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Engineers in Hydraulic, Civil & Fire Protection Design

RESPONSE TO THE DEPARTMENT OF PLANNING DIRECTOR GENERAL'S REQUIREMENTS FOR THE ROYAL FAR WEST CHILDREN'S HOMES, MANLY PART 3A CONCEPT APPLICATION

HYDRAULIC SERVICES

Issue **F**

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A	07.03.11	Initial Report
B	18.03.11	Reference information amended
C	29.03.11	Revised Conceptual Stormwater Plans Added
D	15.04.11	Revised Proposed Site Plan
E	19.04.11	Revised Site Plans and See level policy notes
F	6.05.11	Revised Site Plans

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INTRODUCTION

This Assessment has been prepared by Whipps Wood Consulting in relation to the proposed redevelopment of the Royal Far West Children's site in Manly.

The Royal Far West Children's Home have owned a large land holding within Manly since the organisations inception and since this time have continued to provide specialist health care services to meet the needs of country children and their families who live in rural and remote New South Wales. These services include paediatric medical, child and adolescent mental health, ophthalmology, allied health, dental and orthodontics.

In addition, The Royal Far West School provides an educational service for NSW country families attending the Royal Far West Children's Health Scheme (RFWCHS) for medical and paramedical assessment and treatment. Short term programs are delivered to four multigrade classes from Preschool to Year 12 students, one of which is for students with severe disabilities.

The original facilities and buildings on site have been incrementally expanded over the years and are now outdated, poorly coordinated and in need of upgrading. In considering various options moving forward, Royal Far West are proposing to introduce new, purpose built facilities which will extensively improve the clinical, schooling and accommodation services currently offered to children and their families. To realise these redevelopment aspirations, the proponent is seeking to rationalise the overall site arrangement, and introduce a new mix of high quality tourism, retail and residential uses. Within this context, the proposal will provide a range of uses which are consistent with the types of projects identified at Schedule 1 of the Major Development SEPP as 'Major Projects'.

In respect to the proposed development the NSW Department of Planning has indicated a number of issues within the Director Generals' Requirements (DGR's) Application No MP10_0159, which are to be addressed.

The purpose of this Assessment is to response to the Director General's Requirements (DGR'S) as they pertain to the hydraulic services i.e. Stormwater, Stormwater Flooding, Sewer and Water supply.

EXISTING SITE

The site is known as 12 -22 Wentworth Street, 16 South Steyne and 19-21 South Steyne, Manly and includes the following Properties:

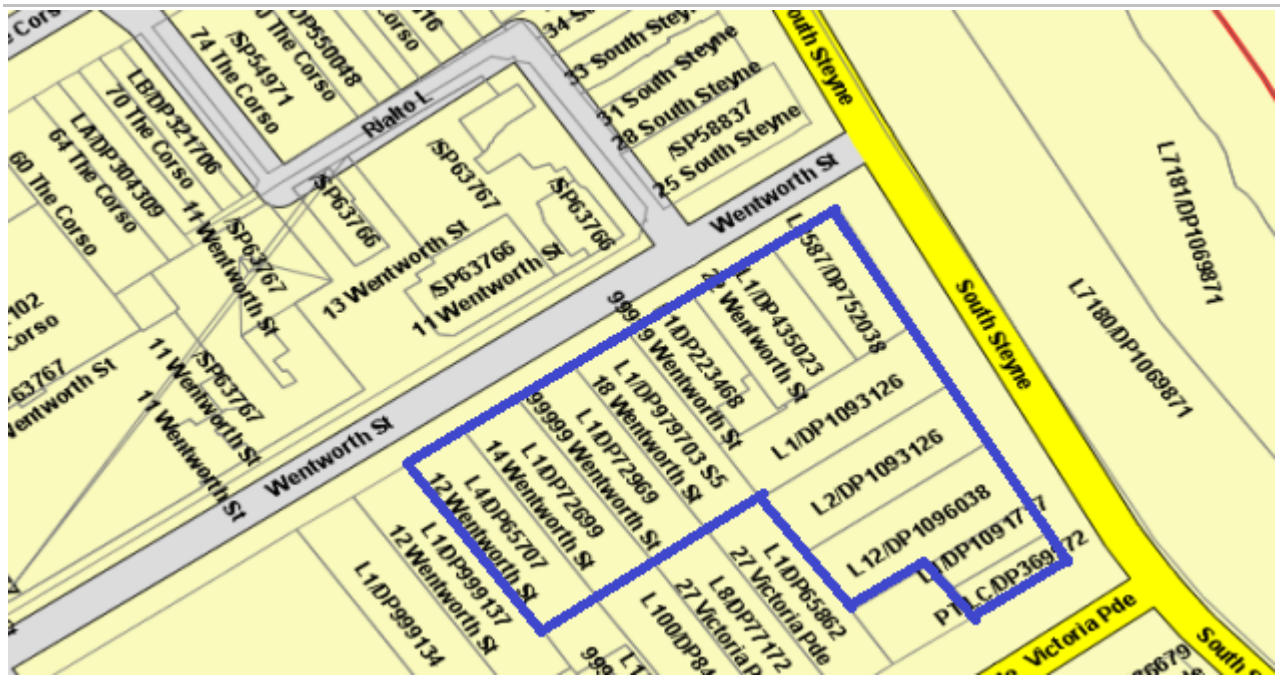
PROPERTY	STREET ADDRESS	LOT	DP	AREA M2
Elsie Hill	12 Wentworth St	4	65707	638.60
Elsie Hill extension	14 Wentworth St	1	72699	632.30
Hostel	16 Wentworth St	1	72969	645.00
Hostel	18 Wentworth St	1	979703	638.60
Garden	20 Wentworth St	1	223468	448.00
Playground	22 Wentworth St	2587	752038	645.00
Playground School over	22 Wentworth St	1	1093126	847.30
Drummond	22 Wentworth St	2	1093126	708.10
Barron	19-21 South Steyne St	12	1096038	714.50
Terrace	16 South Steyne St	1	1091717	202.00
Terrace	16 South Steyne St	C	369972	133.40
School extension	20 Wentworth St	2	223468	82.20
School extension	22 Wentworth St	1	435023	613.00
TOTAL				**6,948.0**

The site comprises the eastern end of the street block bounded by Wentworth Street, Victoria Parade and South Steyne, Manly. The western end of the street block accommodates Manly Public School and between the school and the site are several older style walk up apartment buildings. To the east across South Steyne is Manly Beach. The site is regularly proportioned, has an area of 6,950m2 and grades generally toward South Steyne Street.

Currently the site accommodates a clinical services building, a short stay residential facility for patients and their families, an affordable housing accommodation facility, an integrated school facility, a playground, a garden and a car park and is located mainly within the 5(a) Special Uses (Children's Home) zone, pursuant to Manly Local Environmental Plan 1988 (MLEP 1988).

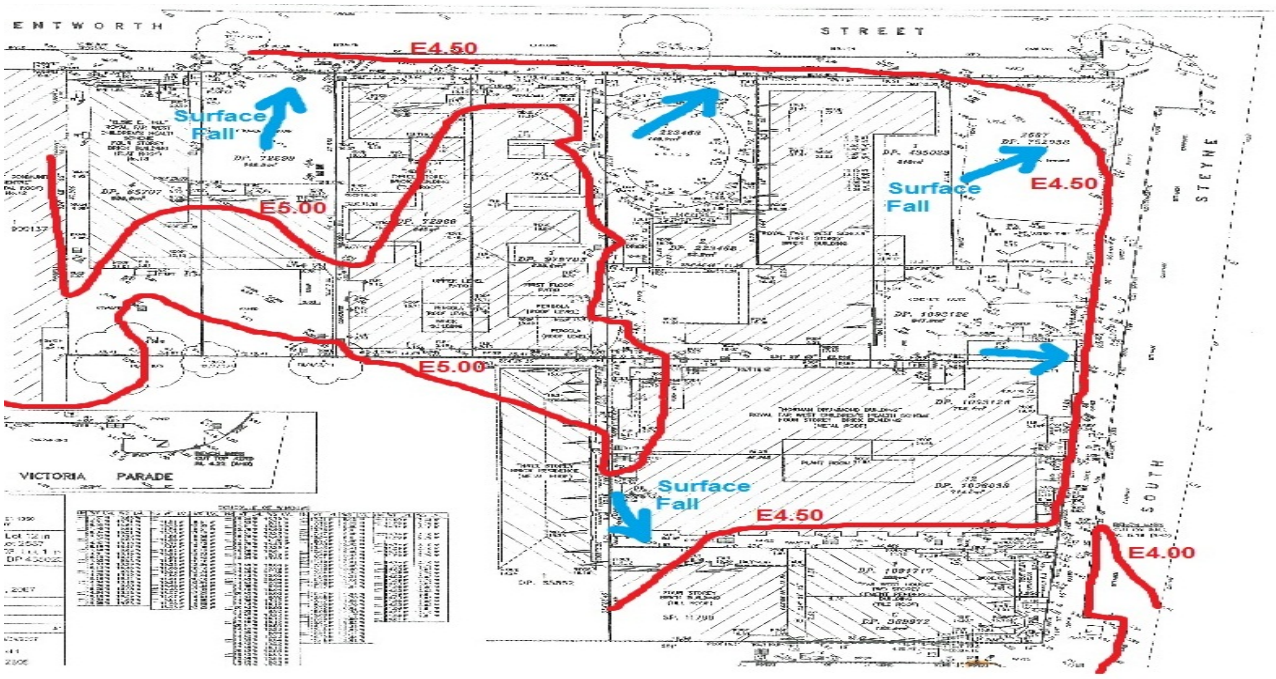
The Drummond Far West Home, which forms part of the site, is listed as a Heritage Item under MLEP 1988, as are several surrounding buildings.

FIGURE 1 – TITLE ARRANGEMENTS



Source: RPData

FIGURE 2 – SITE CONTOURS



As noted in the above contour plan the site is relatively flat with a central localised high point of RL 5.0 AHD and a reasonably uniform grade of 0.5m toward the surrounding streets. It does not appear that any overland flow from the surrounding Streets or the adjacent Manly Public School enters the site, nor does it appear that the development will impede the existing overland flow paths which may disadvantage adjacent properties.

