



# **ROYAL REHABILITATION CENTRE SYDNEY MORRISON ROAD, RYDE, NSW**

## **Civil Engineering Concept Design Report**

### **Prepared for:**

#### **Peloton Group Pty Ltd**

Suite 11, 204 Kings Lane  
East Sydney, NSW 2010  
Tel: (02) 9351 5288 Fax: (02) 9351 5388

### **Prepared by:**

#### **Meinhardt Infrastructure & Environment Pty Ltd**

A.C.N. 100 868 979  
Level 2, 400 Kent Street, Sydney 2000  
Tel: (02) 9669 3088 Fax: (02) 9319 7508

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## **1.0 INTRODUCTION**

### **1.1 General**

Meinhardt Infrastructure and Environment (Meinhardt Pty Ltd) have been engaged by Peloton Group Pty Ltd to undertake the design and documentation of the civil engineering works for the proposed redevelopment at the Ryde Rehabilitation Centre, Morrison Road, Ryde, NSW.

### **1.2 The Site**

Royal Rehabilitation Centre Sydney currently occupies a 17 ha site bounded by Morrison Road, Princes Street, Victoria Road and generally Charles Street Ryde.

The site is generally undulating terrain however generally falls to the middle of the site near Linley Way, where the land then falls south towards the lowest point of the site near Charles Street and Henry Street. The highest parts of the site are generally located near Victoria Road and also near the intersection of Princes Street and Morrison Road.

### **1.3 Proposed development**

Royal Rehabilitation Centre Sydney (RRCS) is proposing to develop a new medical and rehabilitation centre on part of the existing site near Morrison Road. This rehabilitation Centre development is part of the proposed redevelopment of Ryde Rehabilitation Centre lands, with the remainder of the site being subject to future development.

The rehabilitation development will include a mixed-use development, which will comprise the following:

- Roads, car parks, footpaths, , landscaped open spaces;
- Spinal and neurological rehabilitation hospital buildings;
- Professional suite offices;
- Administration building;
- Research facility;
- Sporting courts and a community centre; and
- Local convenience retail space.
- Central parkland and stormwater detention basin.

### **1.4 Proposed Design**

Meinhardt have completed preliminary design of the roads, earthworks, footpaths and stormwater system within the roadways to enable spatial planning of the site. Further detail design of these elements will be required in the future to finalise road geometry and levels; earthworks; cut and fill volumes as well as stormwater pipe and pit sizes and levels.

## **2.0 PROPOSED DESIGN**

### **2.1 Erosion & Sediment Control**

The erosion and sediment controls for the development have been designed and documented by Harris Page Pty Ltd.

## 2.2 Roads

### 2.2.1 General

All roads within the RRCS development have been designed in accordance with AUSTRROADS guidelines for a speed limit of 50 km/hr. In general the roads have been designed to comprise:

Minimum road reserve width	=	15m
Minimum trafficable lane width	=	3.5m
Minimum parking lane width	=	2.5m
Minimum verge width	=	3.5m
Minimum footpath width	=	1.5m
Minimum cycleway width	=	2.5m
Minimum grade of roads	=	1.0 %
Maximum grade of roads	=	12%
Minimum kerb radii	=	6m

In accordance with the approved concept plans for RRCS, site entry / access will be provided at three roundabouts namely:

- At the intersection of Morrison Road and Douglas Street;
- At the intersection of Morris road and Payton Street;
- At the intersection of Charles Street, south of Henry Street.

These roundabouts will comprise a single circulating lane with a central mountable domed island and will provide suitable deflection of vehicles to control speed however will be mountable to allow large vehicles to turn. The roundabouts have been designed to allow vehicles up to a 12.5m single rigid truck to turn without restriction.

Intersections within the development have been designed to enable a 9m single rigid truck to turn within trafficable lanes and have been designed such that 12.5m long rigid trucks will need to use additional lanes for turning however can be accommodated within the kerbs proposed.

