Long Bay Correctional Complex

Stormwater Drainage

Statement & Brief

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LONG BAY CORRECTIONAL COMPLEX
LONG BAY FORENSIC AND PRISON HOSPITALS
STORM WATER DRAINAGE STATEMENT AND BRIEF

SCOPE

Storm water drainage design shall comply with referenced documents, agreements between Multiplex and the Department of Justice.

Meinhardt will (a) undertake the conceptual design, detail design and the documentation of the main site drainage, diversion drains and on site detention (OSD) and (b) undertake periodic site inspections during construction, for compliance with design intent.

REFERENCED DOCUMENTS

The following documents apply to storm water drainage design:

1 Storm Water Management Concept Plan, as part of the Long Bay Correctional Complex Master Plan dated August 2004.
2 Randwick City Council conditions to the Master Plan.
3 Australian Rainfall and Runoff, 1987.
4 Project Deed, Schedule 4, Draft Technical Requirements and Draft Design Brief.

FORENSIC HOSPITAL

Site Extent

Included in this site are the Forensic Hospital (FH) itself, the adjacent Justice Health Operations (JHO) building, the Pharmacy/Store (PS) building and the small extension to the existing car park.

Detention

The diversion of existing drainage external to the perimeter wall and the new building areas will not be subject to on site detention (OSD). The existing catchment boundaries within the Long Bay Correctional Complex at the Forensic Hospital site are not altered. An existing site discharge point on Anzac Parade is maintained for the new works associated with the Forensic Hospital. The works are consistent with the principles and intent of the Stormwater Management Concept Plan of the Long Bay Correctional Complex Master Plan, insofar as they apply to this project only.

On site stormwater detention is to be provided for all new built items. The stormwater discharge for the JHO and PS will be directed to the existing site drainage and site discharge point, without on site detention applied, however, the volume of the OSD required for the Forensic Hospital alone is to be increased to compensate for the omission of OSD to the JHO and PS buildings. OSD is to be applied to the car park extension prior to its connection to existing drainage. The standard of OSD will be in accordance with the requirements of the Randwick City Council (RCC) and the stormwater management plan for the LBCC.

Detention Basin and Site Grading
The OSD is to be located under the ACU 1+2 building. Roof and site drainage is to be directed to this building and to the below floor storage. A portion of the OSD will be set aside for the retention of water and its reuse as an irrigation source. The outlet from the storage is to be controlled to the permissible site discharge (PSD) required for the above combination of building discharges. The site drainage and PSD storage will cater for 100-year average recurrence interval (ARI) events. Overflow pits and pipes at the perimeter wall will make provision for larger and more rare events. The capacity of these overflows is nominal only.

Site grading and building floor levels will be set to direct the rainfall runoff, up to the 100 year average recurrence interval, to the south east corner of ACU 1+2 and then into the basin under the building. There will be a major grated surface inlet pit at this location.

The grading of the Forensic Hospital site will, around the circulation road, fall away from the buildings, across the circulation road and into a central depression (swale) within the sterile zone. Gradients across the swale will be a maximum of 1V:10H. The swale will be graded longitudinally to low points, generally located at the spaces between buildings, where grated drainage pits will collect the runoff.

Pipe work within the secure perimeter walls shall be no larger than 375 mm diameter.

Site Discharge
The controlled discharge PSD is to be passed under the perimeter wall at the north-west corner of the FH site where it will connect to new drainage associated with diversion works. These then pass to the site discharge point in the vicinity of the Pharmacy/Store building.

Pipe work passing beneath the secure perimeter wall shall be no larger than 225 mm diameter. Multiple pipes are permitted

Diversion of Existing Drains
The new building works are located over existing drains. These are to be diverted around the new works. OSD will not be applied to the diverted drainage or to catchments outside the Forensic Hospital, JHO, PS and car park extension.

GPT
Gross pollutant traps are proposed to the drainage associated with the new building works, only.

Staged Works
The Forensic Hospital works are to be staged. All new buildings within both Forensic Hospital and the Prison Hospital perimeter walls are to be complete before the existing Long Bay Hospital is decommissioned, demolished and a landscape area created in its place. Stormwater drainage from the existing hospital will require short term temporary connections.

