

# Fairfield City Council Sustainable Resource Centre Expansion

## Flood Risk Management Report

**Author:** Jacky Hu

**Reviewer:** Vincent Chu

**Report no:** 10073

Rev 2

For Review

**Date:**

Jan 2019

### Report Amendment Register

Rev. No.	Section & Page No.	Issue/Amendment	Author/Initials	Reviewer/Initials	Date
1		Draft	JH	VC	10/01/19
2		DA Submission	JH	VC	29/01/19

## TABLE OF CONTENTS

<b>1</b>	<b>Executive Summary .....</b>	<b>1</b>
<b>2</b>	<b>Introduction .....</b>	<b>1</b>
2.1	Overview .....	1
2.2	Scope of Work .....	1
2.3	Design Requirements .....	2
<b>3</b>	<b>Study Area .....</b>	<b>2</b>
3.1	Site Location .....	2
3.2	Previous Flood Studies .....	3
3.3	Site Flood Mechanism .....	3
3.4	Proposed Development .....	4
<b>4</b>	<b>TufLOW Modelling .....</b>	<b>4</b>
<b>5</b>	<b>Results &amp; Discussion .....</b>	<b>4</b>
<b>6</b>	<b>Conclusion .....</b>	<b>6</b>

### ATTACHMENTS

Attachment A	General Site Arrangement
Attachment B	Bewsher Consulting 2010 Prospect Creek Flood Map
Attachment C	Flood Maps Produced by WMA

## **1 EXECUTIVE SUMMARY**

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Bonacci Group has been engaged to provide a flood impact assessment report for the proposed works at Fairfield City Council Sustainable Resource Centre. Flood maps have been produced by WMAwater based on design surfaces provided by Mepstead & Associates. The proposed works meets council's flood requirements as it has been demonstrated:

- Compensatory excavation has been provided to mitigate any filling of flood liable land;
- Proposed flood levels, velocities, hydraulic hazards are largely similar to existing conditions;
- There are no adverse impacts offsite.

## **2 INTRODUCTION**

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### **2.1 OVERVIEW**

Bonacci Group Pty Ltd (Bonacci) has prepared this flood assessment report to support the development application for Fairfield City Council (FCC) Sustainable Resource Centre (SRC) Expansion development at 1B Widemere Rd, Wetherill Park NSW 2164.

Flood modelling, model update, validation and flood mapping have been completed by WMAwater (WMA). As part of the Fairfield City Council Developer's Agreement, all aspects of flood modelling is to be conducted through Fairfield City Council's panel of 3 consultants who have access to Council's flood model. WMAwater has been selected from the panel for this project to undertake flood modelling and produce relevant flood maps. Bonacci has been engaged to interpret the results and ascertain the flooding impacts due to the SRC expansion development. Bonacci has prepared this report based on the flood maps produced WMA. The report documents the existing and proposed flood conditions at Fairfield SRC.

### **2.2 SCOPE OF WORK**

The scope of work carried out and reported herein are:

1. Obtain the Digital Elevation Model (DEM) of the existing site from Mepstead & Associates who are the civil design engineers for the project;
2. Obtain the DEM of the proposed works from Mepstead & Associates;
3. Interrogate DEMs and produce elevation vs storage table from above DEMs;
4. Engage WMAwater to undertake flood modelling and flood mapping and provide WMA with above mentioned data;
5. Facilitate the flood model handover process between FCC and WMA;
6. Compare and interpret existing and proposed flood results produced by WMA and advise amendments as required to meet FCC Development Control Plan (DCP) requirements.

This report provides information on the impacts of the proposed development in terms of flows, depths, hazards and levels that enables effective management of existing and future flood risk in the study area.

## **2.3 DESIGN REQUIREMENTS**

This report has been prepared in accordance with Fairfield Citywide Development Control Plan 2013. Schedule 6, Chapter 11 Flood Risk Management of the DCP states that for a development affected by Local Overland Flooding or a development in a floodplain other than Georges River or Cabramatta Creek floodplain, the following is required:

- Engineer's report required to certify that the development will not increase flood effects elsewhere, having regard to (i) loss of flood storage, (ii) changes in flood levels and velocities caused by alteration to the flood conveyance, and (iii) the cumulative impact of multiple potential development in the floodplain.

The Hassall Street Detention Basin is located directly on Prospect Creek and have the potential to significantly influence downstream flood conditions. Any filling of the basin will reduce the storage available and compensatory measures would be needed to mitigate the loss in storage.

