

***INFRASTRUCTURE MANAGEMENT PLAN for  
University of Sydney - Darlington Terraces Mixed Use  
Building Additions and Alterations to the Darlington Road  
Terraces and Public Domain Improvements***

***University of Sydney, Darlington Road, Darlington, 2008***

***Project No 1508-0019***

***Issue D***

***Date 18<sup>th</sup> November 2016***

***Prepared For***

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Camperdown NSW 2006

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A	1/6/16	Issue for Client Review	MA	MA
B	1/7/16	Updated	MA	MA
C	13/9/16	QA	MA	MA
D	18/11/16	Updated	MA	MA

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# University of Sydney - Darlington Terraces Mixed Use Development

## Infrastructure Management Report

1<sup>st</sup> June 2016

### Introduction

The following documents have been referenced in the formulation of this Infrastructure Management Plan.

1. Architectural Drawings prepared by AJ+C, August 2016.
2. The University of Sydney Design Standards.
3. The University of Sydney – ICT marked up drawings “ICT infrastructure for the site”

Generally the University owned terraces dwellings are being refurbished and new three to four storey buildings are being provided on the land between the terraces and Darlington Lane for student accommodation and education facilities. There are 38 terraces; 86 and 87, 94 to 96, 98 to 119 and 121 to 131 and these are already used for student accommodation. It is proposed that the accommodation will provide for 337 beds.

Infrastructure services required for the development include:

- Electrical
- Communications
- Water Supply
- Sanitary Drainage
- Stormwater Drainage
- Gas Supply

and is being provided from Authorities’ mains located in Darlington Road and Darlington Lane.

### Existing Services

All existing services affected by the construction of the Darlington Road Terraces Mixed Use Development will be:

- Capped, sealed and removed, if redundant; or
- Isolated and relocated if the service is to be retained.

All works associated with the capping, diverting or connecting to the existing Authorities’ services infrastructure is to be co-ordinated with the Authorities and Campus Infrastructure Services (CIS) prior to any works being carried out.

The following drawing shows the proposed site and location of authorities’ services.



