



# Proposed Development at 28-32 Somerset Street, Kingswood

## STORMWATER MANAGEMENT REPORT

## Disclaimer

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### 151404-CR02-A 28-32 Somerset Street, Kingswood – Stormwater Management Report

Rev	Description	Prepared by	Reviewed by	Issue Date	Client App	Approval Date
A	Issued for DA	MC	SF	15/06/16		
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## 1. Introduction

Northrop Consulting Engineers (Northrop) has been engaged by Pure Projects to prepare documentation in support of a Development Application (DA) Submission to Penrith City Council (PCC) for the proposed residential development at 28-32 Somerset Street, Kingswood.

The proposed development will involve the demolition of two existing residential dwellings within the subject site and the construction of a six (6) story residential apartment building, complete with a commercial tenancy on ground floor.

Northrop has been engaged to prepare a Stormwater Management Report (and accompanying plans) for the proposed development.

The report outlines the stormwater management strategy developed for managing stormwater runoff from the proposed development, so to document that the proposed concepts meet Council's specifications and requirements within the 2014 DCP as well as Stormwater Drainage for Building Developments. This report should be read in conjunction with Northrop's prepared civil DA drawing set 151404 DA1.00-DA5.01.

## 2. Site Description

### 2.1. Existing Site Description

The address of the subject site is 28-32 Somerset Street, Kingswood. The site is located within B4 mixed use land zoning area. Refer to **Figure 1** for the site location.



**Figure 1 - Locality Plan**

The site is generally trapezoidal in shape and covers an area of approximately 1694 m<sup>2</sup>. The site is enclosed by Somerset Street on the western boundary and Hargrave Street on the southern boundary.

The existing (pre-development) site condition consists of a single storey dwelling located on 28 and 30 Somerset Street whilst 32 Somerset Street is vacant.

Based on survey information, the general site levels fall from a maximum RL of approximately 49.10 m AHD along the western boundary to a minimum RL of approximately 47.58 m AHD on the eastern boundary constituting an average grade of 4.4%. Refer to Attachment A for the existing site survey plan.

## 2.2. Proposed Development

The proposed development will involve the demolition of two existing residential dwellings within the subject site and the construction of a six (6) story building over two (2) basement levels. The development will ultimately yield a total of fifty four (54) apartments and seventy four (74) car parking spaces.

Refer to the architectural drawings prepared by Plus Architecture for more details.

## 2.3. Existing Stormwater Infrastructure

Council has confirmed that there is no existing stormwater infrastructure (i.e. below ground pit and pipe system) present within the roadways fronting the site and that the nearest council stormwater asset is approximately 200m east along Hargrave Street. Council has confirmed that stormwater runoff can be discharged to the kerb via one (1) kerb outlet per 15m of street frontage. The maximum allowable discharge to the kerb at any single point is 25 l/s. Please refer to Northrop's civil DA drawings for further details.

For further information on services such as electrical, sewer, water and gas refer to other disciplines.

## 2.4 Existing Services & Utilities

Based on a Dial Before You Dig assessment, the following services & utilities are available for the proposed development;

- Jemena Gas
- NBN Underground Fibre Optic Cable
- Sydney Water (sewer and water)
- Telstra

For further information and locations of services refer to Attachment C.

## 2.5 Ground Water

Based on the geotechnical report prepared by Douglas Partners, groundwater will not be an issue as the lowest basement level is above the groundwater table. Tanking of the basement is not expected.



#### 4.2. Rainwater Harvesting and On-site Re-use

Rainwater harvesting will minimise the generation of stormwater from the development and as such, a 15KI rainwater tank is proposed. This will be utilised to capture all roof drainage. In this regard, the concept stormwater design is only considering reuse for irrigation and car washing purpose

#### 4.3 OSD Requirements

On-site detention is not required for the proposed site based on Penrith City Council's Stormwater Drainage for Building Developments document. In this case, stormwater is to discharge to the kerb and gutter system in Somerset Street and Hargraves Street as described in section 4.1.

For more details refer to the civil DA drawings.

### 5. Stormwater Quality

The stormwater quality management measures have been designed to comply with the following guidelines:

- Australian Rainfall and Runoff;
- Penrith City Council's Water Sensitive Urban Design Policy;
- Penrith City Council's Water Sensitive Urban Design Technical Guidelines

#### 5.1 Music Modelling

The MUSIC software package was used to assess the extent of pollutant discharged from the site. The effectiveness of the proposed "treatment train" has been assessed based on modelling of the post development conditions with treatment measures

To appropriately manage the volume of pollutants discharged from the site, a treatment train will need to be developed to capture and remove as much of the pollutants from the site before they are discharged to the street.

