Civil Design Strategy

Introduction

Civil expansion works include extension to the existing stormwater drainage system to cater for the new buildings along with formalizing and refining existing overland flow paths within the school grounds to allow for improved outdoor play areas. The Collector Road 01 on the eastern side of the existing school (currently under construction), is also proposed to be upgraded to include bus bays and carpark dropoff zones to service the school expansion.

Existing Structure & Civil Works

Previous documentation of the existing structures was provided to MPC for review. It was found that Blocks A, B, C & D were constructed using reinforced concrete raft type foundations with a combination of light gauge steel and structural steelwork for the walls and roof elements. Previous work as executed (WAE), structural documents prepared by Northrop Consulting Engineers indicate that the geotechnical site classification.

Foundation recommendations outlined in the Douglas Partners report include two options being either to undertake full removal of uncontrolled filling and recompaction of suitable fill materials using Level 1 testing, or to pile the footings to suitable strata at depth.

Site Civil Stormwater Drainsage

Management and Sediment & Erosion Control Report along with detailed plans outlining the full design intent for the school expansion.

In preparing this Stormwater Management Plan, MPC reviewed the Port Macquarie-Hasting Development Control Plan, in relation to stormwater management for the proposed school upgrade. The key requirements to be addressed are summarised as follows:

- Ensure that rainwater runoff from the developed site for all design storms up to a 1:100 year ARI event is directed through the drainage network in accordance with Port Macquarie-Hasting Council’s Development Control Plan (‘DCP’) and AS/NZS 3500.3:2003;

- Ensure contaminated water from new impervious areas is passed through an appropriate pollution and sediment control system, and meets the water quality targets of the Port Macquarie-Hasting Council’s DCP;

- Employ suitable stormwater harvesting measures. This will incorporate new above-ground rainwater collection tanks with a water re-use facility to service toilets and irrigation;

- Ensure that overland flow in the event of a choked or blocked piped system does not adversely impact on buildings located on the site and does not cause a nuisance to neighbouring properties;

- Ensure the design of stormwater pits and pipes considers long term maintenance issues, such as ensuring suitable pipe slopes are specified so as to lower the risk of accumulation of debris and obstructions.

The stormwater management system will collect runoff for all design events up to the 100 year ARI for subsequent storage, re-use and disposal (as appropriate). In-ground pits and pies have been designed for a Minor Storm event of 1:20 years ARI, as per the Port Macquarie-Hasting Council’s Development Design Specification, D5 “Stormwater Drainage Design” document.

The site has been designed for a 1:100 year ARI Major Storm event.

Site Conditions

MPC were provided with a geotechnical engineering report accounting for the proposed upgrade works. The report prepared by Douglas Partners (Project 89691.00, July 2018), classifies the site as Class P (Unsuitable site foundation material), mainly due to the presences of uncontrolled filling on the site. The report also states that the site reactivity of the clay material is Class H1 (Highly reactive clay site), unlike the site classification of Class S for the design of Blocks A, B, C & D previously constructed.

With reference to MPC’s Stormwater Management and Sediment & Erosion Control Report (Ref 18-525 Rev 1, Sept 2018), existing civil documents prepared by Northrop indicate that the geotechnical site classification.

Foundation recommendations outlined in the Douglas Partners report include:

- To undertake full removal of uncontrolled filling and recompaction of suitable fill materials using Level 1 testing, or to pile the footings to suitable strata at depth.

With reference to MPC’s Stormwater Management and Sediment & Erosion Control Report, the site has been designed for a 1:100 year ARI Major Storm event.
Site Conditions

The project site area is 42,000m², of which 75% is estimated “pervious” for modelling the pre-enveloped stormwater runoff characteristics. The total fraction impervious for the developed site will be approximately 25%.

Sub catchment 1 comprises plan area of 14,800m² (approximately) with an average surface slope of 1.8%. This catchment mainly consists of grassed areas and trees and will be separated from the other catchments by a rock-lined and partially vegetated swale running roughly parallel to the western boundary of the site.

Sub catchment 2 comprises a plan area of 9,900m² (approximately) with an average slope of 1% down to the east. This catchment mainly consists of new learning neighbourhood buildings and new sheltered bus bay. New roof and paved areas are about 2,300 m² and 2,400 m², respectively.

Sub catchment 3 comprises a plan area of approximately 17,600 m² (approximately) with an average slope of 1.2% down to the south-east. This catchment mainly consists of existing blocks A, B, C, D existing outdoor learning areas and new sports hall building. Roof and paved areas are about 1,900 m² and 4,300 m², respectively.
Electrical Design Strategy

Electrical

The new configuration of the school has a maximum demand of just under 400A/phase. Therefore the existing Kiosk Transformer and MSB will be retained, with the SPD wound up to 400A/phase to supply the new works. Existing underground power conduits will be utilised where possible.

