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HILLS SHOWGROUND PRECINCT EAST

CIVIL ENGINEERING DUE DILIGENCE REPORT

OCTOBER 2019

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Hills Showground Precinct East

Civil Engineering Due Diligence Report

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EXECUTIVE SUMMARY

The Hills Showground Precinct East - Lot 56 DP 1253217 (Precinct East) can be readily developed in accordance with The Hills Development Control Plan and The Hills Council Design Guidelines for Subdivision and Developments.

Significant excavation will be required for Precinct East to accommodate basement carparking required for the high-rise residential buildings.

A local access road is to be designed and constructed within the site in accordance with Council requirements and will be dedicated to Council upon completion of the project.

A Utilities Impact Assessment and Integrated Water Cycle Management Strategy have been developed and should be read in conjunction with this report. These reports indicate that the site can be readily serviced and stormwater management has been considered as part of the wider precinct works.

Constraints of the Precinct East have been assessed within this report. Augmentation to existing roads for provision of new intersections and interface with existing buildings will require review in subsequent design stages as part of detailed development applications.

1 INTRODUCTION

1.1 OVERVIEW

This report has been prepared for Landcom on behalf of Sydney Metro to support a Concept development application (DA) under Section 4.22 of the *Environmental Planning and Assessment Act 1979 (EP&A Act)*.

The concept for which approval is sought (the ‘Concept Proposal’) is for a high-density mixed-use precinct with a new public park and plaza, and associated facilities on land located within the Hills Showground Station Precinct (the ‘Site’) on development lots (Lot 53, Lot 55 and 56 in DP 1253217) (the ‘DA Area’) (Refer Figure 1-1).

The Concept Proposal comprises residential and non-residential land uses and building envelopes of varying heights from four (13m) to up to twenty storeys (68m). The proposal also includes a new road, landscaping, services and the provision of publicly accessible open space in the form of Doran Drive Plaza and a park. Concept Proposal comprises a total gross floor area (GFA) of 175,796m² across all three development lots.

The Concept Proposal meets the criteria to be declared a State Significant Development (SSD) under State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP).

1.2 SITE DESCRIPTION

1.2.1 HILLS SHOWGROUND STATION PRECINCT

The term ‘the Site’ reflects the Hills Showground Station Precinct boundary identified in the SRDP SEPP and includes the areas detailed in Table 1-1 and illustrated in Figure 1-1. The Site has a total area of 8.4 hectares.

Table 1-1 Hills Showground Station

Existing use	Legal description	Address
Sydney Metro commuter carpark and plaza	Lot 52 1253217	3 De Clambe Drive, Castle Hill
Development Lot – Hills Showground Precinct West	Lot 53 DP 1253217	5 De Clambe Drive, Castle Hill
Development Lot – Doran Drive Precinct	Lot 55 DP 1253217	2 Mandala Parade Castle Hill
Development Lot – Hills Showground Precinct East	Lot 56 DP 1253217	3 Andalusian Way, Castle Hill
Hills Showground Station Box and service facility boxes	Lot 54 & Lot 50 1253217	1 Mandala Parade, Castle Hill
Mandala Parade, De Clambe Drive, Doran Drive, Andalusian Way	N/A	N/A

Figure 1-1: The Hills Showground Station Precinct (the Site)



Source: Cox Architecture 2019

The eastern part of the Site (Hills Showground Precinct East – Lot 56 DP 1253217) currently contains the former Council administration building and associated parking and landscaping. It was being used as a Sydney Metro’s construction site office but is proposed to be demolished by way of a separate DA (304/2020/LA) currently under consideration by Council.

The western part of the Site contains the recently opened Hills Showground Metro Station, plaza and commuter car park. The remainder was cleared to create the two development lots (Lots 53 and Lot 55 DP 1253217) and the roads listed in the table above.

Former development on the western part of the Site consisted of The Hills Entertainment Centre which included an Auditorium and Council’s works depot that were demolished to make way for the metro.

The Site is bordered by the following:

- North and northwest – De Clambe Drive with a drainage basin and the Castle Hill Showground further north
- West – De Clambe Drive and Cattai Creek riparian zone with commercial/industrial warehouses further west
- South to southeast – Carrington Road across which are low density residential developments, a child care and medical/physiotherapy
- East – Showground Road across which are low density residential development.

