



Wood & Grieve Engineers

Stormwater Management Report

BWC 2/25

Blacktown Workers Sports Club

Site A: Outdoor Sports Facilities – 221 Walters Road, Arndell Park

Site B: Seniors Living Village – 170 Reservoir Road, Arndell Park

Client: Paynter Dixon Constructions Pty Ltd
Level 2, 2 Richardson Place
NORTH RYDE NSW 2113

Date: 21st December 2015

Version: A

File Reference: 28811-SYD-C-R-SMP

Prepared by: Ian Harris

Wood & Grieve Engineer Limited
Level 6, Building B, 207 Pacific Highway,
ST LEONARDS NSW 2065
T: (02) 8484 7000 / F: (02) 8484 7100
Email: sydney@wge.com.au
Website: www.wge.com.au

Revision

Site Address: 170 Reservoir Road, Arndell Park NSW 2148
Real Property Description: Lot 14 on DP6796, Lot 10 and 11 on DP818679, Lot 14, 16 and 17 on DP 809530 and Lot 200 & 201 on DP880404
Proposed Development: Sports Club and Facilities
Client: Paynter Dixon Constructions Pty Ltd
Local Authority: Blacktown City Council
Authority Reference #: N/A
Wood & Grieve Reference: 28811-SYD-C-R-FRM



Ian Harris BEng (Hons)
For and on behalf of
Wood & Grieve Engineers

REVISION	DATE	COMMENT	APPROVED BY
A	21.12.2015	Pre DA Issue	IH

COPYRIGHT ©

This report is the property of Wood & Grieve Engineers, and is licensed to the Client for use on this project. Reproduction of this document for this project shall only be undertaken in full. Reproduction for other purposes without the permission of Wood & Grieve Engineers is prohibited.

REVISION

Contents

1.	INTRODUCTION	1
2.	PROPOSED DEVELOPMENT	1
2.1	Site A – Outdoor Sports Facilities	2
2.2	Site B – Senior Living Facilities, Sports Facility and Child Care Facility	2
3.	EXISTING SITE	2
3.1	Site A	2
3.2	Site B	3
4.	PROPOSED STORMWATER MANAGEMENT	3
4.1	Site A	3
4.2	Site B	5
5.	SEDIMENTATION AND EROSION CONTROL	7
	APPENDIX A – CIVIL DRAWINGS	8

Blacktown Workers Sports Club

1. Introduction

Wood and Grieve Engineers have been appointed by Paynter Dixon to undertake design of the stormwater management associated with the proposed redevelopment of the Blacktown Workers Sports Club. Given the integrated nature of the master plan this report has been prepared for all three components needed to facilitate the development:

- Planning Proposal to include 'recreation facility (outdoor)' on Lot 14 Sec 4 DP6796 and Lot 10 DP818679.
- Development Application for the outdoor sports facilities on Lot 14 Sec 4 DP6796 and Lot 10 DP818679.
- Site Compatibility Certificate for a Seniors Living Village on Lot 201 DP880404

2. Proposed Development

The proposed development of the site will be split into two sites as shown in the figure below.