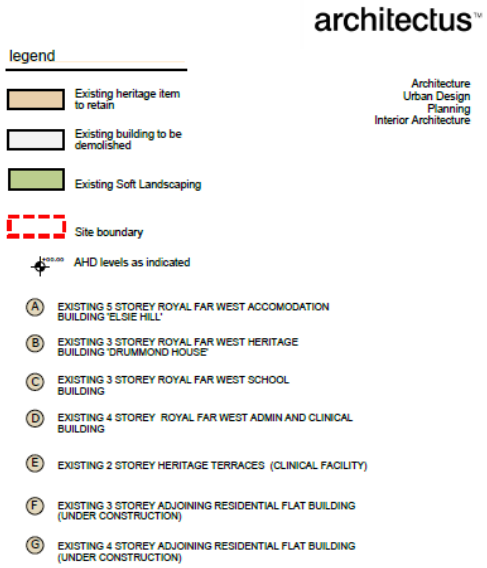
PROPOSED DEVELOPMENT

On behalf of Royal Far West, Architectus have prepared a conceptual option for the infill redevelopment/expansion of facilities on the site the following outlines the existing site details and the proposed development scheme.

EXISTING SITE DETAILS

- Building A – Existing 5 storey royal far west accomodation building 'elsie hill'
- Building B – Existing 3 storey royal far west heritage building 'drummond house'
- Building C – Existing 3 storey royal far west school building
- Building D – Existing 4 storey royal far west admin and clinical building
- Building E – Existing 2 storey heritage terraces (clinical facility)
- Building F – Existing 3 storey adjoining residential flat building (under construction)
- Building G – Existing 4 storey adjoining residential flat building (under construction)

FIGURE 3 – EXISTING SITE PLAN



PROPOSED DEVELOPMENT DETAILS

Building A – Proposed 'royal far west' building. 8 floors total, incorporating admin, clinical and educational facilities on lower levels and short term parental accomodation on the upper levels

Building B – Existing heritage building 'drummond house' to be retained and incorporated into new royal far west facility. removal of non original dining hall at rear to allow for inclusion of childrensoutdoor play area.

Building C – Proposed 11 storey hotel building. ground and level 1 incorporate lobby and communal facilities. lower level hotel rooms incorporate privacy screening where nterface with residential occurs. (refer section)

Building D – Residential courtyard. deep soil planting zones allow for large scale trees to form privacy 'buffer' from hotel rooms

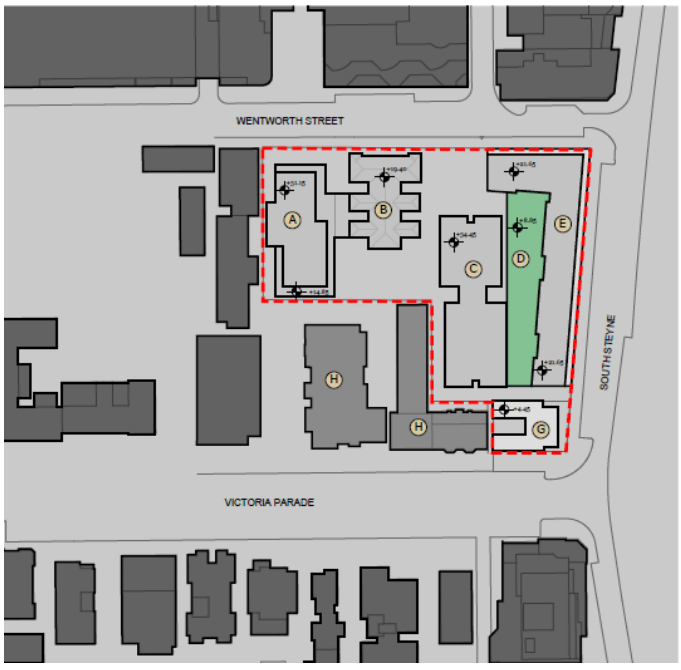
Building E – Corner residential building, 7 storeys incorporating retail at ground level.

Building F – Beachfront residential building, 6 storeys incorporating retail at ground level. top 2 floors are set back 2-3m from the eastern boundary.

Building G – Existing 2 storey heritage house to be converted from clinical use
to residential.

Building H – Existing adjoining residential flat building (under construction)

FIGURE 4 – PROPOSED DEVELOPMENT PLAN



legend

Existing heritage item to retain

Proposed new building

Residential courtyard

Existing to be demolished

Site boundary

AHD levels as indicated

Architecture
Urban Design
Planning
Interior Architecture

(A) PROPOSED 'ROYAL FAR WEST' BUILDING. 8 FLOORS TOTAL, INCORPORATING ADMIN, CLINICAL AND EDUCATIONAL FACILITIES ON LOWER LEVELS AND SHORT TERM PARENTAL ACCOMODATION ON THE UPPER LEVELS

(B) EXISTING HERITAGE BUILDING 'DRUMMOND HOUSE' TO BE RETAINED AND INCORPORATED INTO NEW ROYAL FAR WEST FACILITY. REMOVAL OF NON ORIGINAL DINING HALL AT REAR TO ALLOW FOR INCLUSION OF CHILDRENS OUTDOOR PLAY AREA.

(C) PROPOSED 11 STOREY HOTEL BUILDING. GROUND AND LEVEL 1 INCORPORATE LOBBY AND COMMUNAL FACILITIES. LOWER LEVEL HOTEL ROOMS INCORPORATE PRIVACY SCREENING WHERE INTERFACE WITH RESIDENTIAL OCCURS. (REFER SECTION)

(D) RESIDENTIAL COURTYARD. DEEP SOIL PLANTING ZONES ALLOW FOR LARGE SCALE TREES TO FORM PRIVACY 'BUFFER' FROM HOTEL ROOMS

(E) CORNER RESIDENTIAL BUILDING, 7 STOREYS INCORPORATING RETAIL AT GROUND LEVEL.

(F) BEACHFRONT RESIDENTIAL BUILDING, 6 STOREYS INCORPORATING RETAIL AT GROUND LEVEL. TOP 2 FLOORS ARE SET BACK 2-3M FROM THE EASTERN BOUNDARY.

(G) EXISTING 2 STOREY HERITAGE HOUSE TO BE CONVERTED FROM CLINICAL USE TO RESIDENTIAL.

(H) EXISTING ADJOINING RESIDENTIAL FLAT BUILDING (UNDER CONSTRUCTION)

DIRECTOR GENERAL'S REQUIREMENTS

In reviewing the Director General's Requirements the clauses which relate specifically to the Hydraulic and Stormwater Services are clauses 1, 5, 10, 11, 12 and 16, as follows. In addition we understand that correspondence received from Manly Council and Sydney Water as attached do not form part of the Environmental Assessment, however, reference to these authorities is included in this Assessment.

KEY ISSUE # 1: RELEVANT EPI'S POLICIES AND GUIDELINES TO BE ADDRESSED

The Environmental Assessment (EA) must address the following key issues:

1. Relevant EPI's policies and Guidelines to be Addressed Planning provisions applying to the site, including permissibility and the provisions of all plans and
- Manly Local Environmental Plan 1988 – Clause 37(3) Master plans;
- Manly Comprehensive Local Environmental Plan;
- Relevant Development Control Plans;
- NSW Sea Level Rise Policy Statement (October 2009) and NSW Coastal Planning Guideline:
  Adapting to Sea Level Rise (August 2010)

KEY ISSUE # 5: ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)

- Detail how the development will incorporate ESD principles in the design, construction and ongoing operation phases of the development;
- Include a description of the measures that would be implemented to minimise consumption of resources, water and energy, including an Integrated Water Management Plan which details any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design; and
- Demonstrate that the development can achieve a minimum 4 Green Star rating, or any other suitably accredited rating scheme.

KEY ISSUE # 10: DRAINAGE

- Drainage issues associated with the proposal including stormwater and drainage infrastructure;
- Detailed plans of the proposed erosion and sediment control measures during demolition, construction and operation

KEY ISSUE # 11: FLOODING

- An assessment of any flood risk on site in consideration of any relevant provisions of the NSW Floodplain Development Manual (2005) including the potential effects of climate change, sea level rise and an increase in rainfall intensity.

KEY ISSUE # 12: UTILITIES

- In consultation with relevant agencies, the EA shall address the existing capacity and any augmentation requirements of the development for the provision of utilities, including staging of infrastructure works and the preparation of an infrastructure management plan.

KEY ISSUE # 16: WASTE

- Describe the measures to be implemented to manage the disposal of contaminated and potentially contaminated biological and sewage waste, if required.

STORMWATER AND SEA LEVEL RISE MANAGEMENT

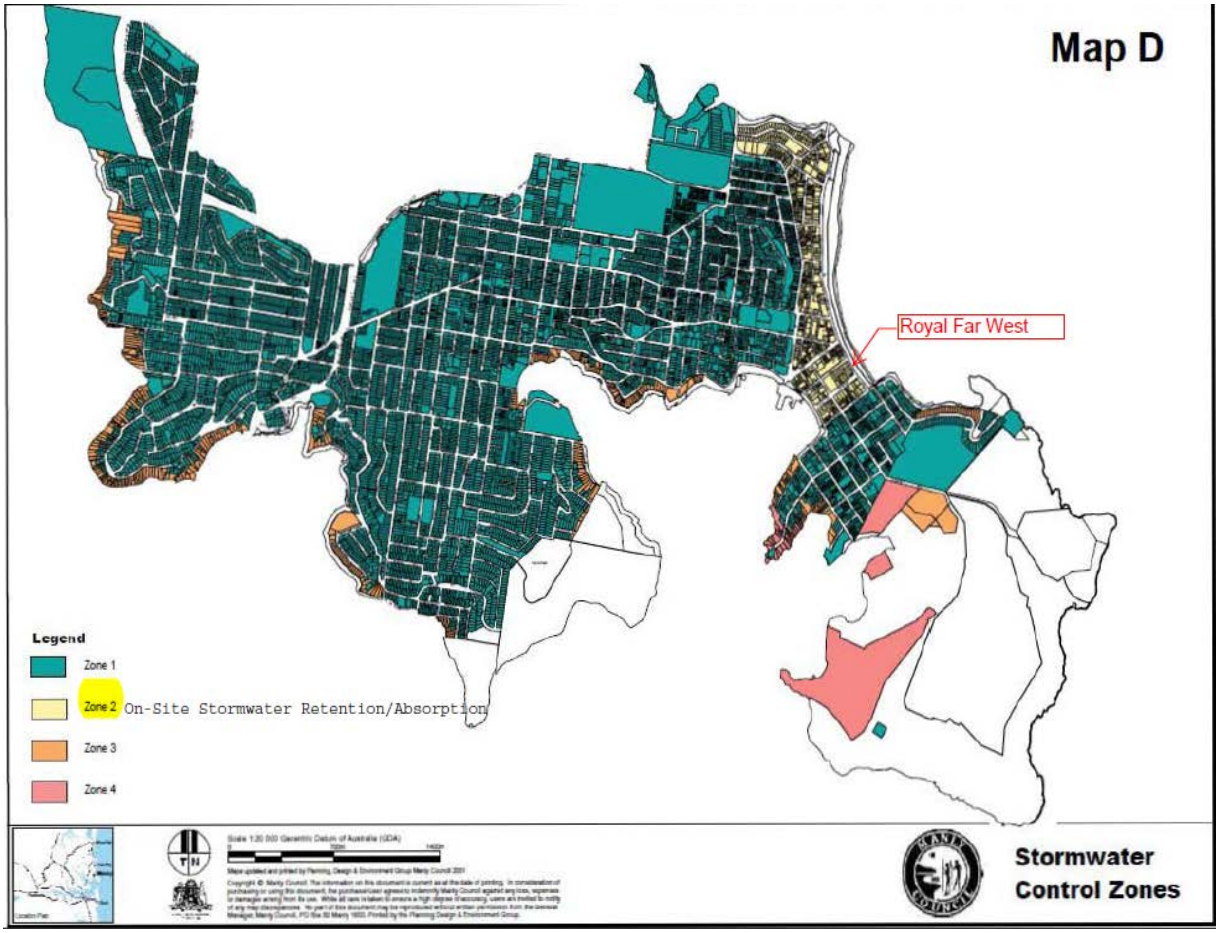
MANLY COUNCIL REQUIREMENTS

The subject site is located within the Manly LGA. Reference to Council's current stormwater code "*Specification for Stormwater Drainage 2003 and Specification for on-site Stormwater Management 2003"* indicates that the site is located within stormwater control Zone 2. Developments within Zone 2 are to collect and discharge stormwater from the site into an onsite absorption system as follows:

On-site stormwater retention (absorption) systems are to be implemented in Zone 2. Absorption systems shall be provided in soft landscape areas, such as in garden areas, and other vegetated on-ground areas.

