LANDCOM

MINTO URBAN RENEWAL

Infrastructure Strategy Report

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HUGHES
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1.0 EXECUTIVE SUMMARY

This is a report by Hughes Trueman on the scope and estimated costs of infrastructure associated with the Minto Urban Renewal Project (MURP) which has been undertaken for and on behalf of Landcom.

This review of civil infrastructure requirements identifies the constraints, opportunities, risks and other issues associated with the currently proposed master planning development layout (October 2005) and staging plans. The staging makes provision for retention of approximately 184 existing dwellings and their services, which will require maintenance of access and service utilities at all times during the progress of the redevelopment works.

The study identifies development constraints and issues which are relevant to the Minto Urban Renewal Project. The most significant of these include:

- Retention of existing dwellings to be occupied continuously throughout the renewal process will impact on safety, access and servicing arrangements,
- Protection or augmentation of existing trunk services to the estate, new infrastructure and temporary connections to service occupied dwellings,
- Removal and replacement of the majority of existing roads and services due to realignment of roads/lot layout and regrading of levels in accordance with Landcom and Council agreed road design standards and to create safe and desirable stormwater flow paths and detention basins,
- Isolated areas of uncontrolled or potentially contaminated or unsuitable fill on the site may adversely affect civil/infrastructure works and impact on housing development,
- Earthworks management during development staging requires coordination of cut, fill, stockpile and borrow operations for the entire development to avoid unnecessary additional costs.

Following the infrastructure scoping and cost planning analysis it is recommended that a number of development issues be confirmed in order to take advantage of the opportunities for cost savings and reduced exposure to risk which may be expected to arise from consideration of the following:

- Detailed development staging,
- Development of residential areas starting with the lower portions and working progressively towards the upper catchment so as to minimise exposure to the risk of inundation of occupied dwellings and to take advantage of cost savings from use of permanent gravity infrastructure services rather than temporary connections,
- Sequential development taking into account the continuity of road and service connections to take advantage of cost savings from use of permanent infrastructure rather than through construction of temporary works and lead-ins,

- Construction stages and contracts to give consideration to the management of earthworks so as to minimise the need for double handling of excavated material or exporting surplus and importing deficit material thereby taking advantage of the cost savings which may be achieved by placing excavated material directly into filling embankments as controlled fill material,
- Definition of the above ground and below ground structures, services and utilities that require modification, removal or replacement so as to confirm the social and economic impact of the proposed layout and works,
- Assessment of the potential soil contamination, spoil locations, volumes and management, thus minimising economic risk and improving the certainty of the master plan,
- Assessment of the Broadband requirements for the area,
- Emission level testing for Electro Magnetic radiation emanating from the Telecom Tower within the SWC land on Eagle View Road,
- Further discussions with service authorities, in particular Telstra and Agility to determine who will be funding the provision of these services.

2.0 INTRODUCTION

2.1 SCOPE OF WORK

The objective of this report is to provide comment on the opportunities and constraints for the MURP and assist the Urban Planners Woods Bagot in finalising the Master Plan documentation. The views expressed herein are advice only and should be treated as such.

Hughes Trueman (HT) were appointed by Landcom to undertake infrastructure advice and review of the civil infrastructure scope, concepts and cost requirements for the redevelopment of the Department of Housing (DOH) Minto housing estate. The Minto Urban Renewal Project (MURP) consists of modifying the existing Minto Master Plan region, consisting of 1030 dwellings by demolishing and removal of 846 dwellings, embellishing and retaining 184 existing cottages and redeveloping the undeveloped vacant land. Upon completion of the urban renewal process, there will be a new estate of 1099 residential lots created.

Following review of the available documentation, HT was to prepare an Infrastructure Strategy Report for the site which would:

- refine infrastructure program for Master Plan requirements;
- provide comment on the current Master Plan servicing;
- identify relationship requirements for staging of the works;
- identify constraints and issues for the total development and individual stages; and
- provide quantity and cost estimates of the proposed works;
- identify potential risk exposure.

2.2 CURRENT MASTER PLAN DOCUMENTATION

HT have used the following documents in the preparation of this report:

- 'Minto Renewal' Subdivision Layout – Staging by Woods Bagot (14 October 2005)
- 'Minto Renewal' Draft Master Plan by Woods Bagot (March 2004)
- 'Minto Renewal' Urban Design and Planning Opportunities and Constraints report by Woods Bagot (January 2004)
- Development Program Report by Hughes Trueman (June. 2005)
- Limited Survey Information by Hard and Forester
- 'Minto Urban Renewal Project' Water Cycle Management by Hughes Trueman (June 2005)
- 'Minto Renewal' Proposed Urban Regeneration, Road , Traffic and Transport Assessment by TTPA (October 2005.)
- 'Minto Renewal' Traffic Management Report by Hyder (January 2004)
- "Bushfire Protection Assessment for the Minto Urban renewal Project" by Conacher Travers (June 2005)

- 'Minto Renewal' Geotechnical and Contamination Assessment by Douglas Partners (May 2005)
- Investigation for Potential Adoption of Water Sensitive Urban Design Principles and Water Quality Monitoring by Australian Wetlands (March 2004)
- 'Minto Renewal' Engineering Opportunities and Constraints report by Hyder (February 2003)
- Engineering and Constraints for Renewal Report (Northern and Southern areas) by Craig and Rhodes (August 2002)

2.3 ADDITIONAL DOCUMENTATION

In addition to the documentation described in Section 2.2 above, the following documentation has been assembled by HT to enable preparation of this report.

- Aerial photograph of the site including cadastral boundaries and existing surface contours prepared by Sinclair Knight Merz.
- Survey of existing cottages by Degotardi Smith & Partners (February 2005)

2.4 INFRASTRUCTURE MASTER PLAN DRAWINGS

The following Infrastructure Master Plan Drawings for the development were prepared by HT in conjunction with this report. The drawings are coincide with the Master Plan documents and drawings (8 June 2005) prepared by Woods Bagot et al. and information from reports, service authorities and the Department of Housing.

These drawings are included as Appendix A of this report:

Drawing No.	Title
05P541-M01D	Cover Sheet
05P541-M02E	Aerial Survey Plan
05P541-M03E	Overall Staging Plan
05P541-M04D	Existing Topographical Features – Cadastral Plan
05P541-M05D	Constraints Plan – Existing Scope Analysis
05P541-M06D	Constraints Plan – Land Use
05P541-M07D	Constraints Plan – Cut and Fill Plan
05P541-M08D	Constraints Plan – Earthworks Management

Drawing No.	Title
05P541-M09D	Road Hierarchy Plan
05P541-M010D	Road Cross Sections
05P541-M011D	Master Plan Staging Plan – Stage 1
05P541-M012D	Master Plan Staging Plan – Stage 2
05P541-M013D	Master Plan Staging Plan – Stage 3A + 3B
05P541-M014D	Master Plan Staging Plan – Stage 4A + 4B
05P541-M015D	Master Plan Staging Plan – Stage 5
05P541-M016D	Master Plan Staging Plan – Stage 6A + 6B
05P541-M017D	Master Plan Staging Plan – Stage 7
05P541-M018D	Master Plan Staging Plan – Stage 8
05P541-M019D	Master Plan Ownership Plan

3.0 EXISTING SITE DESCRIPTION

3.1 TOPOGRAPHY

The Minto Renewal Master Plan area is approximately 140 hectares and is located about 35 km south west of the Sydney CBD and 5 km north of Campbelltown Post office. The Master Plan study area is bounded by existing housing estates of Ingleburn, Bow Bowing, Minto Heights and Leumeah. The master plan is defined between Benham Road and Durham Street to the north, Pendergast Avenue and the adjoining parcels to the south, Eagleview Road to the east and Pembroke Road and Townson Avenue to the west.

The site generally grades from the east to west with most grades being below 10% however some isolated areas exceed 20%. These areas of steep terrain, as shown on the Drawing 05P541-M05C-Constraints – Existing Slope Analysis, make it difficult to provide accessibility without significant earthworks as shown in Drawing 05P541-M07D-constraints cut & fill plan. The eastern boundary of the master plan area, Eagleview Road follows a north-south orientated ridgeline.

The topography of the site, with its troughs and ridges, guides stormwater flows along defined overland flow paths. These overland flow paths, steep slopes and the existing sub-standard stormwater system presently adversely impact upon a number of existing dwellings.

3.2 GEOLOGY

The site consists of Blacktown soils over weathered Ashfield shale of Triassic age, isolated pockets of Hawkesbury Sandstone are shown in the lower areas to the East South and North of the site particularly in the creek valleys. Typical characteristics of the soils include low fertility, tendency towards strongly acidic properties and prone to shrinkage and swelling.

Douglas Partners were engaged to review their previous geotechnical assessment of the site. Their geotechnical report provides the following comments;

- There is no evidence of slope instability on the site and it is considered that most of the site has a low risk of slope instability.
- No evidence of groundwater was encountered in the bores across the site. These investigations indicate that underground services associated with the development will be above the water table.
- The report declares that a maximum batter of 2(H):1(V) be generally adopted, however Douglas Partners recommends that the face be protected or the batter flattened to 3(H):1(V).
- Soil conditions for pavement designs show high plasticity and low CBR values (2-4%)
- Low level contaminants were encountered during the testing process, these levels are all within the EPA's guidelines.

- There are isolated pockets of filled land on the site. Most fill material is thought to have originated on the site and was deposited in an uncontrolled manner. Any site contamination is thought to be a result of activities including imported fill and herbicide use.
- No indications of salinity were observed on the site and the MURP is unlikely to have any significant impact on the amount of saline groundwater entering the creeks in the area.

4.0 PROPOSED WORKS

A coordinated master planning approach between the Department of Housing (DOH), DIPNR and Campbelltown City Council (CCC) which encompasses the majority of the suburb of Minto, aims to renew the suburb of Minto by replacing much of the public housing stock. Along with this replacement strategy, the renewal of the urban framework of Minto also presented a number of opportunities to the region. These included a review of the infrastructure that services the area, an enhancement of the open space and community facilities serving the community and provision of a sustainable housing mix for the area. Accordingly, the master plan states that:

"The focus of the Minto Master Plan is to enhance residential amenity for the whole of the Minto community...",

4.1 INTERNAL WORKS

The Minto Urban Renewal Project works relate to all environmental, social, amenity and engineering aspects of modifying an existing residential area to a revitalised residential estate.

The proposed master plan proposes to demolish 846 existing cottages. This program of demolition has already commenced with a number of the DOH precincts already cleared. Together with the demolition of some dwellings, the master plan proposes to embellish a number of existing dwellings to assist in their long term retention. These cottage works shall enable a mix of retained dwellings, that have been enhanced, and residential redevelopment.

As with all developments whether they be greenfield or brownfield the development process contains a number of fundamental tasks and programs. This project with its mix of redevelopment and dwelling retention does however have some requirements in addition to the standard tasks required during a typical development. These site specific requirements include temporary connection, oval contamination, remediation of stormwater overland flow paths and flooding and water main encasement and protection.

The internal works for the redevelopment of Minto include the initial site establishment. This role in the project includes the establishment of amenities, fencing, traffic control, survey facilities and site security for entire stage. The environmental controls relating to the soil and water management facilities and the management of environmental issues are required to be established at the early stage of the staged development.

Together with the demolition of some of the dwellings there would also be demolition and removal of the existing infrastructure, being road pavements, pedestrian bridges, pipe systems, underground services and utilities and vegetation that cannot be retained during the redevelopment process.

The earthworks for the development will generally be undertaken on an individual stage by stage approach however the stockpiling for and borrowing from stages has been reviewed on a whole redevelopment approach. Accordingly, the regrading works to modify and enhance overland flow paths and to adjust the development platforms will require the reuse, stockpiling, and borrowing of material from the entire development site. It is also anticipated that the works on the site might reveal areas of unsuitable or contaminated material that will need to be disposed of off site. Balance cut to fill from further modelling during the detailed design process will need to be undertaken in an attempt to reduce the large volume of excess cut presented by the current site grading proposals. Re-grading of the proposed lots can be undertaken as part of this process to "lose" a large amount of spoil across the development. This method is considerably more cost effective than removal of the surplus from site.

The road and drainage works along with the servicing facilities require a thorough assessment of the potential opportunities for retention of facilities and the required lead-in of facilities for stages. Based on current proposals, it appears as if only a very small portion of the road, drainage and services can be retained due to the master planning subdivision layout and road hierarchies.

Some of the open space and dual use facilities (open space and stormwater management) will also require extensive works due to the need for relocation and embellishment.

4.2 ESTATE MAJOR WORKS

The estate major works required during the renewal of the Minto region include a number of large infrastructure items that have a wider community benefit nexus than any individual stage of precinct. These features pertain generally to those you would normally see within Council's Contribution Plan. The below list is not exhaustive, however it should provide a good indication of the works required. The facilities to be provided are:

- Construction of an estate entry feature
- Relocation and construction of Benham Oval, incorporating the existing childcare centre and stormwater detention, gross pollutant trap and bio-swale.
- Construction of the multi-use, vegetation, active and passive areas, open gathering areas and stormwater quality and quantity facility in Redfern Park. This includes stormwater detention and the provision of a gross pollutant trap and rain garden.
- The dual use Scarborough Park, incorporating active, passive areas and stormwater detention with gross pollutant trap and rain garden.
- The creation of a picnic and BBQ atmosphere in Valley Vista Park
- The multi-use Kids Park
- The Minto Community Centre
- Renovation of the existing Childcare Centre
- Half Road reconstruction of Eagleview Road fronting the redevelopment area

- Upgrade of the Eagleview Road and Ben Lomond Road including Intersection
- Upgrade of intersection at Ben Lomond Road and Longhurst Road
- Construction of the Monaghan Street link between Pembroke Road and Guernsey Ave.
- Eagleview Road Cycleway
- Half road landscaping to perimeter roads
- Demolition of existing pedestrian overbridges.
- Rose Park Embellishment
- Re-location and embellishment of Kyngmount Reserve.

4.3 STAGING

It is proposed to develop the site over a series of stages. There are eight stages in total with Stages 3, 4 & 6 being further divided in two. These subsequently divided stages are proposed to be constructed in unison with their sister stage but have been split due to physical differences and retention of existing dwellings.

The stages have been developed through consideration of marketing, political, physical and economic constraints. The present staging reflects the requirement for construction of lower staging prior to upper catchment staging in the southern portion of the development. A number of the constraints relating to the present sequencing of the stages and potential are listed below:

- Staging of the relocation of residents and the demolition of Department of Housing estate,
- Minimisation of the disruption to the existing services and thus the residents, within the precincts with cottages being retained,
- Service provisions and the reduction in lead-ins, temporary connections or dependencies upon undeveloped stages for service provisions or access,
- The management of increased or concentrated stormwater flows upon downstream stages have been considered. With the development of the higher Stages 2 and 3 and the construction of a detention facility within Redfern Park as part of the Stage 2 works, it is considered the overland flows and discharges will be adequately dealt with. However, without the construction of the detention facility in Stage 4b flows from Stage 4a and above highlight a concern regarding the increased discharge for residents. The partial construction of the detention facility in its future location or an alternative temporary basin within the existing reserve together with adequate flow paths would reduce this risk.
- The management of the earthworks, particularly the balancing of the material between stages that require substantial filling but do not have a source has been assessed during the cost planning. The sequence of events during the staging and the potential impacts of deleterious material being located during construction highlight some of the possible concerns.
- Marketing of the redeveloped housing estates and the future residential lots.