## **3 STUDY AREA**

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### **3.1 SITE LOCATION**

The site is located at Fairfield City Council (FCC) Sustainable Resource Centre (SRC) at 1B Widemere Rd, Wetherill Park NSW 2164. The site locality is shown in Figure 3-1 and is within Fairfield City Council Local Government Area (LGA). It is bounded by Hassall Street to the south, Widemere Rd to the west and Prospect Creek to the north east. The site currently covers 3 land zones according to Fairfield Local Environment Plan 2013. The majority of the site is IN1- General Industrial with the areas closest to Prospect Creek E2- Environmental Conservation and PU1- Public Recreation. The site is primarily wide-open space consisting of various material stockpiles and existing buildings and sheds. It is located adjacent to the Hassall St detention basin. The site generally falls from south to north east towards Prospect Creek.





Figure 3-1 Site Locality. Source: Google Maps 2019

### 3.2 PREVIOUS FLOOD STUDIES

The site is located within the Prospect Creek catchment. A review of previous flood studies was undertaken to assess the flood behaviour of the site. A flood study was completed for the catchment in 2004 by Cardno Wiling using a 2-dimensional hydraulic model. This study reviewed the flood behaviour following a significant flood along Prospect Creek in January 2001 which flooded a number of properties.

Bewsher Consulting was subsequently commissioned by FCC to review the previous floodplain management studies (Bewsher Consulting 2006, *Prospect Creek Floodplain Management Plan Flood Study Review*), further refine and prepare a revised Floodplain Management Plan covering the full length of the creek (Bewsher Consulting 2010, *Prospect Creek Floodplain Management Plan Review*). The flood map showing the 1% AEP extent from Bewsher's study is shown in Attachment B.

In 2012, Floodmit Pty Ltd provided a site-specific review of the flooding constraints at 191 Hassall Street, Wetheril Park (Lot 1 DP 515773), immediately adjacent to subject site.

### 3.3 SITE FLOOD MECHANISM

The site is immediately adjacent to the Hassall Street Detention Basin (a minor portion of the proposed works extend into the basin). Located at the upstream end of Prospect

Creek, the site is potentially affected by flooding from Prospect Creek and the Hassall St Basin.

### **3.4 PROPOSED DEVELOPMENT**

The proposed works include the following (refer to General Arrangement Plan SK102-01 by Mepstead & Associates dated August 2017):

- Site earthworks and grading to establish a level site including the construction of batters;
- Removal of a small stormwater basin and construction of a new larger sediment basin and stormwater harvesting basin;
- Modifications to the main site entry and exit and carparking area to provide additional car parking spaces.
- Vegetation and tree removal to facilitate above proposed works and replacement tree planting; and
- Associated services infrastructure works.

The proposed works have been designed to ensure project requirements discussed in Section 2.3 are met.

## **4 TUFLOW MODELLING**

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Fairfield City Council's Developers Agreement grants access to a panel of selected consultants for obtaining Council's flood model. WMA has been chosen from the panel and subsequently, all tufLOW flood model updates, validation and verification have been completed by WMA. The existing and proposed DEM surfaces have been provided to WMA for flood model inputs. The DEM surfaces have been provided by Mepstead & Associates dated 05/07/18 and have been based on LiDAR and localised survey undertaken by Mepstead & Associates. Based on the DEM surfaces, storage vs elevation graphs have also been provided to WMA as flood modelling input.

## **5 RESULTS & DISCUSSION**

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Flood mapping results including depths, levels, velocities and provisional hydraulic hazard categories for the 1% AEP have been produced by WMA and shown in Attachment C. As proposed works involve filling of flood liable land adjacent to Hassall St Detention Basin, validation is required to ensure that the basin storage volume below the 1% AEP flood level is not reduced. The Hassall St basin's 1% AEP flood level is RL30.90 (Bewsher 2010, Prospect Creek Floodplain Management Plan Review). Therefore, compensatory excavation is needed to mitigate filling of the flood liable land. Table 5-1 shows the existing and proposed flood storage vs elevation over the footprint of the proposed earthworks extent. The total storage below RL30.90 in the post developed case exceeds existing flood storage.

