

The New England North West Regional Cancer Centre at Tamworth Rural Referral Hospital



- PART 3A PROJECT APPLICATION
CIVIL ENGINEERING REPORT
- 11 November 2010



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1. Stormwater Drainage Assessment

1.1. Assessment Overview

The objective of this assessment is to identify the issues and requirements for stormwater management and flooding for the New England North West Regional Cancer Centre at Tamworth Rural Referral Hospital (NENW RCC at Tamworth Hospital). This is to address the Part 3A Director General Requirements as specified below:

Drainage

- The Environmental Assessment(EA) address issues associated with the proposal including stormwater and drainage infrastructure;
- Detailed plans of the proposed erosion and sediment control measures during demolition, construction and operation

Flooding

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

1.2. Aspects of Drainage Design

There are a number of aspects to be considered for the design of drainage systems. These include site drainage (pits, pipes and provision for overland flow), discharging water quality, on-site detention, serviceability requirements for vehicle and pedestrian in the design event and larger storms, water sensitive urban design, rainwater harvesting and erosion and sediment control. Council requirements on these aspects related to the proposed upgrade to Tamworth Hospital are given in the following sections of Tamworth Regional Council's design standards, plans and specification as listed below:

- Draft Tamworth Regional Development Control Plan 2010;
- Development Control Plan No. 18 – Interim Flood Plain Management Guidelines;
- Development Control Plan No. 19 – Subdivision Guidelines; and
- Engineering Guidelines for Subdivision and Developments.

SKM understand that the State Government will be the approving authority for the hospital development and that their requirement will be consistent with and made in consultation with Tamworth Regional Council.

1.3. Overview of Existing Catchment

The existing state of the site is predominately impervious consisting of roadways, buildings and other paved areas. Topographical surveys provided by Coffey Projects indicate that the upstream catchment starts from the north of the hospital and the hospital site drains from northwest to southeast. Runoff from the hospital predominately been collected by the road side

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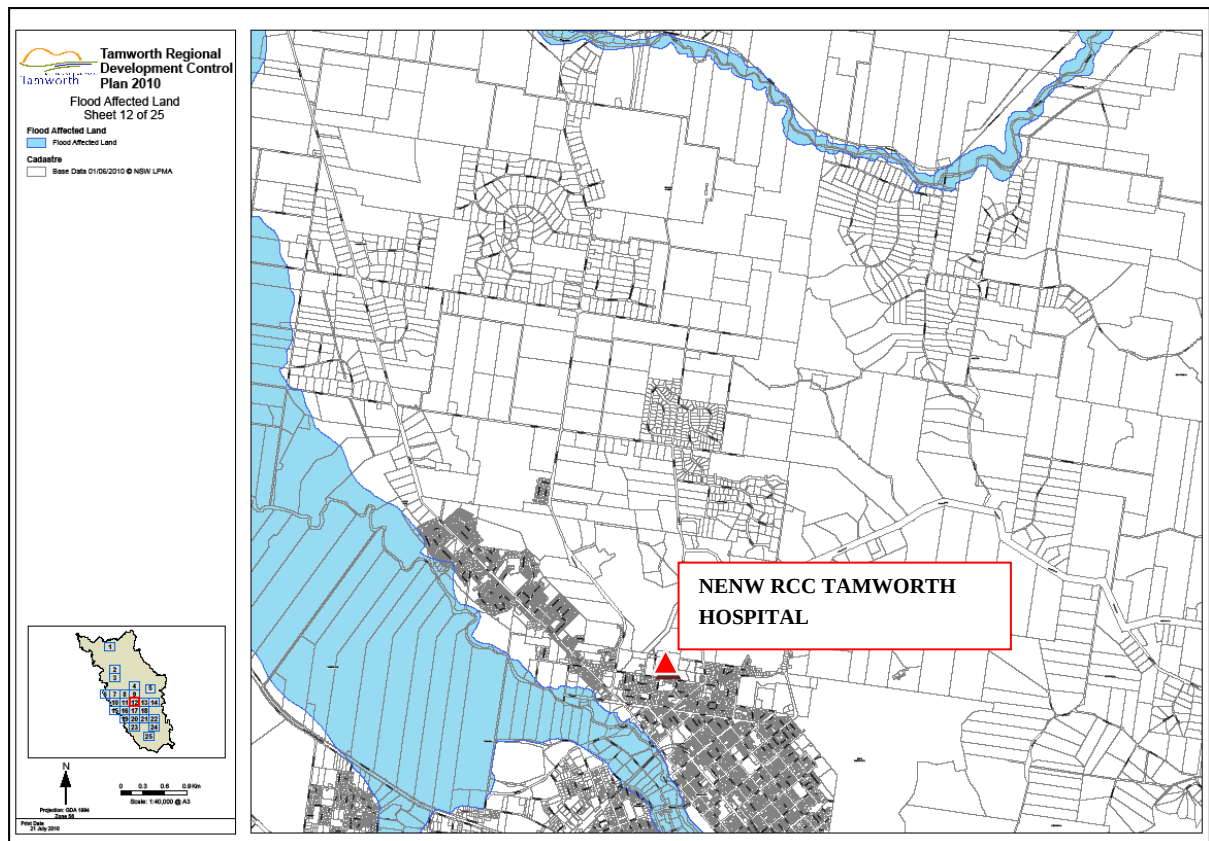
drainage pits and it is then piped and connected to existing Council's stormwater drainage system located at Johnston Street and Dean Street.