4.4 TRAFFIC AND TRANSPORT

A comprehensive Traffic and Transport assessment has been undertaken by Transport & Traffic Planning Associates and concludes and recommends the following:

- The proposed road system will be suitable, safe and appropriate. This is achieved through a road hierarchy system (see Drawing 05P541-M10D-Road Hierarchy) this includes continuity for collector roads, multiple cross intersections are largely avoided and convenient access to and from major roads is achieved.
- There will not be any unsatisfactory road capacity or traffic related environmental implications.
- The traffic flows and speeds can be constrained to appropriate levels with further detail design development. This will include the use of traffic calming devices such as roundabouts, central blister islands, narrowing treatments and raised intersections.
- There will be adequate and suitable arrangements for site access and servicing.
- There will be adequate and suitable arrangements made for pedestrians and cyclists. The proposed road system makes provision for on road and off road cycleways.
- There will be adequate and suitable arrangements made for bus services and on street parking. Three separate bus services will operate through the MURP area, the future bus routes have been confirmed with the bus companies. A fourth bus service will operate from the Minto Mall.

The RTA have previously reviewed the master plan and advised:

> "The proposed improvements of the existing collector road system identified in your letter are considered adequate to cater for the increased traffic likely to be generated by the proposed urban renewal of Minto.
>
> Therefore, the RTA advises that a per lot contribution levy will not be applicable in this instance."

They will, however, review the master plan as part of the SEPP 11 process to identify if any improvements are required (at the development's costs) on the state arterial road network.

4.5 WATER CYCLE MANAGEMENT

A report was undertaken by Hughes Trueman to determine the development's water cycle management opportunities and constraints. The assessment evaluated all levels of storm intensity from low flows created during minor storm events through to the Probable Maximum Flood (PMF). Similarly, impacts on water cycle management from the individual dwelling to the entire estate have been considered. Other aspects considered as part of the report are:

- Opportunity for rainwater re-use. A typical BASIX certificates were incorporated into the water cycle management for individual dwellings.

- The water cycle management proposal incorporates a number of detention basins and overland flow paths. The RAFTS modelling demonstrates that the developed scenario's peak flows for Council's flood planning level do not exceed those of the existing situation. Detention opportunities have been included within Benham Oval, Redfern Park and Scarborough Park.
- Water quality has been assessed through the use of the MUSIC water quality model. The use of vegetative filter strips, bio-retention devices (swales and rain gardens) and Gross Pollutant Traps have been incorporated into the proposed open space facilities noted above. The proposed treatment train of facilities has enabled the system to be designed to ensure that the removal rate of those representative pollutants is greater than the best management standards as a statutory requirement.

The report concludes that:

- Through the use and siting of the detention system, these basins were sufficient to ensure that downstream flows and flood damage risk would not increase in the 100 year ARI event as a result of the proposed development. An assessment of flow depths and velocities in the 100 year ARI indicated that a number of minor piped drainage systems would need to be designed for an ARI greater than the council prescribed criteria of a 5 year ARI. This would ensure the overland flows in a major storm event meet the safety criteria.
- Through the use of multiple treatment facilities listed previously, water quality objectives for the MURP developed site exceed the statutory requirements and benchmark industry standards. However the MUSIC model used is limited to concept analysis, the detailed type, size and removal rates for the different treatment components should be further developed at the detail design stage of the project.

4.6 SERVICES

4.6.1 Water

A 900mm diameter, Trunk main runs through Stages 2 + 3B of the site in an east-west direction. It flows from the Minto reservoir at Eagle View Road via Stages 2 and 3B along the northern edge of the proposed Redfern Park and exits the site at Guernsey Avenue. The water main is located within a 6m wide easement and is of regional importance as it supplies water to the surrounding suburbs.

Smaller diameter mains traverse the site, internally and externally, the internal mains will be retained where possible but re-locations will be unavoidable. The mains 150mm diameter. and above mains will be costly to re-locate but can be moved if necessary. It is intended to retain all of the external mains, these however may require adjustment particularly where proposed roads bisect them.

The list below indicates the location of mains 150mmdiameter. or larger.

Street Name	Water Main Size
Benham Road	150
Mortimer Street	150
Guernsey Avenue	150, 200, 250
Ben Lomond Road	150, 200, 300
Eagleview Road	250, 300, 750
Longhurst Road	150, 200
Townson Avenue	150
Goodwin Crescent	150
Pendergast Avenue	150, 200
Gardiner Street	200
Durham Street	150

4.6.2 Sewer

There are no significant trunk mains within the proposed development, existing sewer can be removed and replaced which will better suit the proposed layout.

A 300mm diameter sewerage trunk main runs in a northerly direction along Guernsey Avenue then through private property in a westerly direction and into Pembroke Road. This main services the majority of the northern precincts. Upgrade requirement of this main has been indicated by Sydney Water. There are 225mm diameter. mains which are located within Ben Lomond Road and Townson Avenue, these mains should remain but without extensive sewerage modelling it is not known whether they will have the capacity to cope with the re-development.

A demand analysis should be carried out in conjunction with Sydney Water to determine whether augmentation of downstream mains is required. Upsizing of the mains may be minimised or avoided if loading on these mains is limited and a separate main is installed to carry upstream catchments to the west.

4.6.3 Electrical

The existing Minto estates' electrical servicing is by underground reticulation Where possible existing ducts and cable routes will be maintained within roads that are to be retained. It is anticipated that all other ducting and cabling through proposed lots will be removed.

The electricity supply across the whole of MURP will need to be increased, additional substations will be required to service the proposal. High voltage and Low voltage cabling will need to be installed across all future stages.

Integral Energy have indicated that a concept electrical design should be undertaken to determine if the regional substation for the area will need to be upgraded as a result of the re-development and future electrical load growth in the area.

4.6.4 Telecommunications

The existing Minto estates' telecommunications network consists of reticulated services but contains no exchange or major through routes. As with electrical, existing telecom ducts and cabling should be retained where possible but they will need to be removed where it does not follow proposed road alignments.

Additional underground conduit provision will be required for Telstra and possibly Optus to cater for increased demand in telecommunication services in the future such as Broadband, cable television and optical fibre cabling. Future long term and additional provision of Telstra and Optus services for the area will need to be reviewed with the service providers.

4.6.5 Gas

Existing gas mains are located throughout the Minto estate, the gas mains within the major roads should be retained, these are located in;

- Guernsey Avenue
- Townson Avenue
- Pendergast Avenue
- Longhurst Road

Gas supply to the future and renovated dwellings can be supplied from these retained mains. These mains are typically 50mm to 75mm diameter. with the supply main located in Pembroke Road, this main is 150mm diameter.

It is not anticipated that the existing gas services will constrain development.

4.7 POTENTIAL WORKS - RISKS

Section 5.9 identifies a number of risk items that relate either to individual stages or to the entire project. These risks may require the following works:

- The potential need for encasement of the existing 900 mm diameter water main that passes through the site,
- The potential for upgrade of the Minto sewer carrier main which services the northern catchment.
- The use of temporary services and lead-ins to provide live connections and uninterrupted service to the retained cottages or to facilitate the proposed staging,

- The potential need for upgrade of the regional sub-station as part of the electrical infrastructure. (Integral Energy have indicated a preliminary design is required to be prepared before confirmation of the future requirement and costing can be confirmed.)
- Contaminated material to be disposed of off site,
- The need to seal all water bodies or stormwater management facilities against the effect of soil salinity.
- Temporary stormwater management during the staged development.
- Measures to ensure the safety of residents adjacent to the works,
- Potential for the construction and upgrade for RTA roads and junctions adjoining the development.

5.0 CONSTRAINTS AND ISSUES

A number of constraints and issues have been identified based on the current master plan and infrastructure available for the renewal project. Although each stage possesses common constraints and development issues, they also present individual distinctive constraints that are intrinsic to their own development.

The typical development constraints relevant to the entire Minto Renewal project are:

- The location of the 900mm diameter water main traversing the site,
- The retention of the existing dwellings and the maintenance of their access and services at all times during the renewal process,
- Provision and amplification of services to the estate,
- Due to the relocation of roads and the regrading of surface levels the majority of road pavements, services and infrastructure shall need to be demolished and removed,
- Bushfire asset protection zones along the north eastern portion of the site adjacent to Eagle View Rd (Stage 3b) will need to be allowed for during the development application process,
- Isolated areas of uncontrolled or contaminated fill on the site that may affect civil works or housing require investigation on a stage by stage basis,
- The sealing of water treatment facilities as a precaution against the presence of soils with acidic or saline properties will need to be confirmed prior to the design of any surface water generating infrastructure,
- Slopes within the site of greater than 10% create access difficulties, requiring regrading works to allow construction of the roads and residential lots,
- The management of the earthworks process during the development staging requires the coordination of cutting, filling, stockpiling and borrowing process for the entire development strategy,
- The potential for increased flooding and inundation of downstream properties due to development of upstream catchments prior to the construction of downstream stormwater quality and quantity facilities has been assessed. This can be averted by the use of overland flow diversions into the proposed detention facilities,
- The functionality of existing receiving services need to be assessed in consultation with the relevant Authorities as part of the individual development stages,
- The impact of the remediation of a "Black Spot" at Ben Lomond and Townson by Campbelltown City Council requires review in relation to the Minto Renewal, Council have confirmed funding has been approved for this intersection,
- No allowance for the Section 27 RTA contribution has been made for the increase lot yield as the development is a renewal of an existing estate, this has been confirmed by the RTA,
- As the redevelopment is a renewal of an existing estate the allowance for SWC DSP/Major Works costs is only the increased lot numbers, and

- No allowance has been made for any Local and Statutory development contributions and fees as the development is a renewal of an existing residential precinct.

5.1 STAGE ONE

5.1.1 Constraints

Earthworks and Regrading

- Excess of spoil to be temporarily stockpiled in Stage 2 & Stage 3b area for future filling. Surplus material to be removed from site

Roads

- Provide temporary traffic management at road "dead ends" to prevent through traffic from entering the future Stage 2.

Estate Works

- Half road width reconstruction is required for the full Stage 1 road frontage of Eagleview Road and full width reconstruction of Ben Lomond Road.
- Intersection upgrade works are required at the intersection of Eagleview Road and Ben Lomond Road.
- Intersection upgrade works are required at the intersection of Longhurst Road and Ben Lomond Road.
- Construction of temporary sales office required within Valley Vista Reserve.
- Demolition of existing pedestrian overbridge.

Sewer Drainage

- Construct sewer drainage network and connect to the existing sewer drainage in Stage 7 via a lead-in pipe.

5.1.2 Opportunities

Roads

- Provide temporary construction entrance or alternative access to Stage 7 off Ben Lomond Road.

5.2 STAGE TWO

5.2.1 Constraints

Earthworks and Regrading

- Stockpile from Stage 1 cut to be used for filling.

Roads

- Provide temporary traffic management at road "dead ends" to prevent through traffic from entering the future Stages 3a and 4a.

- Intersection works are required at the intersections of the new Stage 2 roads and Guernsey Avenue and Gardiner Street.

Adjacent Properties

- Existing occupied dwellings to be retained during construction with live, uninterrupted services to be maintained throughout.

Sewer

- Connect to existing sewer service in Stage 4a via lead-in pipe.

Stormwater Drainage

- Construct detention and water quality control facilities in Redfern Park
- Re-direction of existing overland flow paths into proposed Detention basin and water quality facility.
- Provision of gross pollutant trap within Redfern Park for water quality purposes.
- Lead-in works required to connect to existing stormwater system in Guernsey Avenue.
- Lead in works required to provide drainage of northern part of Stage 2 through Stage 4A & 4B into proposed Benham Oval.

Water Supply

- Protect the existing ∅900mm water main to Sydney Water requirements.
- Provide service extension and cap-off for future connection in Stages 3a and 4a.

5.2.2 Opportunities

Stormwater Drainage

- Utilise new park location for Detention and water quality facilities site.

5.3A STAGE THREE (A)

5.3A.1 Constraints

Earthworks and Regrading

- The remainder of the surplus material from Stage 3a to be removed from site or spread over future lots.

Roads

- Half road width reconstruction is required for the full Stage 3a road frontage of Eagleview Road.

Sewer

- The sewer servicing these lots will need to be deep and flat to enable the ridge properties to drain.

5.3B STAGE THREE (B)

5.3B.1 Constraints

Earthworks and Regrading

- Stockpile from Stage 2 cut to be used for filling.

Roads

- Half road width reconstruction is required for the full Stage 3b road frontage of Eagleview Road, including road frontage adjacent to the water tank.
- Match existing grades and levels at the Ashmead Road extension.

Adjacent Properties

- Existing occupied dwellings adjacent stage boundary to have live, uninterrupted services to be maintained throughout construction.

Sewer

- The sewer servicing these lots will need to be deep and flat to enable the ridge properties to drain.

Stormwater Drainage

- Connect to the existing stormwater service in Eagleview Road via lead-in pipe.

Water Supply

- Connect to the water service in Eagleview Road via lead-in pipe.

Electricity, Gas &Telecommunications

- Connect to existing services in Eagleview Road via lead-in services.

5.4A STAGE FOUR (A)

5.4A.1 Constraints

Earthworks and Regrading

- Excess of spoil to be temporarily stockpiled in Stage 7

Roads

- Intersection works are required at the intersection of the new Stage 4a roads at Benham Road and Guernsey Avenue.

Sewer

- Connect to existing sewer services in Stage 4b via lead-ins.

Stormwater Drainage

- Connect to Detention basin in Stage 4b via lead-ins.
- Re-direction of existing overland flow paths into proposed Detention.

- Provision of overland flow path for cul-de-sac trapped low point.
- Connection of existing upstream residential drainage system into proposed stormwater system via lead ins.
- Re-direction of existing overland flow paths away from aged care facility to proposed road system.

5.4A.2 Opportunities

Roads

- Retain existing Mortimer Street alignment and levels.

5.4B STAGE FOUR (B)

5.4B.1 Constraints

Earthworks and Regrading

- Excess of spoil to be disposed of off site.

Roads

- Intersection works are required at the intersection of the new Stage 4b roads at Benham Road and Guernsey Avenue.

Staging Works

- Existing occupied dwellings to be retained during construction with live, uninterrupted services to be maintained throughout.