1.2.2 HILLS SHOWGROUND STATION DEVELOPMENT LOTS (DA AREA)

The Concept Proposal relates to the three development lots detailed in Figure 1-1 and Table 1-2 and referred to herein as the ‘DA Area’. This land is currently owned by Sydney Metro.

Table 1-2 Hills Showground Station Precincts

Precinct Name	Legal Description	Address	Description of existing development	Precinct Area (m2)
Hills Showground Precinct West	Lot 53 DP 1253217	5 De Clambe Drive, Castle Hill	L shaped vacant lot with existing stormwater drainage easement on the portion adjacent to De Clambe Drive.	3,293
Doran Drive Precinct	Lot 55 DP 1253217	2 Mandala Parade, Castle Hill	Rectangular vacant lot with no vegetation.	7,969
Hills Showground Precinct East	Lot 56 DP 1253217	3 Andalusian Way, Castle Hill	Former two storey Council administration building and associated parking and landscaping.	28,226

1.3 PLANNING CONTEXT

The Site is located in The Hills Shire local government area (LGA), 25km north-west of the Sydney CBD and in proximity to the following centres in the region accessible along the North West Metro: Castle Hill, Norwest Business Park and Rouse Hill Town Centre.

The Site forms part of the broader Showground Station Precinct (figures below) covering 271 hectares, rezoned in 2017 as part of the Department of Planning, Infrastructure and Environment's (The Department) priority precinct program. The rezoning of the Precinct, along with changes to height, density, and lot size controls, as well as other supporting controls will:

- transform the area around the new Hills Showground Station into a vibrant urban centre
- provide for a maximum of 5,000 new dwellings and 2,300 new jobs over 20 years
- deliver nearly two hectares of parks and new open space
- provide community facilities, recreation areas and a mix of housing choice for people at all life stages.

This rezoning of the broader precinct followed the finalisation of the North Rail Link Corridor Strategy in September 2013 by the Department and Transport for NSW (TfNSW) to guide planning and development along the rail corridor, with a Structure Plan prepared for each of the new eight stations. Subsequently, the Hills Shire Council (Council) unanimously voted to nominate the Showground Station Precinct, along with the Bella Vista Station and Kellyville Station Precincts, as Priority Precincts. These precincts were subsequently announced by the NSW Government in August 2014 as a means of implementing the Corridor Strategy and the Council's own corridor strategy known as 'The Hills Corridor Strategy adopted in November 2015'.

The planning controls for the Site and the broader Showground Station Precinct are set out in The Hills Local Environmental Plan 2012 (THLEP) and supported by site specific controls in The Hills Development Control Plan 2012 (THDCP).