The existing site is mainly grass areas and consists of minor impervious area such as the tennis court and internal access roads. The tennis court and a section of the internal access roads will be demolished and cleared to make way for the proposed development.

1.4. Flooding

NENW RCC at Tamworth Hospital is located north east of Peel River approximately 600m from the river. Based on recent adopted Council's *Tamworth Regional Development Control Plan (DCP) 2010* and the DCP has identified the flood proofing guidelines and flood maps showing areas/lands that are potential to be affected by flood. Based on the flood maps shown in Figure 1, NENW RCC at Tamworth Hospital has not been identified as flood affected lands.

Figure 1 Flood Map¹



¹ Tamworth Regional Council, 2010, Tamworth Regional Development Control Plan
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1.5. On Site Detention

Council have undertaken a hydrological assessment to identify the requirement of the stormwater drainage associated with the proposed development and email response received on the 1st November 2010 from Warren Faulkner (Tamworth Regional Council) has advised that OSD will not be required as long as the following requirements can be met:

- The increase in impervious area is less than 4400 m²;
- The impervious area of the proposed development is directly plumbed to an internal stormwater line, allowing for surcharge for events in excess of ARI 10 year to a suitable overland flow path;
- The internal stormwater lines have sufficient capacity or are upgraded; and
- The overland flow path is provided for the ARI 100 year event.

A preliminary catchment analysis has been undertaken to determine the total increase of impervious area from the proposed development. This analysis has identified that the total increase of impervious area is less than the 4400m². Other Council's requirements have been addressed in Section 1.5 of this report and concept stormwater drainage plan. Based on the assessment, it is envisaged that the OSD will not be required for the proposed development.

1.6. Stormwater Drainage Infrastructure

The existing hospital is currently serviced by several stormwater drainage systems located around the buildings and car park. The survey plan shows there are two existing hospital stormwater drainage systems located within the project site and below are the brief description of the systems:

- A drainage systems located along the length of the existing access road. There are several kerb inlet pits located along the road to collect runoff from the existing car park and the access road. The drainage system consists of pipes with sizes ranging from DN375 to DN450 and the system is connected into the Council stormwater drainage system at Johnston Street.
- A drainage system located along the existing hospital entrance car park and the runs in front of the existing pool. The existing system is then crosses the tennis court diagonally and connects into the Council system at Johnston Street. This system consists of pipes with sizes ranging from DN375 to DN600 Reinforced Concrete Pipe (RCP).

The proposed development will impact the existing hospital stormwater drainage system and new system will be provided to capture the stormwater runoff from the proposed buildings, roadways and car park. The new drainage system is then connected to the nearest Council's stormwater drainage pit. A concept stormwater drainage plan has been prepared to document the stormwater infrastructure requirements for the proposed development and is shown in Figure 2.

The proposed drainage system will use existing pits and pipes where possible and redundant stormwater infrastructure will be removed where required. Stormwater runoff for minor events will be captured by drainage pit with larger flows conveyed through the site as overland flow along roadways as currently exists

1.7. Water Sensitive Urban Design (WSUD)

Council's Guidelines specify that treatment of the first flush from developed areas is required. As such, stormwater from roof and hard surface areas must be treated to remove nutrients, gross pollutant, suspended solids, hydrocarbons and other pollutants (such as metals) prior to leaving the site.

