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## **FLOOD INVESTIGATION REPORT**

**CW20023**

PROPOSED DEVELOPMENT AT

**46 Kraft Road  
Pallara**

PREPARED FOR

**Yu Fen Li**

**November 2022**

### **Civil Works Engineers**

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REVISION / CHECKING					
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## 1. Introduction

This Flood Investigation Report (FIR) has been prepared to identify the flooding related development requirements for the proposed development at 46 Kraft Road, Pallara, and address the further advice letter submitted by Brisbane City Council (BCC) on 23 August, 2022. The site is within the local government area of Brisbane City Council and this development will be assessed against the relevant provisions of the Brisbane City Plan 2014. For clarity and consistency, the abovementioned property from herein will be referred to as the “site”.

The further advice letter from BCC requests that flood report reference previous Council approved flood studies. Therefore, the Flood Overlay and Stormwater Code Assessment Report for 55-81 Sweets Road, Pallara, provided by Storm Water Consulting Pty Ltd will be referenced throughout this report. For clarity and consistency, the abovementioned flood study from herein will be referred to as the “neighbouring flood report”.

### 1.1. Background Information

The report has been prepared utilising the following available information:

- Survey Plan provided by AJS Surveys (Appendix B);
- Subdivision Layout Plan provided by AJS Surveys (Appendix C);
- Flood Overlay and Stormwater Code Assessment Report for 55-81 Sweets Road, Pallara, provided by Storm Water Consulting Pty Ltd – “neighbouring flood report”;
- LIDAR from ELVIS – Elevation and Depth – Foundation Spatial Data;
- BCC City Plan 2014; and,
- BCC eBIMAP information.

### 1.2. Scope of Report

This report will address the flooding-related development requirements including the following specific items:

- Extent of existing overland flow path during a 2% AEP storm event;
- Extent of existing flooding other than overland flow;
- Minimum flood immunity levels;
- Minimum undercroft height requirements;
- Vehicular access requirements; and,
- Impact to neighbouring properties, specifically to the existing houses/structures on 38, 45, and 54 Kraft Road, and 39 Sweets Road.

### 1.3. Response to Further Advice Letter

In response to the further advice letter dated 23 August 2022, regarding Stormwater item 1, please see the following responses below in blue and RFI item in italics.

#### **STORMWATER**

1. *In response to PO2 and PO7 of the Stormwater code a flood study is still required to support the development. The required filling of the site has a high likelihood of impacting surrounding properties adversely.*

We understand that PO2 relates to flood level and hazard on neighbouring premises. However, given the significant developments being undertaken in the area and the need for a catchment wide trunk infrastructure system, as well as, filling for flood immunity requirements across significant portions of the area, we understand that Council's primary interest relates to the impact to existing residential dwellings. The proposed development does not result in an increase in flood level over 3mm to upstream, downstream, or adjacent residential dwellings, and as such, generally complies with AO2.1 of the Stormwater Code. Notwithstanding this, there are increases in flood levels away from residential dwellings within neighbouring properties. These increases in flood levels are understood to be reduced once the trunk infrastructure and stormwater channel works are built in the surrounding area.

It is noted that a performance outcome for stormwater quality is being negotiated with Council, due to the site constraints. The performance outcome includes the provision of a Water Sensitive Urban Design (WSUD) Street Tree for every two proposed Lots, which is commonly requested and approved by Council as a performance outcome. In addition to this, a 10m wide ecological area, offset from the rear property boundary is proposed. This ecological area complies with Council's ecological requirements, and as discussed with Council, also forms part of the performance outcome due to the environmental benefits this ecological area will provide. It should be noted that increasing the width of the ecological area will not result in a reduction in flood level to upstream, downstream, or adjacent residential dwellings and as such, it is in our opinion that the performance outcome is acceptable, appropriate, and generally complies with AO2.2.

The development proposes Lot and Road levels which are located at or above the minimum flood immunity levels in Table 9.4.9.3.D and 9.4.9.3.F and as such, complies with AO7.1.

Flood depths along Kraft Road are generally less than 300mm, and therefore remains trafficable. There is one location in Kraft Road near the proposed intersection for the new internal road to the site where the 2% AEP flood depth is up to 0.400m. This is not considered to cause adverse flood impacts because;

- The trafficable flood depth is only exceeded by 100mm in one isolated location, with the flood depth generally being exceeded by only 50mm, which is relatively minor. This flood depth is even less towards the crown of the road.
- The period where the flood depth exceeds 300mm would be well below the 6-hour maximum outlined in Section 6.2 of the Flood Overlay Code (2014), especially when considering table drains relieving flood depths.
- The depth-velocity (DV) products remain well below 0.4m<sup>2</sup>/s, refer to Figure 64 below.
- Future developments at 45 and 46 Kraft Road (and other properties along Kraft Road) will require to upgrade Kraft Road frontages in accordance with BCC's Stormwater Masterplan for Pallara; which includes road widening and drainage swales. It is expected that this will improve the flow capacity and reduce flow depths on Kraft Road.

As such, the development generally complies with AO7.2.

- a. Provide a 2D flood study undertaken by a Registered Professional Engineer Queensland (RPEQ) that provides flood immunity for all new lots and roads while ensuring no impacts to neighbouring properties. Approved development flood studies are to be referenced with respect to the applicable flows to use within the flood study, and surveyed levels of 39 Sweets Road, to ensure no adverse impacts;*

A Flood Investigation Report has been prepared which provides flood immunity for all new lots and roads, while limiting the impacting to neighbouring properties. The majority of variables used in the modelling have been referenced from neighbouring approved flood studies. Surveyed levels of 39 Sweets Road are not required as the flood modelling indicates that there is no increase in flood level to this property.

- b. Provide a survey of the existing houses/structures on 38, 45 and 54 Kraft Road, and 39 Sweets Road and demonstrates these are not impacted.*

38 Kraft Road is understood to now be owned by Council, and therefore will be utilised to convey overland flow and the existing dwelling and structures on this site removed. As such, it is understood that there is no requirement to minimise the increase in flood level near the existing dwellings or within this property.

There is a max increase in flood level of approx. 3mm located near the greenhouses and sheds within the site of 45 Kraft Road.

54 Kraft Road is not residential in use and has greenhouses built on it. There is a typical increase in flood level of approx. 60mm to 90mm, with increases up to 160mm located along the property frontage and north-western corner of the site. While there are increases in flood level to this site, no lives are expected to be at risk of significant flooding. Furthermore, the increases identified above do ultimately serialise the future development potential of this property as filling will be required regardless to achieve flood immunity against the creek's 1% AEP flood level (18.30m AHD).

There is a typical decrease in flood level of approx. 15mm to 50mm within the site of 39 Sweets Road, with a reduction of around 5mm to 15mm located around the existing dwellings and structures on site. As such, this development does not result in an increase to flood levels around the existing dwellings or structures.

## 2. Site Description

### 2.1. Existing Site

The site is located at 46 Kraft Road, Pallara, with the real property description of Lot 108 on RP87803. The total site area is 16,149m<sup>2</sup>. According to BCC's City Plan 2014 the site is currently zoned as Low Density Residential Zone.

The site fronts Kraft Road to the west, a residential property to the north which is understood to now be owned by Council and converted to drainage reserve, parkland and a newly constructed subdivision to the east, and a non-residential property to the south, refer to Figure 1 below for the site locality. The existing site falls east, towards neighbouring properties, at a grade of approximately 1V:160H. Stormwater runoff from the site is understood to discharge from the site via overland sheet flow per the existing topography. The site currently contains a dwelling with auxiliary structures. Refer to Appendix B for the Survey Plan.



*Figure 1 – Site locality map (Brisbane City Plan 2014)*

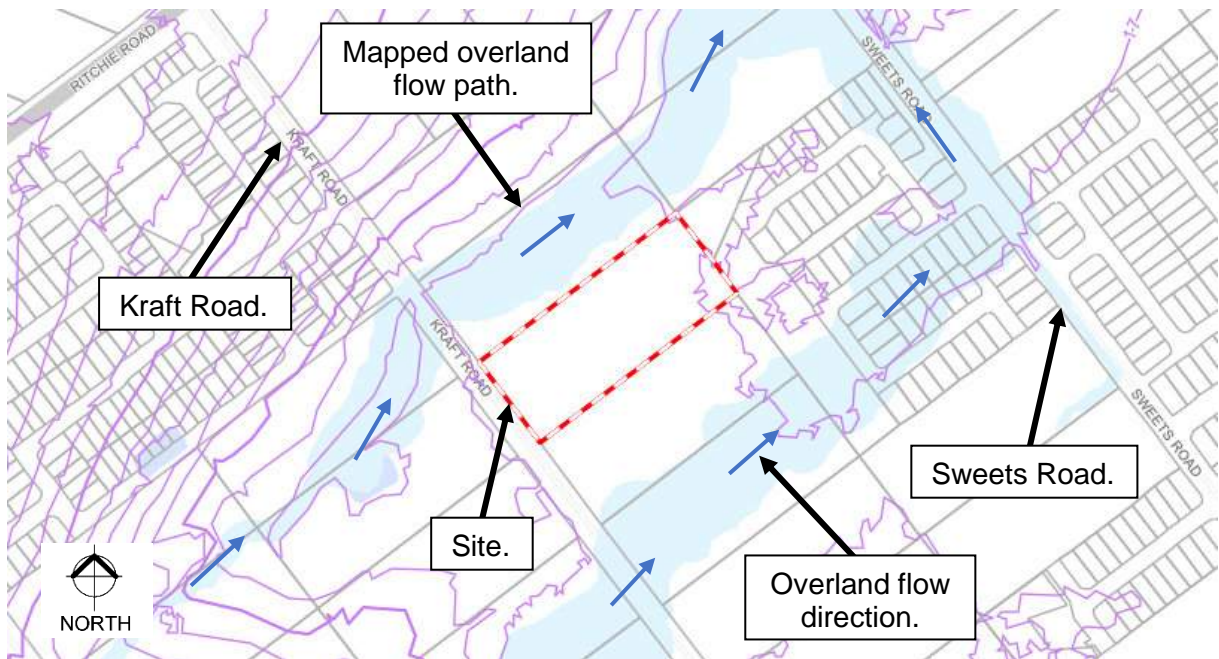
### 2.2. Proposed Development

It is proposed to subdivide the site from one (1) into thirty (30). This will include a new internal road and stormwater infrastructure. It is proposed to discharge majority of the site to the existing stormwater channel in 38 Kraft Road, with smaller catchments discharging to the front and rear of the site. Refer to Appendix C for the Subdivision Layout Plan.

### 2.3. Existing Flood Conditions and Stormwater Infrastructure

As per BCC interactive mapping, the site not located within the overland flow flood planning area, refer to Figure 2 below. However, as per the Further advice from the information request from Brisbane City Council, dated 23 August 2022, a flood study is required to support the development.

The site is not known to be affected by other sources of flood (Creek/waterway flooding, Brisbane River flooding, or storm tide inundation). However, the creek/waterway flood planning area 5 is located south within the neighbouring properties (54 Kraft Road, Pallara, Lot 107 on RP87803), as well as indicated in the FloodWise Property Report to affect this site. Refer to Appendix D for the FloodWise Property Report.



**Figure 2 – Overland Flow flood planning area (Brisbane City Plan 2014)**

The figure above shows an overland flow path traversing south-west to north-east via neighbouring properties. Flood modelling undertaken for the development at 55-81 Sweets Road, Pallara (neighbouring flood report), indicates that this overland flow also traverses the subject site.

There is no existing stormwater infrastructure which relieves the overland flow, however there are plans to construct a trunk stormwater main as part of neighbouring development applications which will ultimately reduce the overland flow in the area. There are several stormwater culverts which convey runoff under roads crossing the overland flow path. Refer to Appendix E and F for eBIMAP and Dial Before You Dig plans showing the existing stormwater culvert locations and information. It should also be noted that there is a newly constructed stormwater channel as part of the development north-east of the site, at 55-81 Sweets Road.

### 3. Hydrology

#### 3.1. Pre-Development

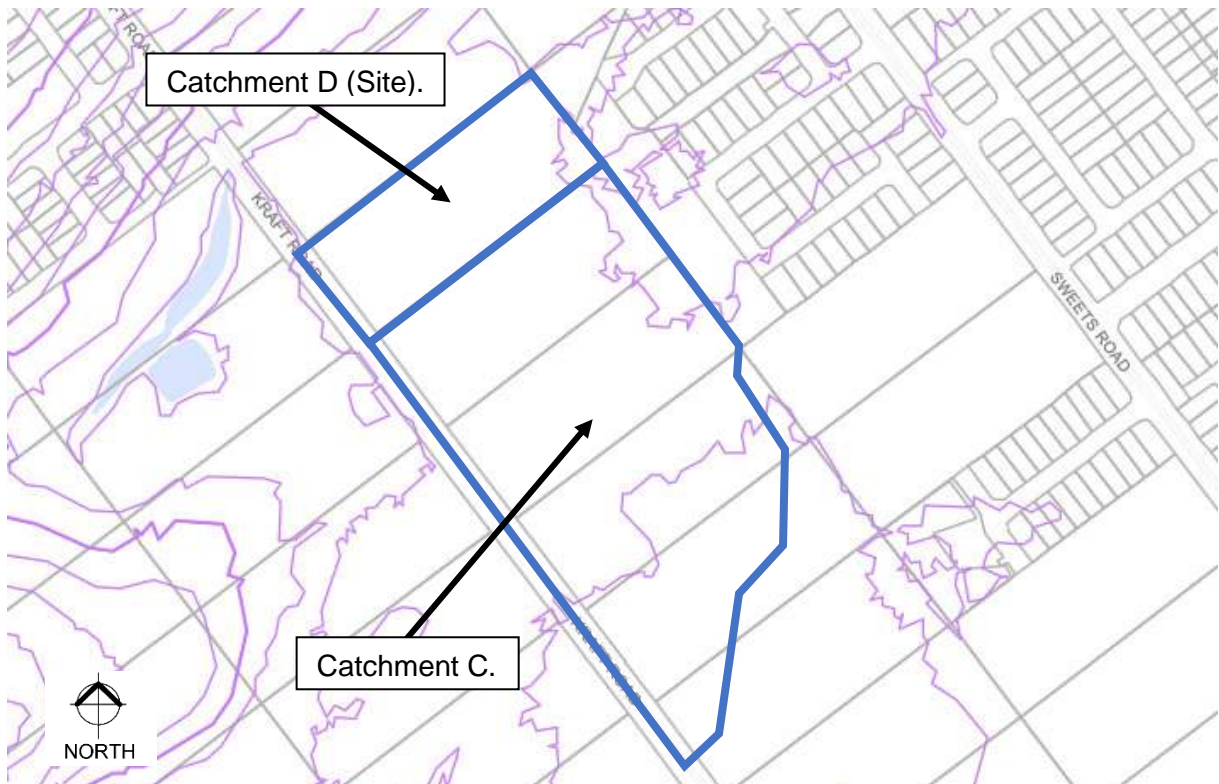
Stormwater catchments and their flow rates have been obtained from Storm Water Consulting Pty Ltd, who prepared the neighbouring flood report. As this neighbouring development has been completed, the post-development data from the neighbouring flood report will be adopted for the pre-development data of this flood report, except for Catchments C and D. These two catchments have been adjusted to provide a single catchment which covers the development site wholly. A WBNM analysis has been undertaken to determine peak flows and hydrographs for these adjusted catchments.

##### 3.1.1. WBNM Parameters for Catchments C and D

The WBNM analysis was undertaken for Catchments C and D, for the 2% AEP storm event, for the 60, 90, and 120 minute storm durations, using a fraction impervious of 0.05. The catchments were modelled in the WBNM using a Lag Parameter within the recommended specified in the WBNM User Guide (2007). The loss values used for the neighbouring flood report have been adopted in the WBNM, which include 3.75mm for initial loss, and 2.5mm for continuing loss. Brisbane IFD data has been used for the WBNM.

##### 3.1.2. Catchment Area for Catchments C and D

The shared catchment boundary between catchments C and D has been adjusted to the property common property boundary of 46 and 54 Kraft Road, as shown on Figure 3 below. The external boundary for these catchments has remained the same. Refer to Section 3.3 below for the catchment and hydrology summary.



**Figure 3 – Pre-Development Catchment C and D (Brisbane City Plan 2014)**



### 3.3. Hydrology Summary

Table 1 below presents the boundary/inflow names and peak flows. Refer to Appendix G for the catchment areas and locations, and Appendix H for the Peak Flow Hydrographs.

**Table 1 – Hydrology Summary**

Q50			
	Peak Flows (m <sup>3</sup> /s)		
Inflow name	60 minute storm	90 minute storm	180 minute storm
US Boundary 1	7.13	7.31	7.10
US Boundary 2	7.07	6.95	6.66
Inflow 3	2.11	1.99	1.87
Inflow 4	1.88	1.77	1.65
Inflow 5	2.30	2.12	1.88
Inflow 6	0.12	0.09	0.09
Inflow 7	1.47	1.39	1.30
Inflow 8	0.19	0.14	0.13
Inflow EX	0.80	0.63	0.57
Inflow 10	1.02	0.82	0.74
Inflow 11	4.97	4.79	4.49
Inflow 12	0.35	0.28	0.25
Inflow DEVS1	0.51	0.39	0.36
Inflow DEVS2	0.22	0.20	0.18
Inflow DEVS3	0.82	0.67	0.62
Inflow DEVS4	0.72	0.55	0.51
Inflow DEVS5	0.28	0.23	0.21
Inflow DEVS6	0.28	0.21	0.19
Inflow PR	0.97	0.73	0.68
Inflow Rear	0.05	0.04	0.04

## 4. Hydraulic Modelling

A 2D HEC-RAS hydraulic model has been set up to model the overland flow path traversing the site. The model extends to the same flow area as per the neighbouring flood report.

### 4.1. Terrain

The 2D surface terrain was generated using LIDAR sourced from ELVIS – Elevation and Depth – Foundation Spatial Data. This terrain was slightly modified to include the as-con earthworks survey for 55-81 Sweets Road, Pallara.

### 4.2. 2D Model Set up

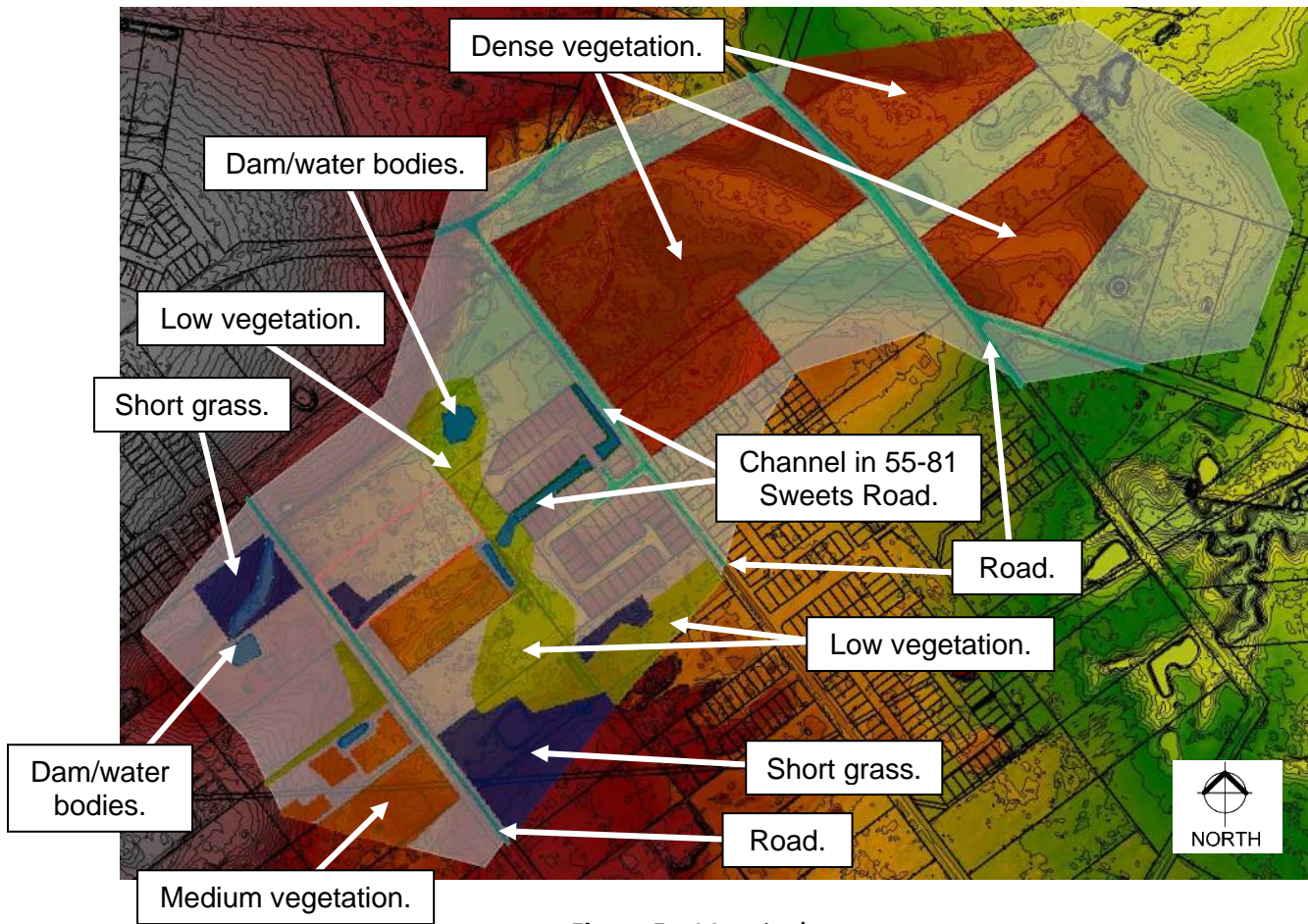
2x2m 2D grid with a 1.0 second model time step has been adopted.

### 4.3. Manning's n

Lane use mapping based on aerial imagery was used to define various surface types within the modelled area. Refer to Table 2 below for the Manning's n surface roughness values have been used in the hydraulic modelling, and Figure 5 for their location. These values and areas match the flood report prepared for 70-78 Kraft Road, and 62 Kraft Road, Pallara, prepared by JFP Urban Consultants.

**Table 2 – Manning's n values**

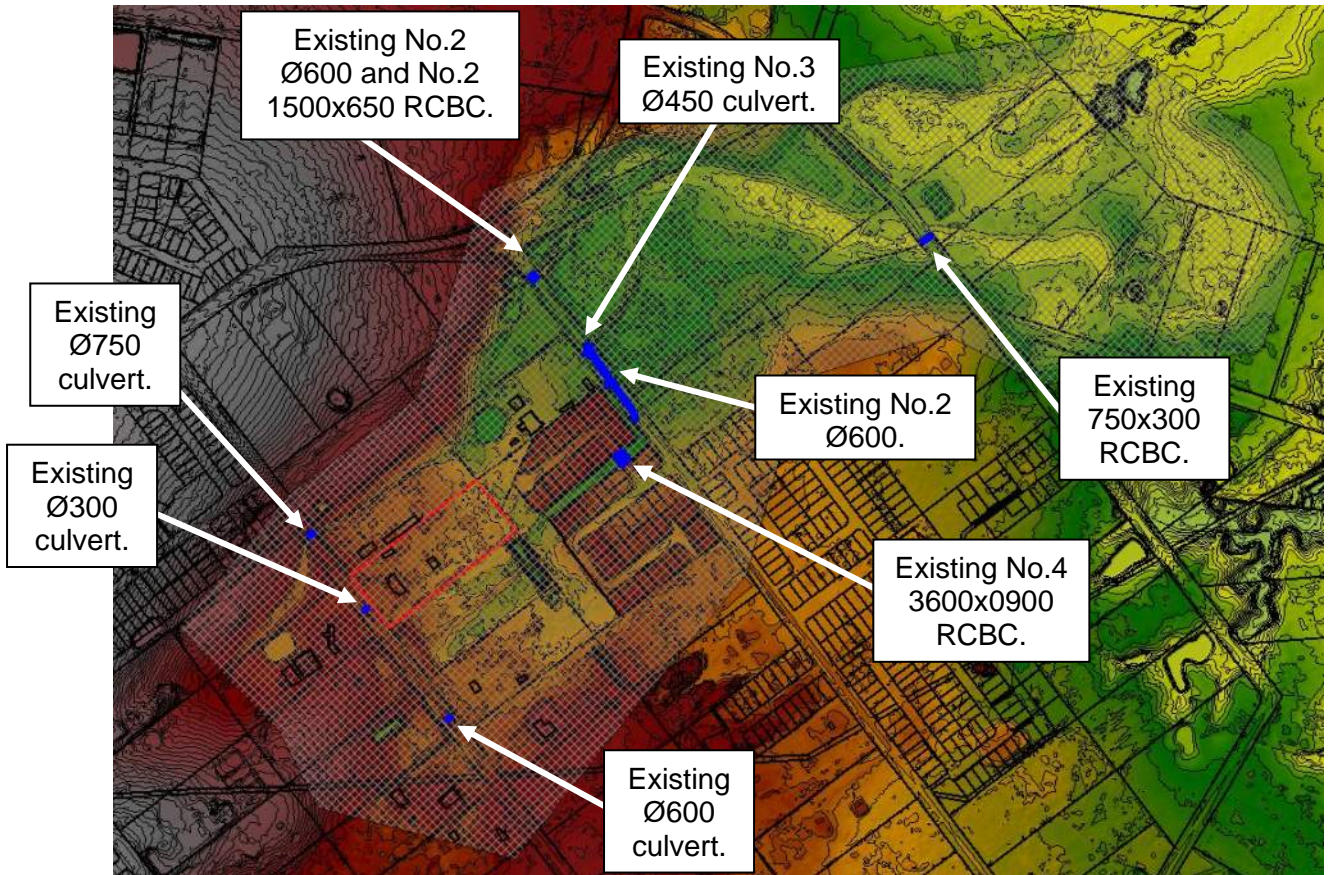
Land Use Description	Manning's n
Base Manning's n	0.040
Bitumen roads	0.020
Dams and water bodies	0.035
Base of channel at 55-81 Sweets Road	0.035
Short grass	0.045
Batters of channel at 55-81 Sweets Road	0.050
Low vegetation	0.060
Medium vegetation	0.100
Dense vegetation	0.150
Obstructions such as on-ground builds and fill areas	Blockages/inactive areas



*Figure 5 – Manning's n areas*

#### 4.4. Culverts

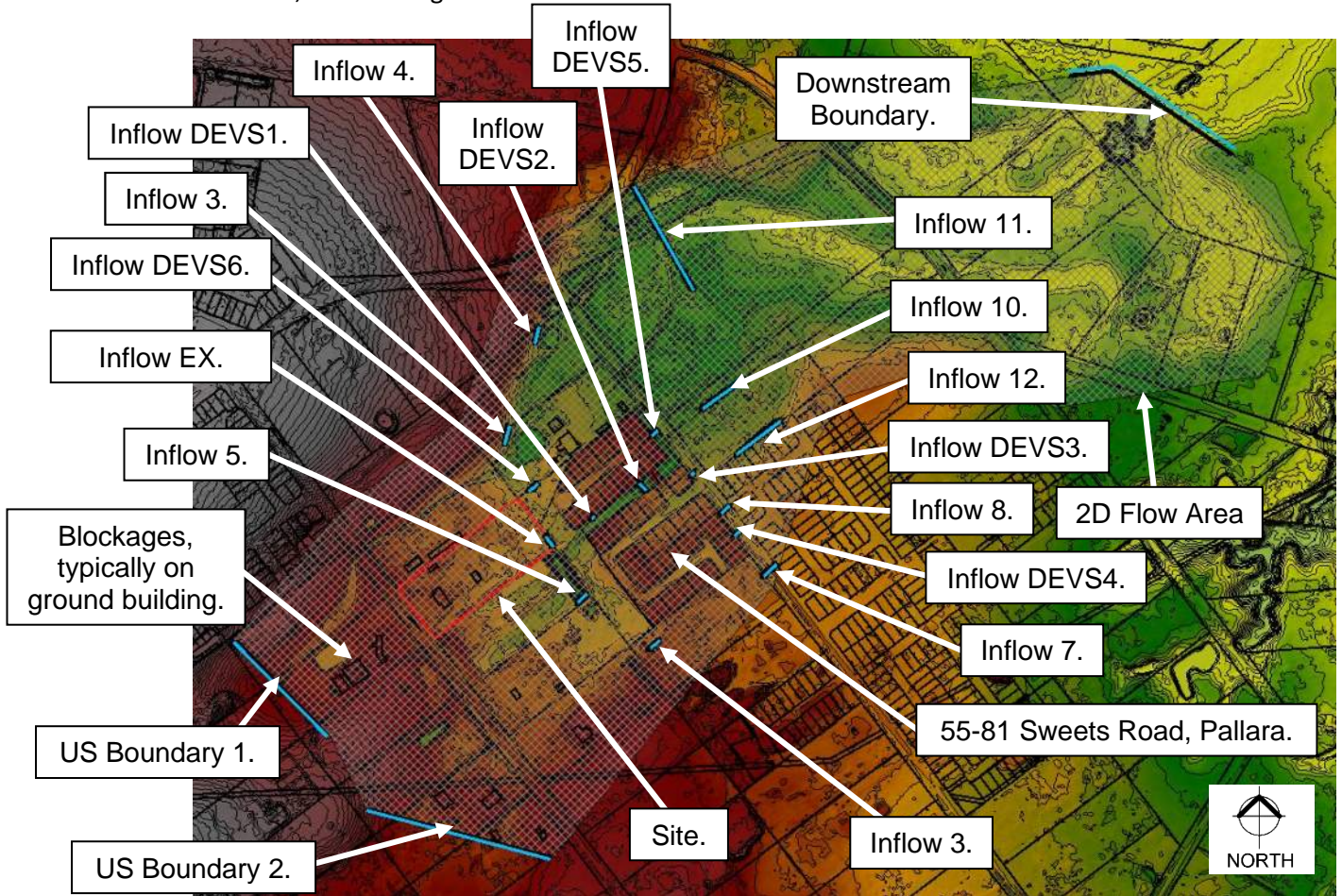
Existing culverts crossing roads were include in the model. The information for these culverts was obtained from survey data or flood reports for nearby developments. Refer to Figure 6 for the location and sizing.



*Figure 6 – Existing Culvert Locations and Sizes*

#### 4.5. Boundary Conditions and Blockages

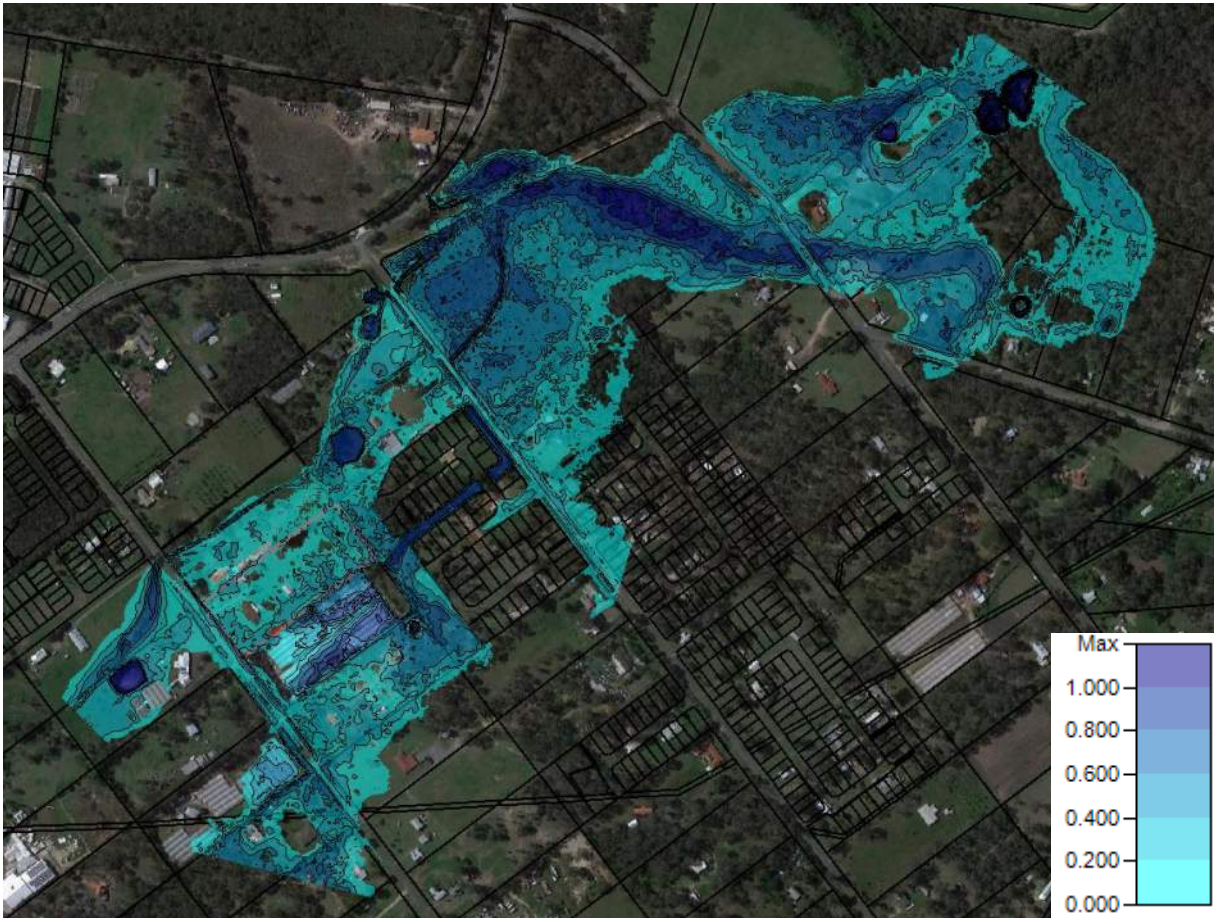
The inflow hydrograph for the 2% AEP storm event for the 60, 90, and 120 minute duration was entered as the inflow conditions. The inflow boundary locations from the neighbouring flood report were adopted. The downstream boundary condition was set to normal friction slope of 0.5% as per the existing grade calculated. Refer to Figure 7 below for the 2D flow area, boundary locations, and blockages modelled.