- Building Runoff – via first flush devices to rainwater reuse tank;
- Rainwater Reuse Tank;
- Stormfilter 5 cartridge system (Stormwater 360); and
- Enviropod (Stormwater 360) filter baskets for all surface runoff inlet pits;

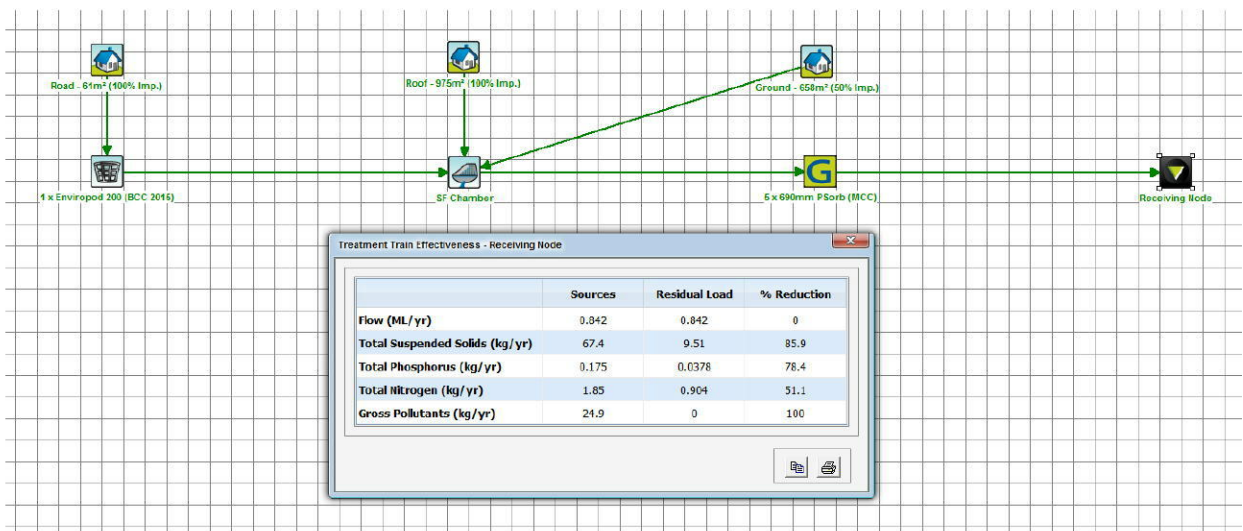
The results from the MUSIC model of the site under proposed conditions with the described treatment devices are presented in *Table 2*.



**Table 2 - MUSIC modelling results of the Subject Site under Post Developed Conditions**

Pollutants	% Reduction Under Proposed Conditions	% Reduction Targets required by Council
Gross Pollutants (GP)	100%	90%
Total Suspended Solids (TSS)	85.9%	85%
Total Phosphorous (TP)	78.4%	60%
Total Nitrogen (TN)	51.1%	45%

Refer to **Figure 2** for the MUSIC modelling results for the proposed development.



**Figure 2 - MUSIC screenshot of Modelling Results of the Site Area under Proposed Development Conditions**

The results in *Table 2* show that the implementation of the proposed treatment devices within the treatment train can effectively capture and remove a sufficient amount of pollutants from the site. The results demonstrate that the proposed treatment train can effectively reduce the total volume of pollutant discharged from the site under proposed conditions to ensure they meet Council's requirements of:

- Gross Pollutants (GP) Reduction: 90%
- Total Suspended Solids (TSS) Reduction: 85%
- Total Phosphorus (TP) Reduction: 60%
- Total Nitrogen (TN) Reduction: 45%

### 5.1.1. PROPOSED STORMWATER TREATMENT TRAIN

In order to achieve the reduction targets present in **Section 5.4.2**, the following treatment devices are required as part of the treatment train:

- Stormwater360 Enviropod 200 inserts

A total of 3 Stormwater360 Enviropod 200 inserts will be used as pre-treatment for stormwater runoff to capture litter and coarse sediment from part of the site. The following capture rates have been adopted for the MUSIC model, based on information provided by Stormwater360:

- TSS                  85%
- TN                    45%
- TP                    60%
- GP                    90%

- 15kL Rainwater Tank

A 15kL rainwater tank will be implemented to capture stormwater runoff generated off the roof of the building (approx. 975m<sup>2</sup>). The collected rainwater will be used for irrigation of the landscaped areas across the site as well as car washing.

A maintenance plan for the rainwater tank is shown below in *Table 3*.

