# Australian Catholic University Strathfield Campus

Infrastructure Assessment

December 2011

Australian Catholic University (ACU)

Mott MacDonald

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# Issue and revision record

| Revision | Date | Originator | Checker | Approver | Description |
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| B | 05/08/11 | CB | PMcB | PMcB | Final |
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# Executive Summary

This infrastructure assessment has been produced to address the Director General's Requirements (DGRs) relating to the Australian Catholic University Strathfield site (MP 10_0231).

A summary of the Key Assessment Requirements of the DGRs are included in Section 2 of this report. Subsequent sections of this report provide supporting information concerning infrastructure servicing requirements and issues with respect to the proposed development.

There are a number of infrastructure issues associated with the servicing of the site; these are broadly outlined below.

## Sustainable Water Management

### *Water Quantity Management*

On-site Stormwater Detention (OSD) will be provided on a catchment-by-catchment basis where the proposed development is such that site catchment outflows are greater than existing, in accordance with Strathfield Council's Stormwater Management Code. Options for integrating water quantity and quality management facilities may also be considered.

### *Water Quality Management*

Water quality treatment will be required at the site stormwater discharge points where proposed development includes on-grade carparking in excess of 10 additional spaces. Various options for managing the water quality treatment include the provision of Gross Pollutant Traps (GPTs) or the provision of bioretention facilities in conjunction with stormwater detention. Other WSUD treatments may be considered in the design of the private domain.

### *Water Conservation*

Initiatives such as rainwater harvesting for the proposed buildings may be implemented to provide water for non-potable uses such as irrigation of the northern playing fields, toilet flushing and laundry uses. Further initiatives, such as water efficient fixtures will be incorporated into the future building design and the design of the private domain.

## Services Infrastructure

The campus is currently serviced by water, sewer, power, gas and communications. Proposed buildings within the campus will generally utilise the existing system where possible. Specific comments in relation to each service are included below.

### *Sewer*

Proposed buildings will discharge to existing sewer connection points at the downstream ends of their respective catchments. A sewer diversion will be required around the building proposed at the north-eastern corner of the campus to maintain the existing service.

A Section 73 Feasibility Notice of Requirements has been received and does not indicate any required major upgrades to Sydney Water's network to facilitate development.

### *Water Supply*

Existing Sydney Water mains run along Barker Road and provide the existing point of connection to the campus. It is anticipated that the existing connection and campus reticulation network can be utilised to service the new buildings within the development.

A Section 73 Feasibility Notice of Requirements has been received and does not indicate any required major upgrades to Sydney Water's network to facilitate development.

### *Power*

Existing substations within the campus (2no.) are serviced from Ausgrid distribution mains in Barker Road and Albert Road. Proposed buildings within the development would be serviced from the existing points of connection. The capacity of the existing substations to service the proposed development will need to be further assessed during the future design.

### *Gas*

Gas services exist in Barker Road and Albert Road. A gas supply point exists adjacent to the Clancy Building off Albert Road.

***Communications***

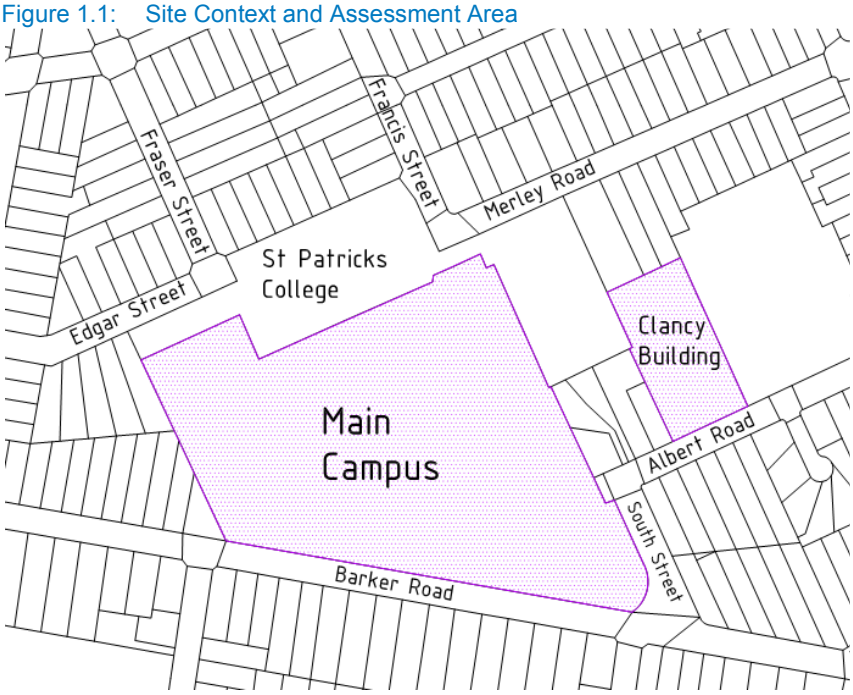
Telecommunications connections exist off Barker Road to service the existing campus. Proposed buildings will tie into the existing internal network or obtain new connection off the external authority mains as required.

# 1. Introduction

## 1.1 Background

Mott MacDonald Hughes Trueman (MMHT) has been commissioned by Hassell acting on behalf of Australian Catholic University (ACU) to assist with the infrastructure assessment for the proposed redevelopment of the Strathfield Campus, specifically in relation to the Project application submitted with the Department of Planning (MP10_0231). The ACU Strathfield Campus site is indicated on Figure 1.1 below.

Figure 1.1: Site Context and Assessment Area




The main Campus (Lot 11 DP 869042) to the west occupies an area of approximately 5.9 hectares. The eastern campus (Lot 12 DP 1058289) occupies approximately 0.76 hectares.

## 1.2 Purpose of Assessment

The main aims of this Infrastructure Assessment are:

- To consider the constraints and opportunities relevant to the site
- To assess the servicing requirements for the proposed development of the ACU Strathfield Campus
- To identify the broad infrastructure requirements to facilitate development of the ACU Strathfield Campus

- To consider practical, achievable sustainable principles in the provision of infrastructure
- To address the Director General's Requirements for Project Application – MP10_0231

## 1.3 Scope of Assessment

This study investigates the following:

- The infrastructure site constraints and opportunities,
- Topographical constraints – slope, drainage corridors
- Locations and indicative capacities of existing trunk infrastructure services – telecommunications, sewer, water, power, drainage, gas
- Appreciation of hydrological issues by desktop review of available information
- Identification of Stormwater Quantity Management issues - detention requirements and options for consideration – likely land-take
- Identification of likely Stormwater Quality Management obligations, land-take, etc.
- Integration issues with adjacent properties and proposed development

Associated with this assessment is a set of Infrastructure Masterplans prepared by Mott MacDonald Hughes Trueman that summarise the relevant infrastructure servicing issues.