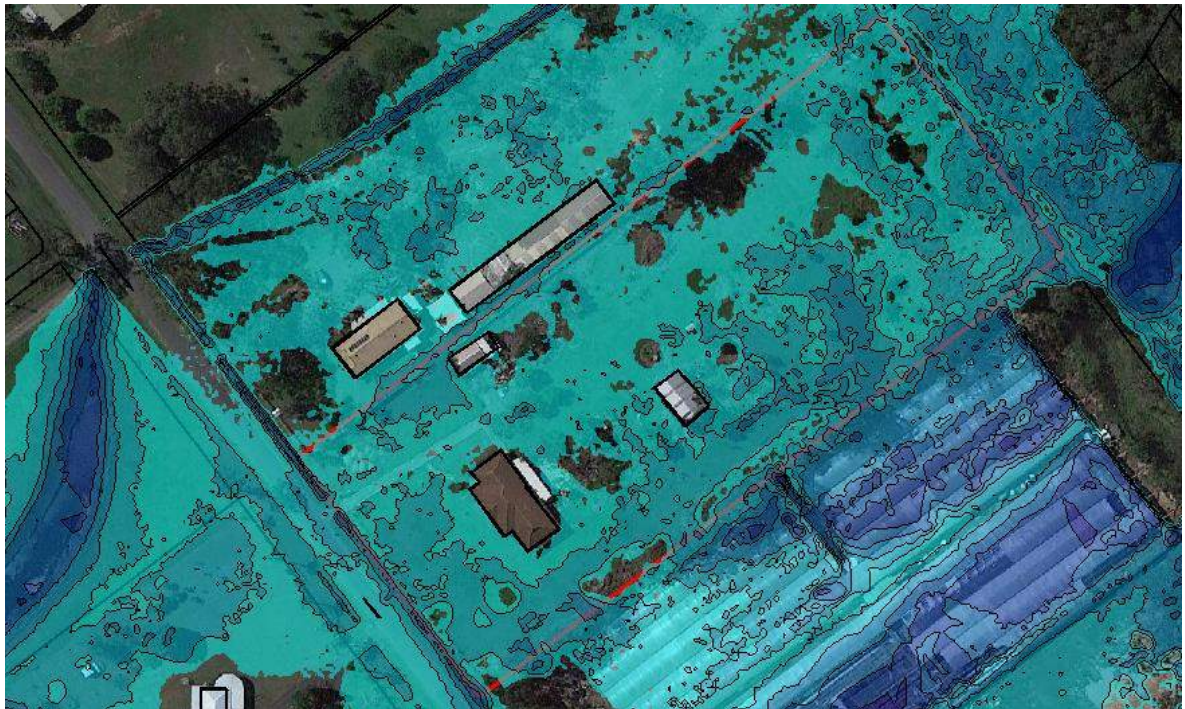
*Figure 7 – HEC-RAS 2D Pre-Development Model Layout*

#### 4.6. Pre-Development Flood Results

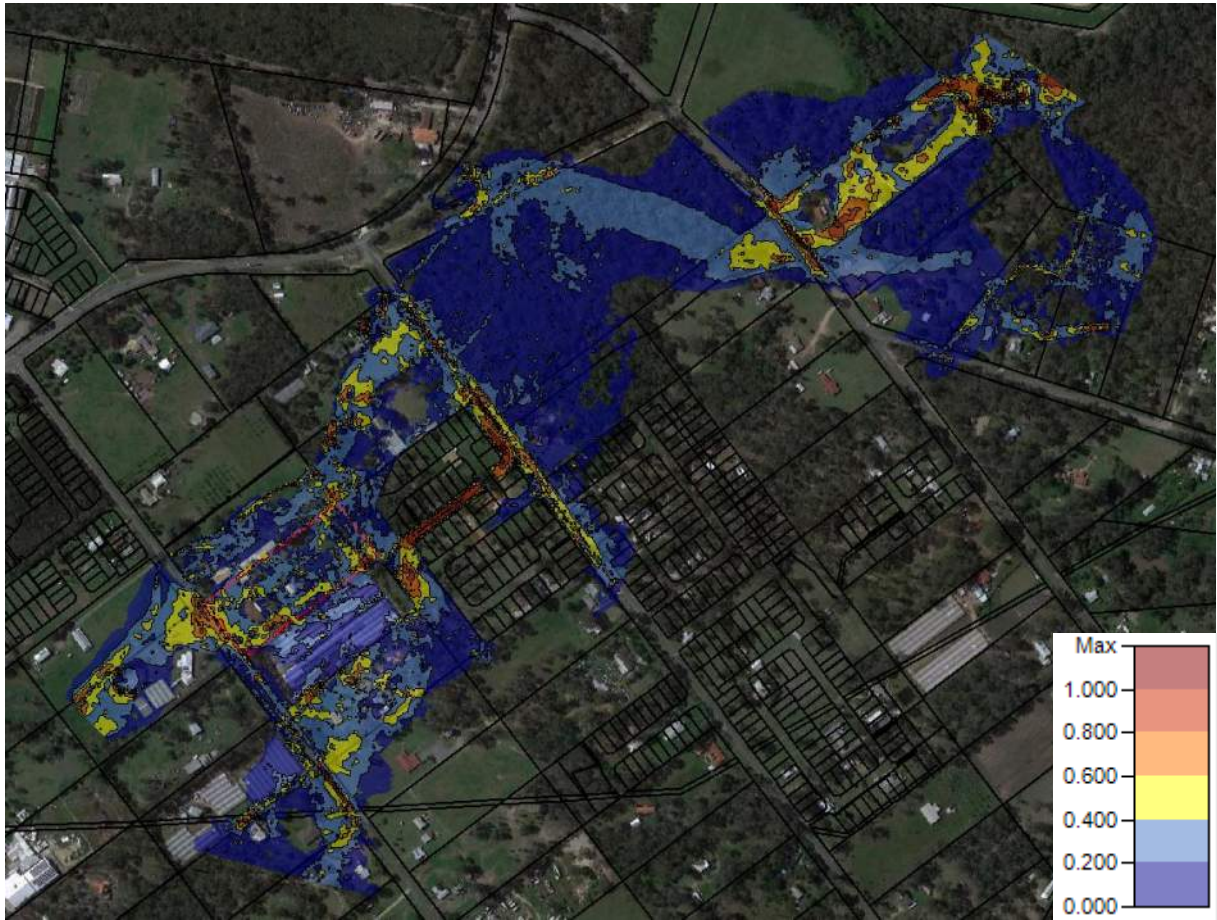
The pre-development flood depth, velocity, velocity depth product, and water surface elevation are shown in Figures 8 to 15 below.



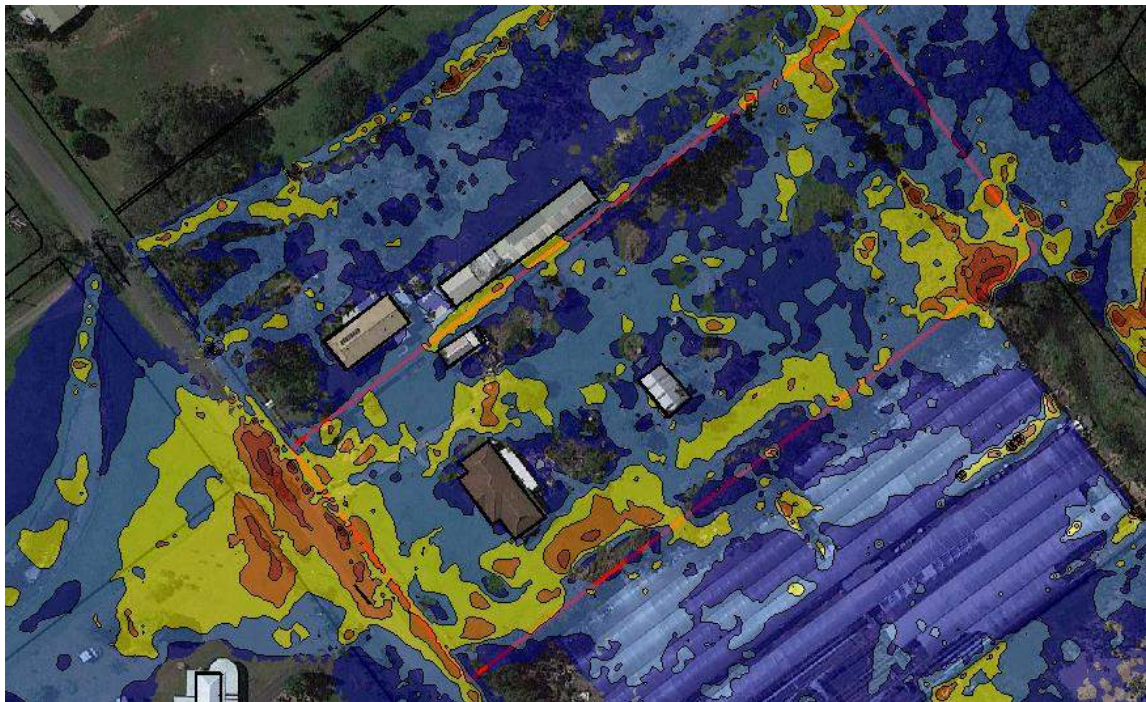
**Figure 8 – Pre-Development 2% AEP 60min flood depths (m)**



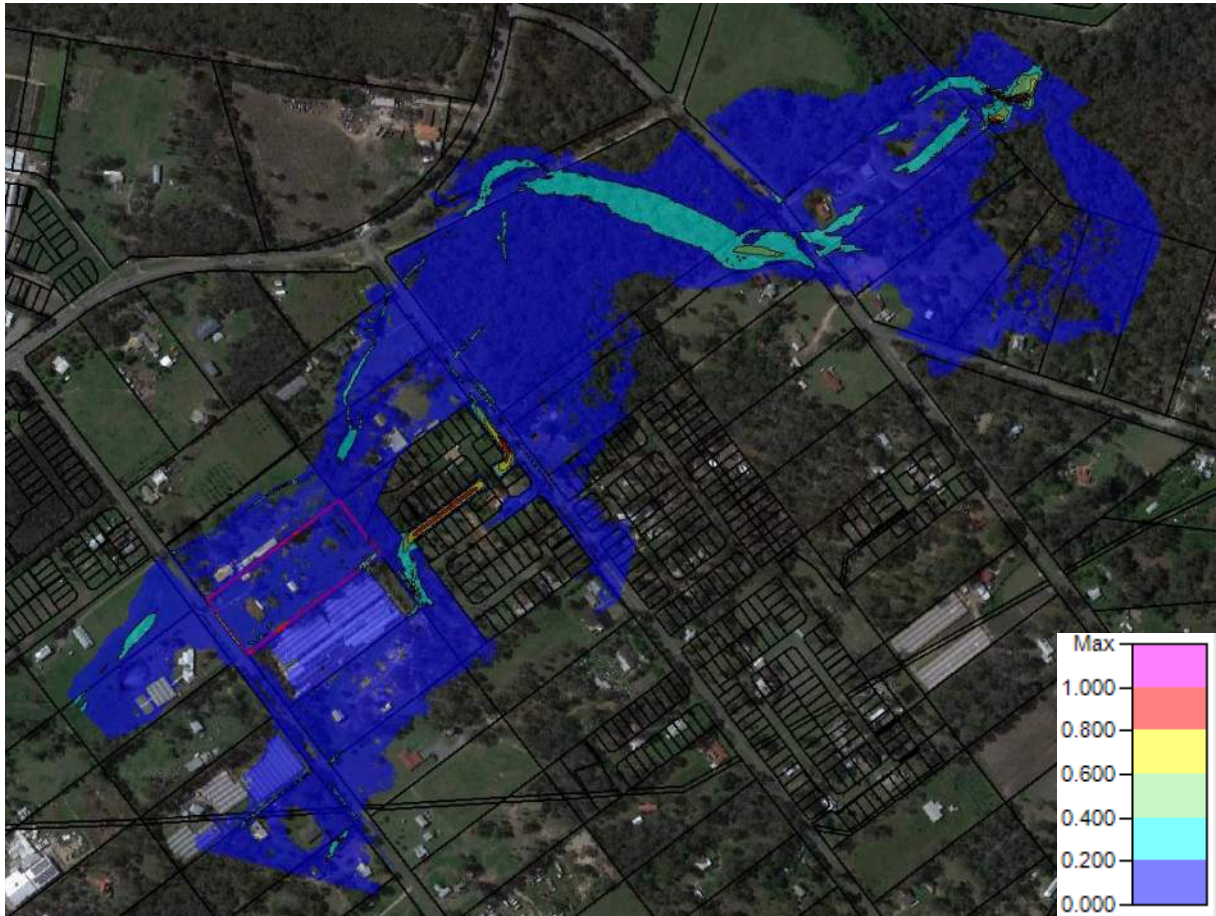
**Figure 9 – Pre-Development 2% AEP 60min flood depths in meters (Site View)**



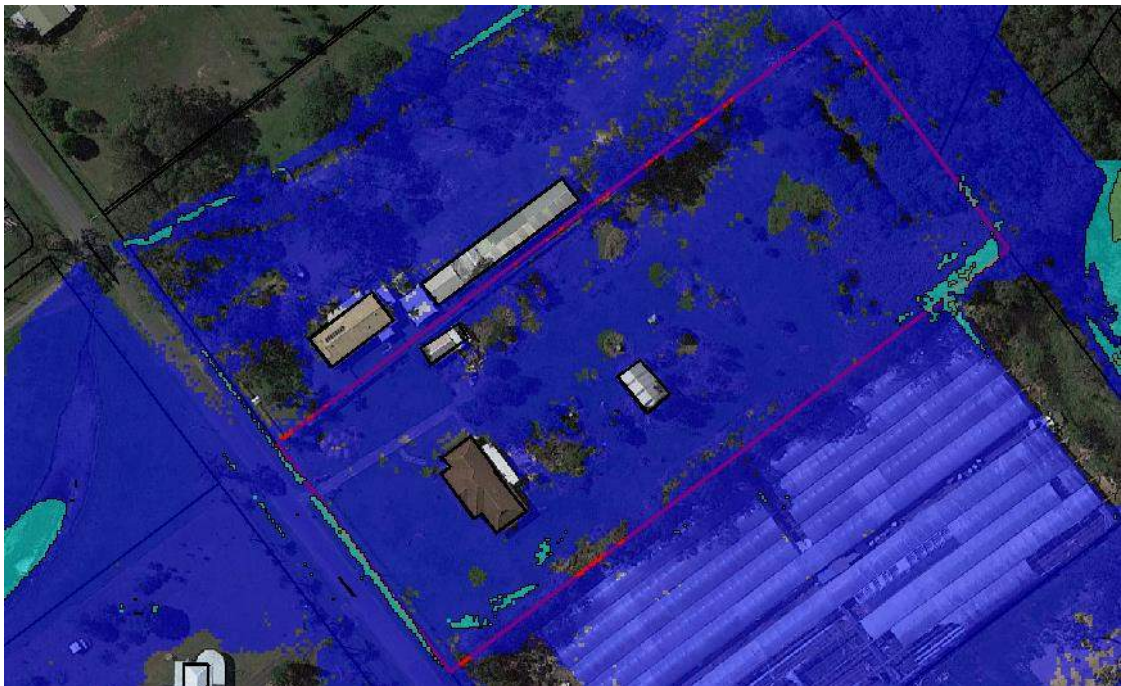
**Figure 10** – Pre-Development 2% AEP 60min flood velocities (m/s)



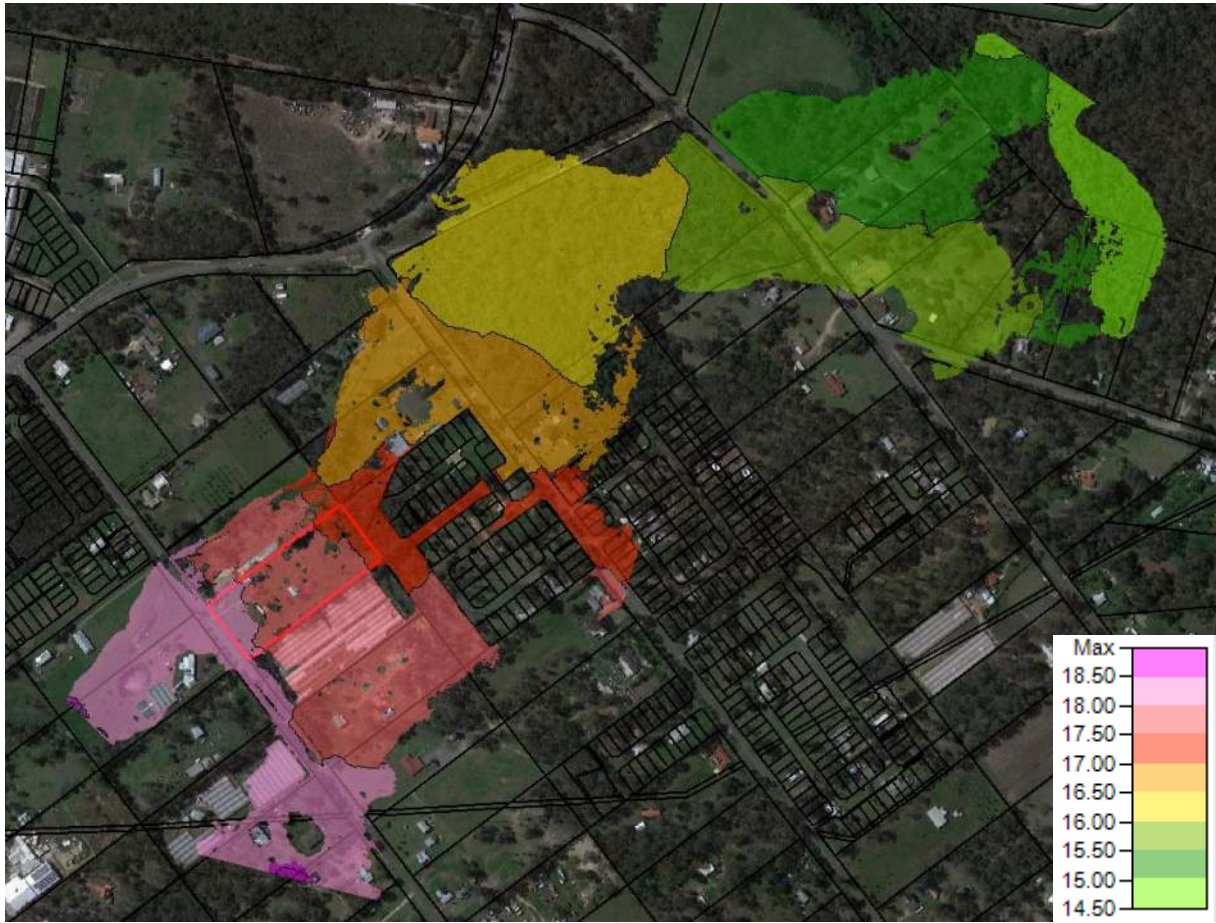
**Figure 11** – Pre-Development 2% AEP 60min velocities in meters/second (Site View)



**Figure 12** – Pre-Development 2% AEP 60min depth velocity products ( $m^2/s$ )



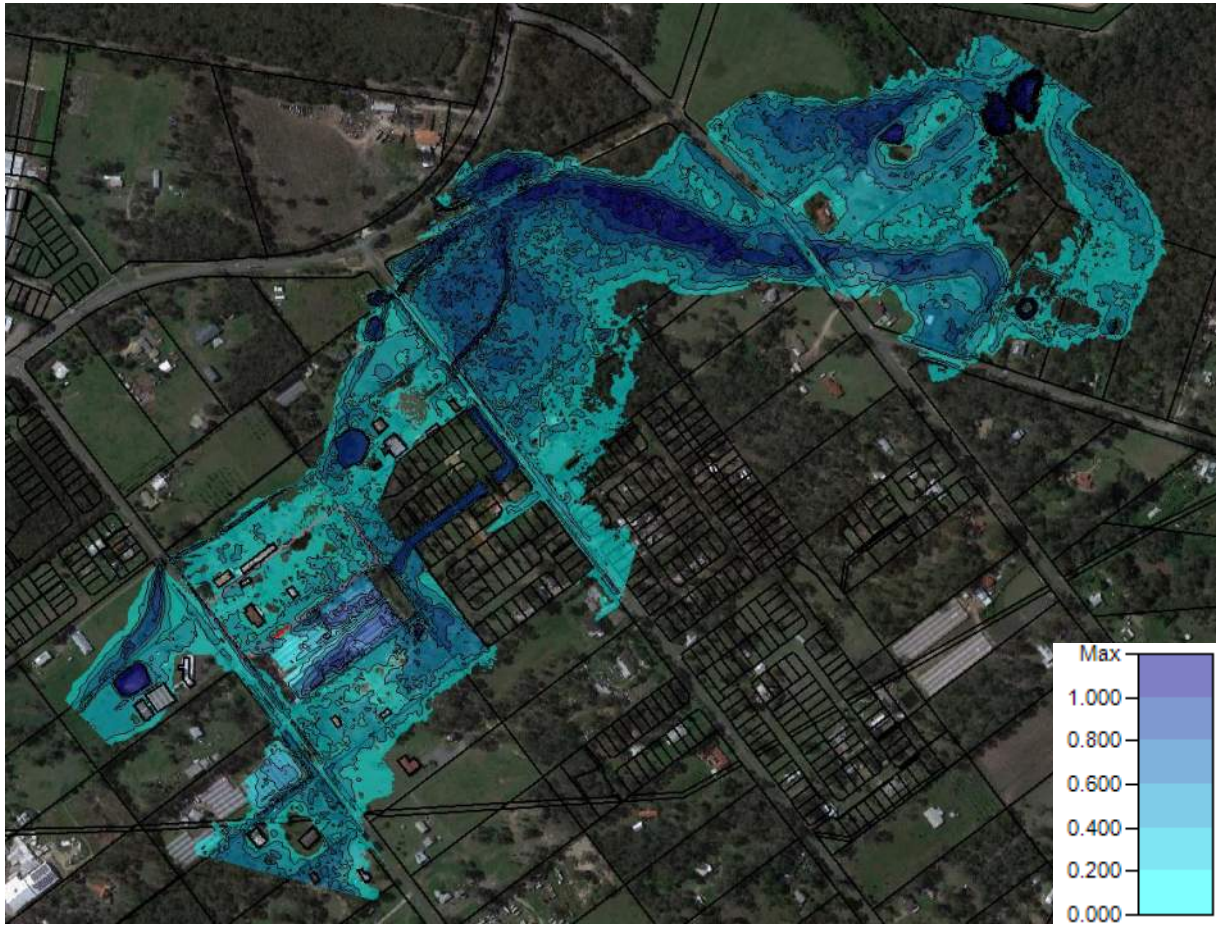
**Figure 13** – Pre-Development 2% AEP 60min depth velocity products in meters<sup>2</sup>/second (Site View)



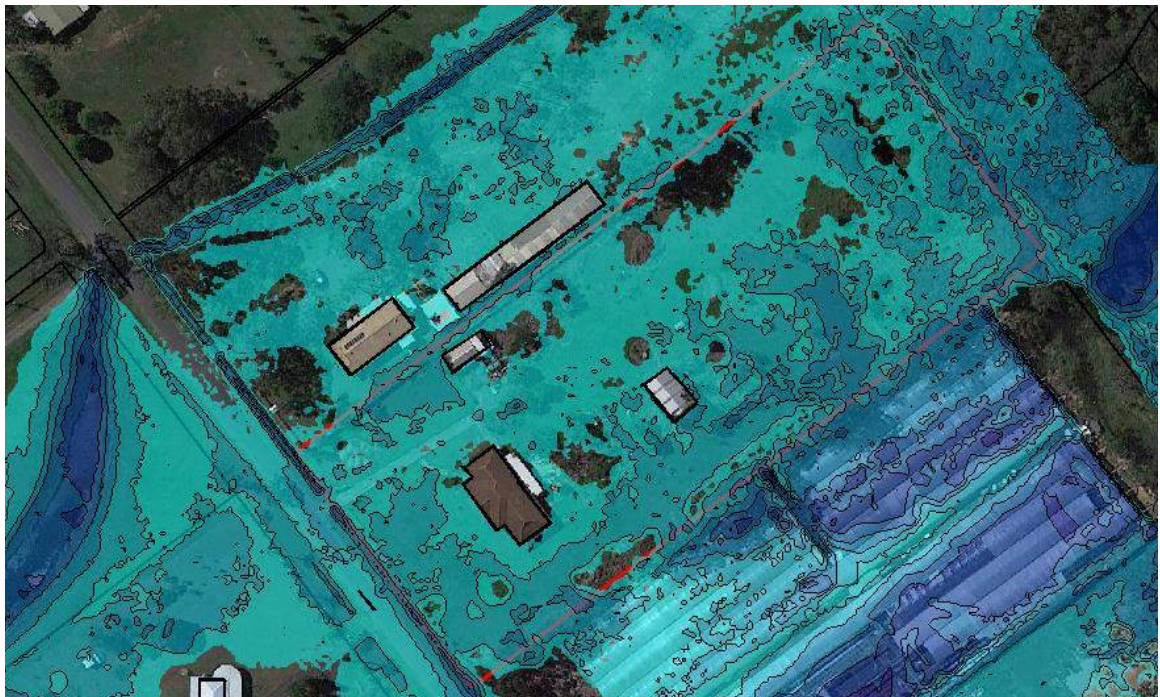
**Figure 14** – Pre-Development 2% AEP 60min water surface elevation (m AHD)



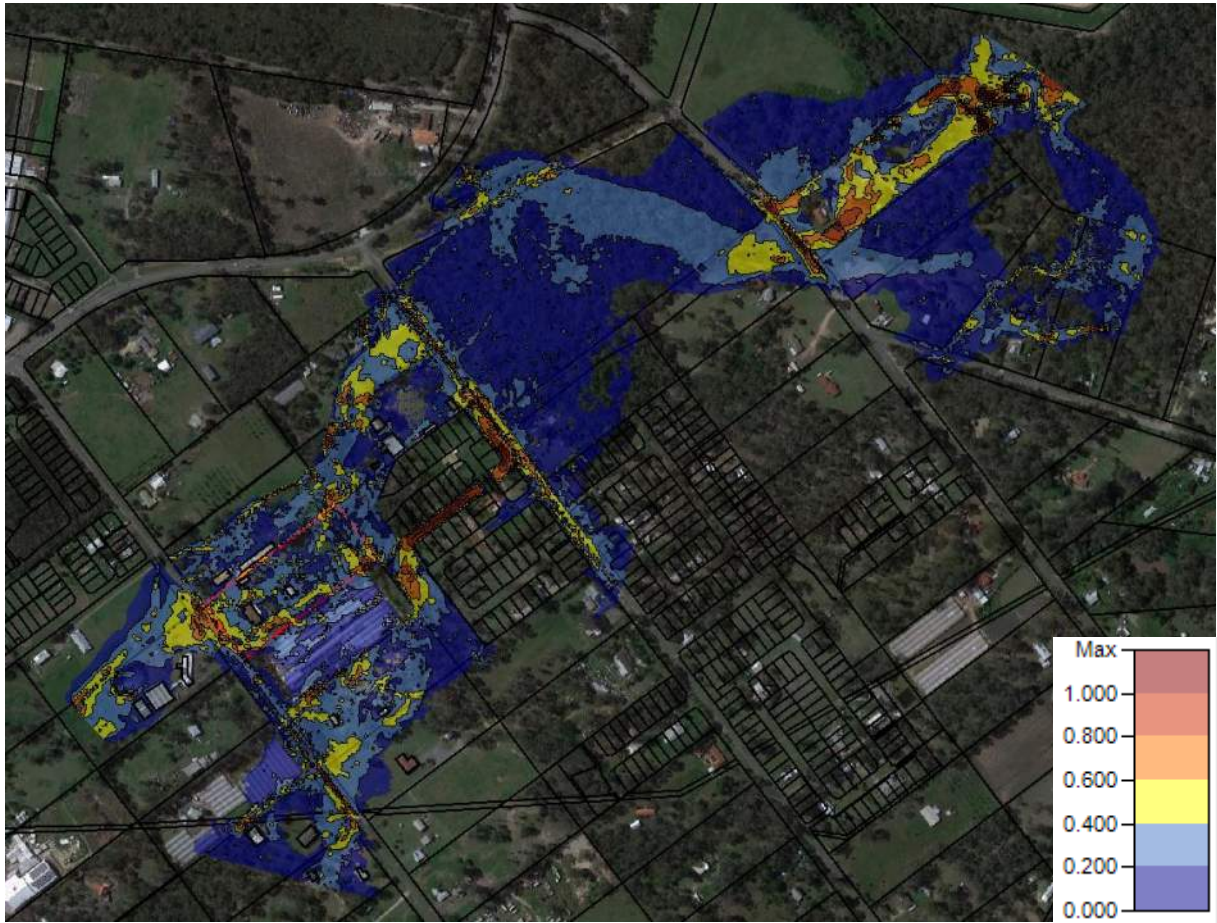
**Figure 15** – Pre-Development 2% AEP 60min water surface elevation in meters AHD (Site View)



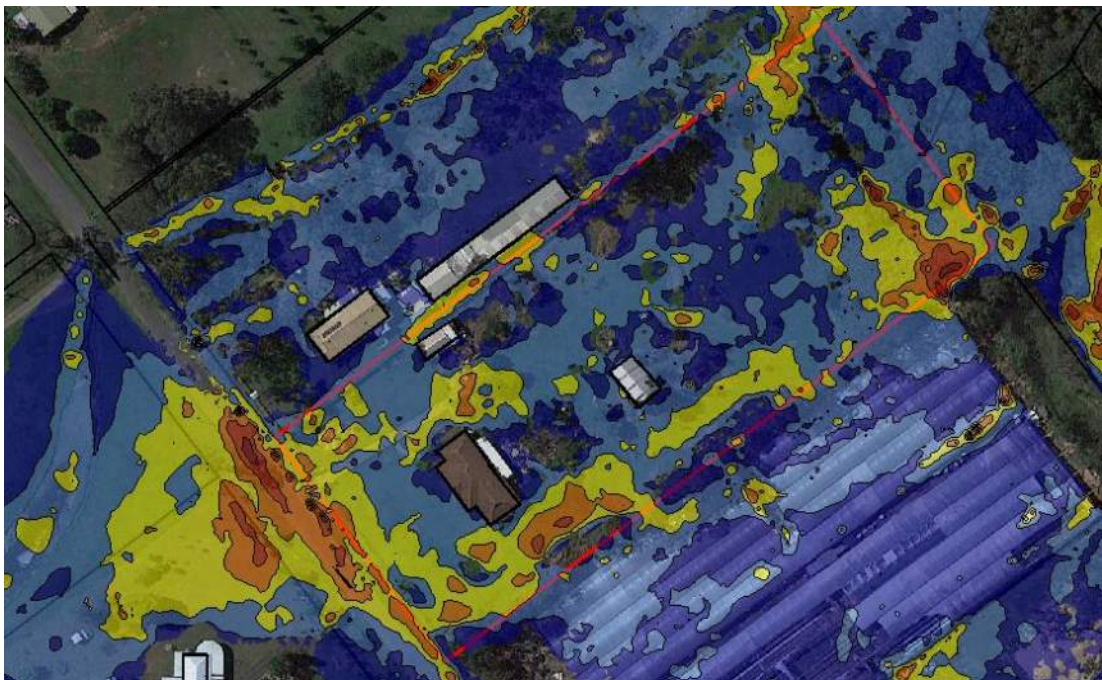
**Figure 16 – Pre-Development 2% AEP 90min flood depths (m)**



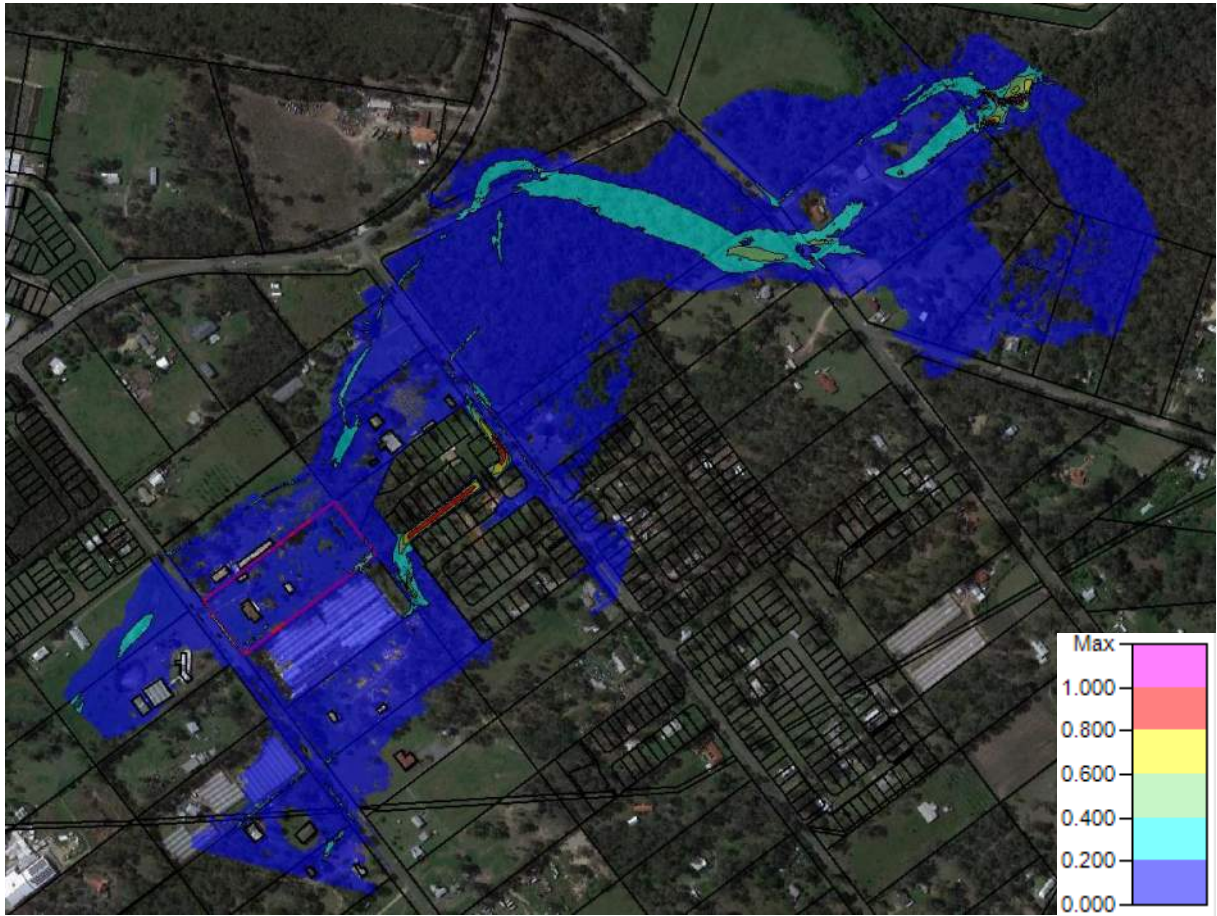
**Figure 17 – Pre-Development 2% AEP 90min flood depths in meters (Site View)**



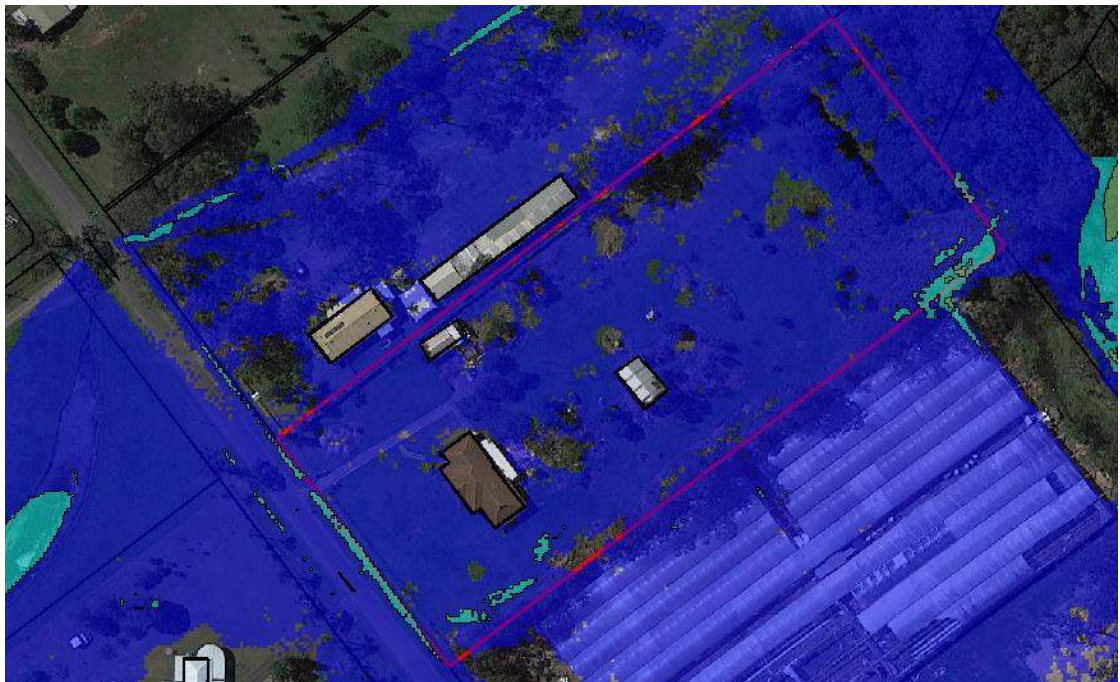
**Figure 18** – Pre-Development 2% AEP 90min flood velocities (m/s)