**Table 3 – Rainwater Tank Maintenance Plan**

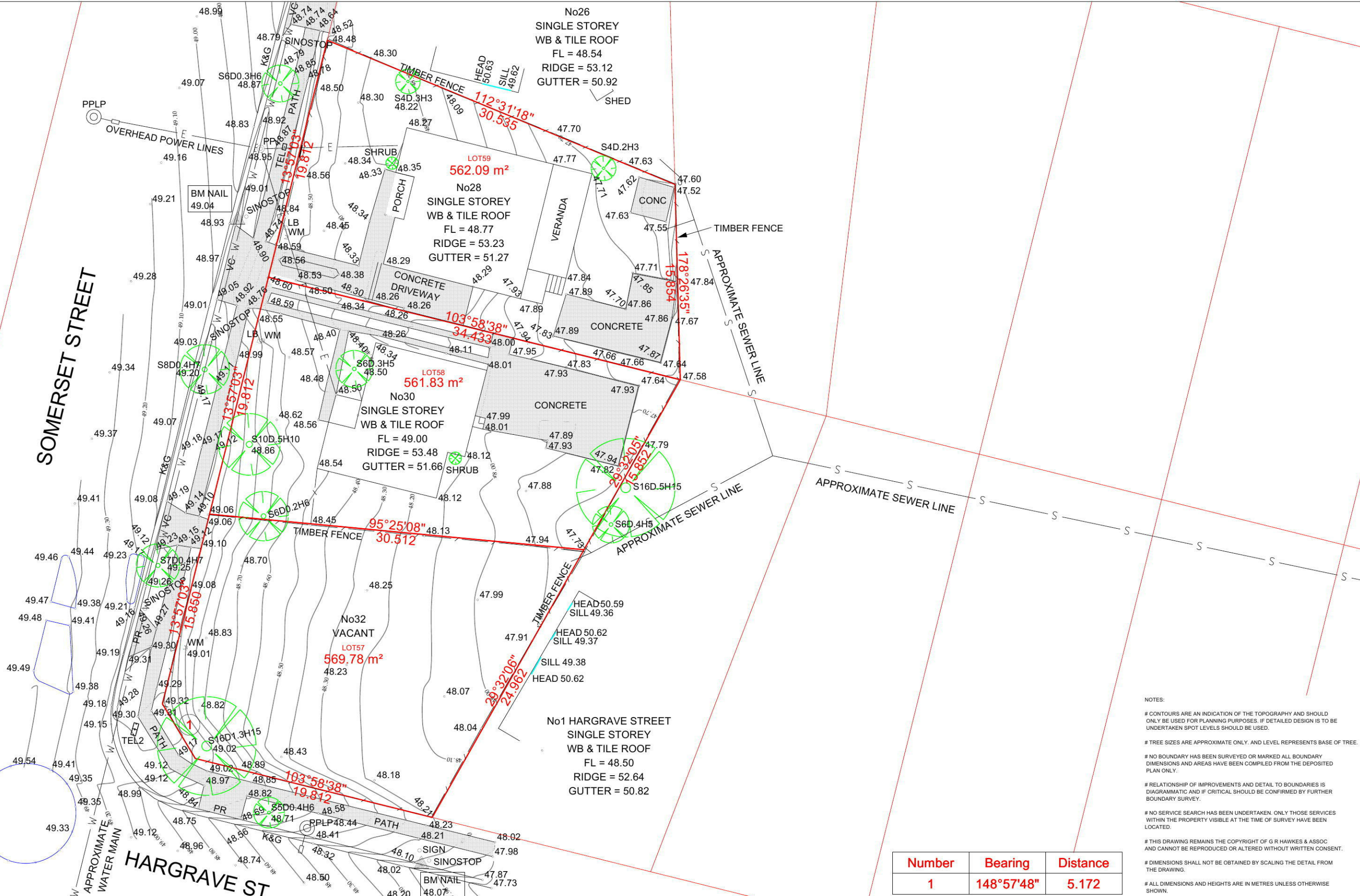
<b>Inspection Items</b>	<b>Frequency</b>	<b>Action Required</b>
First Flush Device	1-3 months or as required	Inspect and clean first flush device from debris
Contamination	1-3 months	Disinfection of tank(s)
Inlet/outlet screen	6 months	Remove leaves and debris on surface
Roof gutters	6 months	Remove leaves and debris in gutters
Tank structure	2 years	Check footings and fittings for signs of corrosion/deterioration
Depth of sediment within tank	5 years	De-sludge tank(s) by engaging professional cleaner

## 6. Conclusion

Northrop Consulting Engineers has prepared this report and the corresponding drawings to provide information to Penrith City Council on the stormwater management requirements for the development to assist Council in assessing the Development Application.

The findings of this report and associated concept designs indicates effective stormwater management measures can be integrated into the proposed development, in accordance with the Penrith City Council's engineering standards, and that no major factors relating to stormwater management would preclude the proposed development of the site.

