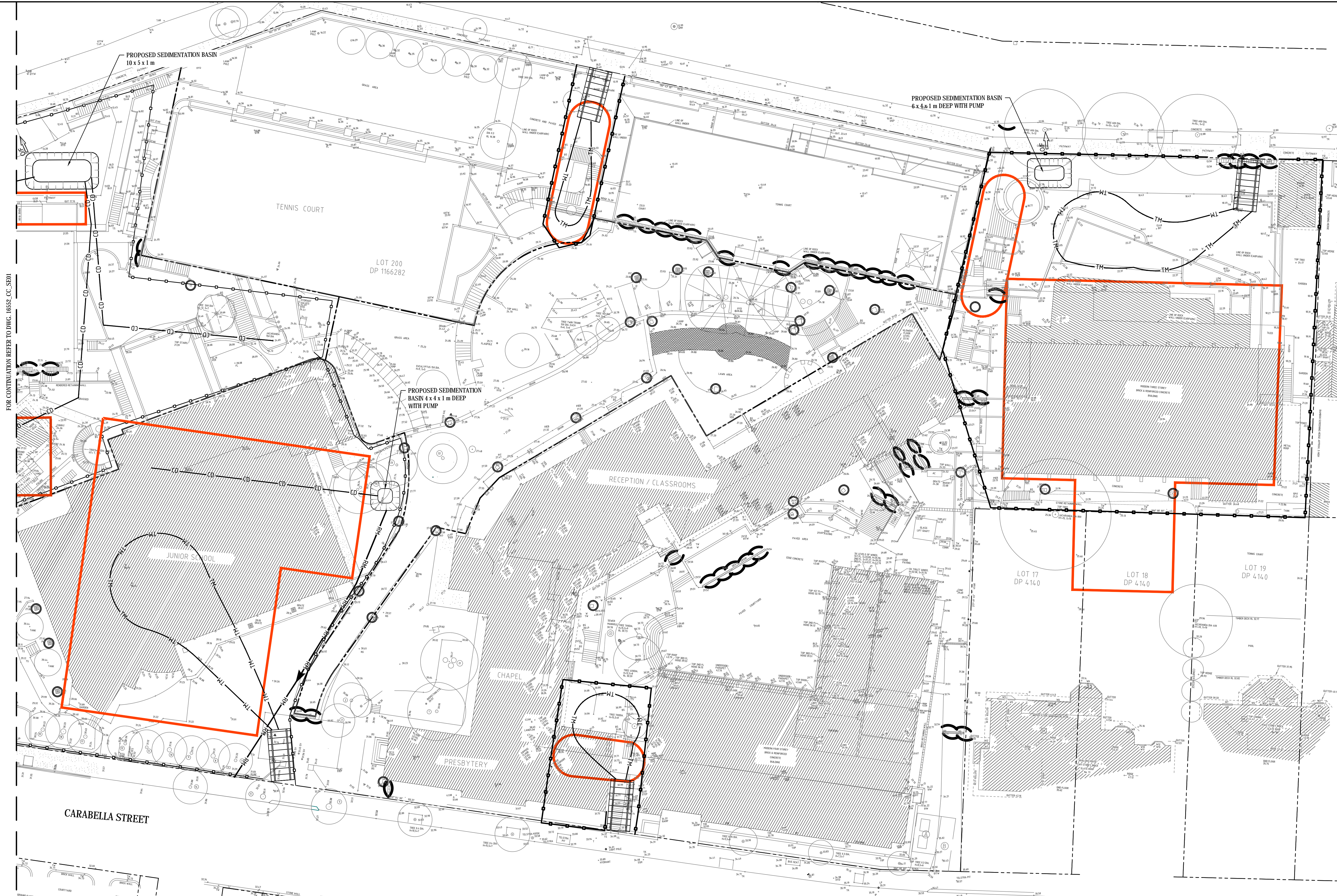
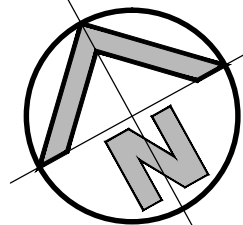
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Revision

16652\_DA\_SE01

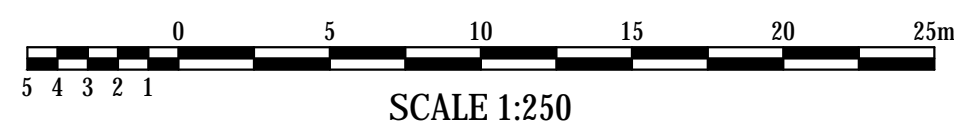
03





FOR CONTINUATION REFER TO DWG. 16532\_CC\_SE01

SEDIMENT EROSION CONTROL PLAN  
SCALE 1:250



SCALE 1:250

FOR DA ONLY

**SURVEY  
INFORMATION**  
SURVEYED BY:  
HAMMOND SMEALLIE  
& CO PTY LTD  
DATUM: AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
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Client  
**LORETO KIRIBILLI**  
Architect  
**fjmt**  
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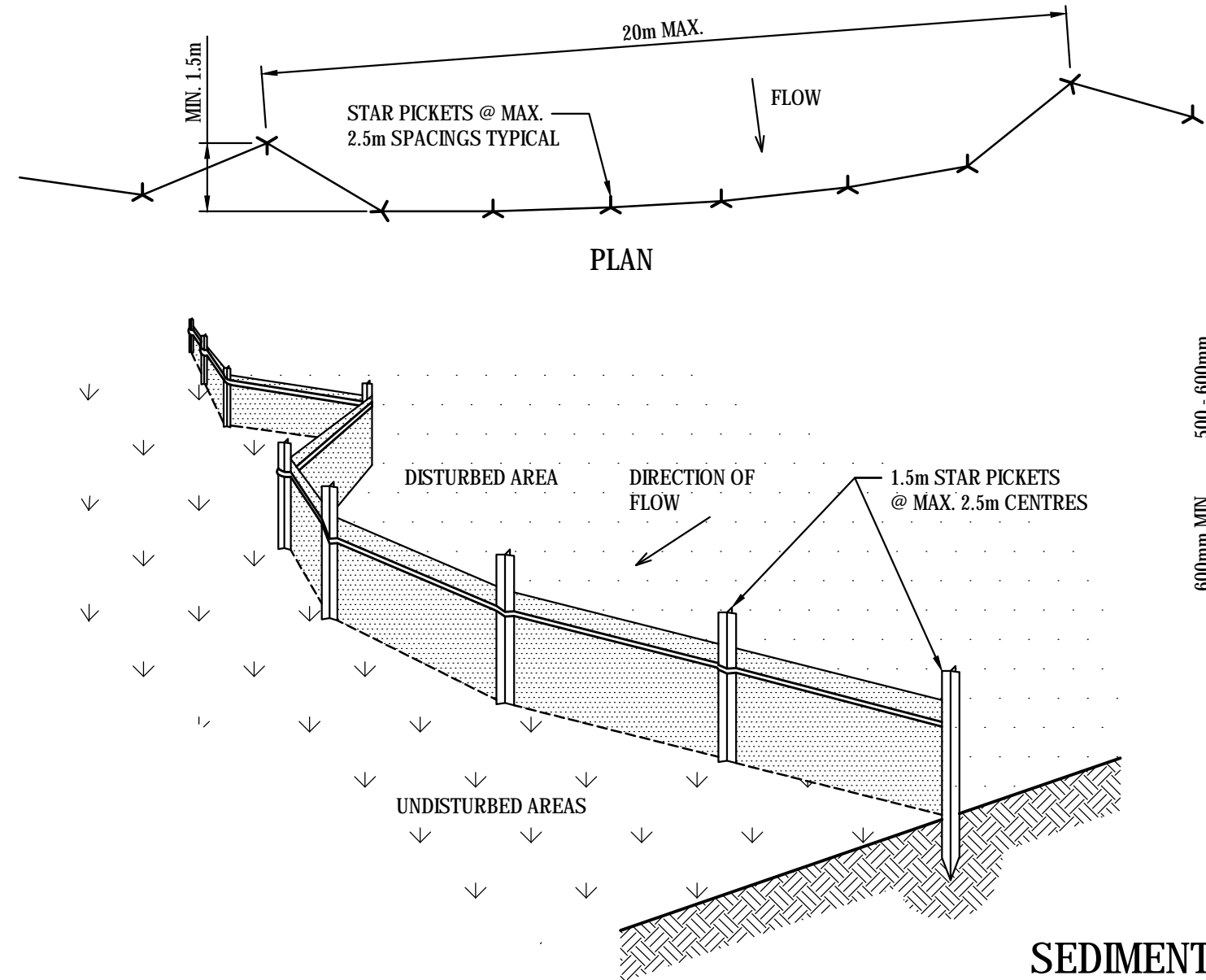
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Project  
**MASTER PLAN, CARABELLA STREET,  
KIRIBILLI, NSW**  
Title  
**SEDIMENT EROSION CONTROL PLAN  
SHEET 2 OF 3**

Drawn M.CERNA	Designed S.SPIRIG	Date NOV 2016
Checked S.SPIRIG	Approved A.FRANCIS	Scale 1:250 @ A1
Drawing number <b>16652_DA_SE02</b>		Revision <b>03</b>

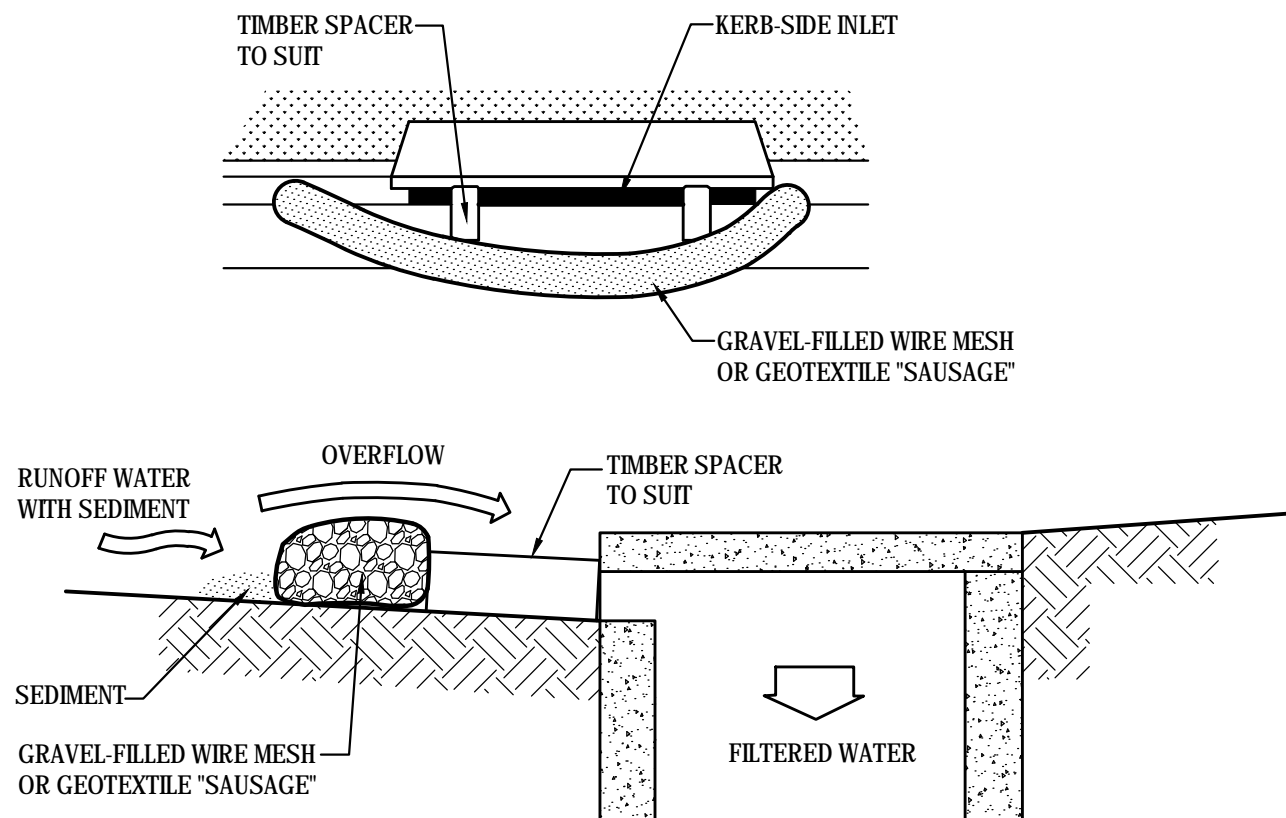




**SEDIMENT FENCE**  
SCALE N.T.S.

**SEDIMENT FENCE CONSTRUCTION NOTES:**

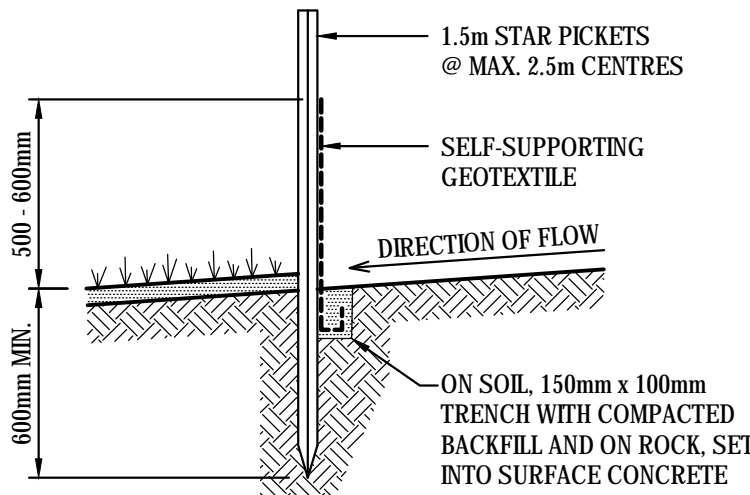
1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND 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 1.5m LONG STAR PICKETS INTO GROUND @ 2.5m 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.