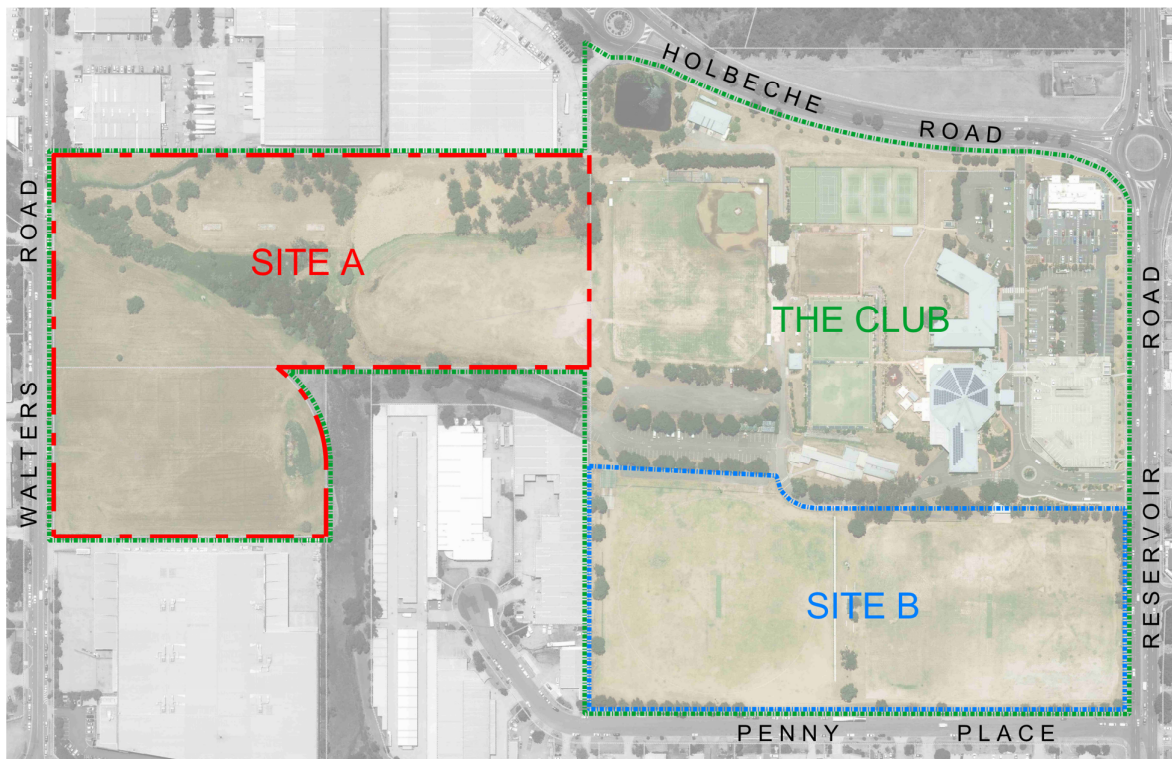


Figure 1 – Site Layout showing breakdown.

Blacktown Workers Sports Club

2.1 Site A – Outdoor Sports Facilities

Site A of the redevelopment is the relocation and upgrade of the existing outdoor sporting facilities on the site. It is proposed that the existing playing fields located south of the sites main access road will be relocated to the existing open spaces within the site adjacent to Walters Road and next to the existing baseball field on the site.

The works include development of four new full sized playing fields, two training pitches and four all weather pitches. In addition to the playing fields two new grandstands with associated vehicle parking will be constructed.

There will be significant bulk earthworks required to prepare the site for the construction of the new development.

2.2 Site B – Senior Living Facilities, Sports Facility and Child Care Facility

The development of Site B will include the construction of a new senior living precinct on the existing sports fields. There will also be a new sports facility located to the south of the existing baseball field and a childcare facility to the south of the existing bowling green.

The seniors living precinct will include a basement level under a podium accessed from the main entrance of the site.

Both the seniors living and the child care facilities will be constructed above the levels of the existing access road to help achieve flood planning levels for these buildings.

3. Existing Site

3.1 Site A

The site proposed for the development of Site A is currently split Bungarribee Creek. The creek runs north west across the development site and discharged from the site through a culvert under Walters Road. This creek and its associated riparian zone will be retained following development.

The proposed locations for the new Site A development are currently undeveloped.

As discussed above there are two areas which are to be developed in Site A, split by the creek. These will be referred to as the southern site and northern site.

The development areas are located up to 10m above the top of the existing creek bank.

The southern site currently falls steeply from the south western corner to the creek. There is currently a 10m fall across the site.

The northern site is located on a relatively flat section of the site at RL59.00 which then batters steeply to the creek near the creeks banks.

Currently all stormwater runoff from the proposed development areas are conveyed across the site in an uncontrolled and untreated manner towards the creek and discharge directly into the creek.

Blacktown Workers Sports Club

3.2 Site B

Site B is located to the south of the main access road through the site and is currently playing fields, the site as a consequence is currently relatively flat. The topography generally falls from east to west from RL65.00 to RL59.00.

The north of the area proposed for seniors living currently sits higher than the main access road through the site. This provides protection in the current situation against overland flow which passes through the site from Reservoir Road to the creek.

Currently all stormwater runoff from the proposed development areas are conveyed across the site in an uncontrolled and untreated manner towards the creek and discharge directly into the creek.

