Carter Street Precinct

Report for Goodman Property Services

Response to Draft DCP Infrastructure

Author: Peter Wark

Approver: Anthony McLandsborough

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Suite 702, 154 Pacific Highway, St Leonards, NSW 2065

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Finalisation signatures

The design described in this report is considered to have been finalised.

Signature **Date**

Peter Wark
Civil Engineer (Author) 23/04/14

Anthony McLandsborough
Director 23/04/14

Notes: The finalisation signatures shown above do not provide evidence of approval to the design. Approval signatures are shown on the title sheet of the design plans.

Contents

1 Introduction

Goodman Property Service owns 27.9Ha of land within the Carter Street Urban Activation Precinct (52ha). The potential redevelopment of the Goodman site within the Carter Street UAP provides a mixture of housing and employment opportunities complemented by improved public transport services and good access by walking and cycling to the surrounding open space and recreational facilities.

Goodman, with the assistance of its consultant team, has prepared a Masterplan of the 27.9Ha site which proposes a number of land uses including residential, retail, commercial and open spaces, similar to those proposed by DP&I within the Goodman site north of Carter Street.

AT&L has provided infrastructure advice for the Masterplan for the Goodman site, including assessing infrastructure costs.

In response to the public exhibition of the Carter Street UAP, AT&L has prepared an infrastructure submission on behalf of Goodman to comment and compare the DPI's Masterplan and Goodman Masterplan for the Carter Street UAP.

This report seeks to respond the DPI's Draft DCP:

- Street Network and Layout
- Street Cross Sections
- Stormwater – Flooding/ WSUD/ On Site Detention
- Utility Service Infrastructure
- Site Grading and Earthworks
- Remediation
- Comparative Infrastructure Costs

2 Site Description

2.1 Existing Site

The existing site is located on the western side of the Sydney Olympic Park and northern side of the M4. The site is 27.9Ha in area and is bounded by Hill Road, Old Hill Link, Edwin Flack Avenue, Birnie Avenue and Carter Street. The site generally grades from the Birnie Avenue west to Hill Road. refer Figure 2. The existing site has a significant drop in level approximately 300m east of Hill Road.

The site currently accommodates a mixture light industrial and commercial development comprising large warehouse and office buildings with external hardstand areas and driveway accesses. Uhrig Road is an existing concrete local road that connects Edwin Flack Avenue to Carter Street.

The site is contaminated, and requires extensive remediation and hot spot removal to ensure it meets EPA Guidelines for residential use. The site also has the potential for asbestos to be within the existing buildings and the upper levels of fill across the site.

Figure 1 – Carter Street Precinct 1942

2.2 Existing Infrastructure

Utility service infrastructure servicing the site exists with the surrounding roads and includes, potable water, sewerage, high voltage and low voltage electricity, telecommunication and gas.

The existing stormwater drainage system includes internal site drainage connecting to local road drainage with the site catchment draining to an existing Council owned 3 x 1500 dia. culvert system

in the south western end of the site which in turn flows to Haslams Creek approximately 200m to the west of the Hill Road.

It is understood that individual lots may have existing on site detention systems although not all lots.

The existing ground below the site is understood to have been filled (ref: to WSP Environment and Energy report 00037445.01 dated 19/04/2013) and isolated areas of contamination (hydrocarbons) are located across the site although this will be subject to further investigation and confirmation.

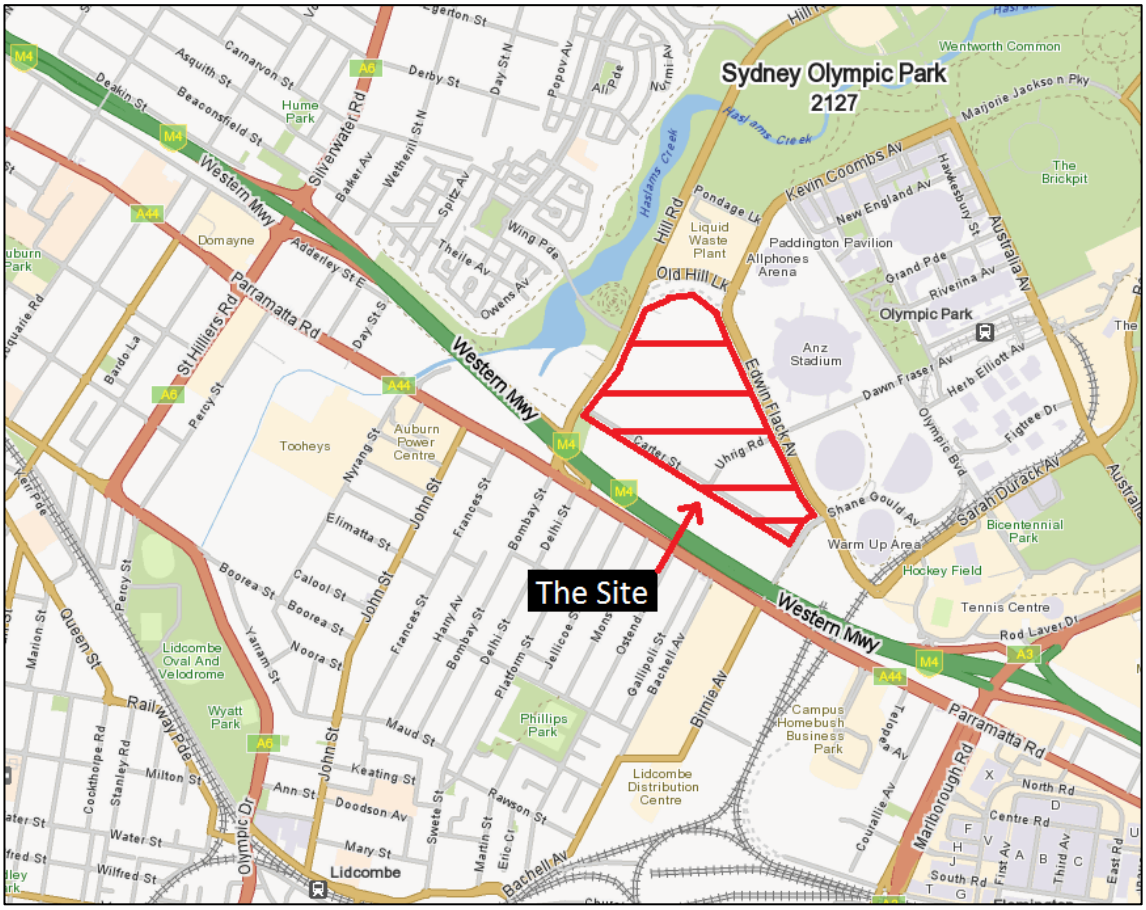


Figure 2 – Locality Plan

3 Infrastructure Submission

3.1 Street Network and Layout

The road network has been categorised into 3 standard road sections, T1, T2 and T3. The Goodman proposed masterplan road network is shown on the plan below.