# Electrical

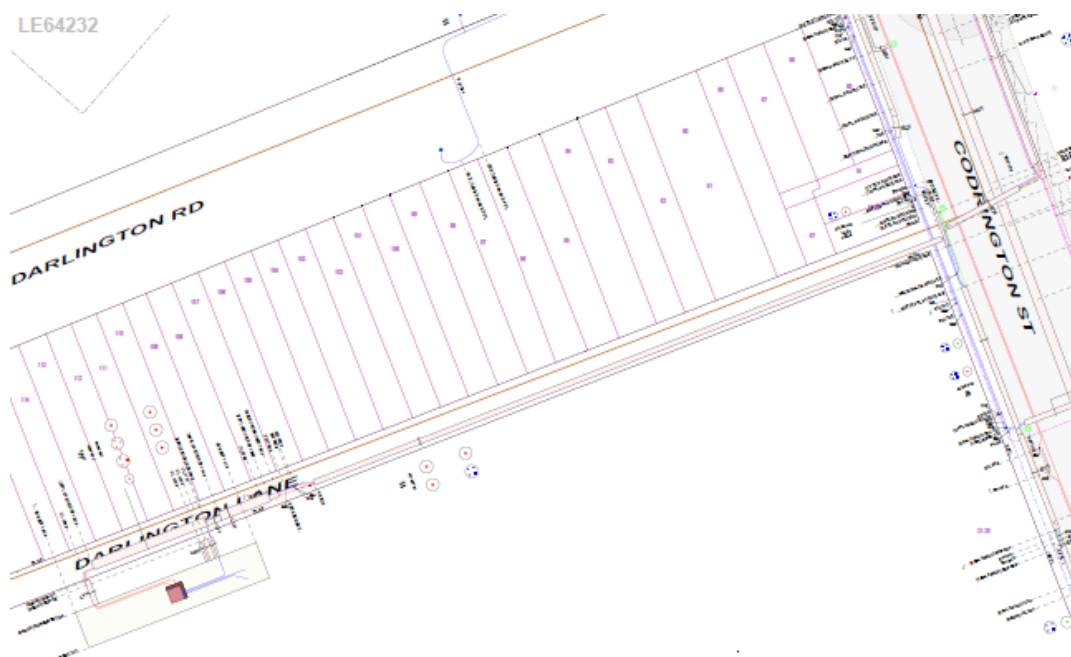
## Electrical Infrastructure

A preliminary maximum demand has been calculated and an Application for Connection has been lodged with Ausgrid. As the development comprises 4 separate lots the Application has indicated to Ausgrid the preference to obtain 3 new supplies from Substation No. S62254 located in Darlington Lane along with upgrade of/modifications to the existing aerial supplies to Terrace No's. 86 & 87 on Darlington Road. The 3 No. new supplies, designed by a separate ASP3, would reticulate in underground conduits along Darlington Lane, co-ordinated with other inground services to each new Building as follows:

- To a main switchboard in Building A. This will in turn support the refurbished Terraces No's. 121 to 131 on Darlington Road;
- To a main switchboard in Building B. This will in turn support a main distribution board in Building C and the refurbished Terraces No's. 98 to 119 on Darlington Road;
- To a main switchboard in Building D. This will in turn support the refurbished Terraces No's. 94 to 96 on Darlington Road.
- A new street lighting circuit will also feed a newly proposed Darlington Lane lighting layout.

The Darlington Road Terraces will be serviced from the respective Building main switchboard or main distribution board via underground conduits. The location of these conduits will be co-ordinated with other in ground services and landscaping, with final reticulation to the final distribution board for each Terrace via the Terrace sub floor void.

The ASP3 design includes the removal of all consumer main cables to the existing Darlington terraces.