Where ever possible, on-site absorption is to be provided in hard landscaped areas, under driveways and other paved surfaces. The use of porous pavement (pervious paving) is preferred.

All sites within zone 2 must provide for on-site absorption unless the applicant can demonstrate that on-site absorption is not suitable by the submission of relevant evidence from a qualified geotechnical engineer indicating that the soil absorption characteristics and site constraints prevents its application.



NSW COASTAL RISK MANAGEMENT GUIDE

The NSW Coastal Risk Management Guide: Incorporating Sea Level Rise benchmarks in coastal risk assessments identifies 5 key benchmarks to be considered in land use planning and development assessment in coastal NSW. The following outlines each of these benchmarks and a relevant response related the hydraulic services only.

Benchmark 1: Incorporating the projected impacts of sea level rise on predicted flood risks and coastal hazards.

Response: Reference to the predicted sea level rise information based on an average recurrence interval of 100 years for the year 2100, indicates a still water level of 2.28m which is below the lowest site level of 4.0m. Based on this predicted sea level there is potential for periodic catchment flooding and oceanic inundation.

Benchmark 2: Designing and upgrading public and private assets in low-lying coastal areas where appropriate, taking into account the design life and the projected sea level rise over this period.

Response: The details nominated in this report provide the Royal Far West Children's Home with an assessment of the sea level rise issues which will be incorporated into the development

Benchmark 3: Assessing the influence of sea level rise on new development

Response: The influence of the sea level rise has been identified in the response to Benchmark 1

Benchmark 4: Consider the impact of sea level rise on Coastal and Estuarine Habitats and identifying valuable habitats at most risk from sea level

Response: Due to the intensity of building on the existing site and other developments within the vicinity of the site it is not considered that either the proposed development or sea level rise will have an impact on the Coastal or Estuarine Habitats

Benchmark 5: Assessing the impact of changed salinity levels in estuaries, including implications for access for fresh water.

Response: It is not anticipated that the new development will impact on salinity levels in estuaries, as the site discharges to the ocean and the development will incorporate measures to remove pollutants carried in the stormwater flows and provide absorption for low intensity storm events.

NSW SEA LEVEL RISE POLICY

The NSW Government's Sea Level Rise Policy nominates 8 identifiable items related to Planning Criteria for Proposed Development within Costal Areas. The following outlines each of these items and a relevant response related the hydraulic services only.

Item 1: Development avoids or minimises exposure to immediate coastal risks (within the immediate hazard area or floodway).

Response: The location of the development sits within an existing developed envelope with defined flood paths routes within the adjoining streets, which are not compromised by the proposed development. It is therefore not anticipated that the development will be affected by any immediate costal risks.

Item 2: Development provides for the safety of residents, workers or other occupants on-site from risks associated with coastal processes.

Response: The centre of the existing site is situated on a localised high point which enables overland flows to be conveyed toward Wentworth Street or South Steyne Street via the existing driveways and playground areas. It is envisaged that the proposed development will adopt the same or similar profiles. Further based on table 4.1 from the NSW Coastal Risk Management Guide, it is projected that the mean ocean water level within Sydney, based on an Average Recurrence Interval of 100 years in 2100 shall be 2.28m which is below the lowest existing site level of 4.0m.

Therefore it is not anticipated that residents, workers or other occupants on-site are at risk from coastal processes.

Item 3: Development does not adversely affect the safety of the public off-site from a change in coastal risks as a result of the development.

Response: As previously noted the proposed development sits within an existing developed envelope with defined flood paths routes within the adjoining streets. It is therefore not anticipated that the development will be affect the safety of the public off-site from a result of the development

Item 4: Development does not increase coastal risks to properties adjoining or within the locality of the site.

Response: Again the development sits within an existing developed envelope with defined flood paths routes within the adjoining streets which are not compromised by the proposed development.

Item 5: Infrastructure, services and utilities on-site maintain their function and achieve their intended design performance.

Response: In the event of a change in costal processes is not anticipate that the sewer, stormwater or potable water services would be affected primarily as they are located below ground or supported within the buildings. In the event of flooding stormwater collected on site is able to surcharge from the piped system to the surrounding streets.

Item 6: Development accommodates natural coastal processes including those associated with projected sea level rise.

Response: A review of the anticipated sea level rise based on the NSW Government's documented predictions indicates that the proposed development shall be above the 1:100 mean water level.

Item 7: Coastal ecosystems are protected from development impacts.

Response: The proposed development is located within an existing densely developed area therefore it is not anticipated that the development will adversely affect the existing coastal ecosystems. However, the development will incorporate measures to remove pollutants carried in the stormwater flows and provide absorption for low intensity storm events to mitigate any impact on the coastal ecosystems

Item 8: Existing public beach, foreshore or waterfront access and amenity is maintained.

Response: It is not anticipated that the development will impact on the existing public beach, foreshore or waterfront access and amenity

FLOODING

In reviewing the issue of flooding reference has been made to the:

- Manly Council stormwater literature and;
- Climate Change Actions report prepared for Council by Cardno and;
- NSW Sea Level Rise Policy Statement (October 2009) and;
- NSW Coastal Planning Guideline: Adapting to Sea Level Rise (August 2010)
- NSW Coastal Risk Management Guide

In relation to the aforementioned documents the Climate Change Actions report prepared for Council by Cardno indentifies preliminary predictions of specific climate change impacts within the Manly LGA with respect to sea level rise, catchment flooding and oceanic inundation. The basis of these predictions is the Sea Level Rise projections detailed in the NSW Government Sea Level Rise policy (October 2009) which (relative to the 1990 mean sea level) indicate increases in the mean sea level of 0.4m by 2050 and 0.9m by 2100.

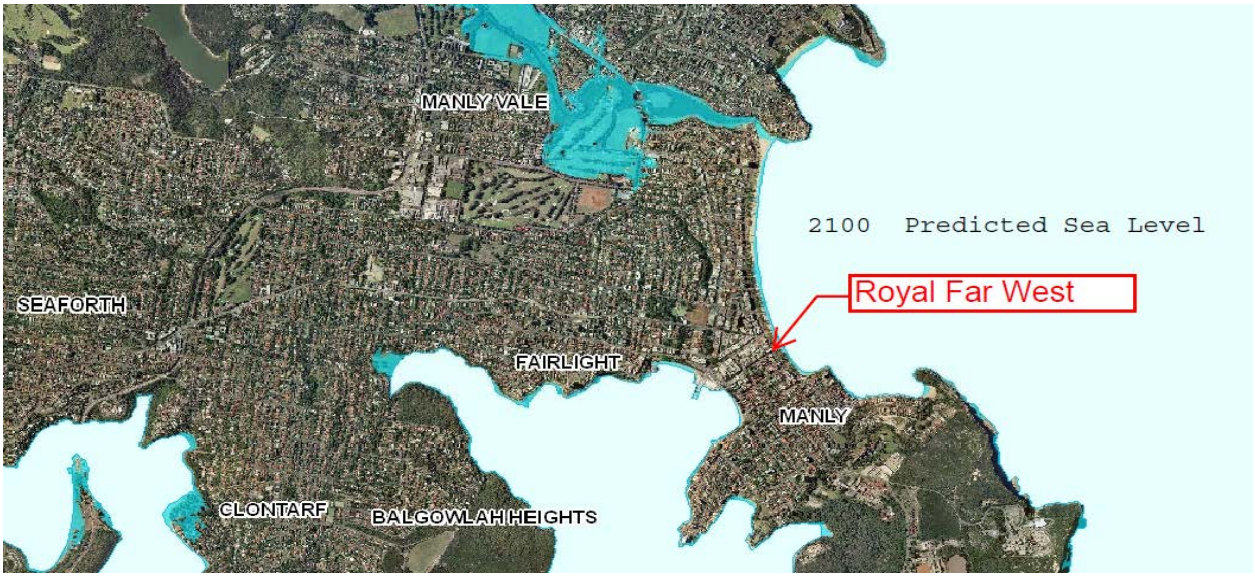
References to Manly Council literature refers to historical data available to date which identifies actual flooding events.

Based on Historical Data Manly Council does not identify the Royal Far West Children's Home as being flood affected based.

However, the Cardno Climate Change Actions report indicates due to the impact of predicted future Sea Level Rise and increases in rainfall based on changed climatic conditions, there is potential for flooding within the vicinity of the site from both Ocean Inundation and increased rainfall, although it is not possible to predict the frequency of these events, nor do the report findings indicate that the site will be submerged as a consequence of Sea Level Rise up to the year 2100.

The following figures from the Cardno Report indicate the predicated affect of sea level rise within the Manly LGA based on the sea level rise projections identified in the NSW Sea Level Rise Policy Statement (October 2009)

2050 PREDICTED SEA LEVEL



2100 PREDICTED SEA LEVEL

The figures indicate that the area within the vicinity of the Manly Golf Course is affected by seal level rise in both 2050 and 2100, whilst the effect of sea level rise within the vicinity of the Royal Far West Children's Home is limited to a reduction in the adjacent beach frontage and the potential for periodic catchment flooding and oceanic inundation.

The following is an extract from the NSW Coastal Risk Management Guide.