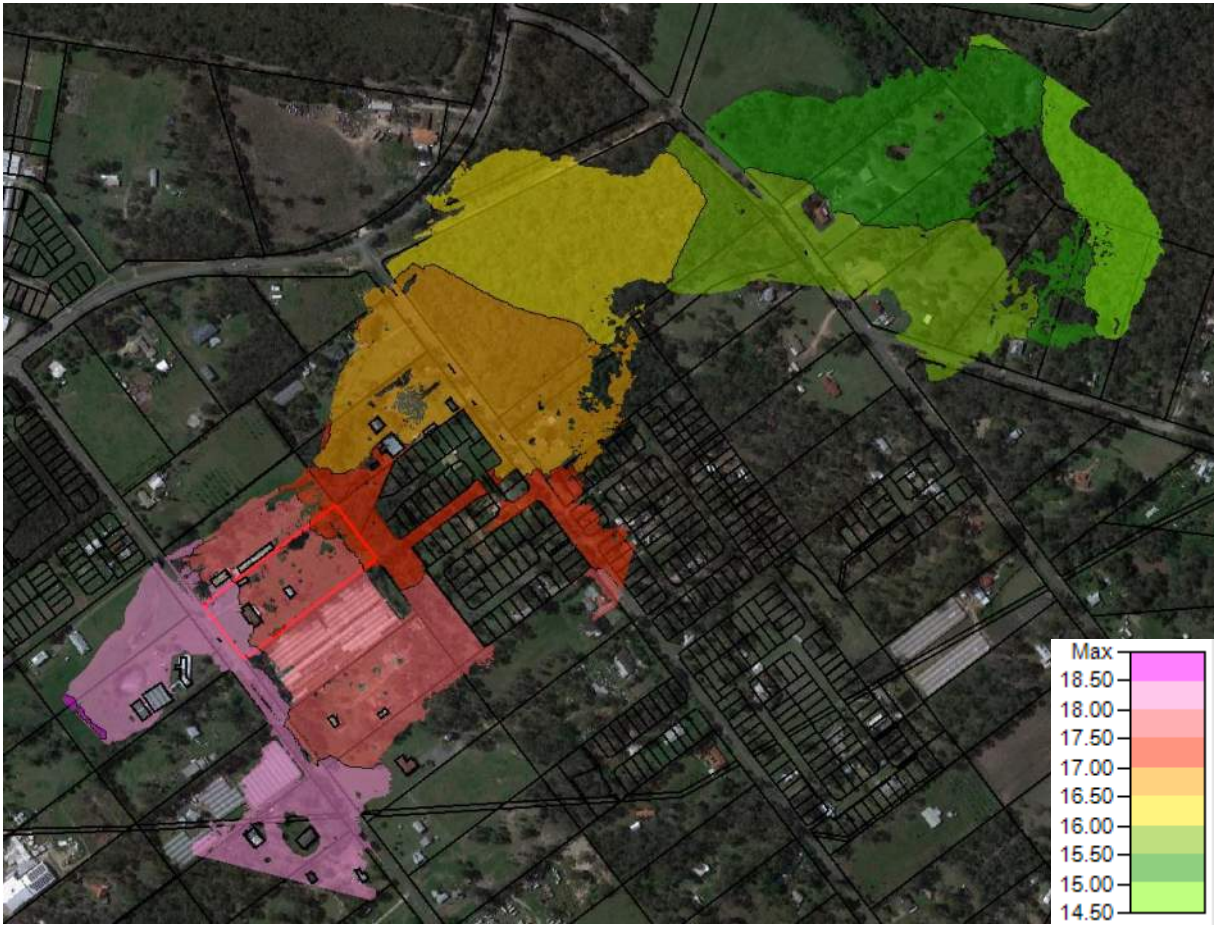
**Figure 19** – Pre-Development 2% AEP 90min velocities in meters/second (Site View)



**Figure 20** – Pre-Development 2% AEP 90min depth velocity products (m<sup>2</sup>/s)



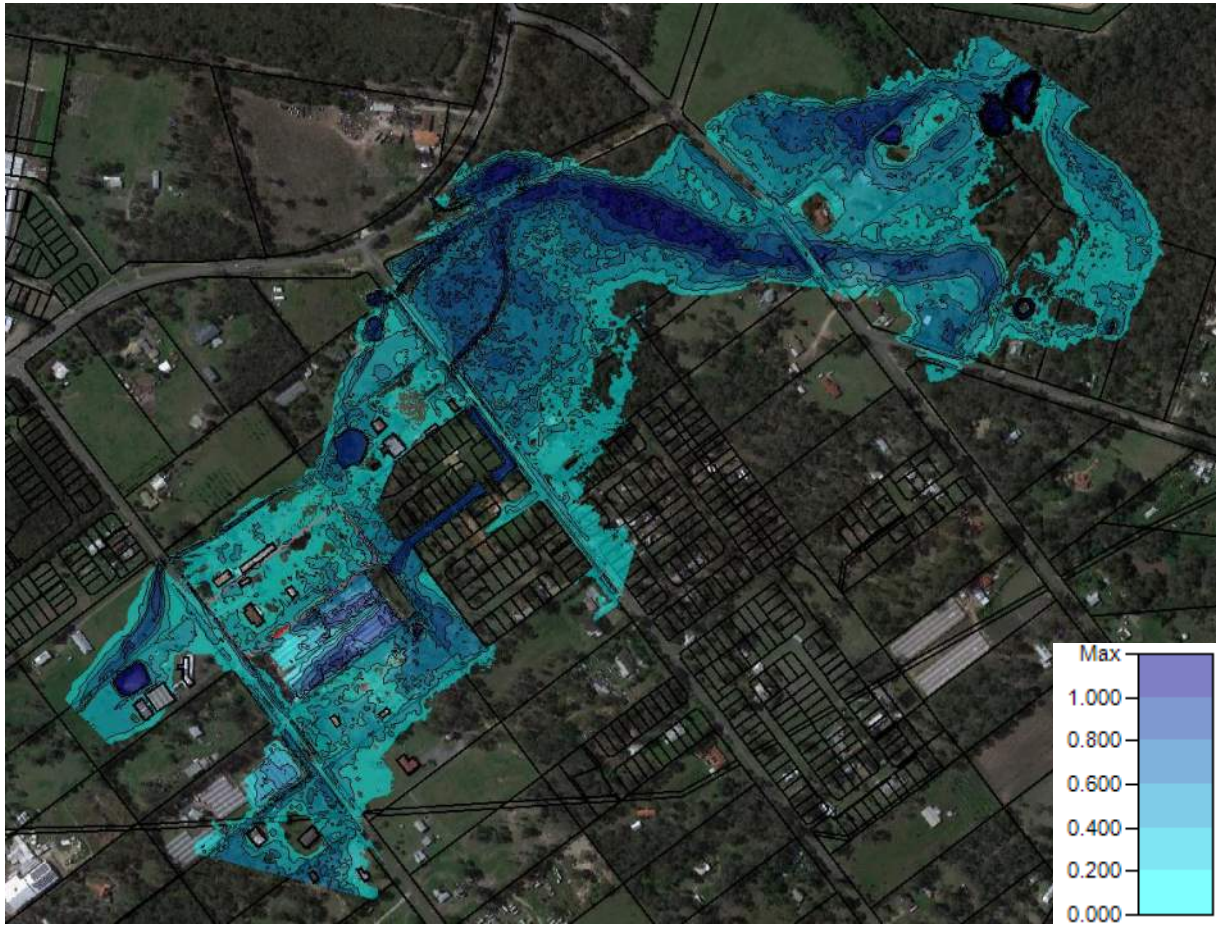
**Figure 21** – Pre-Development 2% AEP 90min depth velocity products in meters<sup>2</sup>/second (Site View)



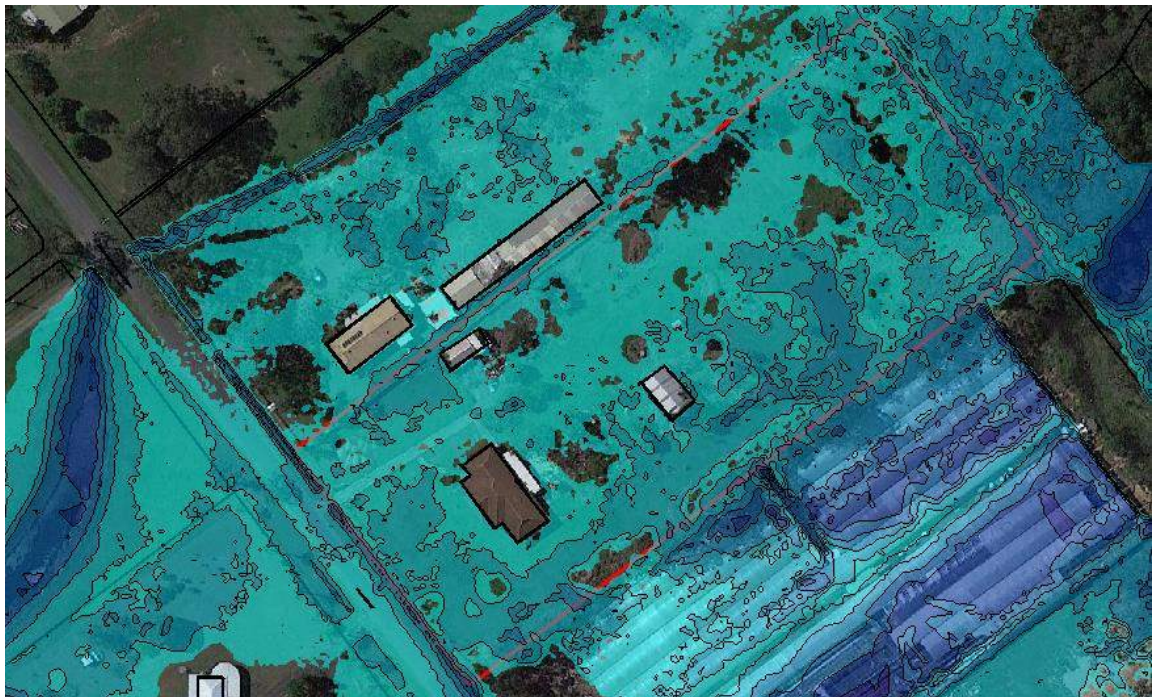
**Figure 22** – Pre-Development 2% AEP 90min water surface elevation (m AHD)



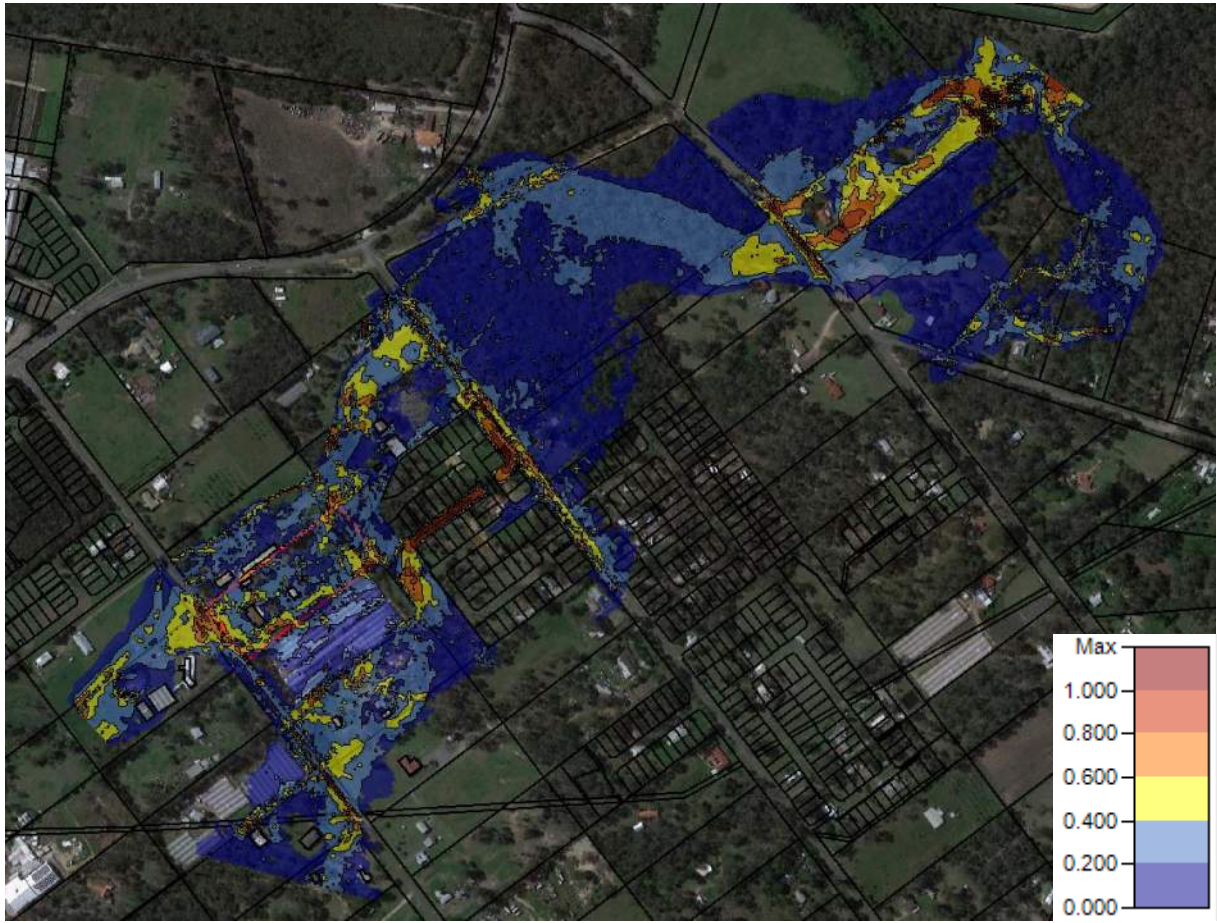
**Figure 23** – Pre-Development 2% 90min AEP water surface elevation in meters AHD (Site View)



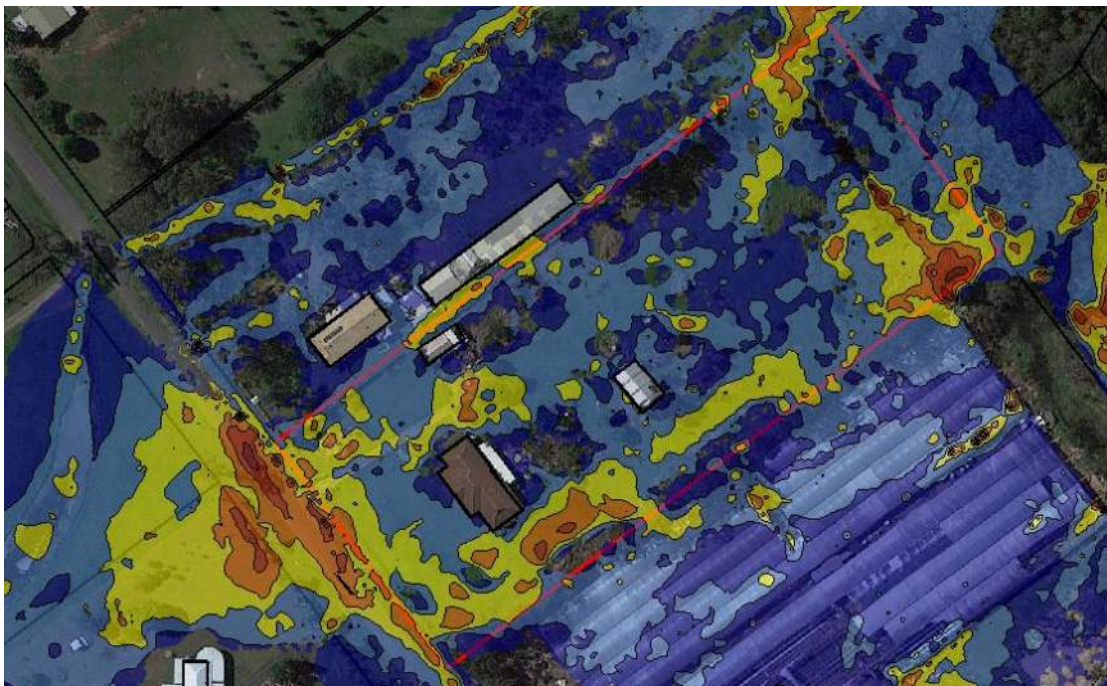
**Figure 24 – Pre-Development 2% AEP 120min flood depths (m)**



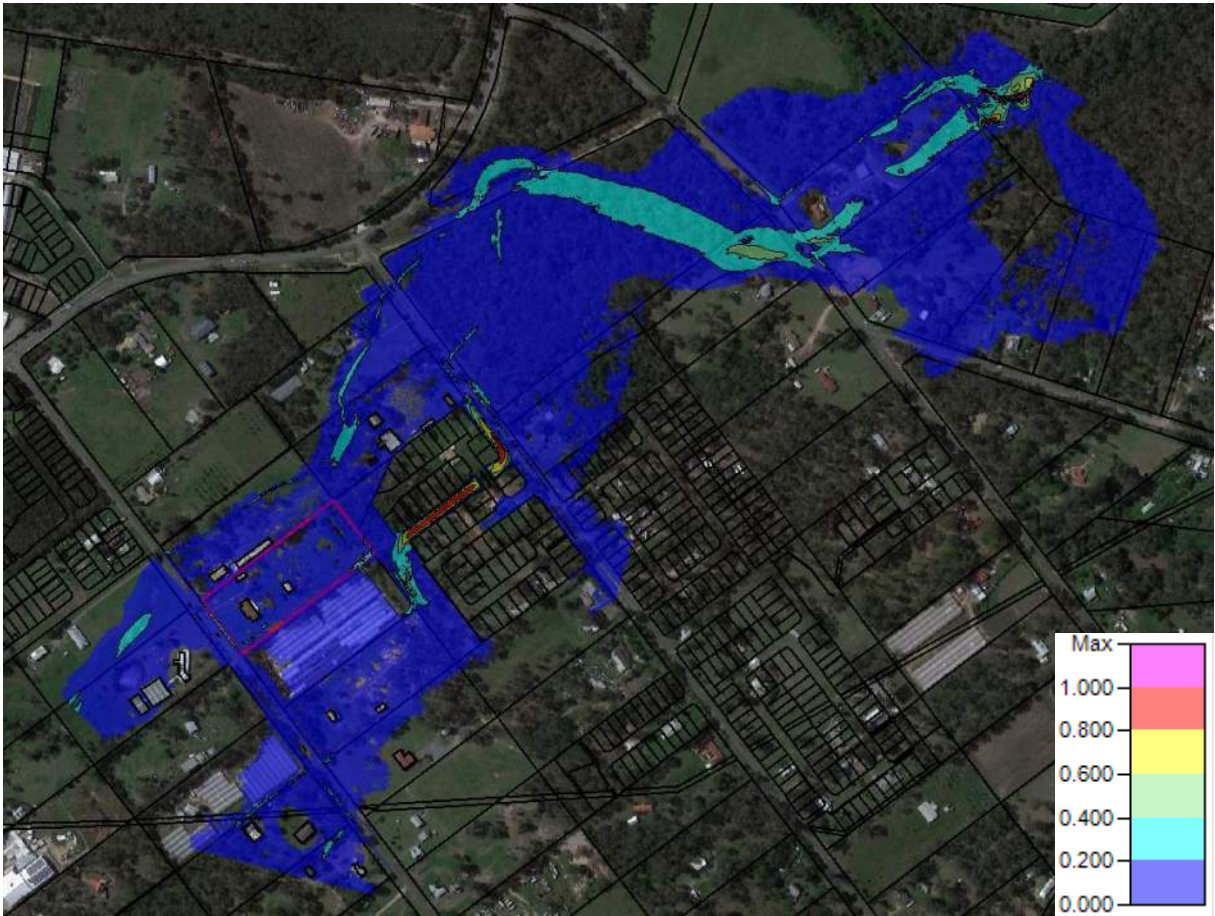
**Figure 25 – Pre-Development 2% AEP 120min flood depths in meters (Site View)**



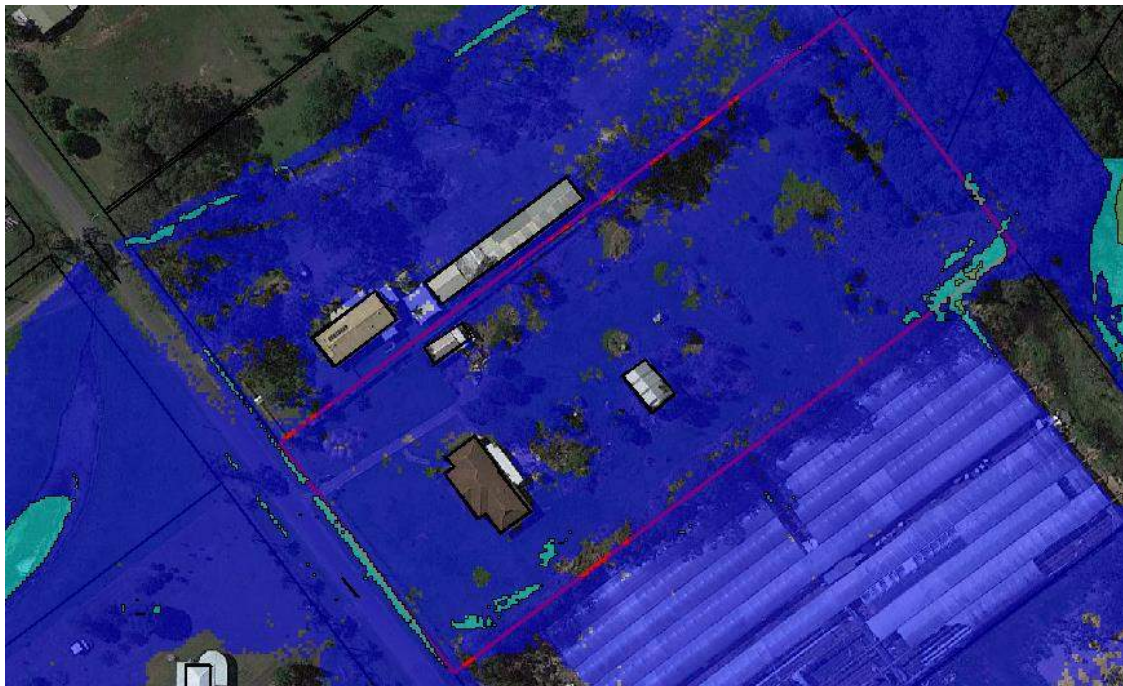
**Figure 26** – Pre-Development 2% AEP 120min flood velocities (m/s)



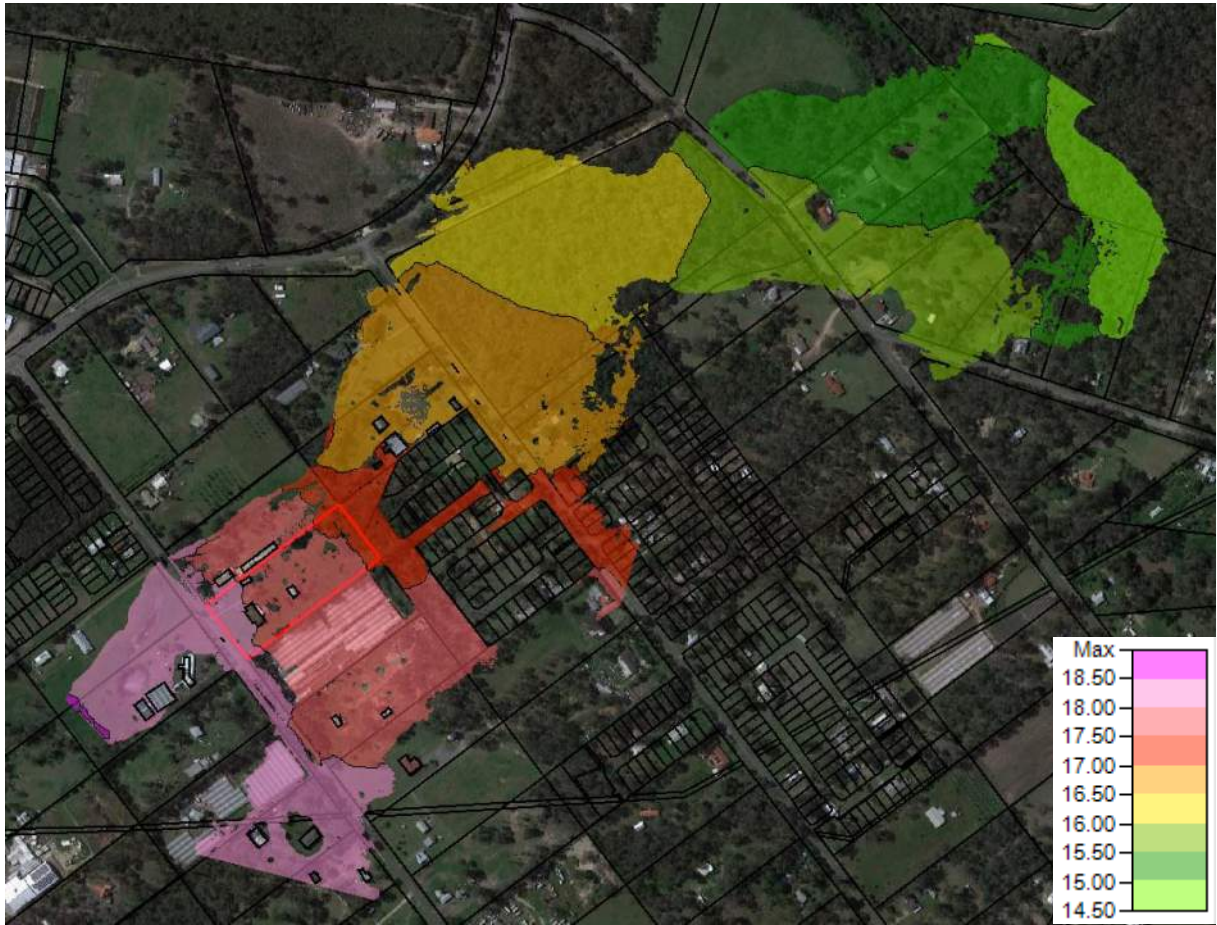
**Figure 27** – Pre-Development 2% AEP 120min velocities in meters/second (Site View)



**Figure 28** – Pre-Development 2% AEP 120min depth velocity products ( $m^2/s$ )



**Figure 29** – Pre-Development 2% AEP 120min depth velocity products in meters<sup>2</sup>/second (Site View)



**Figure 30** – Pre-Development 2% AEP 120min water surface elevation (m AHD)



**Figure 31** – Pre-Development 2% 120min AEP water surface elevation in meters AHD (Site View)

#### **4.7. Summary of Pre-Development Results**

The modelling shows that the site is affected by overland flow during the 2% AEP storm event, for 60, 90, and 120 minute storm durations. The majority of overland flow which impacts the site comes through from the western property boundary fronting Kraft Road, via overland flow overtopping the swale/road reserve and discharging through the site to the north-east. Some overland flow comes from 54 Kraft Road, entering the south-eastern corner of the site before the dam/earthworks structure located in the rear of this lot. Majority of the stormwater runoff leaves the site via the north-east property boundary, and is conveyed north, with a smaller amount of runoff being conveyed south through 55-81 Sweets Road stormwater channel.

##### **4.7.1. Maximum Flood results**

The 120 minute storm duration resulted in the maximum flood values for the site. The site has a maximum depth of approximately 0.620m located at the southern property boundary of the site, with typical flood depths between 0.100m to 0.400m within the site. The peak flood level is 18.220 mAHD, located at the north-western corner of the site. The maximum flood velocity within the site is 1.100m/s located towards the eastern property boundary, with typical velocities around 0.300m/s to 0.500m/s. The maximum depth velocity product is 0.470m<sup>2</sup>/s located towards the eastern property boundary, with typical depth velocity products around 0.100m<sup>2</sup>/s to 0.200m<sup>2</sup>/s within the site.

#### **4.8. Post-Development**

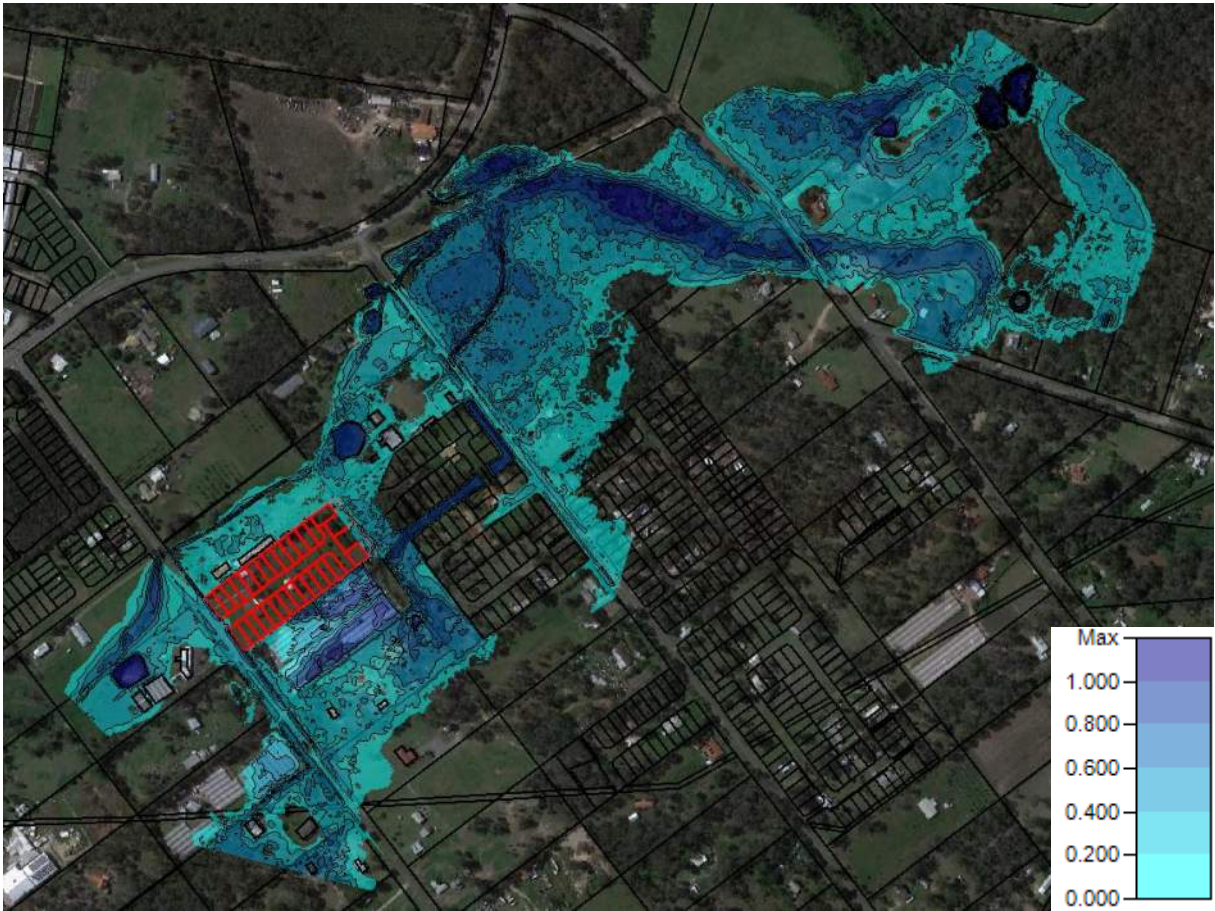
Earthworks are proposed within the site to provide flood immunity. The proposed subdivision layout includes a 10m wide area at the rear of the site which will not be filled. Refer to Appendix A for the Concept Services Sketches. It should be noted that the Kraft Road roadworks modelled complies with Council's request to retain the existing swales, and provide a type G kerb on a 6.25m alignment. Retaining walls have also been modelled as blockages. The pre-development inflow, named Inflow EX, has been removed and replaced with two new inflows, named Inflow PR and Inflow Rear, to model the stormwater discharge from the developed site, and the rear undeveloped area of the site respectively. The post-development terrain has been modified to include the fill proposed. All other variables have remained the same as per the post-development model. Refer to Figure 32 below for the post-development model changes.



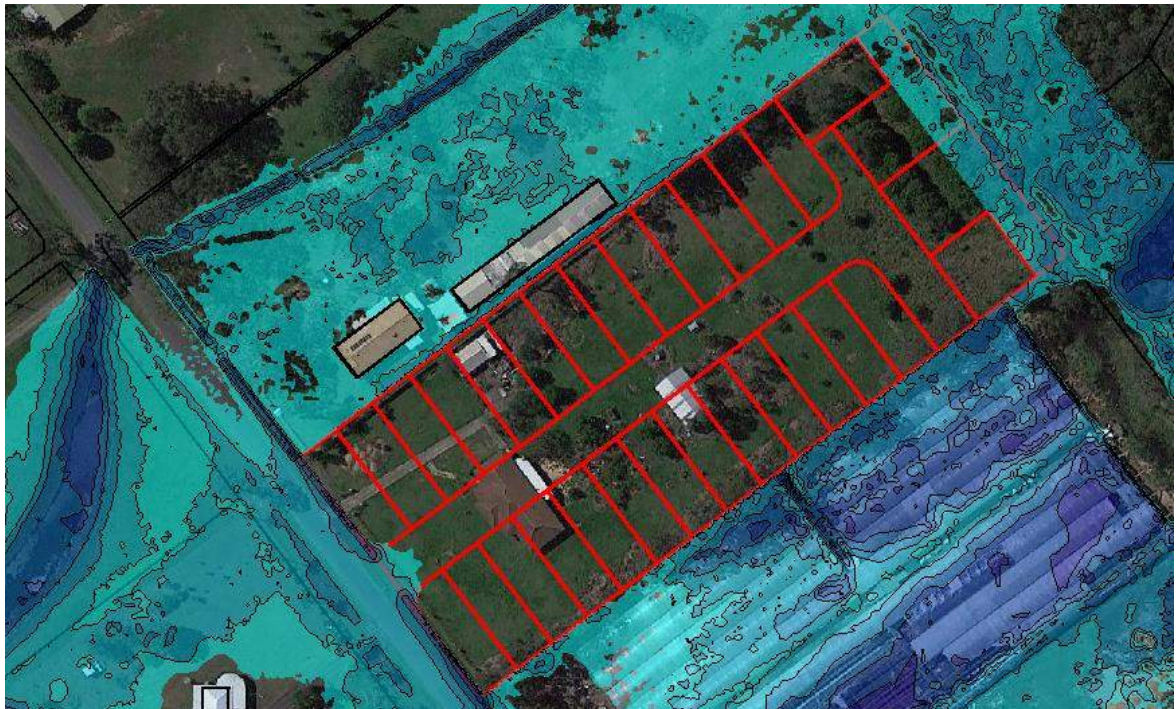
*Figure 32 – HEC-RAS 2D Post-Development Model Layout*

#### **4.9. Post-Development Flood Results**

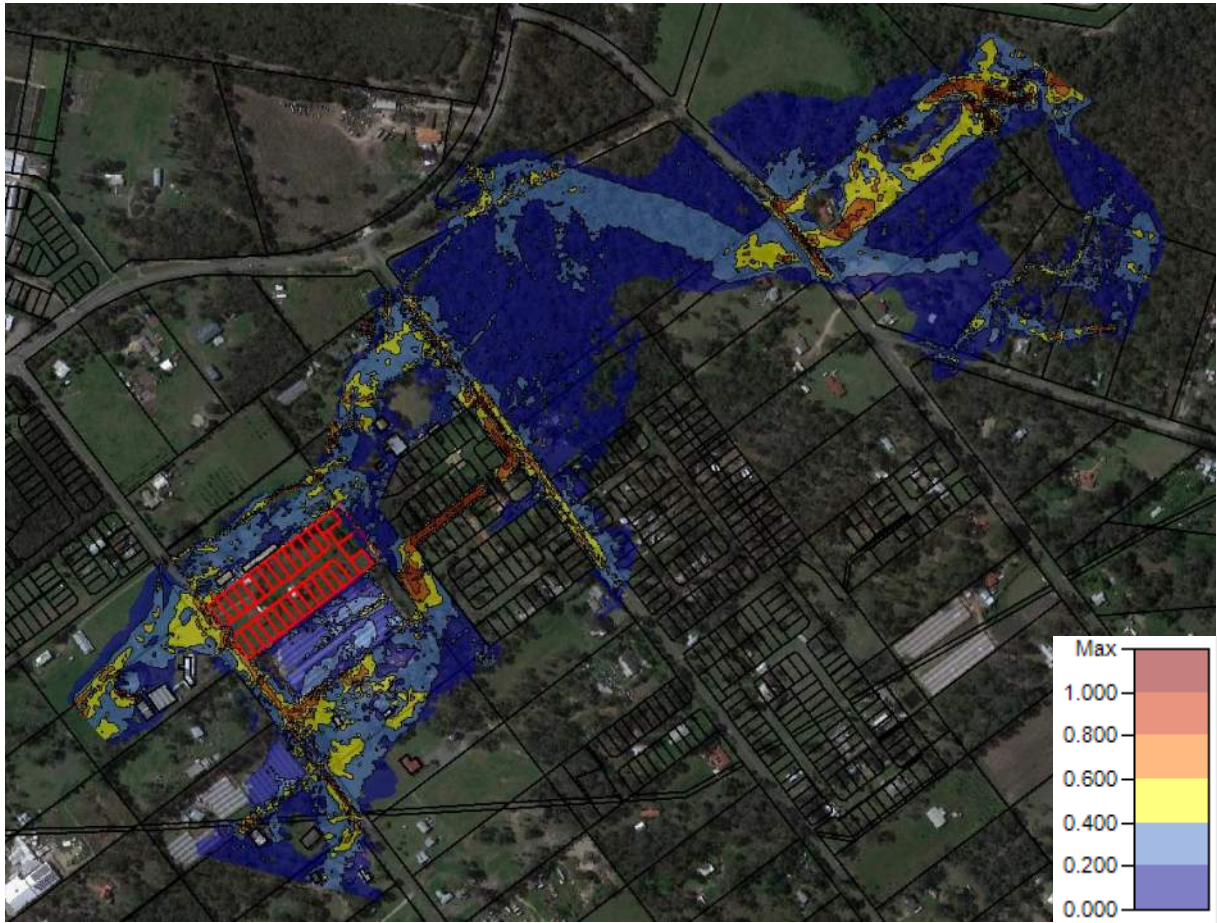
The post-development flood depth, velocity, velocity depth product, and water surface elevation are shown in Figures 33 to 56 below.