## Attachment A – Site Survey



NOTES:

- # CONTOURS ARE AN INDICATION OF THE TOPOGRAPHY AND SHOULD ONLY BE USED FOR PLANNING PURPOSES. IF DETAILED DESIGN IS TO BE UNDERTAKEN SPOT LEVELS SHOULD BE USED.
- # TREE SIZES ARE APPROXIMATE ONLY, AND LEVEL REPRESENTS BASE OF TREE.
- # NO BOUNDARY HAS BEEN SURVEYED OR MARKED ALL BOUNDARY DIMENSIONS AND AREAS HAVE BEEN COMPILED FROM THE DEPOSITED PLAN ONLY.
- # RELATIONSHIP OF IMPROVEMENTS AND DETAIL TO BOUNDARIES IS DIAGRAMMATIC AND IF CRITICAL SHOULD BE CONFIRMED BY FURTHER BOUNDARY SURVEY.
- # NO SERVICE SEARCH HAS BEEN UNDERTAKEN. ONLY THOSE SERVICES WITHIN THE PROPERTY VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED.
- # THIS DRAWING REMAINS THE COPYRIGHT OF G R HAWKES & ASSOC AND CANNOT BE REPRODUCED OR ALTERED WITHOUT WRITTEN CONSENT.
- # DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE DETAIL FROM THE DRAWING.
- # ALL DIMENSIONS AND HEIGHTS ARE IN METRES UNLESS OTHERWISE SHOWN.

Number	Bearing	Distance
1	148°57'48"	5.172

Revision	Date	Description	Drawn By	Approved By
A	25/05/2015	Detail Survey	PE	GH

Surveyed By:



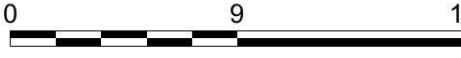
GRHawkes & Associates Pty Limited

E-Mail: grh@grh.com.au | Mob: 0419 249 667  
Web: www.grh.com.au

Title:

**DETAIL SURVEY**  
**No28, 30 & 32 SOMERSET STEET**  
**KINGSWOOD 2747**  
**LOT 57 DP215146**  
**& LOTS 58 59 DP36728**

Scale Bar:



Surveyed By: PE    Job No: 1481    Contour Interval: 0.10


Print Scale: 1:300 @ A3    Projection: MGA    Datum: AHD

Notes:

LB = LETTER BOX    TEL = TELSTRA PIT  
 S = TREE SPREAD    PR = PRAM RAMP  
 D = TREE DIAMETER    PP = POWER POLE  
 H = HEIGHT OF TREE    PPLP = POWER POLE WITH LIGHT  
 WM = WATER METER    VER = VERANDA  
 FL = FLOOR LEVEL  
 GAR = GARDEN  
 VC = VEHICLE CROSSING