Extreme Storm Water Events
Runoff for events larger and more rare than the 100-year case will be managed by a combination of site storage and discharge using the OSD system plus site ponding. Ponding will occur at the site low points, principally at the south-east corner of ACU 1+2, the open area between ACU 3+4 and Recreation and at the swale in the sterile zone between ACU's 1+2

and 3+4. At the latter location there will be a large grated overflow pit with multiple 225 mm diameter pipes connected to a grated pit on the outside of the perimeter wall, through which the excess runoff will be directed beyond the perimeter wall, bypassing the OSD. This overflow will only activate for events larger than the 100-year event. The floor level of ACU 1+2 is approximately 500-600 mm above the top of the overflow pit located at the edge of the perimeter wall. This provides a significant freeboard to extreme stormwater events. All other floor levels are higher than that of ACU 1+2.

GPT
Gross pollutant traps are proposed to the drainage associated with the new building works, only.

Absorption and infiltration
Absorption and infiltration of storm water is not part of the drainage proposal. The criteria of the RCC and the geotechnical investigation indicate that these arrangements are unlikely to be feasible.

PRISON HOSPITAL

Site Extent
This site shares a common wall with the existing Metropolitan Medical Transit Centre (MMTC) on its north side.

Catchments
There is a small catchment from within the MMTC that currently discharges into the PH site in the vicinity of the Sally Port and the Visitor, Service and Administration building, using two drainage lines. This project will accept this discharge into the PH site and convey it through the site and through the OSD. Note however that the area used to determine the OSD volume will exclude the catchment in the MMTC site, on the basis that, in due course, it will provide its own OSD.

Ramped Access's to MMTC
The adjacent MMTC site is higher than the Prison Hospital (PH) site. There are two, ramped accesses between the sites, one vehicular plus pedestrian and one pedestrian only. The upper ends and surrounds of these ramps will be bunded (nominally 150mm) to limit the quantity of surface water from the MMTC site entering the PH site, as overland flow.

OSD and Site Grading, Extreme Storm Water Events
Site grading is slightly southwestward. There will be an OSD provided in this vicinity to which all stormwater runoff up to the 100 year ARI event will be directed. For larger and more rare events the site is to be provided with two overflow pits at its south boundary. The functioning of these will be similar to that of the overflows at the FH site.

The grading of the Prison Hospital site will, around its perimeter, fall away from the buildings and into a central depression (swale) within the sterile zone. Gradients across the swale will be a maximum of 1v:10h. The swale will be graded longitudinally to low points where grated drainage pits will collect the runoff.

Drainage Scheme
There are three main drainage lines, the eastern, the central and the western. All fall toward the south. The eastern and western are within or adjacent to the swale and sterile zone. The central passes beneath the Mental Health Unit. There is overland flow provision for the central line between the Visitor, Service & Administration and Mental Health Unit buildings, past the substation and to the swale in the sterile zone.

Diversion of Existing Drains
Existing drainage of land to the east of the site passes through the site to a drainage line on the west side. This external drainage will be intercepted and diverted around the east and south sides of the site and be reconnected to the existing receiving drain. OSD will not be applied to this external drainage. The diverted drainage could, in the future, be directed to the OSD and the OSD be enlarged, as a further stage in the implementation of the Stormwater Management Concept Plan

Building Floor Levels
The proximity of the Gatehouse and Sally Port to the existing road is the principle determinant of their floor levels. The other building floor levels have been set to fall toward the south and to allow paths to be within disabled and trolley limits.

Absorption and infiltration
Absorption and infiltration of storm water is not part of the drainage proposal. The criteria of the RCC and the geotechnical investigation indicate that these arrangements are unlikely to be feasible.

CONCLUSION

Storm water works for this project will:

1 Provide on site detention to the developed areas of this project, only, for rainfall events up to and including the 100-year average recurrence interval event.
2 Utilise the sterile zone as a shallow swale drain.
3 Divert existing drainage external to the Forensic and Prison Hospitals away from them.
4 Make provision for rainfall events larger than the 100-year event.
5 Set building floor levels above the 100-year rainfall event water levels.
6 Exclude absorption and infiltration.
7 The works are consistent with the principles and intent of the Stormwater Management Concept Plan of the Long Bay Correctional Complex Master Plan.
8 Have no adverse effects on the existing drainage standard, for the balance of the Long Bay Correctional Complex site.