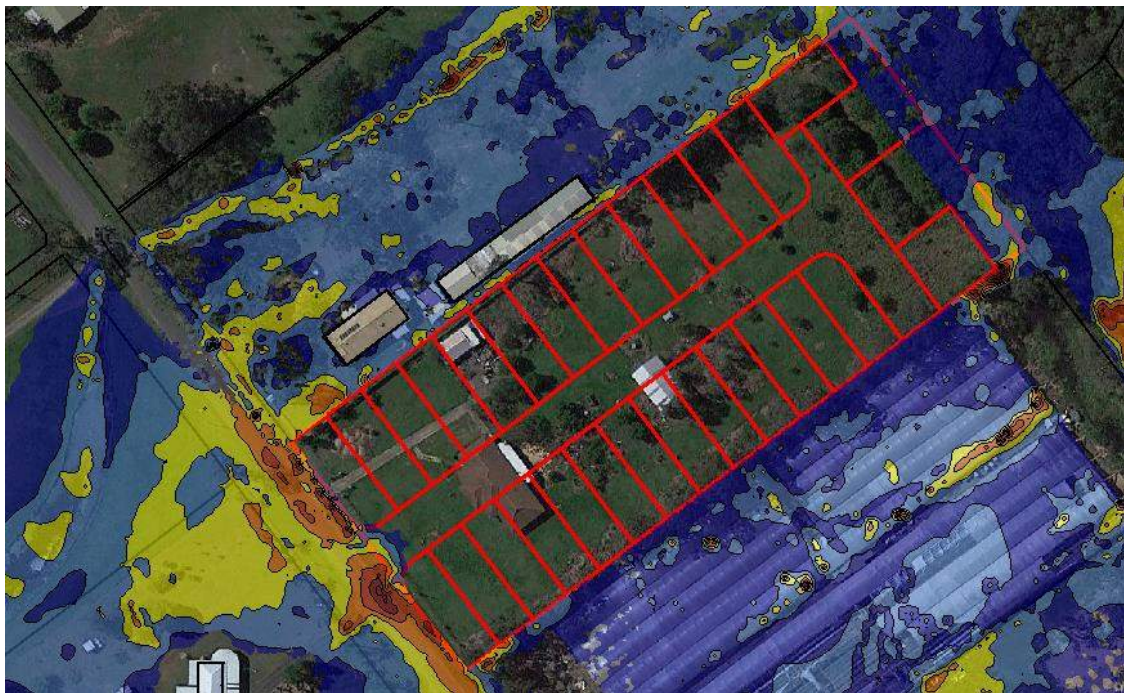
**Figure 33** – Post-Development 2% 60min AEP flood depths (m)



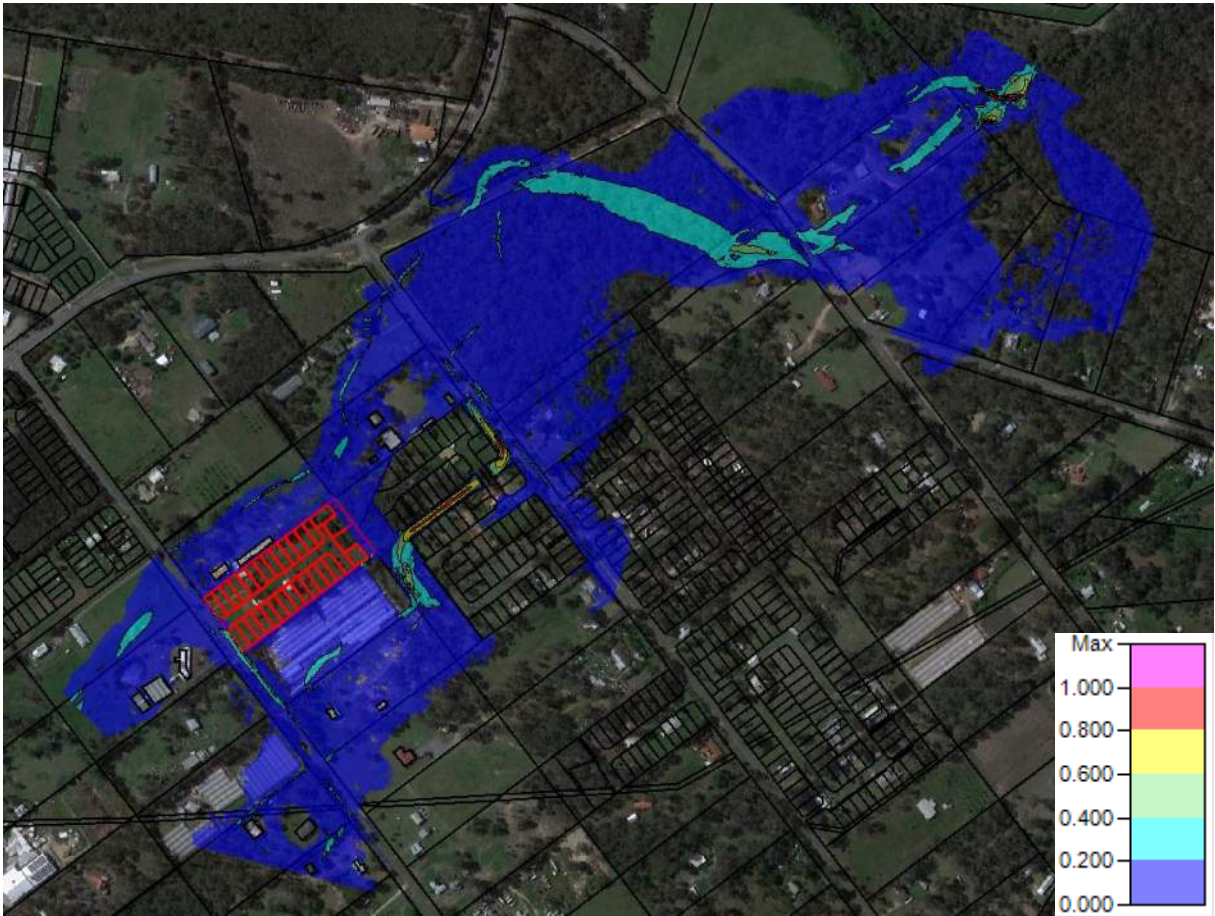
**Figure 34** – Post-Development 2% 60min AEP flood depths in meters (Site View)



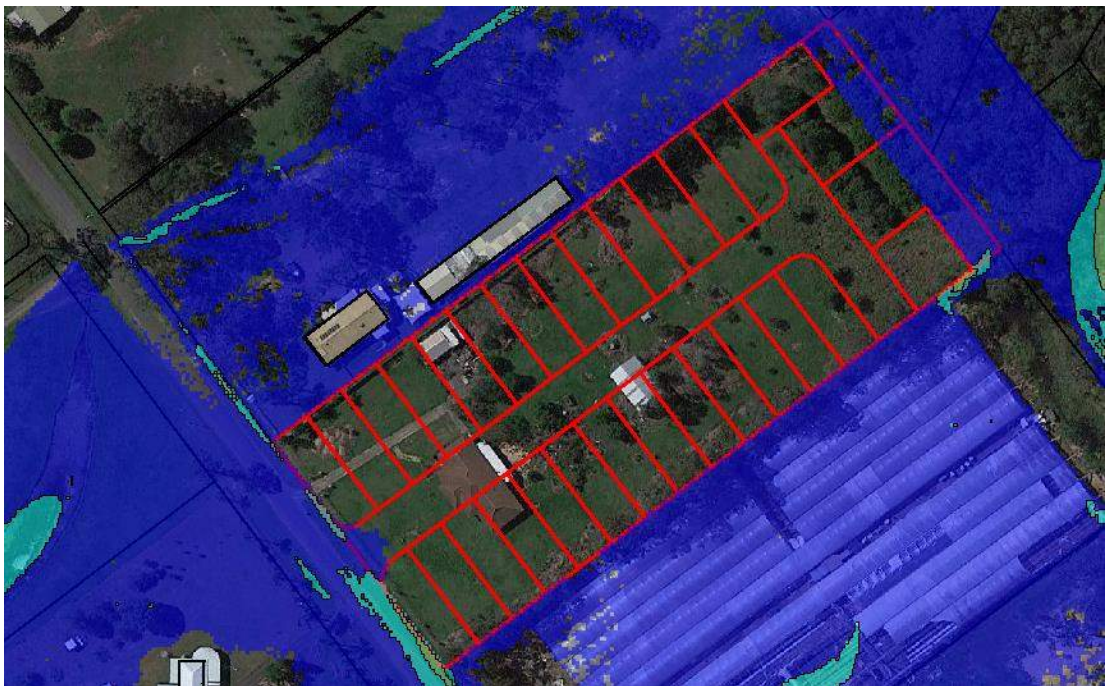
**Figure 35 – Post-Development 2% 60min AEP flood velocities (m/s)**



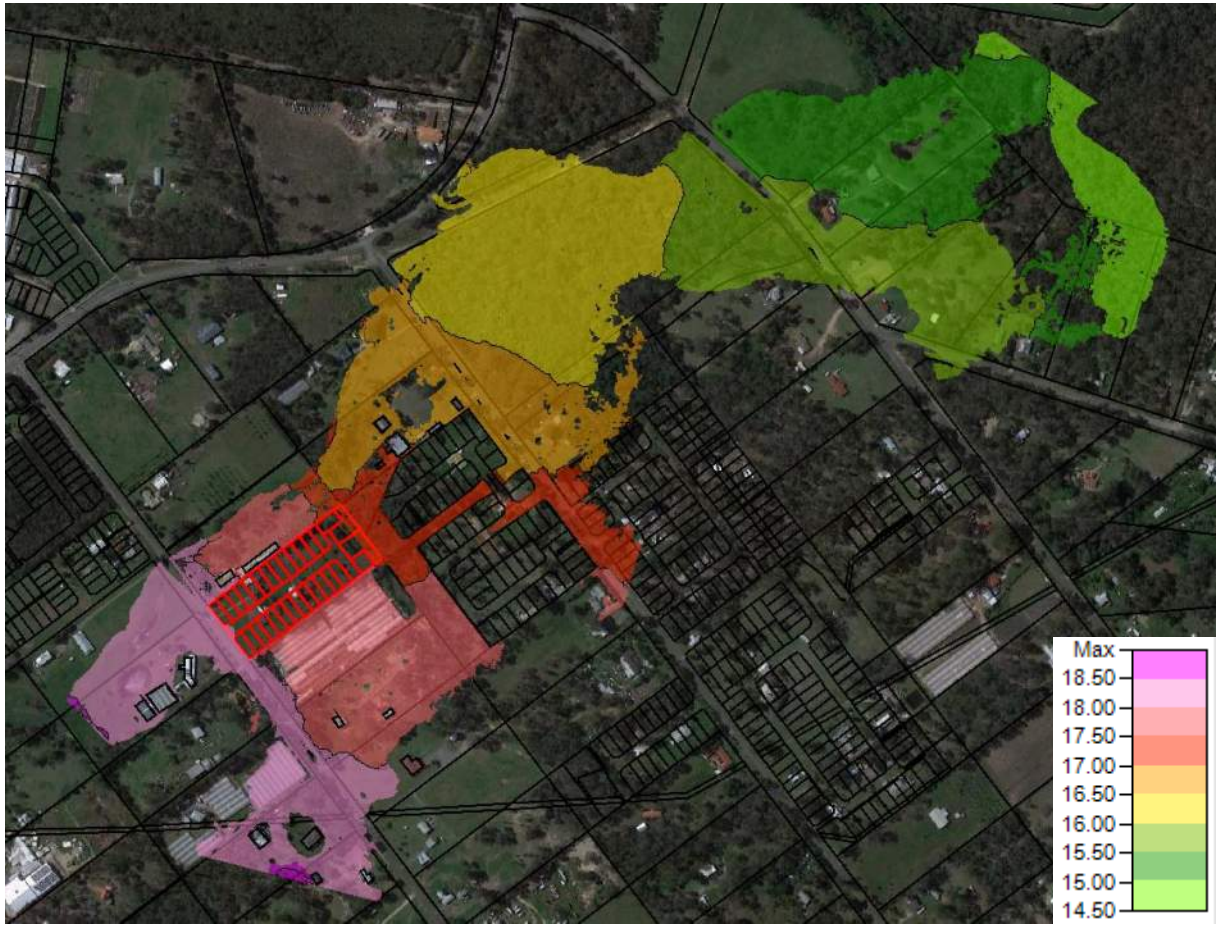
**Figure 36 – Post-Development 2% AEP 60min velocities in meters/second (Site View)**



**Figure 37** – Post-Development 2% AEP 60min depth velocity products (m<sup>2</sup>/s)



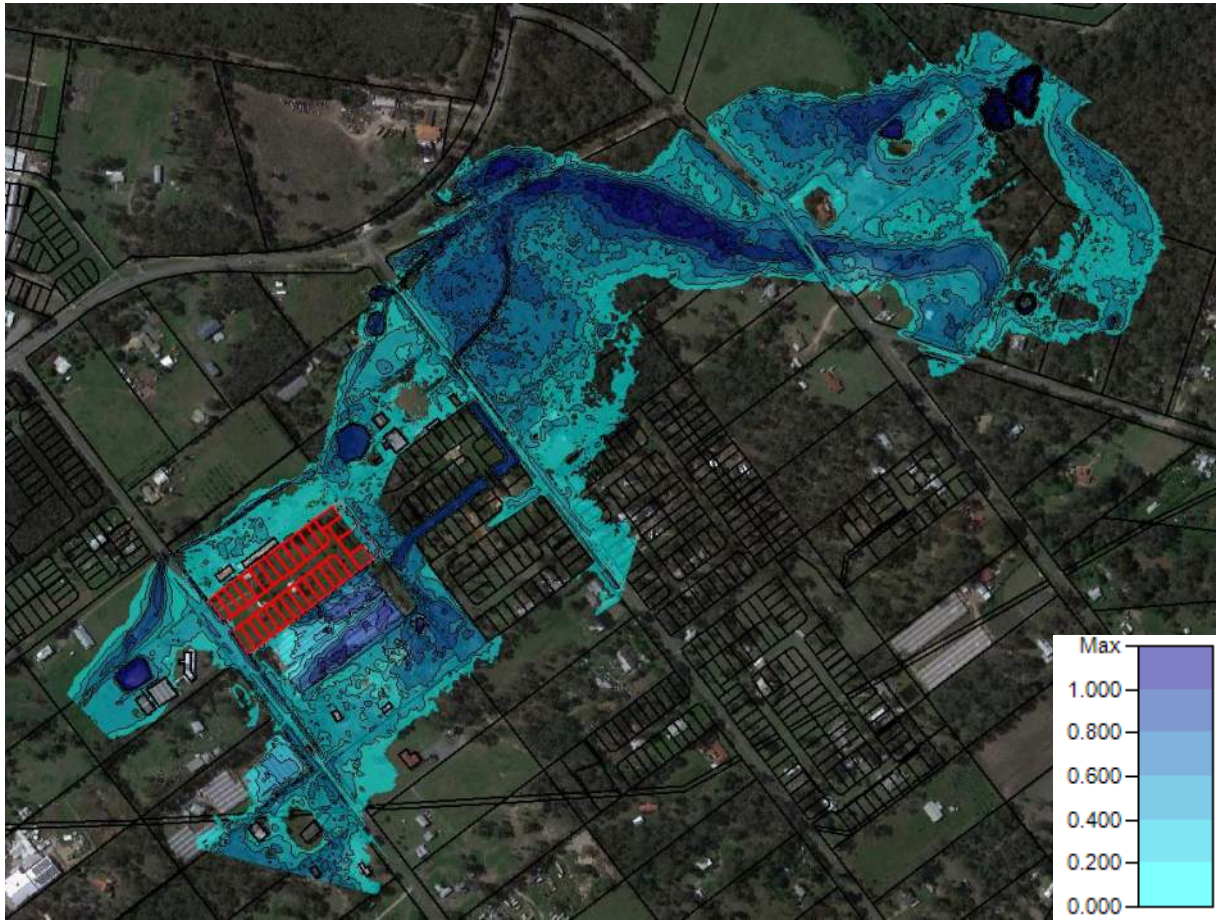
**Figure 38** – Post-Development 2% AEP 60min depth velocity products in meters<sup>2</sup>/second (Site View)



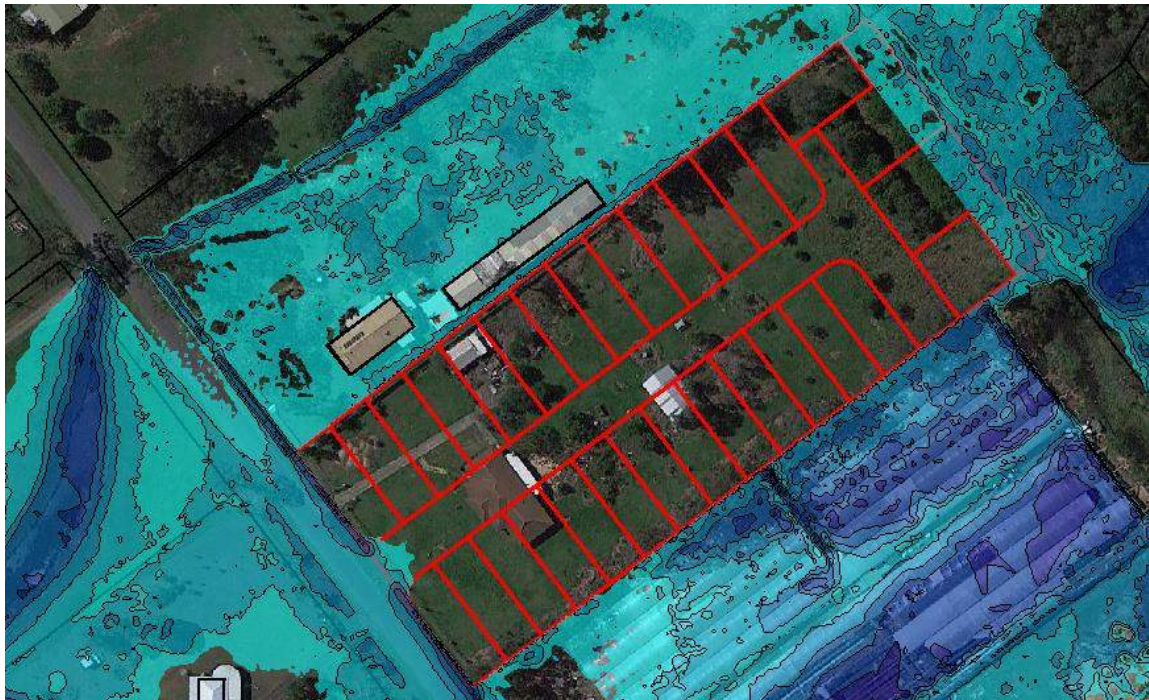
**Figure 39** – Post-Development 2% AEP 60min water surface elevation (m AHD)



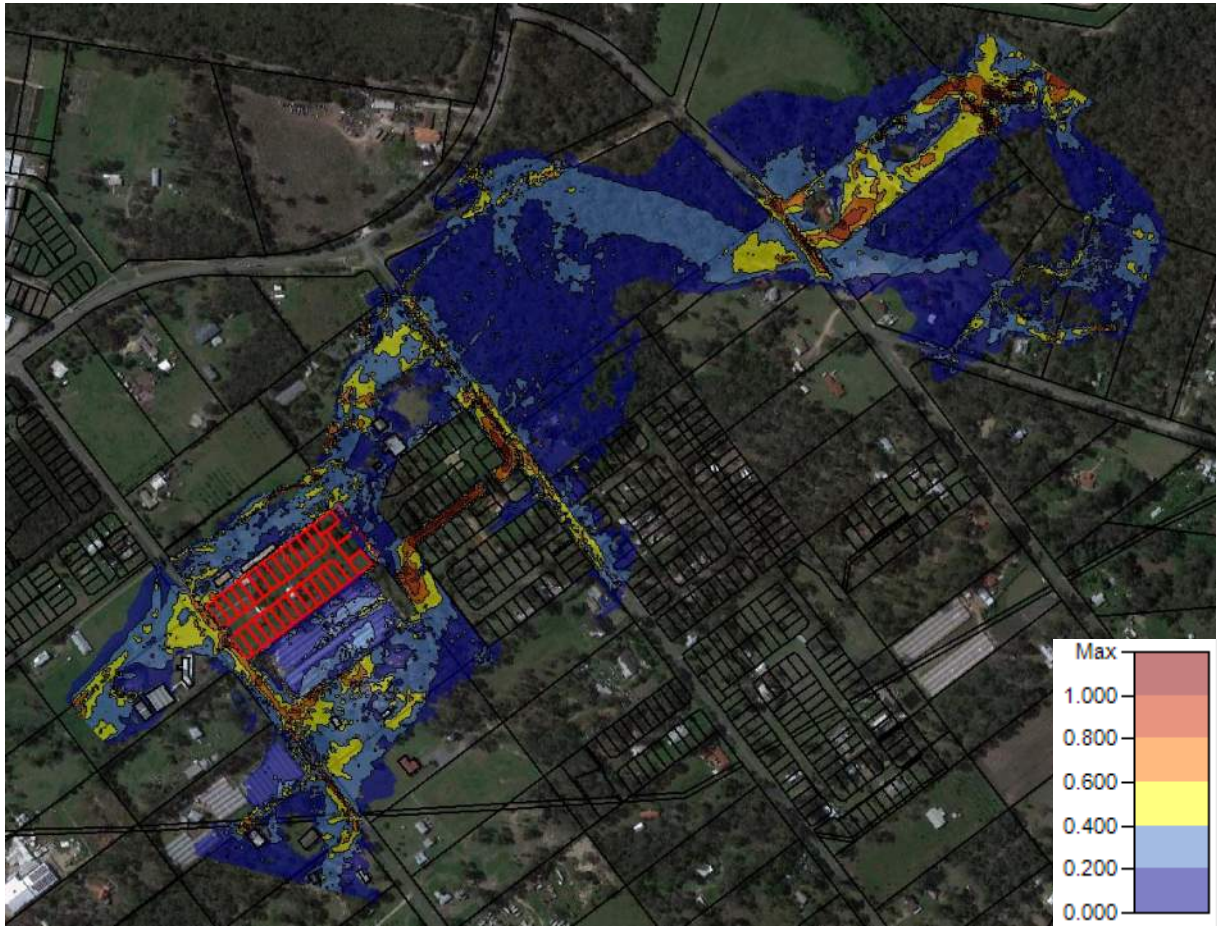
**Figure 40** – Post-Development 2% AEP 60min water surface elevation in meters AHD (Site View)



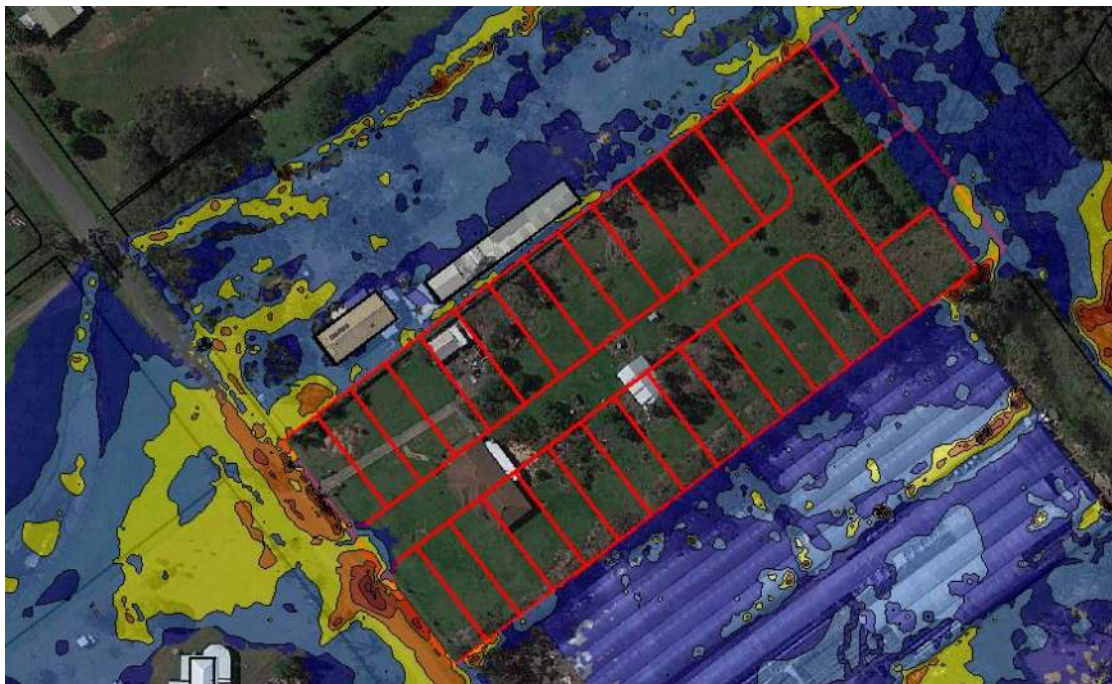
**Figure 41 – Post-Development 2% 90min AEP flood depths (m)**



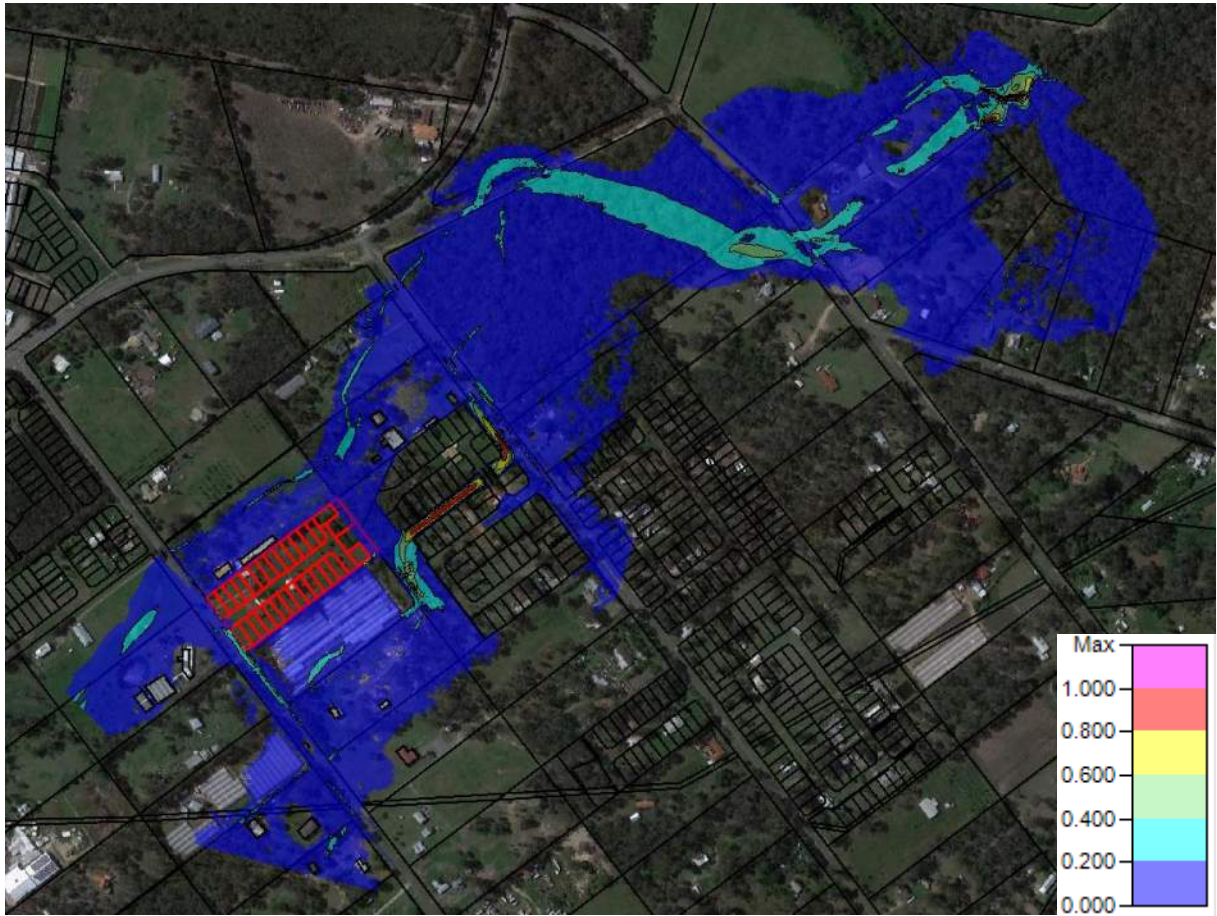
**Figure 42 – Post-Development 2% 90min AEP flood depths in meters (Site View)**



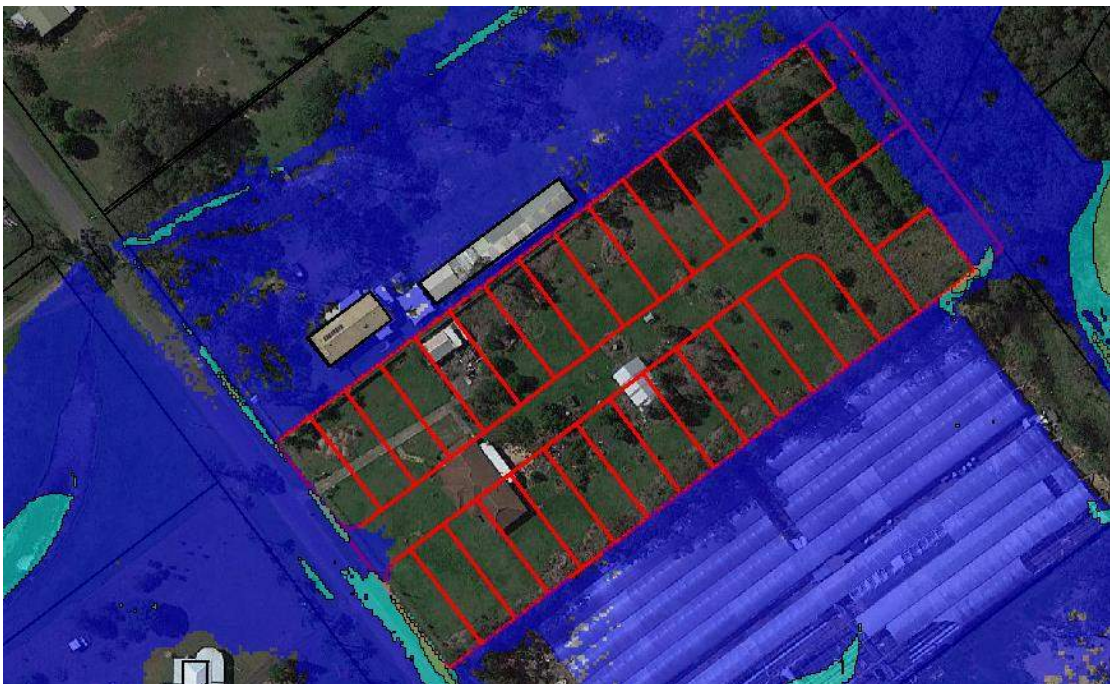
**Figure 43** – Post-Development 2% 90min AEP flood velocities (m/s)



**Figure 44** – Post-Development 2% AEP 90min velocities in meters/second (Site View)



**Figure 45** – Post-Development 2% AEP 90min depth velocity products ( $m^2/s$ )



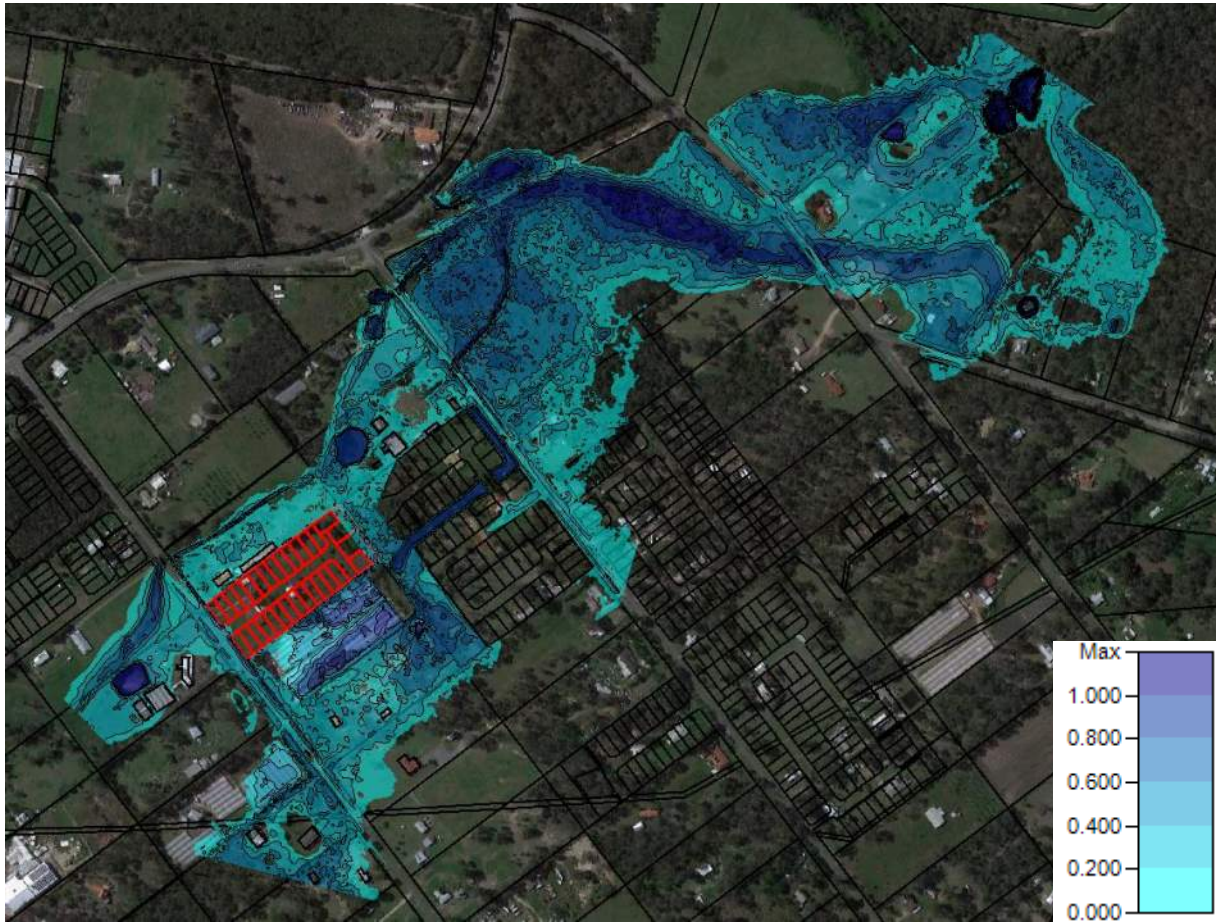
**Figure 46** – Post-Development 2% AEP 90min depth velocity products in meters<sup>2</sup>/second (Site View)