In circumstances where it is necessary to consider physical coastal processes and/or the influence of tidal waters, it is recommended that the additional impact of projected sea level rise up to the planning benchmarks be considered. This will enable sea level rise to be appropriately considered in planning decisions, hazard mitigation strategies and infrastructure design. For land-use planning purposes, 2050 and

2100 sea level rise benchmarks should be used. For other purposes (e.g. infrastructure design), linear interpolation between the 1990 base sea level and the 2050 and 2100 sea level rise benchmarks can be used to estimate projected sea level rise for coastal planning horizons or asset life other than those corresponding to the benchmark years. For consideration of sea level rise beyond 2100, an additional 0.1 metres per decade allowance can be used above the 2100 benchmark level. This approach assumes a linear rise beyond 2100 at rates equivalent to that projected for the last decade of the twenty-first century (2090–2100). These sea level rise projections will need to be discounted to accommodate the sea level rise measured between 1990 and present. This can be assumed to be approximately 3 millimetres/year from 1990 (CSIRO, 2009). For practical implementation, sea level rise benchmarks, which are generally referenced to 1990 mean sea levels, can be broadly related to the AHD. Analysis of hourly water levels at Fort Denison (Sydney Harbour) over the period from January 1989 to December 1990 indicates a mean sea level over this period of approximately 0.06 metres AHD.

Table 4.1 provides an estimate of design ocean still-water levels at Fort Denison for varying average recurrence interval (ARI) events in 2050 and 2100 that incorporate provision for sea level rise. It is recommended that these levels be used in the Newcastle–Sydney–Wollongong area for the design of maritime structures, determining oceanic inundation/wave runup levels and for oceanic and hydrodynamic modelling processes where full oceanic tidal conditions are expected. In other locations (e.g. NSW North and South coasts), analysis of local tidal records will be needed to develop this information. Where tidal conditions less than the oceanic range prevail (e.g. inside constrained estuarine environments), Table 4.1 does not apply and locally derived design still water levels would be determined on a site-specific basis, taking into consideration the sea level rise benchmarks for oceanic conditions.

Table 4.1 - Design ocean still water levels at Fort Denison for 2010 and predicted levels for 2050 and 2100 incorporating projected sea level rise.
(A diagrammatic representation of these levels is indicted in Appendix B)

Average Recurrence Interval (years)	*2010 design still water levels (metres AHD)*	*2050 design still water levels (metres AHD)*	*2100 design still water levels (metres AHD)*
0.02	*0.97*	*1.31*	*1.81*
0.05	*1.05*	*1.39*	*1.89*
0.1	*1.00*	*1.44*	*1.94*
1	*1.24*	*1.58*	*2.08*
10	*1.35*	*1.69*	*2.19*
50	*1.41*	*1.75*	*2.25*
100	*1.44*	*1.78*	*2.28*

Notes: The design still water levels are only relevant where full ocean tide conditions prevail. (1.) Design Stillwater levels for 2010 were derived from extreme value analysis of Fort Denison tide gauge data from June 1914 to December 2009 (after Watson and Lord, 2008). There are negligible tidal friction losses between the ocean and Fort Denison within Sydney Harbour; therefore, Fort Denison data provides an indicative representation of oceanic still-water levels. The design still-water levels inherently incorporate allowance for all components of elevated ocean water levels experienced over this timeframe (including tides, meteorological influences and other water level anomalies); however, they exclude wave setup and wave runup influences. (2.) Design still-water levels for 2050 and 2100 incorporate planning benchmark allowances for sea level rise with a reduction of 60 millimetres to accommodate the estimated amount of global average sea level rise that has occurred between 1990 and present. From satellite altimetry, this is estimated to be 3 millimetres/year (CSIRO, 2009). These design levels are indicative and provided for guidance only.

Based on table 4.1 it is projected that the mean ocean water level within Sydney, based on an Average Recurrence Interval of 100 years in 2100 shall be 2.28m which is below the lowest existing site level of 4.0m.

The previous projected sea level rise diagrams indicate that the area within the vicinity of the Manly Golf Course is affected by seal level rise in both 2050 and 2100, whilst the effect of the projected future sea level rise within the vicinity of the Royal Far West Children's Home is limited to a reduction in the adjacent beach frontage and the potential for periodic catchment flooding and oceanic inundation. This analysis is confirmed by the mean water level indicated in Table 4.1 above.

WATER SENSITIVE URBAN DESIGN AND INTEGRATED WATER MANAGEMENT

Based on the location of the site opposite Manly Beach the implementation of a water sensitive urban design (WSUD) strategy and integrated water management strategy are key issues for the proposed site development. These strategies include measures to reduce the impact of the development on both the existing authorities' infrastructure and adjoining environment.

The key issues identified in relation to the strategies include the:

1. Incorporation of Gross Pollutant Traps (GPT) to reduce the volume and percentage of suspended pollutants from the stormwater flows which discharge from the site.
2. Provision of onsite absorption systems to cater for minor storm events which provides a first flush capability, to remove pollutants such as salt and other chemicals which are collected from roof and surface areas in the first minutes of a storm event.
3. Harvesting of rainwater for the purpose of reuse in sanitary flushing, irrigation systems and other non-potable water uses.
4. Electronic Monitoring of water demand for defined areas to enable the detection of spikes which may indicate leakage from the system
5. Reuse of fire water from testing procedures to reduce the consumption of potable water and minimise the discharge from the site to the authorities' drainage infrastructure.
6. Reduction in the site outflows.

In addition the project will also adopt a range of best practice measures including the installation of WELS rated tapware and fixtures.

The principle design consideration for the Water Sensitive Urban Design is to provide a system which is practical to implement and provides a measurable difference to reduce the impact of the development on the surrounding environment and the authorities' infrastructure i.e. potable water consumption and waste discharge.

In addition the DGR's require details to enable the development to achieve a minimum 4 Green Star rating. In relation to the hydraulic services the requirements for 4 Green star accreditation are achieved by the providing rainwater harvesting systems for sanitary flushing, the reuse of fire systems test water, installation of gross pollutant traps.

INTEGRATED WATER MANAGEMENT

The principles of the proposed Integrated Water Management strategy are to:

1. Control the outflow from the site by providing adequate surface and roof drainage systems
2. Reduce the pollutant outflows from the site by providing first flush and gross pollutant treatment systems
3. Capture, store and reuse roof water for non-potable uses around the site
4. Provide opportunities for absorption to occur to reduce the site outflows.

The anticipated outcomes of this approach will include reduced reliance on Potable Water Supplies, reduction in pollutants discharging to the Council infrastructure and reduction in the volume of the site outflows.

WATER QUALITY TREATMENT

The NSW Department of Environment, Climate Change and Water recommend reduction targets in annual runoff pollutant loads for developments of:

• 85% for total suspended solids (TSS);
• 60% for total phosphorous (TP); and
• 45% for total nitrogen (TN).

Based on these recommendations the proposed water quality strategy will target the following pollutants:

1. Gross Pollutants
2. Sediment
    - Coarse (0.5 – 5mm)
    - Medium (0.06 – 0.5mm)
    - Fine (<0.06mm)
3. Nutrients and Metals
4. Oil and Grease

The primary pollutant treatment systems shall include a combination of:

1. Filtration and Bio-retention devices (grass swales)
2. Porous Paving
3. Infiltration devices
4. Propriety Primary Treatment Devices

The incorporation of these systems has a demonstrable and measurable impact on the quality of stormwater discharge leaving the site.

In addition to these treatment systems Rainwater tanks also provide an opportunity to not only harvest and reuse water collected from roof areas but also provide an effective method of capturing gross pollutants such as plastic bags which are able to enter the roof water drainage systems and to mitigate flows from the site during storm events.

STORMWATER DRAINAGE PROPOSAL

Currently stormwater on site is collected into a series of downpipes and pits which variously discharge to Council's drainage systems, at surface level or to kerb connection points in either Wentworth Street or South Steyne Street.

The centre of the existing site is situated on a localised high point which enables overland flows to be conveyed toward Wentworth Street or South Steyne Street via the existing driveways and playground areas.

Discussions with Manly Council Engineer, Mr Maran Muthiah, indicate that on-site detention is not required and further there is no history of flooding within the vicinity of the site. As previously mentioned the site is situated in Council's designated Stormwater Control Zone 2, which indicates that absorption is the Council-preferred drainage solution.

However, as large absorption storages might not be considered appropriate, due to the presence of perimeter footings and the Basement Carpark the extent of area available for absorption is limited. Based on this Mr Maran Muthiah indicated that Council may consider, subject to formal assessment, the installation of porous paving that could be introduced in as many areas as possible and that grass swale depressions might be located within landscaped areas in an attempt to naturally retain some stormwater and direct it by infiltration into the soil below, with any excess runoff being directed to the street by a conventional gravity drainage system including pits and pipes and overland flow paths.

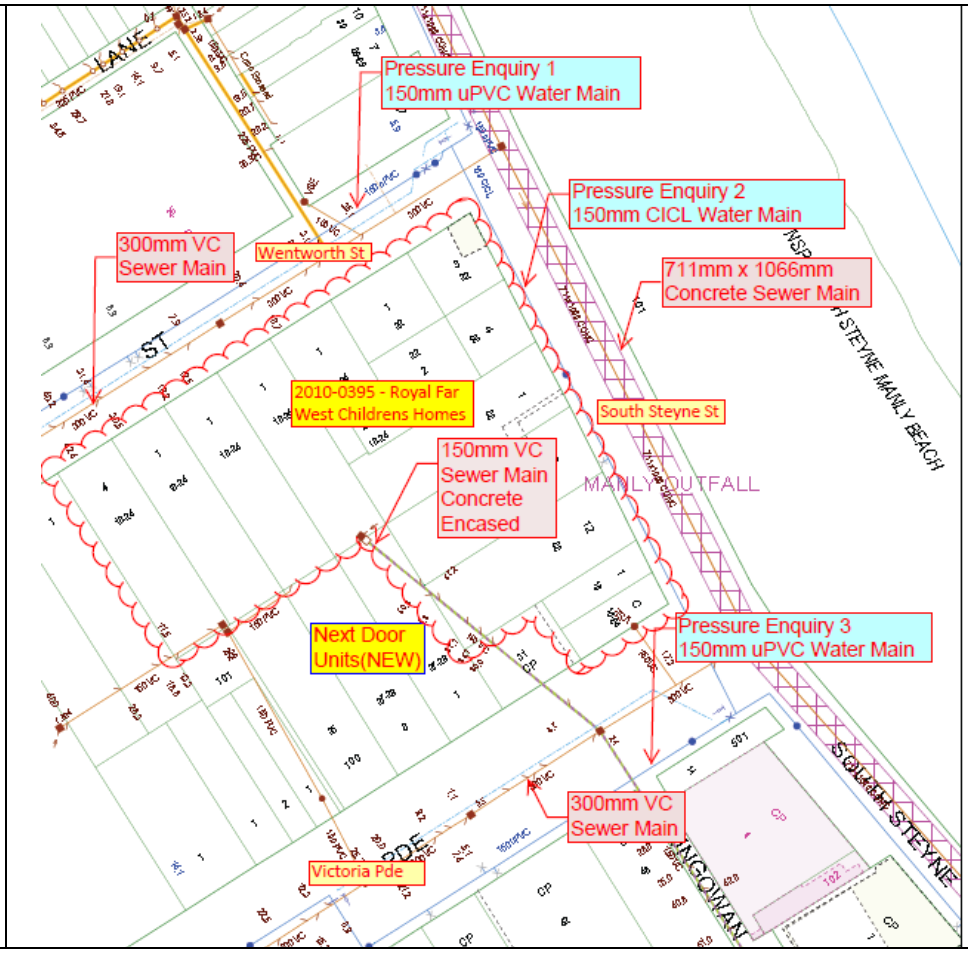
In principles of the stormwater drainage design are to mitigate the flows from the site, contain minor flows on site, reduce pollutants in the site runoff and harvest rainwater to reduce the demand on the potable water systems.

