MEMORANDUM

Document Type:	Technical Memorandum – Final
To:	Justin Micallef, Oakstand
From:	Anna Nagalingam / Karl Martin
Date:	Monday, 29 March 2021
Project Number:	7790
Project Name:	Forestry Place
SUBJECT:	**TECHNICAL ADVICE – Hydraulic Servicing Strategy**

INTRODUCTION

Indesco has been engaged by Oakstand to provide Civil Engineering pre-DA services for Forestry Place. The site is Block 7 Section 4 Yarralumla, ACT, bounded to the east by Wilf Crane Crescent and Banks Street, and to the west by the Royal Canberra Golf Course. Bentham Street is located to the south and Westridge House to the north. The site is approximately 11 Ha and is a former Commonwealth Scientific Industrial Research Organisation (CSIRO) site. There are several heritage buildings on the site and there are large areas with established trees.

The current development proposal is for up to 300 dwellings in a residential and mixed-use development. The development intent will be to retain the existing tree planting and heritage buildings. Wilf Crane Crescent will be gazetted as a public road and excised from the site boundary. Subdivision of the site will result in 6-8 separate blocks being created.

PLANNING

The site is located on designated land and subject to the requirements of the National Capital Plan (NCP). The National Capital Authority (NCA) administer the NCP and will require consultation and clearance with the ACT Government on civil infrastructure elements including:

- Roads;
- Stormwater;
- Street lighting;
- Car parking;
- Street trees/verges;
- Paths;
- Waste Management; and
- Line marking and Road Signage.

The relevant ACT Government agency is Transport Canberra and City Services (TCCS). Civil infrastructure assets within Federal land are maintained through a managing contractor arrangement; however, TCCS design standards and technical specifications typically apply as a benchmark for civil infrastructure within NCA areas.

Icon Water are the responsible authority for all water supply and sewer assets in the ACT.

STORMWATER

There is a ridge running through the site, with the eastern catchment falling to the east towards Banks Street and the western catchment falling west towards the golf course. Both catchments ultimately drain north to Lake Burley Griffin.

A stormwater masterplan is currently being prepared to support the site masterplan. The stormwater strategy will include piping the minor storm event (20% AEP) to the existing stormwater network. The site will be graded to prevent flood impact from the major storm event (1% AEP) on existing and future buildings. Water Sensitive Urban Design strategies will be adopted to ensure that the existing peak discharge from the pipe network does not exceed pre-development conditions. Opportunities for onsite stormwater reuse will also be proposed.

The north western portion of the site sits significantly lower than the central ridge which will provide some challenges in stormwater and sewer servicing to Area C of the development. This is likely to result in deeper than typical pipework and an increased construction cost for this work.

WATER SENSITIVE URBAN DESIGN

Compliance with the ACT Water Sensitive Urban Design (WSUD) General Code will requires a series of measures to be undertaken including:

- On Site Detention - Limiting peak discharge flow rates from site to pre development levels,
- On Site Retention – capture and on site reuse of a portion of stormwater received,
- Stormwater Quality – reduction of gross pollutants, suspended solids, phosphorus, and nitrogen level of stormwater discharged,
- Reduction of mains water consumption – Use of efficient fixtures and appliances as well as sustainable landscape treatments and stormwater reuse to limit consumption of potable water,

On Site Retention

The WSUD General Code Rule 2.1 in summary requires that for every 100m^2 of site impervious area 1.4kL of onsite stormwater retention storage (OSR) must be provided on site. This storage must be retained and reuse on site for purposes such as irrigation or toilet flushing.

Preliminary calculations based on the current architectural master plans are provided in Table 1.

On Site Detention

The WSUD General Code Rule 2.2 in summary requires that for every 100m^2 of site impervious area 1.0kL of on-site stormwater detention (OSD) is provided. This volume is required to be captured and released over a period of 6 hours following the storm event. It is noted however that 50% of the retention volume may also be counted as stormwater detention if this water is reused on site. As such the reduced detention volume can be adopted.

Preliminary calculations are provided in Table 1.

Table 1. OSD and OSR volume requirements

Block / Zone	Impervious Area (Estimated)	OSR (m3)	OSD (m3)	OSD (Reduced by 50% OSR)	Total Storage OSR + OSD
A	9600	134	96	29	163
B	7200	101	72	22	123
C	13600	190	136	41	231
D	6400	90	64	19	109

Stormwater Quality

The WSUD General Code Rule 3.1 requires reduction of pollutant volumes in discharged stormwater as per the following targets:

a) gross pollutants by at least 90%
b) suspended solids by at least 60%
c) total phosphorous by at least 45%
d) total nitrogen by at least 40%.

Stormwater quality modelling has been undertaken using Music software and found that the site can achieve the above requirements by utilising a large volume of captured stormwater for site irrigation. Irrigation has been assumed to apply to 50% of all landscaped areas at a rate of 1.4mm / day.

This is expected to be the most cost-effective solution as well as providing the added benefit to landscaping quality.

Mains Water Reduction

The WSUD General Code Rule 1 requires the development to achieve a minimum 40% reduction in mains water consumption compared to an equivalent development constructed in 2003.

Compliance with this requirement is able to be met through a commitment to use of commonly available water efficient fixtures such as showers toilets and taps, and efficient appliances (dish washers and washing machines). This strategy is to be combined with the stormwater retention and reuse for landscape irrigation to meet the required reduction in mains water consumption at the lowest cost.