**Table 5-1 Storage vs Elevation table**

<b>From RL (AHD)</b>	<b>To RL (AHD)</b>	<b>Existing Flood Storage over earthworks extent (m3)</b>	<b>Proposed Flood Storage over earthworks extent (m3)</b>
30.4	30.9	1029.288	691.209
29.9	30.4	449.236	601.541
29.4	29.9	114.603	463.203
28.9	29.4	15.833	283.599
28.4	28.9	0.13	0.004
27.9	28.4	0	0
27.4	27.9	0	0
26.9	27.4	0	0
26.4	26.9	0	0
Total storage below RL30.9		1609.09m <sup>3</sup>	2039.556m <sup>3</sup>

From the flood maps in Attachment C, the following is observed:

- The site is impacted by Prospect Creek and Hassall St Detention Basin flooding in the 1% AEP;
- Flood waters generally flow from west to east along Prospect Creek;
- 1% AEP flood velocities are generally low at the creek bank (between 0-0.5m/s) and high velocities (>1ms) are observed at the creek bed in both the existing and proposed design scenarios;
- As the proposed changes to the existing carpark entry/exit is located above 1% flood extent, it is not believed to have adverse flood impact offsite;
- The proposed flooding conditions are generally unchanged from pre-developed conditions.
- Outside the areas where earthworks are proposed, the flood levels are largely similar (within 10mm difference) i.e. there are no offsite impacts;
- Outside of areas of proposed works, the 1% AEP velocities have not changed significantly (changes observed near Prospect creek bed and near Widemere Road are minor and not materially significant);
- The hydraulic hazard has not changed significantly. The hazard at the proposed sediment basin have increased to H4- Unsafe for all people and vehicles. It is not believed that vehicles or pedestrians have access to the area.

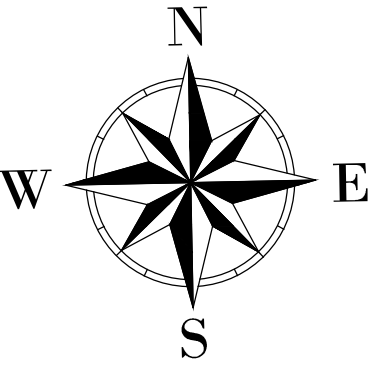
## **6 CONCLUSION**

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Detailed flood mapping has been produced by WMA based on the proposed earthworks designed by Mepstead & Associates. The proposed flood conditions are largely similar to existing flood conditions. Compensatory excavations have been provided to offset any filling of flood liable land. From the mapping results, there are no adverse impacts offsite. Proposed flood velocities, levels and hydraulic hazard are largely consistent with the existing. The requirements detailed in Section 2.3 have been achieved.

## **Attachment A – General Site Layout**





SCALE 1:1500 @ A1  
SCALE 1:3000 @ A3

Issue	Description	Date	Drawn	Approved
-	-	-	-	-



**mepstead  
& ASSOCIATES**  
REGISTERED SURVEYORS AND  
DEVELOPMENT CONSULTANTS

**Sydney**  
9/4 Central Avenue, Thornleigh N.S.W. 2120  
**Phone** 02 9875 4500 **Fax** 02 9875 4833

**Postal**  
PO BOX 22, Thornleigh N.S.W. 2120  
**Internet**  
mepstead@mepstead.com.au  
www.mepstead.com.au

**Client:**  
FAIRFIELD CITY COUNCIL  
C/O DFP PLANNING PTY. LTD.

**Project:**  
PROPOSED EXPANSION OF FAIRFIELD  
SUSTAINABLE RESOURCE CENTRE

Designed: LB	Scale: 1:1500	A1
Drawn: LB	Datum: A.H.D.	
Checked: SW	Date: AUGUST 2017	
L.G.A.: FAIRFIELD CITY COUNCIL		

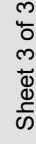
**Drawing Title:**  
GENERAL ARRANGEMENT PLAN