Computer File: S:\GRH\GRH JOB Documents\DETAIL 28 30 32 SOMERSET ST KINGSWOOD

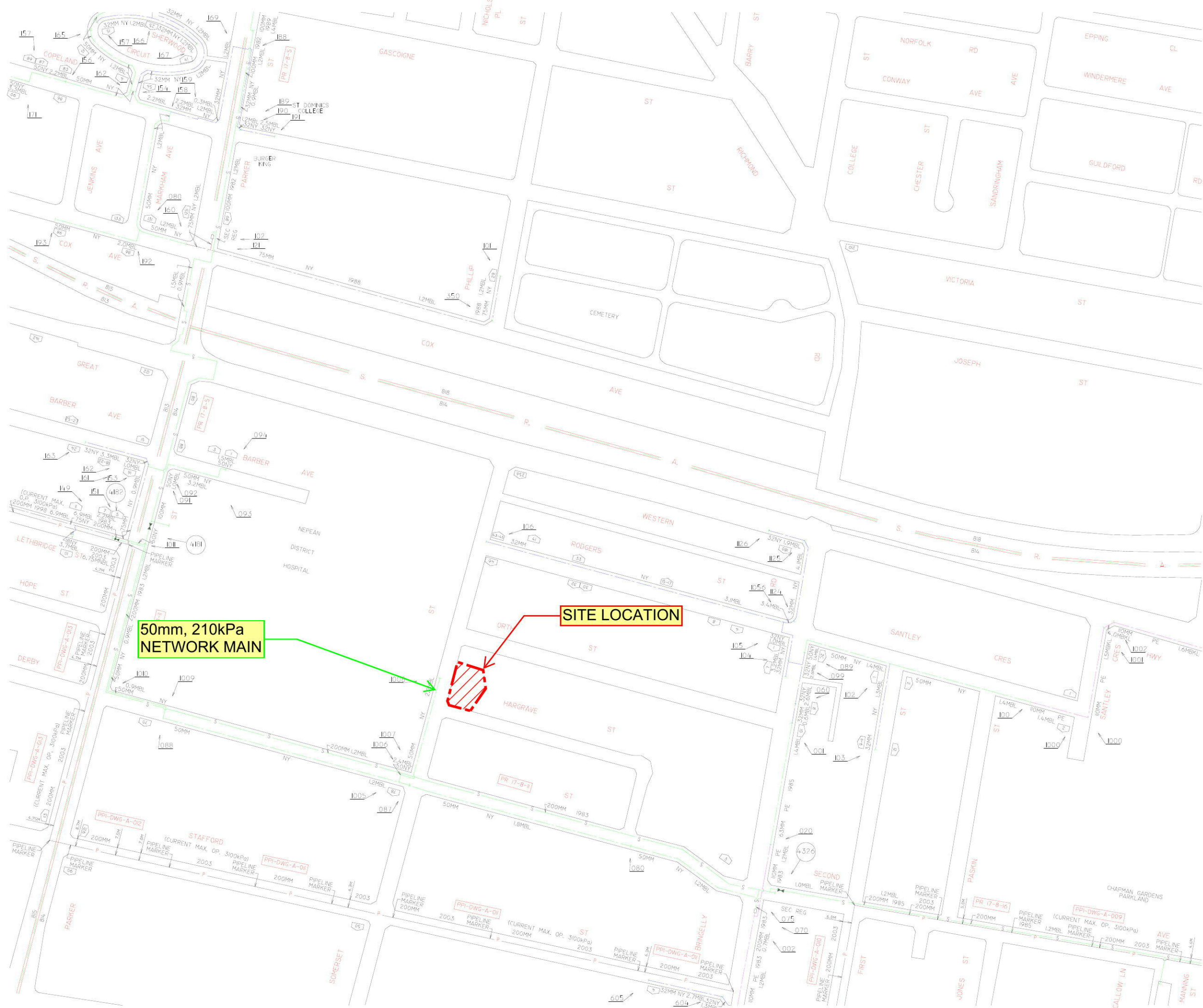
Surveyed For:



Rev: A    Page: 1 - 1







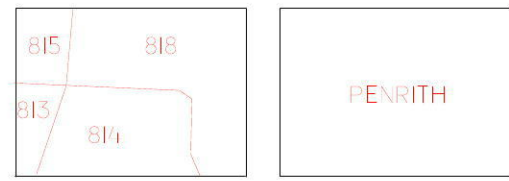
# ST MARYS 4C



THIS MAP UPDATED ON 30/12/2013  
 THIS PLAN IS DIAGRAMATIC ONLY. DISTANCES  
 SCALED FROM THIS PLAN MAY NOT BE ACCURATE.