Generally the major road network (T1) as shown within the Draft DCP is an acceptable outcome and provides a high level of connectivity and service for the project. In addition to the T1 roads, numerous minor north south roads (T2 and T3) have been shown within the Draft DCP. The layout of the north south local roads in the Draft DCP scheme results in undesirable alignments at each intersection with Carter Street and in our opinion is not cost efficient nor efficient in use of the and area available. We are of the opinion the local roads should be re-aligned and rationalised to provide a more consolidated and functional road network.

The Draft DCP road network presents the following issues that are not seen as efficient or desirable:

- Significant duplication of utility and stormwater drainage infrastructure (capital cost and asset maintenance burden).
- Significantly greater road pavement areas (capital cost and asset maintenance burden) plus the generation of large volumes of stormwater requiring treatment.
- More complex road network with a significant number of 4 way cross intersections which may require traffic signal control.
- Minimises block sizes which can constrain basement carpark layouts.
- Poor alignment of multiple intersections along Carter Street.

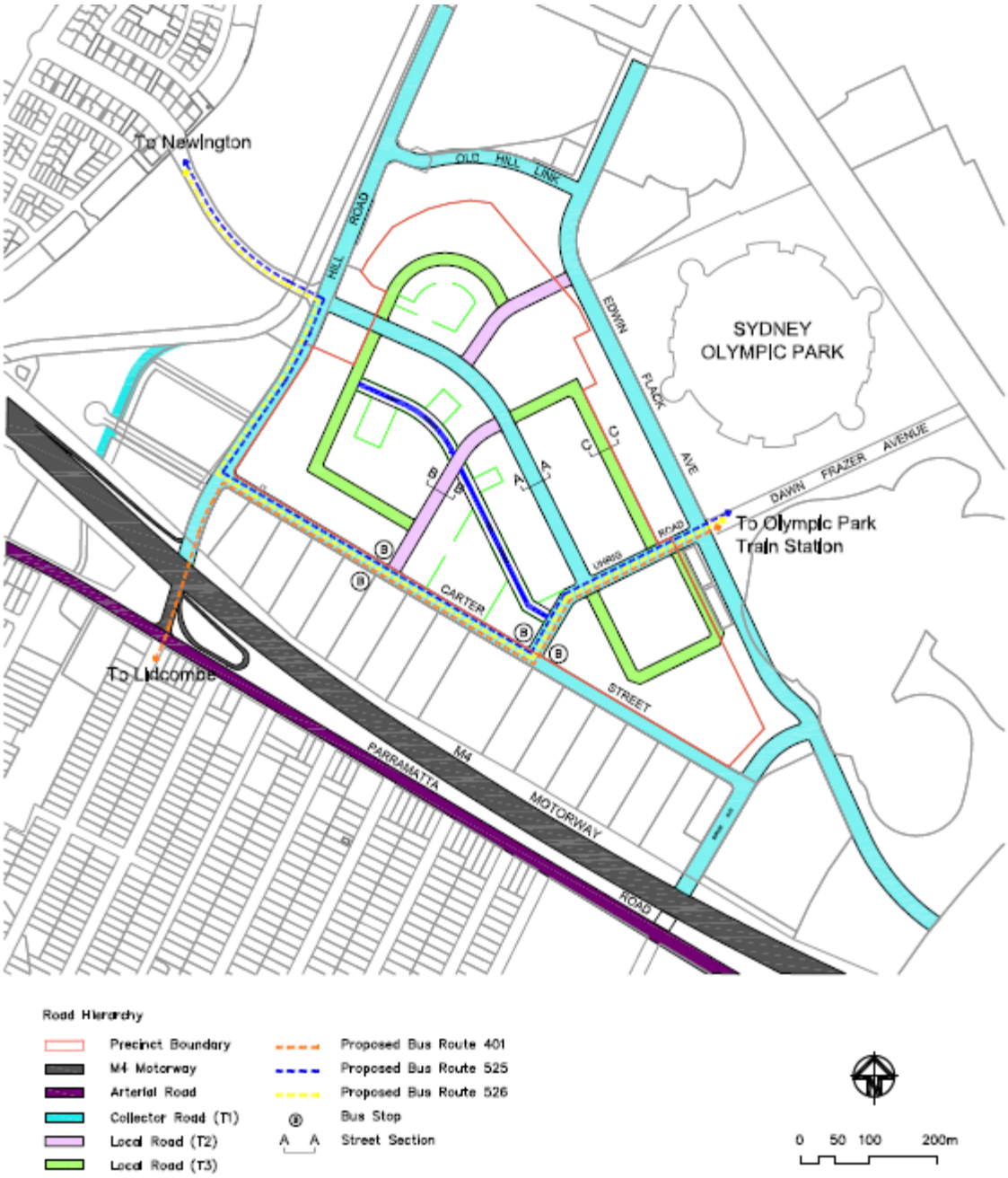


Figure 3 – Goodman Road Network Proposal

3.2 Street Cross Sections

The proposed Goodman Masterplan largely incorporates the street cross section elements as suggested within the draft DCP, with the exception of bio-swales located centrally within the roadways as noted above. The treatment of water will be managed via a bio-swale located within the green corridor on the western side of the project. Typical cross sections of the proposed roads as compared to the Draft DCP proposal are shown below.