The following sections of this report document the infrastructure assessment findings for Stormwater, Water, Sewer, Telecommunications, Electricity, Gas and other potential opportunities and constraints. Figures within this report are intended to emphasise important issues within the respective report section. The masterplan drawings attached as Appendix A should be referred to for a complete picture of the relevant service/issue. Refer to Appendix A for a list of the masterplan drawings included as part of this assessment.

## 1.4 Drawing Base

The drawing bases used for the Infrastructure Masterplans are:

- Survey by Denny Linker & Co (15/05/2010)
- Masterplan Drawings by Hassell
- Information from Service providers as discussed in Section 3.3 (Dial Before You Dig)

## 1.5 Regional Context

The ACU Strathfield site comprises two campuses separated by residential lots. The main campus, accounting for approximately 90% of the total site area, is bounded by Barker Road to the south, existing residential lots to the west, St Patricks College and Edgar Street (beyond) to the north and existing residential lots and South Street (bounding southern portion of campus) to the east. The smaller campus housing the Clancy Building is bounded generally by existing residential development to the west, north and east and by Albert Road to the south. More broadly, the site is located within the Strathfield Local Government Area (LGA).

## 1.6 Site Areas and Current Land Zonings

The site is zoned Special Uses (Community Purposes) 5A under the Strathfield Local Environmental Plan (LEP) 2008. A new Strathfield Comprehensive LEP 2011 is currently under development.

# 2. Director General's Requirements - Summary

Table 2.1 presents a summary of the Key Assessment Requirements of the Director General relevant to infrastructure, water and environmental issues. The relevant section/s of this report that addresses these issues is referenced in the Table.

Table 2.1: Director General's Requirements Summary (MP10_0231)

| Key Issue | Description | Ref. Section | Summary |
|---|---|---|---|
| **Relevant EPI's, Policies and Guidelines to be addressed** | Strathfield Council Stormwater Management Code | 4.1.1, 4.4 | The code stipulates requirements with respect to On-site Stormwater Detention and building floor level controls. These will be incorporated in the future design. |
| | Strathfield Development Control Plan 2005, Part M Education Establishments | 4.1.1 | Section 4.20 of the DCP requires compliance with Council's Stormwater Management Code, as described above. |
| **Localised Impact and Integration** | Impacts on services and infrastructure | 4.6 | It is considered that only minor local upgrades will be required to facilitate the proposed campus intensification, however, potential capacity limitations are currently under assessment by relevant authorities. |
| **Drainage and Stormwater** | Drainage Issues | 3.1, 4.4 | The proposed development will discharge to the existing surrounding stormwater system with OSD provided in areas where the proposal results in an increase in impervious area and increased site discharge. |
| **Flooding** | Assessment of Flood Risk | 3.1, 3.4.2, 4.4 | The site sits at the top of the Cooks River and Powells Creek catchments, therefore only local flooding is considered applicable. The impacts of potential increased rainfall intensity will be incorporated into the future stormwater and OSD design for the development, where applicable. |
| **Utilities** | Staging of Infrastructure Works | 4.7 | The proposed development is concentrated in a number of discrete pockets of the campus. Infrastructure upgrades will therefore generally be staged in accordance with the adjacent development staging, except in the case of any regional or campus-wide upgrades required. |
| | Integrated Water Management Plan | 4.5 | Proposed alternative water supply opportunities include utilising the proposed building roof catchments to provide irrigation to the playing fields and other non-potable site uses.<br>Water Sensitive Urban Design principles may be incorporated in the design of the open space, landscaped areas and, in particular, the water |

| Key Issue | Description | Ref. Section | Summary |
|---|---|---|---|
| | | | quality treatment for the carpark runoff water. |
| | Infrastructure Management Plan | 3.3, 4.6 | Existing water services reticulate along the roads adjacent to the site. It is envisaged the proposed buildings will utilise the existing campus connections.<br>(pending regional capacity advice from Sydney Water).<br>Existing sewerage services convey wastewater from each site catchment. Proposed buildings will discharge to the existing campus system.<br>(pending regional capacity advice from Sydney Water). |
| | Director General's Requirements MP10_0231 (Date Issued – 17 February 2011) | | |

# 3. Existing Site Conditions, Infrastructure & Constraints

## 3.1 Catchments & Hydrology

### 3.1.1 Regional

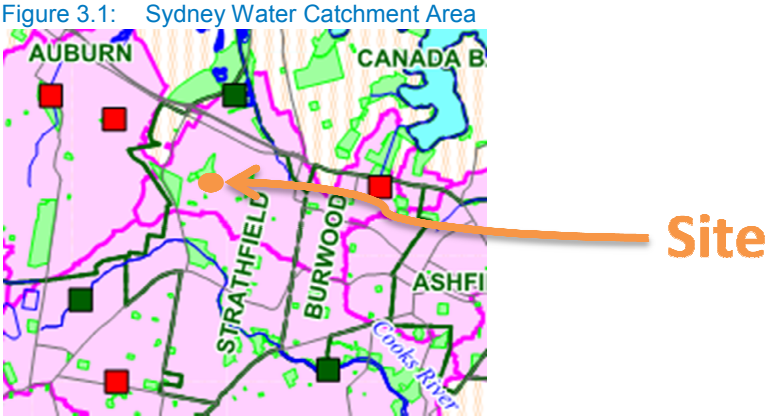
The site sits at the boundary of two major catchments – the Cooks River Catchment and the Powells Creek Catchment, with approximately 81% of the site falling within the latter, including all of the Clancy Building Campus. The south-west corner of the site along Barker Road falls within the Cooks River Campus. The Powells Creek Catchment can be further divided into two subcatchments – that draining to the Strathfield Creek sub-branch, comprising the eastern portion of the main campus and the Clancy Building Campus, and that draining to the Edgar Street Sub-branch, comprising the remainder (primarily to the north and west) of the site.

The portion of the site within the Cooks River Catchment drains to the south towards Cooks River, which subsequently flows to the east, discharging into the Alexandra Canal and Botany Bay.

The site areas within the Powells Creek Catchment ultimately drain to the Parramatta River via Powells Creek. The north-west of the site drains to the Edgar Street sub-branch midway between Fraser and Francis Streets to the site's north. The Edgar Street sub-branch discharges into Saleyards Creek, which discharges into Powells Creek. The eastern portion of the site drains to the east to the Strathfield Creek sub-branch, which discharges into Powells Creek.

More broadly, the site falls within Sydney Water's stormwater catchment area, which is depicted by the pink zone in Figure 3.1 below.