Issue: -
Drg. No. SK102-01
Our Ref: 5593
Sheet No. -

PRELIMINARY ISSUE



## **Attachment B – Bewsher Consulting 2010 Prospect Creek Flood Map**



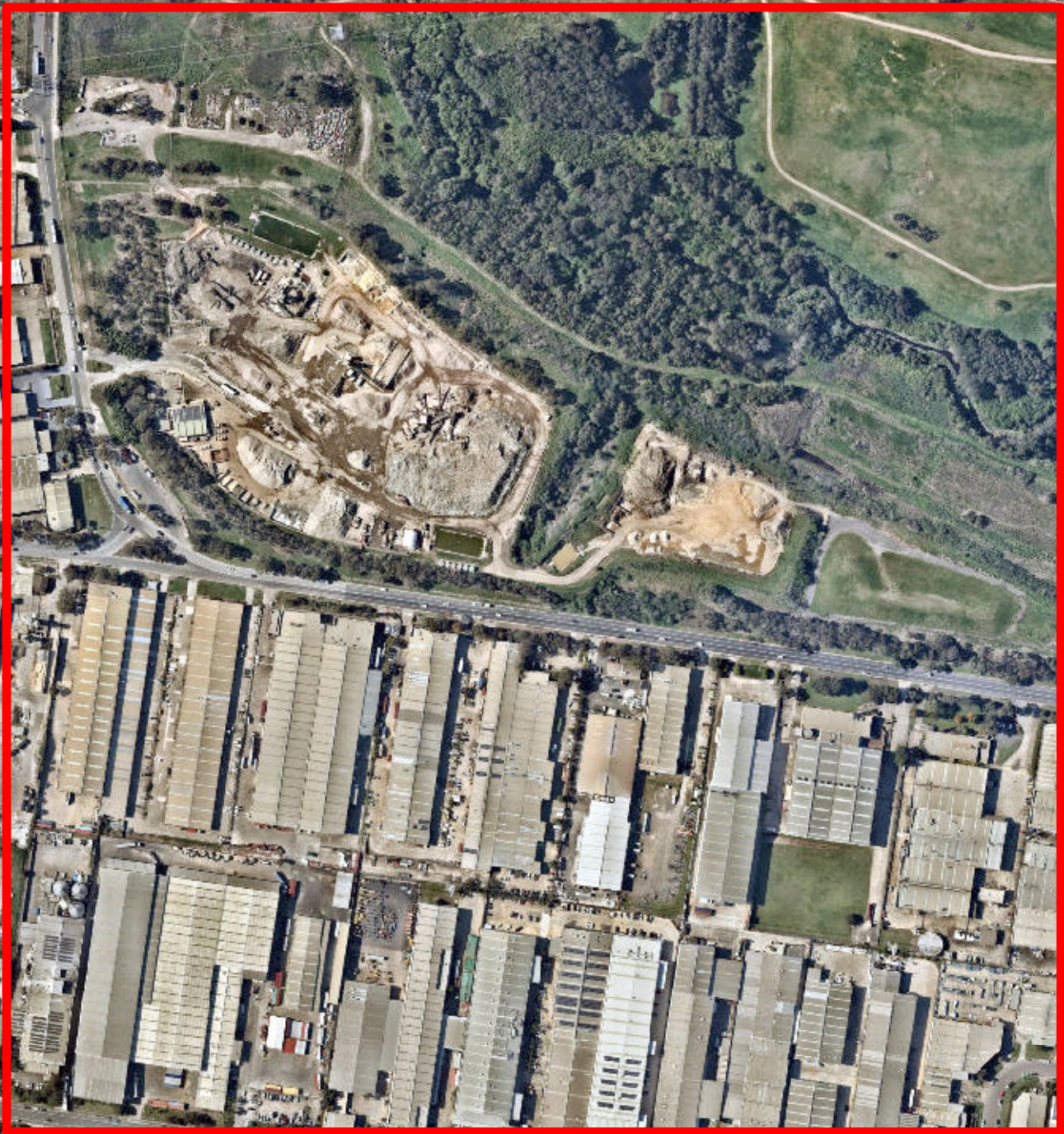


## **Attachment C – Flood Maps Produced by WMA**



FIGURE 01  
STUDY AREA

From RL (AHD)	To RL (AHD)	Existing Flood Storage (m3)	Design Flood Storage (m3)
30.4	30.9	1029.288	691.209
29.9	30.4	449.236	601.541
29.4	29.9	114.603	463.203
28.9	29.4	15.833	283.599
28.4	28.9	0.13	0.004
27.9	28.4	0	0
27.4	27.9	0	0
26.9	27.4	0	0
26.4	26.9	0	0
Total Storage below RL30.9		1609.09	2039.556