PE6B	SM4A	SM4B
PE6D	SM4C	SM4D
PE9B	SM7A	SM7B

ADJOINING MAPS



NETWORK AREA      MUNICIPALITY AREA

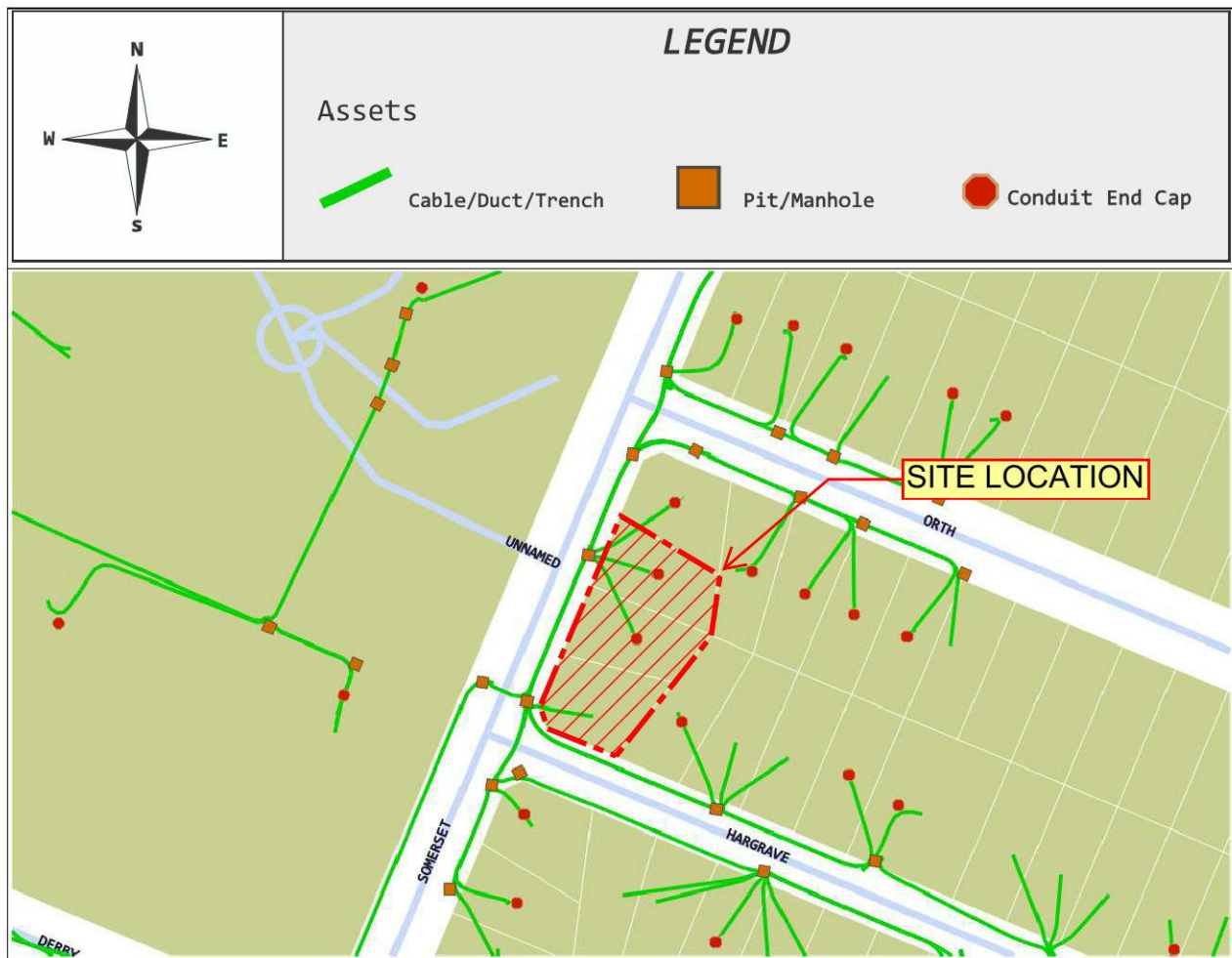
# Jemena

## KEY

- | MAX ALLOWABLE OPERATING PRESSURE |  |
|----------------------------------|--|
|                                  | TRUNK PIPELINE 7000 kPa                          |
|                                  | PRIMARY MAIN 3500 kPa                            |
|                                  | SECONDARY MAIN 1050 kPa                          |
|                                  | NETWORK MAIN 400 kPa                             |
|                                  | NETWORK MAIN 300 kPa                             |
|                                  | NETWORK MAIN 210 kPa                             |
|                                  | NETWORK MAIN 100 kPa                             |
|                                  | NETWORK MAIN 30 kPa                              |
|                                  | NETWORK MAIN 7 kPa                               |
|                                  | NETWORK MAIN 2 kPa                               |
|                                  | PROPOSED MAINS                                   |
|                                  | STEEL MAN PROJECT NUMBER                         |
|                                  | PRESSURE MONITORING STATION                      |
|                                  | VALVE  |
|                                  | SYSTEM PRESSURE REGULATOR                        |
|                                  | SIPHON   |
|                                  | NETWORK NODE                                     |
|                                  | NETWORK VALVE NODE                               |
|                                  | VALVE NUMBER                                     |
|                                  | 6 INCH CAST IRON MAIN                            |
|                                  | 150MM STEEL MAIN                                 |
|                                  | 100MM POLYETHYLENE/NYLON MAIN                    |
|                                  | 50MM NYLON INSERTED INTO 6NB MAIN CAST IRON MAIN |
|                                  | DISTANCE IN METRES OF MAIN FROM BOUNDARY LINE    |
|                                  | 1957 YEAR LAID                                   |
|                                  | MUNICIPALITY BOUNDARY                            |
|                                  | NETWORK BOUNDARY                                 |
|                                  | HOUSE NUMBER                                     |