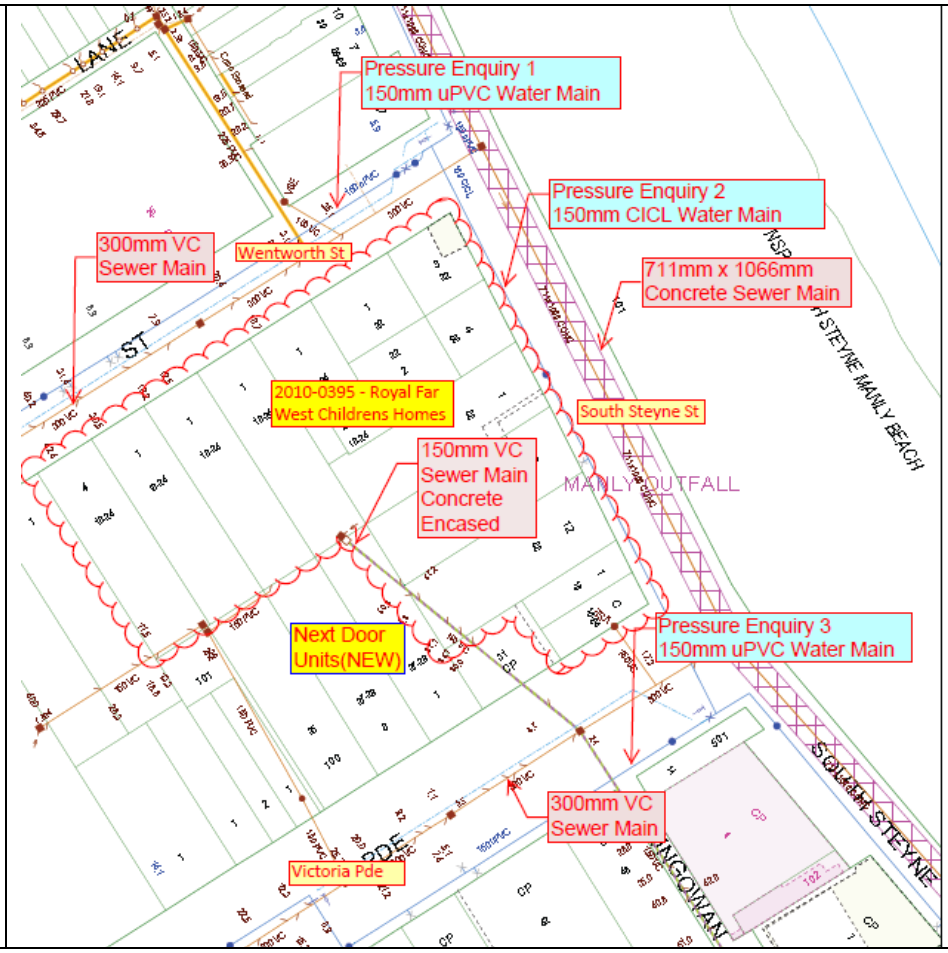
Based on these principles it is proposed that roof water shall be collected and directed to one or more rainwater harvesting tanks via a GPT. Excess water from the tank/s would be directed to Council's drainage infrastructure system in Wentworth Street or South Steyne. Surface water will either be collected through porous paving systems to absorption zones or directly to landscaped swales incorporating an infiltration system.

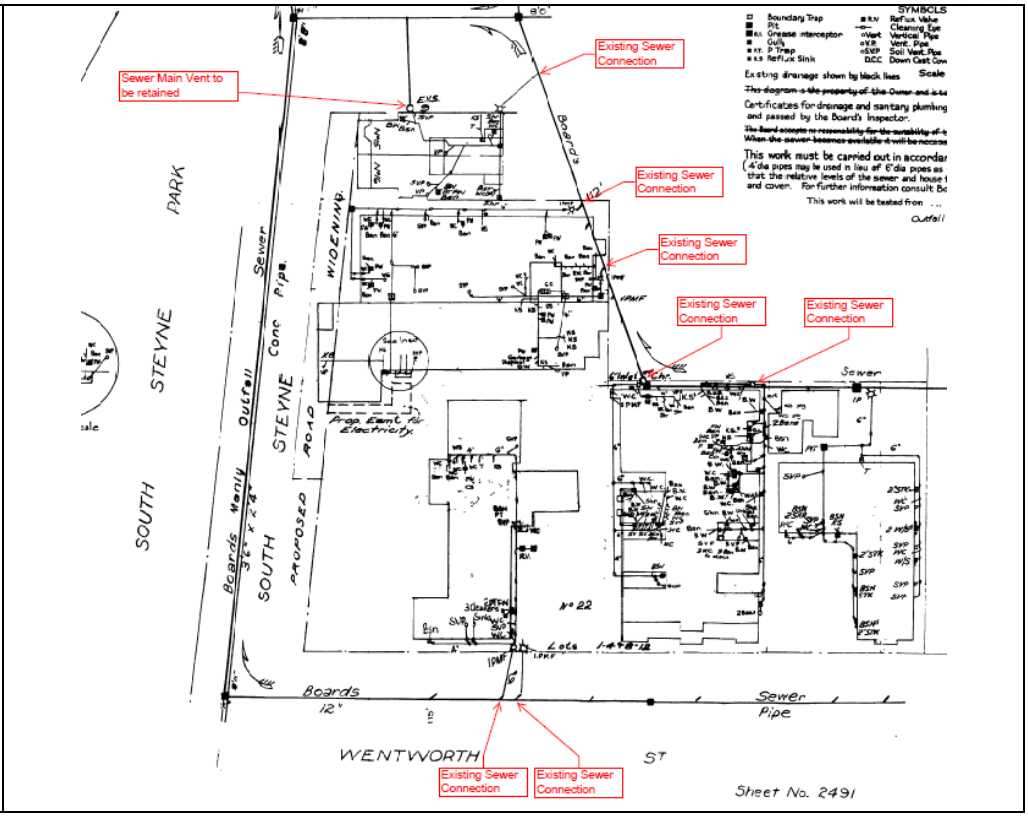
As previously indicated the details included with this assessment are conceptual only based on the current level of planning.

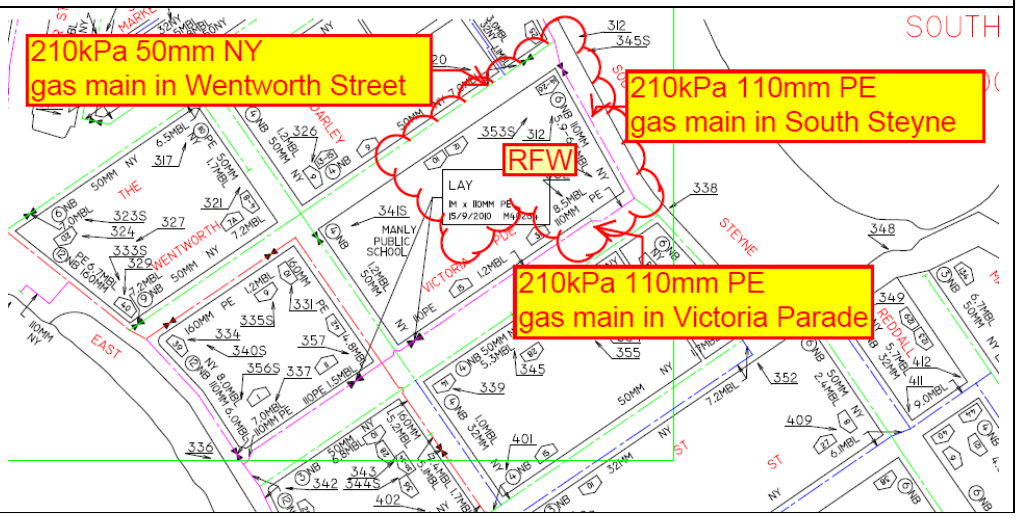
UTILITIES

The following indicates details in relation to the sewer, water and gas utilities main infrastructure and requirements for the site development.

WATER SUPPLY - POTABLE / DRINKABLE WATER SUPPLY	
Supply Authority	Sydney Water
Location and Size	Water mains are located in the following streets: Wentworth Street - 150mm uPVC Main South Steyne – 150mm CICL Main Victoria Parade – 150mm uPVC Main
Mains upgrade	Based on the size of the water main and the proposed height of building 'C' (11 stories / 33 Meters approximately) a water main amplification may be required to increase the 150mm main in Wentworth Street from South Steyne through to the western boundary site with a 200mm main.
HYDRA MAP	
Sydney Water water mains Map	

SEWER DRAINAGE SYSTEM	
Supply Authority	Sydney Water
Location and Size	Sewer mains are located in the following streets: Wentworth Street - 300mm VC Main South Steyne – 711mm x 1066mm Concrete Sewer Main (not available for connection) Victoria Parade – 300mm VC Main A 150mm VC Sewer main also transverses the site from the rear of lots 18-24 Wentworth Street to a sewer manhole located in Victoria Parade.
Mains Connection	A new sewer sideline may be required to replace the existing connections. This will involve a major works contractor due to the size of the mains – 300 dia. In Wentworth Street and Victoria Parade.
Building Adjacent to Sewer	A Sydney Water Sewer main traverses the south west corner of the site. Any works near this location will require approval from Sydney Water.
HYDRA MAP	
Sydney Water HYDRA Map	

Sewer Service Diagram	

GAS SERVICE	
Supply Authority	Jemena (Gas Supply Authority)
Location and Size	Gas mains are located in the following streets: Wentworth Street – 210kPa 50mm NY Main South Steyne – 210kPa 110mm PE Main Victoria Parade – 210kPa 110mm Pe Main
NATURAL GAS MAINS DIAGRAM	
Gas Main Diagram	

CONSTRUCTION PHASE EROSION AND SEDIMENT CONTROL

In accordance with the best practice state government guideline "Managing Urban Stormwater – Soils and Construction" (*Landcom, 2004*), Erosion and Sediment Control Plans are required for sites of area less than 2,500 m2 while Soil and Water Management Plans (SWMPs) are required for sites greater than 2,500m2. The proposed development covers a total area of approximately 7,000 m2, therefore a Soil and Water Management Plan would be required.