CURRENT STORMWATER HARVESTING SCHEMES

Canberra has one neighbourhood-scale stormwater harvesting and managed aquifer recharge system, the Inner North Reticulation Network (INRN). The scheme captures and treats urban stormwater in constructed wetlands before pumping though a reticulation network for irrigation of urban open spaces. Indesco was directly involved in the design and construction of the INRN, which was completed in 2015.

As well as the INRN there are various smaller stormwater harvesting schemes in Canberra including irrigation systems extracting water directly from the major lakes and systems that utilise balancing tanks for customer supply. Customers include Parks and City Services, Education ACT, Sport and Recreation and Non-Government Schools.

POTENTIAL FOR STORMWATER HARVESTING

Harvesting undertaken on TCCS stormwater systems or stormwater landing outside the block boundary is generally subject to an abstraction charge and licensing agreements including a water access entitlement.

Rates applicable in the period July 2020 – June 2021 published on Access Canberra's Water Resources licensing fees and charges schedule are as follows:

- water supplied through the urban water supply network - $0.631 per kilolitre
- water taken from surface water or groundwater - $0.305 per kilolitre

Water harvested within the block and used on site for irrigation or other purposes does attract an abstraction charge or licensing requirements due to an exemption under the 2007 Water Resources Regulation clause 6-1-a.

> **6 Exemptions from requirement for licence to take water—Act, s 28 (2) (e)**
>
> (1) On application, the authority may, by written notice given to a person, exempt the person from the requirement to hold a licence to take water for any of the following:
>
> (a) the taking of water from hard surfaces at premises if it is to be used at the premises;
>
> **Example**
>
> rainwater that falls on the surface of a car park at premises could be collected into a small pond and used to irrigate part of the premises

As the wording of the clause notes specifically the taking of water from hard surfaces if it is to be used **at the premises** ACT Health has been contacted for further clarification.

Heath Chester from ACT Health has provided written confirmation that water harvested from hard surfaces on the site and sold to a neighbouring block could be undertaken as a private arrangement with the neighbouring landowner and would not compromise the exemption to licensing or charges. A copy of this correspondence has been attached.

SEWER

There are currently two DN150 sewer ties to the site that drain east towards a trunk DN375 sewer main located adjacent to Yarralumla Creek. The trunk main discharges to the Main Outfall Sewer on the south side of Lake Burley Griffin.

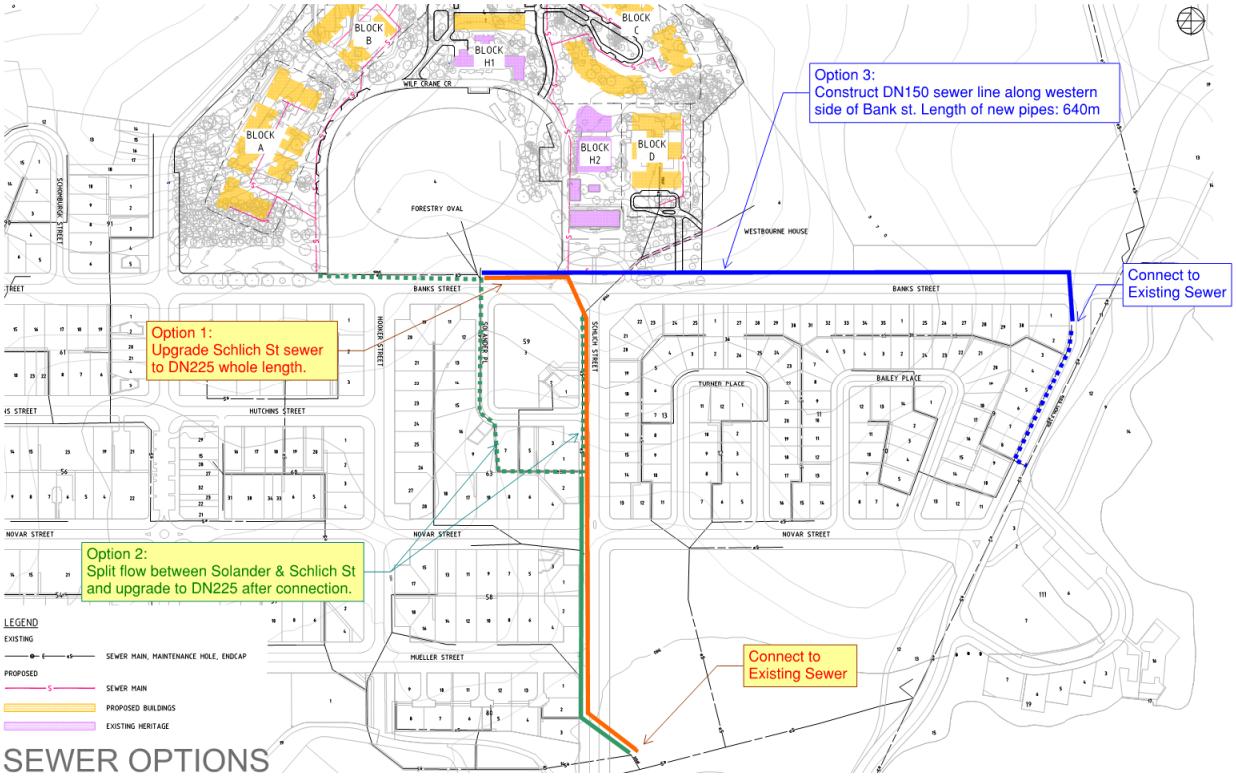
Icon Water have previously advised that the existing sewer network does not have capacity for the increased flow from the development. This advice was based on a previous development scheme for ~250 dwellings. The advice and augmentation options discussed below are still valid for a development scheme of up to 300 dwellings.