# Communications

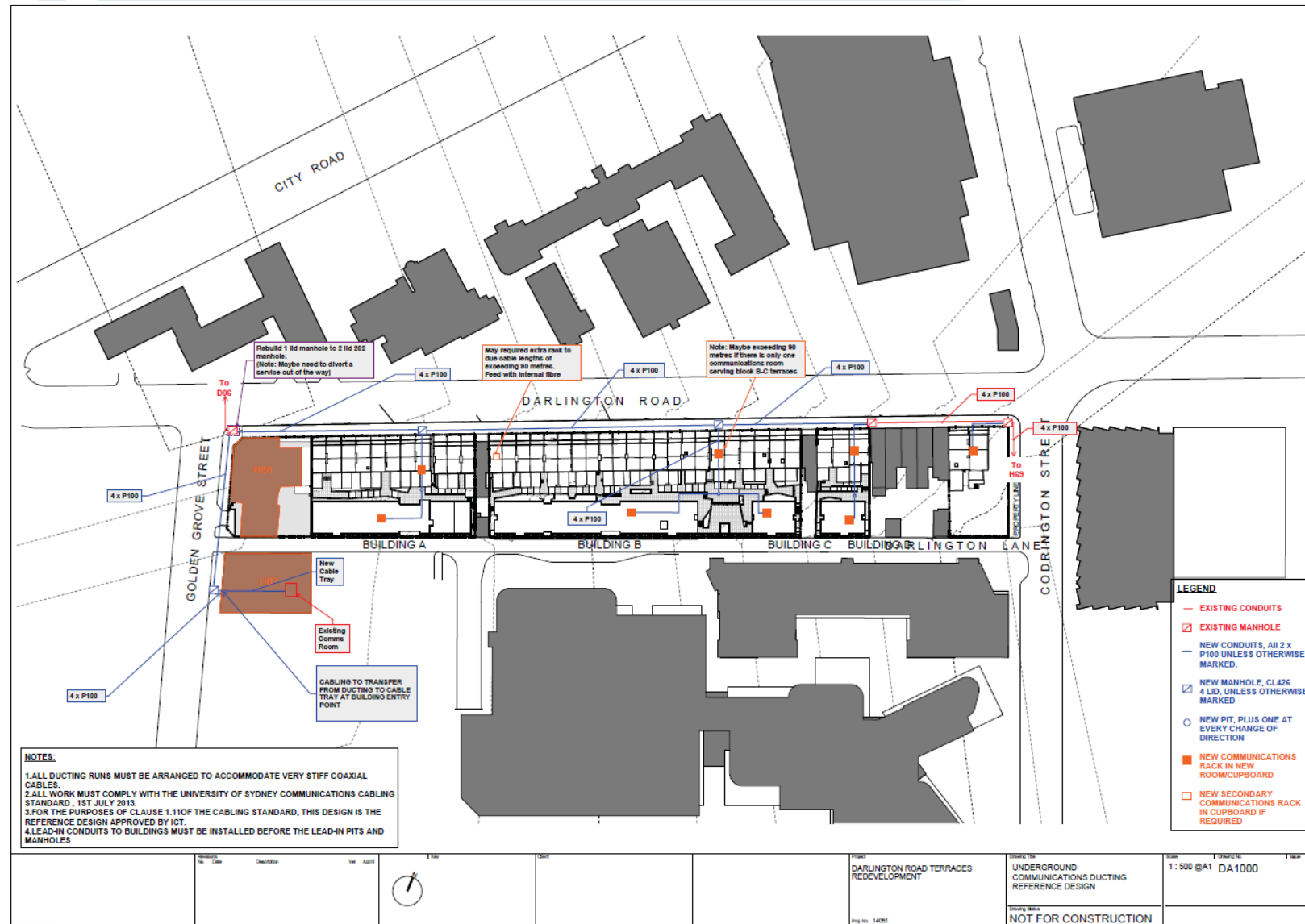
## Communications Infrastructure

Telecommunication lead-in provisions to each Lot will service the development from an upgraded/extended Telstra underground infrastructure located on Darlington Road.

Pits at strategic locations will service Campus Distributors located as follows:

- Refurbished Terrace No. 87, which will in turn support the refurbished Terrace No. 86.
- Refurbished Terrace No. 94, which will in turn support the refurbished Terrace No's. 95 & 96 along with Building D via its own Building Distributor.
- Refurbished Terrace No. 103, which will in turn support the refurbished Terrace No's. 98 to 102, 103 to 119 and Buildings B & C via their own respective Building Distributor.
- Refurbished Terrace No. 124, which will in turn support the refurbished Terrace No's. 121 to 123, 125 to 131 and Building A via its own Building Distributor.

The Building Distributor in Buildings A, B, C and D will be serviced from the respective Campus Distributor by underground conduits. The location of these conduits will be co-ordinated with other in ground services and landscaping reticulating via the Terrace sub floor void.