4. Proposed Stormwater Management

The following section of the report will discuss the proposed stormwater management measures which will be incorporated into the development of the sites.

4.1 Site A

4.1.1 Flooding

Modelling of the existing stormwater conveyance and flooding across the entire site has been undertaken by Wood and Grieve using XPSWMM flood analysis software. The results of the modelling across the site can be found in Wood and Grieves flood report.

The modelling results indicate that in the 100 year flood event the southern site will not be flood affected. The levels of the floodwaters varying between RL53.00 and RL52.50 which will be a minimum of 2.0m below the final levels of the redeveloped site. Batters for the southern playing fields will impact marginally on the flood plain however compensatory storage will be provided within the site to ensure that the flood impacts upstream and downstream of the development will not be adversely affected.

Areas of the northern site will be impacted by the 100 year flood event. This is limited to the car parking areas west of the new grandstand. The car parking area will be designed to safely allow flood waters to inundate the area whilst retaining the current flood storage provided by the site. The flood storage will be maintained by retaining the existing levels through the car park.

A new access road entering off Walters Road is proposed along the northern boundary of the precinct. This access road will impact on the flood extent at the intersection with Walters Road. To counter this loss of flood storage there will be compensatory storage provided alongside the creek.

4.1.2 Stormwater Conveyance

Stormwater conveyance across the Site A sites will be achieved by two independent drainage systems on each of the sites.

Blacktown Workers Sports Club

4.1.2.1 Playing Fields

The playing fields will be drained by means of infiltration through the playing surface into a grid of subsoil drainage lines designed in accordance with the Football NSW guidelines for drainage and irrigation of playing fields.. These subsoil lines will be directed to a rainwater reuse system adjacent to the playing fields which will store the water and use it for the irrigation of the fields. Overflow from the rainwater reuse system will discharge into the existing creek through a head wall located on the creeks bank.

4.1.2.2 Grandstand & Car Parking

The grandstand and car parking areas represent an increase in impermeable area for the sites. Runoff conveyance for these areas will be via a roof and in ground drainage system.

The grandstand roof areas will be drained via a box gutter system designed in accordance with AS3500. This system will be designed to convey the minor design storms in accordance with Blacktown City Councils guidelines for development and will be directed to the in ground drainage system surrounding the grandstands and car parking areas.

The car parking areas will drain through a conventional in ground drainage network. Runoff flows will be directed to stormwater drainage inlet structures and conveyed underground to the proposed attenuation systems prior to discharge into the creek. The in ground drainage system will be designed to convey the minor design storm in accordance with the Blacktown City Council guidelines for development.

Runoff flows in excess of the capacity of the in ground drainage system will be conveyed as overland flow to the proposed attenuation systems on the site prior to discharge into the creek.

4.1.3 Stormwater Attenuation

The increase in impermeable area resulting from the development will mean that stormwater attenuation will be required on the site. The site is located within the Upper Parramatta River Catchment Trust catchment and all stormwater attenuation will be designed in accordance with the UPRCT design guidelines.

It is proposed that the attenuation for the development will be provided in the form of a number of underground concrete tanks. Currently two tanks are proposed for the Site A works, one for the northern precinct and one for the southern.

All stormwater runoff will be directed to these tanks along with any overflow from the rainwater reuse system. Discharge flows will be controlled by the incorporation of orifice plates and overflow weirs within the underground detention tanks.

Initial sizing of these tanks have been calculated using the UPRCT spreadsheets and are indicated on the stormwater management plan prepared by Wood & Grieve.

4.1.4 Stormwater Treatment

As the discharge from the Site A development will be directly into the existing creek it will be essential to ensure pollution contained within the runoff is treated prior to discharging into the waterway.

Blacktown Workers Sports Club

All stormwater runoff from the site will be treated prior to discharging from the site. Treatment trains will be designed to comply with the pollution reduction targets set by Blacktown City Council. MUSIC modelling will be undertaken to ensure these targets are met for the development.

Treatment will be constructed downstream of the stormwater attenuation systems to ensure all runoff is passed through the system prior to discharging into the creek.

Currently it is proposed that water quality treatment will be provided using stormwater filter systems contained within underground precast concrete units as this will minimise the spacial and visual impact of the treatment devices on the development.

