Donnelley Simpson Cleary
Consulting Engineers

DISCOVERY POINT STAGE 1

WOLLI CREEK, NSW

BUILDING SERVICES

INFRASTRUCTURE PLANNING CONSIDERATIONS

Project No : 7231E

Revision : A – Planning Application Issue

REVISION SCHEDULE

NO	DATE	DESCRIPTION
A	3 February 2011	Planning Application Issue

TABLE OF CONTENTS

1 HYDRAULIC SERVICES

1.1 Authorities Sewer Mains.

Existing Sydney Water sewer main including sewer access chamber exists at the southern side of the proposed location for the Recycled Water Facility (RWF). The main balancing tank for the RWF will be located under the proposed Building 2 footprint close to the intersection of Brodie Spark Drive and Magdalene Terrace.

The main (RWF) will be located under the Building 1C footprint in Basement 3. There is also an existing Authorities sewer main located on the eastern side of the Vine (Site 4) and Verge (Site 2) buildings.

1.2 Sewer

If practical all new buildings in the Discovery Point development will gravitate and direct sewer drainage towards a centralized flow balance tank. Alternatively a separate building sewer pumpout well with rising mains for each building will direct sewer towards a centralized flow balance tank, which will be operated by Water Factory Company. The sewage lines running to this flow balance tank will have the ability to divert all the sewage to the Sydney Water Sewerage network upon major interruptions to the RWF E.g. total power failure. This diversion will be managed by Water Factory Company under agreements between Water Factory Company & Sydney Water. The proposed RWF overflow will gravitate and connect to the existing Sydney Water sewer main located close to the intersection of Brodie Spark Drive and Magdalene Terrace.

[For further details on the (RWF) refer to Section 1.10].

A new sewer rising main will be installed between the flow balance tank and the RWF located in the basement of Building 1C.

A Trade Waste connection associated with the RWF will also be installed into the discharge line that connects to the Sydney Water Sewer system. This connection will also be managed by Water Factory Company under agreements between Sydney Water & Water Factory Company.

Sewage diversion from existing buildings into the flow balance tank will also be undertaken by Water Factory Company, under agreement between Water Factory Company and each owner's corporation. This agreement will be facilitated by Discovery Point Pty Ltd.

A back up power source will be provided for the pumps.

A wastewater pre-treatment system including a coalescing plate oil separator will be provided at the car-wash bay(s) in the basement to remove the oil and sedimentation from the wastewater prior to discharge to the sewer.

Kitchen grease arrestor/s will be provided as required by Sydney Water in the basement to serve any ground floor Food Retail tenancies.

1.3 Domestic Water Supply

A ringmain extension is to be provided from the existing Authorities 300mm DICL water main in Brodie Spark Drive connecting to the existing Authorities 200mm uPvc Authorities water main in Magdalene Terrace via Discovery Point Place and Spark Lane. (This will be documented by a Water Services Coordinator.)

Provision of separate Authorities water meters to each building including backflow prevention devices will be located at the boundary (where practical.)

The need for pumps in the domestic water system is subject to the results of flow and pressure tests of the water main by Sydney Water.

Individual sub water meters with data logging will be provided to each apartment, retail tenancy including Supermarket.

The sub water meters for the residential apartments will be located either under the kitchen sink or inside the laundry tub cabinets. These meters will be provided with electronic remote read-out facilities, to enable meter readings to be conducted without entering the premises

Water saving devices will be provided to the hot and cold water outlets in all showers, basins, sinks and laundry troughs etc. to reduce water usage as well as to reduce the pressure fluctuations at the fixtures.

All water closets will also be fitted with dual flush cisterns to reduce water consumption.

1.4 Recycled Water Supply

A recycled street water main is to be provided from the proposed Recycled Water Facility (RWF) located in the basement of Building 1C and extended to each building via Brodie Spark Drive, Magdalene Terrace and Spark Lane. **Note:** This work to be documented by a Water Services Coordinator.

Provision of separate Authorities water meters to each building including backflow prevention devices will be located at the boundary (where practical).

The need for pumps in the domestic water system is subject to the results of flow and pressure tests of the recycled water main.

Individual sub water meters with data logging will be provided to each user point.

The sub water meters for the residential apartments will be located either under the kitchen sink or inside the laundry tub cabinets. These meters will be provided with electronic remote read-out facilities, to enable meter readings to be conducted without entering the premises

Water saving devices will be provided to the recycled water outlets in all washing machines etc. to reduce water usage as well as to reduce the pressure fluctuations at the fixtures.

All water closets will also be fitted with dual flush cisterns to reduce water consumption.

(For further details on the RWF refer to Section 1.10).