A Detailed SWMP would be completed to accompany further applications for construction and other works.

The soil and water management plans would provide a control strategy for each sub catchment to ensure appropriate runoff quality. These controls would consist of filter fences, run off diversion mounds and stabilised site access.

SUMMARY

This assessment has been prepared by Whipps Wood consulting in response to the NSW Department of Planning – Director General's Requirements for the proposed redevelopment of the Royal Far West Children's Home in Manly.

In responding to the Director General's Requirements there are 6 key issues to be addressed in relation to the Hydraulic and Stormwater services for the site. These key issues are as follows:

Key Issue # 1: Relevant EPI's Policies and Guidelines to be addressed
Key Issue # 5: Ecologically Sustainable Development (ESD)
Key Issue # 10: Drainage
Key Issue # 11: Flooding
Key Issue # 12: Utilities
Key Issue # 16: Waste

The relevant policies and guidelines referred to in this report predominately relate to the Manly Council Stormwater Specifications and the NSW Government – Sea Level Rise policy. Reference to these documents provide the basis of our response to Key Issues 10(Drainage) and 11 (Flooding)

The proposed Drainage system for the development comprises both rainwater harvesting and strategies to capture, mitigate and treat stormwater flows. A review of the differences between the existing and current impervious areas indicates that there is a slight reduction in the overall site impervous area, the nett result of which is a minimal change to the calcualated site outflows. However, the implementation of limited site absorption and rainwater harvesting will mitigate the existing flows. Further as the site is slightly elevated it is possible to direct overland flows generated on site toward the surrounding streets.

Water quality is a key component of the drainage design. The drainage proposal incorporates measures to limit and capture targeted pollutants from the site runoff. These measures include the installation of Gross Pollutant Traps, rainwater tanks and passive options .i.e. infiltration systems and porous paving.

An assessment of the flooding impacts indicates that to date Manly Council do not consider the site to be flood affected. However, projections within the Climate Change Actions report prepared for Council by Cardno, based on the NSW Government Sea Level Rise policy (October 2009), indicate that in the future the site may experience periodic catchment flooding and oceanic inundation.

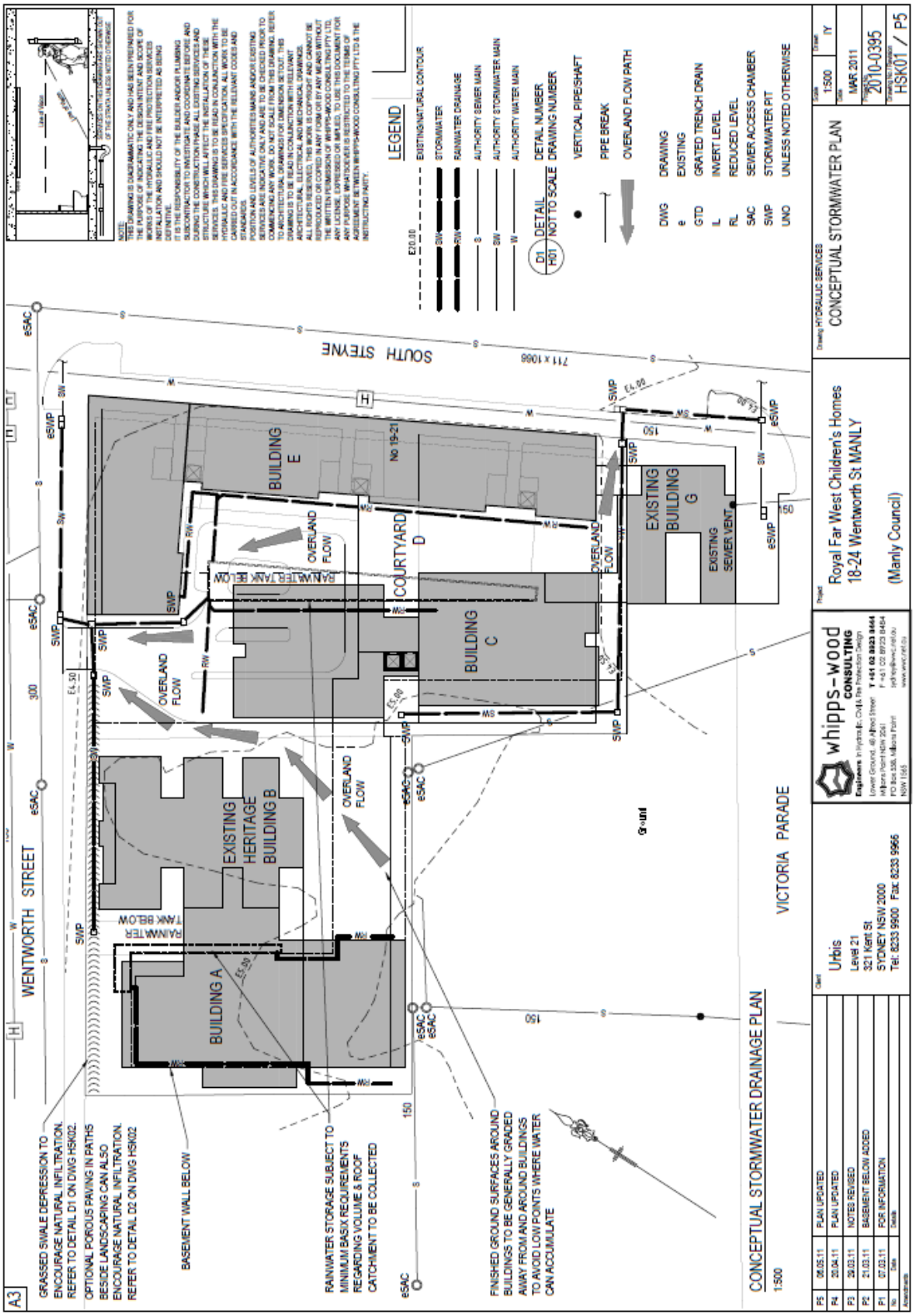
To reduce the environmental impact of the development a number of measures including rainwater harvesting, electronic monitoring of water supplies, reuse of fire systems test water and the installation of WELS rated fixtures and fittings are proposed.

Based on information provided by the various infrastructure authorities there are a number of water, sewer and gas mains located within the surrounding streets. Preliminary advice provided by Sydney Water indicates that some augmentation of the sewer and water main infrastructure will be required for the development based primarily of the location of new buildings and the proposed building heights.

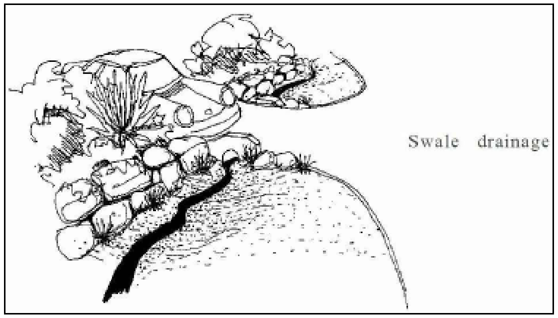
REFERENCES

- Cooperative Research Centre for Catchment Hydrology, 1999
- Climate Change Actions for Manly 2008 – 2038 – Cardno
- NSW Sea Level Rise Policy Statement (October 2009) and NSW Coastal Planning Guideline: Adapting to Sea Level Rise (August 2010) and NSW Coastal Risk Management Guide
- Specification for Stormwater Drainage 2003 and Specification for on-site Stormwater Management 2003 – Manly Council

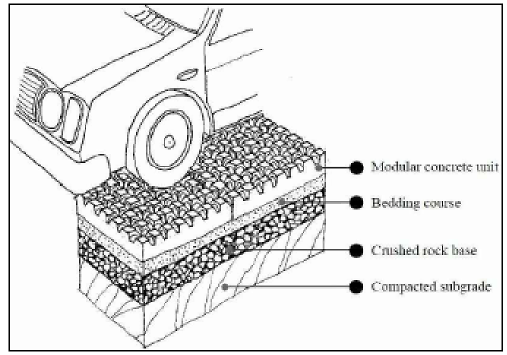
APPENDIX A – CONCEPTUAL STORMWATER PLAN



A3



D1 HSK01 SAMPLE SWALE ARRANGEMENT
NOT TO SCALE



D2 HSK01 SAMPLE MODULAR POROUS PAVING ARRANGEMENT
NOT TO SCALE

NOTE:
THIS DRAWING IS DIAGRAMMATIC ONLY AND HAS BEEN PREPARED FOR THE PURPOSE OF INDICATING THE DESIGN INTENT AND SCOPE OF WORKS OF THE HYDRAULIC AND FIRE PROTECTION SERVICES INSTALLATION AND SHOULD NOT BE INTERPRETED AS BEING DEFINITIVE.
IT IS THE RESPONSIBILITY OF THE BUILDER AND/OR PLUMBING SUBCONTRACTOR TO INVESTIGATE AND COORDINATE BEFORE AND DURING THE CONSTRUCTION PHASE ALL EXISTING SERVICES AND STRUCTURE WHICH WILL AFFECT THE INSTALLATION OF THESE SERVICES. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE HYDRAULIC AND FIRE SERVICES SPECIFICATION. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT CODES AND STANDARDS.
POSITION AND LEVELS OF AUTHORITIES MAINS AND/OR EXISTING SERVICES ARE INDICATIVE ONLY AND ARE TO BE CHECKED PRIOR TO COMMENCING ANY WORK. DO NOT SCALE FROM THIS DRAWING. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSION SETOUT. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTURAL, ELECTRICAL AND MECHANICAL DRAWINGS.