Sewer

- Connect to the existing sewer service in Guernsey Avenue.

Stormwater Drainage

- Construct Detention basin and water quality control facilities. Connect outlet to the existing stormwater service in Guernsey Avenue.
- Re-direction of existing overland flow paths into proposed Detention and water quality facilities.
- Provision of gross pollutant trap within Benham Oval for water quality purposes.

5.4B.2 Opportunities

Roads

- Retain existing road alignments and levels for minor access streets off Guernsey Avenue and Mortimer Street.

Sewer

- Retain the existing sewer reticulation to all retained dwellings in Stage 4b.

Stormwater Drainage

- Utilise new oval location for Detention basin site.

5.5 STAGE FIVE

5.5.1 Constraints

Earthworks and Regrading

- Potential for existing filled oval to contain unsuitable or contaminated material.
- Surplus material from Stage 7 or other stages is to be used to replace contaminated material disposed of off-site. Any excess of spoil to be removed from site.

Roads

- Provide temporary traffic management at road "dead ends" to prevent through traffic from entering the future Stage 7.

Estate Major Works

- Intersection works are required at the intersection of the new Stage 5 roads at Ben Lomond Road and Townson Avenue.
- Demolition of existing overbridge.

Sewer

- Connect to the existing sewer service in Townson Avenue.

Stormwater Drainage

- Provision of Gross Pollutant Traps for water quality purposes in Townson Ave. and Ben Lomond Road.

5.6A STAGE SIX (A)

5.6A.1 Constraints

Earthworks and Regrading

- Excess cut to be stockpiled on Stage 7.

Roads

- Intersection works are required at the intersection of the new Stage 6a roads and Eagleview Road
- Provide temporary traffic management at road "dead ends" to prevent through traffic from entering the future Stage 7.

Estate Major Works

- Half road width reconstruction is required for the full Stage 6a road frontage of Eagleview Road.
- Re-location and Embellishment of Kyngmount Reserve

5.6A.2 Opportunities

- Retain existing Pendergast Avenue alignment and levels.

5.6B STAGE SIX (B)

5.6B.1 Constraints

Earthworks and Regrading

- Surplus material to be stockpiled in Stage 7 for future filling.

Roads

- Intersection works are required at the intersection of the new Stage 6b roads and Townson Avenue
- Provide temporary traffic management at road "dead ends" to prevent through traffic from entering the future Stage 7.

Staging Works

- Existing occupied dwellings to be retained during construction with live, uninterrupted services to be maintained throughout.

Stormwater Drainage

- Construct Detention Basin and water quality control facility in Scarborough Park
- Provision of gross pollutant trap for water quality purposes
- Re-direction of existing overland flow paths into proposed Detention and water quality facilities.

Sewer

- Connect to the existing sewer service in Townson Road.

5.6B.2 Opportunities

Sewer

- Retain the existing sewer reticulation to all retained dwellings in Stage 6b.

5.7 STAGE SEVEN

5.7.1 Constraints

Earthworks and Regrading

- Stockpile from previous stages cut to be used for filling.
- Excess cut from Stage 7 to be carted from site or spread over lots.

Roads

- Intersection works are required at the intersection of the new Stage 7 roads at Ben Lomond Road.
- Provide temporary traffic management at road "dead ends" to prevent through traffic from entering the future Stage 8.

Stormwater Drainage

- Connect new stormwater drainage services to existing service in Townson Road via lead-in.

5.8 STAGE EIGHT

5.8.1 Constraints

Earthworks and Regrading

- Excess cut from Stage 8 to be carted from site, or spread over lots.

Roads

- Half road width reconstruction is required for the full Stage 8 road frontage Eagleview Road.
- Demolish the existing intersection between Ben Lomond Road and Pendergast Road.

5.9 RISK ITEMS

The risk items listed below have been identified as having an impact on the project. Preliminary allowances for these risk items have been made within the cost estimate based on the available data, but more investigation is recommended as the project progresses to clarify and refine these costs and risks:

5.9.1 Staging

Development of the higher portions of the site followed by the lower generally require extensions of gravity driven services such as the stormwater drainage and sewer networks beyond the stage boundaries. It is considered that with adequate planning these lead in works would generally be permanent with some temporary component. The lead in works are included within the estimate for each stage.

5.9.2 Private property

Several lots within the site are not owned by the development consortium. The Stage 3B connection to the Sydney Water sewerage system will require works within private property. Sydney Water requires the permission of the property owner for these works to be carried out, but can force permission if it is shown that the property owner is being unreasonable. No allowance for negotiation, compensation or restoration has been made for this item.

5.9.3 Bushfire Asset Protection Zones

Stage 3B and the areas immediately to the east of Eagle View Road contain significant vegetation cover. An assessment of potential bushfire impacts has been undertaken. Recommendations for the extent of APZ have been made and indicate a 40m wide protection zone to be established from the extremity of future dwellings.

5.9.4 Uncontrolled Fill

Isolated pockets of uncontrolled fill are believed to exist across the site. Areas with uncontrolled fill that will affect civil works or housing is to be excavated and refilled in a controlled manner. In addition, uncontrolled fill has been identified as the most likely possible source of any soil contamination within the site, allowance has been made for its disposal as a risk item.

5.9.5 Acidic/Saline Soils

Typically, soils in the region are clay soils with acidic properties which are prone to shrinkage/swelling. Geotechnical advice indicates that there are no saline soils at the site. Council have however requested the any water bodies must be sealed against any saline intrusion.

5.9.6 Demolition Asbestos Contamination

Housing demolition and asbestos contamination is a possible risk, but is not included in the scope of this report.

5.9.7 Ben Lomond/Townson Road Intersection

The intersection of Ben Lomond Road and Townson Road has been identified as an accident blackspot. Council have recently received funding under the Blackspot Improvement Program for a roundabout at this intersection.

5.9.8 Retention of Roads/Pavement Materials

Opportunities for retention of existing roads are limited, however savings may be realised by use of existing road materials in new roads.

5.9.9 Retention of Dwellings

Stages 2, 4b and 6b contain 178 existing dwellings that will be retained and remain occupied for the duration of construction. The occupants of these dwellings will require external access and connection to uninterrupted services at all times. Specific details regarding construction methodology are unavailable at this time.

5.9.10 Sydney Water water mains

The existing 900mm diameter water main currently traverses the site in an East -West direction, generally along the northern edge of the proposed Redfern Park. It is considered that relocation of the water main is not feasible due to the cost involved. Consideration has been given to the boundary orientation of proposed lots along the water main route to minimise the impact of the water main on useable lot area. Sydney Water may require that the existing access rights provided by the existing 6m wide easement be maintained.

5.9.11 Connection to Existing Downstream Sewer System/s

The sewer reticulation system shown connects to existing downstream mains at various locations both inside and outside of the project site boundaries. It is intended to retain the sewer mains which run along Guernsey Ave.(300 diameter.) and Townson Ave. (225 diameter.). Lengths of sewer main within the development will also be retained where possible where they follow proposed property boundaries. Allowance has been made for future upgrading of the Guernsey Ave. sewer that may be under capacity as a result of the development. A flow analysis should be undertaken to confirm if this main requires upgrading.

5.9.12 Retention of Services

It has been identified that some impact on residents and construction costs can be reduced by the retention of existing services where possible. This is only considered feasible where the existing road route and profile is being maintained. Due to changes in ground levels because of earthworks or road modifications, existing services may not have sufficient cover to be retained. For preliminary costing purposes, it has been assumed that all existing services within the site will be replaced. More refinement can be expected as the design progresses.

5.9.13 Telecommunications

Communications with Telstra have indicated that they will be expecting the relocation of their services as well as provision of new services to be developer funded. This is not the case generally within urban subdivisions, it is suggested further discussion with Telstra or their competitors be undertaken during the design process. As part of the costing an allowance has been made for inclusion of these works.

5.9.14 Electricity

Due to increased use of electrical household appliances such as air conditioners there is a possibility that the regional sub-station for the area will need to be up-graded. Preliminary discussions with Integral Energy have indicated this, however, until such time that a preliminary design can be lodged with IE.

5.9.15 Resident Safety

The proximity of the works to occupied residential areas may constitute a safety hazard to residents during construction however, with proper management of the works and suitable security measures the level of hazard would be reduced.

5.9.16 Broadband Supply

The need to supplement the current roll out of broadband network to assist in Television reception and computer use has been acknowledged as a risk for most developments in western Sydney. Although this is a problem in some areas we believe that due to the topography of the site and the current levels of pay television and household computer ownership that it wouldn't be a great issue.

5.9.17 Telecommunications Tower

The proximity of a Telecom tower within the SWC land on Eagle view Road was thought initially to be problematic to the siting of dwellings within Stages 3a & 3b. Campbelltown Councils DCP 107 Siting of Communication facilities states that, residential dwellings should not be within 300 metres of these towers due to Electromagnetic radiation emissions. Following emission testing carried out across the whole of the Minto renewal area, results indicate that the emissions from the tower are much lower than the required safety levels indicated in Councils DCP.

5.9.18 Bulk Earthworks

Preliminary model gradings of roads and batters across the development have been undertaken. The present regrading design produces an excess cut across all stages in the amount of approximately 122,000 cubic metres. Further design works should be undertaken to determine how much of the excess cut can be retained on site by spreading on lot areas that can be raised. New areas such as Stage 2 3a, 3b and 5 could be utilised to reduce the amount of cut having to be exported from the site. Allowance at this time has been made to export all excess fill.

6.0 CONCLUSION AND RECOMMENDATIONS

Activity principles were established based on preliminary infrastructure information and investigations only. To take advantage of the opportunities for reduced economic exposure to risk it is recommended that the following activities are undertaken:

- Incorporate the proposed development layout into the existing cadastral boundaries, and survey to provide a refined site grading plan,
- Finalise the detailed survey of the developable area to identify above ground and below ground structures, services and utilities needing modification, removal or replacement,
- Preparation of an Earthworks Management Report as described in earlier sections of this report to coincide with the construction stages. This would minimise the double handling of excavated material or exporting surplus and importing deficit material from independent stages thereby providing cost savings,
- Further assessment of the geotechnical aspects of the site, with particular reference to the fill areas and contaminated material.
- Investigation of the capacity of existing Authority services on the site and the extent of augmentation, and retention that is possible,
- Assessment of the maintenance and precautionary requirements of Sydney Water in regards to the 900 mm water main that bisects the site, together with flow analysis with regard to the Minto sewer carrier main.
- Further discussion with Integral Energy to ascertain the full costing of the possible upgrade for the regional sub-station.
- Further discussion with Telstra to persuade the service provider to fund the servicing arrangement for the development.
- Assessment of the Broadband requirements for the area, and
- Further discussion with Agility to confirm the service provider is to fund the servicing arrangement for the development.

APPENDIX A – CONCEPT PLANS

MINTO URBAN RENEWAL PROJECT

INFRASTRUCTURE MASTERPLANS

PREPARED BY:

HughesTrueman
Consulting Engineers Planners & Managers
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T 02 9890 5244 F 02 9891 1099 parramatta@hughestrueman.com.au

CIVIL DRAWING LIST

05PS41-MD-0	COVER SHEET
05PS41-MD-0	AERIAL SURVEY PLAN
05PS41-MD-0	OVERALL STAGING PLAN
05PS41-MD-0	EXISTING TOPOGRAPHICAL FEATURES - CADASTRAL PLAN
05PS41-MD-0	CONSTRAINTS PLAN - EXISTING SLOPE ANALYSIS
05PS41-MD-0	CONSTRAINTS PLAN - LANDUSE
05PS41-MD-0	CONSTRAINTS PLAN - CUT AND FILL PLAN
05PS41-MD-0	CONSTRAINTS PLAN - CUT/ANDSCAL MANAGEMENT
05PS41-MD-0	PROPOSED BOUNDING CONTOUR PLAN
05PS41-RD-0	ROAD HIERARCHY PLAN
05PS41-RD-0	ROAD CROSS SECTIONS
05PS41-MD-0	MASTERPLAN STAGING PLAN - STAGE 1
05PS41-MD-0	MASTERPLAN STAGING PLAN - STAGE 2
05PS41-MD-0	MASTERPLAN STAGING PLAN - STAGE 3
05PS41-MD-0	MASTERPLAN STAGING PLAN - STAGE 4
05PS41-MD-0	MASTERPLAN STAGING PLAN - STAGE 5
05PS41-MD-0	MASTERPLAN STAGING PLAN - STAGE 6
05PS41-MD-0	MASTERPLAN STAGING PLAN - STAGE 7 & 8
05PS41-MD-0	MASTERPLAN STAGING PLAN - STAGE 7
05PS41-MD-0	MASTERPLAN STAGING PLAN - STAGE 8
05PS41-MD-0	MASTERPLAN GANDWAY PLAN

CLIENT:

LANDCOM

HT Project No: 05PS41
Dwg No: MD1 Rev: D
ISSUED FOR DA

Date: 18.10.05

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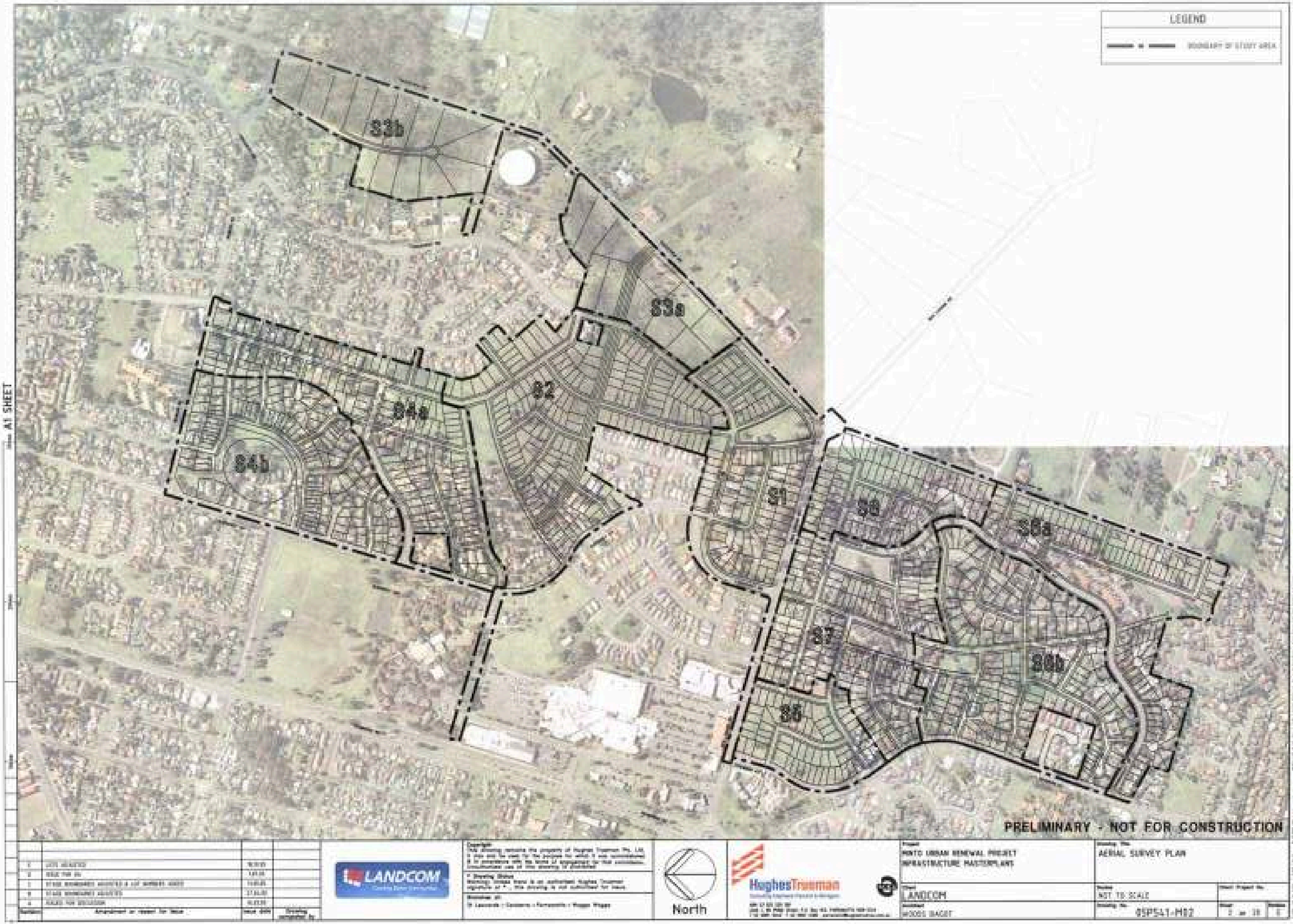