A new sub-main supply will be installed to supply the homebase blocks directly from the existing MSB. This will be a 250A/phase supply to Block E (DB-E), which will then supply Blocks G (DB-G 63A/phase) and F (DB-F 125A/phase).

The new Block H (DB-H) will be supplied from the existing MDB with 125A/phase supply.

Existing Blocks B and C will utilise existing distribution boards for their new configurations.

Communications

The existing campus distributor, located in existing Block B will be retained and utilised for the new works. Each new homebase block and the new sports court/hall will have a new 42RU floor mounted rack served via a multi-core optic fibre back to campus distributor.

Spare existing underground comms conduits and pits will be utilised as possible for the reticulation of the communications.

EFSG Coordination

Electrical Projects Australia are required to coordinate with existing services and note electrical departures to comply with Department of Education Facilities & Standard Guidelines (EFSG). This will be identified in the EFSG checklist for each space within the proposed scope of works at LCPS.
NEW COMMS RACK
1 PER LEARNING
NEIGHBOURHOOD

NEW DISTRIBUTION BOARD &
MAIN SWITCHBOARD
1 PER LEARNING
NEIGHBOURHOOD

UTILISE EXISTING UNDERGROUND
POWER CONDUITS FOR NEW
CABLING PATHWAYS

NEW MAIN SWITCHBOARD

POWER CONTROL PANEL

EXISTING MAIN SCHOOL
COMMUNICATIONS TO
REMAIN

EXISTING SUBSTATION

REESTABLISHED POWER &
TELSTRA CONDUITS TO BE
UTILISED FOR CABLE PATHWAYS
TO EXISTING MSB

NETWORK CARRIER
INPUT

EXISTING POWER & TELSTRA
CABLING WITHIN TO BE
REESTABLISHED TO SUIT NEW
CIVIL LEVELS

UTILISE EXISTING UNDERGROUND
COMMUNICATIONS CONDUITS
FOR NEW CABLING PATHWAYS

1. Dimensions are in millimeters unless otherwise shown.
2. Check all dimensions on site prior to construction and fabrication.
3. Work to given dimensions. Do not scale from drawing.
4. Drawings are not for construction but only as a design concept and indication.
5. All work discrepancies to be brought to the attention of the proprietor.

© SHAC Pty Ltd

Lake Cathie Public School Upgrade
1240 Ocean Drive, Bonny Hills

PROJECT NAME AND ADDRESS

REV A 18.10.18

Electrical Masterplan

SHAC Architects

ABN 32 131 584 846
224 Maitland Road, Islington NSW 2296

Justin Hamilton (6160)

02 4961 5888

Drawing and design © SHAC Pty Ltd. The signed control copy of this drawing is held by SHAC Pty Ltd.
Hydraulic Design Strategy

Introduction

Based on DBYG information & data collected from the detailed site survey, hydraulic services located water, sewer mains and gas services on site servicing the existing school.

Where required as per DA conditions with regard to emergency access, specific site service to be relocated at new locations, however the primary aim is to utilise existing services and underground pipework.

Potable Cold Water Reticulation

- The existing potable cold water property services and boundary main meter assembly is to remain in its current location in the northern corner of the site.
- The existing potable cold water pipelines nominated to be disconnected are to become redundant, permanently capped at their source of supply and removed from site.
- All necessary potable water connections have been designed to connect all fixtures, plant, equipment and fire hose reels.

Reclaimed Water Reticulation

- The existing reclaimed water property service and meter assembly is to remain in its current location in the northern corner of the site.
- The existing potable cold water pipelines nominated to be disconnected are to become redundant, permanently capped at their source of supply and removed from site.
- All necessary potable water connections have been designed to connect all fixtures, plant, equipment and fire hose reels.

Potable Cold Water Reticulation

- The existing potable cold water property services and boundary main meter assembly is to remain in its current location in the northern corner of the site.
- The existing potable cold water pipelines nominated to be disconnected are to become redundant, permanently capped at their source of supply and removed from site.
- All necessary potable water connections have been designed to connect all fixtures, plant, equipment and fire hose reels.

Reclaimed Water Reticulation

- The existing reclaimed water property service and meter assembly is to remain in its current location in the northern corner of the site.
- The existing potable cold water pipelines nominated to be disconnected are to become redundant, permanently capped at their source of supply and removed from site.
- All necessary potable water connections have been designed to connect all fixtures, plant, equipment and fire hose reels.

Sanitary Drainage

- The existing sewer pump station is to remain in its present location.
- All disused sanitary drainage pipelines will be permanently capped at their source and removed from site.
- New sanitary drainage pipelines are nominated to be installed to connect all proposed sanitary fixtures in accordance with AS3500.2-2015.

EFSG Coordination

McCallum Plumbing & Fire Consultants Australia are required to coordinate with existing services and note hydraulic departures to comply with Department of Education Facilities & Standard Guidelines (EFSG). This will be identified in the EFSG checklist for each space within the proposed scope of works at LCPS.