Three potential options have been identified for the required offsite augmentation work as follows:

1. Directing all flow from the site to the existing sewer network on Schlich St. This option will require the following works:
    a. Additional sewer to be constructed in Banks Street.
    b. Utilise the existing DN150 sewer between Banks St and Section 63 Block 2.
    c. Upgrade of the existing sewer to DN225 downstream of Section 63 Block 2.

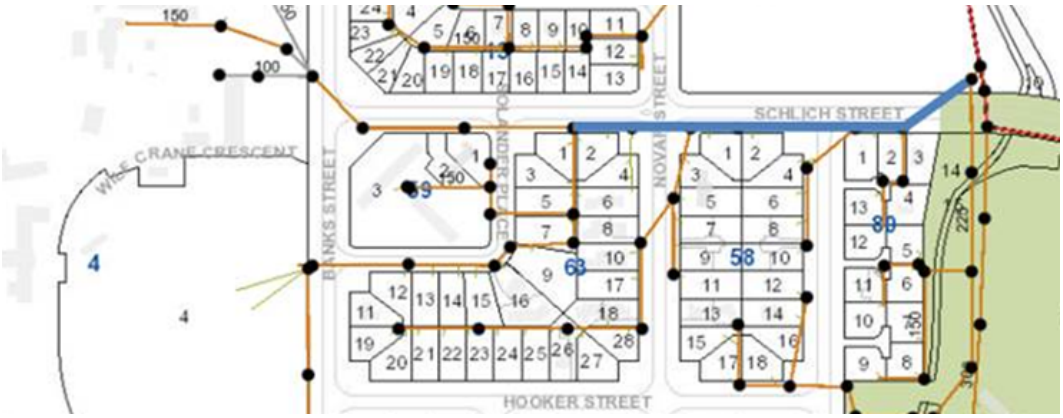
2. Distributing the generated sewer flow between the sewer connections on Solander Place and Schlich Street. This option will require upgrade of the existing sewer to DN225 downstream of Section 63 Block 2.

3. Construction of a new sewer along Banks Street from the site to Brown Street to the north approximately 540m.



Icon Water have advised that they do not support option 3 due to the nature of works required to modify the connection to the main outfall sewer, citing high construction cost, maintenance and odour issues in the future as the key issues. As such this option has not been considered further.

Advice from Icon Water noted that options 1 and 2 are permissible provided the section of existing DN150 sewer network on Schlich Street downstream of Section 63 Block 2 is upgraded to the downstream DN225 connection point.



Option 2 requires less construction of sewer assets compared with Option 1 due to a reduced extent of work on Banks St and provides equivalent flexibility for future servicing. As such **Option 2** is the recommended option, refer to drawings 7790-060, and 7790-061 for details. The upgrade of existing sewer within Schlich St is in close proximity to existing high value street trees and is likely to require alternative construction methodologies such as pipe bursting to protect these trees.

CURRENT SEWER HARVESTING SCHEMES

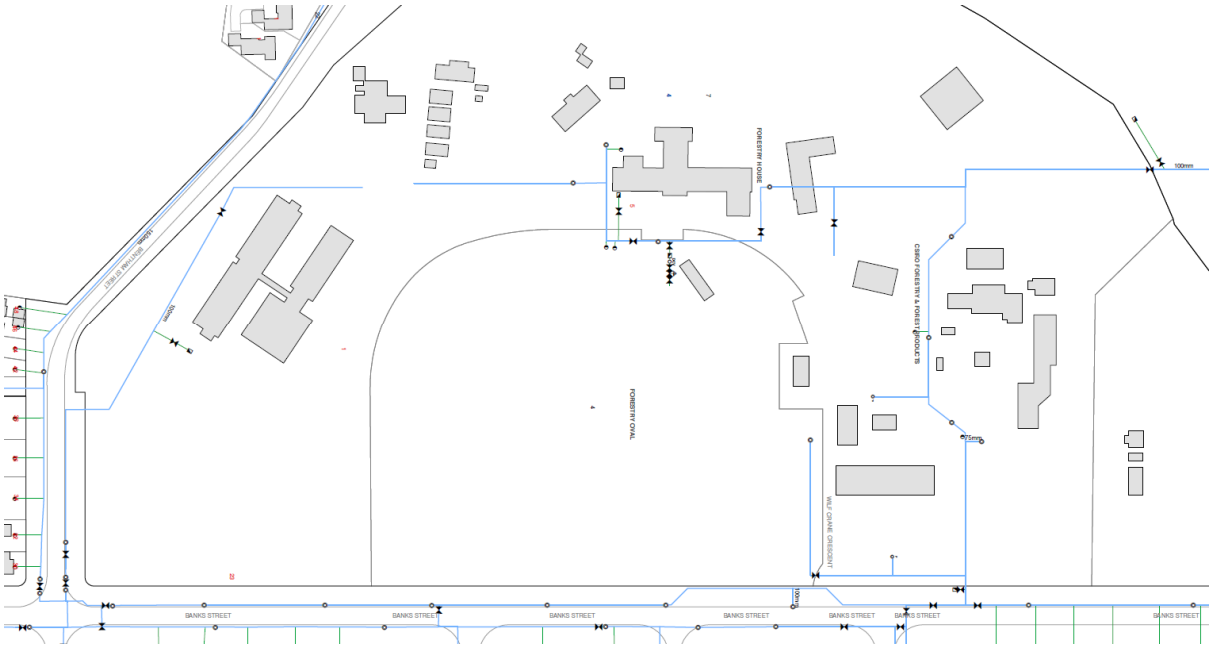
Canberra has two sewage treatment plants, the Lower Molonglo Water Quality Control Centre (LMWQCC) and the Fyshwick sewage treatment plant. The LMWQCC is the primary facility, providing tertiary treatment of 95% of Canberra's wastewater. A third facility, a small sewer mining scheme at Southwell Park was trialled, but was found not to be economically viable, when compared to accessing recycled water from the larger facilities and has since been decommissioned.