LEGEND
BOUNDARY OF STUDY AREA
S3b
S3a
S2
S4a
S4b
S1
S6
S6a
S7
S6b
S5
PRELIMINARY - NOT FOR CONSTRUCTION
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MINTO URBAN RENEWAL PROJECT
INFRASTRUCTURE MASTERPLANS
AERIAL SURVEY PLAN
LANDCOM
NOT TO SCALE
05P541-M02
A1 SHEET

PRELIMINARY - NOT FOR CONSTRUCTION

LANDCOM

HughesTrueman

Project: MINTO URBAN RENEWAL PROJECT
INFRASTRUCTURE MASTERPLANS

Drawing Title: OVERALL STAGING PLAN

Client: LANDCOM

Drawing No. 05PS41-M03

A1 SHEET

LEGEND

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Project: MINTO URBAN RENEWAL PROJECT INFRASTRUCTURE MASTERPLANS

Drawing Title: EXISTING TOPOGRAPHICAL FEATURES CADASTRAL PLAN

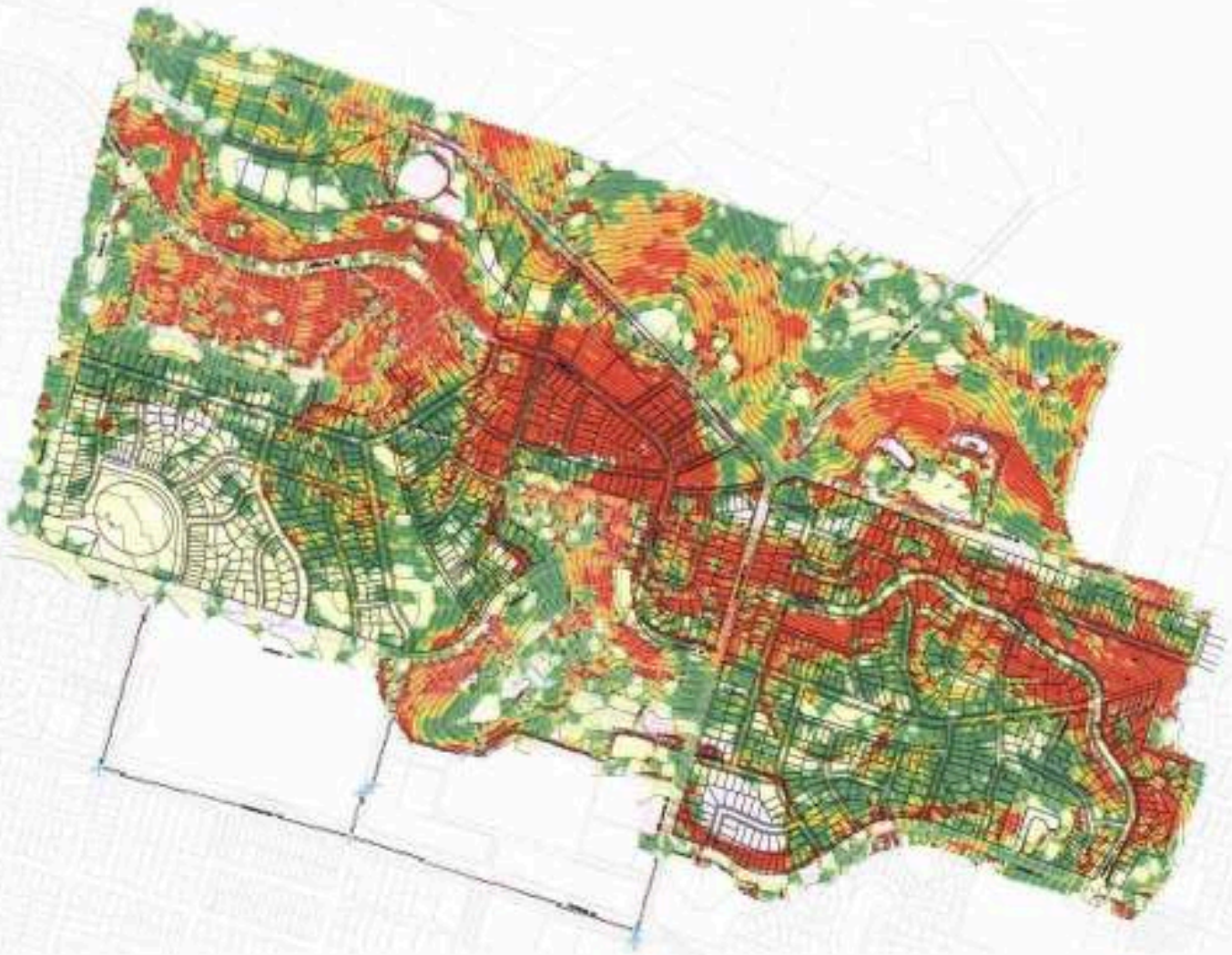
Client: LANDCOM

Architect: WOODS BAGOT

Drawing No. 05P541-H14

Sheet 4 of 28 | Revision 3

A1 SHEET



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2	ISSUE FOR D.A.	12.07.07	
1	FINAL SUBMISSION ADDED	23.06.07	
A	ISSUED FOR DISCUSSION	14.05.07	
Revision	Amendment or Issued for Issue	Issue date	Drawing completed by

LANDCOM

* Drawing Status
Warning: Unless there is an authorised Hughes Trueman signature in "", this drawing is not authorised for issue.

Directions (if)
Or Lawrence • Canberra • Parramatta • Wagga Wagga

North

HughesTrueman

Project: MINTO URBAN RENEWAL PROJECT INFRASTRUCTURE MASTERPLANS	Drawing Title: CONSTRAINTS PLAN EXISTING SLOPE ANALYSIS
Client: LANDCOM	Scales: 1:4000 A3 A1
Architect: WOODS BAGOT	Drawing No.: DSP541-M05
	Sheet: 5 of 21
	Revision: D

A1 SHEET

PRELIMINARY - NOT FOR CONSTRUCTION

D	UPD ADJUSTED	M.M.05	
C	ISSUE FOR D.A.	12.05.05	
B	ETAILED BOUNDARIES ADJUSTED	21.04.05	
A	ISSUED FOR DISCUSSION	14.03.05	
Revision	Amendment or issued for issue	Issue date	Drawing completed by

LANDCOM

Drawing Status
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HughesTrueman

Project	MINTO URBAN RENEWAL PROJECT INFRASTRUCTURE MASTERPLANS
Drawing Title	CONSTRAINTS PLAN LANDUSE
Client	LANDCOM
Number	14006 AT 61
Client Project No.	
Architect	HUGHES TRUEMAN
Drawing No.	DSPS41-M06
Sheet	4 of 23
Revision	D

PRELIMINARY - NOT FOR CONSTRUCTION

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North

Hughes Trueman

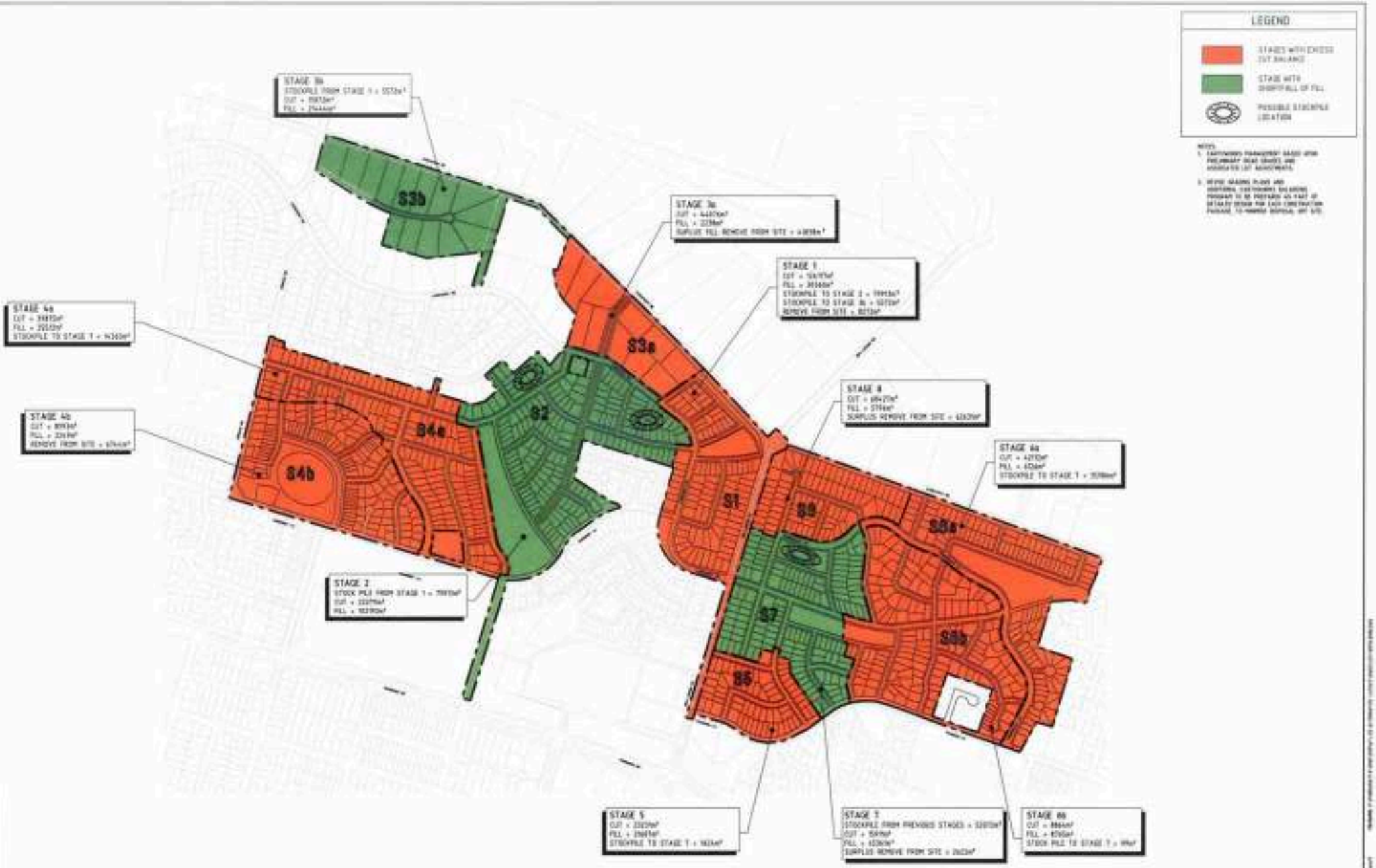
Project: MINTO URBAN RENEWAL PROJECT INFRASTRUCTURE MASTERPLANS

Drawing Title: CONSTRAINTS PLAN CUT AND FILL PLAN

Client: LANDCOM

Drawing No.: 05P541-M07

A1 SHEET



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2	ISSUE FOR S.A.	1.07.21	
1	STAGE BOUNDARIES ADJUSTED	17.06.21	
4	ISSUED FOR MEETINGS	14.05.21	

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Directors of:
JS Lawrence • Canberra • Parramatta • Wagga Wagga

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HughesTrueman
Surveying Engineering Planning & Management

Project
MINTO URBAN RENEWAL PROJECT
INFRASTRUCTURE MASTERPLANS

Drawing Title
CONSTRAINTS PLAN
EARTHWORKS MANAGEMENT

Client
LANDCOM

Scale
1:4000 AT A1

Other Project No.