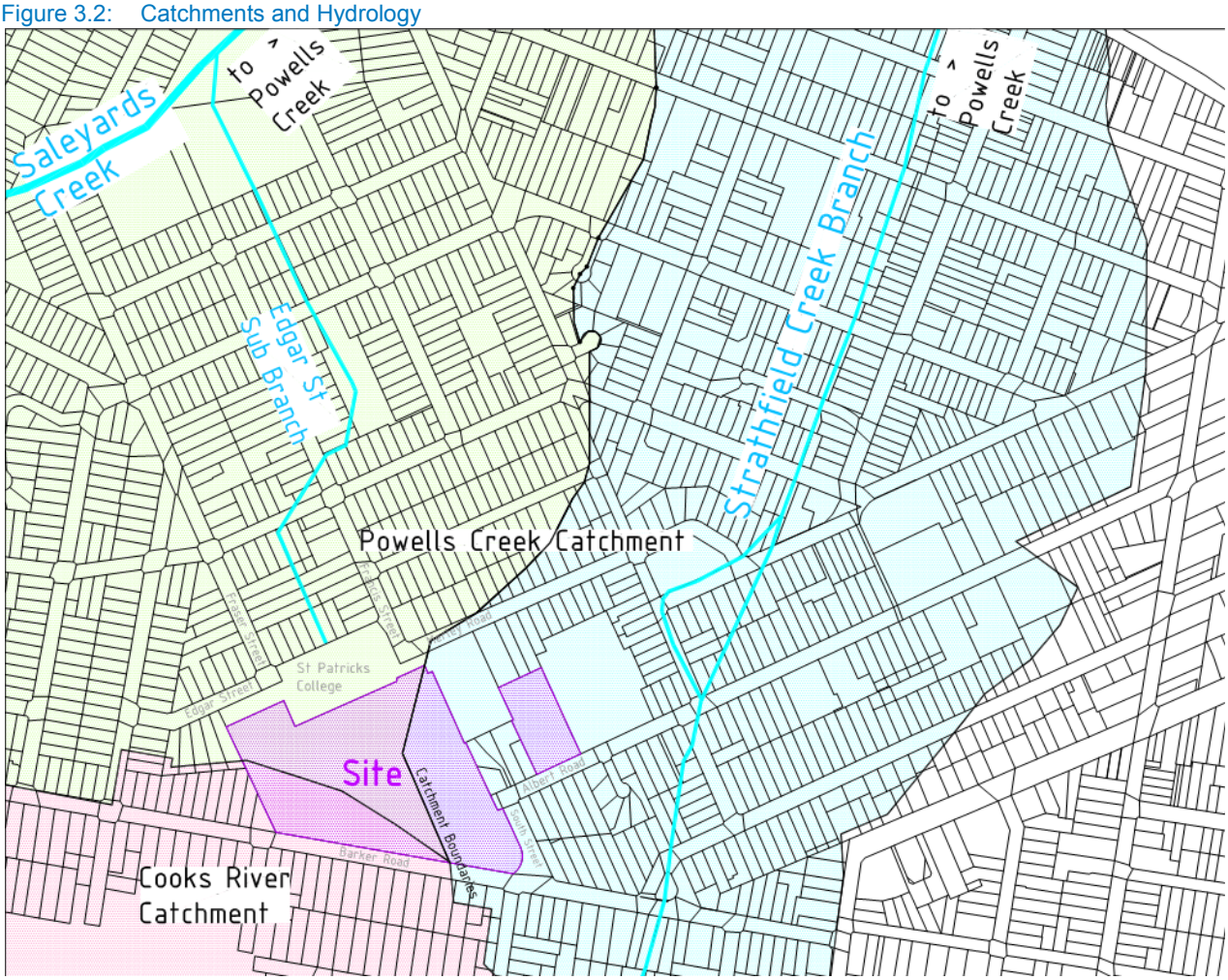
Figure 3.1: Sydney Water Catchment Area




Source: Sydney Water Stormwater Catchments, Sydney Water Asset Management. 2005

The existing regional catchments and hydrology are schematically shown on Figure 3.2 below.

Figure 3.2: Catchments and Hydrology




### 3.1.2 Site Drainage

Local stormwater drainage reticulation exists in each of the catchments shown in Figure 3.2 above. The site area within the southern, Cook's River Catchment, discharges to a stormwater line running down Wilson Street. Existing pits and pipes within the site discharge to council pits in Barker Road.

The eastern catchment, ultimately draining to the Strathfield Creek Branch, drains to Council's stormwater in Albert Road.

The northern catchment is principally composed of grassed playing fields and is close to 100% pervious. The majority of excess flow within this catchment flows to Edgar Street, where Council's street system connects to the Edgar Street Sub-branch.

### 3.1.3 External Catchments

As the site sits on the boundary at the top of two major catchments, there are no external catchments upstream of the site.

## 3.2 Existing Site Characteristics

### 3.2.1 Land Use & Topography

The southern portion (accounting for more than half) of the existing main campus is characterised by existing development, primarily of existing educational buildings and on-grade carparks interspersed with small areas of open space. A ridge line (running approximately north-south) divides the southern portion of the campus with grades to the east and west typically around 3-4%.

The northern portion of the campus is made up entirely of sporting fields and is characterised by grades flat grades of typically less than 0.5% attributable to its function. A batter, at approximately 1(V):3(H) divides the northern and southern campus areas at the centre while transitioning back to a natural interface at the eastern and western boundaries.

The eastern campus is wholly developed comprised mainly of the Clancy Building. There is a small grassed area at its south, fronting Albert Road.

### 3.2.2 Watercourses

No watercourses appear to pass through the subject site.

### 3.2.3 Stormwater Quality

Existing stormwater quality management facilities within the existing site are not apparent.

### 3.2.4 Transport Infrastructure

The site has frontages to two roads; Barker Road and Albert Road. Three (3) existing accesses exist off Barker Road, the main access

being the easternmost. A fourth, gated access exists at the end of Albert Road. The access road from the Albert Road entry connects through to the two eastern, Barker Road accesses. All existing accesses are driveways with the exception of the eastern access off Barker Road, which has dedicated left and right turning lanes into and out of Barker Road.

Access to the Clancy Building Campus is from Albert Road.

## 3.3 Existing Utility Services

### 3.3.1 Water

Information on existing water services has been supplied through the Dial Before You Dig (DBYD) service and is shown on MMHT Drawing 294464C-08.

The water supply for the site comes from the Bankstown Reservoir at the corner of Liverpool Rd and Stacey St. There is a 600 mm trunk main running along Liverpool Rd (The Hume Hwy) which has a number of offtakes at Centenary Drive (250 mm) and Homebush Rd (180 mm).

Existing water mains run along the roads adjacent to the development: Barker Road, South Street and Albert Road. Existing connection points are believed to exist along Barker Road and Albert Road.

### 3.3.2 Sewerage

Information on existing sewerage services has been supplied through the DBYD service and is shown on MMHT Drawing 294464C-09.

There are three existing primary discharge locations from the site, corresponding with the existing catchments. A connection at the south-west corner of the site runs along Barker Road to the west, prior to heading south before joining a 300mm main running easterly along Cooks River.

The eastern catchment discharges to two points, the first along Barker Road to the south and the second towards the centre of the campus and easterly around the Clancy Building. These mains converge at the intersection of Albert Road and Dickson Street and join a 660mm x 990mm concrete tunnel (Western Branch Submain) further east. All mains from the site ultimately discharge to the South Western Ocean Outfall Sewer.