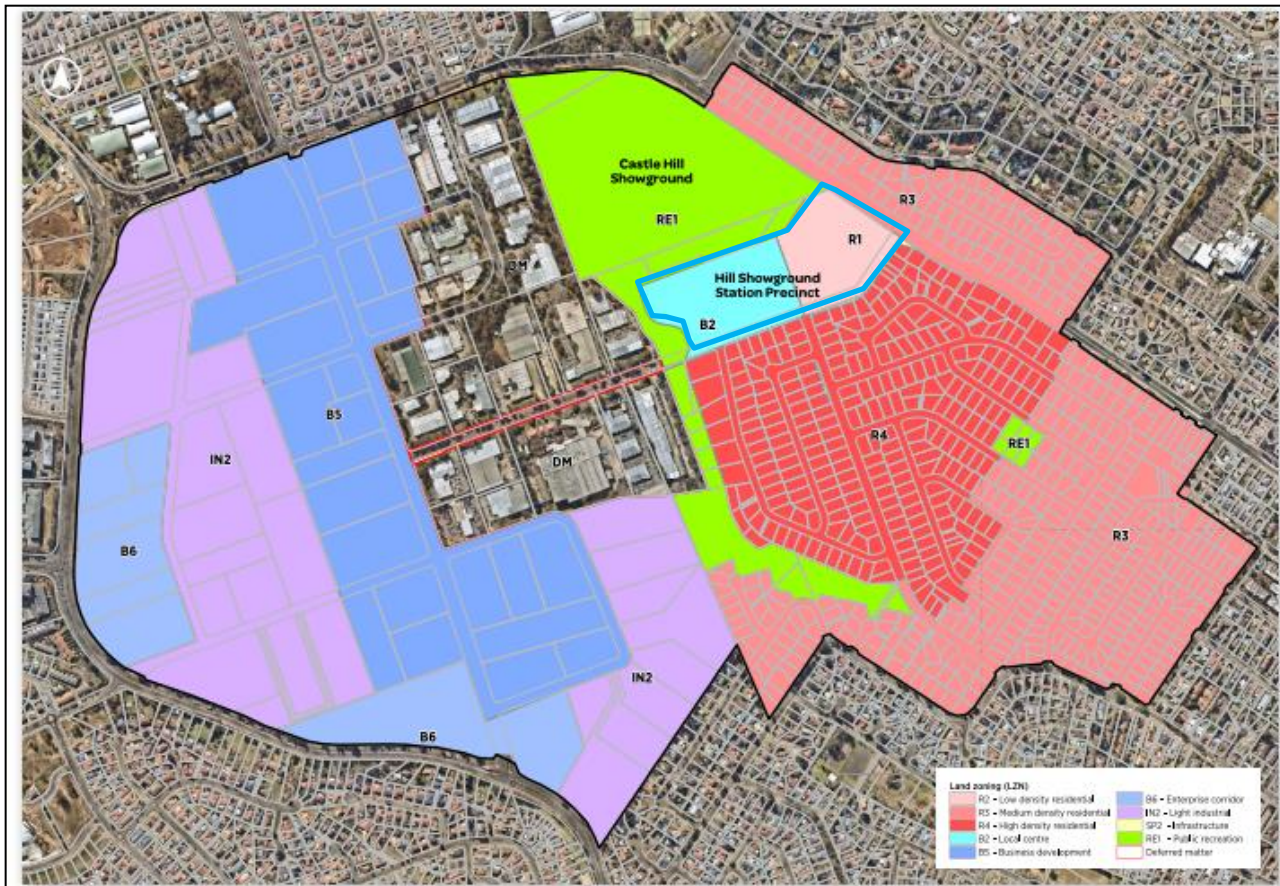
The Site is envisaged to be developed to accommodate a high-density mixed-use precinct in line with the planning controls:

- Hills Showground Precinct West (Lot 53 DP 1253217) is zoned B2 Local Centre with maximum height of 68m (20 storeys) and Floor Space Ratio (FSR) of 5:1)

- Doran Drive Precinct (Lot 55 DP 1253217) is zoned B2 Local Centre with maximum height of 68m (20 storeys) and FSR of 4:1
- Hills Showground Precinct East (Lot 56 DP 1253217) is zoned R1 General Residential with a maximum building height of 52m (16 storeys) and FSR of 3:1.

An excerpt of the zoning of the Site and broader Showground Precinct is provided at Figure 1-2

Figure 1-2 Zoning of the broader Showground Station Precinct



Source: Department of Planning, Infrastructure and Environment 2019

1.4 CONCEPT PROPOSAL

The DA will specifically seek approval for a Concept Proposal comprising:

- A maximum gross floor area (GFA) of 175,796 m² equating to up to approximately 1,900 dwellings including affordable housing
- A maximum GFA of 13,600m² for non-residential development (commercial, retail and community facilities)
- Building envelopes, and allocation of GFA to the three precincts:
- Landscape concept for the public domain detailing the extent of public domain including streets, pedestrian pathways, provision of Doran Drive Plaza to be a minimum of 1,405m² and a new Park on Precinct East to be a minimum of 3,500m²
- Provision of car parking and bicycle parking
- Strategies for utilities and services provision, managing stormwater and drainage, achievement of ecologically sustainable development (ESD) and design excellence

- Staging plan addressing the timing of future subdivision, construction, release and development of land
- Concept principal subdivision of development Lot 56 DP 1253217 into future major lots, public domain areas and roads.

Refer Figure 1-3 for excerpt of the Concept Proposal Reference Scheme and Figure 1-3 for an excerpt of the Height Plan.

No building or construction works are proposed to be undertaken as part of this Concept Proposal. Once the SSDA is approved, the successful purchasers of the development precincts and/or lots from Sydney Metro, will be responsible for submitting subsequent DAs for the design and construction of the buildings and public domain areas in accordance with the approved Concept.

Figure 1-3 Concept Proposal Reference Scheme



Source: Cox Architecture 2019

Figure 1-4 Height plan



Source: Cox Architecture 2019

1.5 PURPOSE OF THIS REPORT

WSP have been engaged by Landcom to undertake an engineering due diligence investigation to support the Concept Proposal, more specifically to provide civil engineering advice for the proposed development of the Hills Showground Precinct East - Lot 56 DP 1253217 (Precinct East).