Sewer mining is not supported as there is no facility that will accept solids discharge.

WATER SUPPLY

Water mains in the vicinity of the site are located as follows:

- Both verges of Banks Street (DN150 and DN100),
- Bentham Crescent (DN100).
- Within Section 4 Block 7 spanning north south and connecting to Yarralumla Section 119 Block 2 (Golf Course) DN100.



Icon Water have advised that the existing DN100 water supply main located within the site does not have sufficient capacity to provide the fire protection flows required for the development. The alignment of the existing DN100 main also conflicts with buildings proposed in the development.

It is proposed that a new DN150 ring main is constructed in the verge of Wilf Crane Cr with connections at each end to the DN150 main in the western verge of Banks St. The DN150 ring main will provide service connections to all new blocks, and connections to retain services for existing buildings and irrigation supplies.

The DN100 main currently located within the site is to be removed and the connection to the neighbouring golf course realigned to a suitable location near the edge of Block C to limit encumbrance on the site.

WATER SUPPLY CAPACITY

Icon Water have provided pressure data within the existing Banks St water mains for development flows ranging from 0-70lps to allow water pressure modelling within the block.

Modelling of the site has been undertaken for a peak demand scenario (6.7lps) and for a fire fighting scenario based on fire category F5 requirements – (45lps flow rate on top of peak demand), applicable to residential developments greater than one self contained unit high such as apartments. Icon Water table IW8 notes the minimum requirements for a development classified F5 Fire Risk.

Table IW.8 Fire Risk Types and Hydrant Spacing

Fire Risk Type	Minimum Firefighting Flow Provision (l/s)	Fire Hydrant Spacing
F1 **F2** **F3**	200 150 100	Two (2) DN80 spring hydrants together shall be located as close as possible to the end of each cul-de-sac and at 135 metre intervals along the main interspersed with one (1) DN80 spring hydrant at 45 metre intervals.
F4	60	Three (3) DN80 spring hydrants together as close as possible to the end of each cul-de-sac and one (1) DN80 spring hydrant at 60 metre intervals along the main.
F5	45	Two (2) DN80 spring hydrants together as close as possible to the end of each cul-de-sac and one (1) DN80 spring hydrant at 60 metre intervals along the main.
F6	25	Mains ≥ DN100: One (1) DN80 spring hydrant as close as possible to the end of each cul-de-sac and one (1) DN80 spring hydrant at 90 metre intervals along the main. Reticulation Mains < DN100: One (1) DN80 spring hydrant on the DN100 main just prior to tapering down to DN63 PE100 pipe and one (1) DN80 spring hydrant at the end of the DN63 PE100 pipe for mains flushing purposes. If there are no other fire hydrants within 150 metres of the end of the cul-de-sac then two (2) DN80 hydrants together shall be provided just prior to tapering down.

Icon Water – Fire Risk Categories

Pressures provided by Icon Water indicate high static pressure availability at the connection points in Banks street exceeding 80m static head. Consideration of the use of pressure limiting devices may be required depending on the final block layout and elevation of water supply fixtures.

Pressures available under peak demand plus a fire flow of 45lps exceed 45m residual pressure at both connection points.

Icon Water's service pressure limits are noted as follows:

Service Pressure Limit	Demand Condition	Static Head (metres)
Maximum	All applications	75
Minimum residual	Peak Hour Demand – for domestic development not exceeding two storeys in height (refer to Notes 1 and 3)	20
	Peak Hour Demand – for domestic development exceeding two stories and for shopping, commercial and industrial developments (refer to Notes 1 and 3)	30
	Peak Hour Demand – for very large blocks such as institutional campuses	Notes 2 & 3
	Firefighting – whilst drawing the specified flow stated in Table IW.2 at points (in the water main) within 150 metres of the fireground, concurrently with Peak Hour Demand flows (refer to Note 3)	10

Icon Water Service Pressure Limits

Pressure modelling has tested peak flow and fire flow conditions at the highest point within the block using pipe roughness coefficients as per Icon Water standards.

The modelling undertaken using Pipes++ software using the provided pressures confirmed that upgrade of the water main within Wilf Crane Cr to 150mm diameter with dual connection points on Banks St is sufficient to service the development in both peak demand and F5 fire flow conditions, refer to the modelling results as follows:

	Peak flow (6.7lps)	**Fire Flow (6.7lps + 45lps)**
Residual pressure at RL 590.750	31.8m	20.8m
Minimum Pressure Required (Greater than 2 storey Residential / commercial)	30m	10m

For details of the required water main upgrade in Wilf Crane Crescent refer drawing 7790-70.