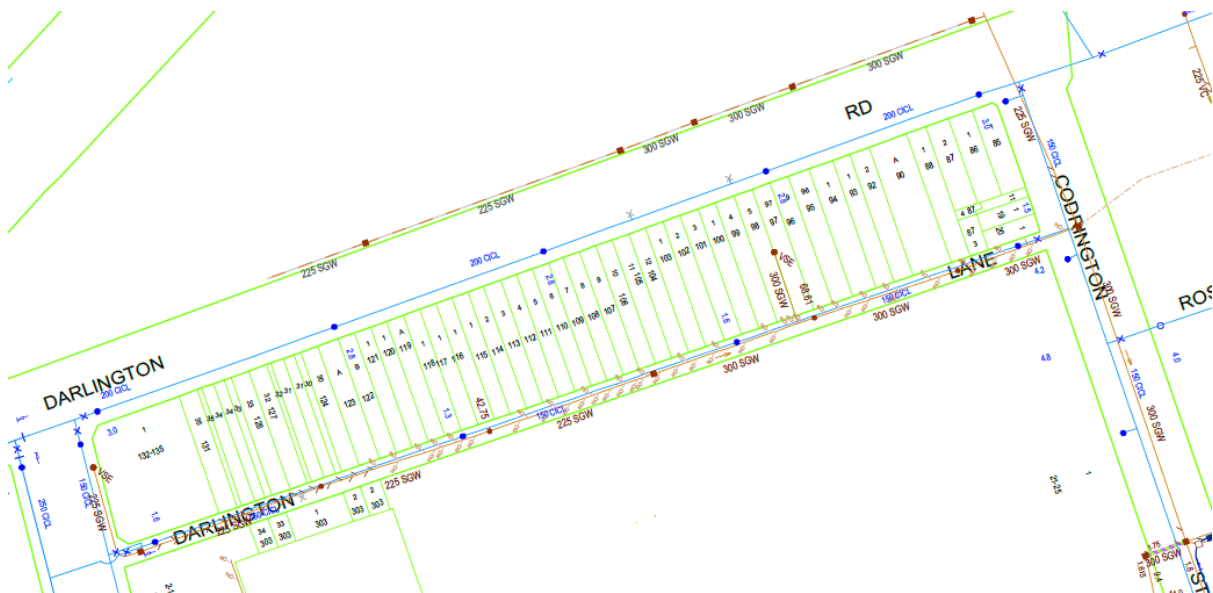


# Hydraulics

## Hydraulic Infrastructure

Figure below indicates the approximate location of the water and sewerage mains available serving the Development in Darlington Road and Lane.

We note that the report incorporating the water and sanitary requirements for the Development; 4596001\_University of Sydney – Sewer & Water Masterplan\_Rev A prepared by Warren Smith & Partners Pty Limited, dated 12<sup>th</sup> August 2015, was submitted to Sydney Water Corporation for approval. To date Sydney Water Corporation has not responded formally to the submission.



## Water

The calculated Probable Simultaneous Flow (PSF) for the domestic cold water supply to the proposed Development including the terraces has been calculated at 22.0 L/sec. The domestic cold water will be supplied via the 150mm diameter water main located in Darlington Lane. A water meter incorporating backflow prevention provisions will be supplied to each lot.

The Calculated simultaneous demand for Building A site is approximately 7 L/sec.  
 The Calculated simultaneous demand for Building B site is approximately 12.5 L/sec.  
 The Calculated simultaneous demand for Building C site is approximately 1.75 L/sec.  
 The Calculated simultaneous demand for Building D site is approximately 1.7 L/sec.

The attached water pressure flow statement from Sydney Water shows that the water main is capable of providing in excess of 50 litres/second at minimal pressure loss.

A separate 150mm connection from the existing 150mm diameter water main located in Darlington Lane will be extended to serve the hydrant and sprinkler Fire Services within each



lot and will incorporate a combined fire hydrant / sprinkler booster assembly and hydrant feed. A combined flow of 40 litres/second is estimated. The attached water pressure flow statement from Sydney Water shows that the water main is capable of providing the required flow for fire fighting requirements.

## Statement of Available Pressure and Flow



Zoe Wu  
25 Atchison Street  
St Leonards, 2065

Date: 20/04/2016

Pressure & Flow Application Number: 51340  
Your Pressure Inquiry Dated: Fri, Apr 1, '16  
Property Address: 95 Darlington Rd, Darlington 2008

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: Darlington Lane	Side of Street: North
Distance & Direction from Nearest Cross Street	65 metres West from Codrington Street
Approximate Ground Level (AHD):	33 metres
Nominal Size of Water Main (DN):	150 mm

### EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	42 metre head
Minimum Pressure	37 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	37
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	38
	10	38
	15	37
	20	36
	26	35
	30	34
	40	31
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	50	28
	5	37
	10	36
	15	36
	20	35
	26	34
	30	33
Maximum Permissible Flow	40	30
	50	26
	52	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)

## Sewer Drainage

The anticipated sewer Fixture Loading Units of the proposed development has been calculated at 770 Fixture Loading Units. The proposed development, including the terraces, will be served via the existing 225mm/300mm diameter Sydney Water SGW sewer main.