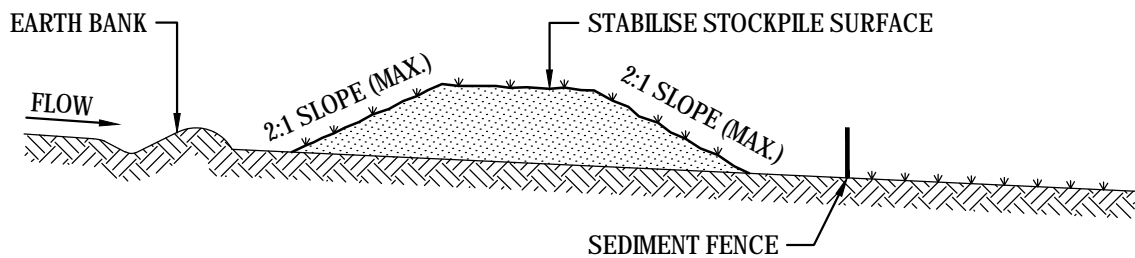
**MESH & GRAVEL INLET FILTER CONSTRUCTION NOTES:**

1. 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.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
3. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
4. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
5. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY CAN FIRMLY ABUT EACH OTHER AND SEDIMENT / LADEN WATERS CANNOT PASS BETWEEN.

**MESH & GRAVEL INLET FILTER**  
SCALE N.T.S.



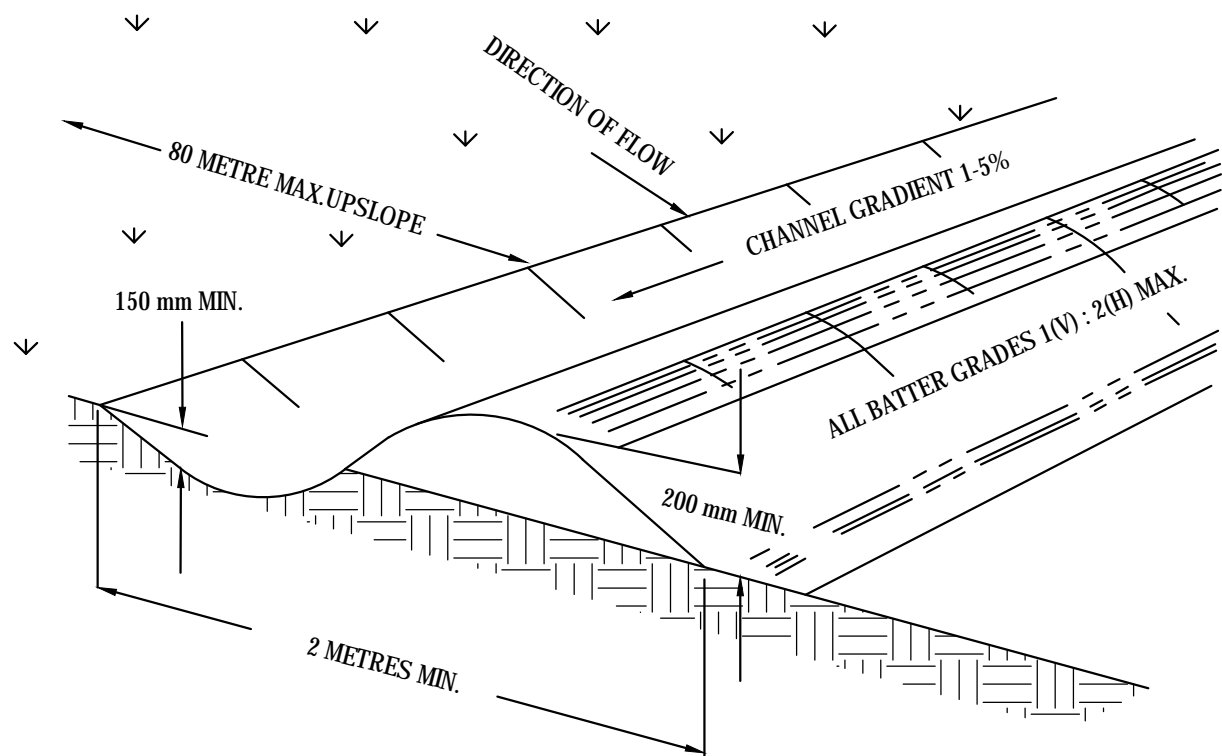
**SECTION DETAIL**



**STOCKPILE 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 PLACED FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED E.S.C.P. OR S.W.M.P. TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.

**STOCKPILES**  
SCALE N.T.S.

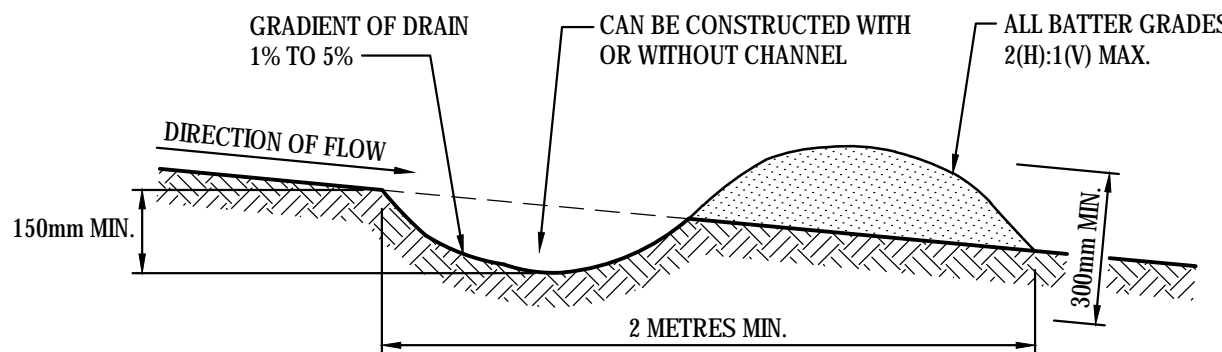


NOTE: ONLY TO BE USED AS TEMPORARY BANK WHERE MAC. UPSLOPE LENGTH IS 80 METERS.

**CATCH DRAIN CONSTRUCTION NOTES:**

1. CONSTRUCT ALONG GRADIENT AS SPECIFIED.
2. MAXIMUM SPACING BETWEEN BANKS SHALL BE 80 METRES.
3. DRAINS TO BE OF PARABOLIC OR TRAPEZOIDAL CROSS SECTION NOT V-SHAPED.
4. EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE.
5. CONSTRUCTION IS OF A TEMPORARY NATURE AND SHALL BE COMPACTED AT THE END A DAYS WORK OR IMMEDIATELY PRIOR RAIN.
6. ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO SEDIMENT BASIN OR SIMILAR.
7. DISCHARGE RUNOFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILISED OR AN UNDISTURBED DISPOSAL AKSTE WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED.
8. COMPACT WITH A SUITABLE IMPLEMENT IN SITUATIONS WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN FIVE DAYS.
9. EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.

**CATCH DRAINS SD 5-8**  
SCALE N.T.S.

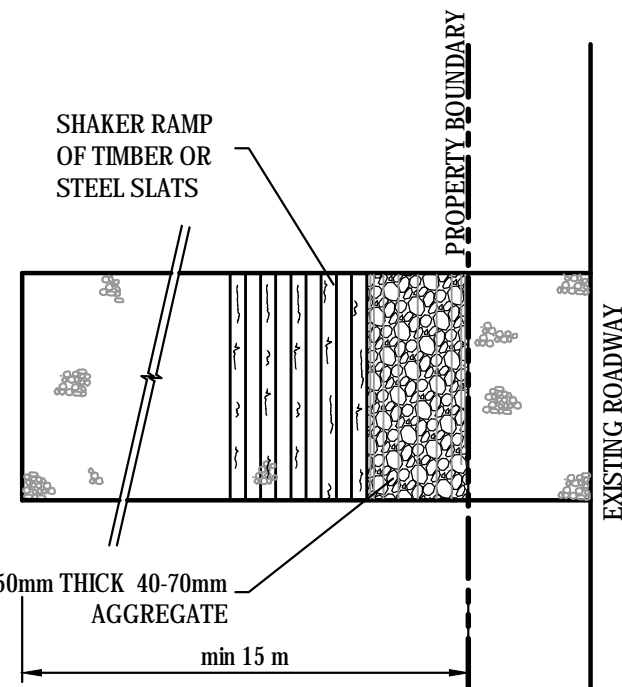


NOTE: ONLY TO BE USED AS TEMPORARY BANK WHERE MAXIMUM UPSLOPE LENGTH IS 80 METRES.

**EARTH BANK CONSTRUCTION NOTES:**

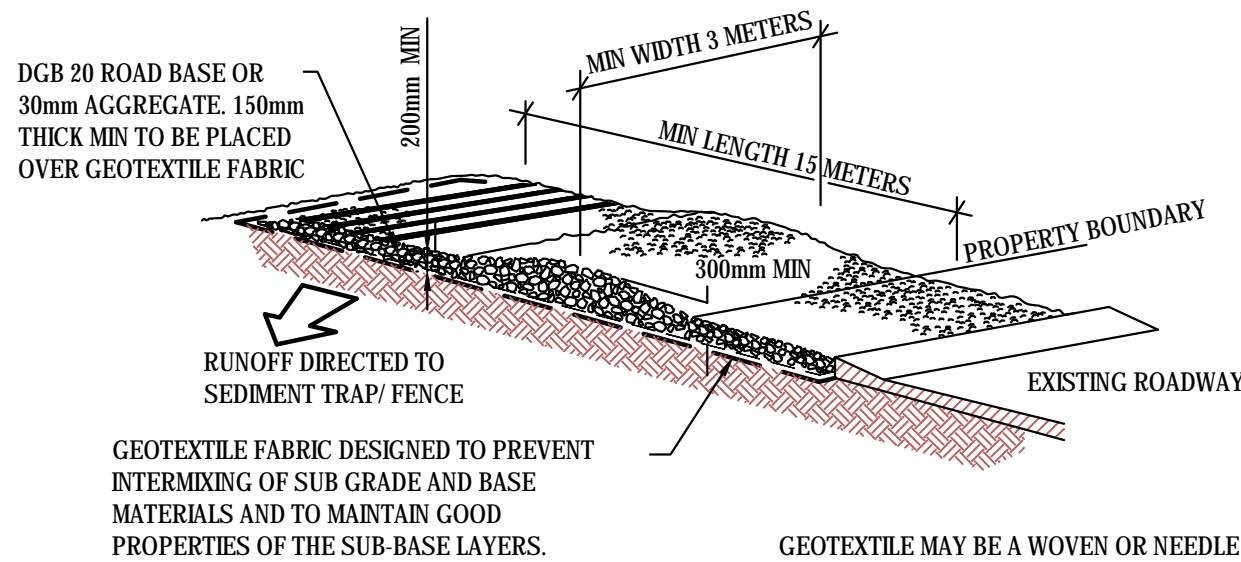
1. BUILD WITH GRADIENTS BETWEEN 1% AND 5%.
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE - WORK AROUND THEM.
3. ENSURE THE STRUCTURES ARE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT COULD IMPEDE WATER FLOW.
4. BUILD THE DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS-SECTIONS, NOT "V" SHAPED.
5. ENSURE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE.
6. COMPLETE PERMANENT OR TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION.

**EARTH BANK (LOW FLOW)**  
N.T.S.



**STABILISED SITE ACCESS WITH SHAKER RAMP**  
N.T.S.

CONSTRUCTION SITE



GEOTEXTILE MAY BE A WOVEN OR NEEDLE PUNCHED PRODUCT WITH A MINIMUM CBR BURST STRENGTH (AS3706.4-90) OF 2500 N

**STABILISED SITE ACCESS WITH SHAKER RAMP**  
N.T.S.

**NOTES:**

1. THIS DEVICE IS TO BE LOCATED AT ALL EXITS FROM CONSTRUCTION SITE.
2. THIS DEVICE IS TO BE REGULARLY CLEANED OF DEPOSITED MATERIAL SO AS TO MAINTAIN A 50mm DEEP SPACE BETWEEN PLANKS.
3. ANY UNSEALED ROAD BETWEEN THIS DEVICE AND NEAREST ROADWAY IS TO BE TOPPED WITH 100mm THICK 40-70mm SIZE AGGREGATE.
4. ALTERNATIVELY, THREE(3) PRECAST CONCRETE CATTLE GRIDS (AS MANUFACTURED BY \*HUMES CONCRETE MAY BE USED. 1, 2 & 3 ABOVE ALSO APPLY.