Surveyed
NOSSIS BASSIT

Drawing No.
05P541-M08

Sheet
9 of 31

Revision
D

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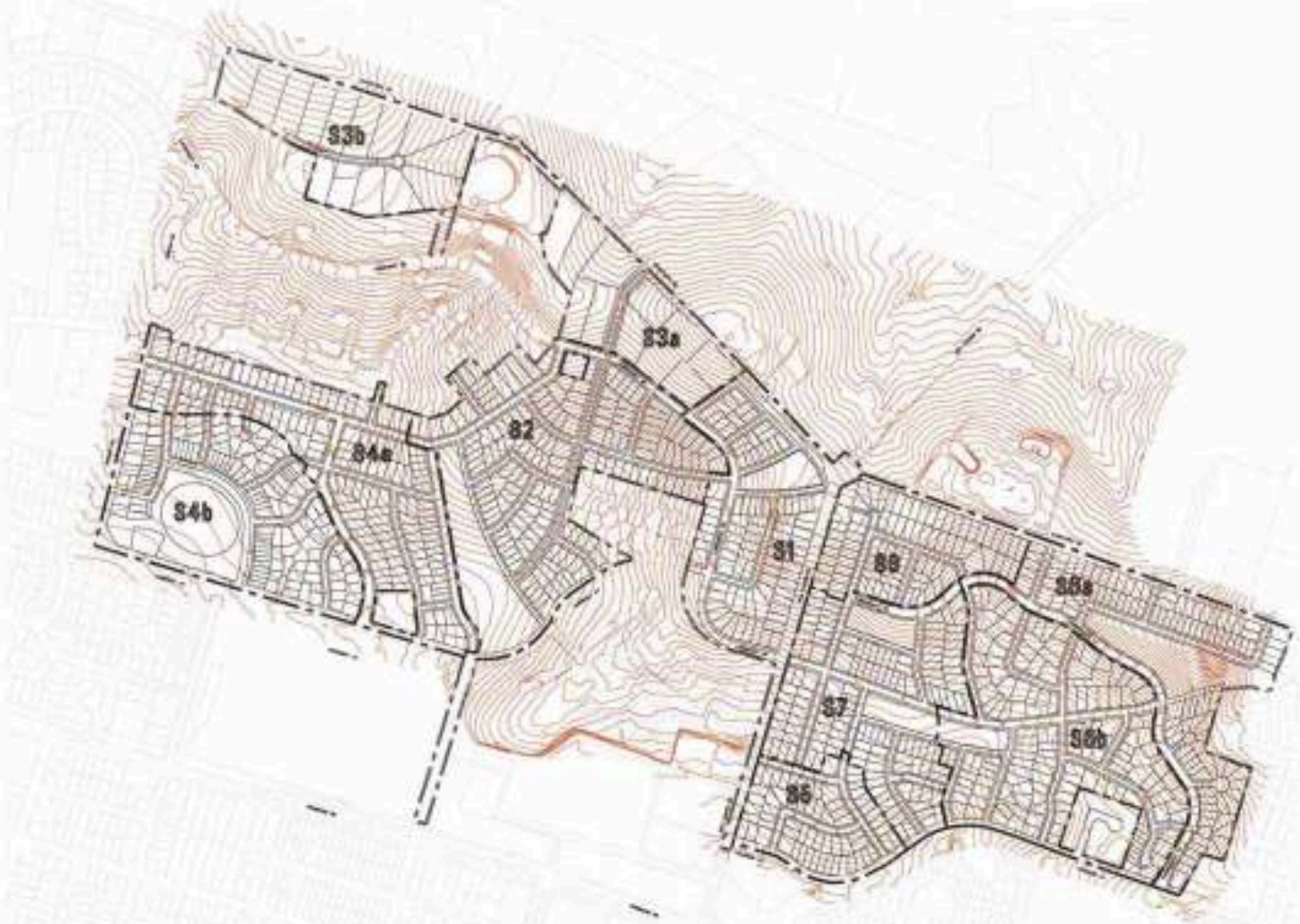

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C	ISSUE FOR S.A.	1.07.21	
B	STAGE BOUNDARY ADJUSTED	27.11.20	
A	ISSUE FOR DISCUSSION	16.10.20	

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Canberra ● Parramatta ● Wagga Wagga

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Project
MINTO URBAN RENEWAL PROJECT
INFRASTRUCTURE MASTERPLANS

Client
LANDCOM

Job Number
w0005 88001

Drawing Title
PROPOSED REGRADING CONTOUR PLAN

Scale
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Drawing No.
05PS41-M09

Sheet
1 of 1

Issue
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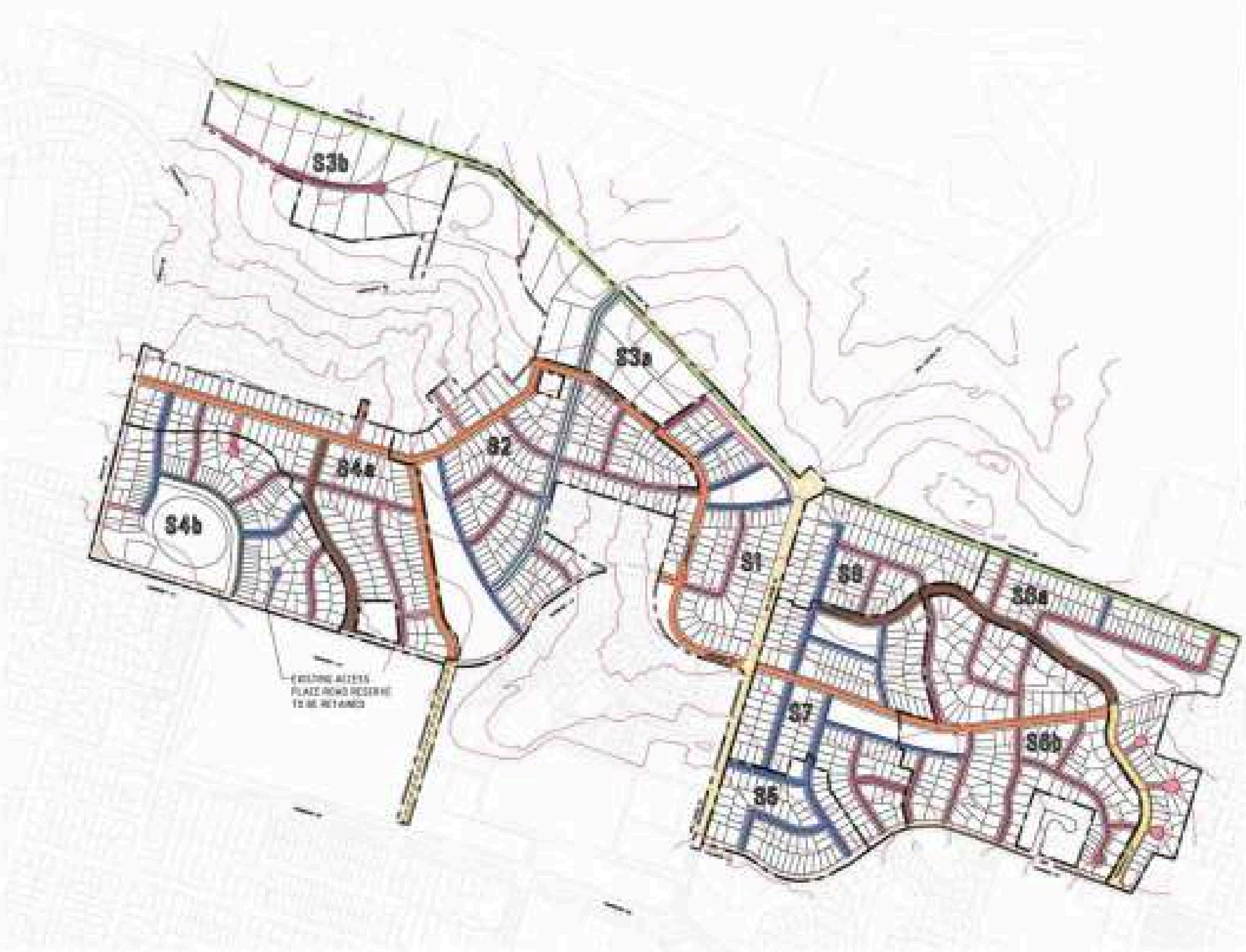

LEGEND

- ROAD TYPE 1 – ACCESS PLACE
- ROAD TYPE 2 – ACCESS ST. UNDER 12m LOTS
- ROAD TYPE 3 – ACCESS ST. OVER 12m LOTS
- ROAD TYPE 4 – UPGRADING EXISTING TO MINOR COLLECTOR
- ROAD TYPE 5 – MINOR COLLECTOR
- ROAD TYPE 6 – UPGRADING EXISTING TO ACCESS STREET
- ROAD TYPE 7 – SWALE STREET
- ROAD TYPE 8 – OVAL PARKING
- ROAD TYPE 9 – EXISTING ROAD RESERVE (MONAGHAN ST)
- ROAD TYPE 10 – EXISTING ROAD RESERVE (BEN LOMOND RD)
- ROAD TYPE 11 – EAGLEVIEW ROAD HALF ROAD WORKS
- ROAD TYPE 12 – EXISTING ROAD VERGE WORKS
- ROAD TYPE 13 – EXISTING ACCESS PLACE ROAD WORKS
- ROAD TYPE 14 – EAGLEVIEW ROAD HALF ROAD WORKS WITH PARKING AND SHARED WAY

NOTE: REFER TO ROAD CROSS SECTIONS ON DWG M11

PRELIMINARY - NOT FOR CONSTRUCTION

4	LOTS ADJUSTED		
3	ISSUE FOR DA		
2	STAGE BOUNDARIES ADJUSTED		
1	ISSUED FOR DISCUSSION		
Revision	Amendment or reason for issue	Issue date	Drawing completed by

LANDCOM

North

Hughes Trueman

Project: MINTO URBAN RENEWAL PROJECT INFRASTRUCTURE MASTERPLANS

Drawing Title: ROAD HIERARCHY PLAN

Client: LANDCOM

Architect: WOODS BAGOT

Scale: 1:4000 AT A1

Drawing No.: 05P541-M10

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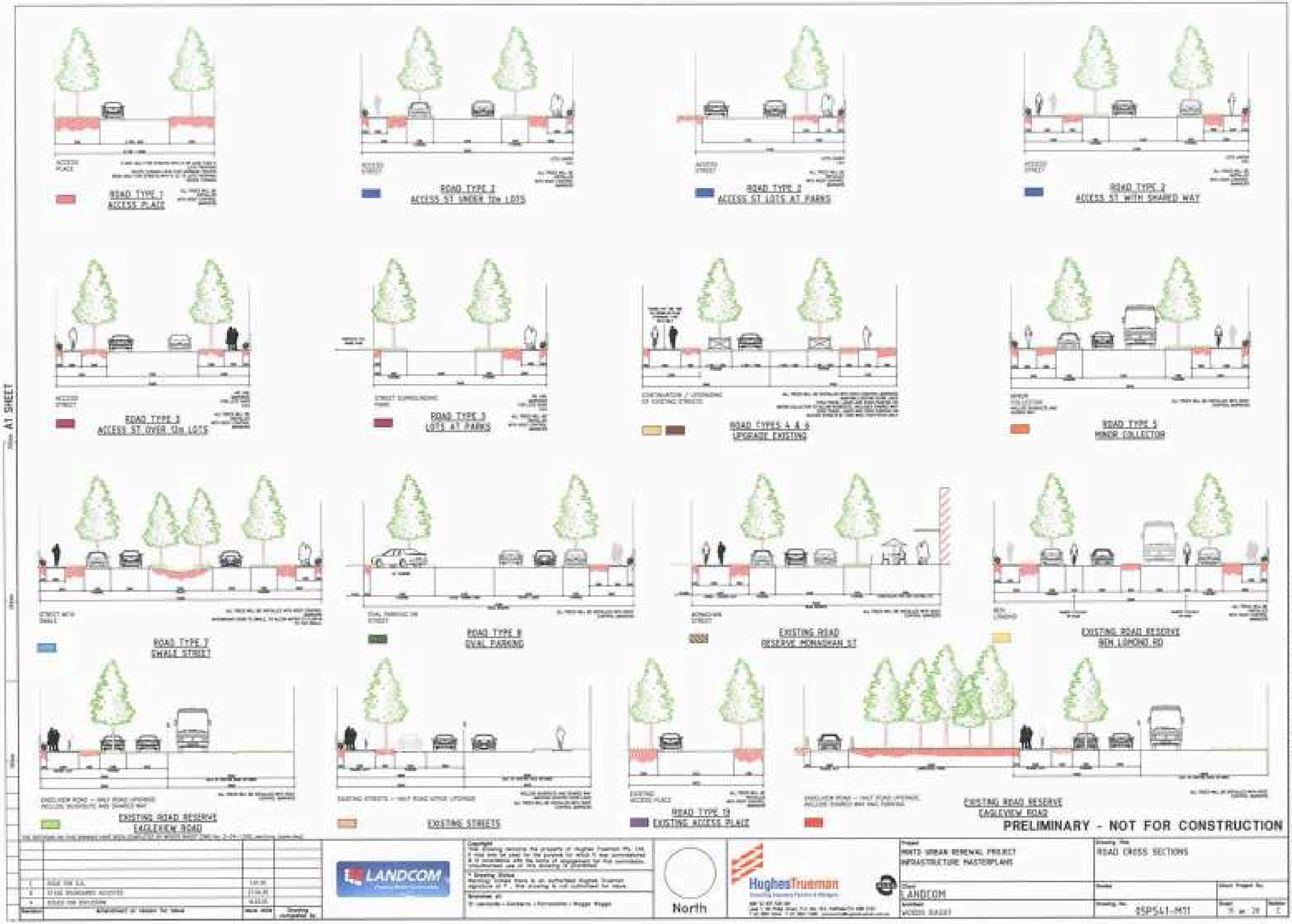

ROAD TYPE 1
ACCESS PLACE
ROAD TYPE 2
ACCESS ST UNDER 12m LOTS
ROAD TYPE 2
ACCESS ST LOTS AT PARKS
ROAD TYPE 2
ACCESS ST WITH SHARED WAY
ROAD TYPE 3
ACCESS ST OVER 12m LOTS
ROAD TYPE 3
LOTS AT PARKS
ROAD TYPES 4 & 6
UPGRADE EXISTING
ROAD TYPE 5
MINOR COLLECTOR
ROAD TYPE 7
SWALE STREET
ROAD TYPE 8
OVAL PARKING
EXISTING ROAD
RESERVE MONAGHAN ST
EXISTING ROAD RESERVE
BEN LOMOND RD
EXISTING ROAD RESERVE
EAGLEVIEW ROAD
EXISTING STREETS
ROAD TYPE 9
EXISTING ACCESS PLACE
EXISTING ROAD RESERVE
EAGLEVIEW ROAD
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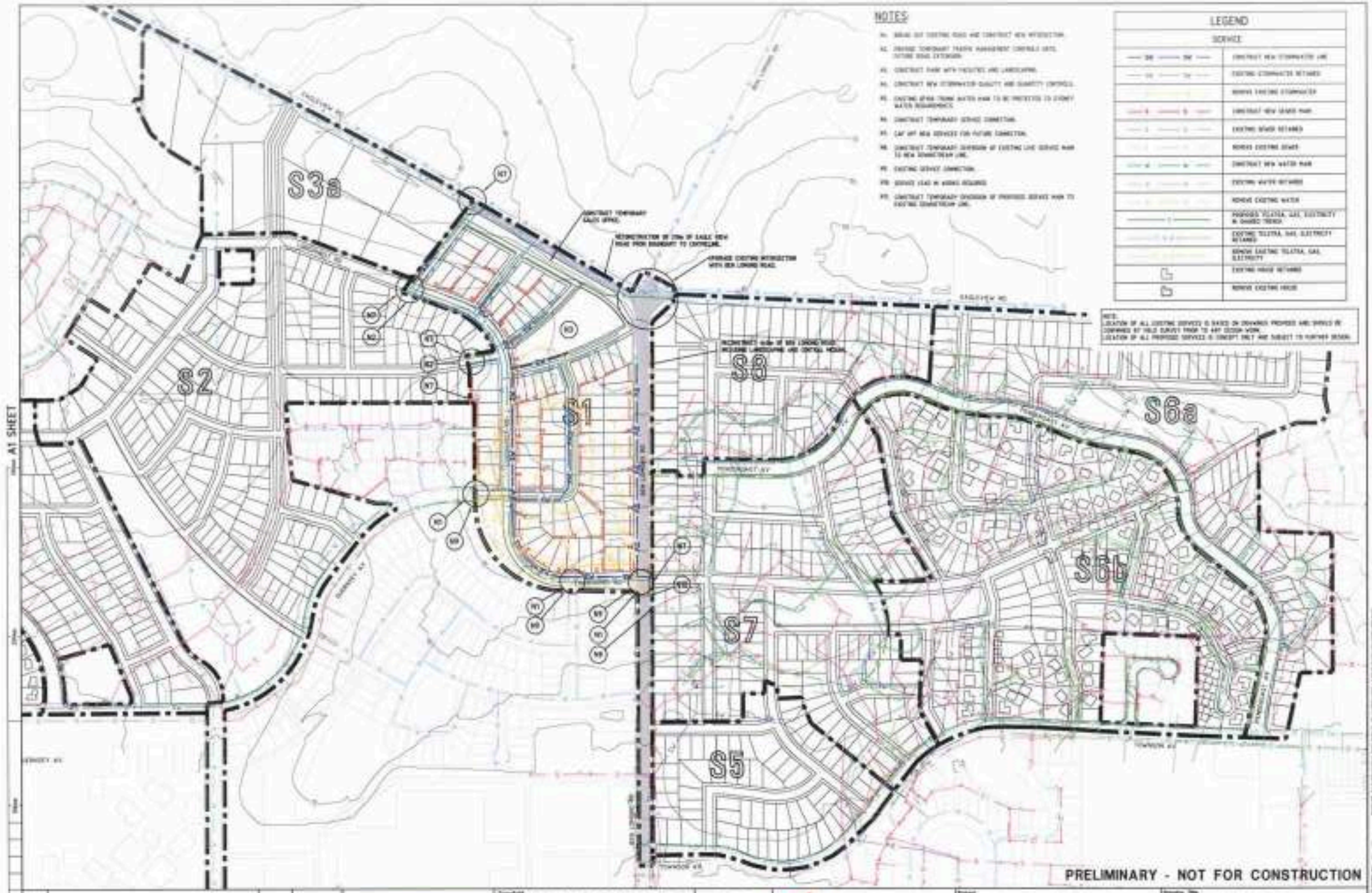
MINTO URBAN RENEWAL PROJECT
INFRASTRUCTURE MASTERPLANS
ROAD CROSS SECTIONS
LANDCOM
05P541-M11