### 3.3.3 Telecommunications

Existing telecommunications services and pits run along the northern side of Barker Road, along South Road and Albert Road. Campus connections are provided from Barker Road for the Main Campus and Albert Road for the Clancy Building Campus.

An Aarnet optical fibre connection runs along Albert Street from the east and through the main campus. This is understood to run generally along the access road from Albert Road and terminates at a pit towards Barker Road.

### 3.3.4 Electricity

Ausgrid (formerly Energy Australia) provides electrical services to the site. Distribution lines run along the northern side of Barker Road and South Road. The main campus is serviced by two (2) substations; the first adjacent to Barker Road at the approximate midpoint of the campus frontage and the second adjacent to the Albert Road access. The Albert Road substation also services the Clancy Building via conduits along Albert Road.

### 3.3.5 Gas

Existing gas services, operated by Jemena, reticulate along the roads around the site. A 160mm Polyethylene main runs along the southern side of Barker Road, along the western side of South Street and northern side of Albert Road, where it terminates at the eastern edge of the Clancy Building Campus. An additional 75mm Nylon main runs along the southern edge of Albert Road and eastern edge of South Street, before connecting into the 160mm main along Barker Road.

## 3.4 Development Constraints

### 3.4.1 Acid Sulfate Soils

Acid Sulfate Soils (ASS) typically occur in flat, low lying areas and floodplains. It is considered unlikely that the subject site is significantly affected by ASS. A future geotechnical investigation should confirm the presence of any ASS across the site.

### 3.4.2 Flooding

As addressed in Section 3.1, the site is situated at the catchment boundary between the Cooks River and Powells Creek catchments and

is at the top of both catchments. It is therefore not anticipated that the site will be subject to major regional flooding. Council does not identify the site as being flood affected.

The site may be subject to local flooding, however strategies such as the provision of clear overland flowpaths and applying freeboard to proposed developments can be implemented to mitigate this risk.

The NSW Floodplain Development Manual provides guidelines for the management of flood liable land. The Manual is intended as a guideline for Councils in addressing flood management strategies and development requirements. Council's requirements and the general guidelines set out in the Manual will be incorporated into the future development design. Additionally the impacts of climate change, including increased rainfall intensities will be assessed and incorporated into the future design, as applicable.

### 3.4.3 Existing Services

Existing authority services typically run along the adjacent roads and verges. Where development is proposed in these areas, the services will need to be accurately located and protected. Within the campus, an Aarnet fibre exists as described in Section 3.3.3. Similar measures will be required with regard to the protection of this service.

Existing services within the campus, servicing the various campus buildings will need to be protected and maintained during development of new buildings to maintain continuity of supply and alternative/temporary connections provided where this cannot be achieved.

### 3.4.4 Existing Easements

A number of existing easements exist within the site. A number of these are indicated below on Figure 3.3 and described in Table 3.1.

The figure below is intended to summarise a number of existing easements in the context of the constraints they may impose on future development. Reference should be made to the survey by Denny Linker for full details of the nature and location of the below easements.

Figure 3.3: Existing Easements


Source: Plan Showing Details and Levels at "Australian Catholic University" Barker Road & Albert Street Strathfield, Denny Linker & Co. 2010

Table 3.1: Existing Easements

| Easement Ref. per Figure 3.3 | Description |
|---|---|
| (C) | Restriction on Use of Land by D.P. 869042 |
| (D) | Right of Footway 1, 2 and Variable Width Vide D.P.827585 |
| (G) | Right of Way Vide Lease 5823618 |
| (H) | Right of Way and Easement for Electricity Purposes Vide Lease 5823618 |
| (J) | Right of Footway 1.0 Wide (Benefiting the Property) (D.P. 827585) |
| (K) | Easement for Electricity Purposes Vide Lease 5823618 |
| (L) | Easement to Drain Water 2.5 Wide (D.P. 1058289) |
| (P) | Easement to Drain Water 1.525 and 2.54 Wide (Benefiting the Property) (D.P.1072557) |
| (S1) | Lease for Substation Premises No.s 5391 and 5392 Vide Lease 5823618 |
| (S2) | Lease for Substation Premises No.s 5391 and 5392 Vide Lease 5823618 |

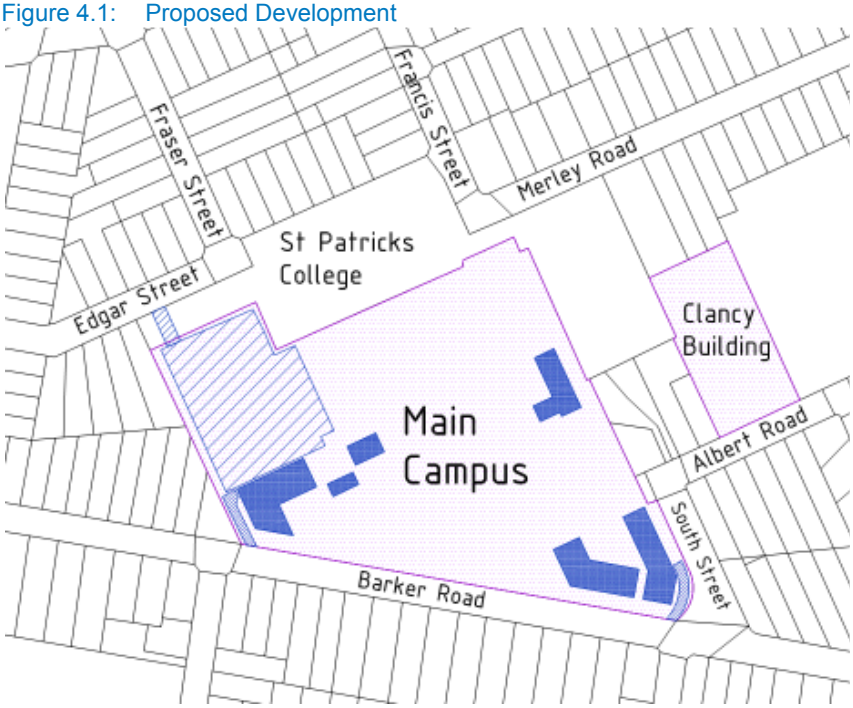
Source: Plan Showing Details and Levels at "Australian Catholic University" Barker Road & Albert Street Strathfield, Denny Linker & Co. 2010

# 4. Development & Future Infrastructure Requirements

## 4.1 Proposed Development

It is proposed to develop a number of new University buildings, principally located in four development precinct located generally at the south-east, east, west and central areas of the campus, as shown on Figure 4.1 below. A new underground carpark is proposed at the north-western corner of the campus underneath the existing playing fields. New access roads will be provided from Barker Road and Edgar Street. Additionally, precinct wide improvements are proposed to the various open space areas around the campus.

