Civil

TaylorThomsonWhitting

Civil Design Statement for UNSW Tyree Building

for University of New South Wales

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TTW Job No: 091426P

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1.0 GENERAL

The Civil & external Stormwater Engineering component of the development is to be designed and constructed to comply with:

- The relevant current Australian Standards, Building Code of Australia and Design Codes.
- The requirements of all relevant Statutory Authorities and Local Regulations including Randwick City Council requirements and development approval consent conditions.
- UNSW Campus 2020 Master plan Stormwater Strategy by ANA Technical Services Pty Ltd.
- Relevant Natspec technical specifications modified to the requirements of this project prepared by a suitably qualified Civil Engineer.

The current Civil & external stormwater engineering design drawings for the project are as follows:

- SKC01 – (Notes and Legends)
- SKC02 – (Turning Circle 8.8m Light Truck)
- SKC03 – (Site works Plan)
- SKC04 – (Details Sheet)
- SKC05 – (Erosion & Sediment Control Plan)

The above design drawings are to be progressively updated and are subject to change. These drawings are also subject to relevant Authorities' approval and development consent conditions.

On completion of construction the Civil Engineer shall certify that the civil works are constructed in accordance with the plans and specifications.

Staging of the works will be required to be such that the agents of erosion are minimised at any one time. Necessary measures will be adopted as may be necessary for erosion control, including the following where applicable:

- Staging: Staging of operations (eg. clearing, stripping, demolition);
- Restoration: Progressive restoration of disturbed areas;
- Drains: Temporary drains and catch drains;
- Dispersal: Diversion and dispersal of concentrated flows to points where the water can pass through the site without damage;
- Spreader Banks: Or other structures to disperse concentrated silt traps;
- Construction and maintenance of silt traps to prevent discharge of scoured material to downstream areas;
- Temporary grassing: Or other treatment to disturbed areas (eg. contour ploughing);
- Temporary fencing.

The builder will be required to liaise and comply with the requirements of the Department of Conservation and Land Management (Soil Conservation Service) and the local Council.

The builder will be required to apply dust and noise control measures to minimise disturbance to the functioning of neighbouring properties. The contractor will be required to demonstrate the proposed works equipment to be within acceptable limits for noise and vibration as determined by a registered acoustic consultant.

2.0 BULK EARTHWORKS AND EARTHWORKS

The design of all excavation or earthworks to be fit for purpose and with drainage, siltation and sediment controls satisfying all authority requirements.

Shoring, excavation techniques, excavation support, temporary and permanent batters shall be in accordance with TTW's specification and the recommendations of a qualified practicing Geotechnical Engineer – Refer to Pells Sullivan Meynink Pty. Ltd.'s Geotechnical Investigation Ref.PSM1397.R1 DRAFT1 dated 14 October 2009.

Bulk earthworks will be designed to minimise impact on the environment and provide control measures during construction to this effect.

To maintain the water quality during the construction stage, soil and erosion control measures will need to be installed. These measures include silt fences around the site, hay bales upstream of culverts and an appropriate 'truck shake down' facility at the exit to the site.

Bulk earthworks will be designed to minimise impact on the environment and provide control measures during construction to this effect.

Site preparation will include the following:

- Stripping of topsoil from work areas to be stockpiled for landscape areas.
- Tyne, water and roll the areas over which filling, paving or building slabs are to be placed. Six passes of a 10 tonne static roller are required. The final pass shall be a proof roll where movement of greater than 3mm under the roller will indicate Bad Ground.
- Placement of acceptable material from cut areas shall be placed in layers of not more than 200mm to the compaction requirements.

- Filled areas and cut areas to be overlain by buildings and pavements are to be protected to maintain a constant moisture content in the soil. The protection is to remain in place until construction is complete.
- Temporary Batters must be as specified by the Geotechnical Refer to Pells Sullivan Meynink Pty. Ltd.'s Geotechnical Investigation Ref.PSM1397.R1 DRAFT1 dated 14 October 2009.

2.1 Compaction Of Earthworks

Location	Compaction	Allowable Variation from Optimum Moisture Content
Compaction of subgrade under pavements	98% SMDD	2%, -2%
Compaction of landscape areas	95% SMDD	+2%, -2%
Compaction of pavement base subbase	98% SMDD	+2%, -2%

Maximum fill layer thickness is 200mm.