# ST MARYS 4C

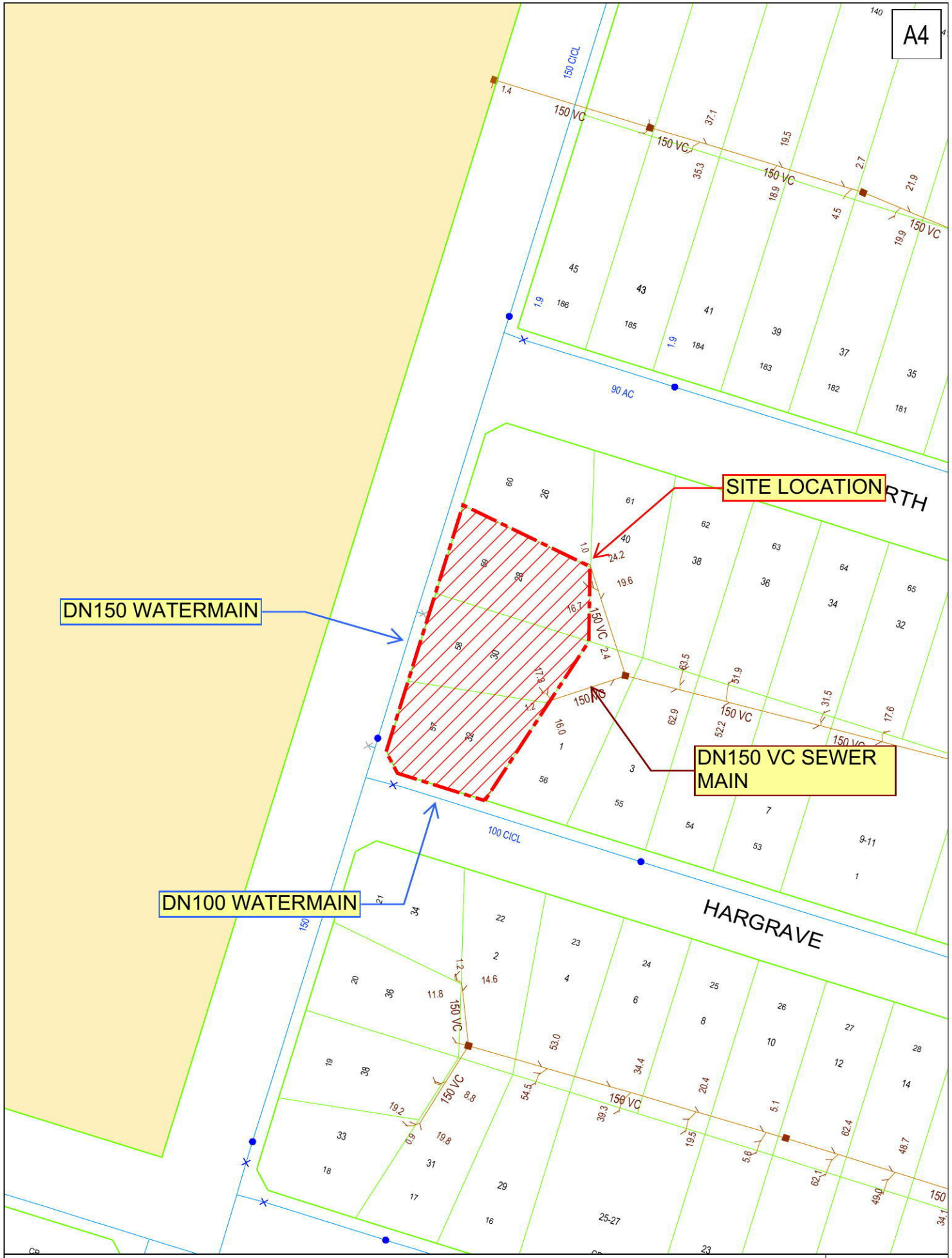




## Conditions

The following are conditions on which NBN Co provides you with the Indicative Plans. By accepting the plans, you are agreeing to these conditions. These conditions are in addition (and not in replacement of) any duties and obligations you have under applicable law.

1. NBN Co does not accept any responsibility for any inaccuracies of its plans. You are expected to make your own inquiries and perform your own investigations (including engaging appropriately qualified plant locators at your cost to locate NBN Co telecommunications facilities during any activities you carry out on site).
2. You should not assume that fibre optic cables follow straight lines or are installed at uniformed depths along their lengths, even if they are indicated on plans provided to you. Careful onsite investigations are essential to locate the exact position of cables.
3. In carrying out any works in the vicinity of NBN Co facilities, you must maintain the following minimum clearances:



DN150 WATERMAIN

SITE LOCATION

DN150 VC SEWER MAIN

DN100 WATERMAIN

HARGRAVE

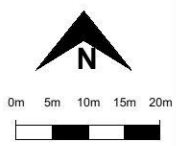
DBYD Address:  
 32 Somerset Street  
 Kingswood NSW 2747

DBYD Job No: 9734251  
 DBYD Sequence No: 48191530

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SYDNEY WATER CORPORATION  
 Scale: 1:1000

Date of Production: 30/09/2015  
 Plan 1 of 1



# Cable Plan

RMCOMMS-SE10



For all Telstra DBYD plan enquiries -  
 email - Telstra.Plans@team.telstra.com  
 For urgent onsite contact only - ph 1800 653 935 (bus hrs)