Figure 4.1: Proposed Development




### 4.1.1 Relevant Policies & Guidelines

A number of policies and guidelines are relevant to the infrastructure planning for the Strathfield Campus. These include:

- Strathfield Council Stormwater Management Code
- Strathfield Development Control Plan 2005, Part M Education Establishments
- Strathfield Council DCP (Part N): WSUD

The requirements of these policies will be incorporated in the proposed development planning and future design and have been discussed in the relevant sections of this report.

## 4.2 Transport

### 4.2.1 Roads

#### 4.2.1.1 External Roads & Intersections

The existing signalised intersection at South Street/Barker Road is to be reconfigured to incorporate the proposed carpark access road to the north. Discussions with Council and the RTA are currently progressing on this basis. The details of this proposed intersection will be developed as part of a future design process.

A new driveway access will be required off Barker Road at the western edge of the campus to service the western development. The nature of this proposed access and any potential impacts on existing services crossing the footpath will be assessed as part of a future design process. The proposed access is to be located to the east of the existing kerb inlet pit on Barker Road.

#### 4.2.1.2 Internal Roads

Significant changes to the existing road system are not proposed. The existing access road from the Albert Road gates through to the bus drop off zone adjacent to Barker Road will be converted to a pedestrian only area. A proposed access road will be provided from Edgar Street at the site's north to access the proposed underground carpark.

### 4.2.2 Other

#### 4.2.2.1 Pedestrian / Cycleway Connectivity

Pedestrian connectivity is provided through the campus via a network of pathways and open spaces.

Dedicated cycleway connectivity is not proposed through the campus.

#### 4.2.2.2 Public Transportation

An existing bus drop off zone within the campus, accessed from the main Barker Road entrance, will be maintained.

## 4.3 Site Grading

The site grading around the proposed buildings and upgraded open spaces is largely constrained by existing roads and buildings in and around the campus. Local amendments to site grading will consider and incorporate suitable overland flow provision away from buildings and through the site. Grading will also need to consider any necessary freeboard provision to the proposed buildings.

The large underground carpark proposed at the north-western corner of the campus will be graded at a minimum of 1%, with the levels of the existing playing fields above to be generally maintained once reconstructed.

Grading of the proposed carpark access roads will need to be carefully considered with respect to level control. It will be necessary to provide freeboard at each end of the road to prevent water ingress to the below ground section. Additionally, potential clashes with existing services will need to be accurately established. Diversion and/or protection measures may be required.

## 4.4 Stormwater Management

### 4.4.1 Water Quality Management Objectives

Strathfield Council DCP (Part N): WSUD specifies water quality objectives for new developments and redevelopments as shown in Table 4.1 below.

Table 4.1: Water Quality Objectives

| Pollutant | Treatment Objective |
|---|---|
| Gross Pollutants | 90% reduction in the post development mean annual load of total gross pollutant greater than 5mm |
| Total Suspended Solids | 85% reduction in the post development mean annual load of total suspended solids |
| Total Phosphorus | 60% reduction in the post development mean annual load of total phosphorus |
| Total Nitrogen | 45% reduction in the post development mean annual load of total nitrogen |

Source: Strathfield Council DCP (Part N): WSUD, Strathfield Council. 2010.

Most of these requirements are typical water quality targets; however, the target for phosphorus of 60% reduction is greater than standard practice and may result in the need for additional water quality treatment measures to achieve this target.

It is considered that given the nature of the proposed development, Gross Pollutant Traps (GPTs) at the site discharge points would be provided to meet the above objectives, however, the ability of the respective proprietary products to meet the required criteria would need to be assessed in greater detail as part of the future design process.

The DCP states that WSUD is to be applied to:

*"All alterations and additions to existing commercial, retail, mixed use and industrial development with a total site area greater than 2000m$^2$, which results in increase in building footprint or gross floor area of greater than 50%. WSUD is to be applied to the whole site.*

The proposed increase in building floor area is in the order of 39%, therefore based on the above, WSUD is not required to be retrofitted across the whole site.

Further, the DCP states that WSUD is to be applied to :

*"Any development which involves the construction or designation of 10 or more additional car parking spaces, whether the spaces be covered or uncovered."*

Greater than 10 additional carparking spaces are proposed, therefore, on this basis, WSUD will be required within those catchments/discharge points where additional carparking is proposed. This is considered potentially relevant to all catchments within the site.

### 4.4.2 Water Quantity Management Objectives

Council's Stormwater Management Code (1994) states that;

*"Council's OSD requirements have been formulated to ensure there is no increase in discharges adjacent to the site or elsewhere in the catchment for all rainfall events through to 100 years ARI"*

and further that,

*"OSD will be required for all developments / building works where the proposed increased paved and/or roofed areas exceed 100m$^2$"*

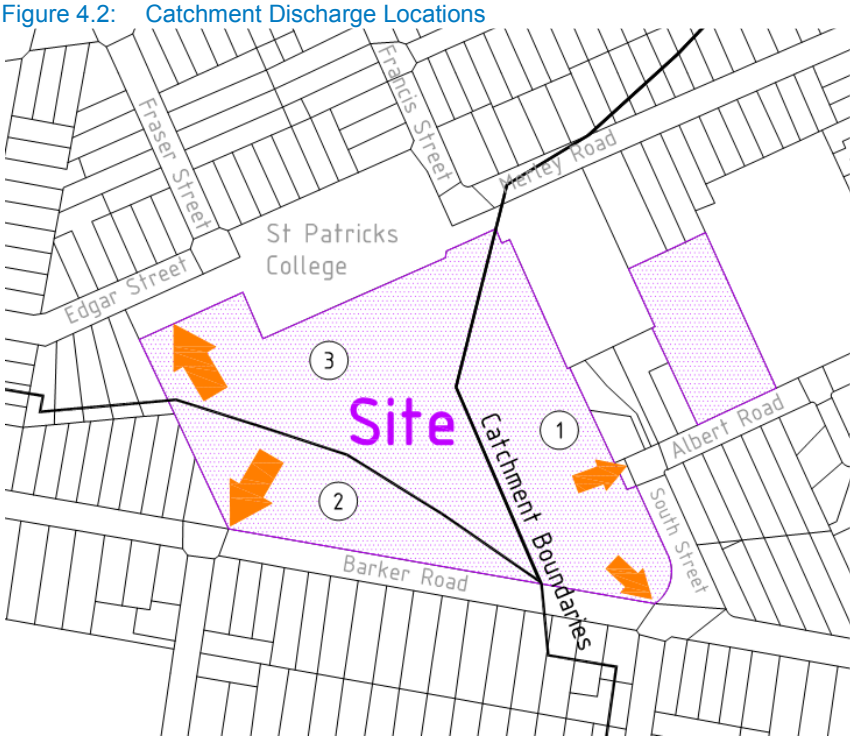
Requirements for water quantity management facilities (On-site Stormwater Detention (OSD)) must be determined on a catchment basis. There are three (3) discrete stormwater discharge points for this site as indicated in Figure 4.2 below.