Road Type T1 – 23m Road Reserve (Collector Road – Uhrig Road)
This road type is proposed for Uhrig Road (Road No. 2) and John Ian Wing Parade (Road No.1) and includes:

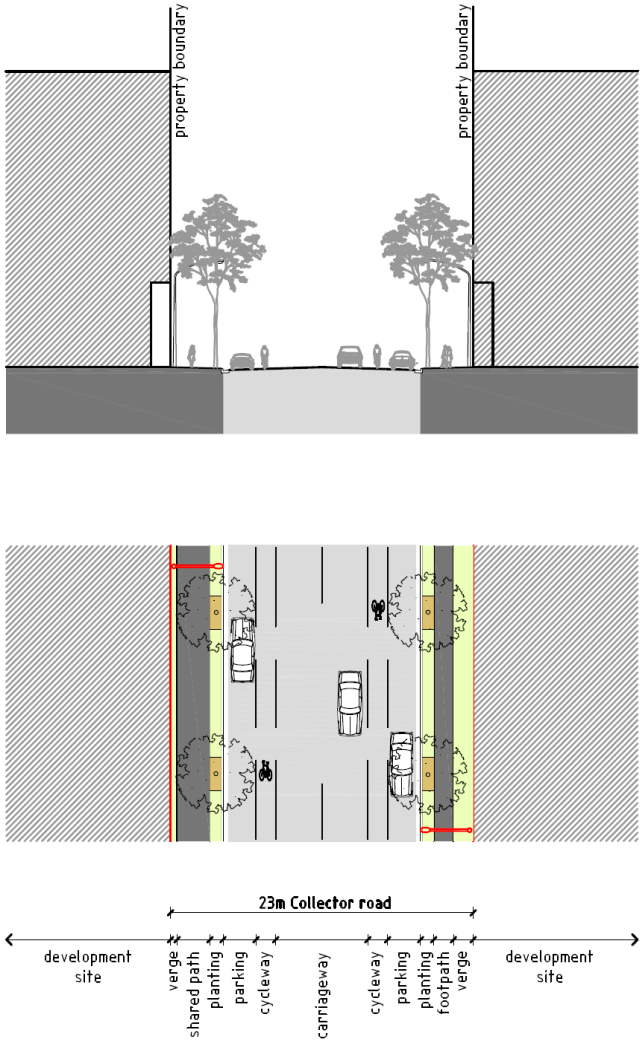
- 7m carriageway
- 2 x 2.5m parking lanes
- 2 x 1.5m on road cycleway
- 4m verge with 2.5m shared path and 1m landscape strip
- 4m verge with 1.5m foot path, 1m and 1.5m landscape strip
- Street lighting at rear of verge on each side of the road

The above elements are consistent with the Draft DCP with an added benefit of an off road shared path being provided to cater for non-commuter cyclists.

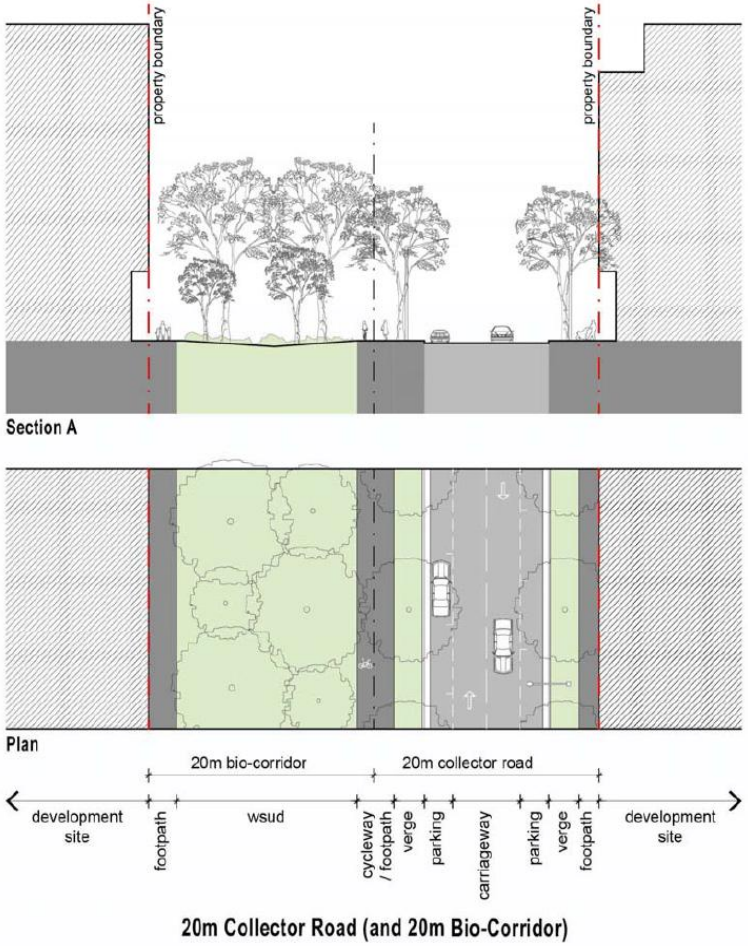
The Goodman scheme proposes to maintain the 1.5m on road cycleways although this may be reconsidered given the current preference for off road cycle ways.

It is proposed to provide 4m wide verges to Uhrig Road. The provision of wide paths for use in outdoor dining is proposed to be provided within the set back to the building line within the lot as an extension to the public road reserve rather than including these areas within the road reserve. This strategy increases the developable lots are while maintaining the street character being promoted in the DCP. An additional benefit of a reduced public road reserve will result in a reduced asset maintenance burden for Council.

The horizontal alignment of Uhrig road is proposed to be maintained in its current location to assist with the proposed staging of the project. It is proposed to reconstruct Uhrig Road and widen the road carriageway and road reserve in accordance with the typical cross sections provided.