**CONSTRUCTION SEQUENCE**

WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:

1. INSTALL SEDIMENT FENCING AND CUT DRAINS TO MEET THE REQUIREMENTS OF THE SEDIMENT AND EROSION CONTROL PLAN. WASTE COLLECTION BINS SHALL BE INSTALLED ADJACENT TO SITE OFFICE.
2. CONSTRUCT STABILISED SITE ACCESS IN ACCORDANCE WITH HORNSBY SHIRE COUNCIL'S REQUIREMENTS.
3. REDIRECT CLEAN WATER AROUND THE CONSTRUCTION SITE.
4. INSTALL SEDIMENT CONTROL PROTECTION MEASURES AT ALL NATURAL AND MAN-MADE DRAINAGE STRUCTURES. MAINTAIN UNTIL ALL THE DISTURBED AREAS ARE STABILISED.
5. CLEAR AND STRIP THE WORK AREAS. MINIMISE THE DAMAGE TO THE GRASS AND LOW GROUND COVER OF NON-DISTURBED AREAS.
6. ANY DISTURBED AREAS, OTHER THAN BUILDING PAD AREAS, SHALL IMMEDIATELY BE COVERED WITH SITE TOPSOIL WITHIN 7 DAYS OF CLEARING. BUILDING PAD AREAS SHALL BE COVERED WITH BITUMEN EMULSION AS SPECIFIED.
7. APPLY PERMANENT STABILISATION TO SITE (LANDSCAPING).

**FOR DA ONLY**

**SURVEY INFORMATION**

SURVEYED BY:  
HAMMOND SMEALLIE  
& CO PTY LTD  
DATUM: AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
03	ISSUED FOR DA	MC	SS	2017/07/17					
02	PRELIMINARY	MC	SS	2016/12/21					
01	PRELIMINARY	MC	SS	2016/12/15					

Client	LORETO KIRRIBILLI
Architect	fjmt
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Project	MASTER PLAN, CARABELLA STREET, KIRRIBILLI, NSW
Title	SEDIMENT EROSION TYPICAL SECTIONS AND DETAILS, SHEET 3 OF 3

Drawn M. CERNA	Designed S. SPIRIG	Date NOV 2016
Checked S. SPIRIG	Approved A. FRANCIS	Scale 1:250 @ A1
Drawing number 16652_DA_SE03		Revision 03

## Appendix B

S4.55 Application Civil Engineering Documentation (Rev 1) by Northrop Engineers dated 06.06.2019.



# LORETO KIRRIBILLI

85 CARABELLA STREET

CIVIL ENGINEERING WORKS PACKAGE



DRAWING SCHEDULE	
DRG No.	DRAWING TITLE
C01.01	COVER SHEET, DRAWING SCHEDULE AND LOCALITY PLAN
C01.11	SPECIFICATION NOTES
C02.01	CONCEPT SEDIMENT AND EROSION CONTROL PLAN
C02.11	SEDIMENT AND SOIL EROSION CONTROL DETAILS
C05.01	STORMWATER DRAINAGE PLAN
C05.11	STORMWATER LONGITUDINAL SECTIONS - SHEET 01
C05.12	STORMWATER LONGITUDINAL SECTIONS - SHEET 02
C05.13	STORMWATER LONGITUDINAL SECTIONS - SHEET 03
C05.91	STORMWATER CALCULATIONS SHEET
C06.01	CATCHMENT PLAN
C09.01	DETAILS

DRAWN: A MARGARIS

DESIGNED: BLAWRENCE

JOB MANAGER: BLAWRENCE

VERIFIER:


REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	ISSUED FOR SECTION 4.55	AM		BL	06.06.19



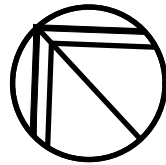
LORETO KIRRIBILLI  
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PROJECT

LORETO KIRRIBILLI

DRAWING TITLE

CIVIL ENGINEERING PACKAGE

COVER SHEET, DRAWING  
SCHEDULE AND LOCALITY PLAN

JOB NUMBER

182476

DRAWING NUMBER

C01.01

REVISION

1

DRAWING SHEET SIZE = A1

NOT FOR CONSTRUCTION



NOTE: ALL CIVIL ENGINEERING CONSTRUCTION WORKS TO BE CARRIED OUT IN ACCORDANCE WITH NORTH SYDNEY COUNCIL DEVELOPMENT GUIDELINES. READ IN CONJUNCTION WITH THE NOTES PROVIDED BELOW.  
IF CONFLICT ARISE, NORTH SYDNEY COUNCIL GUIDELINES AND SPECIFICATIONS TAKE PRECEDENCE. WHERE NORTH SYDNEY COUNCIL GUIDELINES AND SPECIFICATIONS ARE SILENT, THE SPECIFICATION NOTES BELOW TAKE PRECEDENCE

ACCESS AND SAFETY
1. THE CONTRACTOR SHALL COMPLY WITH ALL STATUTORY AND INDUSTRIAL REQUIREMENTS FOR PROVISION OF A SAFE WORKING ENVIRONMENT INCLUDING TRAFFIC CONTROL.
2. THE CONTRACTOR SHALL PROVIDE TRAFFIC MANAGEMENT PLANS FOR THE PROPOSED WORKS COMPLETED BY A SUITABLY QUALIFIED PERSON AND APPROVED BY COUNCIL / REGULATORY AUTHORITY. WORK IS NOT TO COMMENCE ON SITE PRIOR TO APPROVAL OF TRAFFIC MANAGEMENT SCHEME.
3. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES ACCESS TO BUILDINGS ADJACENT THE WORKS IS NOT DISRUPTED.
4. WHERE NECESSARY THE CONTRACTOR SHALL PROVIDE SAFE PASSAGE OF VEHICLES AND/OR PEDESTRIANS THROUGH OR BY THE SITE.
5. THE CONTRACTOR SHALL ENSURE PUBLIC ACCESS EXTERNAL TO THE SITE IS IN ACCORDANCE WITH COUNCILS REQUIREMENTS.

TREE PROTECTION
1. REFER TO LANDSCAPE / ARCHITECTS PLAN FOR TREES TO BE RETAINED AND PROTECTED.
2. ANY EXISTING TREES WHICH FORM PART OF THE FINAL LANDSCAPING PLAN SHALL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY: 2.1. PROTECTING THEM WITH BARRIER FENCING OR SIMILAR MATERIALS INSTALLED OUTSIDE THE DRIP LINE. 2.2. ENSURING THAT NOTHING IS NAILED TO ANY PART OF THE TREE. 2.3. CARE IS TAKEN NOT TO CUT ROOTS UNNECESSARILY. COUNCILS AND/OR INDEPENDENT ARBORISTS TO BE CONSULTED WHERE TREE ROOTS ARE TO BE REMOVED AND/OR CUT.

SEDIMENT AND SOIL EROSION
1. THE SEDIMENT & EROSION CONTROL PLAN PRESENTS CONCEPTS ONLY. THE CONTRACTOR SHALL AT ALL TIMES BE RESPONSIBLE FOR THE ESTABLISHMENT & MANAGEMENT OF A DETAILED SCHEME MEETING COUNCILS DESIGN, OTHER REGULATORY AUTHORITY REQUIREMENTS <u>AND MAKE GOOD PAYMENT OF ALL FEES.</u>
2. THE CONTRACTOR SHALL INSTIGATE ALL SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH STATUTORY REQUIREMENTS AND IN PARTICULAR THE 'BLUE BOOK' (MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION), PRODUCED BY THE DEPARTMENT OF HOUSING AND COUNCILS POLICIES. THESE MEASURES ARE TO BE INSPECTED AND <u>MAINTAINED ON A DAILY BASIS.</u>
3. THE SITE SUPERINTENDENT SHALL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS INSTRUCTED IN THE DRAWINGS AND <u>ADHERE TO ALL REGULATORY AUTHORITY REQUIREMENTS.</u>
4. THE CONTRACTOR SHALL INFORM ALL SUB CONTRACTORS OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSLOPE LANDS AND WATERWAYS.
5. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE SHALL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE; 5.1 <u>CONSTRUCT TEMPORARY STABILISED SITE ACCESS INCLUSIVE OF SHAKE DOWN / WASH PAD.</u> 5.2 <u>INSTALL ALL TEMPORARY SEDIMENT FENCES AND BARRIER FENCES. WHERE FENCES ADJACENT EACH OTHER, THE SEDIMENT FENCE CAN BE INCORPORATED INTO THE BARRIER FENCE.</u> 5.3 <u>INSTALL SEDIMENT CONTROL MEASURES AS OUTLINED ON THE APPROVED PLANS.</u>
6. UNDERTAKE SITE DEVELOPMENT WORKS SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF MINIMUM WORKABLE SIZE.
7. AT ALL TIMES AND IN PARTICULAR DURING WINDY AND DRY WEATHER, LARGE UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL <u>ENSURING CONFORMITY TO REGULATORY AUTHORITY REQUIREMENTS.</u>
8. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) SHALL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
9. WATER SHALL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN STABILISED AND/OR ANY LIKELY SEDIMENT BEEN FILTERED OUT.
10. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES SHALL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE STABILISED / REHABILITATED.
11. ALLOW FOR GRASS STABILISATION OF EXPOSED AREAS, OPEN CHANNELS AND ROCK BATTERS DURING ALL PHASES OF CONSTRUCTION.
12. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED TO ENSURE THAT THEY OPERATE EFFECTIVELY. REPAIRS AND/OR MAINTENANCE SHALL BE UNDERTAKEN REGULARLY AND AS REQUIRED, PARTICULARLY FOLLOWING RAIN EVENTS.
13. RECEPTORS FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER SHALL BE DISPOSED OF IN ACCORDANCE WITH REGULATORY AUTHORITY REQUIREMENTS. CONTRACTOR TO PAY ALL FEES AND PROVIDE EVIDENCE OF SAFE DISPOSAL.
14. IF A TEMPORARY SEDIMENT BASIN IS REQUIRED, ENSURE SAFE BATTER SLOPES IN ACCORDANCE WITH THE GEOTECHNICAL REPORT. MAINTAIN ADEQUATE STORAGE VOLUME IN ACCORDANCE WITH PLANS. TEMPORARY PUMP 'CLEAN FLOCCULATED' WATER TO COUNCILS STORMWATER SYSTEM. ENSURE WHOLE SITE RUN-OFF IS DIRECTED TO TEMPORARY SEDIMENT BASIN.


EXISTING SERVICES
1. ALL UTILITY SERVICES INDICATED ON THE DRAWINGS ORIGINATE FROM SUPPLIED DATA OR DIAL BEFORE YOU DIG SEARCHES, THEREFORE THEIR ACCURACY AND COMPLETENESS IS NOT GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AND CONFIRM THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY. <u>NOTE SERVICE AUTHORITY REQUIREMENTS FOR LOCATING OF SERVICES PRIOR TO COMMENCEMENT OF WORKS.</u>
2. CARE TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS AREA TO BE UNDERTAKEN OVER COMMUNICATION, GAS OR ELECTRICAL SERVICES. HAND EXCAVATION ONLY IN THESE AREAS.
3. THE CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING SERVICES THAT ARE TO BE RETAINED IN THE VICINITY OF THE PROPOSED WORKS. ANY AND ALL DAMAGE TO THESE SERVICES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE DIRECTION OF THE SUPERINTENDENT <u>AT THE CONTRACTORS EXPENSE.</u>
4. THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR THE ADJUSTMENT (IF REQUIRED) OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS.
5. THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS UNLESS DIRECTED OTHERWISE ON THE DRAWINGS OR BY THE SUPERINTENDENT .
6. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED AND MAINTAINED.
7. PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN APPROVAL OF THE PROGRAM FOR THE RELOCATION AND/OR CONSTRUCTION OF TEMPORARY SERVICES AND FOR ANY ASSOCIATED INTERRUPTION OF SUPPLY.
8. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.