Appendix A – Drawings

REQUIREMENTS OF DETENTION AND RETENTION VOLUME

Block	OSR (m3)	OSD (m3)	Total OSR and OSD
A	134	29	163
B	101	22	122
C	190	41	231
D	90	19	109

NOTE: TANK / ABOVE GROUND BASIN LOCATIONS TO BE CONFIRMED FOR EACH BLOCK

LEGEND

EXISTING

STORMWATER MAIN, MAINTENANCE HOLE, SUMP, ENDCAP, HEADWALL

PROPOSED

STORMWATER MAIN

PROPOSED BUILDINGS

EXISTING HERITAGE

ROYAL CANBERRA GOLF COURSE

BLOCK A

BLOCK B

BLOCK C

BLOCK D

BLOCK H1

BLOCK H2

WILF CRANE CR

CONNECT TO EXISTING STORMWATER

RETAIN EXISTING STORMWATER

FORESTRY OVAL

WESTBOURNE HOUSE

SW EASEMENT TO BE CONFIRMED

CONNECT TO EXISTING STORMWATER

BANKS STREET

SCHOMBURGK STREET

BENTHAM STREET

HUTCHINS STREET

HOOKER STREET

SOLANDER PL

SCHLICH STREET

TURNER PLACE

A1 PLOT 1000 0 10 20 30 40 A3 PLOT 2000 20 10

No.	AMENDMENT	APPROVED	DATE	AMENDED BY
A	FOR COORDINATION	KM	27.11.20	RJ

KANNFINCH

CLIENT: oakstand

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CONSULT AUSTRALIA

APPROVED	A.NAGALINGAM	DATE 27.11.2020
CHECKED	K.MARTIN	DATE 27.11.2020
DESIGNED BY	T.NGUYEN	
DRAWN BY	RJ CHIU	
CAD FILE	H:\7790 1 Wilf Crane Crescent, Yarralumla (CSIRO Yarralumla) - Civil Services\20 Drawings\20.1 Civil\01 Substage 1\01 Current Drawings\7790-050-STORMWATER SERVICE.dwg	
SCALE	AS SHOWN	SHEET No.

PROJECT: FORESTRY PLACE YARRALUMLA SECTION 7 BLOCK 4

DRAWING TITLE: STORMWATER DETAIL PLAN

PROJECT No.	DRAWING No.	AMDT
7790	050	A

LEGEND

EXISTING

SEWER MAIN, MAINTENANCE HOLE, ENDCAP

PROPOSED

SEWER MAIN

PROPOSED BUILDINGS

EXISTING HERITAGE

ROYAL CANBERRA GOLF COURSE

BLOCK A

BLOCK B

BLOCK C

BLOCK D

BLOCK H1

BLOCK H2

WILF CRANE CR

EXISTING SERVICE TIE TO BE CONFIRMED

FORESTRY OVAL

EXISTING SERVICE TIE TO BE CONFIRMED

WESTBOURNE HOUSE

SCHOMBURGK STREET

BANKS STREET

CONNECT TO EXISTING SEWER

ASSUMED EXISTING SEWER AND EASEMENT TO BE CONFIRMED

CONNECT TO EXISTING SEWER

SEWER RUNOFF CALCULATION SHEET

Node	Residential EP	Commercial EP	Total EP	Local NSA (ha)	Total NSA (ha)	ADWF (L/s)	PDWF (L/s)	GWI (L/s)	RDI (L/s)	PWWF (L/s)	Pipe Size (mm)	Grade (%)
A	192	0	192	1.2	1.2	0.4	1.4	0.0	2.0	3.4	150	1.00
B	160	0	160	0.9	0.9	0.3	1.2	0.0	1.6	2.7	150	1.00
C	152	0	152	1.7	1.7	0.3	1.1	0.0	2.1	3.2	150	1.00
D	0	258	258	0.9	0.9	0.5	1.8	0.0	1.1	2.9	150	1.00

A1 PLOT 1000 0 10 20 30 40 2000 A3 PLOT 20 10

No.	AMENDMENT	APPROVED	DATE	AMENDED BY
A	FOR COORDINATION	KM	04.12.20	RJ

KANNFINCH

CLIENT

oakstand

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APPROVED	A.NAGALINGAM	DATE	04.12.2020
CHECKED	K.MARTIN	DATE	04.12.2020
DESIGNED BY	T.NGUYEN		
DRAWN BY	RJ CHIU		

CAD FILE H:\7790 1 Wilf Crane Crescent, Yarralumla (CSIRO Yarralumla) - Civil Services\23 Drawings\20.1 Civil\01 Substage 1\01 Current Drawings\7790-060 SEWER_SERVICE.dwg

SCALE AS SHOWN SHEET No.

PROJECT

FORESTRY PLACE
YARRALUMLA
SECTION 7
BLOCK 4

DRAWING TITLE

SEWER DETAIL PLAN

PROJECT No.	DRAWING No.	AME
7790	060	A

CONNECT TO EXISTING 150Ø SEWER AND UTILISE EXISTING PIPEWORK IN BANKS ST / SOLANDER PL

CONNECT TO EXISTING 150Ø SEWER AND UTILISE EXISTING PIPEWORK IN SCHLICH ST

UPGRADE EXISTING 150Ø SEWER PIPE TO 225Ø FROM SECTION 63 BLOCK 2

THE WORK IS IN CLOSE VICINITY TO HIGH VALUE EXISTING STREET TREES AND MAY TRIGGER THE NEED FOR FOR ALTERNATIVE CONSTRUCTION METHODOLOGIES SUCH AS PIPE BURSTING.