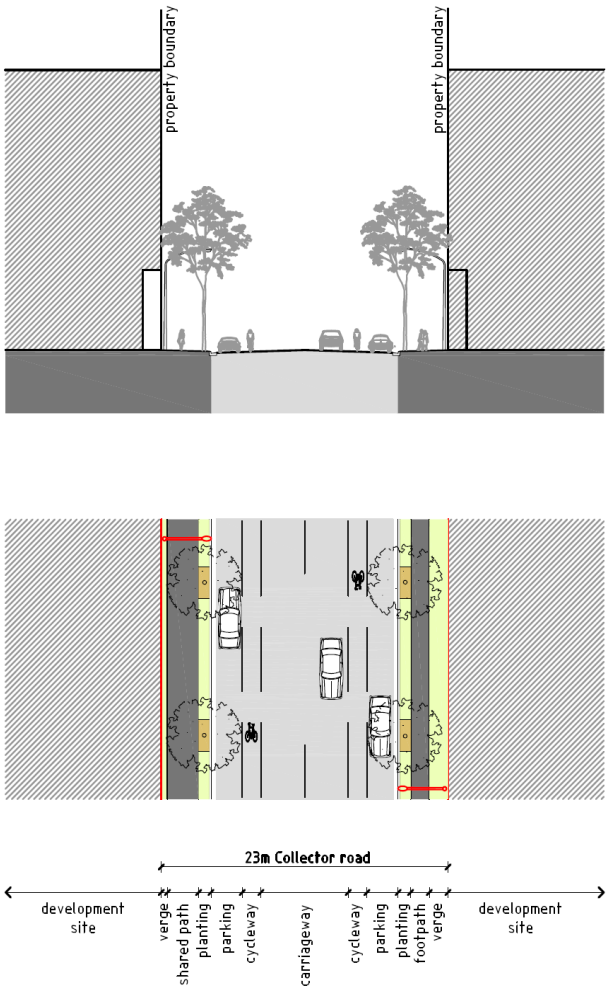
Goodman Proposal

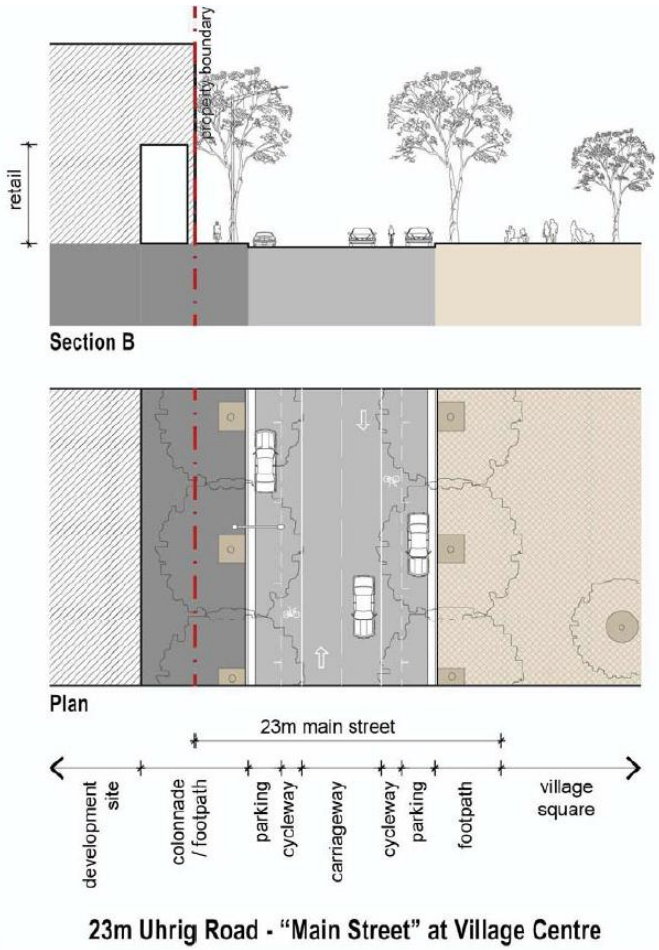


20m Collector Road (and 20m Bio-Corridor)

Draft DCP Proposal

Figure 4 – 23m Road Reserve (Uhrig Road)





23m Uhrig Road - "Main Street" at Village Centre

Goodman Proposal

Draft DCP Proposal

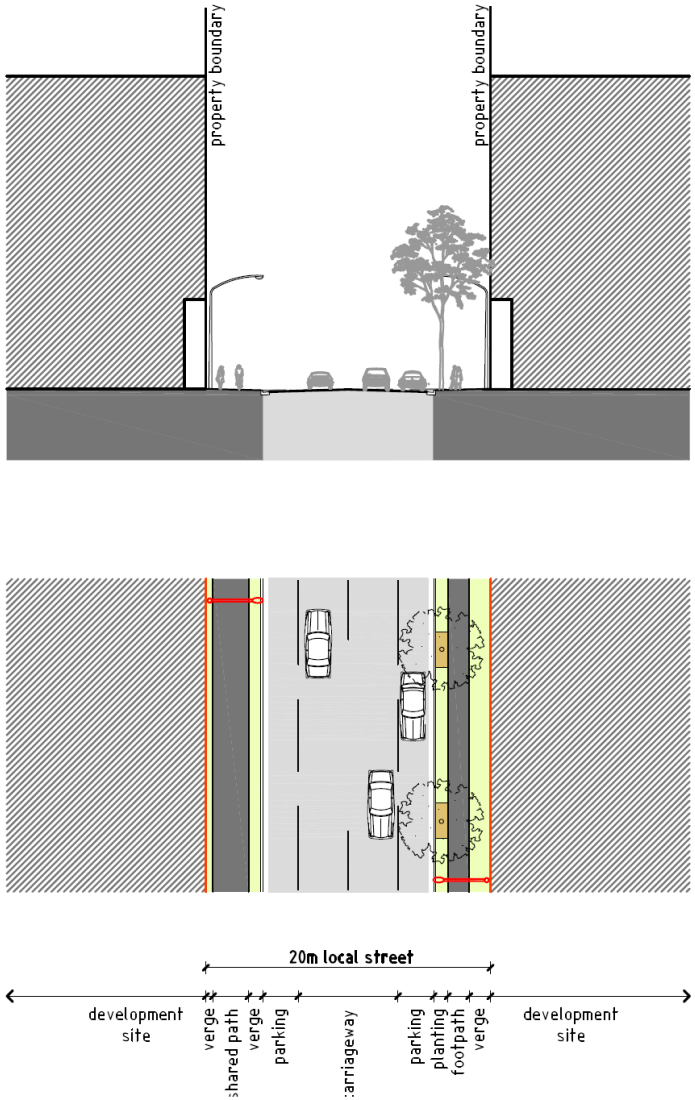
Figure 5 – 23m Road Reserve (John Ian Wing Parade)

Road Type T2 – 20m Road Reserve (East West Connecting Roads)
This road is proposed for East West Roads Connecting to External Road Network (Road No. 3 and 4) and includes:

- 7m carriageway
- 2 x 2.5m parking lanes
- 4m verge with 2.5m shared path and 1m landscape strip
- 4m verge with 1.5m foot path, 1m and 1.5m landscape strip
- Street lighting at rear of verge on each side of the road

The above elements are consistent with the Draft DCP with the exception of:

- The deletion of the centre bio-swale for the reasons provided in Section 3.3.2 below.
- An off road shared path being provided to cater for non-commuter cyclists.