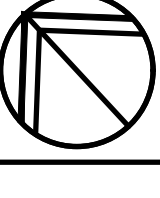
STORMWATER DRAINAGE
1. ALL PIPES SHALL BE CLASS 2 RUBBER-RING JOINTED RCP U.N.O. WHERE uPVC PIPES HAVE BEEN SPECIFIED, THE FOLLOWING CLASS PIPEWORK IS TO BE ADOPTED U.N.O. ø100mm OR LESS TO BE CLASS 'SN10' AND ABOVE ø100mm TO BE CLASS 'SN8'.
2. uPVC STORMWATER LINES PASSING UNDER FLOOR SLABS TO BE CONCRETE ENCASED.
3. FRC PIPES EQUAL TO THAT OF THE STEEL REINFORCED CONCRETE PIPE CLASS SPECIFIED ON THE DRAWINGS MAY BE USED SUBJECT TO APPROVAL FROM THE SUPERINTENDENT.
4. ALL PIPE ARE TO BE LAID AT 1.0% MIN GRADE U.N.O.
5. <u>COVERS</u> 5.1 USE HOT DIPPED GALVANISED COVERS AND GRATES COMPLYING WITH RELEVANT COUNCIL AND AUSTRALIAN STANDARDS. 5.2 ALL COVERS AND GRATES TO BE POSITION IN A FRAME AND MANUFACTURED AS A UNIT. 5.3 ALL COVERS AND GRATES TO BE FITTED WITH POSITIVE COVER LIFTING KEYS 5.4. OBTAIN SUPERINTENDENTS APPROVAL FOR THE USE OF CAST IRON SOLID COVERS AND GRATES. CAST IRON SOLID COVERS (IF APPROVED) TO CONSIST OF CROSS-WEBBED, CELLULAR CONSTRUCTION WITH THE RIBS UPPERMOST TO ALLOW INFILLING WITH CONCRETE. INSTALL POSITIVE COVER LIFTING KEYS AND PLASTIC PLUGS. 5.5. UNLESS DETAILED OR SPECIFIED OTHERWISE, COVERS AND GRATES TO BE CLASS 'D' IN VEHICULAR PAVEMENTS AND CLASS 'B' ELSEWHERE.
5.6. ALL GRATED TRENCH DRAINS SHOULD BE 'CLASS D' CAST IRON WITHIN VEHICULAR PAVEMENTS AND CLASS 'B' HEEL SAFE WITHIN PEDESTRIAN PAVEMENTS.
6. ALL PIPE BENDS, JUNCTIONS, ETC ARE TO BE PROVIDED USING PURPOSE MADE FITTINGS OR STORMWATER PITS.
7. ALL CONNECTIONS TO EXISTING DRAINAGE STRUCTURES SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
8. STORMWATER PIPEWORK TO FINISH FLUSH WITH INTERNAL PIT WALLS AND MUST NOT PROTRUDE. CONNECTION TO BE NEATLY RENDER AND MADE NEAT.
9. THE CONTRACTOR SHALL SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPEWORK.
10. U.N.O. MATERIAL USED FOR BEDDING OF PIPES SHALL BE APPROVED NON-COHESIVE GRANULAR MATERIAL HAVING HIGH PERMEABILITY AND HIGH STABILITY WHEN SATURATED AND FREE OF ORGANIC AND CLAY MATERIAL.
11. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN 50mm CONCRETE BED (OR 75mm THICK BED OF 12mm BLUE METAL) UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK.
12. BEDDING SHALL BE U.N.O TYPE HS2 UNDER ROADS AND H2 UNDER GENERAL AREAS IN ACCORDANCE WITH CURRENT RELEVANT INDUSTRY STANDARDS AND GUIDELINES.
13. THE CONTRACTOR SHALL ENSURE AND PROTECT THE INTEGRITY OF ALL STORMWATER PIPES DURING CONSTRUCTION. ANY AND ALL DAMAGE TO THESE PIPES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE DIRECTION OF THE SUPERINTENDENT AND AT NO EXTRA COST.
14. NOTE THAT THE PIT COVER LEVEL NOMINATED IN GUTTERS ARE TO THE INVERT OF THE GUTTER WHICH ARE 40mm LOWER THAN THE PAVEMENT LEVEL AT LIP OF GUTTER. REFER KERB DETAILS FOR CONFIRMATION.
<u>SUBSOIL DRAINAGE</u> 15. ø100mm SUBSOIL DRAINAGE LINES WITH NON-WOVEN GEOTEXTILE FILTER SOCK SURROUND SHALL BE CONNECTED TO A STORMWATER DRAINAGE PIT (AT MIN 1% LONGITUDINAL GRADE) AND PROVIDED IN THE FOLLOWING LOCATIONS; 15.1. THE HIGH SIDE OF PROPOSED TRAFFICKED PAVEMENT AREAS. 15.2. ALL PLANTER AND TREE BEDS PROPOSED ADJACENT TO PAVEMENT AREAS. 15.3. BEHIND RETAINING WALLS (IN ACCORDANCE WITH RETAINING WALL DETAILS). 15.4. ALL OTHER AREAS SHOWN ON DRAWINGS. 15.5. <u>CONTRACTOR IS TO MAKE ALLOWANCE IN BOTH TENDER AND CONSTRUCTION COSTING TO ALLOW FOR SUBSURFACE DRAINAGE BEHIND ALL RETAINING WALLS / ABOVE LOCATIONS AND TO MAKE CONNECTION TO STORMWATER SYSTEM.</u>
16. WHERE SUBSOIL DRAINAGE PASSES BENEATH BUILDINGS / PAVED AREAS AND/OR PAVEMENTS, CONTRACTOR TO ENSURE ø100mm CLASS 'SN10' uPVC DRAINAGE LINE IS USED AND THAT PROPRIETARY FITTINGS ARE USED TO RECONNECT SUBSOIL DRAINAGE LINE.
17. THE CONTRACTOR SHALL INSTALL INSPECTION OPENINGS / CLEAROUTS TO ALL SUBSOIL DRAINAGE LINES AND DOWNPIPE LINES AS SPECIFIED ON DRAWINGS AND IN ACCORDANCE WITH COUNCIL SPECIFICATIONS AT MAXIMUM 30m CENTRE AND AT ALL UPSTREAM ENDPOINTS.
18. PROVIDE 3.0m LENGTH OF ø100 SUBSOIL DRAINAGE LINE WRAPPED IN NON-WOVEN GEOTEXTILE FILTER FABRIC TO THE UPSTREAM SIDE OF STORMWATER PITS, LAID IN STORMWATER PIPE TRENCHES AND CONNECTED TO DRAINAGE PIT.
19. IN AREAS WHERE DUMPED / HAND PLACED ROCK IS USED AS A MEANS OF SCOUR PROTECTION, CONTRACTOR IS TO EXCAVATE A MINIMUM OF 100mm FROM PROPOSED SURFACE, LEVEL AND COMPACT SUBGRADE AS SPECIFIED. ROCK TO THEN BE PLACED ON GEOTEXTILE FILTER FABRIC.

DRAWN: A.MARGARIS      DESIGNED: B.LAWRENCE      JOB MANAGER: B.LAWRENCE      VERIFIER:

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PROJECT
LORETO KIRRIBILLI

DRAWING TITLE	DRAWING NUMBER	REVISION
CIVIL ENGINEERING PACKAGE	182476	
SPECIFICATION NOTES	C01.11	1
DRAWING SHEET SIZE = A1		

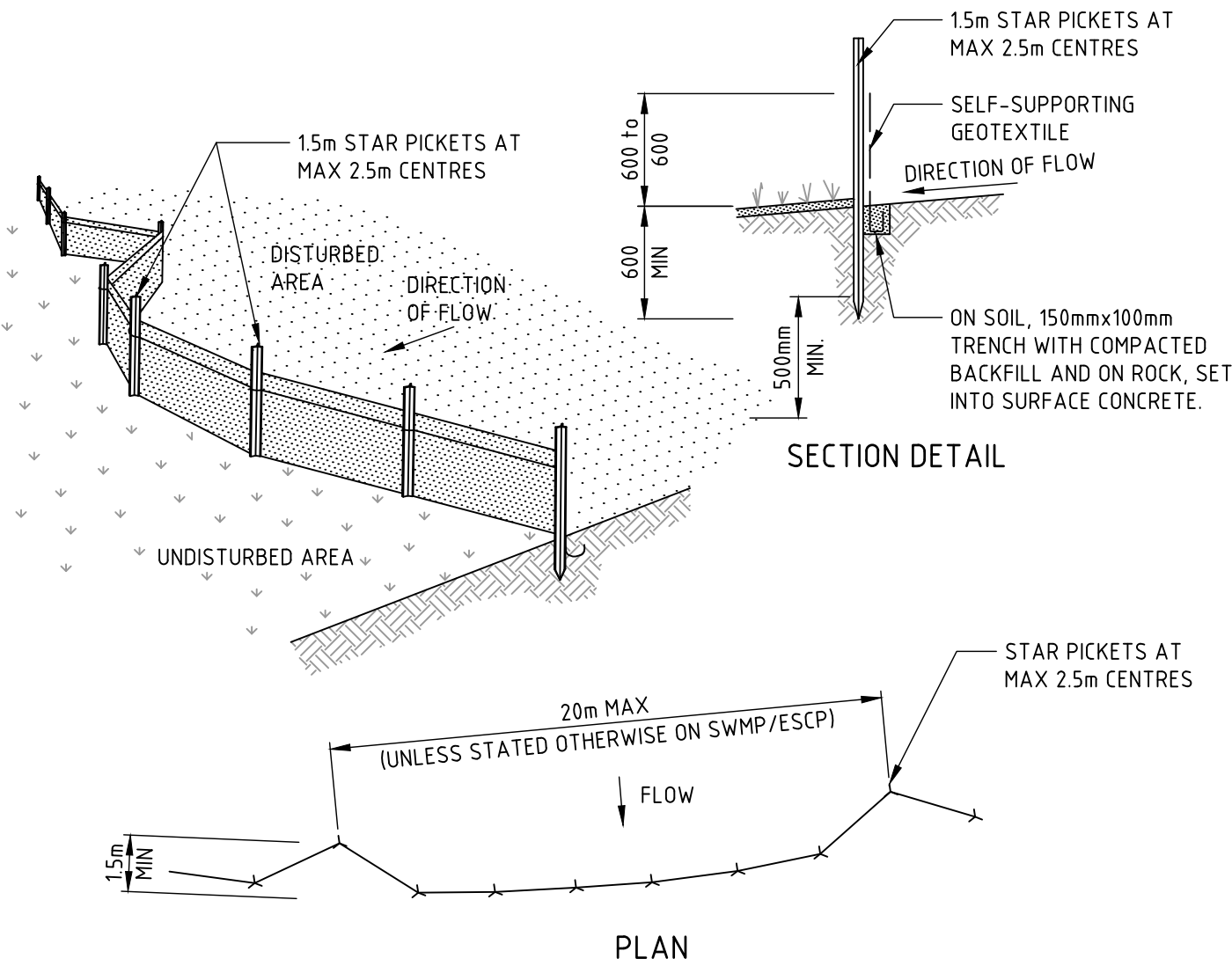
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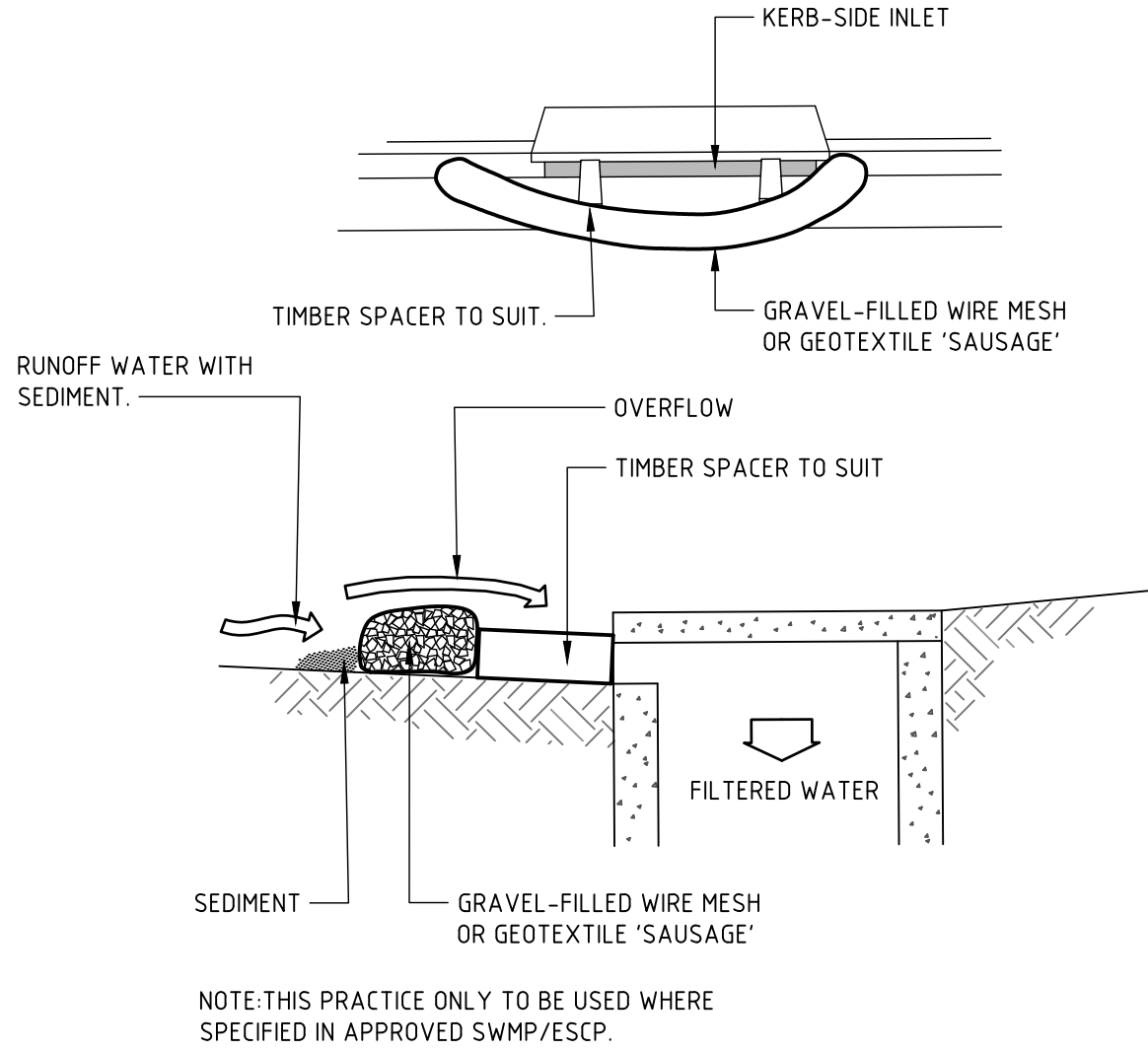