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2	STAGE BOUNDARY ADDED		
1	ISSUE FOR DISCUSSION		
Number	Amendment or reason for issue	Issue date	Drawing completed by

LANDCOM

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Project: MINTO URBAN RENEWAL PROJECT
INFRASTRUCTURE MASTERPLANS

Drawing Title: MASTERPLAN STAGING PLAN
STAGE 1

Client: LANDCOM

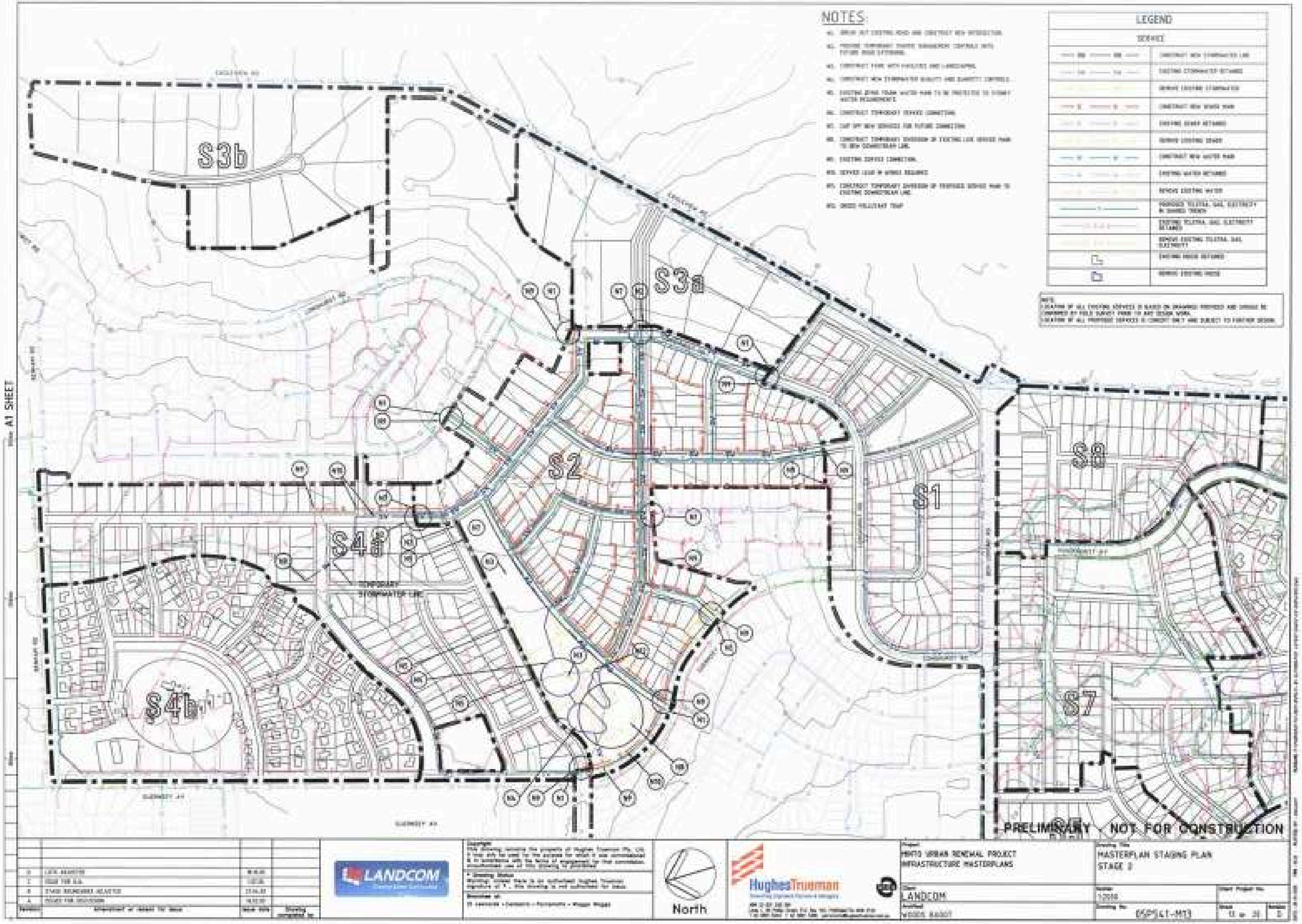
Scales: 1:2000

Architect: MOODIE DAGET

Drawing No.: 85P541-M12

Sheet: 12 of 20

Revision: 5



NOTES:
LEGEND
SERVICE
CONSTRUCT NEW STORMWATER LINE
EXISTING STORMWATER RETAINED
REMOVE EXISTING STORMWATER
CONSTRUCT NEW SEWER MAIN
EXISTING SEWER RETAINED
REMOVE EXISTING SEWER
CONSTRUCT NEW WATER MAIN
EXISTING WATER RETAINED
REMOVE EXISTING WATER
EXISTING HOUSE RETAINED
REMOVE EXISTING HOUSE
S3b
S3a
S2
S1
S8
S4a
S4b
S7
TEMPORARY STORMWATER LINE
A1 SHEET
PRELIMINARY - NOT FOR CONSTRUCTION
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INFRASTRUCTURE MASTERPLANS
MASTERPLAN STAGING PLAN
STAGE 2
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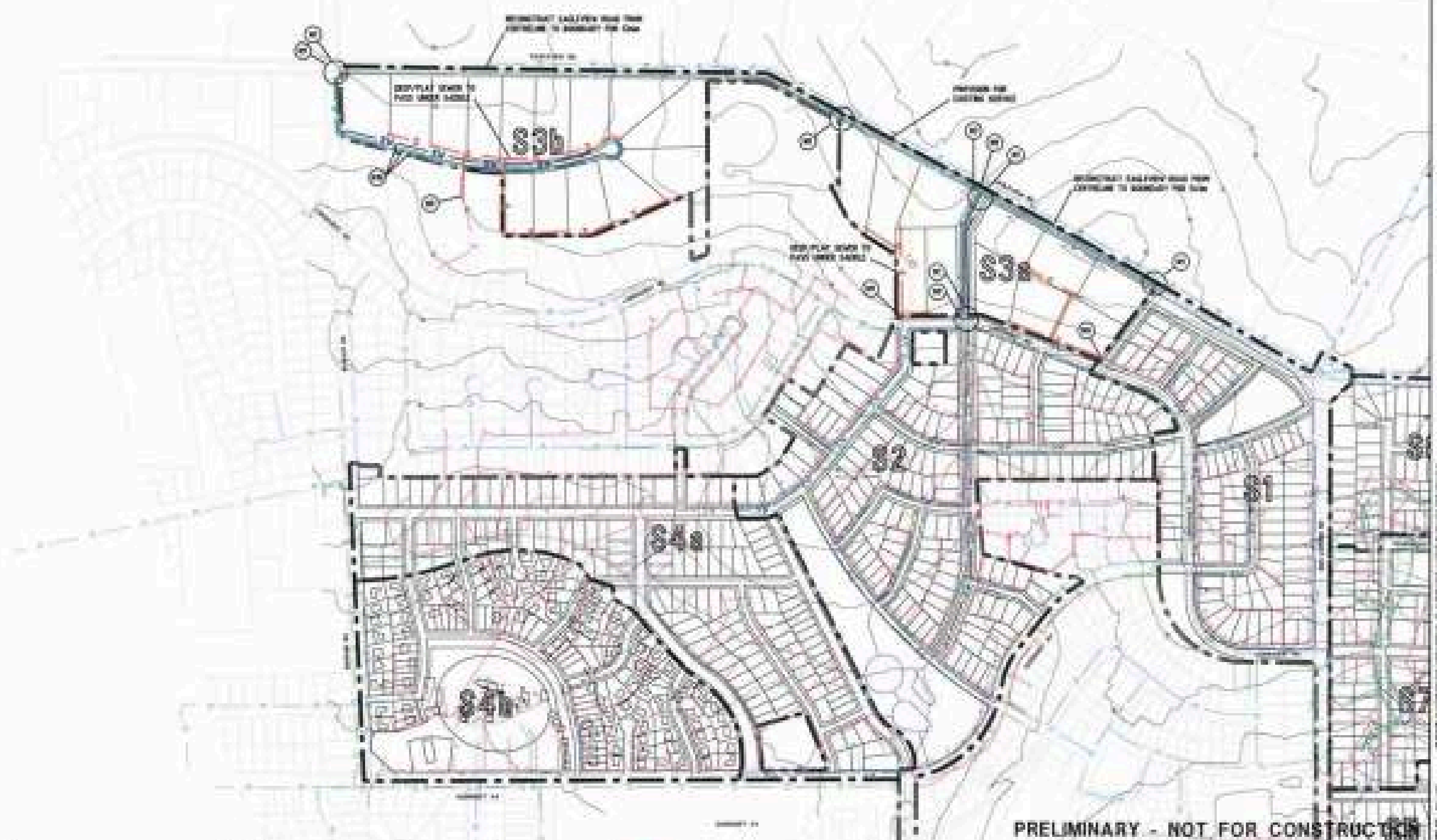
LEGEND

SERVICE	
	CONSTRUCT NEW STORMWATER LINE
	EXISTING STORMWATER RETAINED
	REMOVE EXISTING STORMWATER
	CONSTRUCT NEW SEWER MAIN
	EXISTING SEWER RETAINED
	REMOVE EXISTING SEWER
	CONSTRUCT NEW WATER MAIN
	EXISTING WATER RETAINED
	REMOVE EXISTING WATER
	PROPOSED TELSTRA, GAS, ELECTRICITY IN SHARED TRENCH
	EXISTING TELSTRA, GAS, ELECTRICITY RETAINED
	REMOVE EXISTING TELSTRA, GAS, ELECTRICITY
	EXISTING HOUSE RETAINED
	REMOVE EXISTING HOUSE

NOTE:
LOCATION OF ALL EXISTING SERVICES IS BASED ON DRAWINGS PROVIDED AND SHOULD BE CONFIRMED BY FIELD SURVEY PRIOR TO ANY DESIGN WORK.
LOCATION OF ALL PROPOSED SERVICES IS CONCEPT ONLY AND SUBJECT TO FURTHER DESIGN.

NOTES

N1. BREAK OUT EXISTING ROAD AND CONSTRUCT NEW INTERSECTION.
N2. PROVIDE TEMPORARY TRAFFIC MANAGEMENT CONTROLS UNTIL FUTURE ROAD EXTENSION.
N3. CONSTRUCT PARK WITH FACILITIES AND LANDSCAPING.
N4. CONSTRUCT NEW STORMWATER QUALITY AND QUANTITY CONTROLS.
N5. EXISTING Ø1066 TRUNK WATER MAIN TO BE PROTECTED TO SYDNEY WATER REQUIREMENTS.
N6. CONSTRUCT TEMPORARY SERVICE CONNECTION.
N7. CAP OFF NEW SERVICES FOR FUTURE CONNECTION.
N8. CONSTRUCT TEMPORARY DIVERSION OF EXISTING LIVE SERVICE MAIN TO NEW DOWNSTREAM LINE.
N9. EXISTING SERVICE CONNECTION.
N10. SERVICE LEAD IN WORKS REQUIRED.
N11. CONSTRUCT TEMPORARY DIVERSION OF PROPOSED SERVICE MAIN TO EXISTING DOWNSTREAM LINE.