1.5 Hot Water Service

Each building will incorporate it's own roof mounted centralised gas hot water plant with a flow and return pumped system will supply hot water to individual apartments via an apartment hot water meter and a hot water temperature control devices.

1.6 Roof Drainage

Roof rainwater from the building will be collected by downpipes and gravitate aerially in the basement carpark discharging to the rainwater harvest tank/s before being pumped into the Recycled Water Facility (RWF). Rainwater will be used to supplement the recycled water for toilet flushing, car washing, washing machine and irrigation. Surplus roof water will be diverted via the rainwater harvest tank/s overflow into the Authorities street stormwater system.

Refer to Civil documentation for information on road stormwater drainage including disposal of road surface water from the podium and landscape areas.

A sub-soil pump-out pit with a duty/standby pump assembly will be provided for areas where sub-soil water cannot gravitate into the gravity stormwater system.

1.7 Recycled Rainwater Harvesting

As indicated in "Roof Drainage" above, the roof rainwater for each building will gravitate to recycled holding storage tanks and transfer via pumpset from the holding tanks into the RWF as required.

Domestic water will be used as the back-up water source during dry weather.

The recycled water meters for the residential apartments will be located either under the kitchen sink or inside the laundry tub cabinets. These meters will be provided with electronic remote read-out facilities, to enable the authority to carry out meter readings without entering the premises.

1.8 Fire Fighting Services and Water Supply

Street fire hydrant points will be provided on the Authorities water main to suit Sydney Water requirements. **Note:** This work to be documented by a Water Services Coordinator.

Separate fire sprinkler and fire hydrant booster valves assemblies will be provided to serve each building.

Separate incoming fire sprinkler, fire hydrant and domestic cold water supply from the Authorities street water mains will be provided to serve each building.

Fire hydrants and fire sprinklers will be provided to each building as required by the BCA and the relevant Australian Standards all as discussed with the New South Wales Fire Brigades (NSWFB).

Hydrant landing valves will be provided in the fire stairs and protected passages. Fire hose reels will be installed within 4 meters from required exits. Supplementary hydrants and hose reels will also be installed at convenient locations to provide sufficient coverage to all areas as required by the Australian Standards.

Each building will have a fire control centre located to comply with BCA, which will incorporate the building fire indicator panel and EWIS panel. When constructed as part of the staged development and being over 50m Building 2 will have a fire control room. The Fire panels for existing Greenbank/Verge and Vine along with proposed Stage 1 buildings will all report to the main panels in the fire control room as agreed with NSWFB.

1.9 Gas Supply

A 210kPa pressure Authority gas main is available in Brodie Sparks Drive and will be extended to reticulate down Discovery Point Place and Sparks Lane. Natural gas will be brought into each building via a manual gas isolation valve with the gas boundary regulator located in the basement.

Each retail tenancy area including the Supermarket will be supplied via individual Authorities main gas meters located within the individual tenancy.

The gas meters for the residential apartments will be located either under the kitchen sink or inside the laundry tub cabinet. These gas meters will be provided with electronic remote read-out facilities, to enable the gas supply authority to carry out meter readings without entering the premises.

A separate Authorities master gas meters will be provided for Centralised Gas Hot Water plant serving each building.

1.10 Recycled Water Facility (RWF)

Sewerage infrastructure required to service the Discovery Point development is provided by the existing Sydney Water Corporation (SWC) service.

However, there is significant resident and public interest in ensuring that projected water usage by the proposed residential development is sustainable. The proponents of the development and the Water Factory Company Pty Ltd (WFC) have developed an alternative strategy to treat wastewater from sewage locally, and to produce high quality recycled water for non-potable uses.

The strategy for treatment of wastewater from sewage from Discovery Point residential buildings is to install a RWF within the development. The basement B3 of Building 1C has been identified as most suitable for this purpose for location and construction sequencing reasons. (Refer to Architectural Drawing No.DA2.104).

Waste water will be taken from the SWC sewerage system mains located at the intersection of Magdalene Terrace and Brodie Sparks Drive, and diverted to a flow balance tank (FBT) located within the development. Future buildings of the Discovery Point Development can be plumbed directly to the FBT, which will also be set up to be able to feed back into the SWC main for disposal of Waste Activated Sludge (WAS) as agreed with Sydney Water.

Waste material extracted from the FBT is treated within the RWF. This purpose designed treatment plant is able to produce high quality water suitable for a range of uses including irrigation, car washing, car washing, clothes washing, and toilet flushing purposes. Similar facilities have been successfully installed at Darling Harbour, Mascot and the Pennant Hills Golf Course.