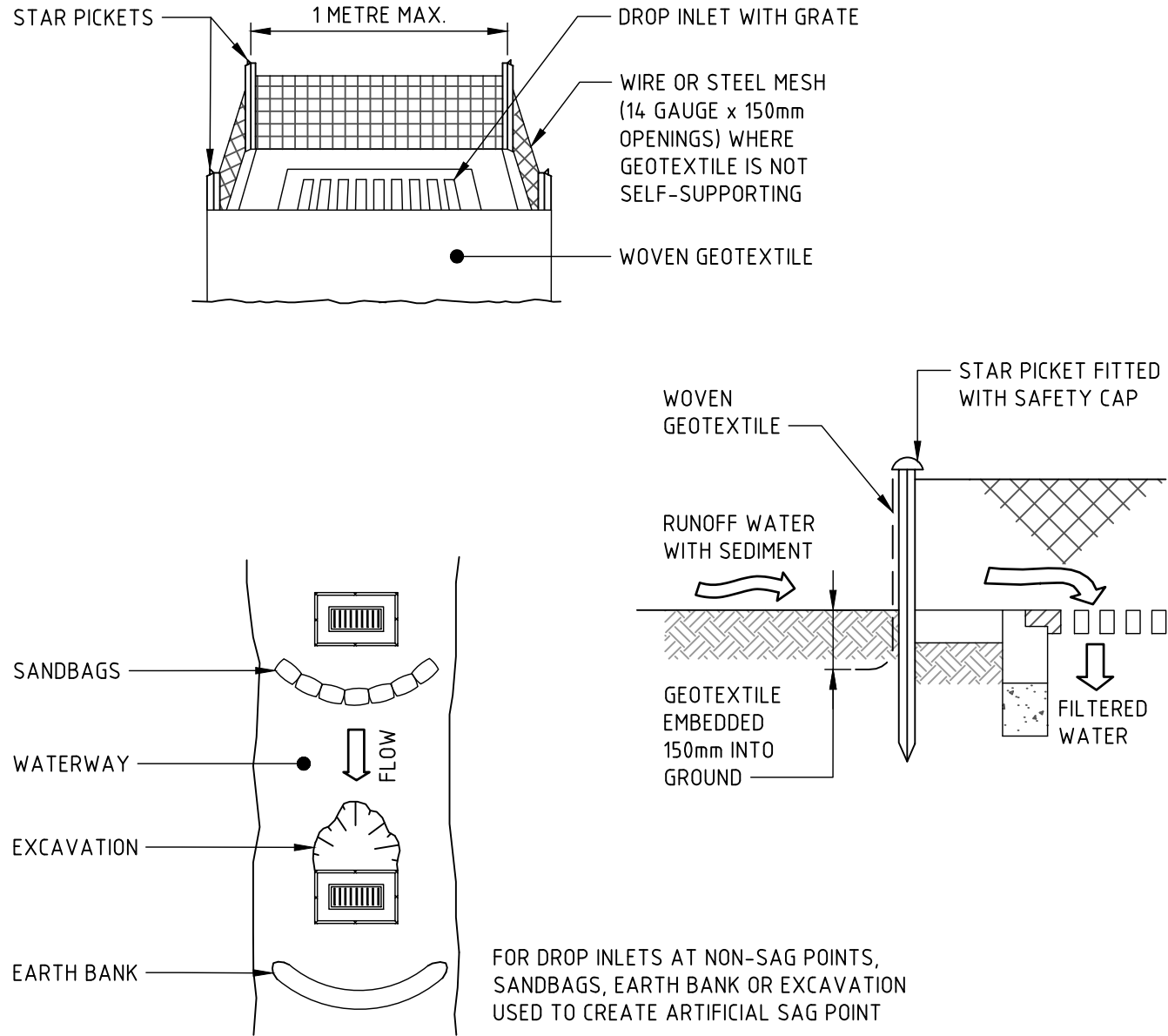
- CONSTRUCTION NOTES**
1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT 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. 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 150mm 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.




SANDBAG SEDIMENT FILTER (SD 6-11)



- CONSTRUCTION NOTES**
1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
  2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOTEXTILE. REDUCE THE PICKET SPACING TO 1 METRE CENTRES.
  3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
  4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER (SD 6-12)

NOT FOR CONSTRUCTION

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									SEDIMENT AND SOIL EROSION CONTROL DETAILS	DRAWING NUMBER
										REVISION
										C02.11
										1
										DRAWING SHEET SIZE = A1



DRAWN: A.MARGARIS  
DESIGNED: BLAVERENCE  
JOB MANAGER: BLAVERENCE  
VERIFIER:



**LEGEND**

- PROPOSED BOUNDARY LINE
- STORMWATER PIPE
- EXISTING STORMWATER NETWORK
- EXISTING STORMWATER NETWORK TO BE DEMOLISHED
- GRATED INLET PIT (NEW / EXTG)
- JUNCTION PIT (NEW / EXTG)
- EXISTING GRATED TRENCH DRAIN
- RW RW RAINWATER PIPE
- DP DP DOWNPIPE
- 1/A STORMWATER PIT TAG  
STRUCTURE No / LINE ID
- OUTDOOR LEARNING AREA
- OVERLAND FLOW

**NOTE**

1. INSTALL EVIROPD BASKET INSERT (200 MICRON) ON ALL GRATED SURFACE INLET PITS

**NOT FOR CONSTRUCTION**

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE	CLIENT
1	ISSUED FOR SECTION 4.55	AM		BL	06.06.19	

LORETO KIRRIBILLI  
CATHOLIC SCHOOL

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0 2 4 6 8 10m

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PROJECT

**LORETO KIRRIBILLI**

DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**STORMWATER DRAINAGE PLAN**

JOB NUMBER

**182476**

DRAWING NUMBER

**C05.01**

REVISION

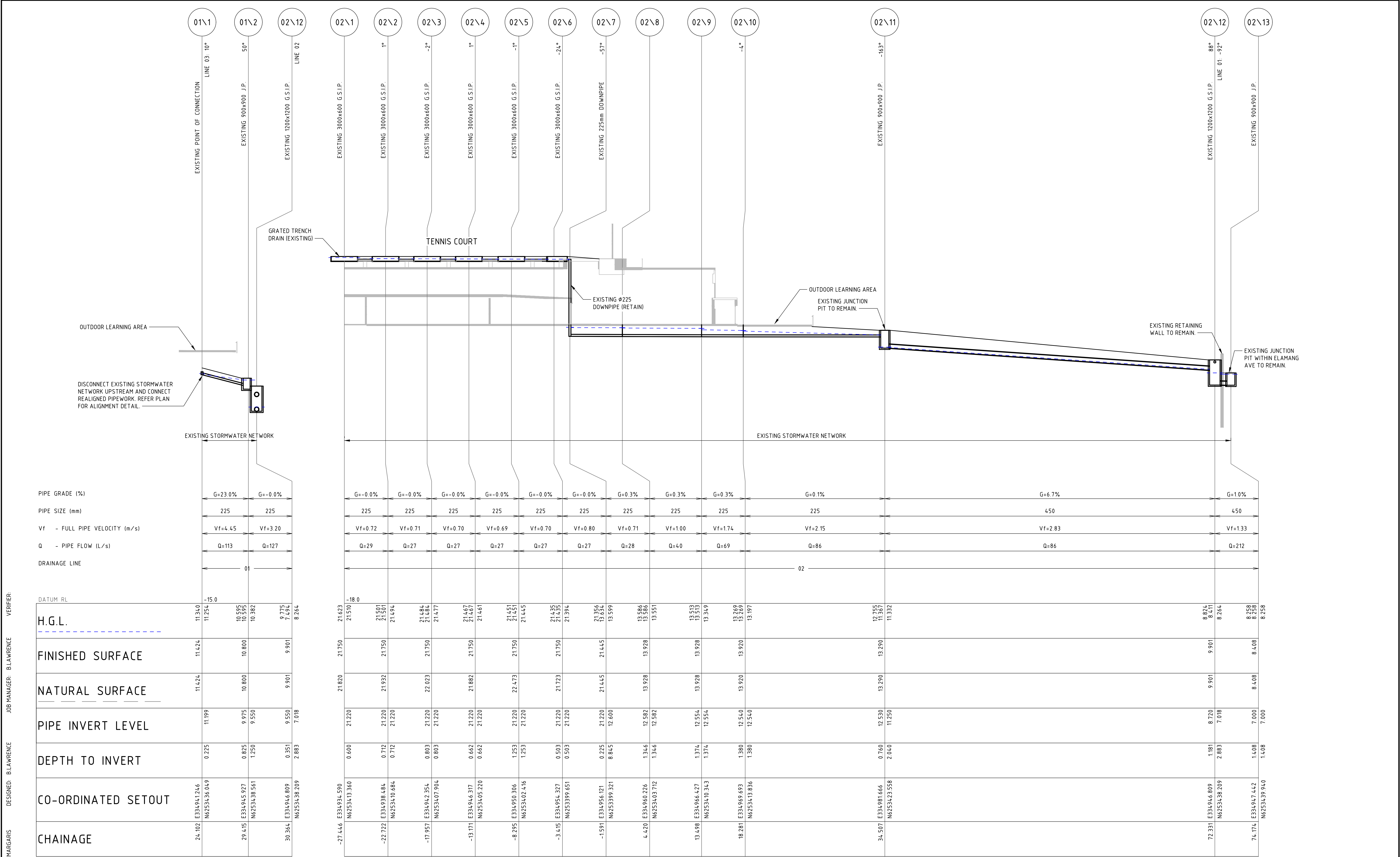
**1**

DRAWING SHEET SIZE = A1

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STORMWATER LONGITUDINAL SECTIONS

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PROJECT

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DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**STORMWATER LONGITUDINAL  
SECTIONS - SHEET 01**

JOB NUMBER

**182476**

DRAWING NUMBER

**C05.11**

REVISION

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DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**STORMWATER LONGITUDINAL  
SECTIONS - SHEET 02**