PRELIMINARY - NOT FOR CONSTRUCTION

Revision	Amendment or reason for issue	Issue date
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3	ISSUE FOR D.A.	[illegible]
2	STAGE BOUNDARY REVISED	[illegible]
1	ISSUED FOR DISCUSSION	[illegible]

LANDCOM

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HughesTrueman

Project: MINTO URBAN RENEWAL PROJECT INFRASTRUCTURE MASTERPLANS

Drawing Title: MASTERPLAN STAGING PLAN STAGE 3A & 3B

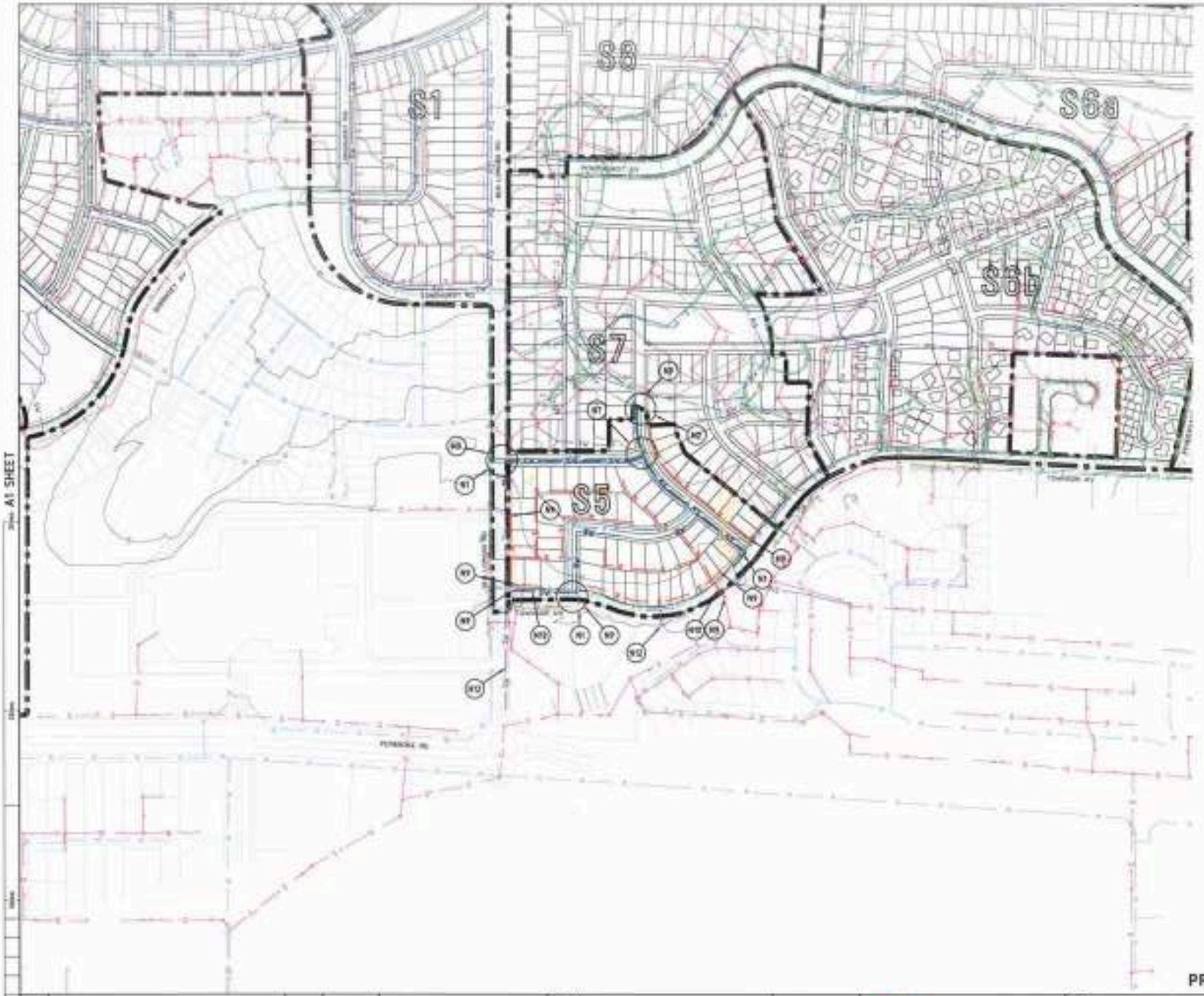
Client: LANDCOM

Location: MOODS BASIT

Drawing No. 05PS41-M14

A1 SHEET


LEGEND
SERVICE
CONSTRUCT NEW STORMWATER LINE
EXISTING STORMWATER RETAINED
REMOVE EXISTING STORMWATER
CONSTRUCT NEW SEWER MAIN
EXISTING SEWER RETAINED
REMOVE EXISTING SEWER
CONSTRUCT NEW WATER MAIN
EXISTING WATER RETAINED
REMOVE EXISTING WATER
PROPOSED TELSTRA GAS ELECTRICITY IN SHARED TRENCH
EXISTING TELSTRA, GAS, ELECTRICITY RETAINED
REMOVE EXISTING TELSTRA, GAS, ELECTRICITY
EXISTING HOUSE RETAINED
REMOVE EXISTING HOUSE
NOTES:
S3b
S3a
S2
S1
S4a
S4b
PRELIMINARY - NOT FOR CONSTRUCTION
North
LANDCOM
HughesTrueman
MINTO URBAN RENEWAL PROJECT
INFRASTRUCTURE MASTERPLANS
MASTERPLAN STAGING PLAN
STAGE 4A & 4B
LANDCOM
WOODS BAGOT
12308
05PS41-M15
AT SHEET



LEGEND	
SERVICE	
	CONSTRUCT NEW STORMWATER LINE
	EXISTING STORMWATER RETAINED
	REMOVE EXISTING STORMWATER
	CONSTRUCT NEW SEWER MAIN
	EXISTING SEWER RETAINED
	REMOVE EXISTING SEWER
	CONSTRUCT NEW WATER MAIN
	EXISTING WATER RETAINED
	REMOVE EXISTING WATER
	PROPOSED TELSTRA, GAS, ELECTRICITY IN SHARED TRENCH
	EXISTING TELSTRA, GAS, ELECTRICITY RETAINED
	REMOVE EXISTING TELSTRA, GAS, ELECTRICITY
	EXISTING HOUSE RETAINED
	REMOVE EXISTING HOUSE

NOTE:
LOCATION OF ALL EXISTING SERVICES IS BASED ON DRAWINGS PROVIDED AND SHOULD BE CONFIRMED BY FIELD SURVEY PRIOR TO ANY DESIGN WORK.
LOCATION OF ALL PROPOSED SERVICES IS CONCEPT ONLY AND SUBJECT TO FURTHER DESIGN.

NOTES:

- N1. BREAK OUT EXISTING ROAD AND CONSTRUCT NEW INTERSECTION.
- N2. PROVIDE TEMPORARY TRAFFIC MANAGEMENT CONTROLS INTO FUTURE ROAD EXTENSION.
- N3. CONSTRUCT PARK WITH FACILITIES AND LANDSCAPING.
- N4. CONSTRUCT NEW STORMWATER QUALITY AND QUANTITY CONTROLS.
- N5. EXISTING Ø150 TOUNG WATER MAIN TO BE PROTECTED TO SYDNEY WATER REQUIREMENTS
- N6. CONSTRUCT TEMPORARY SERVICE CONNECTION.
- N7. CAP OFF NEW SERVICES FOR FUTURE CONNECTION.
- N8. CONSTRUCT TEMPORARY DIVERSION OF EXISTING 150 SERVICE MAIN TO NEW DRAINSCREAM LINE.
- N9. EXISTING SERVICE CONNECTION.
- N10. SERVICE LEAD IN WORKS RETAINED
- N11. CONSTRUCT TEMPORARY DIVERSION OF PROPOSED SERVICE MAIN TO EXISTING DRAINSCREAM LINE.
- N12. SERVICE PEDESTRIAN TRAY

PRELIMINARY - NOT FOR CONSTRUCTION

Issue	Amendment or reason for issue	Issue date	Drawing completed by
D	LOT ADJUSTED	18.08.20	
C	ISSUE FOR DA	13.08.20	
B	STAGE BOUNDARY ADJUSTED	23.06.20	
A	ISSUED FOR DISCUSSION	16.03.20	

LANDCOM

• Drawing Status
Working Copies: None is an authorised Hughes Trueman signature of 'F', this drawing is not authorised for issue.

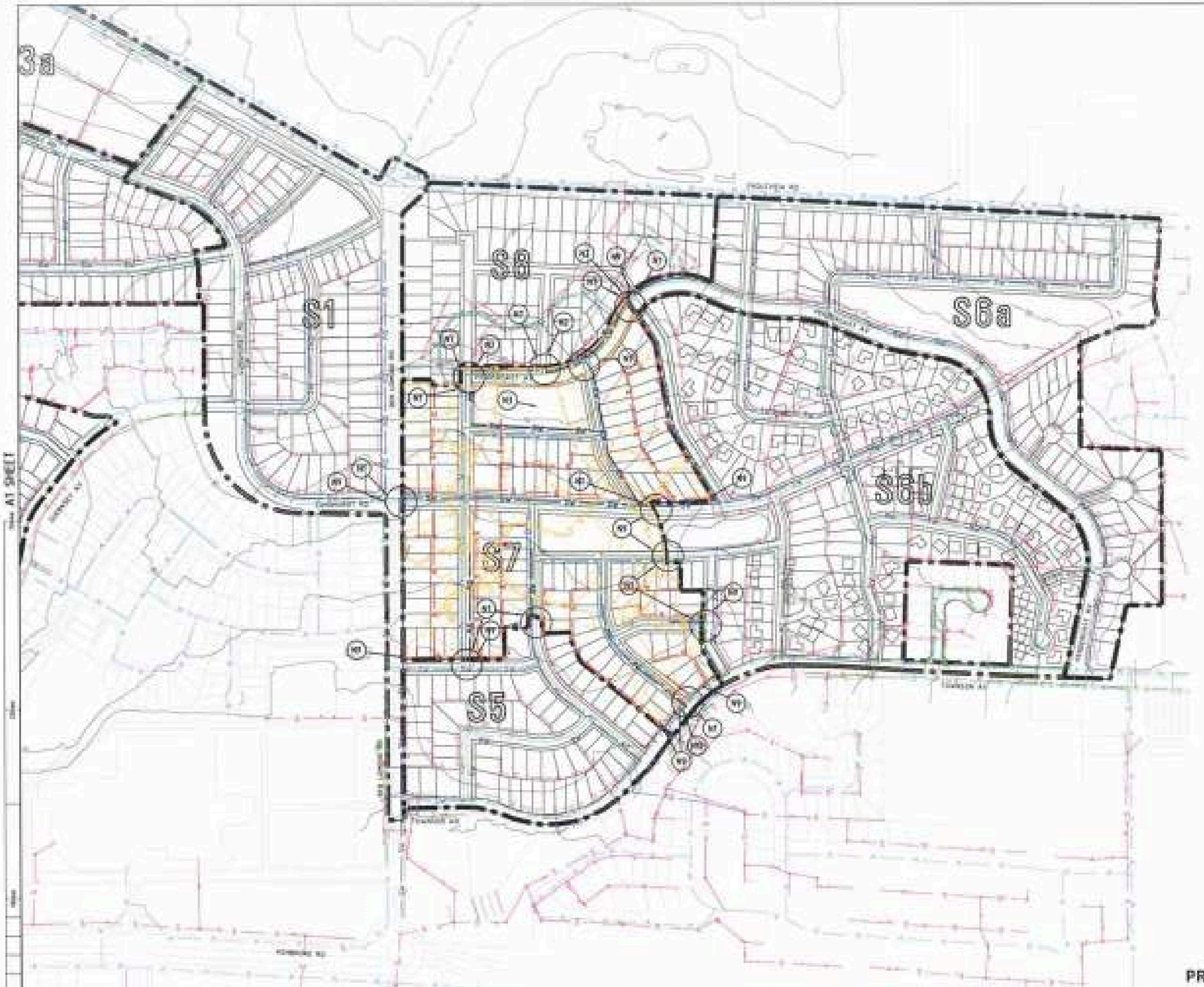
Drawings on:
D: Landcom - Canberra - Parramatta - Wagga Wagga

North

HughesTrueman

Project	MINTO URBAN RENEWAL PROJECT INFRASTRUCTURE MASTERPLANS
Drawing Title	MASTERPLAN STAGING PLAN STAGE 5
Client	LANDCOM
Scales	1:2000
Client Project No.	
Consultant	MOSES BAGBY
Drawing No.	85PS41-M16
Sheet	16 of 29
Revision	D


LEGEND
SERVICE
S1
S6
S6a
S6b
S7
S5
NOTES:
PRELIMINARY - NOT FOR CONSTRUCTION
LANDCOM
HughesTrueman
North
MINTO URBAN RENEWAL PROJECT
INFRASTRUCTURE MASTERPLANS
MASTERPLAN STAGING PLAN
STAGE 6A & 6B
LANDCOM
1:2000
OSPS41-M17
A1 SHEET



LEGEND	
SERVICES	
	CONSTRUCT NEW STORMWATER LINE
	EXISTING STORMWATER RETAINED
	REMOVE EXISTING STORMWATER
	CONSTRUCT NEW SEWER MAIN
	EXISTING SEWER RETAINED
	REMOVE EXISTING SEWER
	CONSTRUCT NEW WATER MAIN
	EXISTING WATER RETAINED
	REMOVE EXISTING WATER
	PROPOSED TELSTRA, GAS, ELECTRICITY IN SHARED TRENCH
	EXISTING TELSTRA, GAS, ELECTRICITY RETAINED
	REMOVE EXISTING TELSTRA, GAS, ELECTRICITY
	EXISTING HOUSE RETAINED
	REMOVE EXISTING HOUSE

NOTE:
LOCATION OF ALL EXISTING SERVICES IS BASED ON DRAWINGS PROVIDED AND SHOULD BE CONFIRMED BY FIELD SURVEY PRIOR TO ANY DESIGN WORK.
LOCATION OF ALL PROPOSED SERVICES IS CONCEPT ONLY AND SUBJECT TO FURTHER DESIGN.

NOTES:

N1. BREAK OUT EXISTING ROAD AND CONSTRUCT NEW INTERSECTION.
N2. PROVIDE TEMPORARY TRAFFIC MANAGEMENT CONTROLS UNTIL FUTURE ROAD EXTENSION.
N3. CONSTRUCT PARK WITH FACILITIES AND LANDSCAPING.
N4. CONSTRUCT NEW STORMWATER QUALITY AND QUANTITY CONTROLS.
N5. EXISTING Ø900 TRUNK WATER MAIN TO BE PROTECTED TO SYDNEY WATER REQUIREMENTS.
N6. CONSTRUCT TEMPORARY SERVICE CONNECTION.
N7. CAP OFF NEW SERVICES FOR FUTURE CONNECTION.
N8. CONSTRUCT TEMPORARY DIVERSION OF EXISTING LIVE SERVICE MAIN TO NEW DOWNSTREAM LINE.
N9. EXISTING SERVICE CONNECTION.
N10. SERVICE LEAD IN WORKS REQUIRED.
N11. CONSTRUCT TEMPORARY DIVERSION OF PROPOSED SERVICE MAIN TO EXISTING DOWNSTREAM LINE.