The calculated Fixture Unit loading from Building A site is approximately 310 FU.  
The calculated Fixture Unit loading from Building B site is approximately 340 FU.  
The calculated Fixture Unit loading from Building C site is approximately 90 FU.  
The calculated Fixture Unit loading from Building D site is approximately 30 FU.

The receiving capacity of the existing sewer main is in excess of 4500 fixture units and accordingly has sufficient capacity to serve the Development.

Grease arrestors are proposed for each for Buildings A and B to receive discharges from the Student Communal food preparation areas in those lots.

All buildings will connect into the main sewer drainage system via gravity.

All connection points and final construction invert levels will be determined during detail design phase of the project.

## Stormwater, Roofwater and Rainwater Re-use

The roof water from Building A and Building B sites will be collected/ conveyed and discharged into rainwater harvesting tanks serving Building A and Building B. The existing terrace roofs facing Darlington Road will continue to discharge to the kerb at Darlington Road as they currently drain. Overflow from the roofwater tanks and ground surface water will discharge by gravity to the Onsite Detention Tanks for each lot as required by Sydney Water and discharged to the new stormwater drainage main extension located in Darlington Lane.

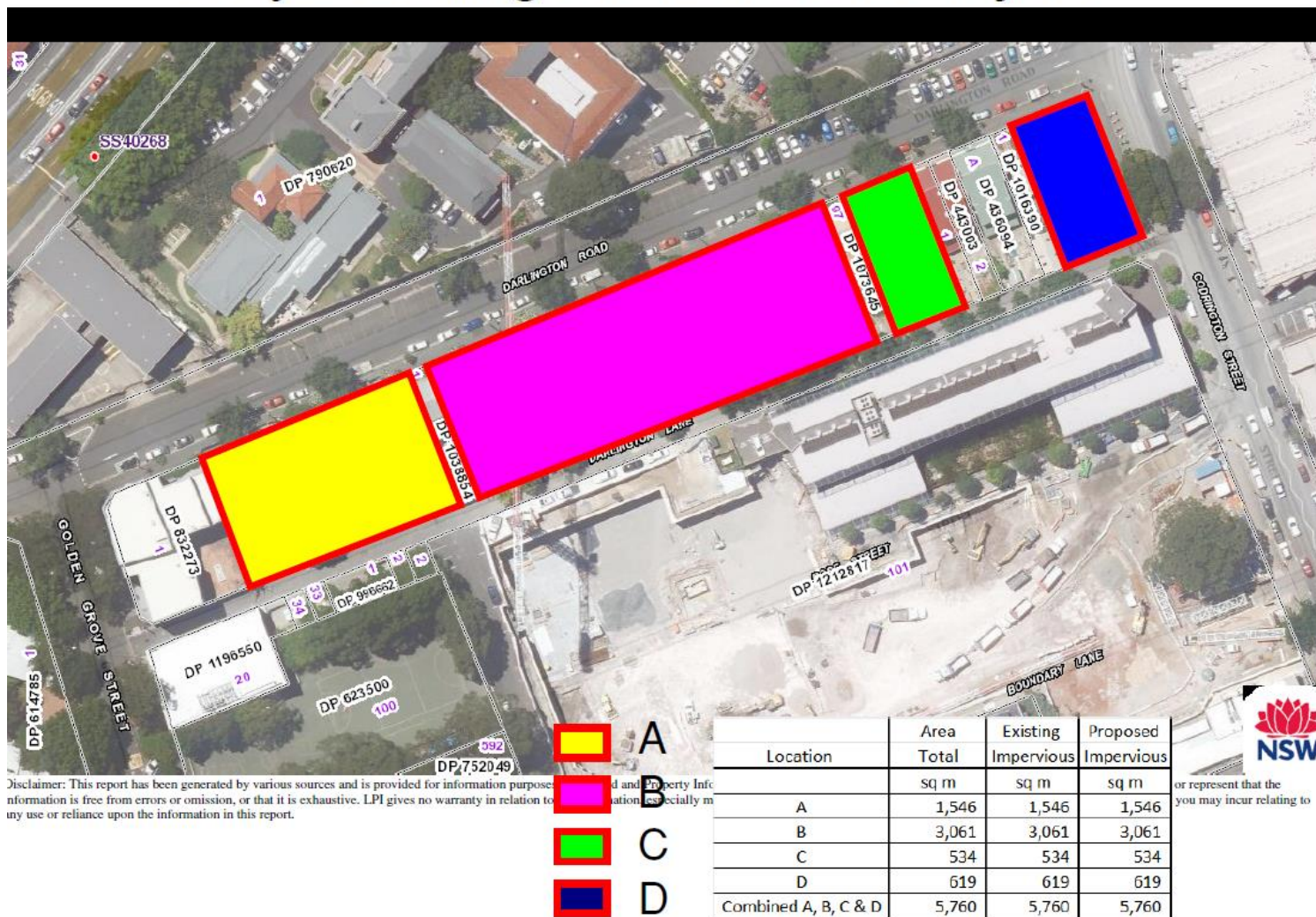
Roofwater captured will be treated and reticulated as Non-potable Cold Water for sanitary flushing Building A and Building B and external hose tap for landscape irrigation.