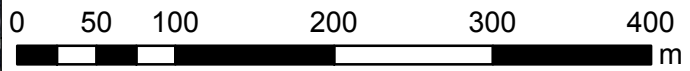
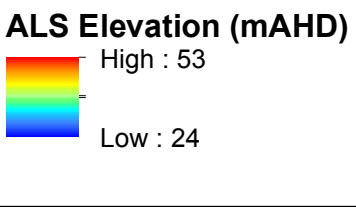
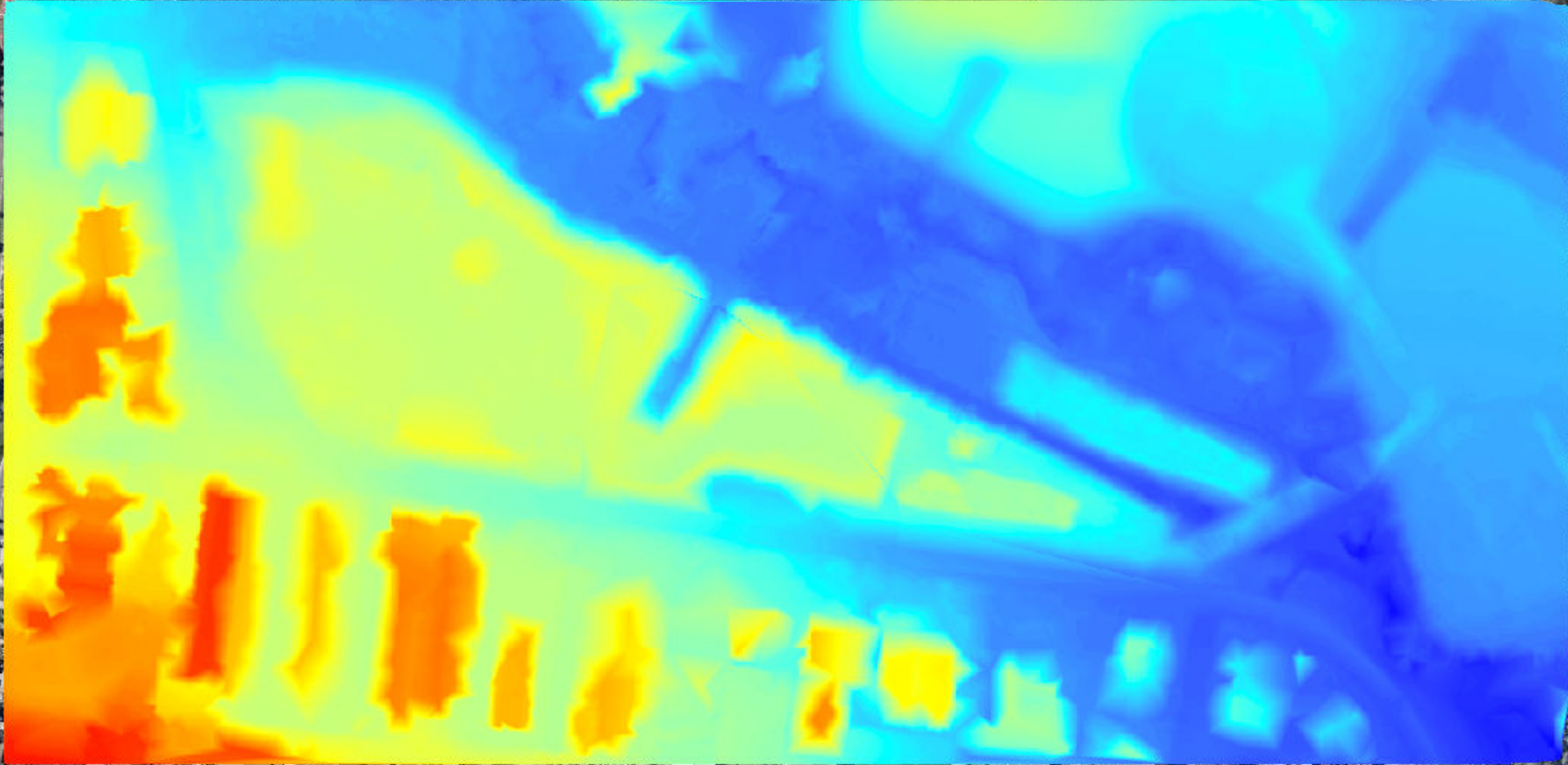
Study Area

0 50 100 200 300 400  
m



FIGURE 02  
EXISTING DEM

From RL (AHD)	To RL (AHD)	Existing Flood Storage (m3)	Design Flood Storage (m3)
30.4	30.9	1029.288	691.209
29.9	30.4	449.236	601.541
29.4	29.9	114.603	463.203
28.9	29.4	15.833	283.599
28.4	28.9	0.13	0.004
27.9	28.4	0	0
27.4	27.9	0	0
26.9	27.4	0	0
26.4	26.9	0	0
Total Storage below RL30.9		1609.09	2039.556

