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For the attention of Lorraine Elliot

15 January 2014

Dear Madam

## Review of Engineering Servicing Report for LandCorp on Cockburn Central West

As requested, the original servicing report for the abovementioned development project has been perused, to see whether all information therein is still relevant to the design, in its current state.

The report, as prepared by Pritchard Francis, Revision 1 (April 2013) refers. We can confirm that the report remains largely relevant with the exception of some minor amendments, which we now submit as addenda to the report. They are as follows:

### **Section 2.1 “Geology”, paragraph 1**

Reads:

*There is an existing wetland on the site, however it is our understanding that the wetland is of low retention value.*

CHANGE:

There is an existing wetland on the eastern side of the site, which is to be retained, and is to be protected from an environmental standpoint. The intent is that this wetland area will be improved, and will be utilised as green open space area as well as a stormwater drainage facility.

### **Section 2.4 “Earthworks and Retaining Walls”, paragraph 1**

Reads:

*Importation of fill will be required to create a site suitable for development.*

CHANGE:

The design intent for the earthworks is that, as far as possible, the cut and fill operations within the site are to result in a net balance, in order to minimise the need for the importation of fill material. This is subject to undertaking a detailed geotechnical investigation and subsequent interpretation of the results.

Included with this review is a preliminary earthworks levels plan, C-SKE-0-0001, which reflects the current amendments to the structure plan.

#### **Section 4.1 “Stormwater Drainage”, paragraph 2**

REPLACE:

Post development residential, retail and commercial lots stormwater drainage can be managed via localised swales and soakwells where the ground condition permits, however these will be minimised as much as possible. Stormwater runoff from road reserves will be conveyed into designated areas, via pit and pipe systems. The existing wetland will be used as an open space as well as a stormwater drainage basin, employing Water Sensitive Urban Sensitive Design (WSUD) principles, with the intent that it will serve as a public amenity as well as performing an engineering function. The majority of the site’s stormwater shall be directed to this proposed low lying area. The intent will be that this area will be designed and retained such that major storm conditions are locally managed, while still ensuring that all relevant environmental considerations are observed. The size and management principles of this drainage basin will be determined and developed during detailed design stage.

#### **Section 4.2 “Sewer Reticulation”, paragraph 2**

ADD:

Due to the topography of the development, and the location of the current possible connection point, there may be a requirement for sewer pumping station within this site. This will be further researched and developed during the detailed design stage.

#### **Section 4.8 “Staging”**

REPLACE:

In order to minimise double handling and unnecessary excessive stockpiling, it is the intent the site will be staged such that topsoil stripping and bulk earthworks will only be undertaken as and when required. In order to attain this goal, the areas have been staged such that the required fill volume is generated, as much as possible, within the same stage, in order to avoid having large areas of stripped and disturbed soil exposed to wind transportation, and hence reducing the possibility of dust nuisance.

#### **Stage 1A – Civil Works for Oval and Community Facilities**

During Stage 1A, necessary earthworks will be carried out including stripping topsoil from these first stages of the site, and cut to fill necessary for the early stages of works such as the new football oval and the future recreation facilities areas. If required, the adjacent Western Power easement may be cut for use as fill.

This stage of works will include construction of a portion of Road 1 and Road 2, the associated drainage, extension of services to the site from existing infrastructure located North West of the site on North Lake Road, retaining walls and other works associated with development of the main oval and support precinct area. The immediately adjacent carparks within the Western Power easement may also be constructed. Further to this, some early drainage works and drainage management features may be constructed within the wetlands area, to be able to manage the initial drainage coming from the early stages.