Catchment (1), as notated in Figure 4.2, has two points of discharge. The majority of the catchment discharges to the northern point along Albert Road while the south-western corner of the site discharges to Barker Road at the eastern boundary of the site. Proposed development within this catchment is in the form of 3no. buildings to be placed typically over existing on-grade carparks. There will not be an increase in impervious area exceeding 100m$^2$ and as such, detention may not be required.

Development within Catchment (2) consists of proposed buildings over an existing on-grade carpark. The increase in impervious area within this catchment will not exceed 100m$^2$, therefore detention may not be required. Where detention is required, it is considered that it may be possible to incorporate this in the proposed driveway reserve in the form of an underground tank or within the proposed building.

Catchment (3) will have an increase in impervious area as a result of the proposed access roads to the carpark at the north-western corner. The increase in impervious area may not be greater than 100m$^2$. Where the area increase is determined to be over 100m$^2$, a below ground tank and proprietary water quality management device may be used to address water management requirements. The point and route of discharge, whether to Francis Street or to the west towards Edgar Street will need to be assessed as part of the future design process.

Figure 4.2: Catchment Discharge Locations




### 4.4.3 Freeboard

Freeboard is a factor of safety above a given flood level (usually 100 year Average Recurrence Interval (ARI)) above which building floor levels and basement entries must be situated.

Council's requirements specify building floor levels must have a minimum freeboard of 0.15m to surrounding ground levels where no significant overland flow occurs. Greater requirements apply where buildings are proposed adjacent to mainstream or channel flows, however, this is not considered applicable to this site. Similar requirements are likely to be required for entries to basement carparks, including to the underground access road to the proposed carpark. This may be achieved by ramping up to a crest prior to ramping down to the access road.

Additionally, non-habitable and habitable floor levels must be 0.15m and 0.3m above the top water level of OSD storages respectively.

## 4.5 Sustainability

### 4.5.1 Water Sensitive Urban Design

WSUD measures are a requirement of the DCP, and are a requirement of the proposed development on this site, as discussed in Section 4.4.1. It is considered that there may be an opportunity to implement WSUD principles into the design of the water management philosophy for the proposed carpark and other landscaped areas within the site.

### 4.5.2 Water Conservation and Re-use

Owing to the large playing fields at the north of the site, there is likely to be a high demand for water for irrigation. It is considered that the proposed building developments provided an opportunity to meet some of the demand for this water requirement. Consideration of the incorporation of rainwater harvesting tanks in each of the proposed building developments should be considered as part of the future design process. Harvested water could also be used to meet other non-potable end-uses such as toilet flushing and laundry.

While water from the proposed carpark could potentially be harvested for re-use, a greater level of treatment would be required than for building roofwater.

Other water conservation strategies such as blackwater reuse and sewer mining could be considered, however, are generally more suited to developments of a larger scale.

## 4.6 Proposed Utility Services

### 4.6.1 Water Supply

#### 4.6.1.1 Proposed Site Servicing

The site will maintain its existing point of connection to the Sydney Water main in Barker Road. Connections to the proposed developments within the site will need to be extended from the existing campus reticulation system.

A Section 73 Feasibility Notice of Requirements has been received from Sydney Water. The notice indicates that the site can be adequately serviced from the existing 200mm main running along Barker Road. The Feasibility Notice of Requirements is attached as Appendix B to this report.

### 4.6.2 Sewerage

#### 4.6.2.1 Proposed Site Servicing

The three proposed development precincts each discharge to different sewer systems, based on their positions within their respective catchments.

The proposed south-western precinct corner of the site will discharge to the existing 225mm sewer in Barker Road, which continues in a southerly direction adjacent to Wilson Street.

The proposed south-eastern precinct of the main campus will discharge to the existing 225mm main in Barker Road, which runs easterly along Barker Road prior to turning north approximately 200m beyond the site boundary.

The proposed north-eastern development precinct of the campus will discharge to the existing 225mm sewer running east around the Clancy Building campus and connecting into the north running sewer described above. An existing sewer main runs through the proposed north eastern precinct. This is believed to service existing buildings within the catchment – this service will need to be maintained while the proposed building is developed. The preferred option to address this is to construct a new permanent sewer around the proposed development site to allow the conflicting sewer to be removed. The feasibility of this is dependent upon the ability to achieve a gravity connection to the sewer invert level at the boundary connection point and will need to be co-ordinated with the proposed access road.

A Section 73 Feasibility Notice of Requirements has been received from Sydney Water. The notice indicates that the development can be adequately serviced from the existing mains described above. The Feasibility Notice of Requirements is attached as Appendix B to this report.

### 4.6.3 Gas

Proposed gas services (if required) would reticulate from the existing service point off Albert Road or from a new connection off Albert Road or Barker Road to the main campus. The existing site survey does not indicate any existing gas service within the main campus.

### 4.6.4 Electricity

It is anticipated that the proposed buildings would be serviced from the existing substations within the site. An assessment of the capacity of the substations to services the increased development load will need to

be undertaken as part of the future design process. Where additional capacity is required, options including the upgrading of the existing substations and the provision of a new substation/s will need to be considered.

### 4.6.5 Telecommunications

It is anticipated that the proposed developments would tie into the existing campus telecommunications network and the existing connections into Barker Road would be maintained.

The existing Aarnet optical fibre running through the campus from Albert Road will need to be maintained and protected during any development works. This service will need to be accurately located in the design process of the proposed access road.

### 4.6.6 Services Easements

Existing easements, as indicated in Section 3.4.4, will need to be incorporated in the proposed development planning or removed where no longer relevant/required. Any proposed authority services through the campus will require an easement – it is not believed any significant authority services are proposed within the campus area.

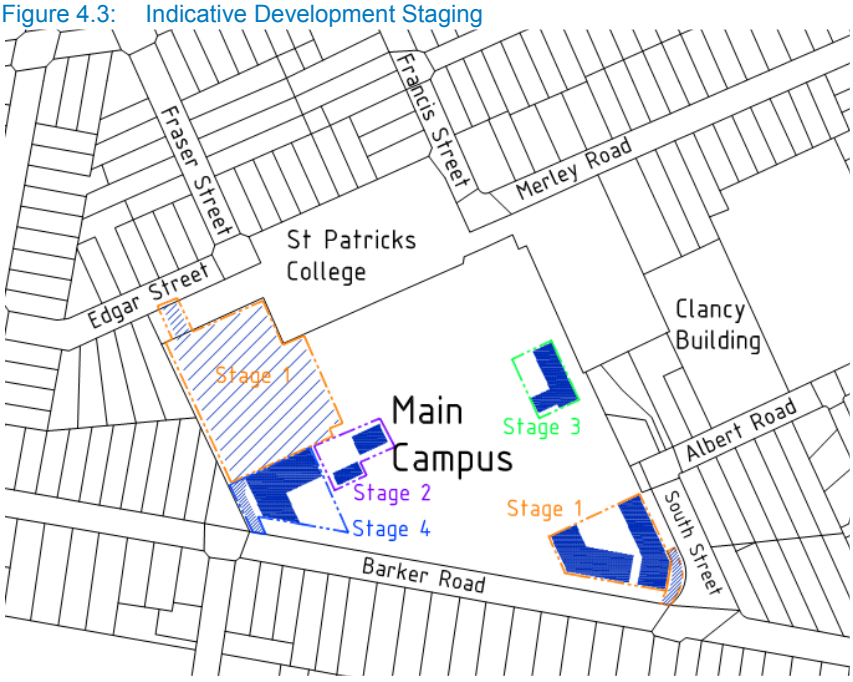
It will be necessary to provide a stormwater connection and overland flowpath through the downstream property to the north of the campus to manage flows from the proposed carpark. An easement may be required through the property (and the north of the campus) to ensure this function is protected.