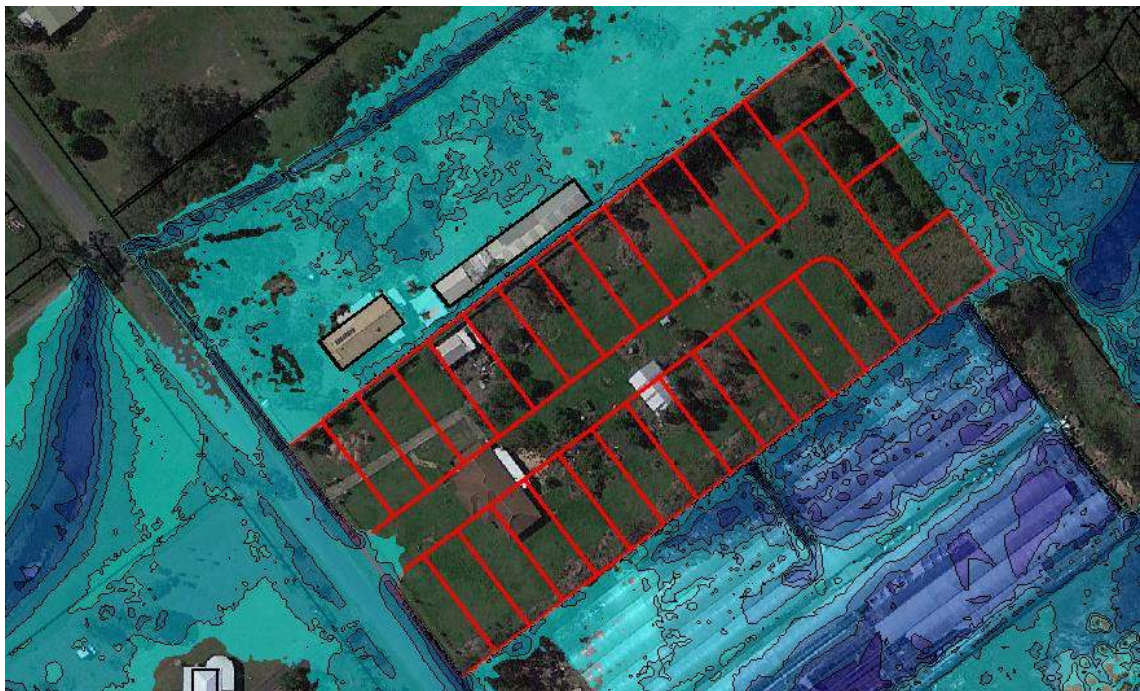
**Figure 47** – Post-Development 2% AEP 90min water surface elevation (m AHD)



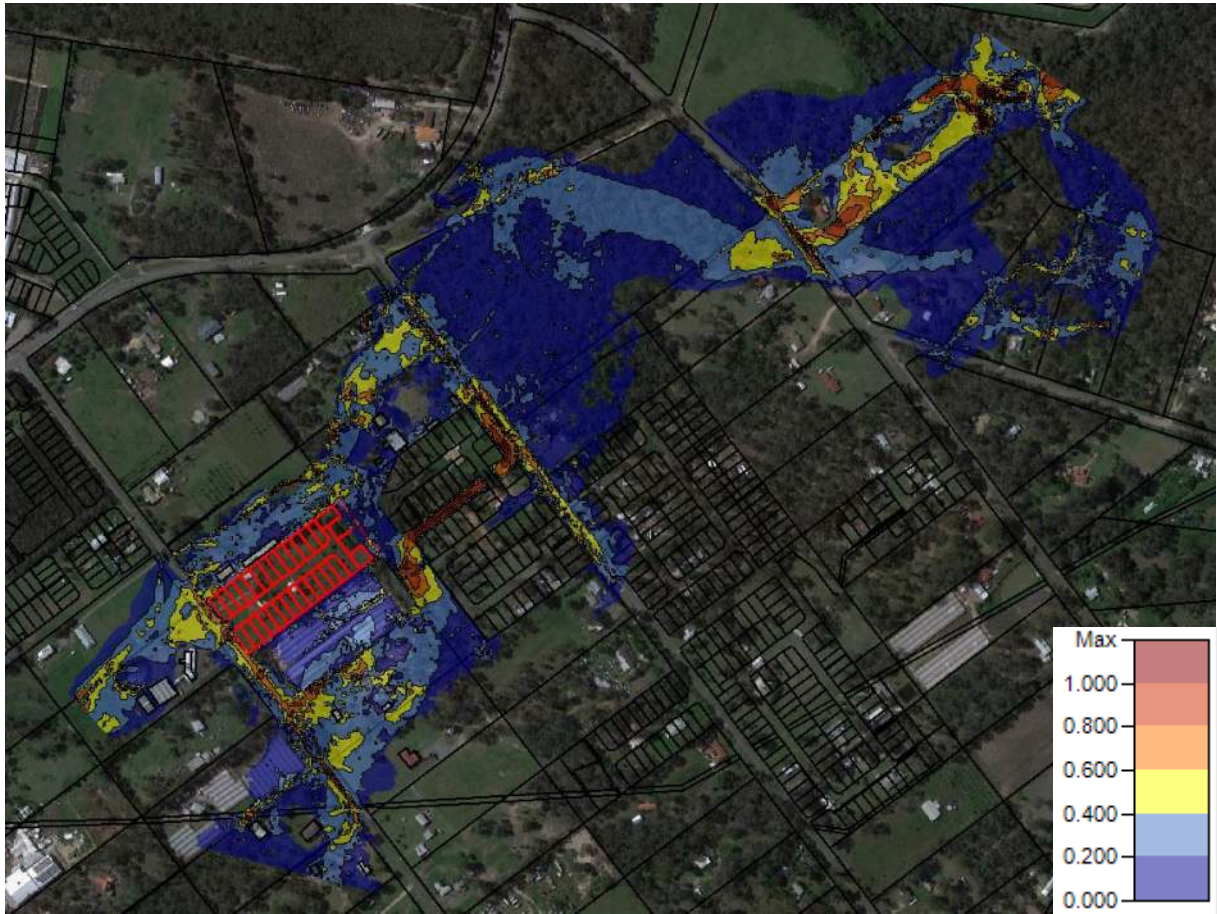
**Figure 48** – Post-Development 2% AEP 90min water surface elevation in meters AHD (Site View)



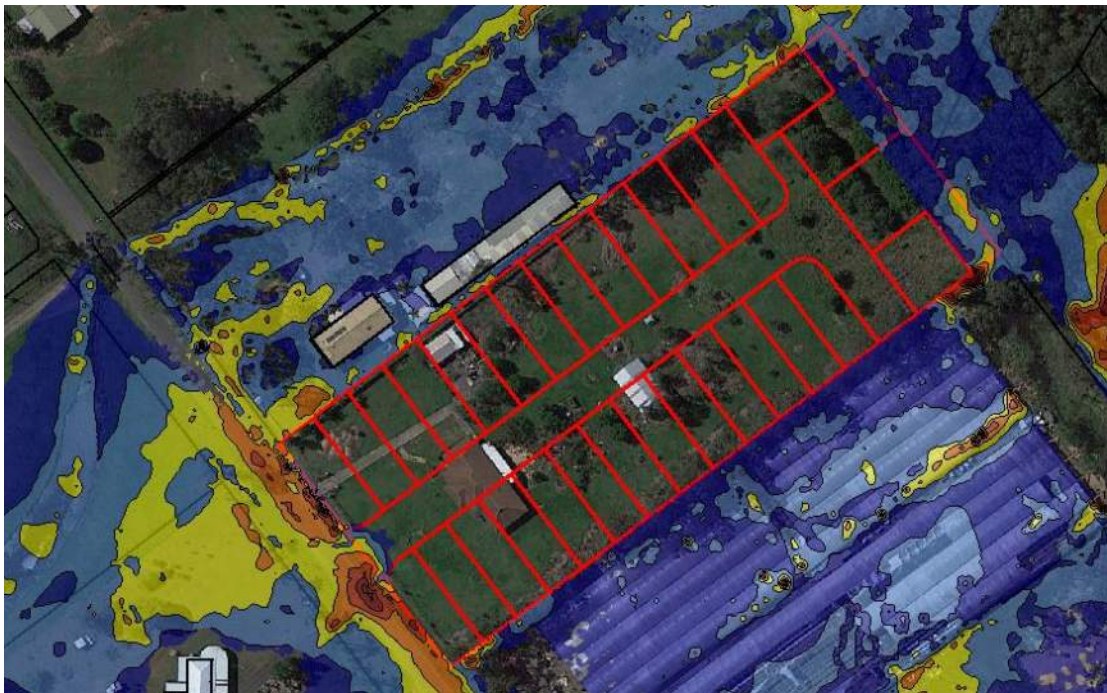
**Figure 49** – Post-Development 2% 120min AEP flood depths (m)



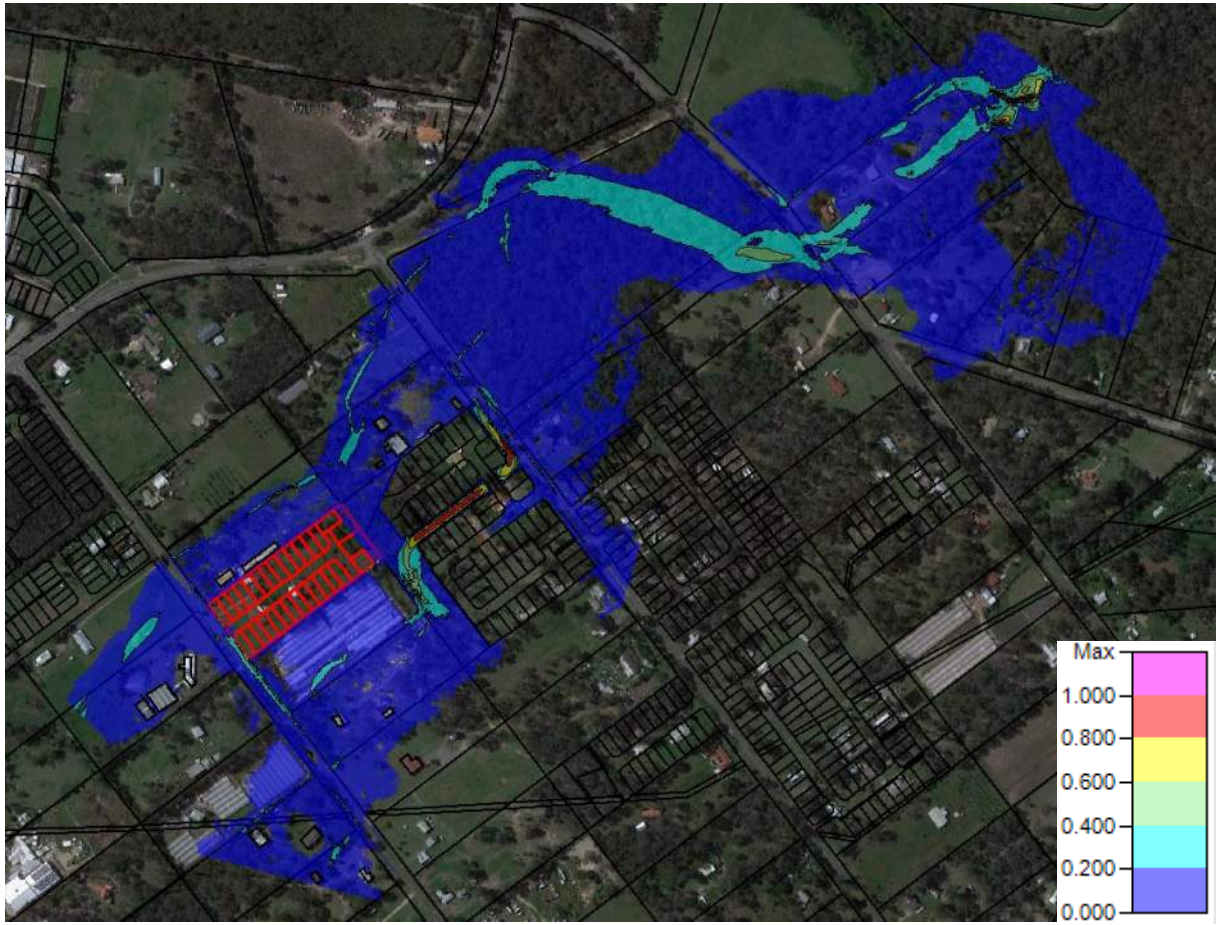
**Figure 50** – Post-Development 2% 120min AEP flood depths in meters (Site View)



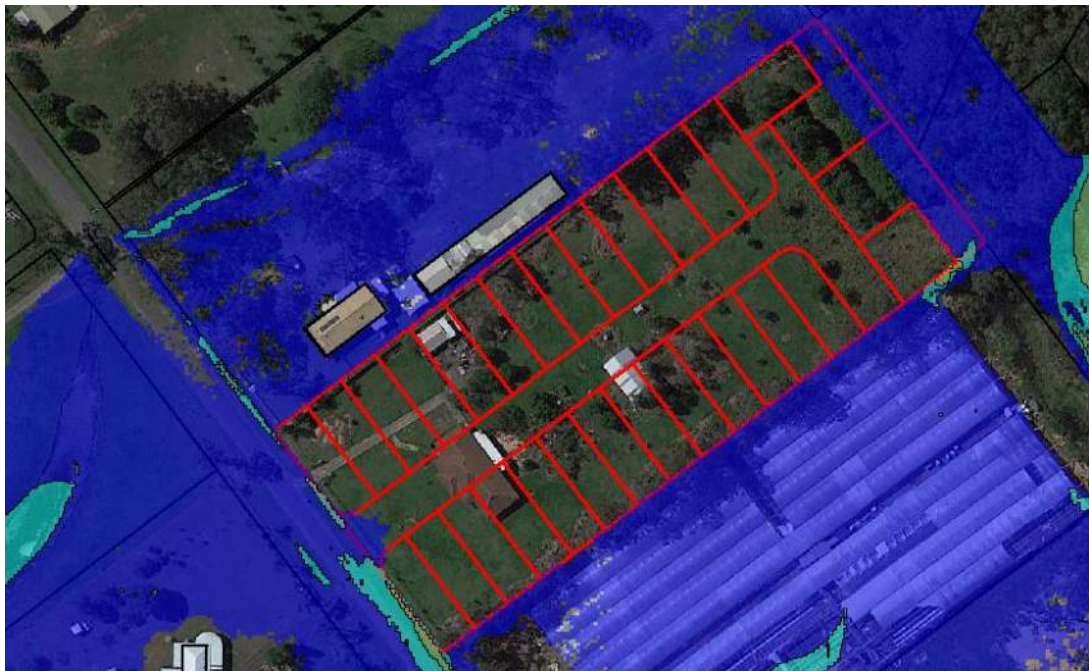
**Figure 51** – Post-Development 2% 120min AEP flood velocities (m/s)



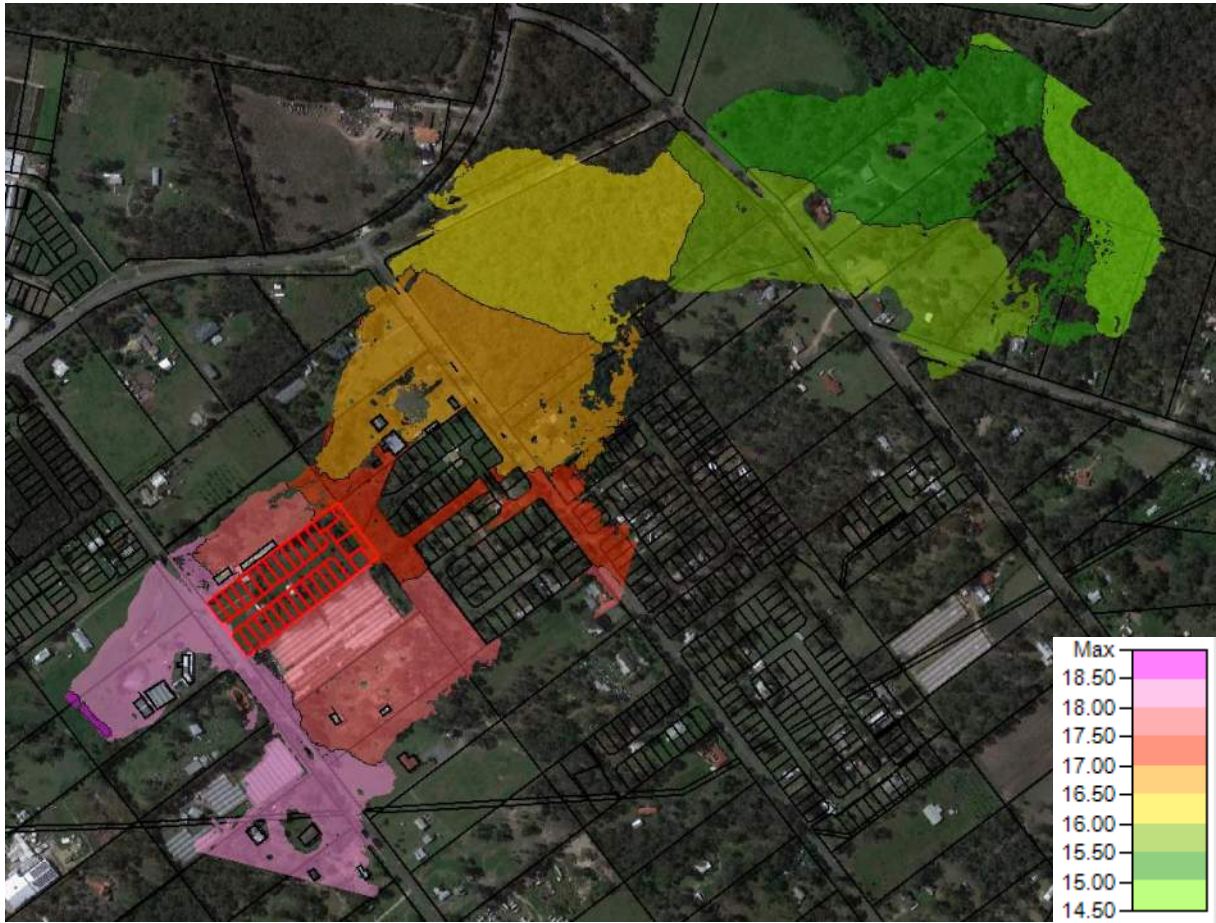
**Figure 52** – Post-Development 2% AEP 120min velocities in meters/second (Site View)



**Figure 53** – Post-Development 2% AEP 120min depth velocity products (m<sup>2</sup>/s)



**Figure 54** – Post-Development 2% AEP 120min depth velocity products in meters<sup>2</sup>/second (Site View)



**Figure 55** – Post-Development 2% AEP 120min water surface elevation (m AHD)



**Figure 56** – Post-Development 2% AEP 120min water surface elevation in meters AHD (Site View)

#### 4.10. Summary of Post-Development Results

The modelling shows that the proposed development will not be flood affected, except for the 10m wide portion at the rear of the site and the start of the proposed new road.

##### 4.10.1. Maximum Flood results

The 120 minute storm duration resulted in the maximum flood values for the site. The site has a maximum depth of approximately 0.540m located at the eastern property boundary of the site, with the site being generally flood free except for the 10m wide section at the rear, and the start of the new road. The peak flood level is 18.330 mAHD, located at the northern property boundary of the site. The maximum flood velocity within the site is 1.400m/s located towards the south-eastern corner of the site, with typical velocities around 0.200m/s to 0.400m/s. The maximum depth velocity product is 0.280m<sup>2</sup>/s located towards the south-eastern corner of the site, with typical depth velocity products around 0.050m<sup>2</sup>/s to 0.150m<sup>2</sup>/s within the site.

##### 4.10.2. Impact Mapping

In order to gauge the effect of the proposed development, impact mapping on the water surface elevation has been provided to identify the change in overland flow flood level, refer to Figure 57 to 62 below.

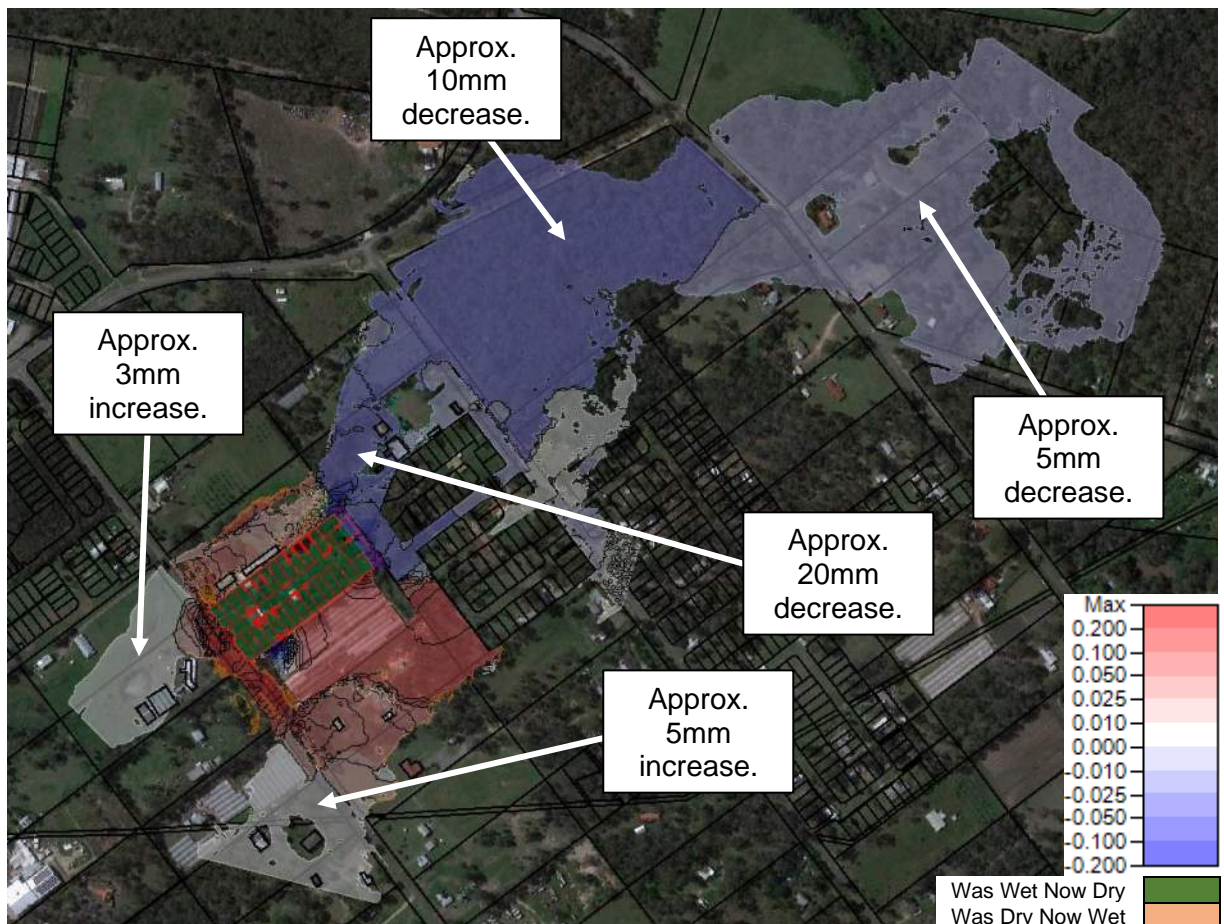
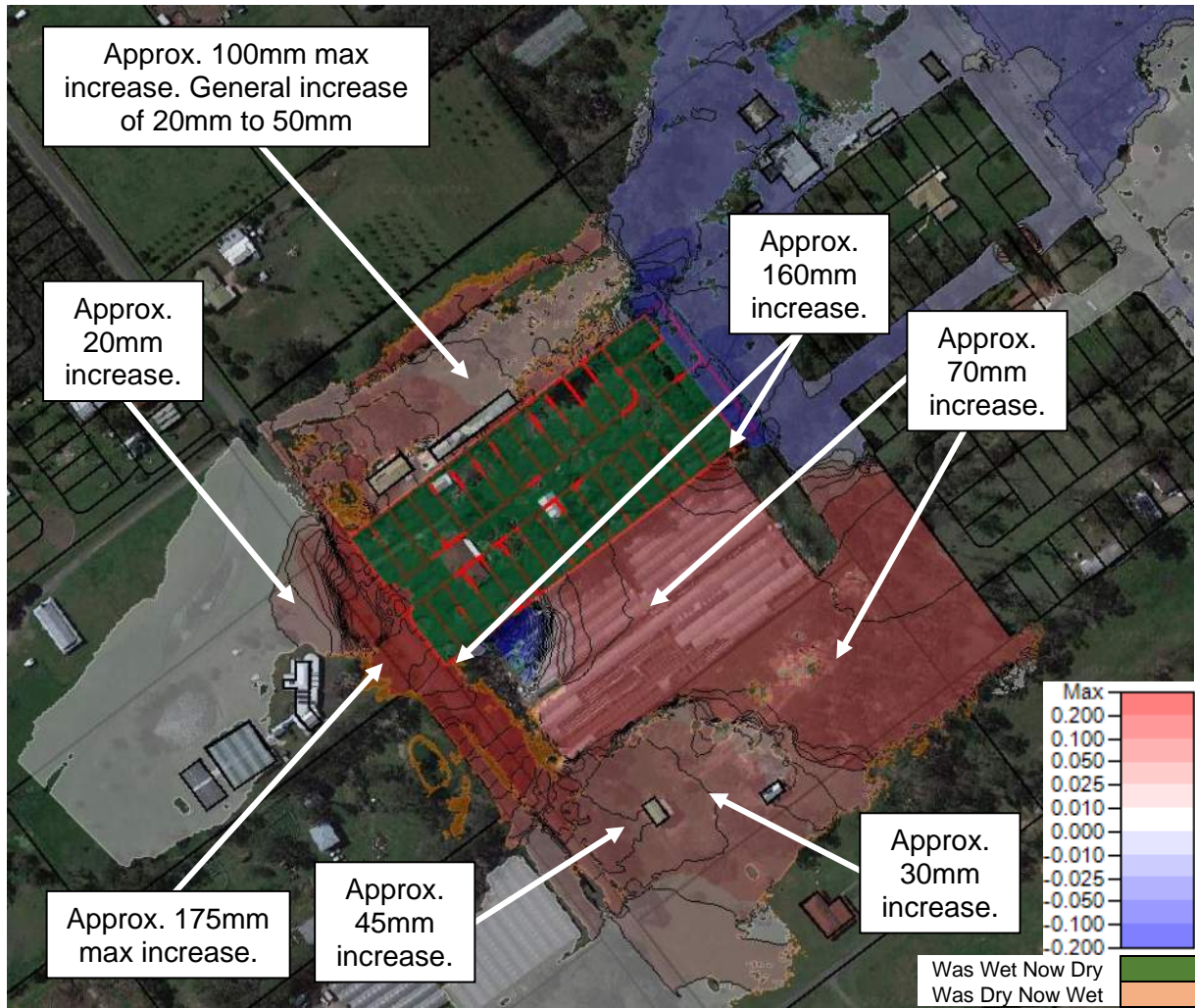
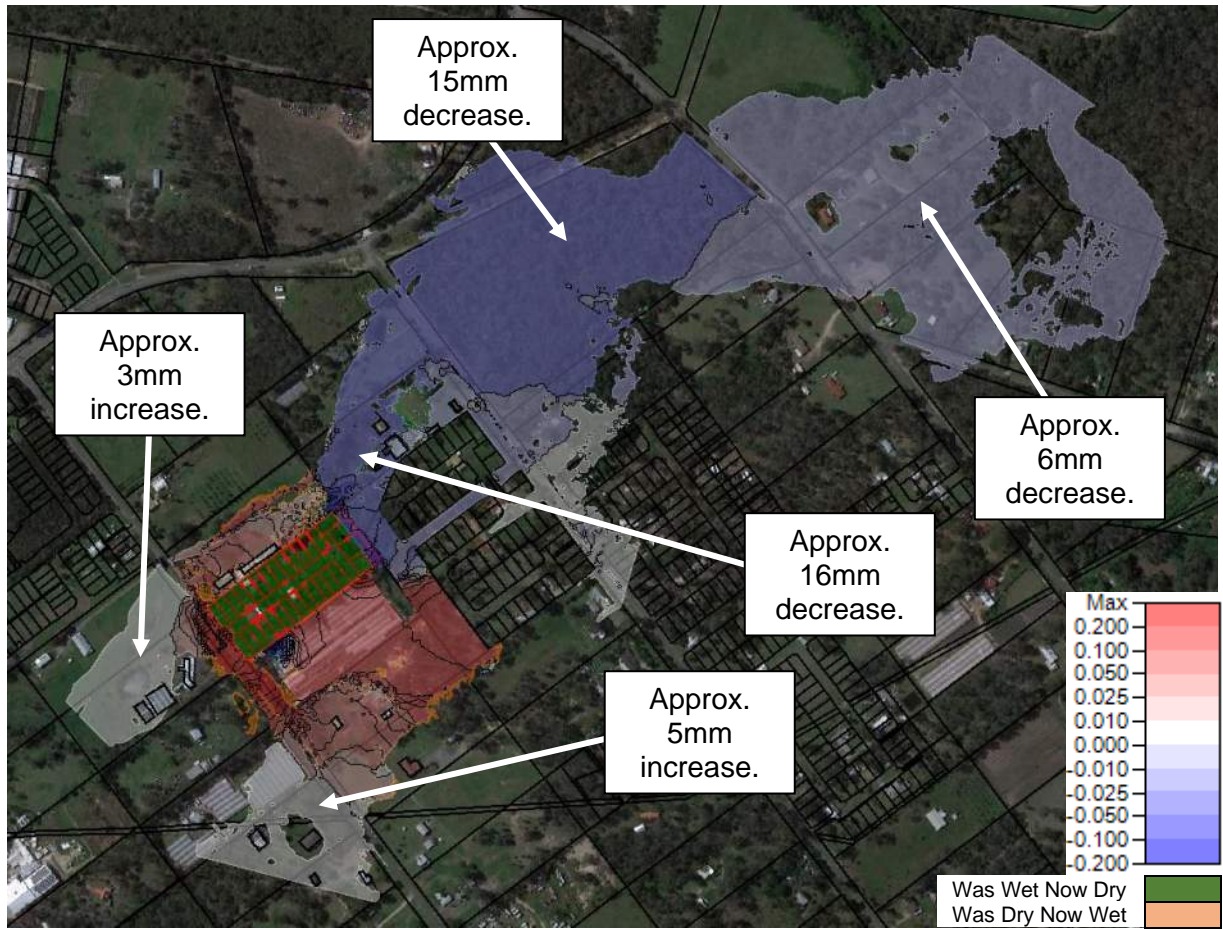


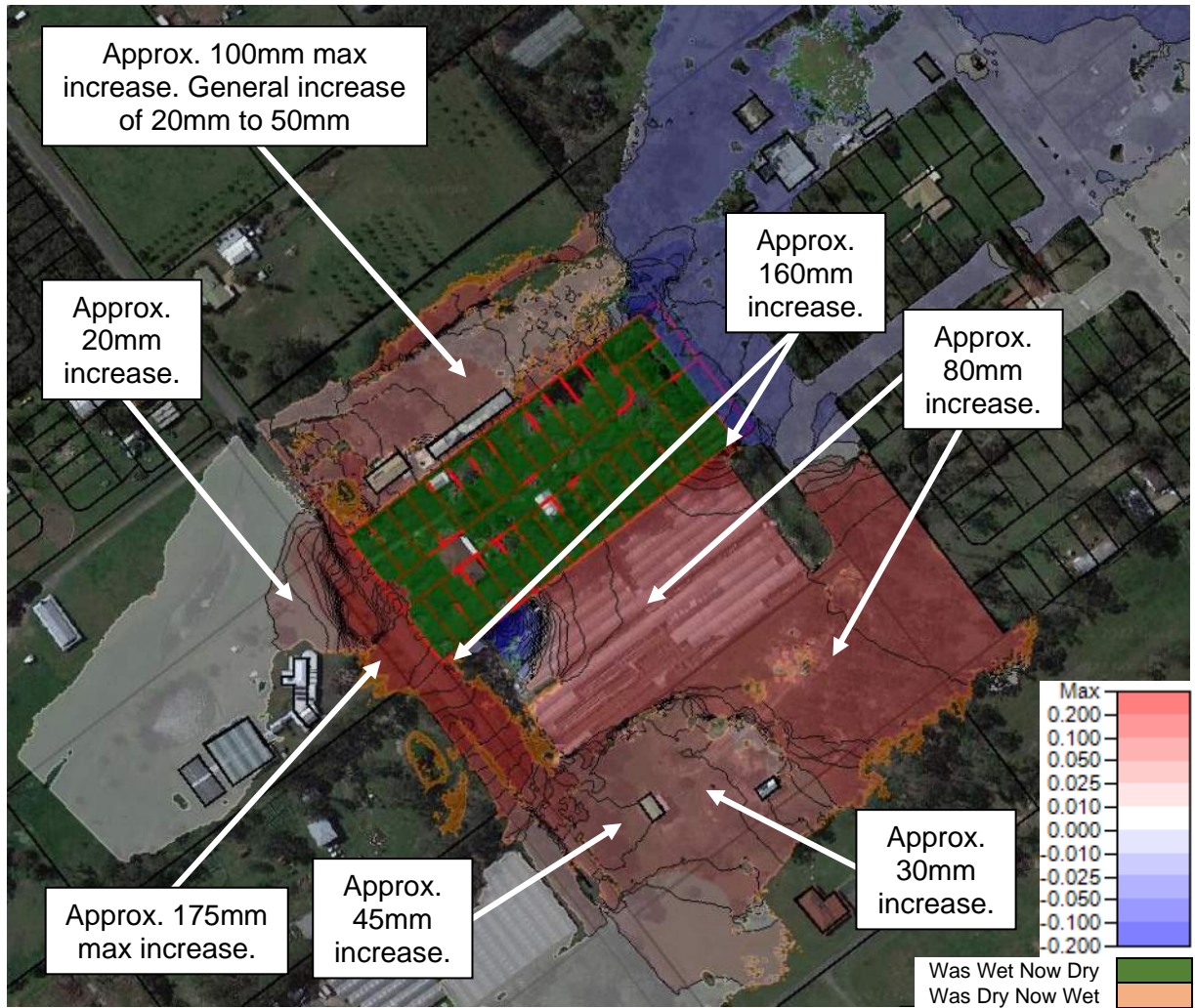
Figure 57 –2% AEP 60min Impact Mapping (m)