Due to the RRCS facility providing care and rehabilitation for injured patients, road 3 and the main entry to the facility has been designed such that grades are maintained in accordance with AS1428. As such, road 3 and the area located between the on grade carpark and the entry courtyard have been graded at 2.5% (and 5%. max). These have dictated the levels of the road and have been coordinated to ensure vehicular access can be provided for the basement carpark and loading docks as shown on the architectural drawings.

## 2.3 Earthworks

The site generally grades towards the centre of the site, near Linley Way and the proposed park and pond.

Due to the topography of the site and its proposed land uses (i.e. rehabilitation and the lifestyle objectives) the proposed development is to be constructed with a central open space/ pond and community facilities, with roads radiating out from the central park and recreational circle.

Bulk earthworks will be undertaken to:

- Remove and reconsolidate uncontrolled fill on site.
- Balance, cut and fill volumes to ensure minimal import and export of material, if possible.
- Remove the need for retaining walls at the sites boundary.

- ❑ Regrade the site to ensure all stormwater over land flows are directed to the detention basin and wetlands, and preserve existing overland flow paths in their current location.
- ❑ Regrade the site to provide effective grades for vehicular, pedestrian movements and disabled access.
- ❑ Provide embankments/batters at maximum slope of 1V in 4H for roadways.
- ❑ Regrade the site to provide benched areas for building construction.

It should be noted however that due to the topography of the site, roads have generally been graded to a maximum of 12% and a minimum grade of 1% with appropriate vertical and horizontal curvature for transitioning of grades and to ensure appropriate sight distances are provided to drivers for safety. As a result of this site topography and the need to meet certain road vertical geometry, these design criteria have dictated where cut and fill will be required. Early analysis of the cut and fill of the site indicates that it will be necessary to export fill from the site and this is compounded by the need to excavate for basement carparks.

A bulk earthworks model will be provided with the Construction Certificate documentation, indicating the final cut and fill volumes, and final design levels for the entire RRCS development site.

## 2.4 Stormwater

All stormwater drainage infrastructures will be designed in accordance with AS3500.3, City of Ryde Council's specifications, Concrete Pipe Association of Australia guidelines and the Australian Rainfall and Runoff publication.

The stormwater system for Royal Rehabilitation Centre will consist of a piped drainage system through the development with overland flow paths provided over roads, paths and open space areas. The stormwater drainage system will then drain to GPT's prior to being discharged into the proposed detention basin located the centre of the site.

A portion of the site, namely areas southwest of Roads 3 and 2, and south of Roads 4, will drain through the proposed wetlands at the southern part of the site prior to connection in to the main drainage system.

The analysis of the on-site detention requirements for the development was undertaken and reported by Cardno in 2007, and revised in 2008.

The site stormwater system for RRCS is based on the concept of a Minor/Major system as described below: -

- ❑ Minor System: Flow accumulated from roof water, pavements and roads directed into pipes. Pipe network flow to have a capacity for the 10-year ARI.
- ❑ Major System: Overland flow paths to be provided for the 100-year ARI.

The location of the major overland flow routes will be incorporated into the road reserves, which traverses through the development.

It is proposed that Gross Pollutant Traps (GPT) will be installed to provide filtering of flows before they enter the detention basin and wetlands. These GPT's will be designed to remove litter, sediment and pollutants for the 3 month ARI event and have sufficient storage for 3 months.

In general stormwater drainage design concepts are as follows: -

- ❑ The size, depth and characteristics of ponding in the proposed basin and wetlands will be incorporated into the development as designed by Cardno.

- ❑ Overland flow paths have been provided through the site to safely convey overflows to the proposed detention basin and wetlands.
- ❑ Harris Page will document the hospital and associated building's hydraulics and stormwater drainage.
- ❑ UPVC or FRC (sewer grade) will be used for pipes diameters between 100 mm and 300 mm.
- ❑ RCP will be used for pipes greater then 375mm diameter and will be provided in all roads under trafficable areas.