PRELIMINARY - NOT FOR CONSTRUCTION

LANDCOM

North

Hughes Trueman

Project: MINTO URBAN RENEWAL PROJECT INFRASTRUCTURE MASTERPLANS

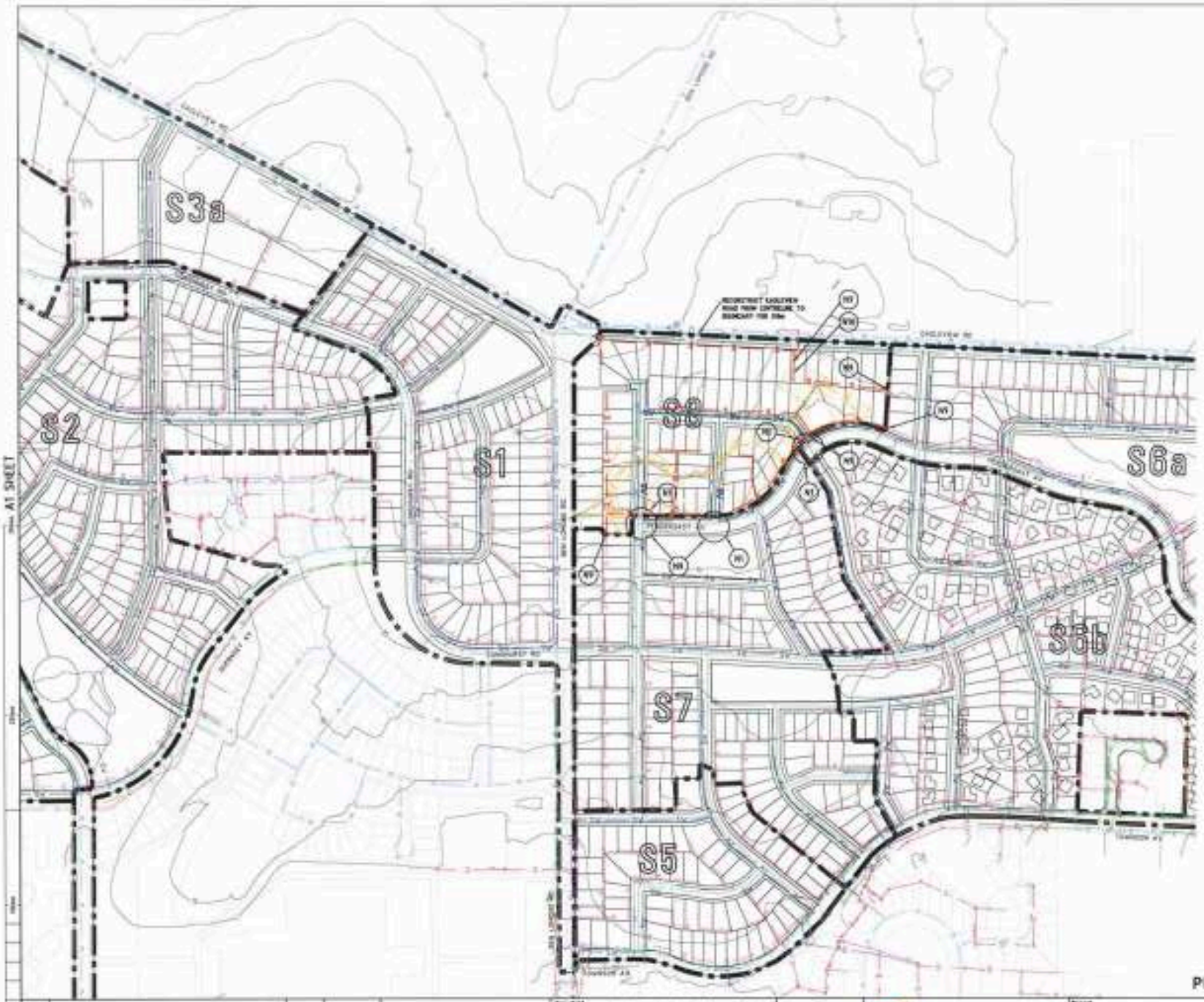
Drawing Title: MASTERPLAN STAGING PLAN STAGE 7

Client: LANDCOM

Architect: WOODS BAGOT

Drawing No. 05PSL1-M18

Revision D


S3a
S2
S1
S6
S6a
S6b
S7
S5
LEGEND
SERVICE
NOTES:
PRELIMINARY - NOT FOR CONSTRUCTION
LANDCOM
North
HughesTrueman
MINTO URBAN RENEWAL PROJECT
INFRASTRUCTURE MASTERPLANS
MASTERPLAN STAGING PLAN
STAGE 8
LANDCOM
MOSS SAGGI
1:1000
85P541-M19


CAMPBELLTOWN CITY COUNCIL
N.S.W. LAND & HOUSING CORPORATION
HOUSING COMMISSION OF N.S.W.
SYDNEY WATER
MINISTER ADMINISTERING THE E.P.& A. ACT, 1979
PRIVATE
A1 SHEET
North
LANDCOM
HughesTrueman
PRELIMINARY - NOT FOR CONSTRUCTION
MINTO URBAN RENEWAL PROJECT
INFRASTRUCTURE MASTERPLANS
MASTERPLAN OWNERSHIP PLAN
LANDCOM
WOODS BAGOT
OSPS41-M20

APPENDIX B – CONSTRAINTS AND OPPORTUNITIES MATRIX

CONSTRAINTS & OPPORTUNITIES MATRIX

Total Area –140 ha
Yield – 1,099 (915 New, 184 Existing Cottages)
LGA - Campbelltown

Stage	Issue / Reference	Comments
All	Existing Housing	Some dwellings are to be retained and will be occupied during the redevelopment requiring services (including temporary connections where necessary) and access to these retained dwellings at all times. Risk Item - Cost allowance made in lieu of development of detailed servicing methodology
All	Retention of Services	Due to changes in ground levels due to earthworks or road modifications, most existing services may not be able to be retained for re-use. For preliminary costing purposes, it has been assumed that most existing services (with the exception of some sewer in stages 4 and 6) will be replaced. More refinement can be expected as the design progresses.
All	Retention of Roads	Opportunities for retention of existing roads are limited to a few roads, however savings may be realised by the re-use of existing road materials in new roads
All	Provision of access and egress	All occupied properties must have access to and from homes during construction phase
All	Existing and potential Bushfire asset protection zones	Bushfire hazard along north eastern portion of site adjacent to Eagle View Rd. The Bushfire report indicates stage 3B will require 40m wide asset protection zones measured from the extremity of the future dwellings.
All	Endangered flora and fauna species and habitats	The site is highly disturbed and there is no record of it containing any endangered fauna or flora species
All	Archaeological and heritage constraints	Single heritage listed building in park- "Redfern Cottage". No known Aboriginal sites.
All	Geological constraints	The developments soils are clay soils with acidic properties which are prone to shrinkage/swelling. Presence of saline soils will need to be confirmed prior to the design of any surface water generating infrastructure
All	Uncontrolled Fill	Isolated pockets of uncontrolled fill may exist across the site. Areas with uncontrolled fill that may affect civil works or housing to be excavated and refilled in controlled manner
All	Soil Contamination	Soil contamination risk identified as being due to imported fill and herbicide use
All	Asbestos Contamination	The risk involved with contamination of the development area due to the demolition of the existing dwellings and their associated facilities is to be provided for by the Department of Housing and has therefore not been included in our costings.
All	Topography and grade constraints	The slopes grades of greater than 10% create difficult accessibility issues and cut to fill requirements
All	Earthworks	Upon the completion of the developments stages a net cut to fill surplus of 113,000m3 shall need to be dispose of off site. It has been assumed that part of this volume shall be available for replacement of any contamination material disposed of off site
All	Roads	Existing internal roads are generally in unfavourable alignment and section. Over 95% of internal roads to be demolished and new street layout constructed
All	Drainage	The existing local flooding that currently occurs on the site needs to be addressed and rectified by provision of overland flow paths as part of the revised urban development
All	Water Supply	Existing external water supply is adequate, however a significant portion shall need replacement due to the urban renewal
All	Sewer	Existing receiving sewer mains capacity should be assessed as part of the development staging
All	Electricity	External electricity supply to site is adequate, however internal reticulation is under capacity. Internal site reticulation to be replaced and new substations constructed. Existing underground conduits to be retained where possible
All	Telecommunications	No constraints due to telecommunication issues, however broadband or internet cabling requirements require assessment as part of individual development stages
All	Gas	Existing gas supply is adequate
All	Estate Major Works	Estate Major Works costs from previous estimates have been amended. All external road works have been included within The Major Works Estimates
All	RTA Blackspots	Possible Black Spot remediation by CCC at Ben Lomond and Townson has not been costed
All	RTA Contribution costs	The RTA major roads contribution costs. No allowance for the increase lot yield has been made for as the development is a renewal from an existing estate
All	SWC DSP/Major Works Fees	An allowance for only the increase lot yield has been made for SWC DSP/Major Works costs as it is an existing estate
All	Local and Statutory development contributions and fees	Reduced fees over greenfields development due to credit for existing use
All	Local Government development controls	To be negotiated with Campbelltown City Council.
All	GST	GST has been excluded from the estimates except where indicated otherwise

CONSTRAINTS & OPPORTUNITIES MATRIX

Total Area ~140 ha
Yield ~ 1,089 (915 New, 184 Existing Cottages)
LGA - Campbelltown

Stage	Issue / Reference	Comments
Stage Specific Issues		
Item	**Issue / Reference**	**Comments**
STAGE 1		
5.1.1	Earthwork and regrading	Excess spoil to be temporarily stockpiled in Stage 2 or future filling or directly fill Stage 2 low point
	Roadworks	Construct 220m half width of Eagle View Rd
	Roadworks	Upgrade Ben Lomond and Eagle View Rd Intersection
	Roadworks	Reconstruct 630m of Ben Lomond Rd incl median
	Roadworks	Intersection work at Ben Lomand and Longhurst Road
	Roadworks	Temporay traffic management at road dead ends to control access to future stages
	Estate Works	Construct temporary Sales office
	Sewer	Construct 50m sewer lead-in from existing sewer in stage 7. Modification of connection point to be undertaken in Stage 7.
	Sewer	Provide to sewer extension and capping of connection main into Stage 3
	Non Gravity services and road access	Main connection point via Ben Lomond Rd intersection with other minor connections to existing roads to be made
STAGE 2		
5.2.1	Earthwork and regrading	Fill the site using the stockpiled from stage 1 and remove surplus from site.
	Roadworks	Temporay traffic managemenmt at road dead ends to control access to future stages
	Roadworks	Intersection works with existing roads
	Estate Works	Retain existing occupied dwellings with live, uninterupted services during renewal works
	Sewer	Construct 75m and 150m sewer lead-in's from stage 4A
	Stormwater	Construction of detention facility within Redfern Park to control discharges through downstream properties
	Stormwater	Provide stormwater extensions/lead-ins into stage 4a and 4b as part of works
	Water Supply	Sydney Water 900mm watermain to be protected to Sydney Water requirements
	Water Supply	Provide to water main extension and capping of connection main into Stage 3a & 4a
	Non Gravity services and road access	Connection made at approximately 6 intersections with Stage 1 and existing roads
STAGE 3		
5.3a.1	Earthwork and regrading	Excess spoil to be removed from site
	Roadworks	Stage 3A - Construct 440m half width of Eagle View Rd
5.3b.1	Roadworks	Stage 3B - Construct 640m half width of Eagle View Rd
	Estate Works	Retain existing occupied dwellings with live, uninterupted services during renewal works
	Sewer	Stage 3B - Construct 50m sewer lead-in's from existing private property. Owners permission required to construct on private land sewer to these stages will need to be deep and flat to enable the ridge properties to drain.
	Stormwater	Construct stormwater line through existing road to service in Eagleview Road.
	Water Supply	Connect to exiting water service in Eagleview Road
	Non gravity services and road access	Stage 3A - connections made via Stage 1 and 2. Stage 3B via new intersection at Ashmead Road
STAGE 4		
4a.1 & 5.4b.1	Earthwork and regrading	excess spoil form Stage 4b to be temporarily stockpiled in Stage 7 or future filling or directly fill Stage 7 low points
	Roadworks	Maintain some existing road alignment and levels
	Estate Works	Retain existing occupied dwellings with live, uninterupted services during renewal works
	Sewer	Connection from Stage 4A to existing sewers in 4B. Majority of dwellings in Stage 4B are to be retained and will have new lots created. These dwellings are already sewered and will only require minor extensions to the existing sewer so that each lots is serviced in accordance with WSA requirements
	Stormwater	Construction of dual use oval and detention facility to control discharges through downstream propoerties and connect to downstream system in Guernsey Av.
		Water quality facilities to be provided in New Blenham Oval
	Non gravity services and road access	Stages 4A & 4B - connections made via Stage 2, Benham Road and Guernsey Rd.
STAGE 5		
5.5.1	Earthwork and regrading	Excess spoil to be carted to be carted off site, however it is anticipated that some of the excess spoil may be utilised to replace any contaminated material.
	Sewer	Sewer to drain under Townson Rd
	Major Works	Rose Park Embellishments
	Stormwater	Provision of Gross Pollutant Traps in downstream system adjacent to Rose Park.
	Non gravity services and road access	Connections made at Ben Lomond Rd, Townson Rd

CONSTRAINTS & OPPORTUNITIES MATRIX

Total Area ~140 ha
Yield ~ 1,069 (915 New, 184 Existing Cottages)
LGA - Campbelltown

Stage	Issue / Reference	Comments
		STAGE 6
6a 1 & 5.6b	Roadworks	Construct 460m half width of Eagle View Rd
	Roadworks	Construct new intersections on Eagle View Rd and Townson Rd
	Roadworks	Temporay traffic managemennt at road dead ends to control access to future stages
	Estate Works	Retain existing occupied dwellings with live, uninterupted services during renewal works
	Major Works	Kyngmount Reserve relocation and embellishment works
	Sewer	Connection from Stage 6 to existing sewers in Townson Rd
	Non gravity services and road access	Connections to be made Eagle View Rd and between new and old sections of Pendergast Rd. In the event that the existing Pendergast Rd alignment and profile are retained, Water, gas and conduits will be retained. Electricity and telcom services within conduits will be upgraded.
		STAGE 7
5.7.1	Earthwork and regrading	Fill the site using the stockpile from stage 4a, 6a, 6b Remove surplus from site
	Roadworks	Temporay traffic managemennt at road dead ends to control access to future stage 8
	Stormwater	Construct stormwater line to the existing line in Townson Road
	Sewer	Extend sewer to pick up Stage 1 connection
	Non gravity services and road access	Connections made at Ben Lomond Rd, Townson Rd and Stage 5
		STAGE 8
5.8.1	Earthwork and regrading	Excess spoil to be removed from site
	Roadworks	Construct half width of Eagle View Rd for Stage 8 frontage
	Roadworks	Construct of Ben Lomond Rd has been undertaken in Stage 1 for Marketing purposes
	Roadworks	Demolish existing intersection between Ben Lomond and Pendergast Rd
	Sewer	Sewer to drain through Stage 7 adjacent to Ben Lomond Rd. - connect to stage 7 extension
	Non gravity services and road access	Connections made at Ben Lomond Rd, Townson Rd and Stage 7. Some dwellings serviced off Eagle View Rd
	Occupied dwellings	No dwellings occupied in Stage 8 during construction