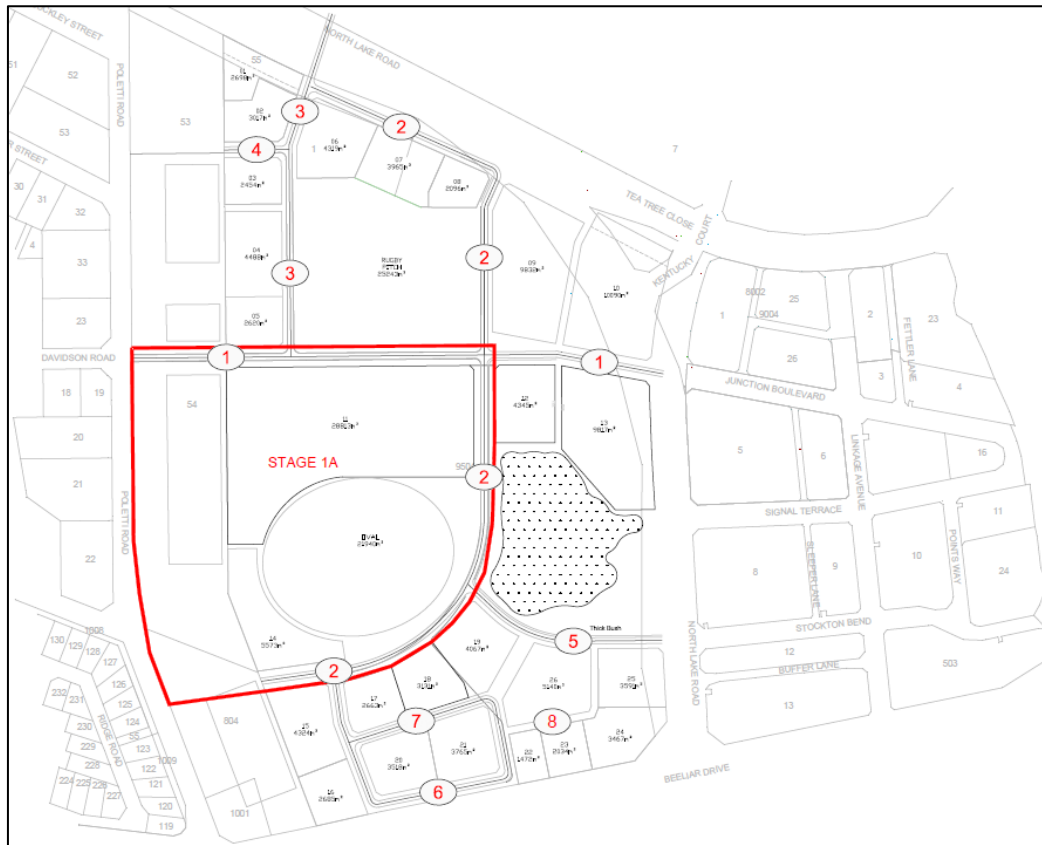


Figure 4.1: Stage 1A

### Stage 1B – Civil Works for North West precinct and playing fields

During Stage 1B, necessary earthworks will be undertaken including the filling operations required for the playing fields and the North Western lots. The adjacent parking areas within the Western Power easement may also be cut for use as fill and any excess fill may be stockpiled on the playing fields until the next stage begins.

This stage of works will also include civil works such as construction of Road 4, Road 3 and the balance of Road 2. It will also include stormwater drainage, sewer, water, power, gas, communication and infrastructure required to service the proposed areas and playing fields. Works will also include servicing for lots being released in this stage. There may also be a requirement to construct a sewer pump station at this stage of the development, at a low point, possibly adjacent to the wetland site, where sewer drainage is pumped to the Northwest corner of the site. This requirement will be determined during detailed design.

