

Liverpool Hospital Redevelopment
Stage 2.1



Project Application and
Environmental Assessment

Appendix F

Civil Engineering Design Report

Prepared By SCP Consulting Pty Ltd

For Department of Planning

On behalf of NSW Health

July 2008



LIVERPOOL HOSPITAL REDEVELOPMENT

BOVIS LEND LEASE JOB NO: 115851

CIVIL ENGINEERING DESIGN BRIEF

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ISSUE: B

REVISION	DATE	ORIGINATOR	CHECKED	APPROVED	REMARKS
A	29 May 2008	AM	ES	PT	For Review
B	26 June 2008	AM	ES	PT	For Review

1. DESIGN STANDARDS AND CODES

The civil engineering works shall be designed in accordance with the latest issue of all relevant design standards, codes and other statutory and authority requirements. As a minimum requirement, the design will be based on but not limited to:

- Liverpool City Council's Guidelines for Engineering Works for Subdivisions and Developments – Part 1 (Design)
- Liverpool City Council's Guidelines for Engineering Works for Subdivisions and Developments – Part 2 (Construction)
- Managing Urban Stormwater: Soils and Construction Manual
- Australian Rainfall & Runoff
- Australian Water Quality Runoff
- AS 3500.3 Stormwater Drainage
- AS 2890.1 Off Street Car Parking
- AS 2890.2 Commercial Parking Facilities
- AS 1742 Manual of Uniform Traffic Control Devices
- New South Wales Roads & Traffic Authority (RTA) Traffic Control at Worksites manual
- Austroads – Pavement Design, A Guide to the Structural Design of Road Pavements
- Austroads – Pavement Design for Light Traffic: Supplement to Austroads Pavement Design Guide

2. SEDIMENT AND EROSION CONTROL

Temporary sediment and erosion control measures will be designed to be incorporated into the construction works and sequencing of the project to ensure that the proposed construction activities on site do not pollute local drainage systems nor have a detrimental effect on downstream waterways.

3. BULK EARTHWORKS AND RETAINING WALLS

Bulk earthworks will be designed to achieve as close to a balanced cut to fill as practical given the final building and road levels.

Retaining walls and batter slopes (permanent and temporary) will be designed based on the recommendations contained with the project's geotechnical report.

4. STORMWATER DRAINAGE

Stormwater drainage for the site will be designed to collect and convey stormwater drainage via a conventional piped stormwater drainage system for storm events up to and including a 1 in 20 year Average Recurrence Interval (ARI) storm event.

Provision will be made for the safe conveyance of storms via overland flowpaths for storm events up to the 1 in 100 year ARI storm event.

Adequate freeboard will be provided within the overland flowpaths to allow some protection from overland flows generated from storm events larger than a 1 in 100 year ARI event.

Stormwater pollution control devices will be incorporated into the site stormwater drainage system to assist with the removal of sediment, oils and hydrocarbons from stormwater runoff from the road and carpark areas.

All building and roof stormwater drainage design and documentation is the responsibility of the hydraulic consultant for the project.

5. FLOODING

From SKM's report "Liverpool Hospital Redevelopment Stage 2 – Stormwater & Flooding Assessment Report (5 November 2007)", we understand that the following flood levels have been determined for the Liverpool Hospital Site:

- Probable Maximum Flood (PMF) = RL 10.9 (AHD)
- 1 in 100 year Average Recurrence Interval Flood (1% AEP Flood) = RL 8.8 (AHD)

An Application for a Section 149 Flood Certificate has been applied for with Liverpool Council to verify that the above flood levels are appropriate and consistent with Council's flood information for the hospital site.

Finished floor levels for all proposed buildings will be reviewed to confirm that they are sufficiently higher (i.e. adequate freeboard) than either the PMF or 1% AEP Flood as appropriate as per the recommendations made in SKM's report "Liverpool Hospital Redevelopment Stage 2 – Stormwater & Flooding Assessment Report (5 November 2007)"

All openings to basement and undercroft areas will be reviewed and the external civil works will be designed to sufficient reduced levels, providing bunding, to ensure that these areas are protected from inundation during flood events.

The civil engineering design will consider the effects of the proposed development on existing flood regimes within the catchment. A review of the available flood studies, flood plain risk management plans and other literature will be conducted during the

design and if considered appropriate, compensatory measures will be recommended and provided for within the design to minimise (i) loss of flood storage and (ii) changes to flood levels and velocities within the catchment.