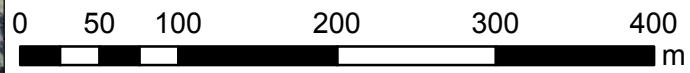
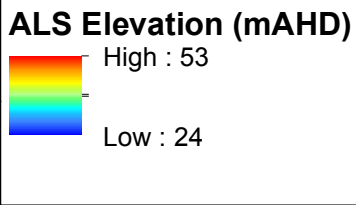
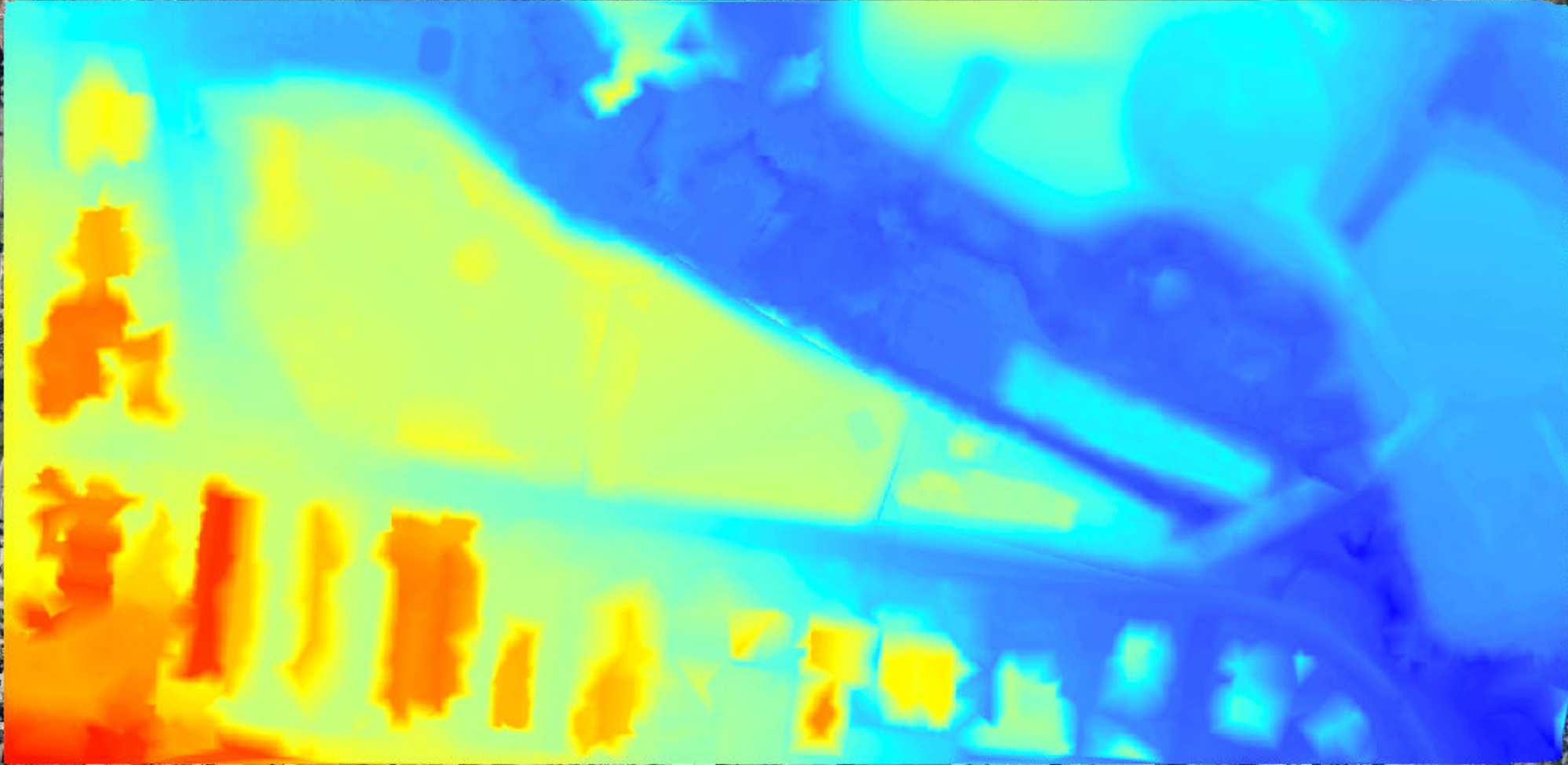


Natural Surface as per DWG provided by the client and dated 26/6/18



FIGURE 03  
PROPOSED DEM

From RL (AHD)	To RL (AHD)	Existing Flood Storage (m3)	Design Flood Storage (m3)
30.4	30.9	1029.288	691.209
29.9	30.4	449.236	601.541
29.4	29.9	114.603	463.203
28.9	29.4	15.833	283.599
28.4	28.9	0.13	0.004
27.9	28.4	0	0
27.4	27.9	0	0
26.9	27.4	0	0
26.4	26.9	0	0
Total Storage below RL30.9		1609.09	2039.556