CONNECT TO EXISTING SEWER MANHOLE AND MODIFY TO SUIT

BANKS STREET
BENTHAM STREET
HOOKER STREET
SOLANDER PL
SCHLICH STREET
TURNER PLACE
HUTCHINS STREET
NOVAR STREET
MUELLER STREET

A1 PLOT 1000 20 10 0 10 20 30 40 A3 PLOT 2000

No.	AMENDMENT	APPROVED	DATE	AMENDED BY
A	FOR COORDINATION	KM	04.02.21	RJ

KANNFINCH

CLIENT: oakstand

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APPROVED	A.NAGALINGAM	DATE	04.02.2021
CHECKED	K.MARTIN	DATE	04.02.2021
DESIGNED BY	T.NGUYEN		
DRAWN BY	RJ CHIU		
CAD FILE	H:\7790 1 Wilf Crane Crescent, Yarralumla (CSIRO Yarralumla) - Civil Services\20 Drawings\20.1 Civil\01 Substage 1\01 Current Drawings\7790-000 SEWER DETAILS.dwg		
SCALE	AS SHOWN	SHEET NO.	

PROJECT: FORESTRY PLACE YARRALUMLA SECTION 7 BLOCK 4

DRAWING TITLE: SEWER DETAIL PLAN SHEET 2 OF 2

PROJECT No.	DRAWING No.	AMDT
7790	061	A

LEGEND

EXISTING

WATER MAIN, STOP VALVE, FIRE HYDRANT,

PROPOSED

WATER MAIN, WATER METER

WATER MAIN TO BE REMOVED

PROPOSED BUILDINGS

EXISTING HERITAGE

ROYAL CANBERRA GOLF COURSE

BLOCK B

BLOCK A

BLOCK H1

BLOCK C

BLOCK H2

BLOCK D

WILF CRANE CR

FORESTRY OVAL

WESTBOURNE HOUSE

BANKS STREET

SCHOMBURGK STREET

BENTHAM STREET

HOOKER STREET

SOLANDER PL

SCHLICH STREET

TURNER PLACE

HUTCHINS STREET

CONNECT TO EXISTING Ø100 PIPE

EASEMENT FOR WATER MAIN THROUGH SITE

REMOVE REDUNDANT WATER MAIN FROM SITE

REINSTATE EXISTING SERVICE CONNECTIONS TO NEW WATER MAIN

WATER METER AND INTERNAL WATER RETICULATION TO EACH BLOCK

END CAP

UTILISE EXISTING MAIN FOR SERVICE PENDING CONFIRMATION OF CONDITION AND SUITABILITY

REINSTATE SERVICE FROM NEW MAIN

CONNECT TO EXISTING Ø150 PIPE

CONNECT TO EXISTING Ø150 PIPE

A1 PLOT 1000 0 10 20 30 40 A3 PLOT 2000 20 10

No.	AMENDMENT	APPROVED	DATE	AMENDED BY
A	FOR COORDINATION	KM	04.12.20	RJ

KANNFINCH

CLIENT

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APPROVED	A.NAGALINGAM	DATE	04.12.2020
CHECKED	K.MARTIN	DATE	04.12.2020
DESIGNED BY	T.NGUYEN		
DRAWN BY	RJ CHIU		

CAD FILE H:\7790 1 Wilf Crane Crescent, Yarralumla (CSIRO Yarralumla) - Civil Services\20 Drawings\20.1 Civil\01 Substage 1\01 Current Drawings\7790-070 WATER SERVICE.dwg

SCALE AS SHOWN SHEET NO.

PROJECT

FORESTRY PLACE
YARRALUMLA
SECTION 7
BLOCK 4

DRAWING TITLE

WATER SERVICE PLAN

PROJECT No.	DRAWING No.	AME
7790	070	A

Appendix B – Correspondence

Karl Martin

Subject: FW: Water licensing enquiry

From: Chester, Heath <Heath.Chester@act.gov.au>
Sent: Tuesday, 8 December 2020 5:18 PM
To: Karl Martin <Karl.Martin@indesco.com.au>
Cc: Luong, Tam <Tam.Luong@act.gov.au>
Subject: RE: Water licensing enquiry

OFFICIAL

Hi Karl

Your interpretation is correct

Regards

Heath Chester | Assistant Director, Water Regulation
Phone: +61 2 62075728 MOB: 0419 162 193 | heath.chester@act.gov.au
Office of the Environment Protection Authority |Access Canberra| ACT Government |GPO Box 158 Canberra ACT 2601| http://www.act.gov.au/accesscbr

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From: Karl Martin <Karl.Martin@indesco.com.au>
Sent: Monday, 7 December 2020 9:41 AM
To: Chester, Heath <Heath.Chester@act.gov.au>
Subject: Water licensing enquiry

Hi Heath,

Thanks for your advice, as discussed we're working on behalf of a developer and scoping a new mixed use site in Yarralumla.

The neighbouring land user is a golf course with a high demand for irrigation. Our client is interested in entering a private arrangement whereby the new development captures water from their rooftops and hard surfaces and any excess may be provided or sold to the neighbouring block.

Noting the capture and reuse of rainwater on block would usually be exempt from a licence to take water and the charges associated, we wanted to confirm with you that this arrangement could still be exempt from licencing and charges if the water was sold to the neighbouring block instead of being used on site.

Regards

Karl Martin
Senior Engineer
P: (02) 6285 1022

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Karl Martin

Subject: FW: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

From: Dahal, Nabin <Nabin.Dahal@iconwater.com.au>
Sent: Friday, 18 December 2020 4:39 PM
To: Karl Martin <Karl.Martin@indesco.com.au>
Cc: Tin Nguyen <Tin.Nguyen@indesco.com.au>
Subject: RE: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

Hi Karl,

Response for the enquiry is as follows:

1. Direct connecting to MOS trunk sewer along Banks Street. We preferred not to connect directly to the critical trunk sewer due to the following reasons:
    a. The deep trunk sewer (13m) will require special structure for connection and it is likely to increase the developer's budget dramatically in the detailed design and construction stage.
    b. Connecting directly to the deep trunk sewer may cause maintenance and odour issue in future.