6. ROADS AND CARPARKS

Design and document the new external roads (within the hospital site) adopting the approved masterplan arrangement but revised so that the road geometry generally complies with Liverpool Council's standard and roundabout geometry to generally comply with Austroads standards.

Roads and carpark areas will be designed to comply with the requirements of Council, AS2890.1 Off Street Parking Facilities and AS2890.2 Commercial Parking Facilities.

Swept turning paths of suitable design vehicles will be reviewed and considered in the design.

Design and document traffic control staging plans in accordance with the RTA's Traffic Control at Worksites manual, as part of the civil works design. This will allow staging of the construction works while maintaining vehicular access to hospital facilities during construction of the civil works.

SCP/C&M will require BLL to confirm preferred staging/sequencing of works so that suitable control plans can be developed/prepared.

7. PEDESTRIAN WALKWAYS / FOOTWAYS AND GENERAL SITE GRADING

Design and document the proposed pedestrian walkways and footways within the hospital site. Locations and treatments shall be provided by the architect and landscape architect.

Design and document the grading of site areas between the buildings and roads to ensure that the areas are adequately drained.

Design and document pedestrian control staging plans in accordance with the RTA's Traffic Control at Worksites manual, as part of the civil works design. This will allow staging of the construction works while maintaining pedestrian access to hospital facilities during construction of the civil works.

SCP/C&M will require BLL to confirm preferred staging/sequencing of works so that suitable control plans can be developed/prepared.

8. PAVEMENTS

Flexible (Asphaltic Concrete) pavements are proposed for the road and carpark areas.

Rigid (Concrete) pavements will be considered for areas with regular heavy vehicle activity and turning movements.

All pavements shall be designed in accordance with Austroads – Pavement Design, A Guide to the Structural Design of Road Pavements including the supplementary guide; as appropriate, and in conjunction with the recommendations contained within the project's geotechnical report.

Pavements will be designed for the following loadings and design life:

	Equivalent Standard Axles (ESA's)	Design Life (Years)
Road – Light Traffic (Flexible Pavement)	5×10^5	20
Road – Heavy Traffic (Rigid Pavement)	2×10^6	20
Carpark (Flexible Pavement)	1×10^5	20

9. TRAFFIC CONSIDERATIONS

Loading Dock – New CSB

Turning paths to be checked for the following vehicles types to AS 2890.2:

	Heavy Rigid Vehicle (HRV)	Medium Rigid Vehicle (MRV)	Garbage Truck (Rear Loading)
Overall Length	12.5m	8.8m	12.5m
Design Width	2.5m	2.5m	2.5m
Wheel Base	6.6m	5.0m	6.6m
Turning Radius	12.5m	10.0m	12.5m
Swept Circle	27.8m	21.6m	27.8m
Clearance Height	4.5m	4.5m	4.5m

Review and provide advice to the architect on ramp gradients and transitions to the loading dock.

Basement Car Park & Entry

Turning paths to be checked for the following vehicles types to AS2890.1 and AS2890.2:

	Ambulance Mercedes-Benz 316 Sprinter	Ambulance Ford Transit – Long Wheel Base, High Roof	Fleet Vehicle B99 Vehicle to AS2890.1
Overall Length	5.640m	5.680m	5.20m
Design Width	1.933m	1.974m	1.94m
Wheel Base	3.350m	3.750m	3.05m
Turning Radius	6.400m	6.650m	6.3m
Swept Circle	12.80m	13.30m	12.6m
Clearance Height	3.60m	3.60m	-

Confirm that the design and dimensions for the carpark isles, spaces and arrangement are in accordance with AS2890.1 and AS2890.2.

Review and confirm the traffic circulation within the basement carpark area and entry to the basement carpark.

Advise on the minimum dimensions to the architect so that sufficient space can be allowed for within the geometry of the carpark entry/exit area for carpark access and ticketing system.

Loading Area – New Central Energy Building

Turning paths to be checked for the following vehicles types to AS 2890.2:

	Heavy Rigid Vehicle (HRV)	Medium Rigid Vehicle (MRV)
Overall Length	12.5m	8.8m
Design Width	2.5m	2.5m
Wheel Base	6.6m	5.0m
Turning Radius	12.5m	10.0m
Swept Circle	27.8m	21.6m
Clearance Height	4.5m	4.5m

APPENDIX A

TURNING PATHS FOR DESIGN VEHICLES