An independent approved NATA registered testing authority will be required to perform all the compaction testing of earthworks and submit test certificates to the Superintendent.

2.2 Testing

The Contractor will be required to provide a plan of test sample locations and a schedule of testing to comply with the following minimum requirements. The following testing frequencies relate to acceptance on a "not one to fail" basis.

Location	Frequency of Tests
Building platforms	Not less than a) 1 test per layer per 100m^2 or b) 1 test per 200m^3 distributed evenly throughout full depth and area or c) 1 test per lot per layer whichever requires the most tests
Pavements	Not less than a) 1 test per 25 linear metres per layer for roadway b) 1 test per layer per 1000m^2 for carparks.
Trenches	a) 1 test per 2 layers per 40 linear metres

Filled landscape area	a) 1 test per layer per 1000m2 or b) 1 test per 200m^3 distributed reasonably through full depth and area whichever requires the most tests.

An independent approved NATA registered testing authority will be required to perform all the compaction testing of earthworks and submit test certificates to the Principal. Certification will be required that aggregates are suitable for use in roadwork and concrete.

3.0 STORMWATER DESIGN PARAMETERS

3.1 Existing Stormwater Drainage Condition

The site is relatively flat and falls from North to South and currently the majority of the site's stormwater system consists of series of pipes & inlet pits. The proposed site is primarily fully developed with about 95% of the surface area impervious surface in its current state.

The site's existing stormwater pipe system drains towards Council's 1050mm Stormwater Trunk system that Traverses north-south along the Anzac Parade boundary.

Some minor diversion of existing stormwater pipe infrastructure within the proposed site is required.

3.2 Proposed Stormwater System

All proposed pipe works which consist of pipes and access pits shall be designed in accordance with Australian Rainfall & Runoff (AR&R), Council and AS 3500.3 1998 and will be directed to Council's receiving stormwater network on Anzac Parade.

Randwick Council requests that the volume of rainwater retention be determined in accordance with the UNSW 2020 Masterplan report. The development would then require retention tank storage be sized for the 20 year ARI storm to an equivalent volume to a percolation chamber sized for the same storm event. As we are still investigating options within the requirements of this report the size of the tank is still yet to be resolved. The tank will overflow into the council 1050 diameter pipe as described in the UNSW 2020 Masterplan Stormwater Strategy report. The tank is to discharge the 100year ARI storm above ground in an emergency.

4.0 FLOODING

Flooding data on Anzac Parade has yet to be received from Randwick Council. Impact on building development will be assessed once this information is at hand.

5.0 PAVEMENT DESIGN PARAMETERS

5.1 General

Pavements include roads, parking areas, paths and service vehicle access areas.

5.2 Design Parameters

Design all pavements for a 40 year life and to be trafficked by vehicles for 1.0×10^6 repetitions of a standard axle load. The standard axle load is as defined in AUSTROADS Pavement Design.

Rigid concrete pavement will be based on a CBR value of 8% as recommended by the geotechnical report.

Concrete Pavement Thickness
170 mm F'c =32MPa SL82
100 mm DGB20

5.3 Pavement Construction

For truck turning areas pavements shall be rigid in construction. For other areas pavements may be either flexible or rigid in construction.

When merging with existing works, provide a neat transition. Ensure that no differential movements occur at the joint.

5.4 Finishes

For vehicular trafficked pavements provide a non-skid finish and for pedestrian trafficked pavements a non-slip finish.

5.5 Subsoil Drainage

Provide subsoil drainage or spoon drains at periphery of excavation to allow for seepage from the ground.

Provide sub-soil drainage to suit roads, ramps and bridge abutments and to the back face of retaining walls.

5.6 Circulation and Parking

The design will comply with the requirements of AS2890.

5.7 Falls for Drainage

Minimum falls for drainage on pavements shall not be less than:

Concrete -	1%	1:100
Asphaltic Concrete or Bitumen -	2%	1:50
Paving -	2%	1:50

5.8 Line marking and traffic Signage

Provide in accordance with AS2890 and AS1742.

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