As part of this due diligence report, WSP have reviewed Works As Executed (WAE) drawings, topographical survey prepared by RPS and undertaken a site visit to determine site constraints.

1.5.1 HILLS SHOWGROUND PRECINCT EAST

Precinct East currently contains the former Council administration building and associated parking and landscaping. The building was being used as a Sydney Metro construction site office but is proposed to be demolished by way of a separate DA (304/2020/LA) currently under consideration by Council.

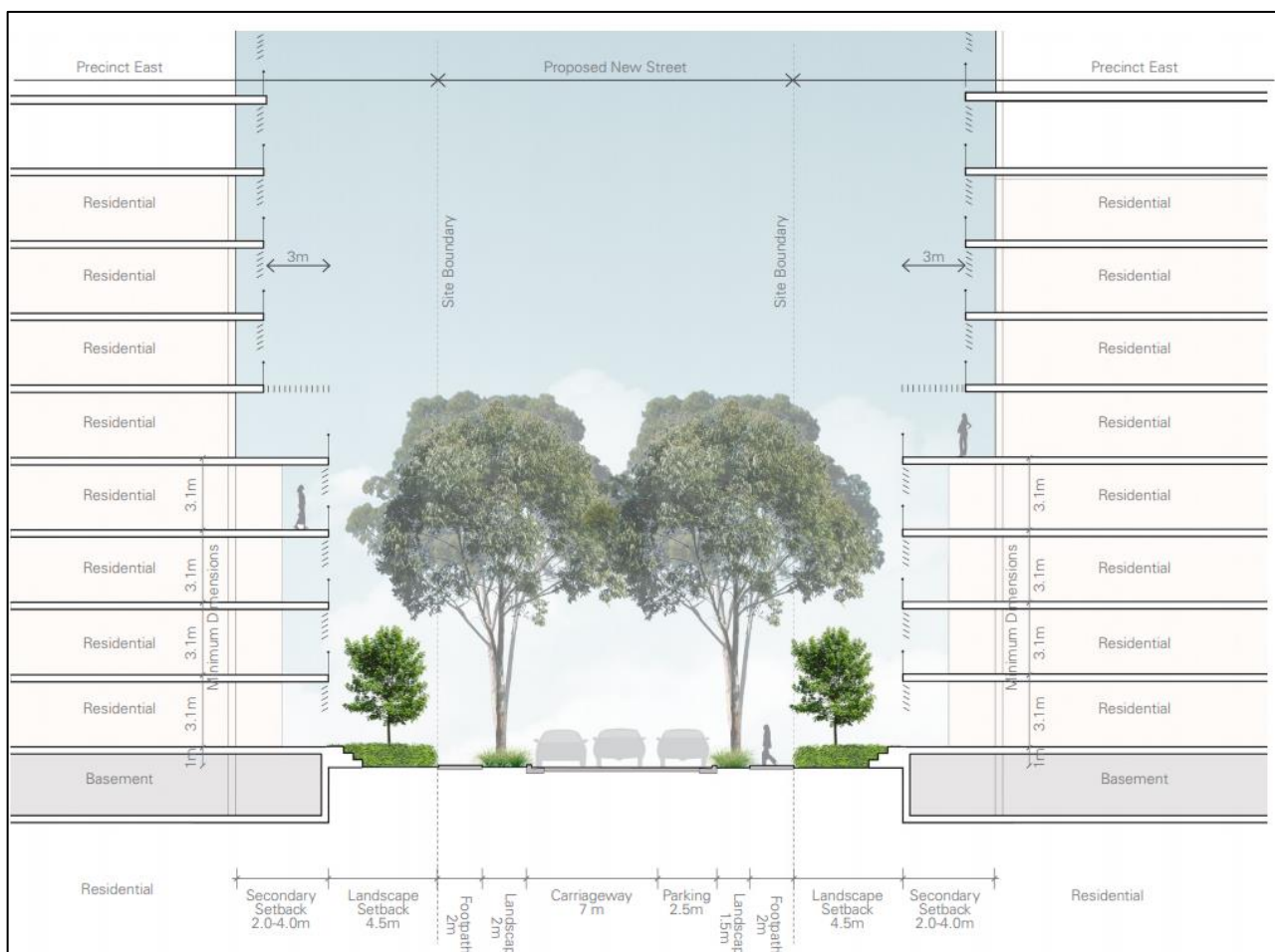
The general topography of the site falls away from the existing building. The predominant fall of the site is to the south west with an existing retaining wall and steep embankment located parallel to Andalusian Way.