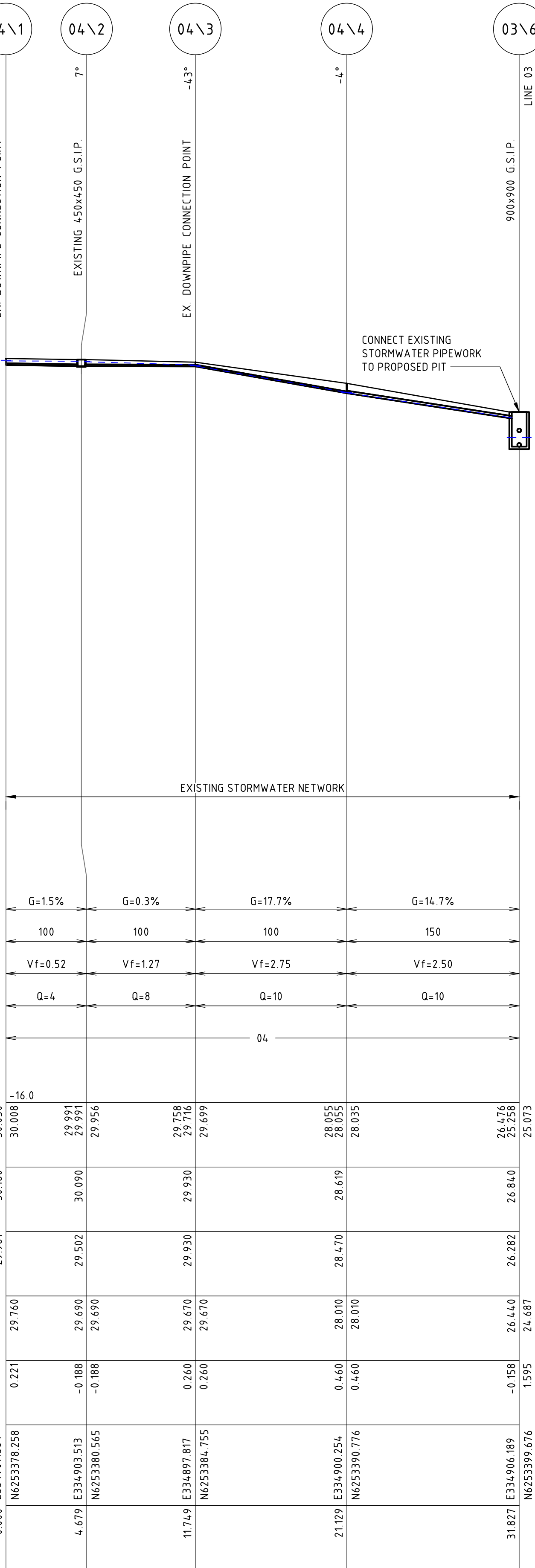
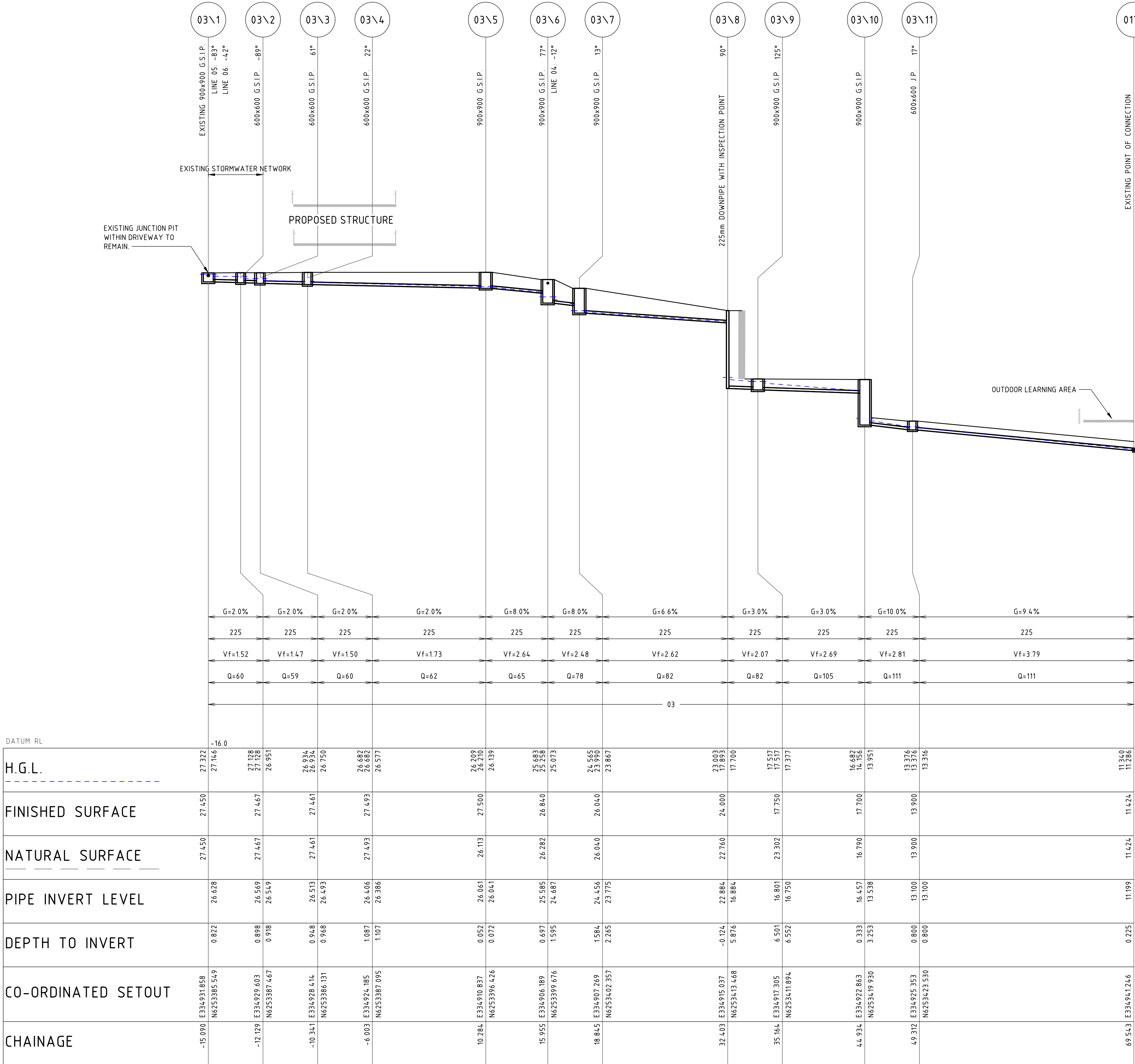
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**182476**

DRAWING NUMBER	REVISION
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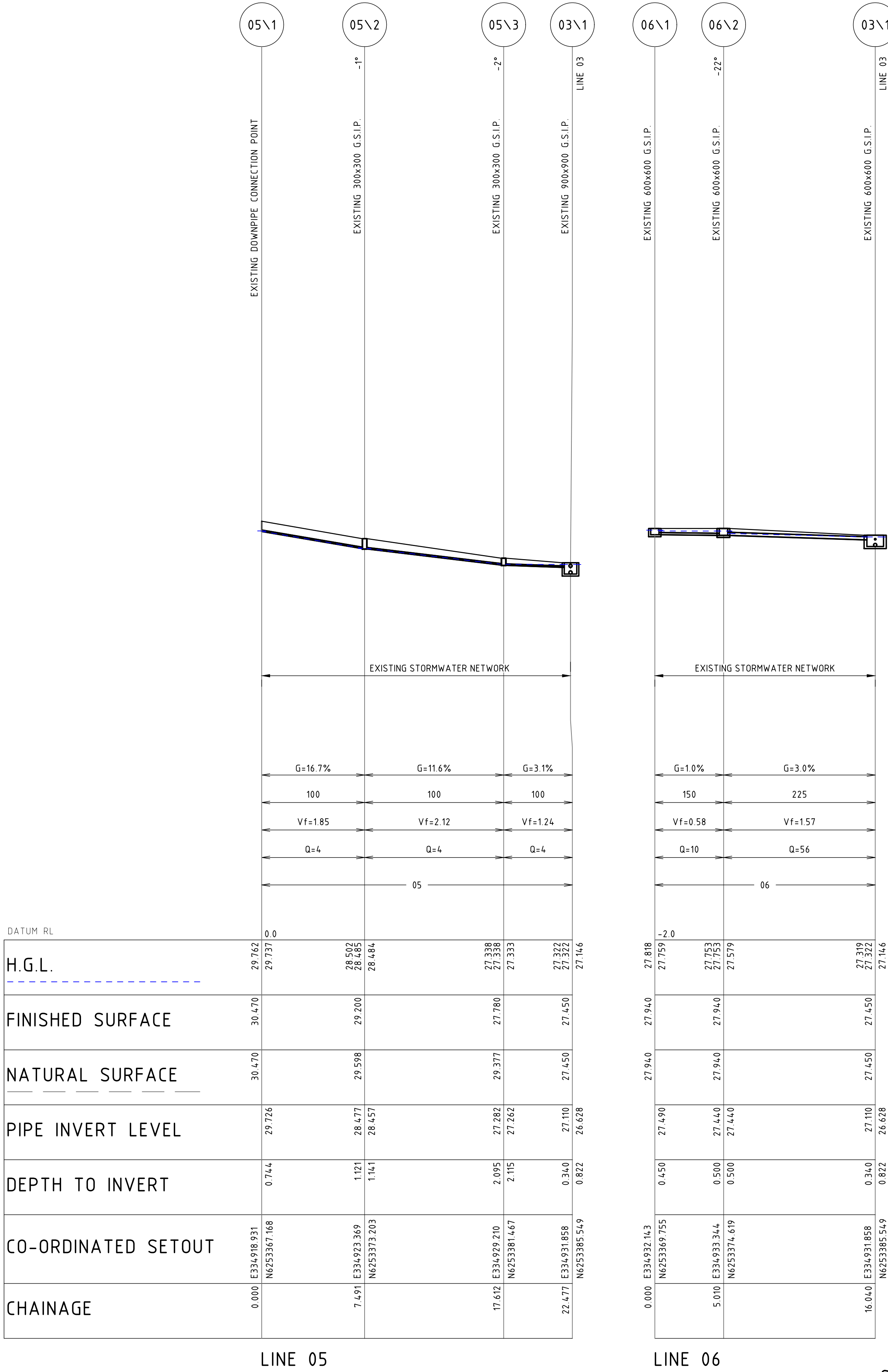
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STORMWATER LONGITUDINAL SECTIONS



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STORMWATER LONGITUDINAL SECTIONS