4.2 Site B

4.2.1 Flooding

4.2.2 Stormwater Conveyance

Stormwater conveyance for the seniors living precinct, sports facility and child care center will be achieved in a consistent manner for all facilities.

Runoff conveyance for these areas will be via roof and in ground drainage systems.

The roof drainage system will be designed to convey the minor design storms in accordance with Blacktown City Councils guidelines for development and will be directed to the in ground drainage system surrounding the grandstands and car parking areas.

The car parking areas and podium drainage will drain through a conventional in ground drainage network. Runoff flows will be directed to stormwater drainage inlet structures and conveyed underground to the proposed attenuation systems prior to discharge into the creek. The in ground drainage system will be designed to convey the minor design storm in accordance with the Blacktown City Council guidelines for development.

Runoff flows in excess of the capacity of the in ground drainage system will be conveyed as overland flow to the proposed attenuation systems on the site prior to discharge from the sites.

4.2.3 Stormwater Attenuation

The increase in impermeable area resulting from the development will mean that stormwater attenuation will be required on the site. The site is located within the Upper Parramatta River Catchment Trust catchment and all stormwater attenuation will be designed in accordance with the UPRCT design guidelines.

It is proposed that the attenuation for the development will be provided in the form of a number of underground concrete tanks. Currently a tank is proposed for each of the developments within the Site B development area, one for the seniors living precinct, one for the sports facility and one for the child care center.

All stormwater runoff will be directed to these tanks along with any overflow from the rainwater reuse system. Discharge flows will be controlled by the incorporation of orifice plates and overflow weirs within the underground detention tanks.

Blacktown Workers Sports Club

Initial sizing of these tanks have been calculated using the UPRCT spreadsheets and are indicated on the stormwater management plan prepared by Wood & Grieve.

4.2.4 Stormwater Treatment

As the discharge from the Site B development will flow into the existing creek it will be essential to ensure pollution contained within the runoff is treated prior to discharging into the waterway.

All stormwater runoff from the site will be treated prior to discharging from the site. Treatment trains will be designed to comply with the pollution reduction targets set by Blacktown City Council. MUSIC modelling will be undertaken to ensure these targets are met for the development.

Treatment will be constructed downstream of the stormwater attenuation systems to ensure all runoff is passed through the system prior to discharging into the creek.

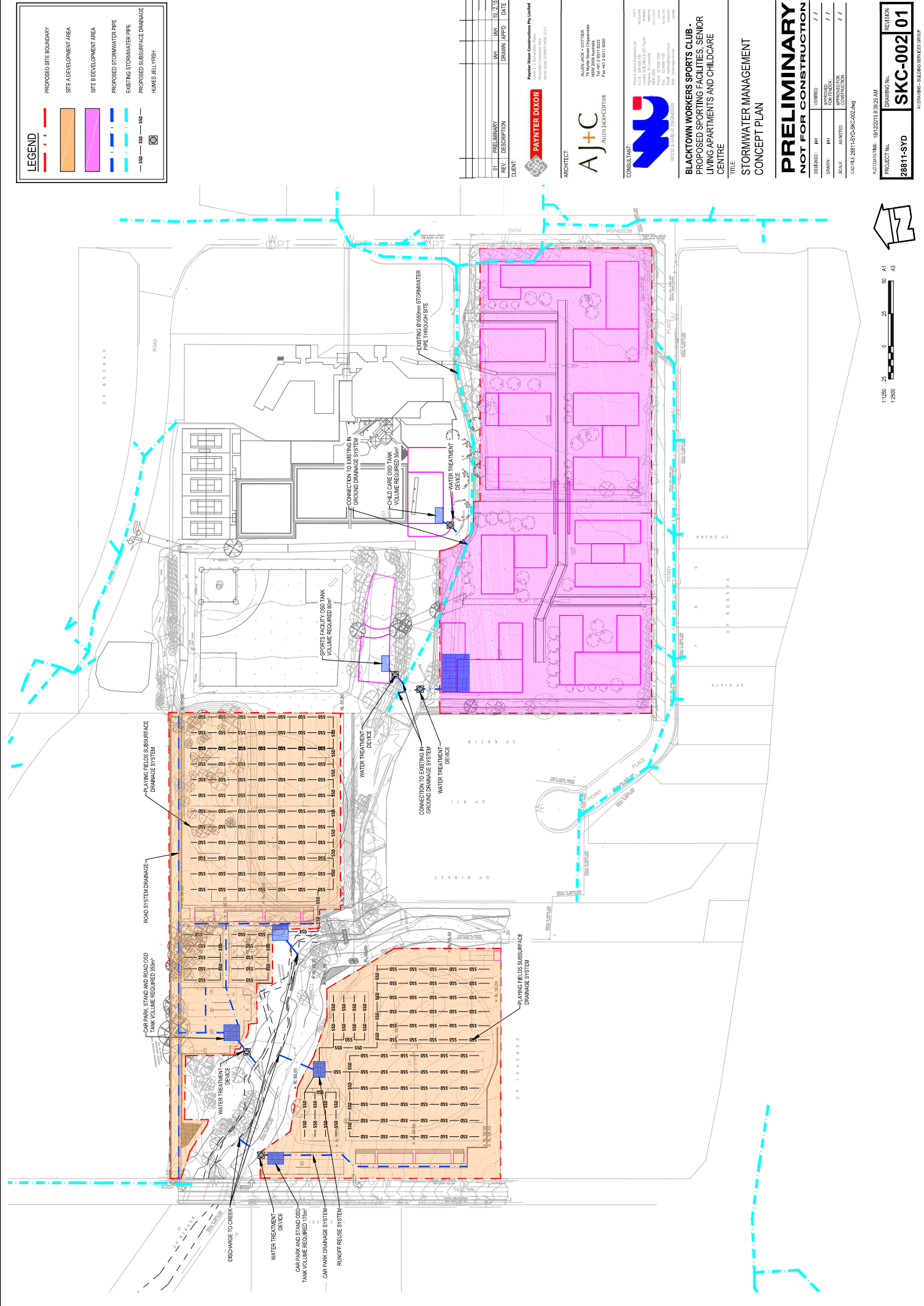
Currently it is proposed that water quality treatment will be provided using stormwater filter systems contained within underground precast concrete units as this will minimise the spacial and visual impact of the treatment devices on the development.