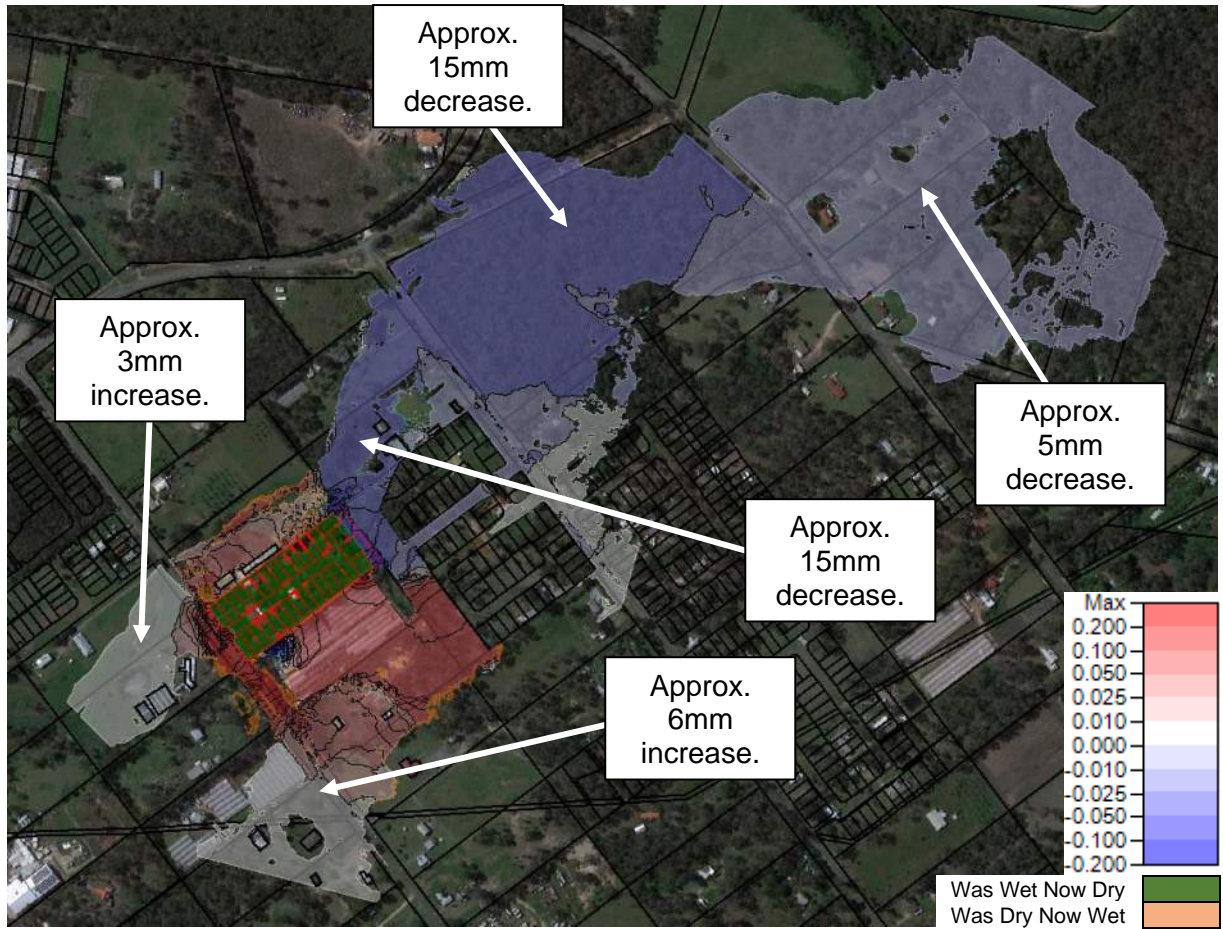
**Figure 58** –2% AEP 60min Impact Mapping (m) (Site View)



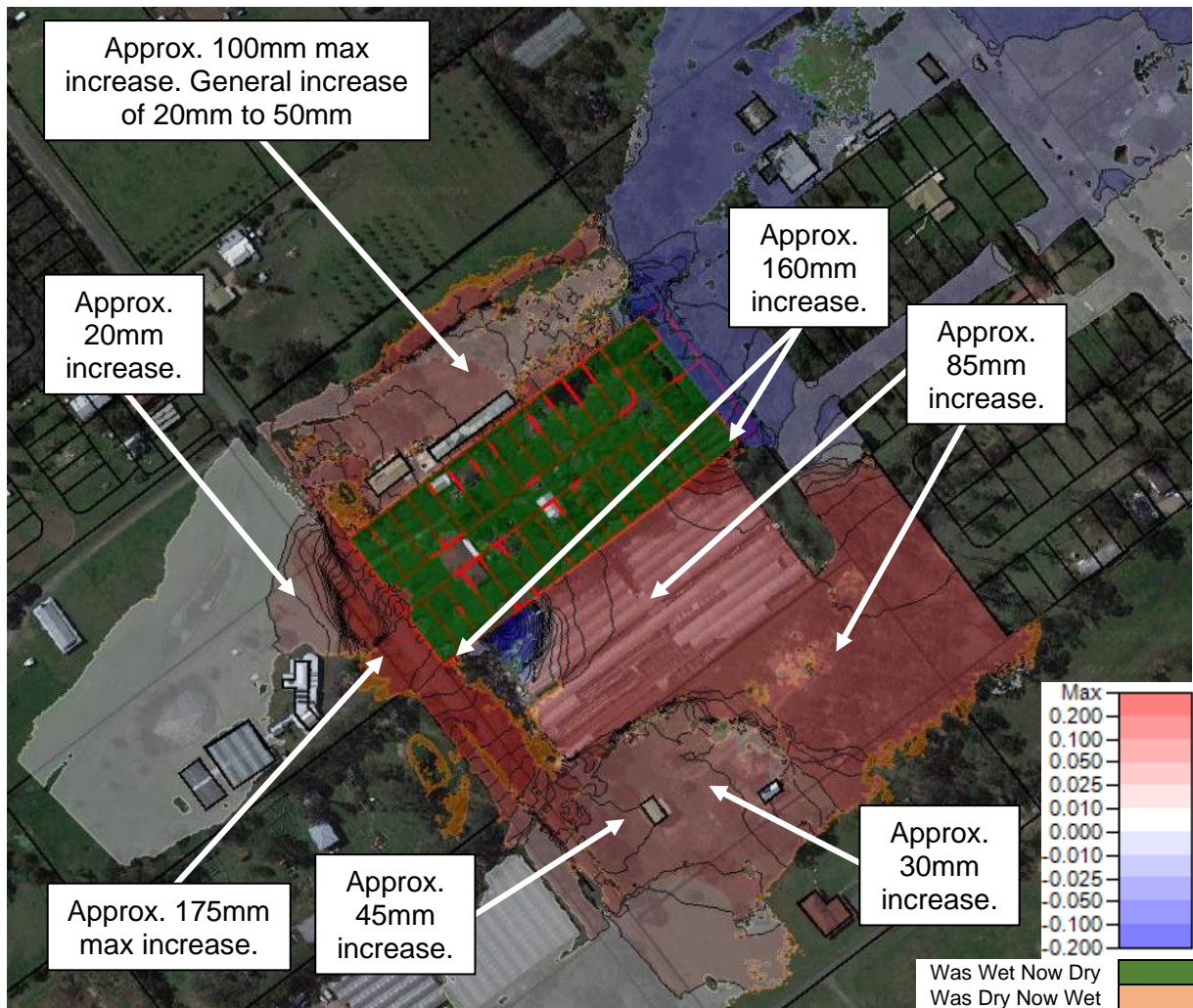
**Figure 59** –2% AEP 90min Impact Mapping (m)



**Figure 60** –2% AEP 90min Impact Mapping (m) (Site View)



**Figure 61** -2% AEP 120min Impact Mapping (m)



**Figure 62** –2% AEP 120min Impact Mapping (m) (Site View)

#### 4.11. Discussion of Impact Mapping Results

The results show both increases and decreases in flood levels on surrounding properties. Decreases are shown downstream of the site for all storm durations. These decreases are generally in the range of 5mm to 15mm. Increases are shown upstream and adjacent to the site for all storm durations. These increases are generally in the range of 20mm to 80mm. Please see the discussion below regarding the impact mapping from the proposed development.

##### **38 Kraft Road**

This property is understood to now be owned by Council, and therefore will be utilised to convey overland flow and the existing dwelling and structures on this site removed. As such, it is understood that there is no requirement to minimise the increase in flood level near the existing dwellings or within this property.

##### **45 Kraft Road**

There is a max increase in flood level of approx. 3mm located near the greenhouses and sheds within the site. There is an increase in flood level generally ranging from 30mm up to 180mm located along site frontage, however there is no increase to the existing dwelling as it is situated on higher ground.

### **54 Kraft Road**

There is a typical increase in flood level of approx. 60mm to 90mm, with increases up to 160mm located along the property frontage and north-western corner of the site. This site is not residential in use and has greenhouses built on it. While there are increases in flood level to this site, no lives are expected to be at risk of significant flooding. Furthermore, the increases identified above do ultimately serialise the future development potential of this property as filling will be required regardless to achieve flood immunity against the creek's 1% AEP flood level (18.30m AHD).

### **62 Kraft Road**

There is a typical increase in flood level of approx. 40mm to 80mm, with increases up to 90mm located along the property frontage. The existing dwellings and structures on this site has recently been cleared, and an application lodged to Council for the development of the site. While there are increases in flood level to this site, no lives are expected to be at risk of significant flooding. Furthermore, the increases identified above do not ultimately sterilise the future development potential of this property as filling will be required regardless to achieve flood immunity against the creek's 1% AEP flood level (18.30m AHD), as proposed in the development's recent application to Council.

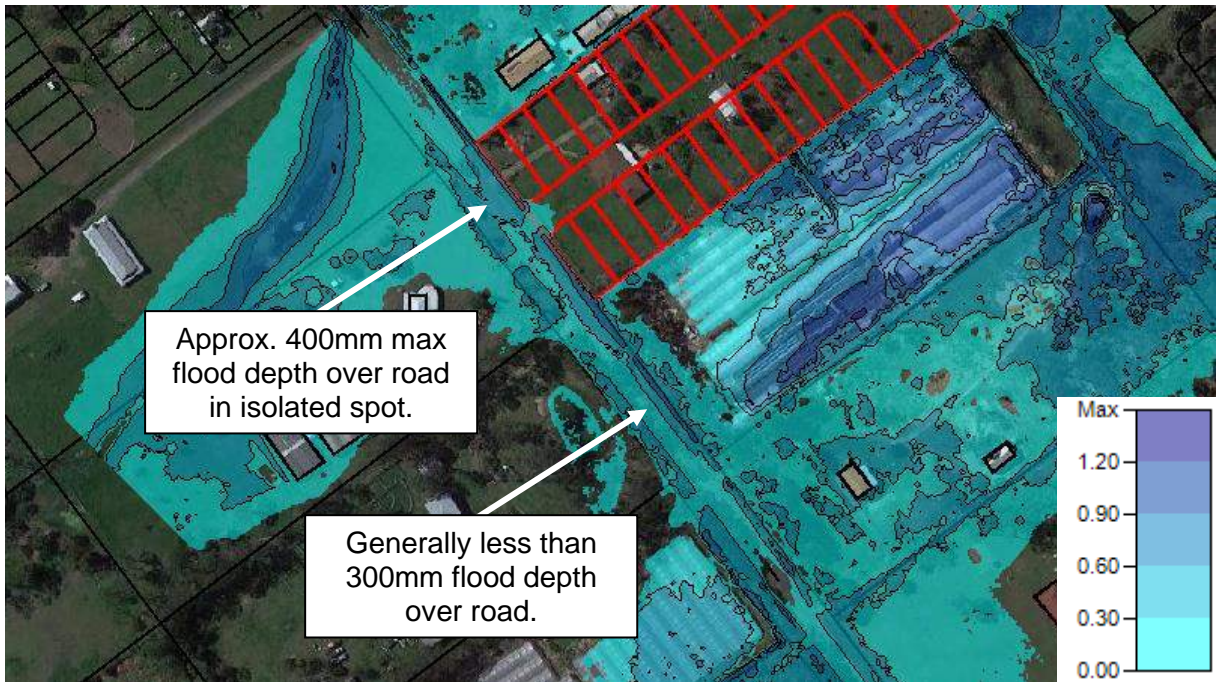
### **39 Sweets Road**

There is a typical decrease in flood level of approx. 15mm to 50mm within the site, with a reduction of around 5mm to 15mm located around the existing dwellings and structures on site. As such, this development does not result in an increase to flood levels around the existing dwellings or structures.

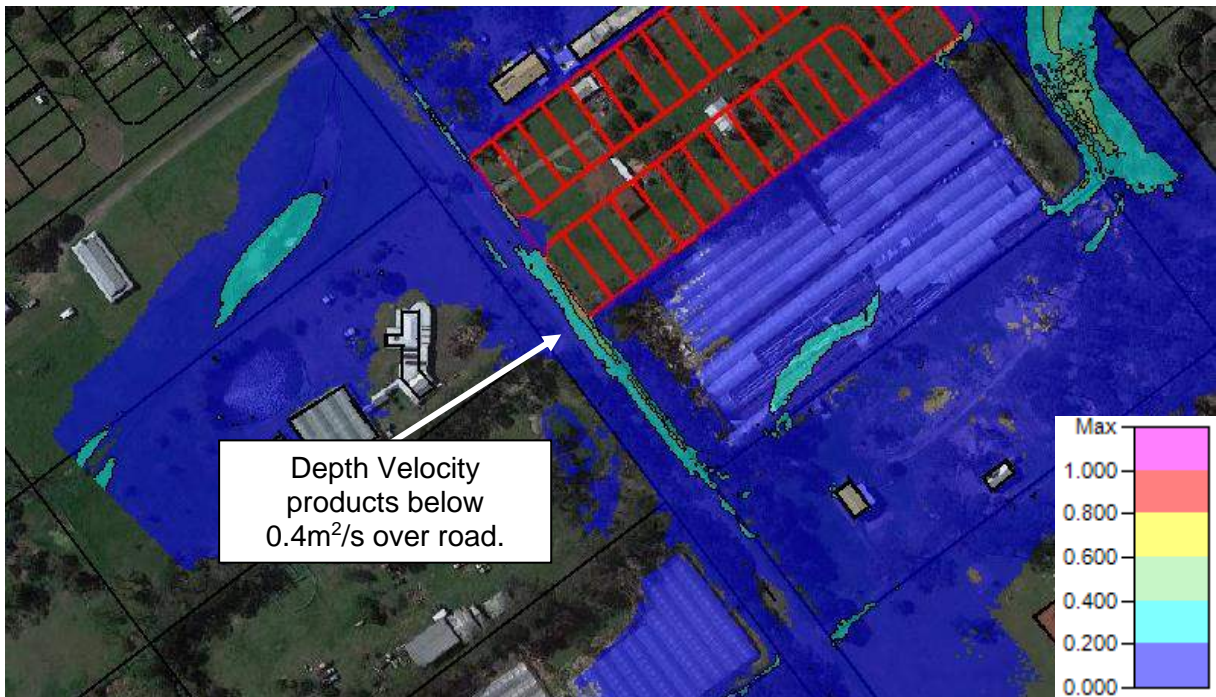
### **Kraft Road road reserve**

There is a typical increase in flood level along Kraft Road. However, a majority of the 2% AEP flood depths along Kraft Road are less than 300mm, and therefore remains trafficable. There is one location in Kraft Road near the proposed intersection for the new road internal to the site where the 2% AEP flood depth is up to 0.400m. This is not considered to cause adverse flood impacts because;

- The trafficable flood depth is only exceeded by 100mm in one isolated location, with the flood depth generally being exceeded by only 50mm, which is relatively minor. This flood depth is even less towards the crown of the road, refer to Figure 63 below.
- The period where the flood depth exceeds 300mm would be well below the 6-hour maximum outlined in Section 6.2 of the Flood Overlay Code (2014), especially when considering table drains relieving flood depths.
- The depth-velocity (DV) products remain well below  $0.4\text{m}^2/\text{s}$ , refer to Figure 64 below.
- Future developments at 45 and 46 Kraft Road (and other properties along Kraft Road) will require to upgrade Kraft Road frontages in accordance with BCC's Stormwater Masterplan for Pallara; which includes road widening and drainage swales. It is expected that this will improve the flow capacity and reduce flow depths on Kraft Road.



**Figure 63** –2% AEP 120min Flood Depth (m) (Road)



**Figure 64** –2% AEP 120min Depth Velocity Product (m<sup>2</sup>/s) (Road)

#### 4.12. 20m Wide Covenant Scenario

A 2% AEP 60 minute duration post-development flood model was also undertaken with a 20m wide covenant/area at the rear of the site with pre-development surface levels. This was reviewed against the 60 minute 2% AEP pre-development flood levels and found to still result in an approx. 45mm increase to flood levels in the southern neighbouring properties, 54 and 62 Kraft Road.

## 5. Brisbane City Council Requirements

Refer to Appendix I for the Flood Overlay Code response.

### 5.1. Minimum Flood Immunity Levels

Minimum flood immunity levels for the proposed dwelling are based on the modelled post-development overland flow maximum water surface elevation levels. Refer to Table 3 below for the minimum lot levels.

**Table 3 – Minimum Lot Levels**

Lot Number	Maximum 1% AEP Creek Flood level (m AHD)	Maximum 2% AEP Post-Development Overland Flow Flood level (m AHD)	Critical Flood Level (m AHD)	Minimum Lot Level (Critical Flood Level + 300mm)
1	18.300	18.340	18.340	18.640
2	18.300	18.190	18.300	18.600
3	18.300	18.050	18.300	18.600
4	18.300	18.040	18.300	18.600
5	18.300	18.010	18.300	18.600
6	18.300	17.960	18.300	18.600
7	18.300	17.940	18.300	18.600
8	18.300	17.930	18.300	18.600
9	18.300	17.890	18.300	18.600
10	18.300	17.840	18.300	18.600
11	18.300	17.800	18.300	18.600
12	18.300	17.770	18.300	18.600
13	18.300	17.690	18.300	18.600
14	18.300	17.520	18.300	18.600
15	18.300	17.360	18.300	18.600
16	18.300	17.370	18.300	18.600
17	18.300	17.740	18.300	18.600
18	18.300	17.750	18.300	18.600
19	18.300	17.750	18.300	18.600
20	18.300	17.750	18.300	18.600
21	18.300	17.750	18.300	18.600
22	18.300	17.750	18.300	18.600
23	18.300	17.750	18.300	18.600
24	18.300	17.750	18.300	18.600
25	18.300	17.750	18.300	18.600
26	18.300	17.790	18.300	18.600
27	18.300	17.820	18.300	18.600
28	18.300	17.940	18.300	18.600
29	18.300	18.020	18.300	18.600
30	18.300	18.280	18.300	18.600

The new road as part of the development will comply with the flood planning levels in Table 8.2.11.3.F. The crown of the new road will be at or above the 1% AEP Creek/waterway flood level of 18.300m AHD.

There is flooding within the covenant proposed for Lots 15 and 16, the maximum flood depth is 0.530m which is less than 0.600m, and the depth velocity product is  $0.028\text{m}^2/\text{s}$  which is significantly less than  $0.400\text{m}^2/\text{s}$  which is the maximum for areas where the risk to life is reasonably foreseeable.

## **5.2. Safe Vehicular Access**

The intersection from Kraft Road to the proposed new road will be trafficable during the 2% AEP overland flow flood event. All Lots will have flood free access.

## 6. Conclusion

This report establishes the required minimum lot levels for the proposed development at 46 Kraft Road, within the local government area of Brisbane City Council.

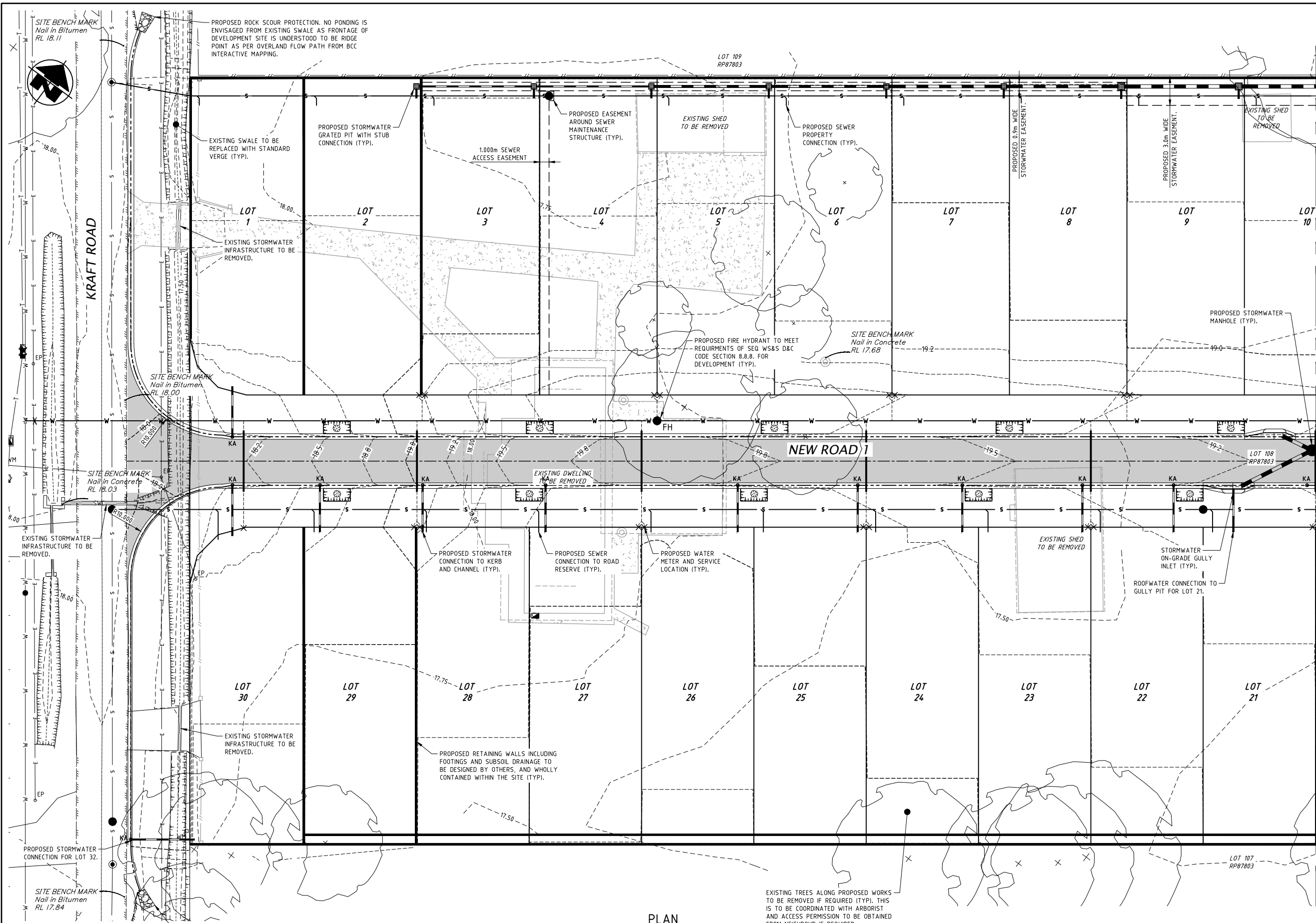
It is proposed to subdivide the site from one (1) into thirty (30) Lots. Earthworks are proposed within the site to provide flood immunity and to limit the overland flow within the site to the 10m wide covenant within the rear of the site.

There is a typical increase in flood level to the upstream and adjacent properties, and typical decrease in flood level to downstream properties. The maximum increase in flood level to existing residential buildings and structures is 3mm, and as such, no lives are expected to be at risk of significant flooding. Where there is an increase in flooding in neighbouring properties, it is not envisaged to ultimately sterilise the future development potential of the property as these properties will require to fill the site to achieve flood immunity against the creek's 1% AEP flood level. There is a typical increase in flood level along Kraft Road, however, a majority of the 2% AEP flood depths along Kraft Road are less than 300mm, and the depth velocity products are well below  $0.4\text{m}^2/\text{s}$ , and therefore remains largely trafficable. Notwithstanding this, the increase in flood levels are understood to be reduced once the trunk infrastructure and stormwater channel works are built in the surrounding area.

Additional flood modelling undertaken using a 20m wide covenant/area at the rear of the site with pre-development surface levels shows only little improvement, with an increase in flood levels of approx. 45mm in the southern neighbouring properties, 54 and 62 Kraft Road. It should be noted that increasing the width of the ecological area will not result in a reduction in flood level to upstream, downstream, or adjacent residential dwellings.

The intersection from Kraft Road to the proposed new road will largely be trafficable during the 2% AEP overland flow flood event. All Lots will have flood free access. The new road as part of the development will comply with the flood planning levels in Table 8.2.11.3.F. The crown of the new road will be at or above the 1% AEP flood level of 18.300m AHD.

## **APPENDIX A – Concept Services Sketch**



DO NOT SCALE. CONFIRM ALL DIMENSIONS ON SITE. ORIGINAL DRAWING SIZE - A1

ISSUE	AMENDMENT	DATE
A	PRELIMINARY ISSUE	21.10.20
B	AMENDMENT ISSUE - TREES	19.03.21
C	PRELIMINARY ISSUE REVISED	25.01.22
D	PRELIMINARY ISSUE REVISED	08.06.22

**LEGEND**

- 3.50--- EXISTING SURFACE CONTOURS
- EXISTING STORMWATER
- PROPOSED STORMWATER
- KA PROPOSED KERB ADAPTOR
- W EXISTING WATER MAIN
- WM EXISTING WATER METER
- EXISTING FIRE HYDRANT
- S EXISTING SEWER
- E EXISTING OVERHEAD ELECTRICAL
- EP EXISTING ELECTRICITY POLE
- EXISTING CONCRETE TO BE REMOVED
- EXISTING BITUMEN TO BE RETAINED
- PROPOSED CONCRETE/PAVEMENT
- EXISTING TELECOMMUNICATIONS PIT

FOR CONTINUATION REFER TO DRAWING CW2023-SK02

ASSOCIATED CONSULTANT

PROJECT  
**46 KRAFT ROAD  
 PALLARA**

CLIENT  
**YU FEN LI**

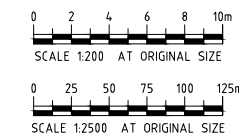
TITLE  
**CONCEPT SERVICES  
 SKETCH  
 (SHEET 1 OF 2)**

**CIVILWORKS ENGINEERS**  
*Property Development Solutions*

176 Boniface Street, Archerfield, QLD 4108  
 PO Box 13, Moorooka QLD 4105  
 T (07) 3195 8180  
 E info@civilworks.com.au  
 W www.civilworks.com.au

Designed	SP	Drawn	SP	Date	21.10.20	
Approved	[Signature]			Scale	AS SHOWN	
Drawing No.	CW20023-SK01				Rev.	D

**PLAN**  
 SCALE 1:200



**PRELIMINARY**  
 NOT FOR CONSTRUCTION

**EARTHWORKS AND RETAINING WALLS NOTE**  
 EARTHWORKS AND RETAINING WALLS ARE REQUIRED TO FACILITATE PROPOSED DEVELOPMENT. REFER TO CW20023-SK10 TO SK12 FOR CONCEPT EARTHWORKS SKETCHES AND SECTIONS.

**EXISTING SERVICES NOTE**  
 THIS DESIGN HAS BEEN PREPARED BASED ON SERVICE AUTHORITY AS CONSTRUCTED INFORMATION. NO POT HOLING HAS BEEN UNDERTAKEN TO VERIFY EXISTING SERVICE LOCATIONS AND DEPTHS. IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERTAKE POT HOLING TO VERIFY THE DESIGN.

**SEWER AND WATER RETICULATION NOTE**  
 SEWER AND WATER RETICULATION TO BE IN ACCORDANCE WITH GRAVITY SEWERAGE/WATER SUPPLY CODE OF AUSTRALIA SEQ EDITION, AND SEQ SEWERAGE/WATER STANDARD DRAWINGS. SERVICES TO BE IN CORRECT SERVICES CORRIDOR IN ACCORDANCE WITH BRISBANE CITY COUNCIL STANDARD DESIGN DRAWINGS, AND CLEAR FROM EXISTING SERVICES.

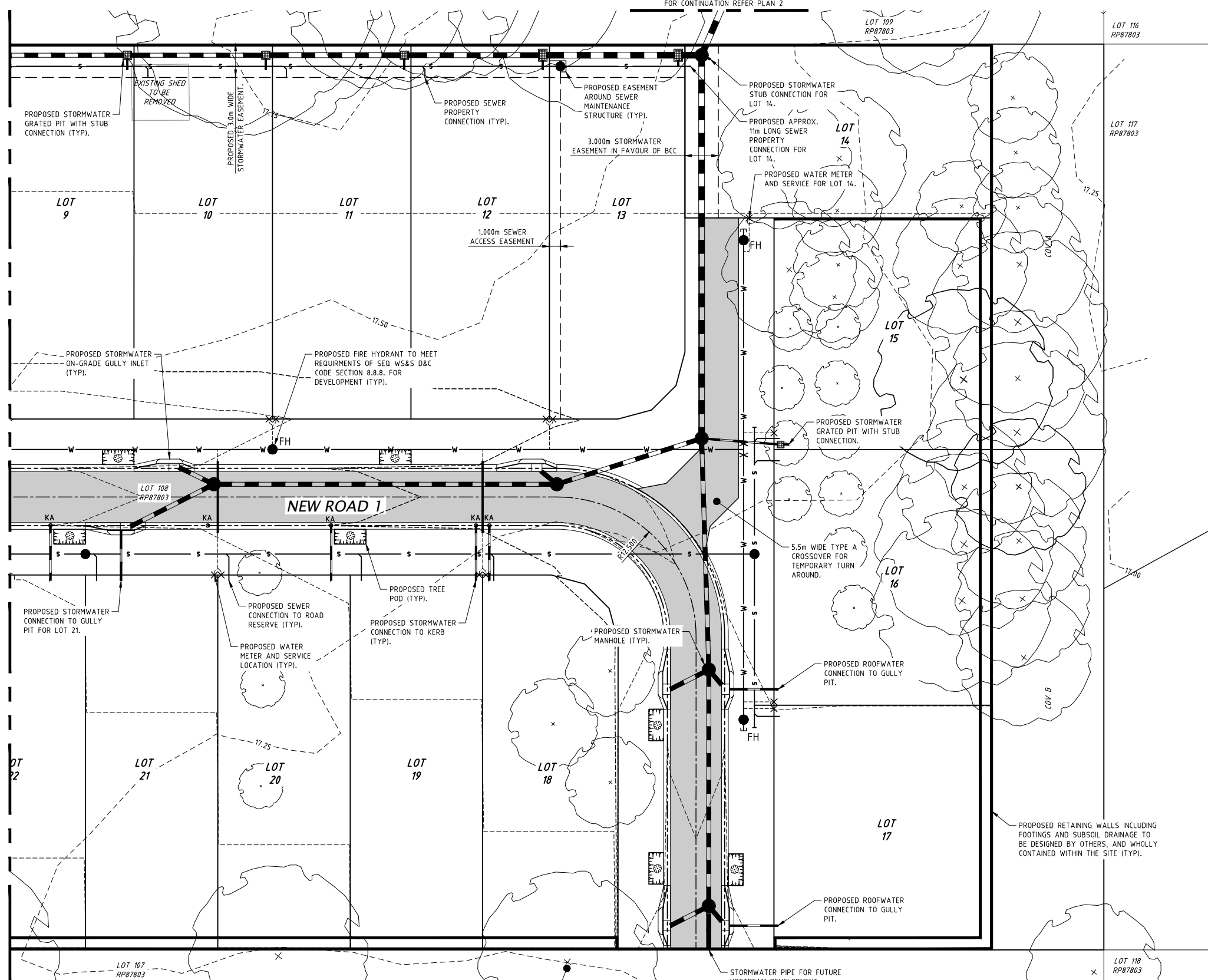
**DIAL BEFORE YOU DIG NOTE**  
 IT IS THE CONTRACTORS RESPONSIBILITY TO CONTACT 'DIAL BEFORE YOU DIG' PH.1100 FOR THE LOCATION OF EXISTING PUBLIC UTILITIES PRIOR TO EXCAVATION. ANY DAMAGE CAUSED TO EXISTING PUBLIC UTILITIES BY THE CONTRACTOR WILL BE REPAIRED BY THE RELEVANT AUTHORITY AT THE CONTRACTORS EXPENSE.

**REAL PROPERTY DESCRIPTION**  
 LOT No. 108  
 PLAN No. RP 87803

PROPOSED ROCK SCOUR PROTECTION. NO PONDING IS ENVISAGED FROM EXISTING SWALE AS FRONTAGE OF DEVELOPMENT SITE IS UNDERSTOOD TO BE RIDGE POINT AS PER OVERLAND FLOW PATH FROM BCC INTERACTIVE MAPPING.

PROPOSED ROCK SCOUR PROTECTION. NO PONDING IS ENVISAGED FROM EXISTING SWALE AS FRONTAGE OF DEVELOPMENT SITE IS UNDERSTOOD TO BE RIDGE POINT AS PER OVERLAND FLOW PATH FROM BCC INTERACTIVE MAPPING.

EXISTING TREES ALONG PROPOSED WORKS TO BE REMOVED IF REQUIRED (TYP). THIS IS TO BE COORDINATED WITH ARBORIST AND ACCESS PERMISSION TO BE OBTAINED FROM NEIGHBOUR IF REQUIRED.



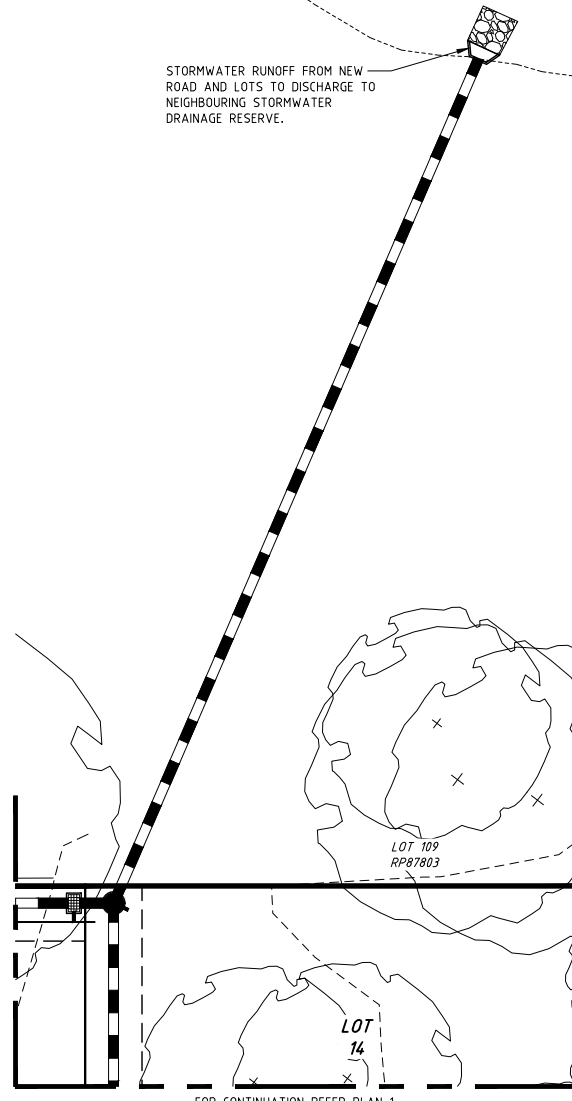
**PLAN 1**  
SCALE 1:200

EXISTING TREES ALONG PROPOSED WORKS TO BE REMOVED IF REQUIRED (TYP). THIS IS TO BE COORDINATED WITH ARBORIST AND ACCESS PERMISSION TO BE OBTAINED FROM NEIGHBOUR IF REQUIRED.