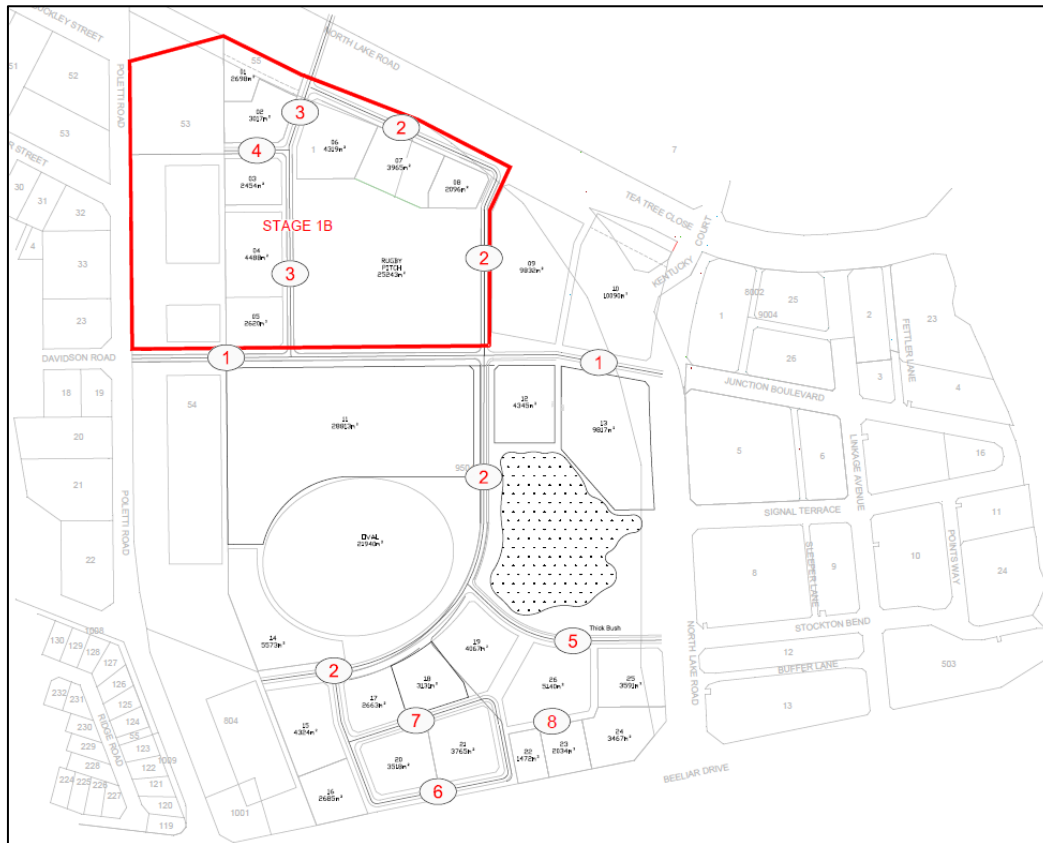


Figure 4.2: Stage 1B

## Stage 2 – Civil works for North East precinct

Completion of topsoil stripping and earthworks fill operations will be undertaken as required. Civil works including the construction of the balance of Road 1 as well as the intersection with Midgegooroo Avenue, the provision of water, sewer, stormwater drainage, retaining walls and authority services required to release these lots will be undertaken. The area within and immediately surrounding the wetland will be constructed and upgraded, including drainage management features, hard and soft landscaping, and any other requirements arising from environmental and local authority requirements, as per the Local Water Management Strategy.