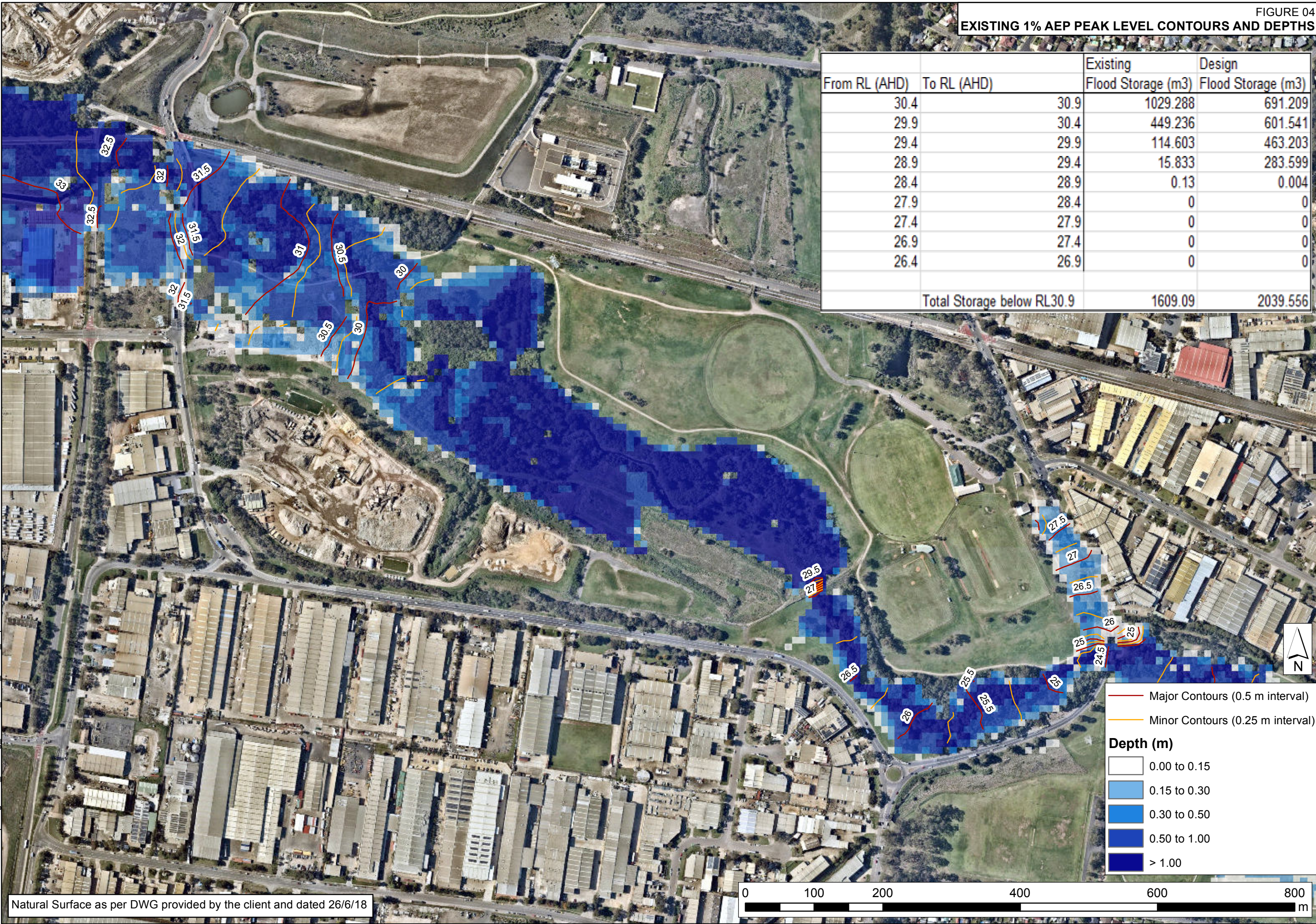


Design as per DWG provided by the client and dated 4/7/2018



EXISTING 1% AEP PEAK LEVEL CONTOURS AND DEPTHS

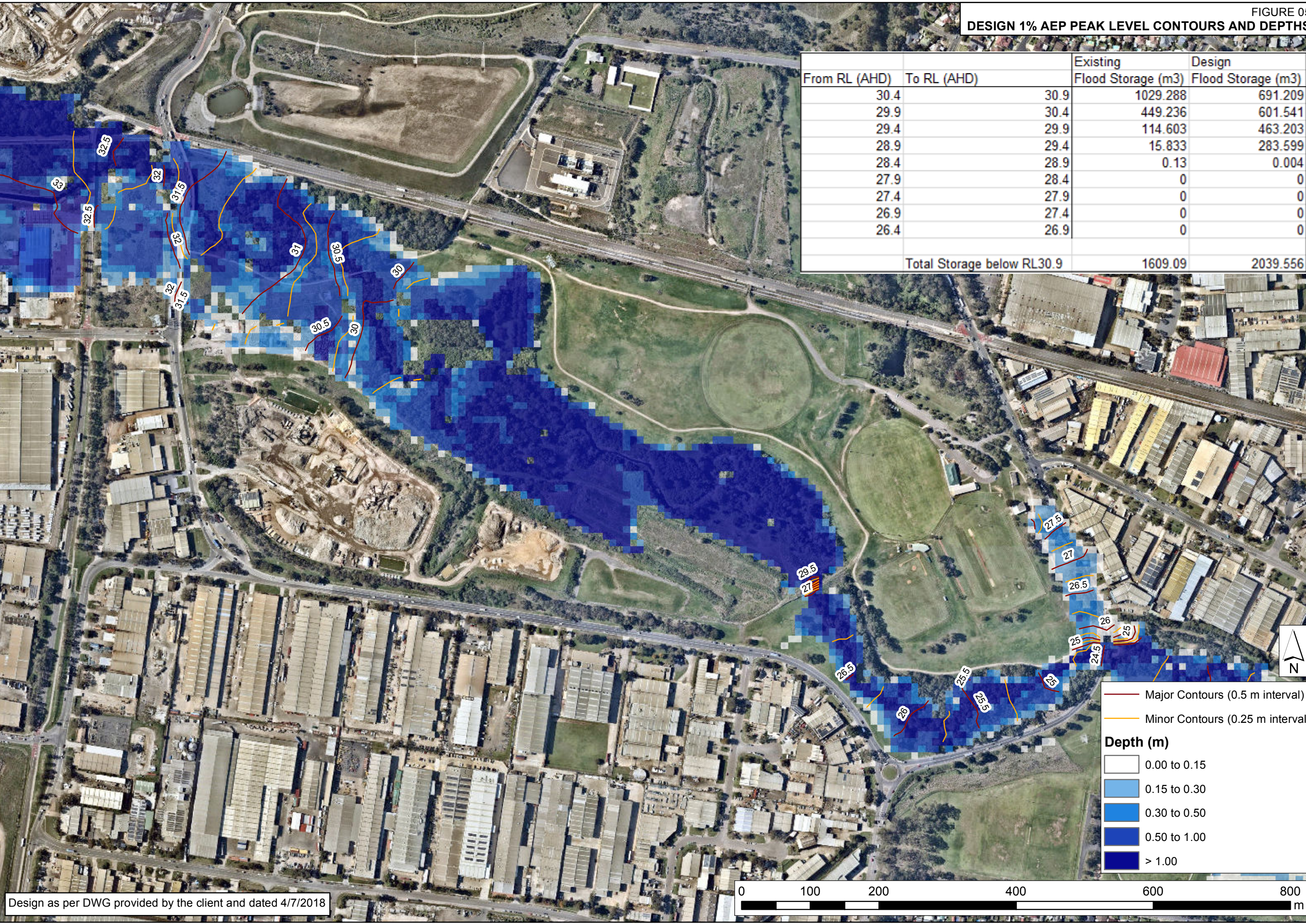
From RL (AHD) To RL (AHD)		Existing Flood Storage (m3)	Design Flood Storage (m3)
30.4	30.9	1029.288	691.209
29.9	30.4	449.236	601.541
29.4	29.9	114.603	463.203
28.9	29.4	15.833	283.599
28.4	28.9	0.13	0.004
27.9	28.4	0	0
27.4	27.9	0	0
26.9	27.4	0	0
26.4	26.9	0	0
Total Storage below RL30.9		1609.09	2039.556



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Natural Surface as per DWG provided by the client and dated 26/6/18