## 4.7 Staging

### 4.7.1 Infrastructure Dependencies

The provision of infrastructure for the proposed development will be linked to the development staging. Refer to Figure 4.3 below for details of the indicative staging strategy.

Figure 4.3: Indicative Development Staging




The initial stage of work proposed consists of the north-western underground carpark, including the access road from Edgar Street and the south-eastern development precinct. The second stage of work will be the central precinct. This stage will be followed by the eastern development precinct and the western development precincts respectively. It is considered that where there are interfacing development stages, the requirements of the latter stage must be considered in the design and planning of the former stage. Where internal campus upgrades of infrastructure are required (e.g. substations, if applicable), these will be undertaken when the population/demand increase from the relevant stage triggers this requirement.

# 5. Infrastructure Issues Matrix

Table 5.1: Matrix of Infrastructure Issues

| Item | Ref. Section | Issue | Comment | Risk/Action |
|---|---|---|---|---|
| **1** | | **Base Information** | | |
| 1.1 | 1.4 | Survey Information | Underground Survey Required | The existing detail level survey does not show underground services within and around the campus. These will need to be accurately located to ensure they are not affected by proposed building works and where any connections or amplifications are proposed. Services must be located in line and level. |
| **2** | | **Site Constraints** | | |
| 2.1 | 3.1, 3.4.2 | Flooding | Local Flooding | The site sits at the top of two catchments (Cooks River and Powells Creek) and is not believed to be affected by major regional flooding. The site is not indicated by Council as flood affected. Local flooding (as with any site) will need to be managed through the provision of unobstructed overland flowpaths and appropriate freeboard and building level controls. |
| 2.2 | 3.3, 3.4.3 | Existing Services | Continuity of Service | Existing services throughout the campus will need to be maintained during future development works to ensure continuity of supply to existing buildings. Services will need to be located and protected during construction. |
| 2.3 | 3.4.4 | Easements | Existing Easements | A number of easements are relevant to the site. These may form constraints around which the development planning must progress. |
| **3** | | **Infrastructure Requirements** | | |
| 3.1 | 3.2.4 | Transport | Existing Intersections | The existing 3no. accesses off Barker Road and gated access off Albert Road are to be maintained in their present states. The access road from the Albert Road entrance will become a pedestrian only zone, however, it is envisaged that the driveway crossing will be maintained for emergency access. |
| 3.2 | 4.2 | | Proposed Intersections | It is proposed to reconfigure the existing signalised intersection of Barker Road/South Street to incorporate the proposed access road. An additional driveway access is proposed off Barker Road at the western edge of the campus to provide access to the western development. |
| 3.3 | 4.4.2 | Water Quantity Management | Detention Requirements | Water quantity management requirements need to be considered on a catchment-by-catchment basis. Detention may be required to ensure post-development flows do not exceed pre-development flows. |
| 3.4 | 4.4.1, 4.5.1 | Water Quality Management | Water Quality Targets | Strathfield Council specifies strict water quality requirements for new and redevelopments. Water quality management facilities will be required at each site discharge point to address these |

| Item | Ref. Section | Issue | Comment | Risk/Action |
|---|---|---|---|---|
| | | | | requirements. |
| 3.5 | 3.3.1, 4.6.1 | Water Supply | Capacity & Connection Locations | Existing Sydney Water services reticulate along the roads adjacent to the development site. The existing site connection point will be maintained to service the proposed development. |
| 3.6 | 3.3.2, 4.6.2 | Sewerage | Capacity & Discharge Locations | Existing Sydney Water sewerage mains collect sewage flows at discrete points for each site catchment. The proposed development discharge points will be defined by their respective catchment's discharge point. |
| 3.7 | 3.3.4, 4.6.4 | Electricity | Existing Substations & Supply | Ausgrid distribution mains service 2no. substations within the main campus, from which the campus buildings and future development will be supplied. The capacity of the existing substations to service future development will need to be further assessed. |
| 3.8 | 3.3.3, 4.6.5 | Telecomms. | Provision of Services | Existing telecommunications services run along the roads adjacent to the site. Service connections are provided off Barker Road. It is envisaged that the proposed development will utilise the existing campus connection points. |
| 3.9 | 3.3.5, 4.6.3 | Gas | Provision of Services | Jemena supplies gas to the site via mains along Barker Road, South Street and Albert Road. An existing gas supply point is located on the Clancy Building Campus off Albert Road. |

# 6. References


- Strathfield Council (1994), Stormwater Management Code
- Strathfield Council (2010), Strathfield Council Development Control Plan (Part N): WSUD
- Strathfield Council (2007), Part M of Strathfield Consolidated Development Control Plan 2005
- Sydney Water Corporation (2005), Sydney Water Stormwater Catchments
- Strathfield Council (2008), Draft Strathfield Local Environmental Plan 2003
- NSW Government (2005), NSW Floodplain Development Manual

# Appendices

# Appendix A. Masterplan Drawings

## Drawing List

294464C-MP01 Cover Sheet

-MP02 General Arrangement Plan

-MP03 Constraints & Opportunities Plan

-MP04 Concept Level Control Plan

-MP05 Concept Sediment and Erosion Control Plan

-MP06 Concept Water Management Strategy Plan

-MP07 Regional Hydrology Plan

-MP08 Concept Water Servicing Strategy Plan

-MP09 Concept Sewer Servicing Strategy Plan

-MP10 Concept Electrical, Telecommunications & Gas Servicing Strategy Plan

# Appendix B. Sydney Water Feasibility Notice of Requirements

Case Number: 124968

21 September 2011

AUSTRALIAN CATHOLIC UNIVERSITY
c/- MOTT MACDONALD HUGHES TRUEMAN

**FEASIBILITY LETTER**

| | |
|---|---|
| **Developer:** | **AUSTRALIAN CATHOLIC UNIVERSITY** |
| **Your reference:** | **294464** |
| **Development:** | **Lot 11 DP869042 179 ALBERT RD, Strathfield** |
| **Development Description:** | **Development of new university buildings. Please refer to attached cover letter and plan.** |
| **Your application date:** | **28 June 2011** |

Dear Applicant

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

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

Sydney Water will then send you either a:

- Notice of Requirements (Notice) and Works Agreement (Agreement); or
- Certificate.