This requirement will be addressed by implementing the installation of suitable water quality devices such as rainwater tanks and Gross Pollutant Trap (GPT) to treat the early flows at stormwater outlet points with larger flows allowed bypassing the treatment devices. Rainwater tank will be provided to capture the flow from the roof gutter and downpipes and stored for reuse. Overflow from the rainwater tank will be discharging into the nearest stormwater drainage pit. A GPT will be provided at the end of the hospital stormwater drainage system prior to connecting into Council's system. The locations of these devices are shown in the concept stormwater drainage plan in Figure 2.

1.8. Erosion and Sediment Control

Erosion and sediment measures will be implemented throughout the construction period. Controls will be implemented to prevent any hazardous materials kept onsite from entering the stormwater drainage systems. A concept erosion and sediment control plan is shown in Figure 3.



- LEGEND**
- PROPOSED STORMWATER DRAINAGE PIPE
 - MAJOR STORM EVENT OVERLAND FLOW PATH
 - PROPOSED STORMWATER DRAINAGE PIT
 - EXISTING PIPE TO BE REMOVED

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REV	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
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PROJECT NENW RCC TAMWORTH HOSPITAL			
DRAFTER L.B.	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
DESIGNED P.D.	DESIGN REVIEW B.S.		

TITLE
**NENW RCC AT TAMWORTH HOSPITAL
CONCEPT STORMWATER DRAINAGE PLAN**

SCALE
DRAWING No
C-002

REV
A

2. Bulk Earthworks

2.1. Assessment Overview

The objective of this assessment is to identify the requirements of the bulk earthworks for the proposed development of The New England North West Regional Cancer Centre at Tamworth Rural Referral Hospital (NENW RCC at Tamworth Hospital).. At this stage this has been undertaken primarily as a desktop study, current available survey information and the layout of the existing and proposed hospital plans.

2.2. Overview of Existing Ground Levels

This overview is based on detail survey plan prepared Bath Stewart Associates in October 2010. The existing site is generally falls from northwest to southeast and towards the existing access road. The existing tennis court is located adjacent to the existing car park and the northern side of the tennis court consists of an approximately one (1) metre cut embankment.

The existing access road consists of two (2) ways cross fall and grade from north to south towards Johnston Street. The existing ground condition for the development site and the existing Pathology building slope towards the access road.

2.3. Excavation and Filing Works

The proposed finish floor level for the lower level is at RL 403.890 with 250 mm floor slab. The car park consists of 2 level and the upper level car park level is at RL 403.75 and the lower level is at RL 402.10 and sloping towards the existing access road. In order to achieve the require levels, it will require cut and fill works and the extent of the works is shown in the concept excavation and filing plan (Figure 4). The existing access road to be retained and the proposed car park entry will tie into the existing road level. Based on preliminary geotechnical investigation report prepared by Coffey Geotechnics dated 1st December 2009 have identified that all natural soils excavated on site with the exception of the topsoil would be suitable for use as fill in an engineered site regrade.

Recent geotechnical investigation by Regional Geotechnical Solutions (RGS), on 25 October 2010 has identified the presence of ash in the vicinity of the site and awaiting chemical analysis results to confirm the soil classification.

A preliminary bulk earthwork analysis has been undertaken to identify the cut and fill volume for the proposed development. The analysis has calculated approximately 710 m³ of excess cut remain after the completion of all site regrading and the excess may be required to be removed off site. The cut and fill volume is based on existing surface ground level including topsoil and considering the presence of ash is classified as contaminated soil and unable to re-used as engineered fill.

3. Reference

Tamworth Regional Council, 2002, Development Control Plan No. 18 – Interim Floodplain Management Policy;

Tamworth Regional Council, 2002, Development Control Plan No. 19 – Subdivision guidelines;

Tamworth Regional Council, 2010, Draft Tamworth Regional Development Control Plan;

Coffey Geotechnics, 2009, Tamworth Hospital Stage 2 and 3 – Preliminary Geotechnical Investigation; and

Regional Geotechnical Solution, 2010, Proposed Cancer Centre, Tamworth Hospital Review of Geotechnical Investigation.