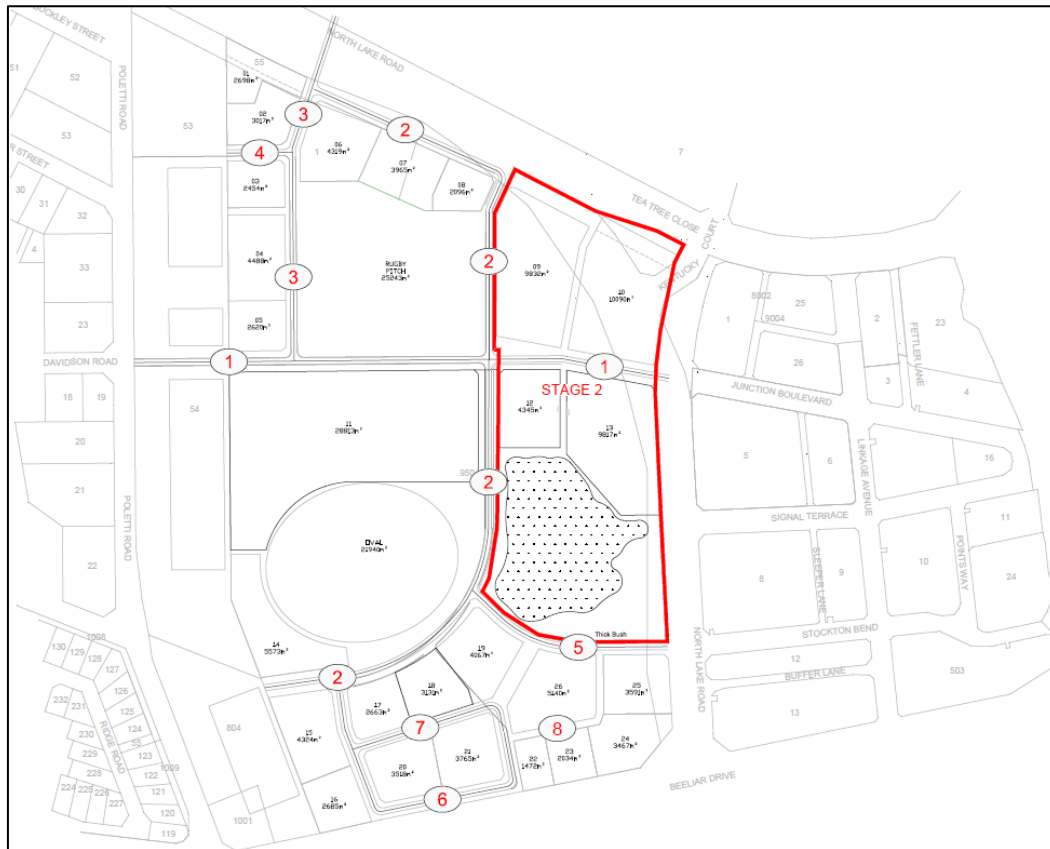


Figure 4.3: Stage 2

### Stages 3A – 3C – Development Release – Vision Completion

This area may be undertaken in one operation or in smaller staged sections dependent upon lot demand; however it will entail the completion of earthworks as required, with a cut to fill operation from west to east. Civil works including the provision of water, sewer, stormwater drainage, retaining walls and authority services required to release these stages will be undertaken. This will also include the construction of Roads 6 and 7, laneway 8 as well as Road 5 and its intersection with Midgegooroo Avenue. Further to this the balance of any parking not already constructed within the Western Power easement will be finalised at this stage.