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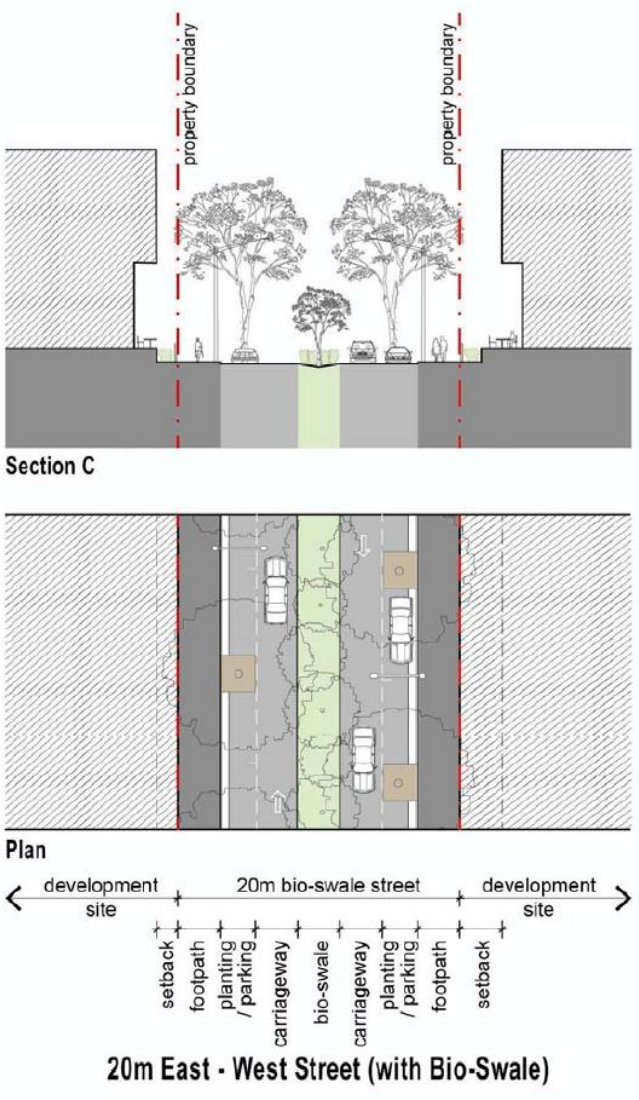


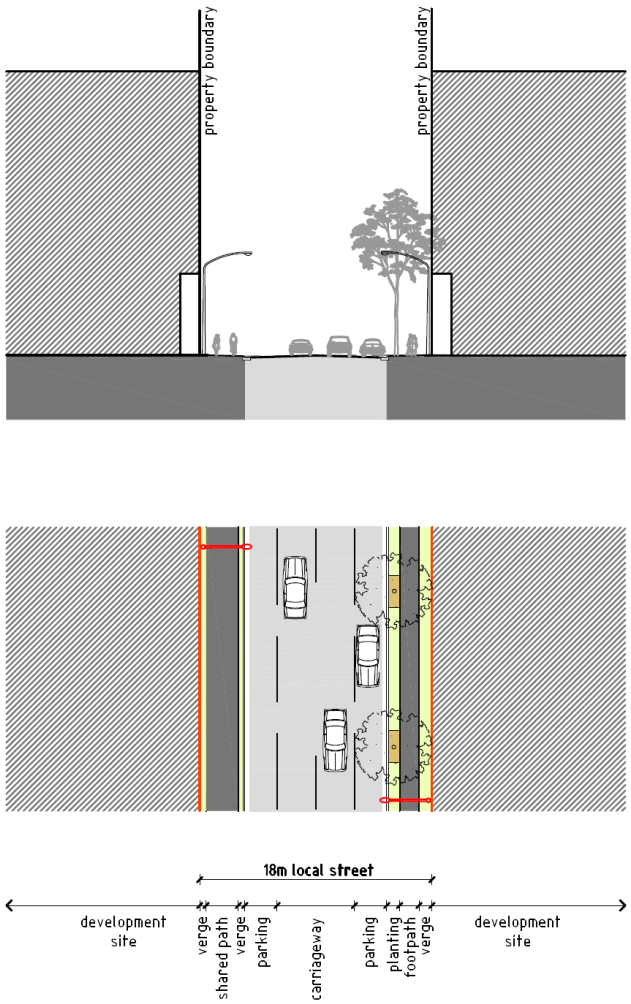
Draft DCP Proposal

Figure 6 – East West Road Reserve

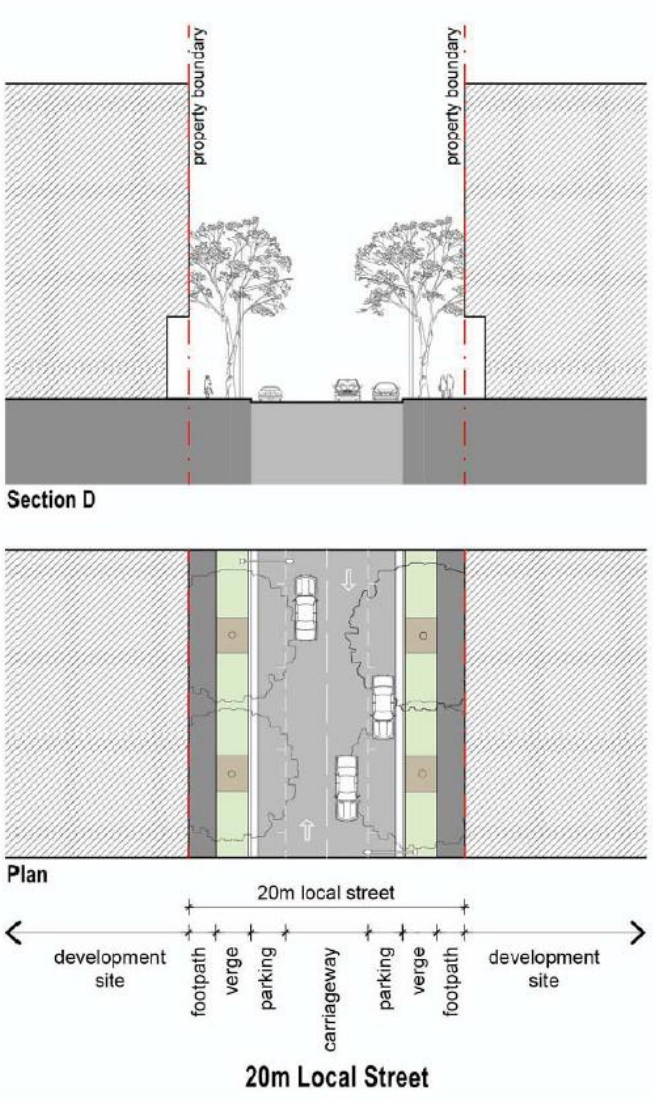
Road TypeT3 – 18m Road Reserve (Local Road)
This road is proposed for Local Roads (Road No. 5, 6, 7 and 8)
and includes:

- 6m carriageway
- 2 x 2.5m parking lanes
- 3.5m verge with 2.5m shared path and 0.5m landscape strip
- 3.5m verge with 1.5m foot path with 2 x 1m landscape strips
- Street lighting at rear of verge on each side of the road

The above elements are consistent with the Draft DCP with the exception of the overall road reserve width being reduced to 18m. It is our opinion this provides a more efficient use of land given these roads are local roads only. The cross section maintains 3m lanes for through traffic and provides a 3.5m verge width that will accommodate a footpath and a standard allocation width for utility services.



Goodman Proposal



Draft DCP Proposal

Figure 7 – Local Road Reserve

3.3 Storm Water

3.3.1 Flooding

The objectives and controls adopted for flooding can be readily achieved on the site as the lowest proposed ground level at the western end of the site is approximately RL 4.5m. It is acknowledged the project will have to be designed to accommodate temporary flood inundation and include overland flow paths in road carriageways as required.

The existing 3 x 1500mm pipe culvert is proposed to be re-aligned to run below the proposed project road ways and subject to further analysis its capacity may be required to be upgraded to meet current standards.

3.3.2 Water Sensitive Urban Design (WSUD)

The Draft DCP includes objectives and controls to be adopted across the site which align with current WSUD best practise.

For the most part the controls can be satisfied although the final location and form will be subject to detailed design.

The Goodman Masterplan incorporates a 20m green corridor including bio-swale running east to west along the southern side of the site to the south of John Ian Wing Parade. This facility will be the primary water quality treatment facility for the site and be designed to achieve the water quality targets included within the Draft DCP. The alignment of the green corridor means that the project catchment will flow to the bio swale. We are of the opinion this provides a desirable outcome for urban amenity of the project as it combines the bio-swale with public open space in a communal space rather than locating directly adjacent to the John Ian Wing Parade. In addition, locating closer to Carter Street increases the project catchment area flowing to the bio-swale. This bio-swale would be designed as the primary water quality treatment facility for the site to meet the targets for the entire site.

The bio-swale would be designed to cater for low flow events to treat storm water. Overland flows resulting from major rainfall events would be drained via road carriageways.

The inclusion of bio-swales within the centre median of Uhrig Road and local roads aligned east west is not favoured due to the following issues:

- Creation of a large maintenance burden
- Bio-retention swales in close proximity to the road pavement, whilst possible is not seen as desirable as it introduces the potential for infiltration of water locally into the sub-grade and pavement sub-base
- Interface of the bio-swale with other utility and stormwater infrastructure
- Occupational health and safety concerns maintaining a system within the centre of a T1 road

3.3.3 Stormwater Detention

The Draft DCP includes a requirement for on site detention to be provided for the site and suggest this should be incorporated within green space at the western end of the site adjacent to Ian John Wing parade.

The Carter Street Precinct is located directly to the south of Haslams Creek and approximately 200m from the water line. The precinct is located at the most downstream end of the catchment and this effectively means the Carter Street catchment drains directly to the harbour.

It is proposed to upgrade the existing 3 x 1500mm diameter pipe culvert system to ensure Carter Street and the precinct is not subject to flooding up to the 100 yr rainfall event.

The inclusion of on site detention may have a detrimental impact on the local drainage and flood regime due to the potential for flows from the upper reaches of the catchment to coincide with the release of flows detained from the Carter Street precinct. On this basis we are of the opinion that on site detention should not be imposed on the precinct.