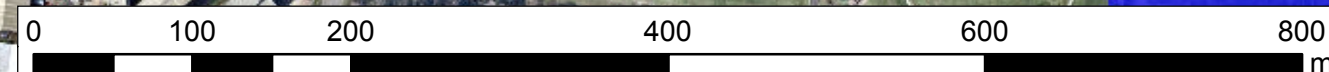
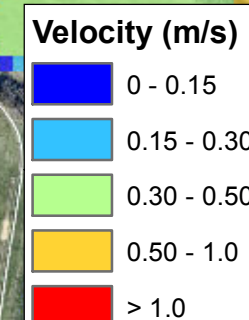
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Design as per DWG provided by the client and dated 4/7/2018



FIGURE 06  
EXISTING 1% AEP PEAK VELOCITIES

From RL (AHD)	To RL (AHD)	Existing Flood Storage (m3)	Design Flood Storage (m3)
30.4	30.9	1029.288	691.209
29.9	30.4	449.236	601.541
29.4	29.9	114.603	463.203
28.9	29.4	15.833	283.599
28.4	28.9	0.13	0.004
27.9	28.4	0	0
27.4	27.9	0	0
26.9	27.4	0	0
26.4	26.9	0	0
Total Storage below RL30.9		1609.09	2039.556



Natural Surface as per DWG provided by the client and dated 26/6/2018