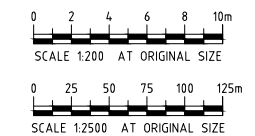
**LOCALITY PLAN**  
SCALE 1:2500

STORMWATER RUNOFF FROM NEW ROAD AND LOTS TO DISCHARGE TO NEIGHBOURING STORMWATER DRAINAGE RESERVE.



**PLAN 2**  
SCALE 1:200

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**REAL PROPERTY DESCRIPTION**  
LOT No. 108  
PLAN No. RP 87803

DO NOT SCALE. CONFIRM ALL DIMENSIONS ON SITE. ORIGINAL DRAWING SIZE - A1

ISSUE	AMENDMENT	DATE
A	PRELIMINARY ISSUE	21.10.20
B	AMENDMENT ISSUE - TREES	21.03.19
C	PRELIMINARY ISSUE REVISED	25.01.22
D	PRELIMINARY ISSUE REVISED	08.06.22

**LEGEND**

- 3.50--- EXISTING SURFACE CONTOURS
- EXISTING STORMWATER
- PROPOSED STORMWATER
- KA ● PROPOSED KERB ADAPTOR
- PROPOSED CONCRETE/PAVEMENT

ASSOCIATED CONSULTANT

PROJECT  
**46 KRAFT ROAD  
PALLARA**

CLIENT  
**YU FEN LI**

TITLE  
**CONCEPT SERVICES  
SKETCH  
(SHEET 2 OF 2)**

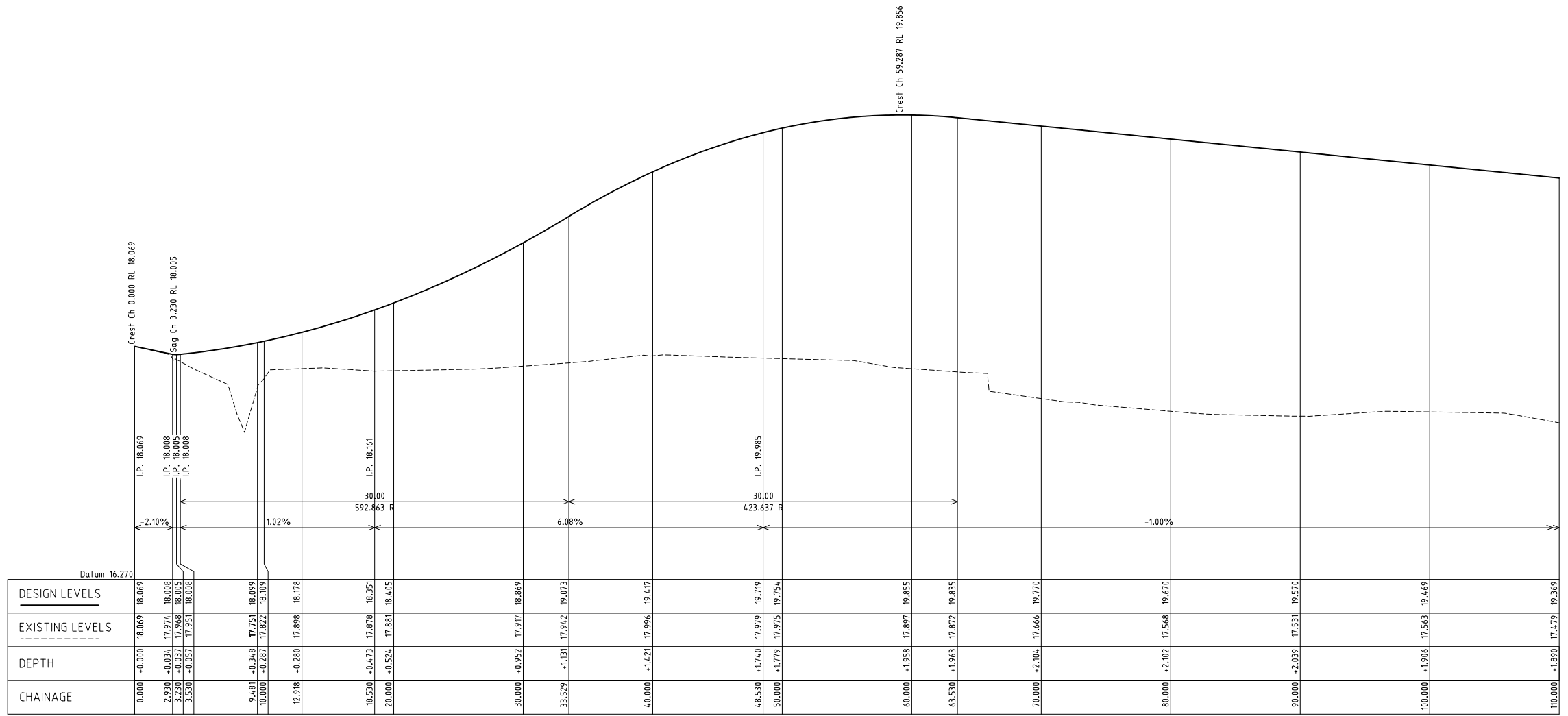
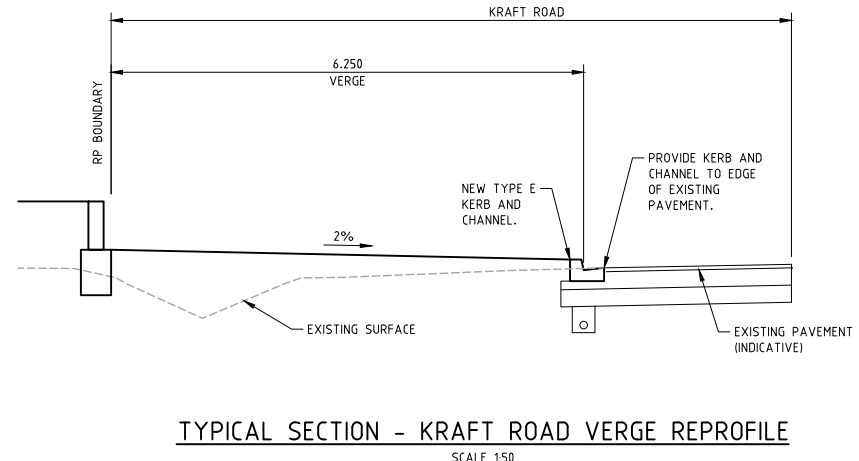
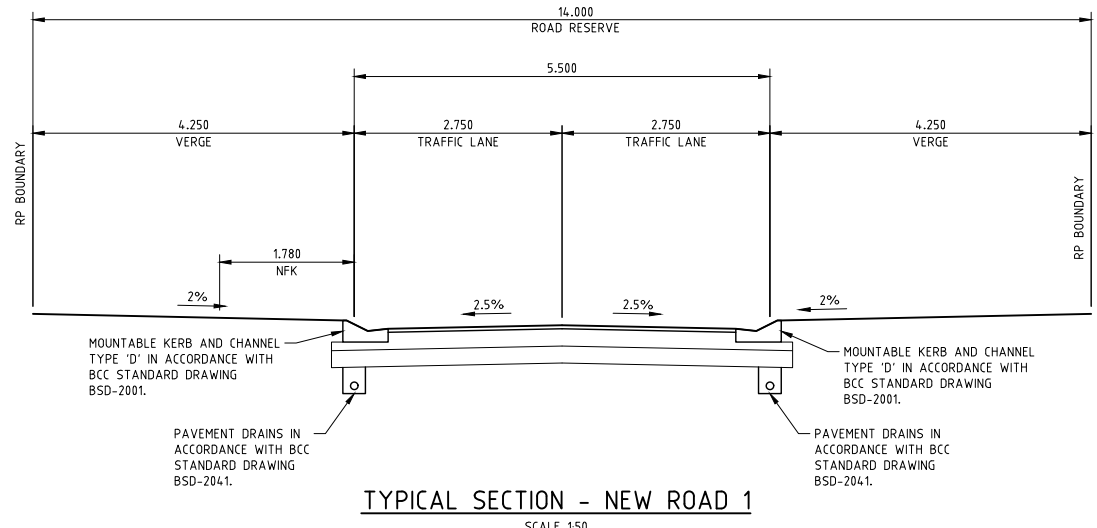
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Property Development Solutions

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PO Box 13, Moorooka QLD 4105  
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E info@civilworks.com.au  
W www.civilworks.com.au

Designed	Drawn	Date
SP	SP	21.10.20
Approved	Scale	
<i>[Signature]</i>	AS SHOWN	
Drawing No.	Rev.	
CW20023-SK02	D	

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ORIGINAL DRAWING SIZE - A1

ISSUE	AMENDMENT	DATE
A	PRELIMINARY ISSUE	21.10.20



**ROAD 01 LONG SECTION**  
SCALE - 1:200 HORIZONTAL 1:20 VERTICAL

ASSOCIATED CONSULTANT

PROJECT  
**46 KRAFT ROAD  
PALLARA**

CLIENT  
**YU FEN LI**

TITLE  
**CONCEPT ROAD  
SECTIONS  
SHEET 1 OF 2**



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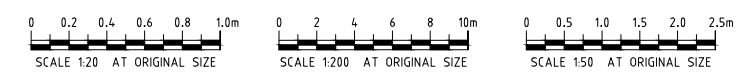
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**REAL PROPERTY DESCRIPTION**

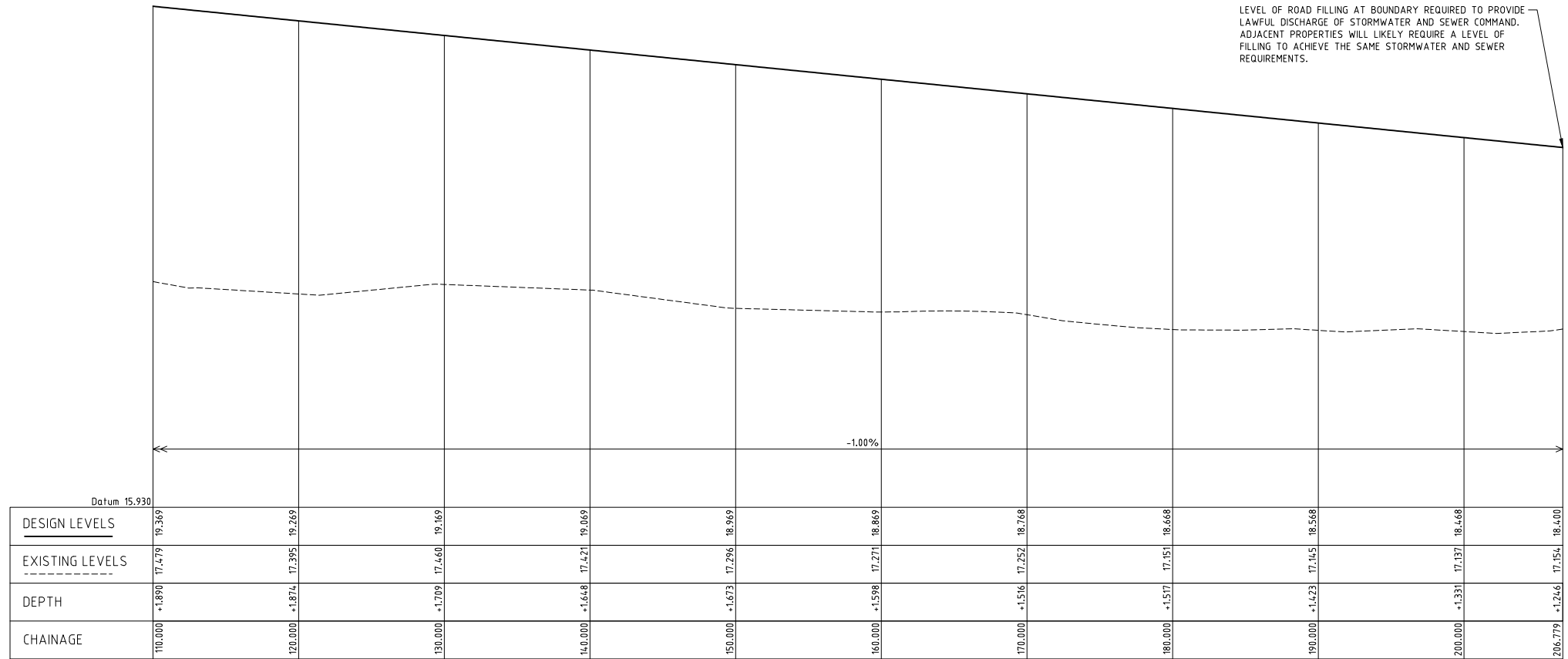
LOT No. 108  
PLAN No. RP 87803

**PRELIMINARY**  
NOT FOR CONSTRUCTION

Designed	Drawn	Date
DM	DM	21.10.20
Approved	Scale	
<i>[Signature]</i>	AS SHOWN	
Drawing No.	Rev.	
CW20023-SK03	A	

DO NOT SCALE.  
CONFIRM ALL DIMENSIONS ON SITE.  
ORIGINAL DRAWING SIZE - A1

ISSUE	AMENDMENT	DATE
A	PRELIMINARY ISSUE	21.10.20



**ROAD 01 LONG SECTION CONTINUED**  
SCALE - 1:200 HORIZONTAL 1:20 VERTICAL

**PRELIMINARY**  
NOT FOR CONSTRUCTION

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ASSOCIATED CONSULTANT

PROJECT  
**46 KRAFT ROAD  
PALLARA**

CLIENT  
**YU FEN LI**

TITLE  
**CONCEPT ROAD  
SECTIONS  
SHEET 2 OF 2**



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**REAL PROPERTY DESCRIPTION**  
LOT No. 108  
PLAN No. RP 87803

Designed	DM	Drawn	DM	Date	21.10.20
Approved		Scale	AS SHOWN	Rev.	A
Drawing No.					CW20023-SK04



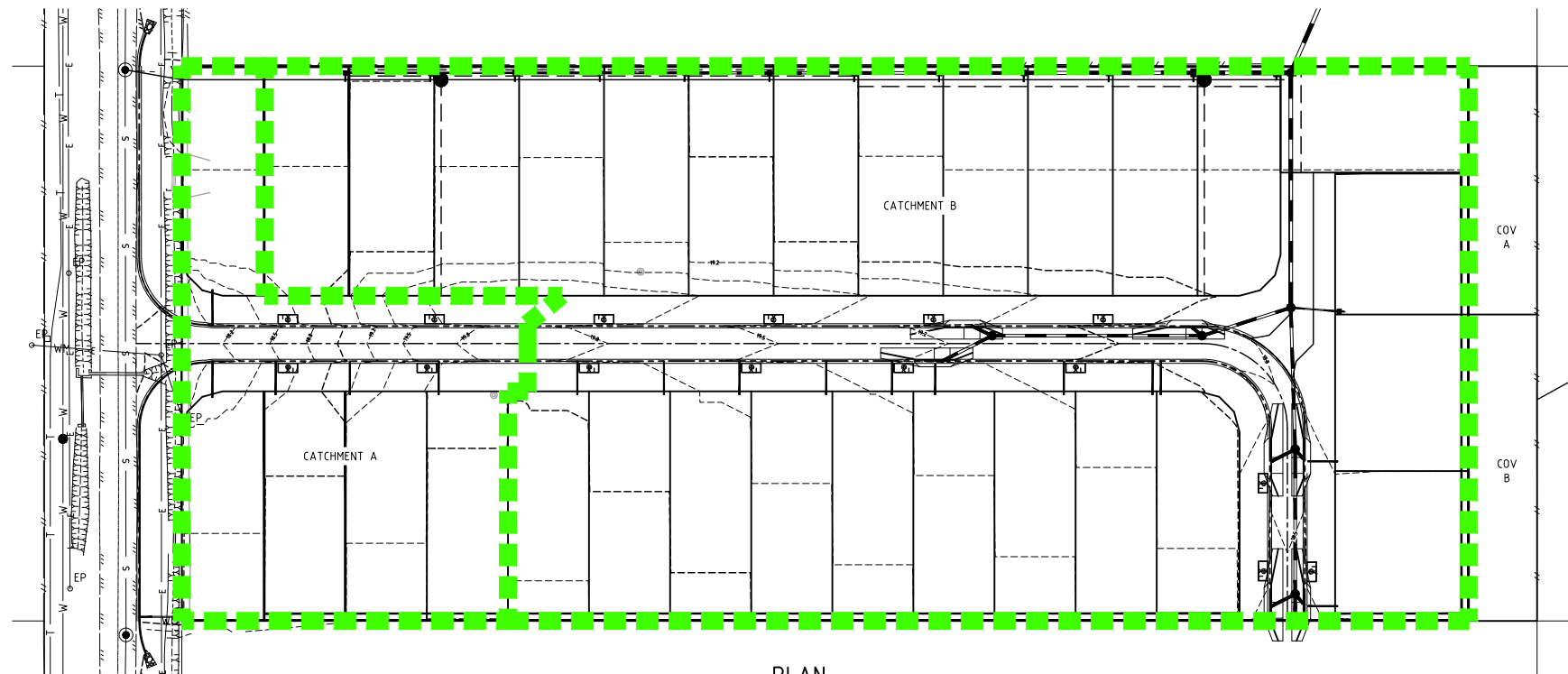
LOCALITY PLAN  
SCALE 1:2500

DO NOT SCALE.  
CONFIRM ALL DIMENSIONS ON SITE.  
ORIGINAL DRAWING SIZE - A1

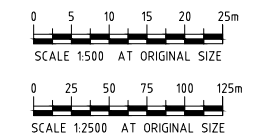
ISSUE	AMENDMENT	DATE
A	PRELIMINARY ISSUE	27.06.22

**LEGEND**

■ CATCHMENT BOUNDARY



PLAN  
SCALE 1:500



**PRELIMINARY**  
NOT FOR CONSTRUCTION

REAL PROPERTY DESCRIPTION	
LOT No.	108
PLAN No.	RP 87803

ASSOCIATED CONSULTANT

PROJECT  
46 KRAFT ROAD  
PALLARA


CLIENT  
YU FEN LI

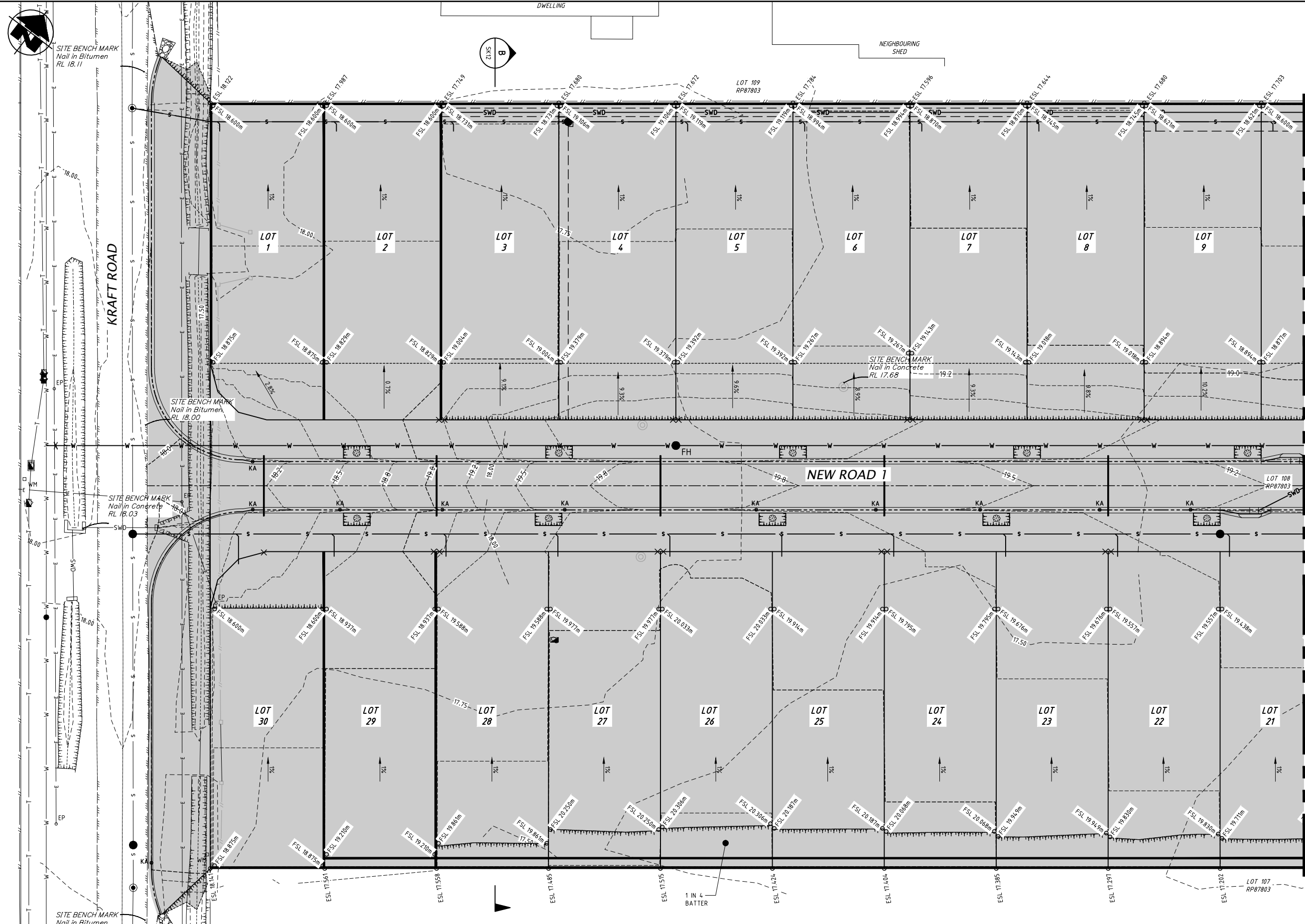
TITLE  
CONCEPT STORMWATER  
CATCHMENT PLAN



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Designed	SP	Drawn	SP	Date	27.06.22	
Approved		Scale	AS SHOWN			
Drawing No.	CW20023-SK05				Rev.	A



DO NOT SCALE.  
CONFIRM ALL DIMENSIONS ON SITE.  
ORIGINAL DRAWING SIZE - A1

ISSUE	AMENDMENT	DATE
A	PRELIMINARY ISSUE	21.10.20
B	PRELIMINARY ISSUE REVISED	08.06.22

**LEGEND**

- 3.50--- EXISTING SURFACE CONTOURS
- 3.50--- PROPOSED SURFACE CONTOURS
- SWD--- EXISTING STORMWATER
- SWD--- PROPOSED STORMWATER
- W--- EXISTING WATER MAIN
- W--- PROPOSED WATER MAIN
- S--- EXISTING SEWER
- S--- PROPOSED SEWER
- E--- EXISTING UNDERGROUND ELECTRICAL
- EP EXISTING ELECTRICITY POLE
- T--- EXISTING TELECOMMUNICATIONS LINE
- █ EXISTING TELECOMMUNICATIONS PIT
- █ PROPOSED RETAINING WALL
- ▨ PROPOSED TOP OF BATTER
- ▨ PROPOSED TOE OF BATTER
- █ AREA OF FILL
- FSL 63.227 FINISHED SURFACE LEVEL
- ESL 63.227 EXISTING SURFACE LEVEL

ASSOCIATED CONSULTANT

PROJECT  
**46 KRAFT ROAD  
PALLARA**

CLIENT  
**YU FEN LI**

TITLE  
**CONCEPT EARTHWORKS  
PLAN  
(SHEET 1 OF 2)**

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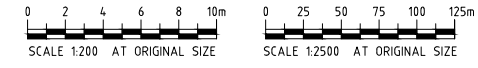
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**PLAN**  
SCALE 1:200

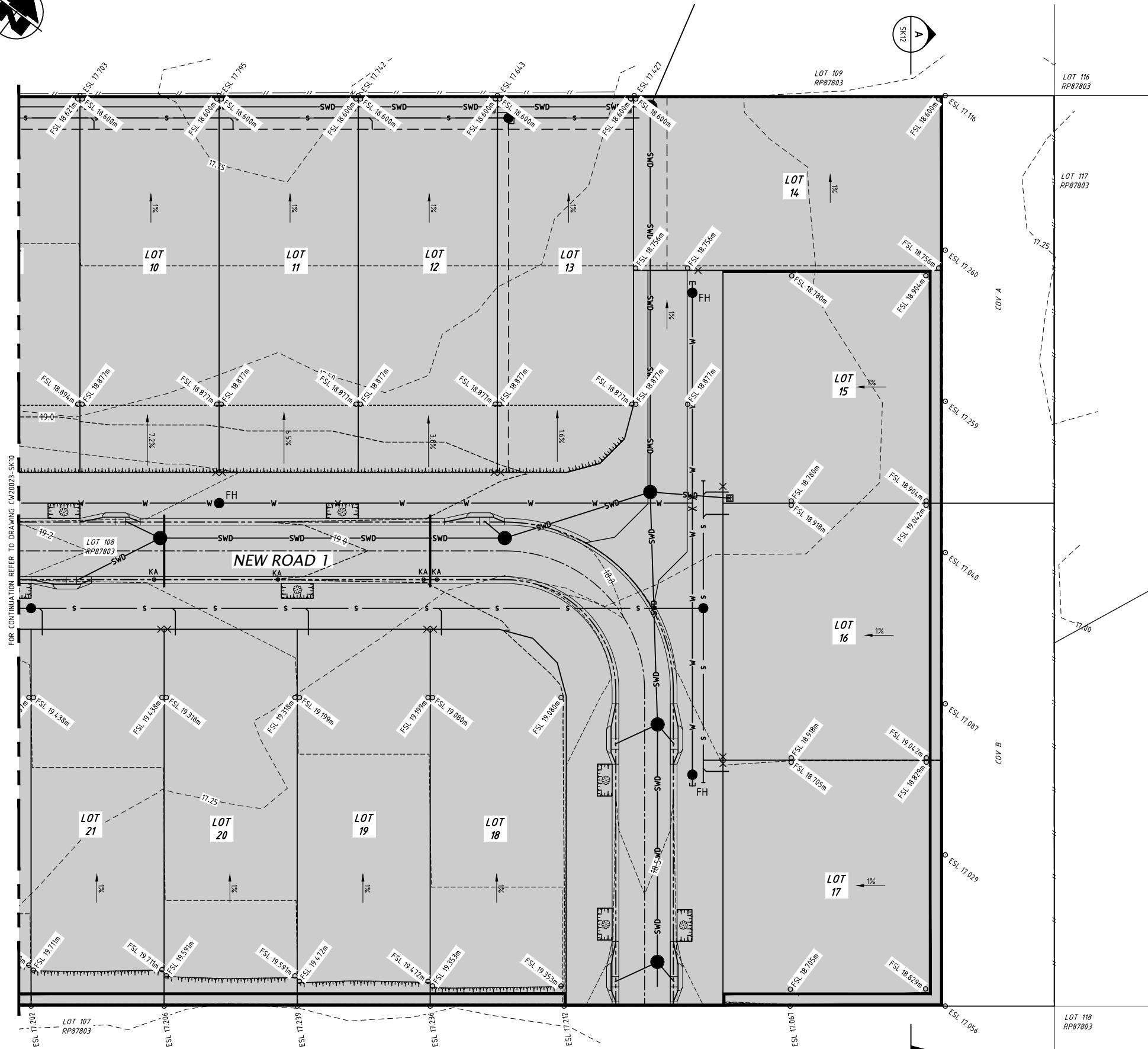


**PRELIMINARY**  
NOT FOR CONSTRUCTION

**REAL PROPERTY DESCRIPTION**

LOT No.	108
PLAN No.	RP 87803

Designed	DM	Drawn	DM	Date	21.10.20
Approved	[Signature]	Scale	AS SHOWN		
Drawing No.	<b>CW20023-SK10</b>			Rev.	<b>B</b>



PLAN  
SCALE 1:200



LOCALITY PLAN  
SCALE 1:2500

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ISSUE	AMENDMENT	DATE
A	PRELIMINARY ISSUE	21.10.20
B	PRELIMINARY ISSUE REVISED	08.06.22
C	PRELIMINARY ISSUE REVISED	29.06.22

**LEGEND**

- 3.50--- EXISTING SURFACE CONTOURS
- 3.50--- PROPOSED SURFACE CONTOURS
- SWD— EXISTING STORMWATER
- SWD— PROPOSED STORMWATER
- W— EXISTING WATER MAIN
- W— PROPOSED WATER MAIN
- S— EXISTING SEWER
- S— PROPOSED SEWER
- E— EXISTING UNDERGROUND ELECTRICAL
- EP EXISTING ELECTRICITY POLE
- T— EXISTING TELECOMMUNICATIONS LINE
- █ EXISTING TELECOMMUNICATIONS PIT
- █ PROPOSED RETAINING WALL
- ▒▒▒▒▒▒ PROPOSED TOP OF BATTER
- ▒▒▒▒▒▒ PROPOSED TOE OF BATTER
- █ AREA OF FILL
- FSL 63.227 FINISHED SURFACE LEVEL
- ESL 63.227 EXISTING SURFACE LEVEL

ASSOCIATED CONSULTANT

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PROJECT  
46 KRAFT ROAD  
PALLARA

CLIENT  
YU FEN LI

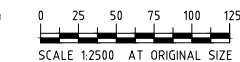
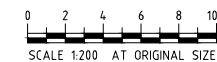
TITLE  
CONCEPT EARTHWORKS  
PLAN  
(SHEET 2 OF 2)



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Designed	Drawn	Date
DM	DM	21.10.20
Approved	Scale	AS SHOWN
	AS SHOWN	
Drawing No.	Rev.	
CW20023-SK11	C	



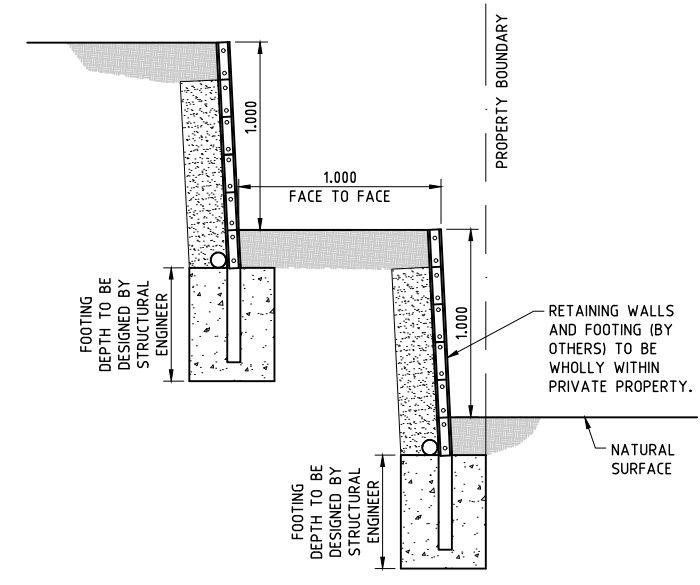
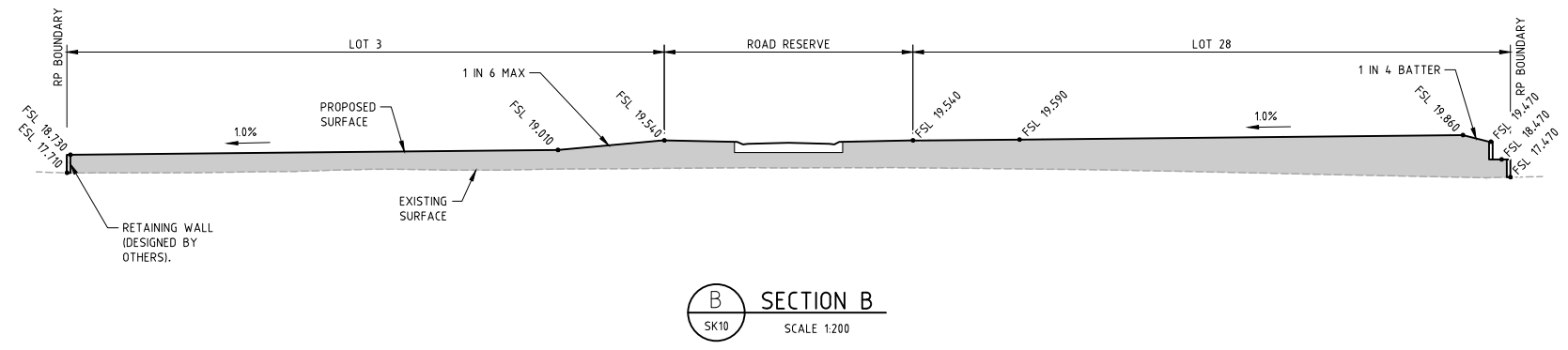
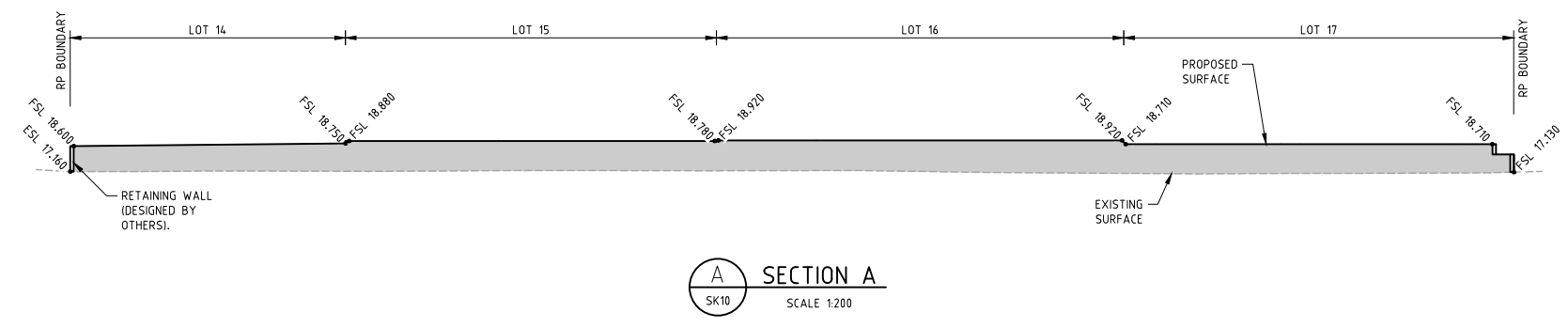
REAL PROPERTY DESCRIPTION	
LOT No.	108
PLAN No.	RP 87803

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CONFIRM ALL DIMENSIONS ON SITE.  
ORIGINAL DRAWING SIZE - A1

ISSUE	AMENDMENT	DATE
A	PRELIMINARY ISSUE	21.10.20
B	PRELIMINARY ISSUE REVISED	08.06.22
C	PRELIMINARY ISSUE REVISED	29.06.22

**LEGEND**

	AREA OF FILL
	FINISHED SURFACE LEVEL
	EXISTING SURFACE LEVEL



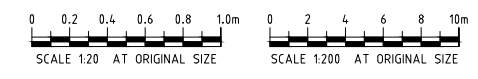
**CONCRETE SLEEPER RETAINING WALL DETAIL**  
SCALE 1:20

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**PRELIMINARY**  
NOT FOR CONSTRUCTION



**REAL PROPERTY DESCRIPTION**

LOT No.	108
PLAN No.	RP 87803

ASSOCIATED CONSULTANT

PROJECT  
**46 KRAFT ROAD  
PALLARA**

CLIENT  
**YU FEN LI**

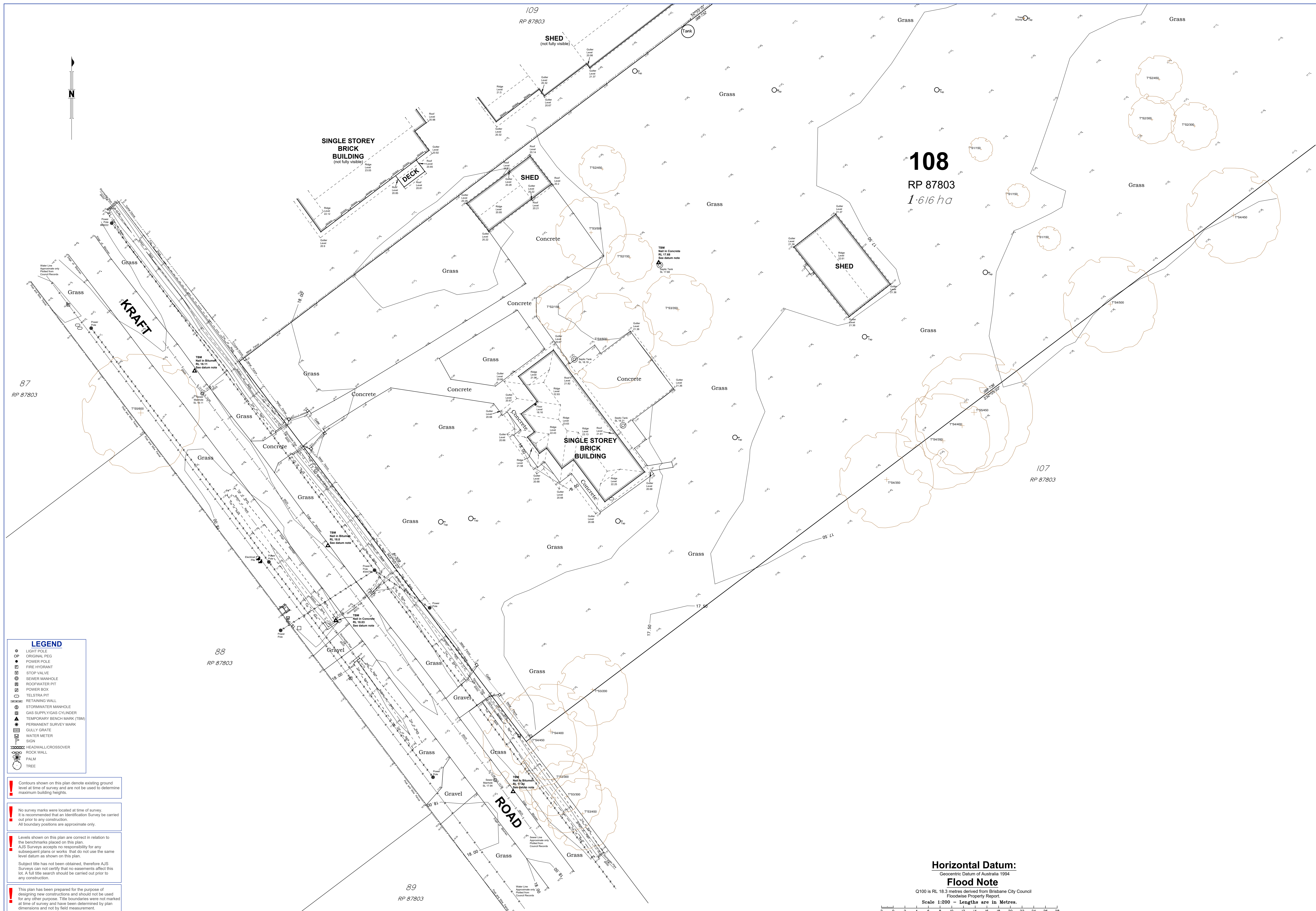
TITLE  
**CONCEPT EARTHWORKS  
SECTIONS AND DETAILS**

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Designed	DM	Drawn	DM	Date	21.10.20
Approved		Scale	AS SHOWN	Rev.	B
Drawing No.					CW20023-SK12

## **APPENDIX B – Survey Plan**



**LEGEND**

- LIGHT POLE
- ORIGINAL PEG
- POWER POLE
- FIRE HYDRANT
- STOP VALVE
- SEWER MANHOLE
- ROOF WATER PIT
- POWER SOCK
- TELSTRA PIT
- RETAINING WALL
- STORMWATER MANHOLE
- GAS SUPPLY/VIGAS CYLINDER
- ▲ TEMPORARY BENCH MARK (TBM)
- PERMANENT SURVEY MARK
- GULLY GRATE
- WATER METER
- SIGN
- ▬ HEADWALL/CROSSOVER
- ROCK WALL
- PALM
- TREE

Contours shown on this plan denote existing ground level at time of survey and are not to be used to determine maximum building heights.