Approximate Site Area Calculations

Site Area	=	6951 m2	
Existing Impervious Area	=	6660 m2	95.81 % of site
Proposed Impervious Area	=	6429 m2	92.49 % of site
Impervious Area Increase	=	-231 m2	-3.32 % of site
Detention Catchment	=	0 m2	0.00 % of site
10yr 1 hr Rainfall Intensity	=	59.56 mm/h	
100yr 5min Rainfall Intensity	=	266.43 mm/h	
20yr 5min Rainfall Intensity	=	205.34 mm/h	
5yr 5min Rainfall Intensity	=	158.63 mm/h	

RATIONAL METHOD FLOW CALCULATION FOR SITE FLOWS

10yr 1 hr Rainfall Intensity	=	59.56 mm/h	59.56 mm/h	59.56 mm/h	59.56 mm/h	59.56 mm/h	59.56 mm/h
Design ARI	=	100 yr	100 yr	20 yr	20 yr	5 yr	5 yr
Catchment Area	=	6951 m2	6951 m2	6951 m2	6951 m2	6951 m2	6951 m2
Impervious Area	=	6660 m2	6429 m2	6660 m2	6429 m2	6660 m2	6429 m2
Design Rainfall Intensity	=	266.43 mm/h	266.43 mm/h	205.34 mm/h	205.34 mm/h	158.63 mm/h	158.63 mm/h
Impervious Proportion	=	95.81 %	92.49 %	95.81 %	92.49 %	95.81 %	92.49 %
C10	=	0.886	0.875	0.886	0.875	0.886	0.875
ARI Multiplier Factor Fy	=	1.200	1.200	1.050	1.050	0.950	0.950
Runoff Coefficient	=	1.000	1.000	0.930	0.918	0.842	0.831
(as per Fig 14.13 in Australian Rainfall & Runoff 1987 ed.)							
Calculated Runoff	=	**514.4** L/s	**514.4** L/s	**368.8** L/s	**364.1** L/s	**257.7** L/s	**254.5** L/s
		Existing Q100	Proposed Q100	Existing Q20	Proposed Q20	Existing Q5	Proposed Q5

NO NET INCREASE PROPOSED TO EXISTING SITE RUNOFF.
IMPERVIOUS AREA IS ANTICIPATED TO DECREASE, AND RAINWATER STORAGE TANKS WILL PROVIDE SOME FLOOD ATTENUATION BENEFIT

No	Date	Details
P3	29.03.11	DETAILS REVISED, SITE AREA CALCULATIONS ADDED
P2	21.03.11	DETAIL REFERENCES ADJUSTED
P1	07.03.11	FOR INFORMATION

Amendments

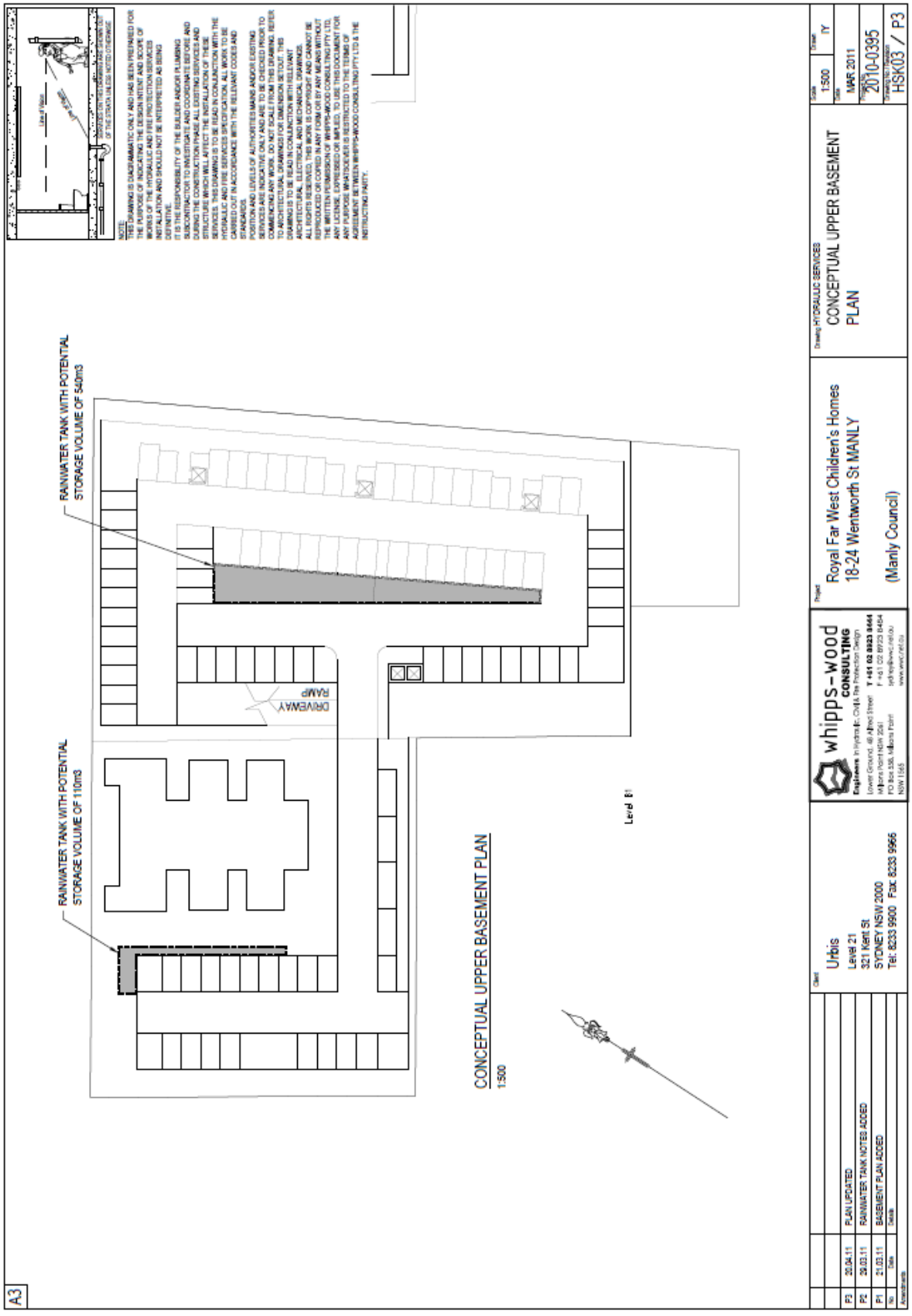
Client
Urbis
Level 21
321 Kent St
SYDNEY NSW 2000
Tel: 8233 9900 Fax: 8233 9966

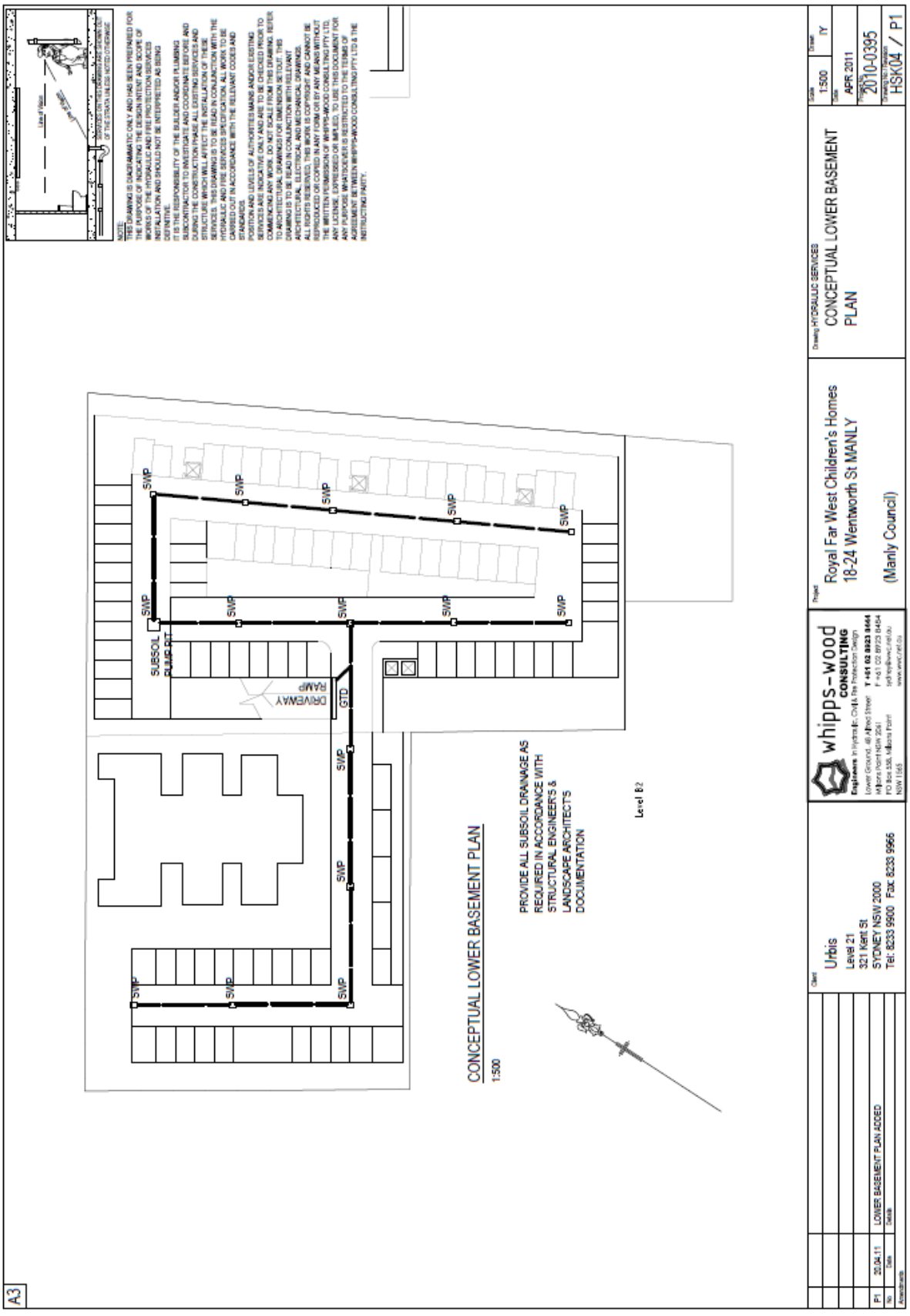
whipps-wood CONSULTING
Engineers in Hydraulic, Civil & Fire Protection Design
Lower Ground, 48 Alfred Street, Milsons Point NSW 2061
PO Box 558, Milsons Point NSW 1565
T +61 02 8923 8444
F +61 02 8923 8484
sydney@wwc.net.au
www.wwc.net.au

Project
Royal Far West Children's Homes
18-24 Wentworth St MANLY
(Manly Council)