Fire Service

- The existing property service and double check assembly will remain in its current location in the northern corner of the site.
- The relocation of the school’s main entry has resulted in the existing fire hydrant pump and h-pattern booster assembly no longer being compliant with AS2419. As AS2419 1-2005 that states that the booster assembly must be adjacent to the principle vehicle access to the site. Therefore, we propose to relocate the existing fire hydrant pump and h-pattern booster assembly to the new main entrance of the school in the south-east corner of the site adjacent to the collector road roundabout.
- The existing fire hydrant pump is to be installed in a new ‘hunter pumps’ hydrant pump enclosure (Model AEG-DE-3-19).
- A new 100mm fire hydrant pipeline has been shown to connect from the existing double check assembly in the northern corner of the site to the relocated fire hydrant pump at the new south east entrance. The fire hydrant pipeline will then ‘back feed’ into the existing fire service via an adjacent dual pillar hydrant location.
- All disused fire hydrant pipework is to be capped permanently and be removed from site.
- Preliminary measurements indicate 3 x new fire hydrants will be required in order to provide necessary coverage to the new buildings in accordance with AS2419.1- 2005.

Gas System

- The intent is for the existing 4,000l lp gas storage tank to remain in service and in its present location.
- Initially there was a concept that the lp gas storage tank could be reduced in size. However, due to the inclusion of gas heating in the proposed new hall, the existing gas system has been deemed to be sufficient and is to remain as existing.
- New gas pipelines are nominated to be installed as necessary to supply new fixtures in accordance with AS5601.1.

Sanitary Drainage

- The existing sewer pump station is to remain in its present location.
- All disused sanitary drainage pipelines will be permanently capped at their source and removed from site.
- New sanitary drainage pipelines are nominated to be installed to connect all proposed sanitary fixtures in accordance with AS3500.2-2015.

EFSG Coordination

McCallum Plumbing & Fire Consultants Australia are required to coordinate with existing services and note hydraulic departures to comply with Department of Education Facilities & Standard Guidelines (EFSG). This will be identified in the EFSG checklist for each space within the proposed scope of works at LCPS.

Gas System

- The intent is for the existing 4,000l lp gas storage tank to remain in service and in its present location.
- Initially there was a concept that the lp gas storage tank could be reduced in size. However, due to the inclusion of gas heating in the proposed new hall, the existing gas system has been deemed to be sufficient and is to remain as existing.
- New gas pipelines are nominated to be installed as necessary to supply new fixtures in accordance with AS5601.1.

Sanitary Drainage

- The existing sewer pump station is to remain in its present location.
- All disused sanitary drainage pipelines will be permanently capped at their source and removed from site.
- New sanitary drainage pipelines are nominated to be installed to connect all proposed sanitary fixtures in accordance with AS3500.2-2015.

EFSG Coordination

McCallum Plumbing & Fire Consultants Australia are required to coordinate with existing services and note hydraulic departures to comply with Department of Education Facilities & Standard Guidelines (EFSG). This will be identified in the EFSG checklist for each space within the proposed scope of works at LCPS.
EXISTING WATER ASSEMBLY & METER TO REMAIN IN SERVICE.

EXISTING 100mm FIRE SERVICE TO BE DISCONNECTED, CAPPED & REMOVED FROM SITE. NEW FIRE HYDRANT TO LOCATION AT NEW ENTRY.

DOUBLE PILLAR FIRE HYDRANT TO AS2419 LOCATED MIN 10m FROM ALL PARTS OF BUILDINGS.

EXISTING FIRE HYDRANT, PUMP & H-PATTERN BOOSTER ASSEMBLY TO BE DISCONNECTED & RELOCATED TO LOCATION AT NEW ENTRY.

PIPEWORK SERVICES CAPPED AT SOURCE, DISCONNECTED & REMOVED FROM SITE.

EXISTING RAINWATER PIPE REMOVED

NEW IN-GROUND FIRE HYDRANT INSTALLED WITH MIN. 600mm GROUND COVER.

NEW LOCATION FOR RELOCATED FIRE HYDRANT PUMP & FIRE HYDRANT PUMP ENCLOSURE TO AS2419.

EXISTING SEWER PUMP STATION TO REMAIN.

RELOCATED H-PATTERN BOOSTER ASSEMBLY TO AS2419.

DISSUSED SANITARY DRAINAGE FROM DEMOUNTABLES CAPPED AND REMOVED FROM SITE.

FIRE HOSE REEL TO AS1221

NOTES:
1. Work to given dimensions. Do not scale from drawing.
2. Dimensions are in millimeters unless otherwise shown.
3. Check all dimensions on site prior to construction and fabrication.
4. Bring any discrepancies to the attention of the proprietor & architect.