2. The map below has addressed the section of sewer main with hydraulic constraint at Schlich Street. Only this section will require to be upsized to DN225. The connection sewer reticulations have sufficient capacity at

both C1 and C2.

3. Please provide the timeframe about the development

Regards,

Nabin Dahal
Senior Technical Officer, Developer Services
Urban Development Services

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SAFETY ◆ EXCELLENCE ◆ OPENNESS

"Please be advised that any connection applications submitted after 27 November 2020 may not be connected by Icon Water until after 11 January 2021 due to reduced resource availability.
For connections to be completed this year, please therefore ensure that Applications for Provisional Certificate of Operation for completed works are submitted by 27 November 2020 at the latest".

From: Karl Martin <Karl.Martin@indesco.com.au>
Sent: Tuesday, 15 December 2020 9:00 AM
To: Dahal, Nabin <Nabin.Dahal@iconwater.com.au>
Cc: Tin Nguyen <Tin.Nguyen@indesco.com.au>
Subject: RE: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

Hi Nabin,

As discussed yesterday the queries we require further information on are as follows:

1. Sewer upgrades to Schlich St – please confirm what sections of sewer need upgrade on this alignment as it seems strange that the whole line would require upgrade given the relatively small catchment and longitudinal grade of the road
2. Pending the response to question 1 – please confirm if upgrade is required to the whole length of the main in Schlich St can this be reduced by splitting some of the flow into Solander Pl.
3. The existing road grade from the site to Brown St is typically ~2%. Please confirm if upgrades would be required in the existing sewer in Brown St including the connection to the main outfall sewer. If this capacity is exceeded can we utilise the same strategy as "Option 2" and direct ~50% of the flow to Schlich St to offset the need for upgrades.

I've attached an updated markup with the queries in RED. Please let me know if you require any further information.

Regards

Karl Martin
Senior Engineer
P: (02) 6285 1022

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From: Karl Martin
Sent: Friday, 11 December 2020 8:05 AM
To: 'Dahal, Nabin' <Nabin.Dahal@iconwater.com.au>
Cc: Tin Nguyen <Tin.Nguyen@indesco.com.au>
Subject: RE: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

Thanks Nabin,

In the mean time before our meeting Monday please find attached sewer options markup that we'd like to discuss. A couple of specific questions we'd appreciate your input on as follows:

1. Has the pipe grade in Schlich C r been taken into account in the previous advice? At a quick assessment this looks to be in the order of 2.5-3%. We're interested to understand why this section is exceeding limits as the rest of the catchment does not look like it contributes significant flow.
2. Does the upgrade have to occur for the whole of Schlich St – i.e. can we utilise some capacity in Solander Place as shown and upgrade from the junction onwards.
3. Does the existing DN225 at the downstream connection point have capacity or does this need upgrade to DN300 also?
4. Would an alignment on Banks Street as shown (Option 3) be considered? And if so does the existing sewer in Brown St also require upgrade. We are concerned the Schlich St upgrade will have significant tree protection and heritage implications.

Appreciate if we can talk through these issues further on Monday.

Regards

Karl Martin
Senior Engineer
P: (02) 6285 1022

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From: Dahal, Nabin <Nabin.Dahal@iconwater.com.au>
Sent: Thursday, 10 December 2020 5:15 PM
To: Tin Nguyen <Tin.Nguyen@indesco.com.au>
Cc: Karl Martin <Karl.Martin@indesco.com.au>
Subject: RE: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

Hi Tin,

I am waiting for a response . Will advise you once I get it.

Regards,

Nabin Dahal
Senior Technical Officer, Developer Services
Urban Development Services

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"Please be advised that any connection applications submitted after 27 November 2020 may not be connected by Icon Water until after 11 January 2021 due to reduced resource availability.
For connections to be completed this year, please therefore ensure that Applications for Provisional Certificate of Operation for completed works are submitted by 27 November 2020 at the latest".

From: Tin Nguyen <Tin.Nguyen@indesco.com.au>
Sent: Wednesday, 9 December 2020 10:07 AM
To: Dahal, Nabin <Nabin.Dahal@iconwater.com.au>
Cc: Karl Martin <Karl.Martin@indesco.com.au>
Subject: FW: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

Morning Nabin,

Just following up your response for the below email, can you please advise at your earliest convenience?

Thanks.

Tin Nguyen
Civil Engineer
P: (02) 6285 1022

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From: Tin Nguyen
Sent: Thursday, 3 December 2020 9:24 AM
To: 'Dahal, Nabin' <Nabin.Dahal@iconwater.com.au>

Cc: Karl Martin <Karl.Martin@indesco.com.au>; Hydraulic Asset Acceptance <HydraulicAssetAcceptance@iconwater.com.au>
Subject: RE: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

Hi Nabin,

Thanks for your advice.

Please find attached proposed water reticulation including reconstruction of the Wilf Crane Cr loop road water main as 150mm diameter with two connections to the existing DN150 on Banks street. We estimate the peak demand to be 6.7L/s.

Can you please provide us with water main pressures at peak demand and fire flows of 10lps increments upto 45lps, so we can model and check internal pressure for peak demand and fire fighting flows for the development?