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**LORETO KIRRIBILLI**

DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**STORMWATER LONGITUDINAL  
SECTIONS - SHEET 03**

JOB NUMBER

**182476**

DRAWING NUMBER

**C05.13**

REVISION

**1**

DRAWING SHEET SIZE = A1



Pit					Pipe										Catchment				Catchment Set		Pit					Pipe								
Pit Name	Pit Type	Surface RL (m)	Major Event Inlet Capacity %	Minor Event Inlet Capacity %	Pipe Name	From	To	Pipe Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Pipe Type	Pipe Diameter (mm)	Pipe Roughness	Roughness Type	Catchment Name	Area (Ha)	Impervious Percentage (%)	Pervious Percentage (%)	Impervious Tc (min)	Pervious Tc (min)	Pit Name	Approach Flow (m3/s)	Captured Flow (m3/s)	Bypass Flow (m3/s)	Max HGL (m)	Ponding Depth (m)	Pit Freeboard (m)	Pipe Name	Max Flow (m3/s)	Max Velocity (m/s)	Max U/S HGL (m)	MAX D/S HGL (m)	Critical Storm (min)
01\1	EX. POINT OF CONNECTION	11.424	80	100	01\1 to 01\2	01\1	01\2	5.312	11.199	9.975	23.04	UPVC	225	0.01	Manning	01\1		0	0			01\1	0	0		11.34	0	0.097	01\1 to 01\2	0.113	4.45	11.254	10.595	25
01\2	EX. 900x900 J.P.	10.8	80	100	01\2 to 02\11	01\2	02\12	0.949	9.55	9.55	0	UPVC	225	0.01	Manning	01\2	0.042	100	0	5	10	01\2	0.018	0.018		10.595	0	0.679	01\2 to 02\11	0.127	3.2	10.382	9.775	10
02\12	EX. 1200x1200 G.S.I.P.	9.901														02\12						02\12												
02\1	EX. 3000x600 G.S.I.P.	21.75	50	100	02\1 to 02\2	02\1	02\2	4.725	21.22	21.22	0	UPVC	225	0.01	Manning	02\1	0.067	100	0	5	10	02\1	0.029	0.029		21.623	0	0.274	02\1 to 02\2	0.029	0.72	21.51	21.501	15
02\2	EX. 3000x600 G.S.I.P.	21.75	50	100	02\2 to 02\3	02\2	02\3	4.765	21.22	21.22	0	UPVC	225	0.01	Manning	02\2		0	0			02\2	0	0		21.501	0	0.344	02\2 to 02\3	0.027	0.71	21.494	21.484	10
02\3	EX. 3000x600 G.S.I.P.	21.75	50	100	02\3 to 02\4	02\3	02\4	4.786	21.22	21.22	0	UPVC	225	0.01	Manning	02\3		0	0			02\3	0	0		21.484	0	0.35	02\3 to 02\4	0.027	0.7	21.477	21.467	10
02\4	EX. 3000x600 G.S.I.P.	21.75	50	100	02\4 to 02\5	02\4	02\5	4.876	21.22	21.22	0	UPVC	225	0.01	Manning	02\4		0	0			02\4	0	0		21.467	0	0.358	02\4 to 02\5	0.027	0.69	21.461	21.451	10
02\5	EX. 3000x600 G.S.I.P.	21.75	50	100	02\5 to 02\6	02\5	02\6	4.88	21.22	21.22	0	UPVC	225	0.01	Manning	02\5		0	0			02\5	0	0		21.451	0	0.366	02\5 to 02\6	0.027	0.7	21.445	21.435	10
02\6	EX. 3000x600 G.S.I.P.	21.75	50	100	02\6 to 02\7	02\6	02\7	1.824	21.22	21.22	0	UPVC	225	0.01	Manning	02\6		0	0			02\6	0	0		21.435	0	0.376	02\6 to 02\7	0.027	0.8	21.394	21.356	10
02\7	EX. 225mm DOWNPIPE	21.445	80	100	02\7 to 02\8	02\7	02\8	6.011	12.6	12.582	0.302	UPVC	225	0.01	Manning	02\7		0	0			02\7	0	0		13.634	0	8.383	02\7 to 02\8	0.028	0.71	13.599	13.586	10
02\8	N/A	13.928	80	100	02\8 to 02\9	02\8	02\9	9.078	12.582	12.554	0.302	UPVC	225	0.01	Manning	02\8	0.028	100	0	5	10	02\8	0.012	0.012		13.586	0	0.885	02\8 to 02\9	0.04	1	13.551	13.513	10
02\9	N/A	13.928	80	100	02\9 to 02\10	02\9	02\10	4.783	12.554	12.54	0.302	UPVC	225	0.01	Manning	02\9	0.081	100	0	5	10	02\9	0.036	0.036		13.513	0	0.913	02\9 to 02\10	0.069	1.74	13.349	13.269	10
02\10	N/A	13.92	80	100	02\10 to 02\11	02\10	02\11	16.226	12.54	12.53	0.062	UPVC	225	0.01	Manning	02\10	0.043	100	0	5	10	02\10	0.019	0.019		13.269	0	1.003	02\10 to 02\11	0.086	2.15	13.197	12.755	10
02\11	EX. 900x900 J.P.	13.29	80	100	02\11 to 02\12	02\11	02\12	37.824	11.25	8.72	6.689	RRJ2	450	0.013	Manning	02\11		0	0			02\11	0	0		11.367	0	1.954	02\11 to 02\12	0.086	2.83	11.332	8.824	10
02\12	EX. 1200x1200 G.S.I.P.	9.901	80	100	02\12 to 02\13	02\12	02\13	1.843	7.018	7	1	RRJ2	450	0.01	Manning	02\12		0	0			02\12	0	0		8.411	0	1.576	02\12 to 02\13	0.212	1.33	8.264	8.258	10
02\13	EX. 900x900 J.P.	8.408														02\13						02\13	0	0		8.258	0							
03\1	EX. 900x900 G.S.I.P.	27.45	50	100	03\1 to 03\2	03\1	03\2	2.961	26.628	26.569	1.999	UPVC	225	0.01	Manning	03\1	0.012	100	0	5	10	03\1	0.005	0.005		27.322	0	0.565	03\1 to 03\2	0.06	1.52	27.146	27.128	15
03\2	600x600 G.S.I.P.	27.467	50	100	03\2 to 03\3	03\2	03\3	1.788	26.549	26.513	2.002	UPVC	225	0.01	Manning	03\2		0	0			03\2	0	0		27.128	0	0.67	03\2 to 03\3	0.059	1.47	26.951	26.934	15
03\3	600x600 G.S.I.P.	27.461	50	100	03\3 to 03\4	03\3	03\4	4.337	26.493	26.406	1.999	UPVC	225	0.01	Manning	03\3	0.005	100	0	5	10	03\3	0.002	0.002		26.934	0	0.757	03\3 to 03\4	0.066	1.5	26.75	26.682	15
03\4	600x600 G.S.I.P.	27.493	50	100	03\4 to 03\5	03\4	03\5	16.287	26.386	26.061	2	UPVC	225	0.01	Manning	03\4	0.005	100	0	5	10	03\4	0.002	0.002		26.682	0	0.96	03\4 to 03\5	0.062	1.73	26.577	26.209	15
03\5	900x900 G.S.I.P.	27.5	50	100	03\5 to 03\6	03\5	03\6	5.671	26.041	25.585	8.028	UPVC	225	0.01	Manning	03\5	0.009	100	0	5	10	03\5	0.004	0.004		26.21	0	1.353	03\5 to 03\6	0.065	2.64	26.139	25.683	15
03\6	900x900 G.S.I.P.	26.84	50	100	03\6 to 03\7	03\6	03\7	2.89	24.687	24.456	8	UPVC	225	0.01	Manning	03\6	0.012	100	0	5	10	03\6	0.005	0.005		25.258	0	1.873	03\6 to 03\7	0.078	2.48	25.073	24.565	10
03\7	900x900 G.S.I.P.	26.04	50	100	03\7 to 03\8	03\7	03\8	13.558	23.775	22.884	6.571	UPVC	225	0.01	Manning	03\7	0.009	100	0	5	10	03\7	0.004	0.004		23.99	0	2.132	03\7 to 03\8	0.082	2.62	23.867	23.003	15
03\8	225mm DOWNPIPE	24	80	100	03\8 to 03\9	03\8	03\9	2.761	16.884	16.801	3	UPVC	225	0.01	Manning	03\8		0	0			03\8	0	0		17.893	0	6.769	03\8 to 03\9	0.082	2.07	17.7	17.517	10
03\9	900x900 G.S.I.P.	17.75	50	100	03\9 to 03\10	03\9	03\10	9.77	16.75	16.457	3	UPVC	225	0.01	Manning	03\9	0.062	100	0	5	10	03\9	0.027	0.027		17.517	0	0.678	03\9 to 03\10	0.105	2.69	17.377	16.682	10
03\10	900x900 G.S.I.P.	17.7	50	100	03\10 to 03\11	03\10	03\11	4.378	13.538	13.1	10	UPVC	225	0.01	Manning	03\10	0.019	100	0	5	10	03\10	0.008	0.008		14.156	0	3.916	03\10 to 03\11	0.111	2.81	13.951	13.376	10
03\11	600x600 J.P.	13.9	50	100	03\11 to 01\1	03\11	01\1	20.231	13.1	11.199	9.396	UPVC	225	0.01	Manning	03\11		0	0			03\11	0	0		13.376	0	0.667	03\11 to 01\1	0.111	3.79	13.316	11.34	10
01\1	EX. POINT OF CONNECTION	11.424														01\1						01\1												
04\1	EX. DOWNPIPE CONNECTION POINT	30.16	80	100	04\1 to 04\2	04\1	04\2	4.679	29.76	29.69	1.496	UPVC	100	0.01	Manning	04\1	0.011	100	0	5	10	04\1	0.005	0.005		30.05	0	0.289	04\1 to 04\2	0.004	0.52	30.008	29.991	10
04\2	EX. 450x450 G.S.I.P.	30.09	50	100	04\2 to 04\3	04\2	04\3	7.07	29.69	29.67	0.283	UPVC	100	0.01	Manning	04\2	0.01	100	0	5	10	04\2	0.004	0.004		29.991	0	0.262	04\2 to 04\3	0.008	1.27	29.956	29.758	10
04\3	EX. DOWNPIPE CONNECTION POINT	29.93	80	100	04\3 to 04\4	04\3	04\4	9.38	29.67	28.01	17.697	UPVC	100	0.01	Manning	04\3	0.004	100	0	5	10	04\3	0.002	0.002		29.716	0	0.226	04\3 to 04\4	0.01	2.75	29.699	28.055	15
04\4	N/A	28.619	80	100	04\4 to 03\6	04\4	03\6	10.697	28.01	26.44	14.677	UPVC	150	0.01	Manning	04\4		0	0			04\4	0	0		28.055	0	0.577	04\4 to 03\6	0.01	2.5	28.035	26.476	15
03\6	900x900 G.S.I.P.	26.84														03\6						03\6												
05\1	EX. DOWNPIPE CONNECTION POINT	30.47	80	100	05\1 to 05\2	05\1	05\2	7.491	29.726	28.477	16.667	UPVC	100	0.01	Manning	05\1	0.009	100	0	5	10	05\1	0.004	0.004		29.762	0	0.718	05\1 to 05\2	0.004	1.85	29.737	28.502	10
05\2	EX. 300x300 G.S.I.P																																	



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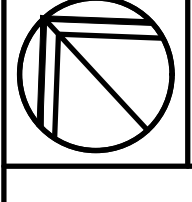
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CATHOLIC PRIMARY SCHOOL

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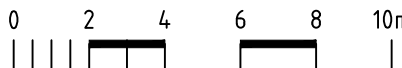


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PROJECT

**LORETO KIRRIBILLI**

DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**CATCHMENT PLAN**

JOB NUMBER

**182476**

DRAWING NUMBER

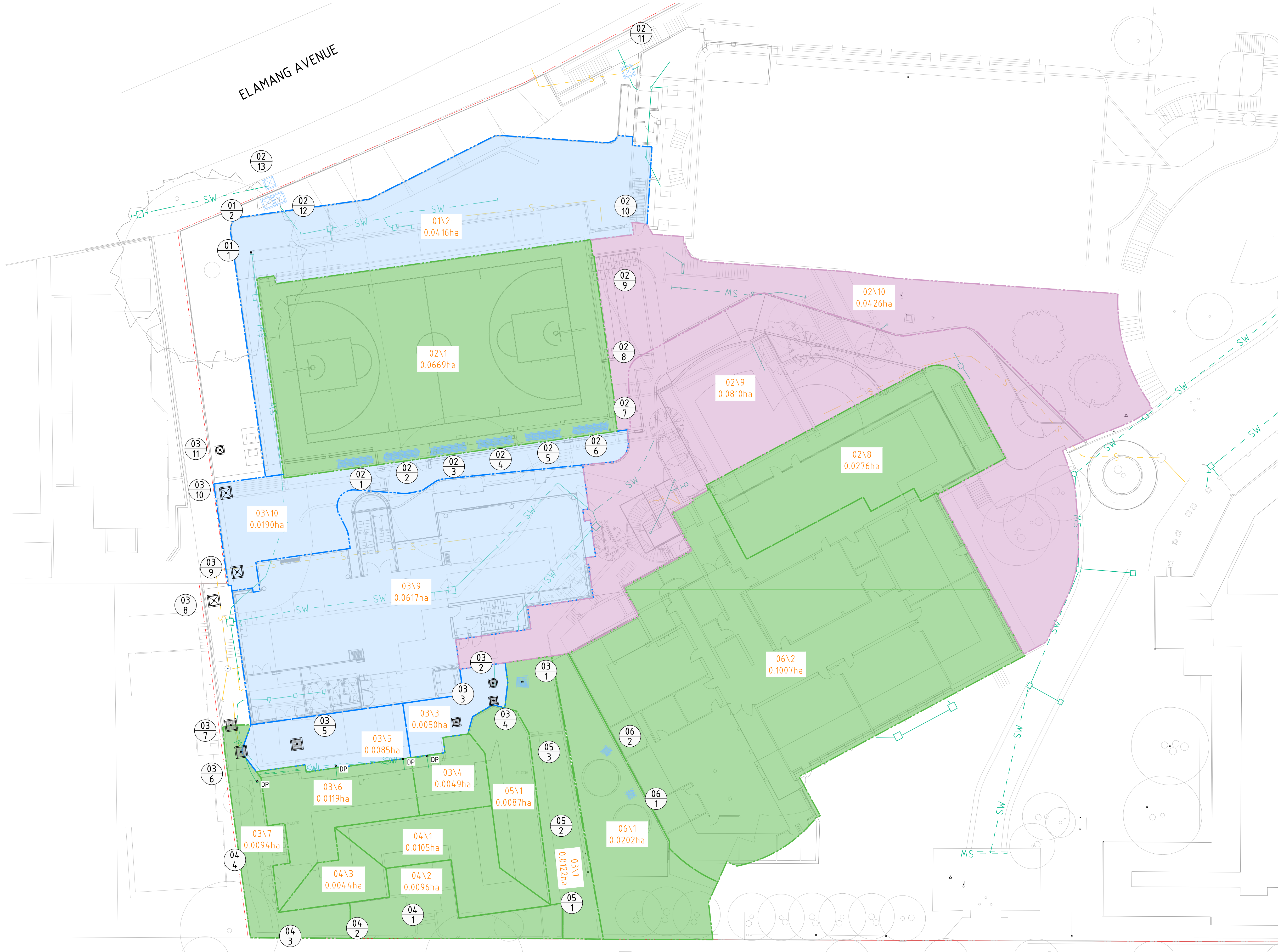
**C06.01**

REVISION

**1**

DRAWING SHEET SIZE = A1

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LEGEND

- PROPOSED BOUNDARY LINE
- GRATED INLET PIT (NEW / EXTG)
- JUNCTION PIT (NEW / EXTG)
- EXISTING GRATED TRENCH DRAIN
- DOWNPIPE
- STORMWATER PIT TAG  
STRUCTURE No / LINE ID
- PROPOSED CATCHMENT BOUNDARY
- RECONFIGURED CATCHMENT  
(MODIFIED TO SUIT REVISED FACADE  
- REFER HYDRAULIC ENGINEERS  
DOCUMENTATION)
- EXISTING CATCHMENT BOUNDARY
- PIT NUMBER / CATCHMENT AREA

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Date: 15.02.2019 11:24 AM



DRAWN: A.MARGARIS    DESIGNED: B.LAWRENCE    JOB MANAGER: B.LAWRENCE    VERIFIER:



LEGEND	
<div></div>	ROOF AREA (IMPERVIOUS)
<div></div>	PAVEMENT AREA (IMPERVIOUS)
<div></div>	LANDSCAPED AREA (PERVIOUS)

SITE IMPERVIOUSNESS		
SURFACE TYPE	APPROVED	S4.55 (PROPOSED)
IMPERVIOUS	80.30%	77.20%
PERVIOUS	19.70%	22.80%

NOTE:  
<sup>1</sup>REFER TO HENRY & HYMAS STORMWATER MANAGEMENT PLAN (REV 2 AUG. 2017)

PROPOSED SCHEME - S4.55(2)