The proposed development of Precinct East will deliver multiple high-rise residential buildings yielding approximately 1060 residential apartments. The residential buildings will have a maximum height of 16 levels. The development will be dissected by an internal access road as shown in Figure 1-3 and Figure 1-4. The proposed road will provide access to the basement carparking provided for the residential buildings and some indented parking within the road reserve. The road will be dedicated to council upon completion of the development.

2 DESIGN CONSIDERATIONS

2.1 ROAD DESIGN

It is proposed to provide a local road to service the Precinct East development. The new local road is to be designed in accordance with The Hills Shire Council 'Design Guidelines Subdivisions/Developments' (HSC Design Guideline) and 'The Hills Showground Development Control Plan (DCP) 2012'. The typical cross section required for the road is shown in Figure 2-1 and requires a road reserve of 17m and a requirement for indented parking. A 4.5m setback from the buildings to the Road Reserve boundary is proposed to accommodate this cross section. It is considered that the proposed cross section has sufficient space in the verge to accommodate all required utilities and provision of stormwater infrastructure.



Source: Cox Architecture 2019

Figure 2-1 Proposed Road Cross Section

2.2 ROAD CRITERIA

Table 2-1 Road Design Criteria

ITEM	REFERENCE STANDARD	CRITERIA TO BE ADOPTED
ROAD RESERVE		
Road Reserve Width	The Hills DCP 2012	Local Street 17m
Travel Lane	The Hills DCP 2012	3.5m
Indented Parking Lane	The Hills DCP 2012	2.5m
Footpath / Verge	The Hills DCP 2012	4m/3.5m
Kerb	HSC Design Guidelines	Roll Top Kerb and Gutter
Horizontal Alignment		
Vehicle Design Speed	HSC Design Guidelines	Local Street 50km/h
Design Vehicle	HSC Design Guidelines AUSTROADS – Intersections at Grade	Design Single Unit Truck with Radius 12.5m
Horizontal Curve	HSC Design Guidelines	Minimum Curves as per section 3.6
Kerb return Radius	HSC Design Guidelines	Minimum 7.5m Splay 4m x 4m
Carriageway Cross fall	HSC Design Guidelines	3%
Footpath Cross fall	HSC Design Guideline	2.5%
Pavement Design	HSC Design Guideline	Minimum Pavement requirement shown in Table 2-1
Vertical Design	HSC Design Guideline	Desirable Maximum Grade 12% Minimum Length Vertical Curve 25m

2.2.1 ROAD DESIGN GENERAL

The road within the Precinct East development will be designed with two-way cross fall and indented parking. Intersections will be designed with the appropriate kerb returns and sight distance checks preformed to ensure adherence to the Austroads standards. The road will be designed to accommodate turning movements for a standard Heavy Rigid Vehicle. Vertical grading of the road will ensure smooth vehicle transition and effective control of the surface water into the stormwater network. Appendix A contains a General Arrangement plan showing the proposed road layout and connections to existing roads.

There is a significant level differential from the proposed intersection at Andalusian way to the existing levels above the embankment pictured in Figure 2-2. To minimise earthworks, it is envisaged roads grades from this intersection will approach the maximum values shown in Table 2-1.

A high-level review of the proposed development and topography indicates no significant restrictions to the application of required road design standards as detailed above.



Figure 2-2 Existing levels abutting Andalusian Way

2.2.2 INTERSECTIONS

The proposed road will provide access to the Precinct East development at two locations. The proposed intersection on De Clambe Drive will require relocation of existing trees and an existing stormwater pit. It is noted that this intersection is located opposite a Right Turn Bus Lane and will likely require to be a Left In Left Out (LILO) intersection subject to further assessment at concept design stage.