Regards,

Tin Nguyen
Civil Engineer
P: (02) 6285 1022

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From: Dahal, Nabin <Nabin.Dahal@iconwater.com.au>
Sent: Wednesday, 25 November 2020 10:55 AM
To: Tin Nguyen <Tin.Nguyen@indesco.com.au>
Cc: Karl Martin <Karl.Martin@indesco.com.au>; Hydraulic Asset Acceptance <HydraulicAssetAcceptance@iconwater.com.au>
Subject: RE: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

Good Morning Tin,

Icon Water response for the water and sewer capacity for proposed development in Yarralumla Section 4 Block 7 is:

Sewer Network

The existing network is not sufficient to take the split loadings at either side of the connections. It will require upgrade the DN150 to DN225 in capacity. It may make more sense to discharge the entire block at C1 and upgrade the sewer along Schlich St to DN225 only.

Water Network

There is DN 100 main loop at the middle of B7/S4 following the outer border route of Wilf Crane Crescent. However, the loop is not connected at south-western side of Wilf Crane Crescent.

Analysis indicates, existing water network doesn't have adequate capacity to provide supply to the proposed site. In addition, fire flow analysis indicates mains are not able to provide fire flow at requested F5 (45 L/s) level.

There are some options available to service the block:

1. Option 1: Augment the existing loop of Wilf Crane Crescent and connect south-western side. Augmentation might not be necessary for whole loop.
2. Option 2: There are two parallel mains along Banks Street with DN 150 and DN 100. The development can connect to DN 150 main at western side of Banks Street. However, as per Icon Water Standard, the development cannot connect to DN 100 main as fire flow requirement is above standard threshold.

Please Note this is based on the EP provided by you and the advice may change if the EP changes.

Regards,

Nabin Dahal
Senior Technical Officer, Developer Services
Urban Development Services

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"Please be advised that any connection applications submitted after 27 November 2020 may not be connected by Icon Water until after 11 January 2021 due to reduced resource availability.
For connections to be completed this year, please therefore ensure that Applications for Provisional Certificate of Operation for completed works are submitted by 27 November 2020 at the latest".

From: Tin Nguyen <Tin.Nguyen@indesco.com.au>
Sent: Wednesday, 25 November 2020 9:10 AM
To: Dahal, Nabin <Nabin.Dahal@iconwater.com.au>
Cc: Karl Martin <Karl.Martin@indesco.com.au>
Subject: FW: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

Good morning Nabin,

Just following up your response re our queries below. Can you please advise?

Thanks.

Tin Nguyen
Civil Engineer
P: (02) 6285 1022

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From: Tin Nguyen
Sent: Friday, 20 November 2020 8:31 AM
To: 'Dahal, Nabin' <Nabin.Dahal@iconwater.com.au>
Cc: Karl Martin <Karl.Martin@indesco.com.au>
Subject: RE: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

Hi Nabin,

Please find detailed EP below:

1. For the whole development, total EP is 677.2
2. Sewer services can be distributed to C1 and C3 as shown in the attached markup, in which C1 is likely to receive 485.2 EP and C3 is likely to receive 192 EP.

Thank you.

Tin Nguyen
Civil Engineer
P: (02) 6285 1022

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From: Dahal, Nabin <Nabin.Dahal@iconwater.com.au>
Sent: Tuesday, 17 November 2020 5:27 PM
To: Tin Nguyen <Tin.Nguyen@indesco.com.au>
Cc: Karl Martin <Karl.Martin@indesco.com.au>
Subject: RE: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

Good Afternoon Tin,

Please provide us the detailed EP for sewer flow distribution assessment.

Regards,

Nabin Dahal
Senior Technical Officer, Developer Services
Urban Development Services

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From: Tin Nguyen <Tin.Nguyen@indesco.com.au>
Sent: Monday, 16 November 2020 10:37 AM
To: Hydraulic Asset Acceptance <HydraulicAssetAcceptance@iconwater.com.au>
Cc: Karl Martin <Karl.Martin@indesco.com.au>
Subject: Sewer and Water Supply Capacity - Yarralumla Section 4 Block 7 Site

Hi Team,

In addition to my earlier email on the Yarralumla Section 4 Block 7 site, please see enclosed the plan showing sewer network downstream of the site. We note the development is currently expected to generate a total increased sewer flow of 17 l/s PWWF which can be distributed between C1 C2 and C3 as necessary. Can you please confirm if there are any other constraints to the development or augmentations required downstream to accommodate this additional flow.

For the water supply, we note there are multiple mains within Banks St adjacent the site can you also please advise the following:

1. The preferred connection locations for water services to the site, are all mains able to be used for connection or only some?
2. Water pressure in the existing water mains for Peak demand of 6.7lps (based on 1.5lps/hectare GFA) and fire flows in 10lps increments up to 45lps.

Happy to discuss if any queries.

Thank you.

Tin Nguyen
Civil Engineer
P: (02) 6285 1022

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From: Tin Nguyen
Sent: Friday, 13 November 2020 9:36 AM
To: Hydraulic Asset Acceptance <HydraulicAssetAcceptance@iconwater.com.au>
Cc: Karl Martin <Karl.Martin@indesco.com.au>
Subject: Existing Sewer Capacity - Yarralumla

Hi Team,

We are working on the redevelopment of 1 Wilf Crane Crescent, Yarralumla as shown in the attached markup. As part of the project, sewer pipes will be constructed to provide sewer services to the development. The intension is to connect the proposed sewer service to the existing sewer network on Banks Street and/or Bentham Street.

Can you please advise the existing PWWF of the sewer pipes highlighted in the attached DBYD?

Thank you.

Tin Nguyen
Civil Engineer
P: (02) 6285 1022

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