NOT FOR CONSTRUCTION


REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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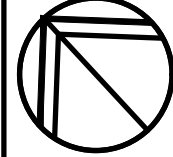
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SCHOOL  
CATHOLIC EDUCATION  
SCHOOL

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PROJECT

LORETO KIRRIBILLI

DRAWING TITLE

CIVIL ENGINEERING PACKAGE

SITE IMPERVIOUSNESS

JOB NUMBER

182476

DRAWING NUMBER

C07.01

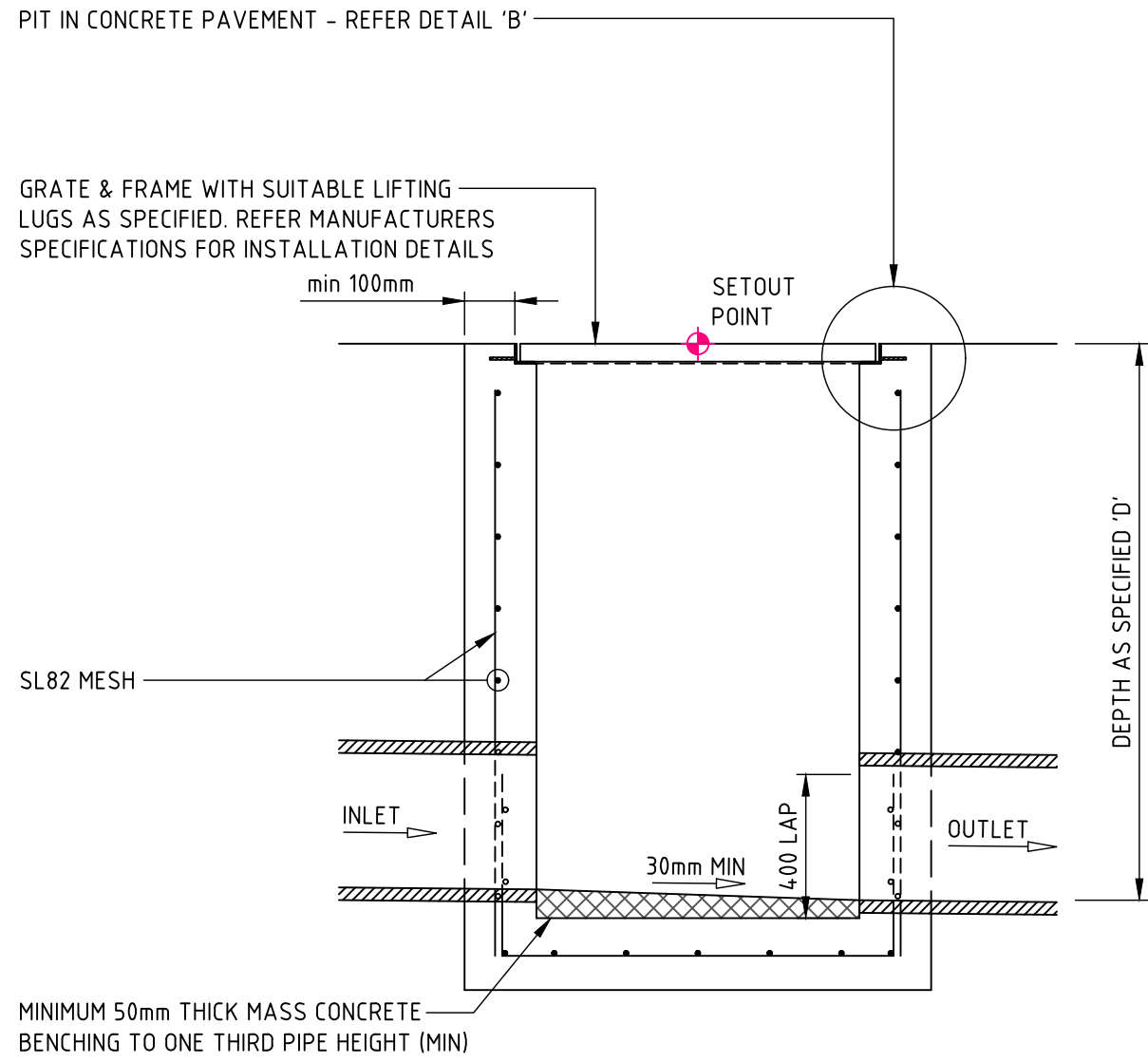
REVISION

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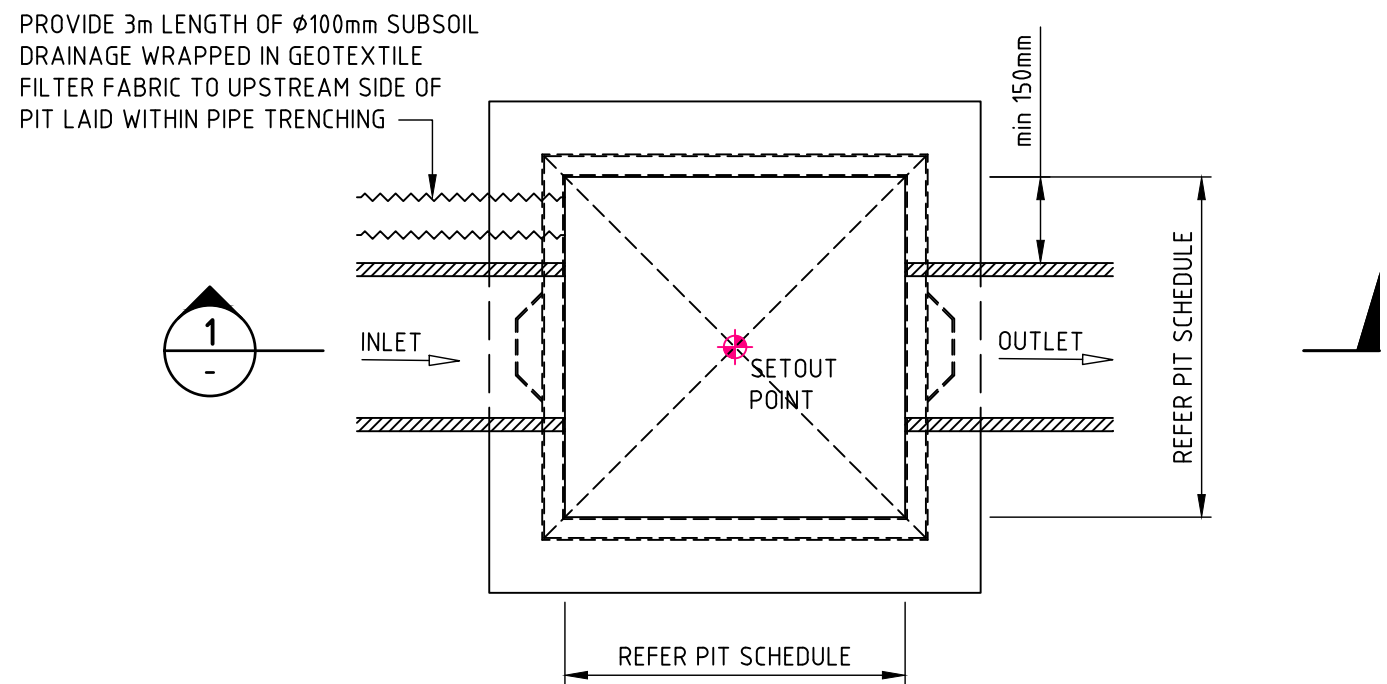
DRAWING SHEET SIZE = A1



Drawn: A.MARGARIS  
Designed: BLAWRENCE  
Job Manager: BLAWRENCE  
Verifier:

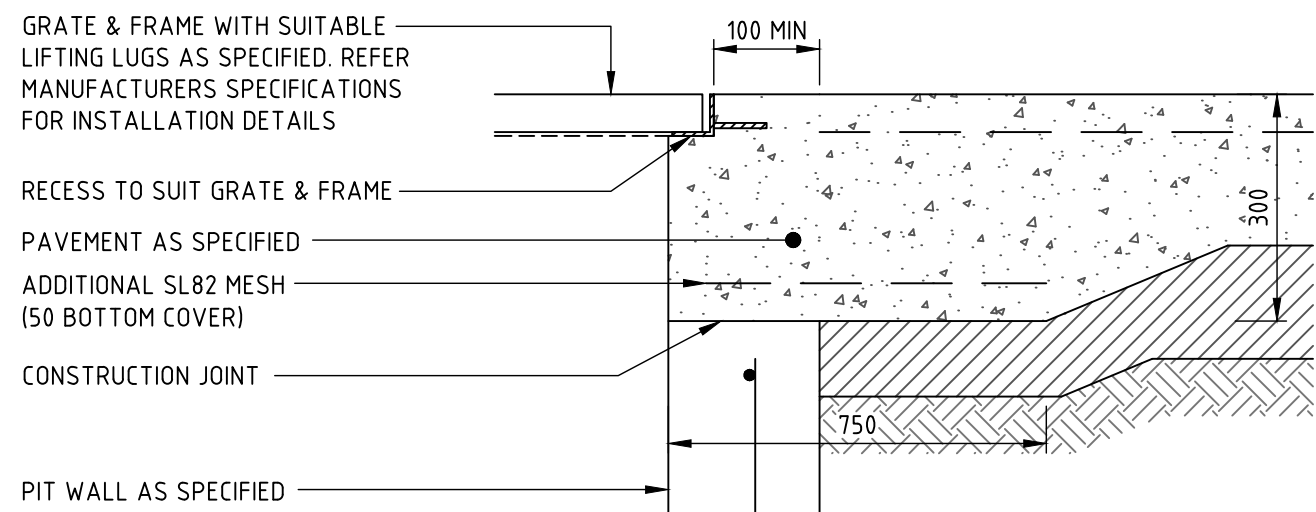


SECTION 1

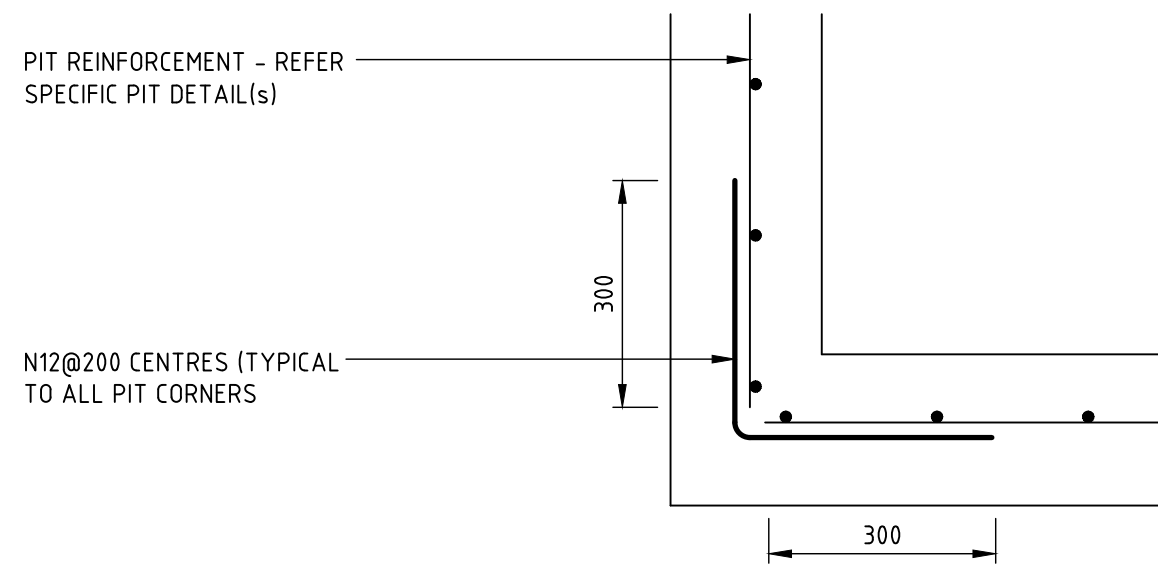


PLAN  
SURFACE INLET 'SIP' / JUNCTION PIT 'JP'

PIT STRUCTURE TO BE 200mm THICK UNLESS SHOWN OTHERWISE. DRILL AND EPOXY PLASTIC PROPRIETARY STEP IRONS IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND MANUFACTURERS SPECIFICATIONS (PITS + 1000mm DEPTH).  
REFER PIT INTERFACE DETAIL 'F' FOR CORNER REINFORCEMENT



PIT INTERFACE - DETAIL 'B'




PIT INTERFACE (PLAN VIEW)- DETAIL 'F'

APPLICABLE TO ALL STORMWATER DRAINAGE STRUCTURES

NOT FOR CONSTRUCTION


REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	ISSUED FOR SECTION 4.55	AM		BL	06.06.19




LORETO KIRRIBILLI  
SCHOOL OF THE SACRED HEART

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PROJECT

**LORETO KIRRIBILLI**

DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**DETAILS**

JOB NUMBER <b>182476</b>	
DRAWING NUMBER <b>C09.01</b>	REVISION <b>1</b>
DRAWING SHEET SIZE = A1	