Figure 2-3 Proposed Intersection at De Clambe Drive

A second intersection is proposed with Andalusian Way. This intersection will form a four-way intersection with the recently constructed Andalusian Way and Mandala Parade. It is proposed to control the intersection with appropriate signage, with the signage arrangement to be developed at design stage. The construction of this intersection will require augmentation to two existing stormwater pits in Andalusian Way, it is noted that these pits are located in the low point of Andalusian way and as such cannot be relocated. The two pits will require augmentation to V type grated lids accommodate a spoon drain at the intersection.



Figure 2-4 Proposed Intersection at Andalusian Way

The existing pram ramp to the south of the proposed intersection will likely require modification but the existing light pole to the north will likely not require relocation (subject to subsequent design stages). A retaining wall will likely be required on the southern interface of the road due to the existing levels of the adjacent building.

2.2.3 PAVEMENT DESIGN

Pavements within the site are to be designed in accordance with HSC guidelines. Designs are to be prepared by a N.A.T.A registered laboratory and qualified Pavement Engineer based on the traffic loading criteria is outlined in Table 2-2.

Table 2-2 Design Traffic Loadings

ROAD TYPE	DESIGN TRAFFIC LOADING	AADT
Access/Local	5x10 ⁵	500-2000

The minimum requirement for pavement thickness in accordance with the HSC guidelines is as per Table 2-3.

Table 2-3 Minimum Pavement Thickness

PAVEMENT LAYER	MATERIAL	MINIMUM THICKNESS
Wearing Course	Asphaltic Bitumen	40mm
Base Course	DGB20	150mm
Sub-base Course	DGS20	150mm

The pavement for the internal road will be required to tie into the existing pavements on De Clambe Drive and Andalusian Way. Concrete footpaths are to be constructed with minimum depth of 75mm and thickened as required at vehicle crossings as per HSC standard drawings. There is an existing footpath network that encompasses the site and a shared path adjacent to the site on Showground Road. It would be preferable to retain as much of these existing paths as practical during development.

2.3 STORMWATER MANAGEMENT

It is proposed to construct a new pit and pipe stormwater network in conjunction with road works to service the Precinct East development. The stormwater management for the site will be in accordance with the Integrated Water Cycle Management Report (IWCM Report)

The proposed stormwater network will comprise a series of pits and pipes that will collect and convey stormwater from the proposed roads, footpaths and landscape areas to the existing drainage network recently upgraded as part of the wider precinct works. The majority of the site will drain to the south west and connect to the system in De Clambe Drive and Andalusian Way. These existing systems will convey the stormwater to the existing detention basin located between De Clambe Drive and Cattai Creek. An indicative stormwater layout for the local road has been shown as part of the General Arrangement plan shown in Appendix A

Water Sensitive Urban Design measures are to be provided in accordance with the IWCM Report.

2.4 UTILITIES

A Utilities Impact Assessment has been prepared by WSP and should be read in conjunction with this report. In summary, Precinct East can be serviced as per the following:

- Sewer: Connection to 300PVC located in Carrington Road to the south east of site
- Water: Connection to existing looped mains in surrounding streets is available
- Electricity: Connection to feeders at the intersection Carrington Road and Showground Road is available
- Gas: Connection to existing Gas main in Carrington Road is available
- Telecommunications: Existing network adjacent to the development, augmentation to this network will be based on demand.

2.5 EARTHWORKS

A high level cut and fill assessment has been undertaken for the proposed development. The results of this assessment are detailed in Table 2-4 below.

Table 2-4 Cut/Fill Volumes

TYPE	VOLUME (m ³)
Cut	109,000
Fill	1,500
Balance	107,500 (cut)

The high-level earthworks volume is based on the following assumptions:

- The existing council building covers a significant proportion of the site. Existing levels within building footprint are interpolated only. No allowance has been made in the earthworks calculations for volume of foundations, basements or subterranean structures, redundant services, existing pavements, etc.
- Average basement depths based on carparking requirements from Cox architects has been allowed in the volumes. Subject to confirmation at the design phase.
- Allowance from road pavements based on the minimum pavement outlined in section 2.6 below.
- No bulking or spill factors have been applied.
- No allowance for services, footings, stripping or stormwater have been made.

Refer to Figure 2-5 for cut (red) and fill (green) plan.