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

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

- if you change your proposed development, e.g. the development description or the plan/ site layout, after today, the requirements in this Letter could change when you submit your new application; and
- if you decide to do your development in stages then you must submit a new application (and pay another application fee) for each stage.

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

To get a Section 73 Certificate you must do the following things. You can also find out about this process by visiting www.sydneywater.com.au > Building and Developing > Developing Your Land.

1. **Obtain Development Consent from the consent authority for your development proposal.**

2. **Engage a Water Servicing Coordinator (Coordinator).**

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

   For a list of authorised Coordinators, either visit www.sydneywater.com.au > Building and Developing > Developing Your Land or call **13 20 92.**

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

3. **Works Agreements**

   It would appear that your feasibility application is served from existing mains and does not require any works to be constructed at this time. Sydney Water will confirm this with you after you have received Development Approval from Council and your Coordinator has submitted a new Development application and Sydney Water has issued you with a formal Notice of Requirements.

4. **Water and Sewer Works**

   **4.1 Water**

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

   Sydney Water has assessed your application and found that:

   § The drinking water main available for connection is the 200mm main on the Southern side of Barker Road

### 4.2 Sewer

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

Sydney Water has assessed your application and found that:
The current wastewater system does have sufficient capacity to serve the proposed development.

- An extension of the wastewater system may be required to service the proposed buildings in the South Western corner of the Lot.
- If required this extension will be designed from the 225 mm wastewater main constructed under Cont 2603 located in Barker Road, which will provide an additional point of connection at least 1m inside the property's boundary.
- The above wastewater infrastructure for this development will be sized & configured according to the Sewerage Code of Australia (Sydney Water Edition WSA 02-2002).
- The proposed buildings in the South Eastern corner of the Lot can connect to the existing 225 mm wastewater main constructed under Cont 390 located inside the applicants boundary.
- The proposed buildings to be located in the centre of the lot on the eastern boundary can connect to the existing 225mm wastewater main constructed under Cont 390 traversing the property.
- The proposed development conflicts with the location of the 225mm wastewater main constructed under Cont 390 traversing the property.
- **A wastewater deviation may be required. Any adjustment or deviation required must be in accordance with the Sewerage Code of Australia (Sydney Water Edition WSA 02-2009). Refer to your WSC for details of requirements.**

## 5. Ancillary Matters

### 5.1 Asset adjustments

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

### 5.2 Entry onto neighbouring property

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

## 6. Stamping and Approval of your Building Plans

You must have your building plans stamped and approved **before the Certificate can be issued. Building construction work MUST NOT commence until Sydney Water has granted approval.** Approval is needed because construction/building works may affect Sydney Water's assets (e.g. water and sewer mains).

Your Coordinator can tell you about the approval process including:

- Your provision, if required, of a "Services Protection Report" (also known as a "pegout"). This is needed to check whether the building and engineering plans show accurately where Sydney Water's assets are located in relation to your proposed building work. Your Coordinator will then either approve the plans or make requirements to protect those assets before approving the plans;
- Possible requirements;
- Costs; and
- Timeframes.

You can also find information about this process (including technical specifications) if you either:

- visit www.sydneywater.com.au > Building and Developing > Building and Renovating. Here you can find Sydney Water's *Guidelines for Building Over/Adjacent to Sydney Water Assets*; or
- call 13 20 92.

**Notes:**

- **The Certificate will not be issued until the plans have been approved and, if required, Sydney Water's assets are altered or deviated;**
- **You can only remove, deviate or replace any of Sydney Water's pipes using temporary pipework if you have written approval from Sydney Water's Urban Growth Business. You must engage your Coordinator to arrange this approval; and**
- **You must obtain our written approval before you do any work on Sydney Water's systems. Sydney Water will take action to have work stopped on the site if you do not have that approval. We will apply Section 44 of the *Sydney Water Act 1994*.**

## OTHER THINGS YOU MAY NEED TO DO

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

### Disused Sewerage Service Sealing

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

### Soffit Requirements

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

### Trade Waste Information

Should this development generate trade wastewater, this notice of requirements does not guarantee the applicant that Sydney Water will accept the trade wastewater to its sewerage system. In the event trade wastewater is generated, the property owner is required to submit an application for permission to discharge trade wastewater to the sewerage system before business activities commence. A boundary trap will be required where arrestors and special units are installed for trade waste pre-treatment.

If this development type is "Industrial" then the property may be part of sewerage catchment subject to a wastewater reuse scheme. This may impact the level of pollutants such as Total Dissolved Solids (TDS) that Sydney Water will accept from the property to the sewerage system. Businesses wishing to discharge wastewater (other than domestic sewage) should first contact a Sydney Water Trade Waste Office. A boundary trap will be required where arrestors and special units are installed for trade wast pre-treatment.

Prospective Purchasers should be made aware of the above situation under the requirements of vendor disclosure.

For further information please visit the Sydney Water website at: http:// www.sydneywater.com.au/OurSystemsandOperations/TradeWaste/

To contact a Trade Waste Customer Service Representative please see below for Local Government Areas and their relevant contact number.

**For the following LGA's the contact number for a Trade Waste Customer Representative is 02 9694 6500:**

Ashfield, Bankstown, Botany Bay, Burwood, Camden, Campbelltown, Canada Bay, Canterbury, Fairfield, Hurstville, Kiama, Kogarah, Leichhardt, Liverpool, Marrickville, Randwick, Rockdale, Shellharbour, Strathfield, Sutherland, Wingecarribee, Wollondilly, Wollongong

## Backflow Prevention Information

In accordance with Sydney Water's Backflow Prevention Containment Policy, you must install a backflow prevention containment device immediately downstream of each master water meter/s servicing the property. In circumstances where there is no master meter/s the containment device shall be installed on the water supply entering the property boundary.

The device is to be installed on all water supplies entering the property, regardless of the supply type or metering arrangements. It is needed to reduce the risk of contamination by backflow from these supplies.

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

The device must be installed as a condition of continued use of the water supply. Failure to install and maintain the device may result in disconnection of the water service. A licensed plumber with backflow accreditation can advise you of the correct requirements for your property. To view a copy of Sydney Water's Backflow Prevention Policy and a list of backflow accredited plumbers visit http://www.sydneywater.com.au/Plumbing/BackflowPrevention/

## Fire Fighting

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

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

**Large Water Service Connection**

The existing development is connected to Sydney Water's watermain system via two standard water meters. Should the new development require a larger connection/s you will need to get approval from Sydney Water.

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

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

You will have to pay an application fee.

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

**Disused Water Service Sealing**

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

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

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

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

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**END**