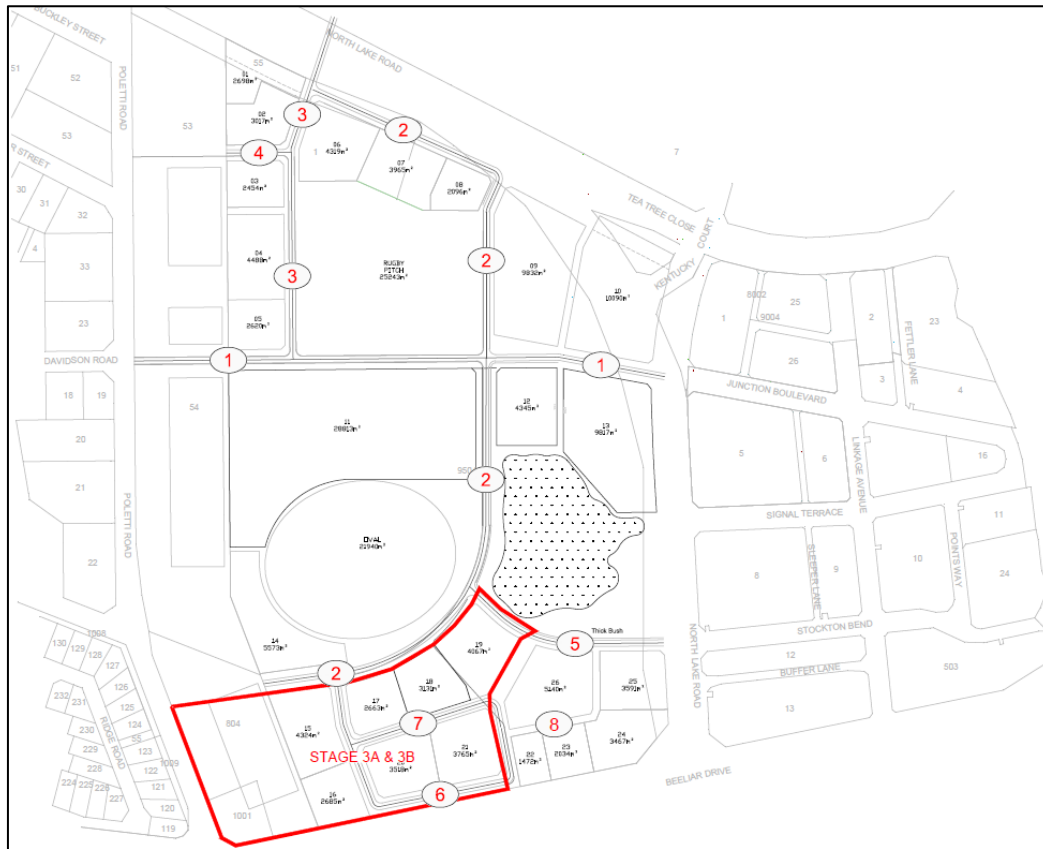


Figure 4.4: Stage 3A & 3B

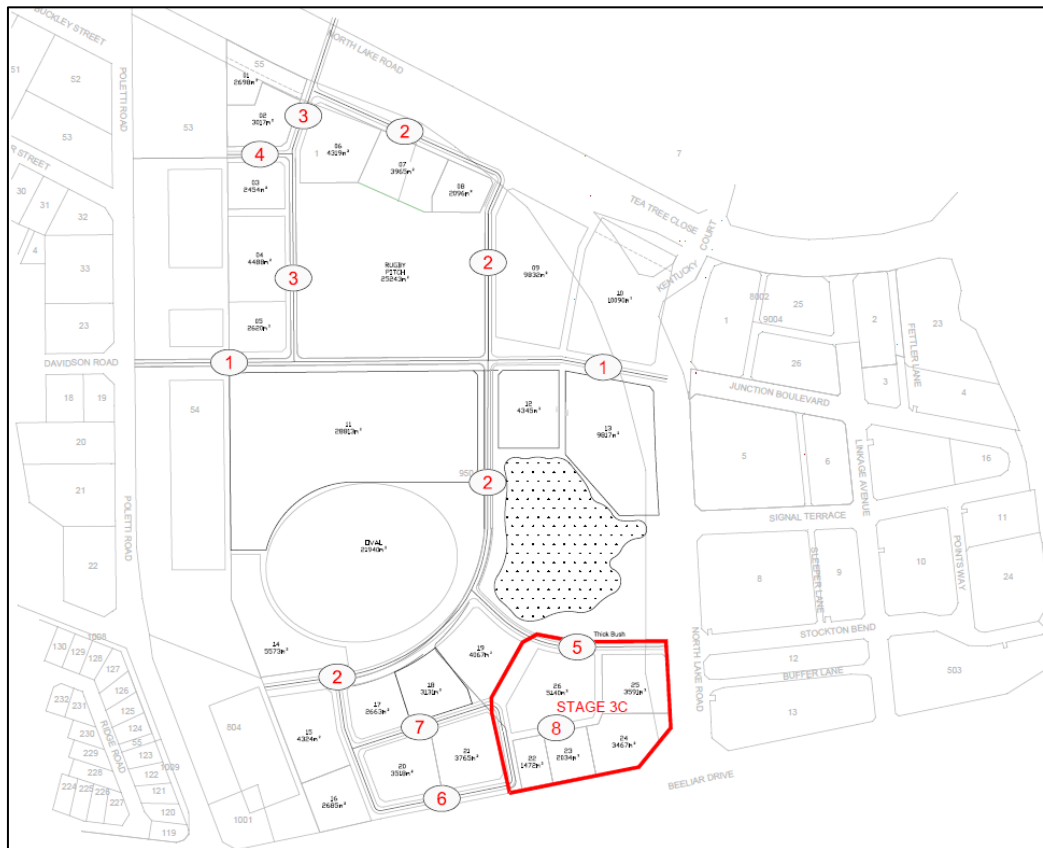


Figure 4.5: Stage 3C

Yours faithfully

A handwritten signature in black ink, appearing to read 'Lyndsay Hammond', written in a cursive style.

Lyndsay Hammond  
Senior Engineer

cc Matt Bradley  
LandCorp