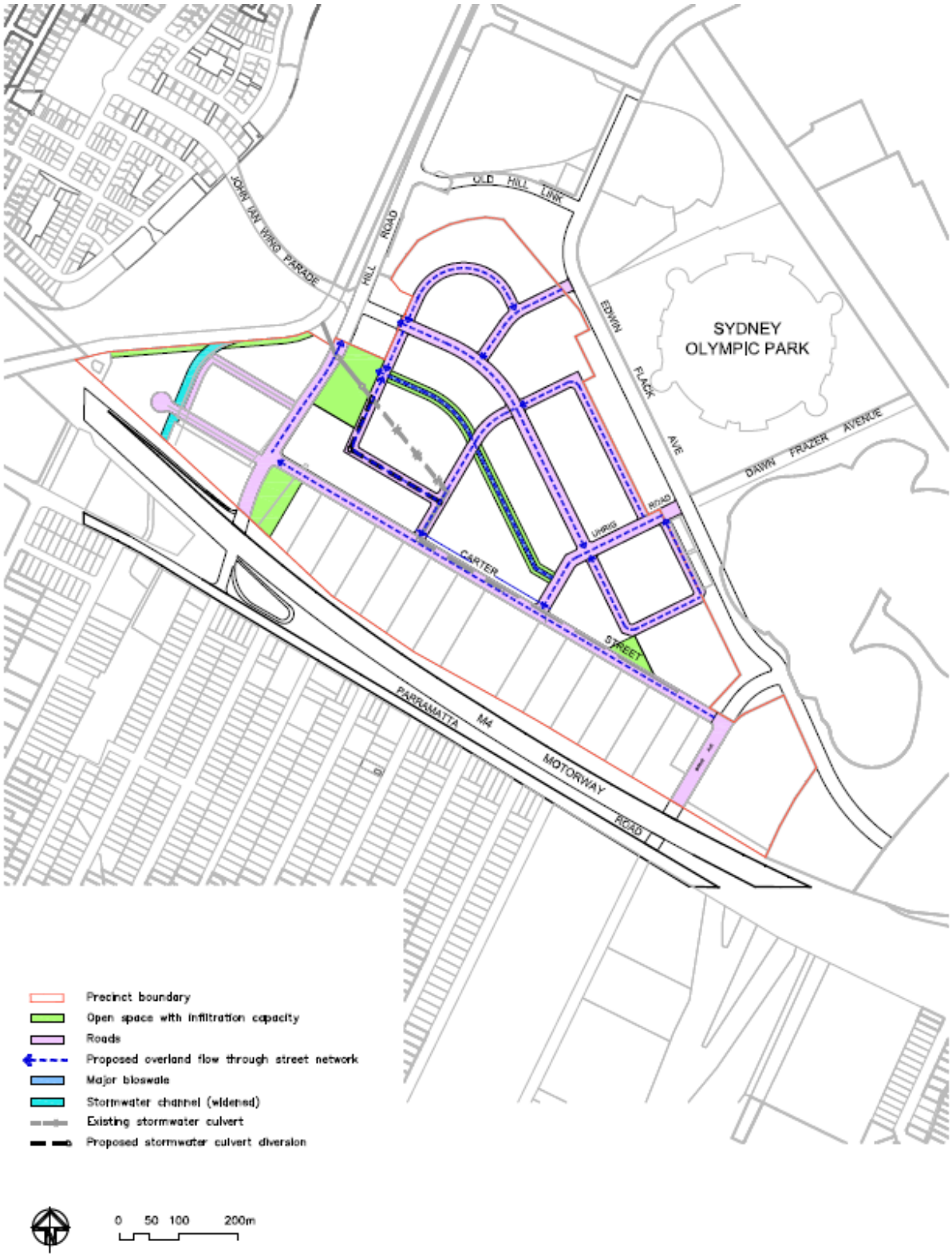


Figure 8 – Goodman Storm Water Management Strategy

3.4 Utility Services Infrastructure

While not specifically addressed in the Draft DCP, utility infrastructure for the project to be provided and incorporated within the proposed road verges. It is proposed to adopt a shared trench arrangement in line with the NSW Streets Opening typical details.

The use of shared service pits as suggested in the Draft DCP could be investigated although current industry standard practise would suggest this would not be acceptable to individual utility authorities. Telecommunications and electrical utility authorities require distinct separation between their services to avoid operational interference. In addition, it is envisaged WHS and security requirements would require specific agreements to be put in place to enable access.

The cost for upgrading lead in services are deemed to be recoverable and an offset mechanism is to be agreed for any contributions or levy imposed on the project.

3.5 Site Grading and Earthworks

The Draft DCP does not provide detail on proposed site grading although it is suggested that the existing drop in level at the western end of the site may be incorporated into the project. The site generally falls east to west from approximately RL 20.5m to RL 5m.

The Goodman Masterplan incorporates a site grading that is compatible with the existing road grades around the perimeter of the precinct. This method of site grading removes the step in existing ground levels at the north western end of the site which is in the order of 5m. In addition, the design grades of the proposed road network will be acceptable and readily connect to Carter Street, Hill Road, Burnie Avenue and Edwin Flack Drive.

3.6 Remediation

A major issue in terms of earthworks across the site is the requirement to remediate a number of existing areas identified as contamination “hot spots” (ref: to WSP Environment and Energy report 00037445.01 dated19/04/2013). The estimated cost of remediation of hot spots alone is in the order of ten million dollars.

In addition, the WSP report refers to a potential for material previously filled across the site (approximately 2m in depth) to be classified general solid waste (GSW). For any option adopted, the GSW would have to be removed and is deemed to be unsuitable for re-use on site. The estimated cost of excavating and disposing of GSW is in the order of $130 million dollars.

In its existing state, the land to the north of Carter Street is not suitable for residential development. As identified above, significant remediation of contaminated land and existing filled ground is required to achieve a site suitable for residential use.

3.7 Comparative Infrastructure Costs

A comparative assessment of the infrastructure cost (excluding GSW removal) for the Draft DCP scheme was undertaken. Utilising the cost rates developed, this comparison indicates the Goodman Masterplan scheme provides a cost saving of approximately 18% over the Draft DCP scheme due to the reduced number of roads and associated drainage and utility infrastructure. In addition, there are benefits in a significant reduction in whole of life asset maintenance costs.

The reason for the significant difference in overall infrastructure cost can be attributed to the DIP scheme containing approximately 1km of additional roads including pavement, drainage and utility infrastructure.

A comparison of infrastructure costs for the DCP scheme and the Goodman scheme are provided in Attachment A.

Indicative cost estimates for community facility infrastructure noted in Table 6 of the UAP Report are provided in Attachment B.

Attachment A

Comparative Infrastructure Costs

GOODMAN SCHEME		
	SITE AREA (m2)	278930
	DEVELOPABLE AREA (m2)	227600
ITEM	DESCRIPTION	AMOUNT
1.0	GENERAL, PRELIMINARIES AND SITE MANAGEMENT (7.5% of total construction costs)	$ 3,712,716.77
2.0	CLEARING & DEMOLITION	$ 19,448,447.33
3.0	TESTING & INVESTIGATION	$ 51,901.12
4.0	EROSION & SEDIMENT CONTROL	$ 209,197.50
5.0	TOPSOILING AND GRASSING / SITE STABILISATION	$ 550,838.20
6.0	EARTHWORKS (road boxout only)	$ 2,199,965.52
7.0	ROADWORKS	$ 3,023,219.75
8.0	STORMWATER DRAINAGE	$ 4,483,367.50
9.0	CONCRETE WORKS	$ 1,376,155.00
10.0	SUBSOIL DRAINAGE	$ 211,620.00
11.0	SIGNAGE & LINEMARKING	$ 55,224.00
12.0	MISCELLANEOUS WORKS	$ 353,430.00
13.0	SEWER RETICULATION	$ 1,251,720.00
14.0	POTABLE WATER RETICULATION and RECYCLED WATER RETICULATION	$ 2,991,470.00
15.0	INTERNAL INTERSECTION UPGRADES (SIGNALS)	$ 350,000.00
16.0	ELECTRICAL , TELECOM , GAS and SERVICE ROAD CROSSINGS	$ 6,557,190.00
17.0	LANDSCAPING AND IRRIGATION	$ 589,144.33
18.0	EXTERNAL INTERSECTION UPGRADES	$ 5,800,000.00
19.0	CONSULTANTS, DESIGN, PROJECT MANAGEMENT, AUTHORITY DESIGN AND CONSTRUCTION FEES AND CHARGES, EXCLUDES S94 AND PLANNING CONTRIBUTIONS/LEVIES (15% of total construction costs)	$ 7,982,341.05
20.0	LONG SERVICE LEVY (0.35% of total infrastructure costs)	$ 214,192.82
	Sub -Total	**$ 61,412,140.90**
	20% Contingency on items 1-18,20, 5% Contingency for Item 19	**$ 11,085,077.02**
	Total Including Contingency	**$ 72,497,217.92**