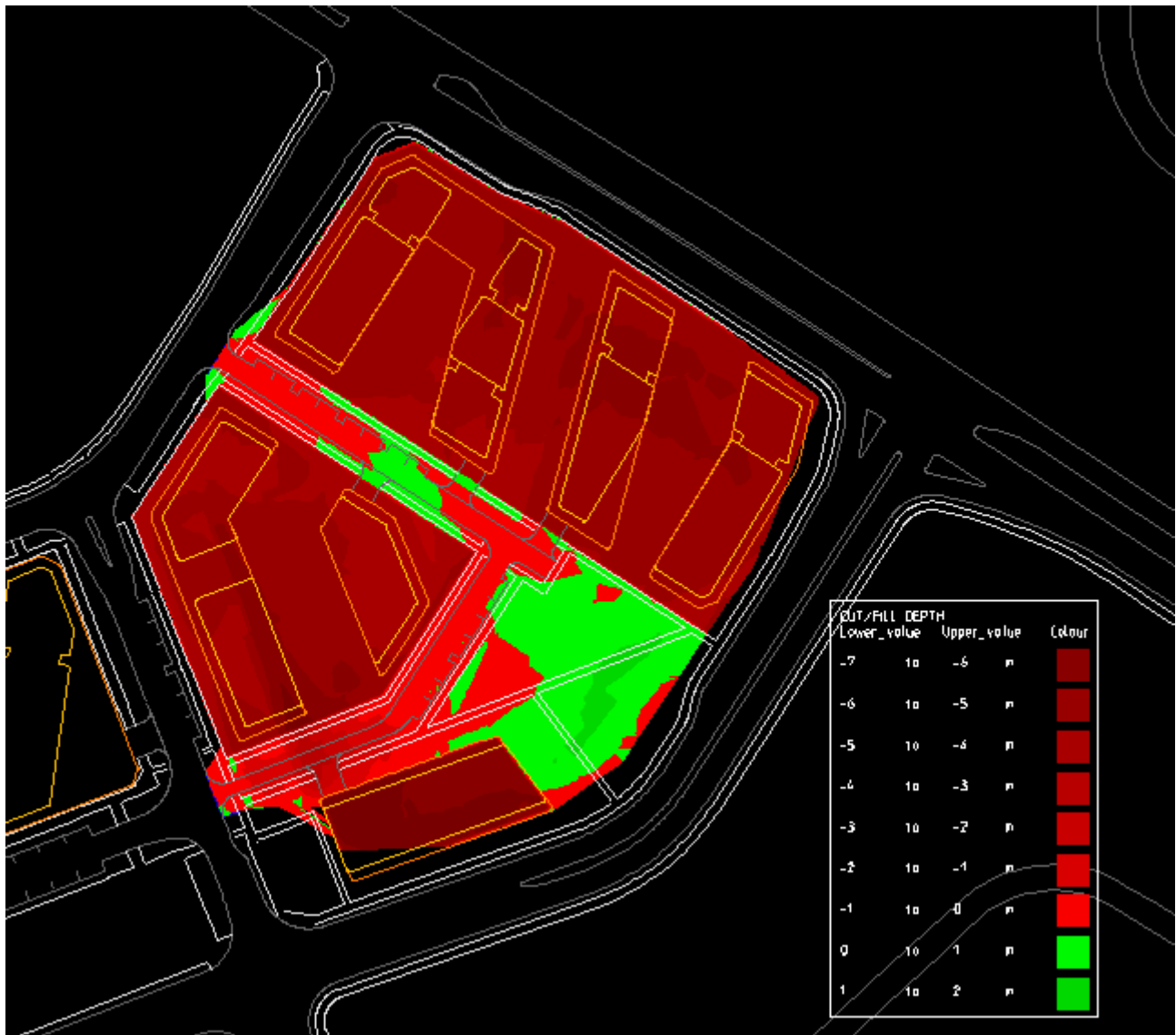


Figure 2-5 Earthworks Cut/Fill Plan

The significant cut volume of 109,000m³ is predominantly derived from the requirement for basements. This will result in the requirement for a large volume of material to be disposed offsite.

3 CONCLUSIONS

Upon investigation of existing site conditions, survey and works as executed drawings, WSP have reviewed the proposed Precinct East development and conclude that the proposal will be able to meet the civil engineering requirements of The Hills DCP 2012 and HSC Guidelines.

It is recommended further survey is undertaken upon demolition of the existing infrastructure within the development site; a Traffic Engineering Assessment of the proposed intersections; and Pavement Design for the site, to further inform detailed design stages.

APPENDIX A-1

GENERAL ARRANGEMENT PLAN



General Arrangement
Figure No. 1