The recycled water produced by RWF will ultimately be utilised within Discovery Point, with apartments plumbed with Recycled Water pipes to toilets and washing machines. In the initial stages, recycled water will also be piped under a separate agreement with Marrickville City Council (MCC) for use in public reserves along the foreshore of the Cooks River. This allows MCC to maintain its open space system with recycled water and thereby meet its Sustainable Irrigation Strategy goals, rather than using potable water from SWC mains supply.

Pipework required to serve Marrickville LGA public reserves will go under Discovery Point Park towards and across the Princes Highway road bridge, and then into Kendrick Park in Tempe.

The operation of the WRF will be undertaken by Water Factory Company on the following basis:

- The plant will operate 24 hours a day, 7 days per week;

- The goods to be produced are recycled water, which is transported by pipe system back to customers;

- Any waste water screenings will be collected and disposed by way of a trade waste agreement with Sydney Water;

- Water supply to Marrickville Council will be supplied via a connection point adjacent to the Cooks River Bridge.

Storage of any recycled water within the Discovery Point development will be within individual buildings as well as tanks adjacent to the Recycling facility itself. Storage of any recycled water within Marrickville LGA will be with tanks installed by Council at the various reserves where irrigation is provided by recycled water.

1.11 JUSTIFICATION OF PROPOSED RWF ACTIVITY

The purpose of the water recycling infrastructure is to provide a secure and sustainable source of non-potable water to development within the Discovery Point Project Area, and potentially adjacent areas depending on supply and demand profiles.

The Water Recycling proposal is justified because:

- It directly contributes to ecologically sustainable development through a better use of an existing resource;

- The facility is designed to service a new mixed used development comprising a considerable residential component approved by the Minister for Planning, the cost of the project is fully borne by the private sector;

- The development can be undertaken without an adverse impact on the environment;

- No public impact from noise or odour will occur from the facility; and the infrastructure provision is in accordance with existing Government Policy.

1.12 EVALUATION OF ALTERNATIVES FOR UNTREATED SEWAGE

The alternative is for Sydney Water to move untreated sewage to its existing treatment plants and ultimately discharged via ocean outfall. Discovery Point and Marrickville Council would also continue to rely on Sydney Water's reticulated potable water supply to maintain their open space systems.

In terms of a site location for the Recycled Water Facility, the proposed location in Building 1C is suitable because of its proximity to SWC mains, deep basements are available for tanks and equipment, and it is early in the construction sequence of Discovery Point development.

1.13 Infrastructure Conclusion

The hydraulic infrastructure within Stage 1 will support Stage 1 and facilitate the ongoing development of future Stages.

The RWF infrastructure within Stage 1 will support Stage 1 and facilitate the ongoing development of future Stages.

2 ELECTRICAL SERVICES

2.1 Electrical Infrastructure

The subject site is currently serviced by existing HV systems associated with Australand Developed Greenbank / Verge and Vine Buildings all of which are located on Brodie Spark Drive.

The existing HV infrastructure will be required to be upgraded and extended and will make use of existing conduit provisions installed for existing buildings. New HV equipment will be installed and cabling will be extended to serve the new Stage 1 works in accordance with Energy Australia's (EA) requirements. The accredited service provider (ASP3) will provide the HV design in accordance with EA design information package. The installation and metering will be carried out by ASP1 and 2 respectively.

As part of the Stage 1 design EA has been commissioned to carry out a feasibility study for the entire Discovery Point precinct. This will put in place future provisioning and planning within Stage 1 and each Stage thereafter to assist with the ongoing development of the Discovery Point precinct.

The feasibility study will also identify an alternate supply location for the 200Amp back up supply to Wolli Creek Station main switchboard No. 2, which currently has a temporary service from the adjacent EA overhead street network.

The LV supply will be reticulated from agreed kiosk substation locations to the main switchboards established for each building which will be housed in a common main switch room to EA final approval.

2.2 Communications Infrastructure

New communications fibre or copper services will be installed in accordance with Telstra, NBN and the Australian Communications Authority requirements.

Conduit infrastructure to facilitate the NBN will be provided to support Stage 1 and will be suitable to support future Stages as an extension off of the base Stage 1 infrastructure provisions.

2.3 External Lighting

The external roadway and public lighting will be installed in accordance with AS1158.

2.4 Foxtel

An integrated Free to Air and Pay TV system will be provided for each building and will be to Foxtel design Guidelines.

2.5 Conclusion

The electrical and communications infrastructure within Stage 1 will support Stage 1 and facilitate the ongoing development of future Stages.

3 MECHANICAL SERVICES

3.1 General Compliance

The mechanical services will designed in accordance with BCA and the relevant Australian Standards

4 LIFT SERVICES

4.1 General Compliance

The lifts will designed in accordance with BCA and the relevant Australian Standards