DCP SCHEME		
	SITE AREA (m2)	279027
	DEVELOPABLE AREA (m2)	165296
ITEM	DESCRIPTION	AMOUNT
1.0	GENERAL, PRELIMINARIES AND SITE MANAGEMENT (7.5% of total construction costs)	$ 4,446,590.49
2.0	CLEARING & DEMOLITION	$ 19,448,447.33
3.0	TESTING & INVESTIGATION	$ 51,901.12
4.0	EROSION & SEDIMENT CONTROL	$ 209,197.50
5.0	TOPSOILING AND GRASSING / SITE STABILISATION	$ 550,838.20
6.0	EARTHWORKS (road boxout only)	$ 2,199,965.52
7.0	ROADWORKS	$ 4,333,395.04
8.0	STORMWATER DRAINAGE	$ 5,579,756.36
9.0	CONCRETE WORKS	$ 2,238,780.40
10.0	SUBSOIL DRAINAGE	$ 344,028.00
11.0	SIGNAGE & LINEMARKING	$ 89,904.60
12.0	MISCELLANEOUS WORKS	$ 353,430.00
13.0	SEWER RETICULATION	$ 2,036,105.29
14.0	POTABLE WATER RETICULATION and RECYCLED WATER RETICULATION	$ 4,866,281.26
15.0	INTERNAL INTERSECTION UPGRADES (SIGNALS)	$ 350,000.00
16.0	ELECTRICAL , TELECOM , GAS and SERVICE ROAD CROSSINGS	$ 9,877,553.17
17.0	LANDSCAPING AND IRRIGATION	$ 958,289.47
18.0	EXTERNAL INTERSECTION UPGRADES	$ 5,800,000.00
19.0	CONSULTANTS, DESIGN, PROJECT MANAGEMENT, AUTHORITY DESIGN AND CONSTRUCTION FEES AND CHARGES, EXCLUDES S94 AND PLANNING CONTRIBUTIONS/LEVIES (15% of total construction costs)	$ 9,560,169.56
20.0	LONG SERVICE LEVY (0.35% of total infrastructure costs)	$ 256,531.22
	Sub -Total	**$ 73,551,164.54**
	20% Contingency on items 1-18,20, 5% Contingency for Item 19	**$ 13,276,207.47**
	Total Including Contingency	**$ 86,827,372.02**

Attachment B

UAP Table 6 Infrastructure Summary Costings

Item	Measure	Who	Indicative Cost *
Local traffic improvement			
1.	Access intersection improvements: • Hill Road and Carter Street: signalisation, upgrade • Hill Road and John Ian Wing Parade: modification of existing signals and upgrade • Edwin Flack Avenue, Dawn Fraser Avenue and Uhrig Road: signalisation • Birnie Avenue and Carter Street: signalisation upgrade	Developer	$6M (design, signals, minor civil works only excluding utility relocation)
2.	Internal intersection improvements: • Carter Street and Uhrig Road: signalisation & upgrade to assist movement of pedestrians & buses • John Ian Wing Parade extension to Uhrig Road	Developer	$500K (signals only)
3.	On-street parking management strategy	Council	Nil to developer
4.	Car share scheme	Developer	Nil
5.	Bus stop infrastructure	Developer	$320K (assumes 2 bus stops internal (Uhrig Rd) and 2 external (Carter St))
6.	Cycle links and public bike parking	Developer	$700K (excludes Carter St off road shared path)
7.	Pedestrian network improvements including pedestrian signals on M4 east bound on ramp, mid- block crossings of Carter Street and footpaths	Developer	$300K
8.	Resident transport information packs	Developer	Nil
9.	Workplace travel plans	Developer	NIl
10.	Wayfinding and directional signage	Developer	$50K

Item	Measure	Who	Indicative Cost
Regional traffic improvement			
11.	Investigate subregional arterial road network capacity through wider area traffic modelling, informed by proposals identified in WestConnex project such as a new east bound ramp onto the M4 motorway from Hill Road	TfNSW	Nil to developer
12.	Investigate design solutions to provide vehicle, pedestrian and cycle access to Carter Street UAP to accommodate West Connex project	TfNSW/ Developer	$50K (concept only)
13.	Investigate intersection improvements when funding available: • Parramatta Road, Hill Road and Bombay Street • Parramatta Road and Birnie Avenue • Hill Road and Old Hill Link • Edwin Flack Avenue and Birnie Avenue	TfNSW/ Developer	$60K (traffic investigation and concept only)
Public transport improvements			
14.	Further feasibility studies into Sydney Olympic Park Line of proposed Western Sydney Light Rail Network incorporating a link into Carter Street	TfNSW/ Parramatta Council	Nil to developer
15.	Review and improve bus service coverage and frequency	TfNSW	Nil to developer
16.	Cycle connection along Carter Street in parallel to M4 Motorway	Developer	$300K (civil cost only)
17.	Investigate options to run more direct train services to Olympic Park Train Station	TfNSW	Nil to developer

Item	Measure	Who	Indicative Cost
Community infrastructure			
18.	Community centre	Developer	Assume 500m2 $1.8M**
19.	Child care centre	Developer	Assume 500m2 $2.1M**
20.	Primary school	Department of Education & Community/ Developer	Assume 2 Ha $60M**
21.	New 1.8 ha park at Hill Road	Developer	$28.8M**
22.	Village park at Uhrig Road and Carter Street as a termination for Dawn Fraser Avenue axis	Developer	Assume 0.8Ha $13M**
23.	Village square as a central meeting place on Uhrig Road 'main street'	Developer	Assume 0.4Ha $6.8M**
24.	Public access along Haslams Creek and construction of Haslams Creek southern bank south of John Ian Wing Parade	Developer	$200K (civil works only)

*Costs included are indicative estimates only and will detailed costing upon investigation and design

** Combined land and build cost