5. Sedimentation and Erosion Control

Ensuring the creek is not impacted by sedimentation or erosion runoff from the development during construction will be crucial to the success of the development. To ensure there are no negative impacts on the ecology of the creek and surrounding riparian zone careful consideration will be required as to the design of the sedimentation and erosion control during construction of the works.

All sedimentation and erosion control will be designed and constructed in accordance with Landcoms "Managing Urban Stormwater - Soils and Construction" and will be carefully monitored and maintained during the construction phase of the works.

Appendix A – Civil Drawings



LEGEND

PROPOSED SITE BOUNDARY

SITE A DEVELOPMENT AREA

SITE B DEVELOPMENT AREA

PROPOSED STORMWATER PIPE

EXISTING STORMWATER PIPE

PROPOSED SUBSURFACE DRAINAGE

HUMES JELLYFISH

REV	DESCRIPTION	DATE
01	PRELIMINARY	18-12-2015

CLIENT: **PAYNTER DIXON**
Paynter Dixon Construction Pty Ltd
Level 2, 2 Macquarie Street
North Sydney NSW 1585 1113

ARCHITECT: **AJ+C**
ALLEN JACK COTTIER
Level 2, 2 Macquarie Street
North Sydney NSW 1585 1113

CONSULTANT: **WOOD LEE ENGINEERS**
Wood & Lee Engineers Ltd
Level 2, 2 Macquarie Street
North Sydney NSW 1585 1113

**BLACKTOWN WORKERS SPORTS CLUB -
PROPOSED SPORTING FACILITIES, SENIOR
LIVING APARTMENTS AND CHILDCARE
CENTRE**

TITLE: **STORMWATER MANAGEMENT
CONCEPT PLAN**

PRELIMINARY
NOT FOR CONSTRUCTION

DESIGNED	IN	VERIFIED	///
DRAWN	IN	APPROVED FOR CONSTRUCTION	///
SCALE	AS SHOWN	APPROVED FOR CONSTRUCTION	///

CAD FILE: 28811-STC-SKC-002.dwg

PROJECT No. **28811-SYD** REVISION **SKC-002.01**

DATE/TIME: 18/12/2015 9:32:25 AM

1:1250 25 0 25 50 A1
1:2500 A3