Sequence Number: 48191527

Please read Duty of Care prior to any excavating

TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

**Generated On 29/09/2015 12:45:48**

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

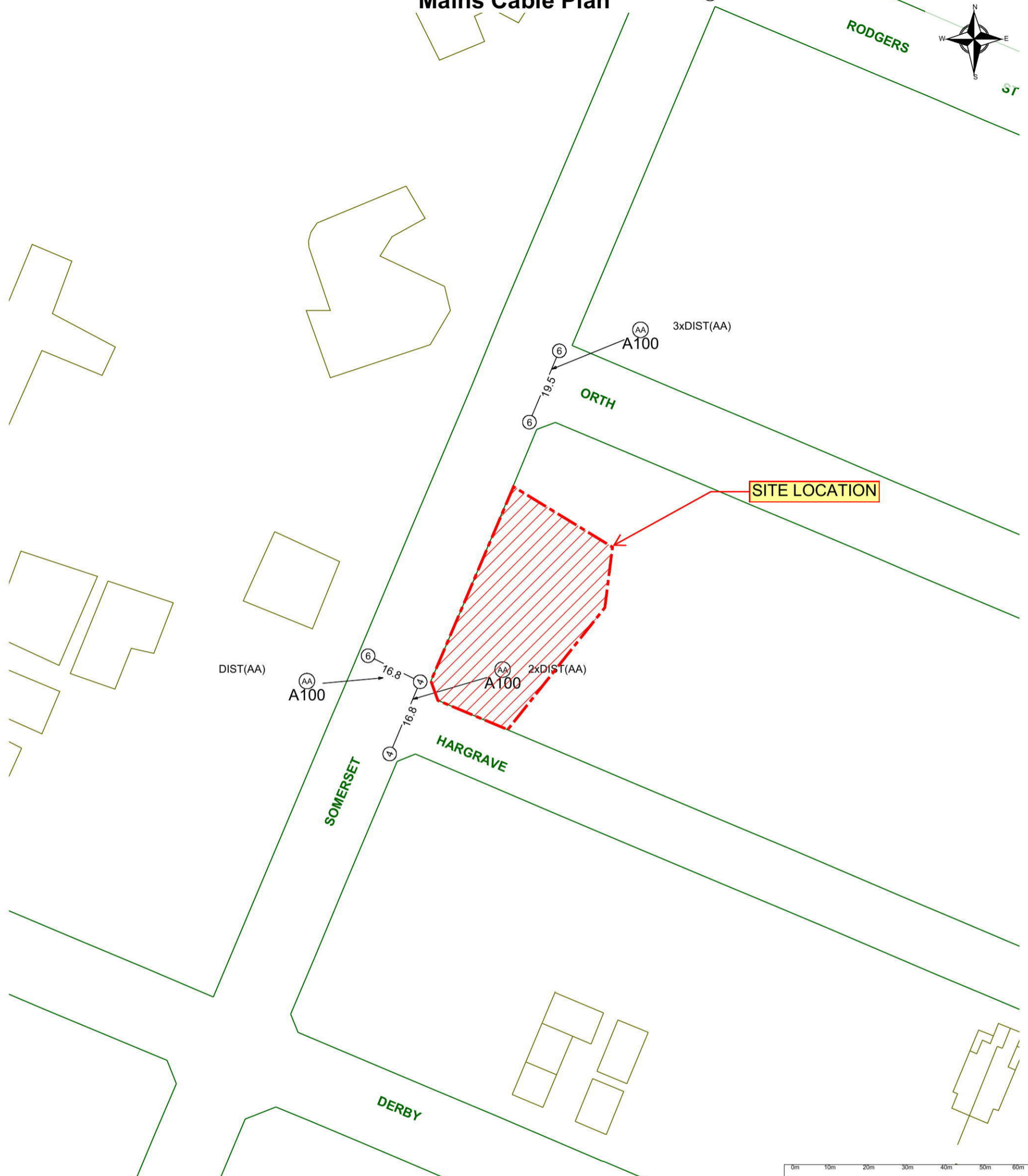
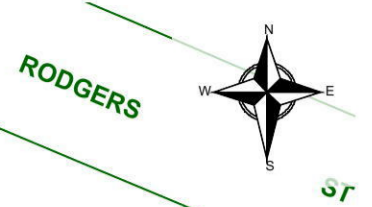
WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

# Mains Cable Plan



For all Telstra DBYD plan enquiries -  
 email - Telstra.Plans@team.telstra.com  
 For urgent onsite contact only - ph 1800 653 935 (bus hrs)

Sequence Number: 48191527

Please read Duty of Care prior to any excavating

TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

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WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

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