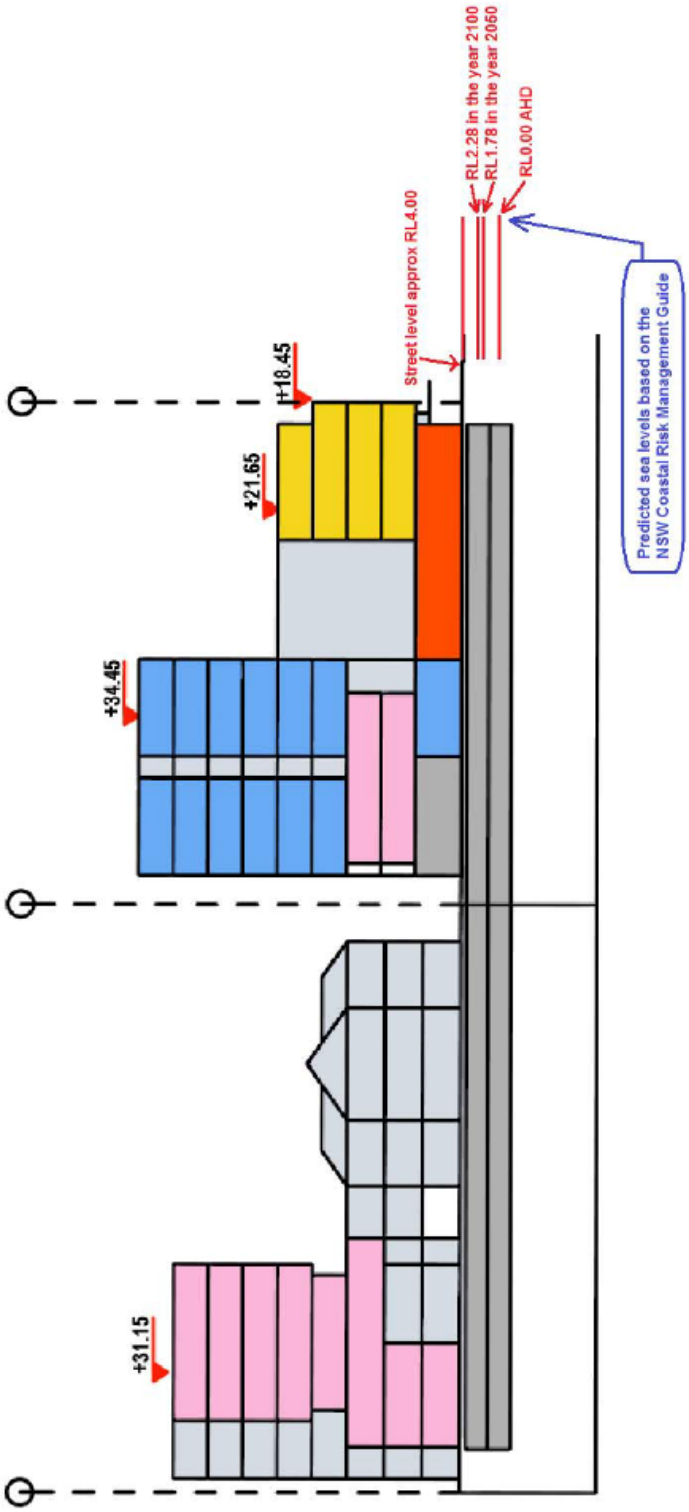
Drawing HYDRAULIC SERVICES
SAMPLE SWALE & POROUS PAVING DETAILS

Scale - | Drawn IY
Date MAR 2011
Project No. 2010-0395
Drawing No / Revision HSK02 / P3


RAINWATER TANK WITH POTENTIAL STORAGE VOLUME OF 540m3
RAINWATER TANK WITH POTENTIAL STORAGE VOLUME OF 110m3
DRIVEWAY RAMP
Level B1
CONCEPTUAL UPPER BASEMENT PLAN
1:500
A3
Client
Urbis
Level 21
321 Kent St
SYDNEY NSW 2000
Tel: 8233 9900 Fax: 8233 9966
whipps-wood CONSULTING
Project
Royal Far West Children's Homes
18-24 Wentworth St MANLY
(Manly Council)
Drawing HYDRAULIC SERVICES
CONCEPTUAL UPPER BASEMENT PLAN
Scale 1:500
Date MAR 2011
Project No 2010-0395
Drawing No HSK03 / P3
Amendments
No Date Details
P3 20.04.11 PLAN UPDATED
P2 29.03.11 RAINWATER TANK NOTED ADDED
P1 21.03.11 BASEMENT PLAN ADDED


CONCEPTUAL LOWER BASEMENT PLAN
1:500
PROVIDE ALL SUBSOIL DRAINAGE AS REQUIRED IN ACCORDANCE WITH STRUCTURAL ENGINEER'S & LANDSCAPE ARCHITECTS DOCUMENTATION
Level B2
SUBSOIL PUMP PIT
DRIVEWAY RAMP
GTD
SWP
Client
Urbis
Level 21
321 Kent St
SYDNEY NSW 2000
Tel: 8233 9900 Fax: 8233 9966
whipps-wood CONSULTING
Project
Royal Far West Children's Homes
18-24 Wentworth St MANLY
(Manly Council)
Drawing HYDRAULIC SERVICES
CONCEPTUAL LOWER BASEMENT PLAN
Scale 1:500
Date APR 2011
Project 2010-0395
Drawing Number HSK04 / P1
P1 20.04.11 LOWER BASEMENT PLAN ADDED
A3

APPENDIX B – SITE & PREDICTED SEA LEVELS



APPENDIX C – MANLY COUNCIL RESPONSE

Manly Council

Your Ref:
Our Ref: 17/12/2010/GM
Enquiries: Strategic Land Use Planning Branch **and** 9976 1614.

Council Offices
1 Belgrave Street
Manly NSW 2095

Correspondence to
General Manager
PO Box 82
Manly NSW 1655

DX 9205 Manly

Telephone 02 9976 1500
Facsimile 02 9976 1400

www.manly.nsw.gov.au
records@manly.nsw.gov.au

ABN 43 662 868 065

Daniel Cavallo
A/Director
Government Land and Social Projects
Department of Planning
GPO Box 39
Sydney
NSW 2001

Dear Mr Cavallo,

Re: Royal Far West Concept Plan (MP10_0159)

In response to the Director General's Requirements (DGRs) for the above project outlined in the Department of Planning letter received by Council on 2 December, 2010, Manly Council at its Ordinary Meeting on the 13 December, 2010, resolved the following:

That Council:

1. Request the Department of Planning to defer consideration of the Concept Plan until Council has had a full briefing from the Board of Far West on the proposal.

2. Express serious concerns to the Minister and Local Member about the proposal and its impact on the amenity, sustainability and environment on the Manly community.

3. Remind the Minister for Planning of the election in March and that the State Government is in a caretaking mode and that any consideration or given consent for the proposal to go forward would not be in the public interest.

Further, the report which informed the above Council resolution regarding the project specified additional matters for consideration in the public interest. The additional considerations that the Council would request that the Department include in the DGRs for the Far West site include each of the following:

- The "NSW Sea Level Rise Policy Statement" dated October 2009, which establishes sea level rise planning benchmarks of an increase in the mean sea levels of 40cms by 2050 and 90cms by 2100, and also the "NSW Coastal Planning Guideline: Adapting to Sea Level Rise" (August 2010) in recognition of the site being within approximately 90 metres of the mean high water mark.

- The impact of the proposed gross floor area of 26,300 square metres comprising:
    - 7500 square metres Far West Health facility,

- 1300 square metres Retail,
- 7500 square metres Hotel, and
- 10000 square metres Residential on the Manly Town Centre and the Ocean Beach.

- The DGRs should also require the proponent to address the relationship of the proposed Far West, Hotel, retail/Commercial and Residential development to the scale and character of the surrounding development, and the potential visual impact and increased shadowing of the Ocean Beach, the residential amenity of the area and it's significant function as a destination for day visitors from within the Sydney Region and beyond. Any future proposed development should comply with the DGRs specific requirements regarding urban design, building mass and form, and streetscape.

It is acknowledged that the 14 December deadline received for this response set by the Director General has passed. It was not possible to meet this due to Council's requirement to fulfil its administration of approved minutes for its meeting on 13 December, 2010.

For further discussion, information or assistance please contact Council's Strategic Land Use Planning Branch on ph 9976 1614.

Yours faithfully,

Henry Wong
General Manager

Date: 20/12/2010

CC The Hon Tony Kelly
CC Mr Mike Baird MP

APPENDIX D – SYDNEY WATER RESPONSE

Sydney WATER

15 December 2010

Mr Daniel Cavallo
A/Director, Government Land and Social Projects
Department of Planning
GPO Box 39
Sydney NSW 2001

Attention: Peter McManus

Project Application MP10_0159 – Royal Far West Concept Plan

Dear Mr Cavallo,

Thank you for your letter of 1 December 2010 requesting details of key issues and assessment requirements for the redevelopment and expansion of the Royal Far West facilities for the purpose of mixed use development. Sydney Water has reviewed the preliminary environmental assessment and provides the following comments for the Department's consideration.

Sydney Water requirements for Environmental Assessment
To provide the developer with detailed servicing advice Sydney Water needs the environmental assessment to include the following:

1. *Integrated Water Management Plan* – the Integrated Water Management Plan should include any proposed alternative water supply, proposed end uses of potable and non-potable water, demonstration of water sensitive urban design and any water conservation measures.

2. *Infrastructure Management Plan* – the developer needs to provide Sydney Water with information on the required water and wastewater services, and any augmentation that may be required for the proposed development. This will allow Sydney Water to determine the impact of the proposed development on its existing services and identify any augmentation requirements. When determining landscaping options, the developer should take into account that certain tree species can cause cracking or blockage of Sydney Water pipes.

Sydney Water Servicing
Sydney Water will further assess the impact of individual developments when the proponent applies for a Section 73 Certificate. This assessment will enable Sydney Water to specify any works required as a result of the development and to assess if amplification and/or changes to the system are applicable. Sydney Water requests the Department of Planning to continue to instruct proponents to obtain a Section 73 Certificate from Sydney Water.

The proponent must fund any adjustments needed to Sydney Water infrastructure as a result of any development. The proponent should engage a Water Servicing Coordinator to get a Section 73 Certificate and manage the servicing aspects of the development. Details are available from any Sydney Water Customer Centre on 13 20 92 or Sydney Water's website at www.sydneywater.com.au.

Sydney Water e-planning

Sydney Water has created a new email address for planning authorities to use to submit statutory or strategic planning documents for review. This email address is urbangrowth@sydneywater.com.au. The use of this email will help Sydney Water provide advice on planning projects faster, in line with current planning reforms. It will also reduce the amount of printed material being produced. This email should be used for:

- Section 62 consultations under the Environmental Planning and Assessment Act 1979
- consultations where Sydney Water is an adjoining land owner to a proposed development
- Major Project applications under Part 3A of the *Environmental Planning and Assessment Act 1979*
- consultations and referrals required under any Environmental Planning Instrument
- draft LEPs, SEPPs or other planning controls, such as DCPs
- any proposed development or rezoning within a 400m radius of a Sydney Water Wastewater Treatment Plant
- any proposed planning reforms or other general planning or development inquiries

If you require any further information, please contact David Demer of the Urban Growth Branch on 02 8849 5241 or e-mail david.demer@sydneywater.com.au

Yours sincerely

Adrian Miller,
Manager, Urban Growth Strategy and Planning