Sub-soil drainage will be collected and conveyed by gravity into the pump wells and pumped discharges into the building stormwater gravity system complete with non-return valve.

The calculated 1:100 ARI from the roofs in Building A site is approximately 56.5L/sec.  
The calculated 1:100 ARI from the roofs in Building B & C site is approximately 112L/sec.  
The calculated 1:100 ARI from the roofs in Building D site is approximately 33L/sec.  
The calculated 1:100 ARI from the roofs in 86 and 87 site is approximately 22L/sec.

Figure below indicates the proposed stormwater total catchment areas for each lot together with Sydney Water requirements for OSD and PSD for the project.

# USyd Darlington Terraces Project



## Darlington Terrace Development – Stormwater Management Report

**JACOBS**

A summary of the current OSD tanks arrangement is shown in Table 8 below.

LOT	Total Area (m <sup>2</sup> )	Revised Existing Impervious Area (m <sup>2</sup> )	Current Proposed Impervious Area (m <sup>2</sup> )	OSD Volume (m <sup>3</sup> )	PSD/ Peak Flow (l/s)
BLOCK A	1,350	1,229	1,207	33	56
BLOCK B AND BLOCK C	2,690	2,287	2,553	58	112
BLOCK D	610	525	590	Nil	Peak Flow=33 l/s
END BLOCK - BUILDING 86 AND 87	600	252	247	Nil	Peak Flow=22 l/s
TOTAL	5,250	4,293	4,597	91	223 l/s

Table 8 : Current OSD and PSD Due to Site Constraints and Revised Development



## Gas

The development is supplied from 50mm diameter nylon main (210kPa system) located in Darlington Road and currently serves the site.

Gas supply to the proposed development will be served via connections to the existing Jemena gas infrastructure, complete with Authority gas meter and regulator assembly for each lot. Jemena (Brad Gee) advised WS&P on the 15<sup>th</sup> September 2015 by email that the site can be supplied by the Darlington Road gas main.

A main gas supply will reticulate throughout the each Lot at low pressure to service all gas appliances.

The existing gas demand for the terrace buildings is estimated at 4,500 MJ/hour (Table 6: Peak Gas Loadings - Warren Smith & Partners Pty Limited report 4596001\_University of Sydney - Natural Gas Masterplan\_20150410 dated 20 September 2015).

The anticipated total Mega Joule (MJ) loading of the proposed natural Gas System for has been calculated at 2,400MJ/hr:

- Domestic Hot Water heating

Building A = 615 MJ/hour

Building B = 1435 MJ/hour

Building C = 105 MJ/hour

Building D = 410 MJ/hour

- Student Meal Preparation Kitchens - 15 cook tops at 30-40MJ/hour

Building A = 240 MJ/hour

Building B = 400 MJ/hour

Building D = 40 MJ/hour

The diagram below shows the existing gas main supplying the site from Darlington Road.