No survey marks were located at time of survey. It is recommended that an Identification Survey be carried out prior to any construction. All boundary positions are approximate only.

Levels shown on this plan are correct in relation to the benchmarks placed on this plan. AJS Surveys accepts no responsibility for any subsequent plans or works that do not use the same level datum as shown on this plan.

Subject title has not been obtained, therefore AJS Surveys can not certify that no easements affect this lot. A full title search should be carried out prior to any construction.

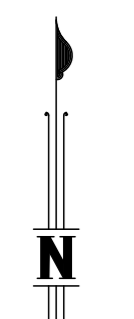
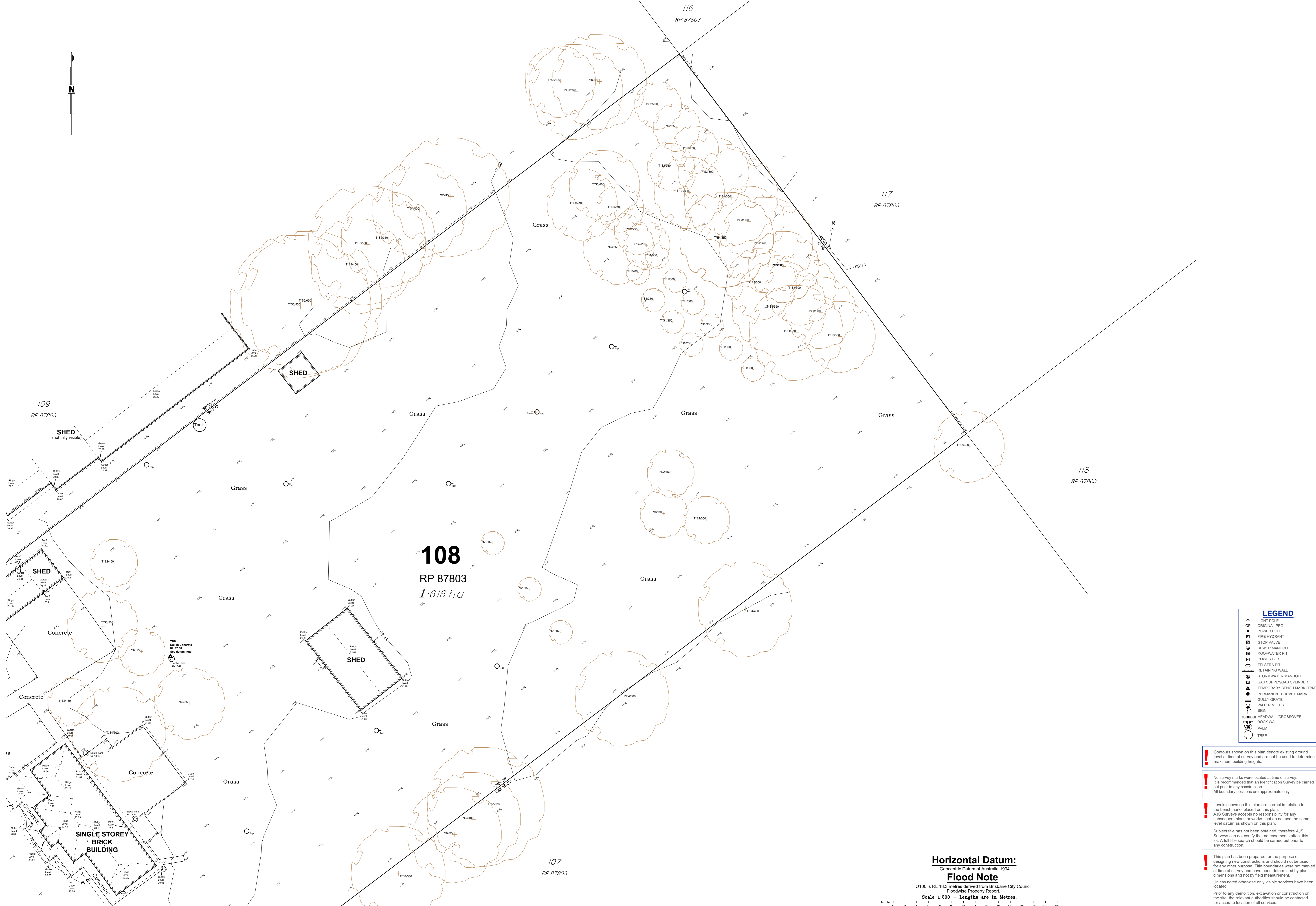
This plan has been prepared for the purpose of designing new constructions and should not be used for any other purposes. Title boundaries were not marked at time of survey and have been determined by plan dimensions and not by field measurement.

Unless noted otherwise only visible services have been located.

Prior to any demolition, excavation or construction on the site, the relevant authorities should be contacted for accurate location of all services.

**Horizontal Datum:**  
 Geocentric Datum of Australia 1994  
**Flood Note**  
 Q100 is RL 18.3 metres derived from Brisbane City Council Floodwise Property Report.  
 Scale 1:200 - Lengths are in Metres.

<p><b>REVISIONS</b></p> <table border="1"> <tr><td> </td><td> </td><td>C</td></tr> <tr><td> </td><td> </td><td>B</td></tr> <tr><td> </td><td> </td><td>A</td></tr> </table>				C			B			A	<p><b>ASSOCIATED CONSULTANTS:</b></p>		<p>SURVEYOR REL</p>	<p>DATE 02/09/2020</p>	<p>LEVEL DATUM: AHD</p> <p>DERIVED FROM PSM 61874 (RL 12.948m)</p>	<p>CLIENT: DAWN CONSTRUCTIONS</p>	<p>SITE: 46 Kraft Road, Pallara                  Lot 108 on RP 87803</p>	<p>SCALE 1:200 (A0)                  PLAN REF: T0319-D1A</p>
		C																
		B																
		A																
<p>03/03/2021 Remove trees as per clients instructions</p>		<p>PDR</p>		<p>DRAWN PDR</p>	<p>CHECKED REL</p>													

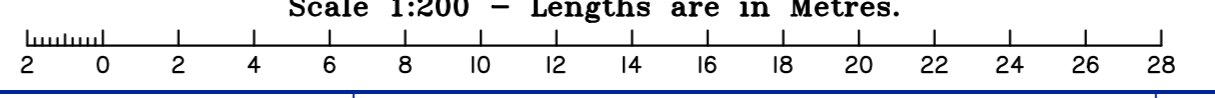


**LEGEND**

- LIGHT POLE
- ORIGINAL PEG
- POWER POLE
- FIRE HYDRANT
- STOP VALVE
- SEWER MANHOLE
- ROOF/WATER PIT
- POWER BOX
- TELSTRA PIT
- RETAINING WALL
- STORMWATER MANHOLE
- GAS SUPPLY/GAS CYLINDER
- ▲ TEMPORARY BENCH MARK (TBM)
- ▲ PERMANENT SURVEY MARK
- GULLY GRATE
- WATER METER
- SIGN
- HEADWALL/CROSSOVER
- ROCK WALL
- PALM
- TREE

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 Q100 is RL 18.3 metres derived from Brisbane City Council Floodwise Property Report.  
 Scale 1:200 - Lengths are in Metres.



<b>REVISIONS</b> <table border="1"> <tr><td> </td><td>C</td></tr> <tr><td> </td><td>B</td></tr> <tr><td>03/03/2021</td><td>Remove trees as per clients instructions</td></tr> </table>			C		B	03/03/2021	Remove trees as per clients instructions	<b>ASSOCIATED CONSULTANTS:</b> <table border="1"> <tr><td> </td><td>A</td></tr> <tr><td> </td><td>PDR</td></tr> </table>			A		PDR	SURVEYOR REL DRAWN PDR	DATE 02/09/2020 CHECKED REL	LEVEL DATUM: AHD DERIVED FROM PSM 61874 (RL 12.948m)	CLIENT: DAWN CONSTRUCTIONS	SITE: 46 Kraft Road, Pallara Lot 108 on RP 87803	SCALE 1:200 (A0) PLAN REF: T0319-D1
	C																		
	B																		
03/03/2021	Remove trees as per clients instructions																		
	A																		
	PDR																		

## **APPENDIX C – Subdivision Layout Plan**



## **APPENDIX D – FloodWise Property Report**



# Brisbane City Council FloodWise Property Report

Report Reference

1667351431052

02/11/2022 11:10:31

Dedicated to a better Brisbane

## THIS REPORT IS FOR BUILDING AND DEVELOPMENT PURPOSES ONLY

The FloodWise Property Report provides property or lot-based flood information for building and development requirements. This report provides information on estimated flood levels, habitable floor level requirements and more technical information on the four sources of flooding: river, creek / waterway, storm tide and overland flow. Refer to the Useful Definitions section for a glossary of terms.

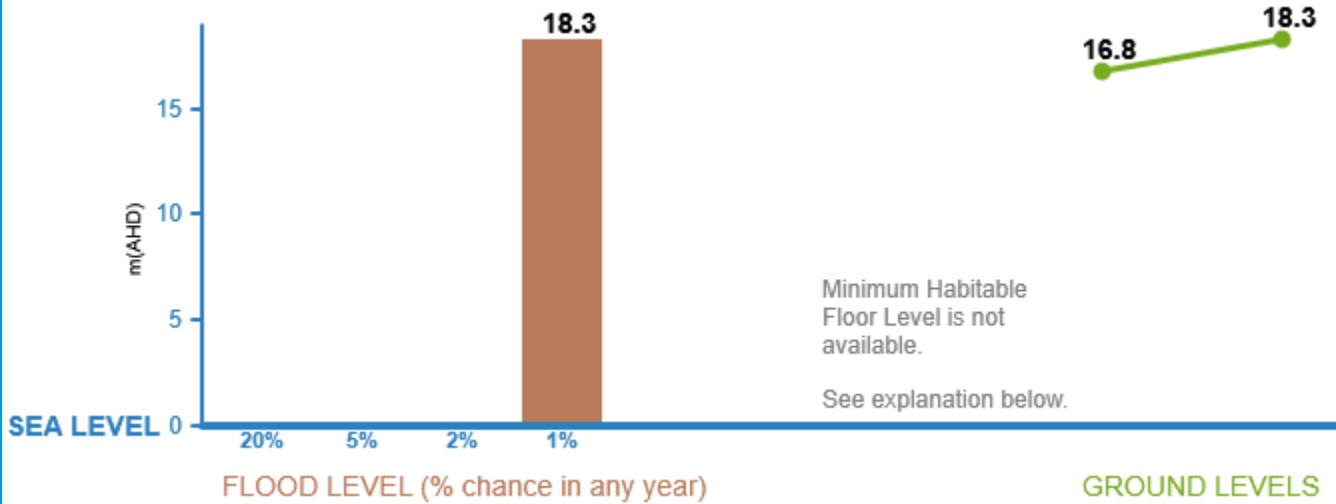
To find out more about how the contents of this report may affect building or development on this property, please visit [www.brisbane.qld.gov.au/planning-building](http://www.brisbane.qld.gov.au/planning-building). For more general information about understanding your flood risk and how to prepare your property, family or business for potential flooding visit [www.brisbane.qld.gov.au/beprepared](http://www.brisbane.qld.gov.au/beprepared)

### THIS IS A REPORT FOR:

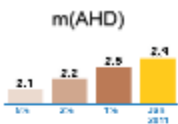
Rateable Address: 46 KRAFT RD, PALLARA QLD 4110

Lot Details: L.108 RP.87803

### FLOOD LEVEL INFORMATION



### EXPLANATION



*m(AHD)* - Metres Australia Height Datum. The level of 0.0m AHD is approximately mean sea level.

*Flood Levels* - The Flood level bar chart above shows the possible flooding level and percentage chance of that level being reached or exceeded in any year. If an orange bar shows, it is the calculated January 2011 flood level at this address or lot. Refer to 'Useful Definitions' for further information.

*Minimum Habitable Floor Level* - Applies to residential development only. Please refer to Council's planning scheme to learn how this may affect you. If a property is in an overland flow path, or a large allotment, a minimum habitable floor level cannot be provided. Refer flood and planning development flags below.

*Ground Levels* - The green line above shows this property's approximate lowest and highest ground levels based on latest available information (2019 airborne laser survey) to Council. If you are building, please confirm with a surveyor.

For further information and definitions please refer to the Useful Definitions page

### FLOOD AND PLANNING DEVELOPMENT FLAGS

DEVELOPMENT  
FLAG(S)

This property may also be affected by one or more flood or property development overlays or flags. These include: LARGE ALLOTMENT

Please review the technical summary over page and refer to Council's planning scheme for further information.



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## TECHNICAL SUMMARY

This section of the FloodWise Property Report contains more detailed flood information for this property so surveyors, builders, certifiers, architects and engineers can plan and build in accordance with Council's planning scheme. For more information about building and development in Brisbane please visit [www.brisbane.qld.gov.au/planning-building](http://www.brisbane.qld.gov.au/planning-building) or talk to a Development Assessment Planning Information Officer via Council's Contact Centre on (07) 3403 8888.

### THIS IS A REPORT FOR:

Rateable Address: 46 KRAFT RD, PALLARA QLD 4110

Lot Details: L.108 RP.87803

### PROPERTY INFORMATION (Summary)

The following table provides a summary of flood information for this property. More detailed flood level information is provided in the following sections of this report.

PROPERTY SUMMARY	LEVEL (mAHD)
Minimum Ground Level	16.8
Maximum Ground Level	18.3
Min Habitable Floor Level	Contact Council
Defined Flood Event Level	18.3
Defined Flood Event Level Source	CREEK/WATERWAY
Source of Highest Flooding	CREEK/WATERWAY
Flooding may also occur from	CREEK/WATERWAY

### ESTIMATED PEAK FLOODING LEVELS

The table below displays the peak estimated flood levels by probability for this property. Estimated flood level data should be used in conjunction with applicable planning scheme requirements - Refer to Flood Planning Development Information.

Note that the overland flow flooding level maybe higher than the levels below from other sources.

DESCRIPTION	LEVEL (mAHD)	SOURCE
20% AEP	N/A*	
5% AEP	N/A*	
2% AEP	N/A*	
1% AEP	18.3	CREEK/WATERWAY

\* Council does not hold flood levels for this probability event.

## FLOOD PLANNING DEVELOPMENT INFORMATION

This section of the FloodWise Property Report contains information about Council's planning scheme overlays. Overlays identify areas within the planning scheme that reflect distinct themes that may include constrained land and/or areas sensitive to the effects of development.

### FLOOD OVERLAY CODE

There are currently no River, Creek/Waterway, or Overland Flow Flood Planning Areas that apply to this property.

### COASTAL HAZARD OVERLAY CODE

There are currently no Coastal Hazard Overlays that apply to this property.

### PROPERTY DEVELOPMENT FLAGS

*Large Allotment* - This property is either a Large Allotment of over 1000 square metres or is located within a Large Allotment. Flood levels may vary significantly across allotments of this size. Further investigations may be warranted in determining the variation in flood levels and the minimum habitable floor level across the site. For more information or advice, it is recommended you engage a Registered Professional Engineer of Queensland.



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#### Useful Definitions

*Australian Height Datum (AHD)* - The reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.

*Annual Exceedance Probability (AEP)* - The probability of a flood event of a given size occurring in any one year, usually expressed as a percentage annual chance.

*Defined Flood Level (DFL)* - The DFL for Brisbane River flooding is a level of 3.7m AHD at the Brisbane City Gauge based on a flow of 6,800 m<sup>3</sup>/s.

*Maximum and Minimum Ground Level* - Highest and lowest ground levels on the property based on available ground level information. A Registered Surveyor can confirm exact ground levels.

*Minimum Habitable Floor Level* - The minimum level in metres AHD at which habitable areas of development (generally including bedrooms, living rooms, kitchen, study, family and rumpus rooms) must be constructed.

*Council's Planning Scheme* - The City Plan (planning scheme) has been prepared in accordance with the Sustainable Planning Act as a framework for managing development in a way that advances the purpose of the Act. In seeking to achieve this purpose, the planning scheme sets out the Council's intention for future development in the planning scheme area, over the next 20 years.

*Residential Flood Level (RFL)* - Residential flood level (RFL) for the Brisbane River flooding equates to the 1% Annual Exceedance Probability flood level.

*Rateable Address* - A Lot or Property may have more than one street address. The address shown on this report is the address used by Council for the Lot or property selected.

*Property* - A property will contain 1 or more lots. The *Multiple Lot Warning* is shown if you have selected a property that contains multiple lots.

#### Brisbane City Council's Online Flood Tools

Council provides a number of online flood tools:

- to guide planning and development
- to help residents and businesses understand their flood risk and prepare for flooding.

#### Planning and Development Online Flood Tools

Council's online flood tools for planning and development purposes include:

- FloodWise Property Report
- Flood Overlay Code

For more information on Council's planning scheme and online flood tools for planning and development:

- phone 07 3403 8888 to talk to a Development Assessment Customer Liaison Officer
- visit [www.brisbane.qld.gov.au/planning-building](http://www.brisbane.qld.gov.au/planning-building)
- visit a Regional Business Centre.

#### Helping residents and businesses be prepared for flooding

Council has a range of free tools and information to help residents and businesses understand potential flood risks and how to be prepared. This includes:

- Flood Awareness Map
- Flooding in Brisbane – A Guide for Residents
- Flooding in Brisbane – A Guide for Businesses
- Early Warning Alert Service. Visit [www.brisbane.qld.gov.au/earlywarning](http://www.brisbane.qld.gov.au/earlywarning) to register for email, home phone or SMS severe weather alert updates.

Note: The Flood Awareness Map shows four levels of flood likelihood from high likelihood (flooding is very likely to occur) through to very low likelihood (very rare and extreme flood events).

For more information on Council's online flood tools for residents and business:

- Visit [www.brisbane.qld.gov.au/beprepared](http://www.brisbane.qld.gov.au/beprepared)
- Phone (07) 3403 8888.



# Brisbane City Council FloodWise Property Report

Report Reference

1667351431052

02/11/2022 11:10:31

*Dedicated to a better Brisbane*

## Disclaimer

1. Defined Flood Levels and Residential Flood Levels, and the Minimum Habitable Floor Levels are determined from the best available information to Council at the date of issue. These flood levels, for a particular property, may change if more detailed information becomes available or changes are made in the method of calculating flood levels.
2. Council makes no warranty or representation regarding the accuracy or completeness of a FloodWise Property report. Council disclaims any responsibility or liability in relation to the use or reliance by any person on a FloodWise Property Report.



## Planning to build or renovate?

For information, guidelines, tools and resources to help you track, plan or apply for your development visit [www.brisbane.qld.gov.au/planning-building](http://www.brisbane.qld.gov.au/planning-building)

You can also find the Brisbane City Plan 2014 and Neighbourhood Plans as well as other information and training videos to help with your building and development plans.

## **APPENDIX E – eBIMAP**



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Notes:

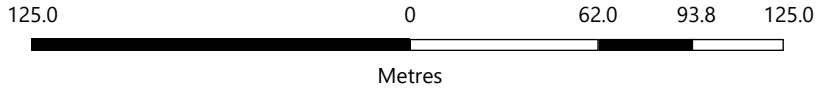
### Map Title

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 Nearmap Imagery © 2019 Nearmap Australia Pty Ltd  
 StreetPro digital spatial data © 2019 Pitney Bowes Inc.  
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 2009 Aerial Imagery © 2009 AAMHatch Pty Limited  
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Print Date:  
 5/11/2020 - 12:44 PM  
 Projection:  
 Web Mercator Auxiliary Sphere



Scale: 1:2,500

# Legend

## Recycled Water Device

- FLOW METER
- FLOW METER - OFFLINE
- <all other values>
- CROSS
- TAPPING BAND
- WYE
- SCOUR OUTLET
- CHEMICAL INJECTION POINT
- ANCHOR BLOCK
- PIER

## Recycled Network Structure Boundary

- PILLAR HYDRANT
- REFLUX
- PRESSURE SUSTAINING
- FLOW CONTROL
- AIR - OFFLINE
- ALTITUDE - OFFLINE
- <all other values>
- BUTTERFLY, OPEN

## Recycled Water Service Valve

- SERVICE VALVE OPEN
- RESERVOIR - OFFLINE
- FILLING STATION
- PUMP STATION - OFFLINE
- BOOSTER PUMP
- LIFT PUMP - OFFLINE
- MODEL LINK
- SCOUR MAIN
- SCOUR MAIN - OFFLINE
- INLINE FLUSHING POINT

## Sewer Fitting - All Other Fittings

- RODDING JOINT
- END CAP
- TEE
- CROSS

## Sewer Manholes

- MANHOLE - OFFLINE
- SCOUR
- AIR - OFFLINE
- REFLUX - OFFLINE
- SEWER DOOR

<all other values>

- LEVEL SENSOR
- LEVEL SENSOR - OFFLINE
- BEND
- JOINT
- TAPPING
- TEE
- PIGGING POINT

## Recycled Water Structures

- CONCRETE STOP
- PIPE BRIDGE

## Recycled Water Hydrant

## Recycled Water Flow Meter

- SCOUR
- PRESSURE REDUCING
- REFLUX - OFFLINE
- PRESSURE SUSTAINING - OFFLINE
- FLOW CONTROL - OFFLINE
- GATE, CLOSED
- BALL, CLOSED
- <all other values>

## Recycled Water- Reservoirs

## Recycled Water Network Structure

## Recycled Water Pump Stations

## Recycled Water Network Structure Boundary

- LIFT PUMP

## Recycled Vertical Pressure Main

- RETIC MAIN
- RETIC MAIN - OFFLINE

## Sewer Fitting - Main Fittings

- OUTLET
- <all other values>
- PROPERTY CONNECTION BOUNDARY
- BEND
- REDUCER
- INLET
- <all other values>

## Sewer Control Valve - by Type

- VACCUM, AS CONSTRUCTED
- SCOUR - OFFLINE

## Sewer System Valve - by Type

- GATE

- PRESSURE GAUGE
- PRESSURE GAUGE - OFFLINE

## Recycled Water Fitting

- END CAP
- GIBAULT JOINT
- REDUCER
- RESERVOIR INLET
- SAMPLING STATION
- <all other values>
- HEAD WALL

## Recycled Water Chamber

- INGROUND HYDRANT

## Recycled Water Control Valve

- AIR
- ALTITUDE
- SCOUR - OFFLINE
- PRESSURE REDUCING - OFFLINE

## Recycled Water System Valve

- GATE, OPEN
- BALL, OPEN
- SERVICE VALVE CLOSED
- RESERVOIR
- TREATMENT PLANT
- PUMP STATION

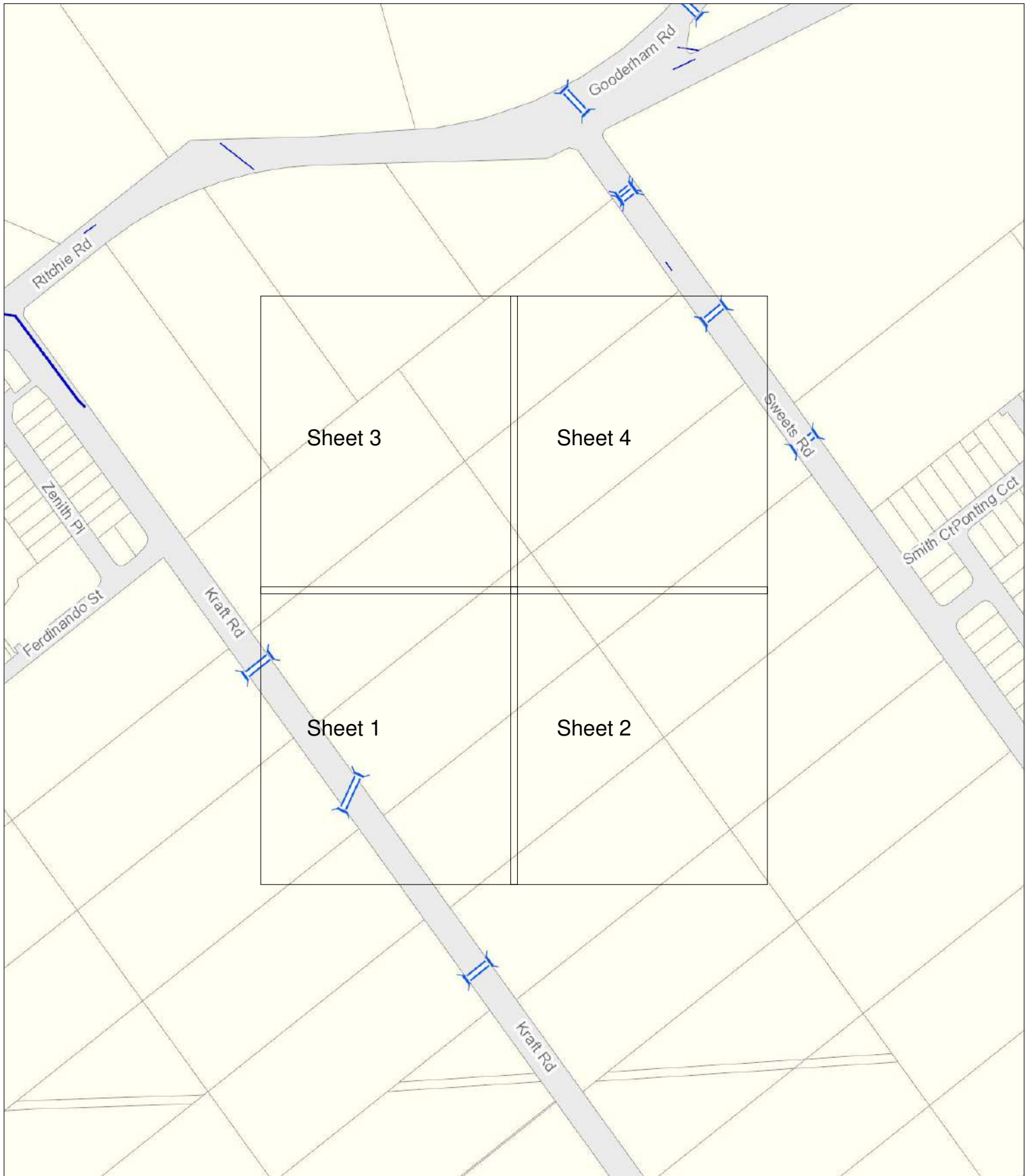
## Recycled Water Pumps

- BOOSTER PUMP - OFFLINE

## Recycled Water Pressure Main

- TRUNK MAIN
- TRUNK MAIN - OFFLINE
- END FLUSHING POINT
- VACUUM LIFT
- JOINT
- JUNCTION
- WYE
- GIBAULT JOINT
- OUTLET
- MANHOLE
- AIR
- REFLUX
- VACCUM - OFFLINE
- <all other values>
- BUTTERFLY

## **APPENDIX F – Dial Before You Dig**



## Map Sheet Overview

Sequence Number: 101539476

### Disclaimer:

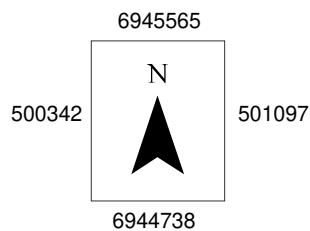
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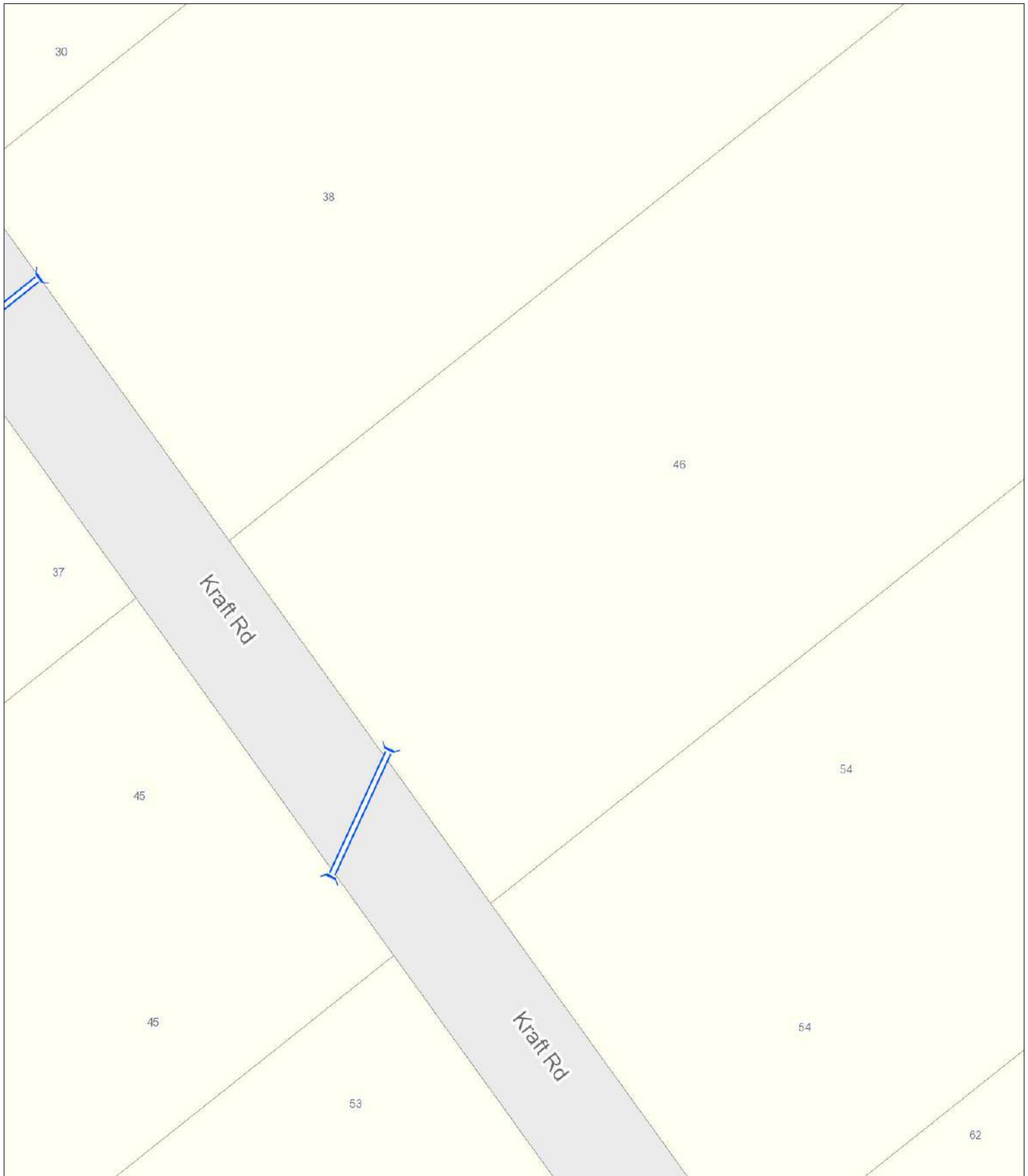
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## BCC Stormwater and Cable Networks

Date: Sep 07, 2020



Copyright BCC, 2020



**BCC Stormwater and Cable Networks**

Sequence Number: 101539476

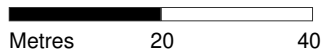
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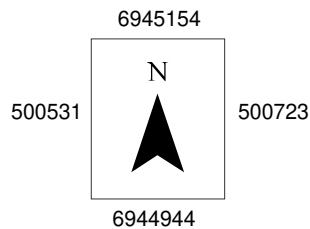
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Scale = 1:1000



**Location:**

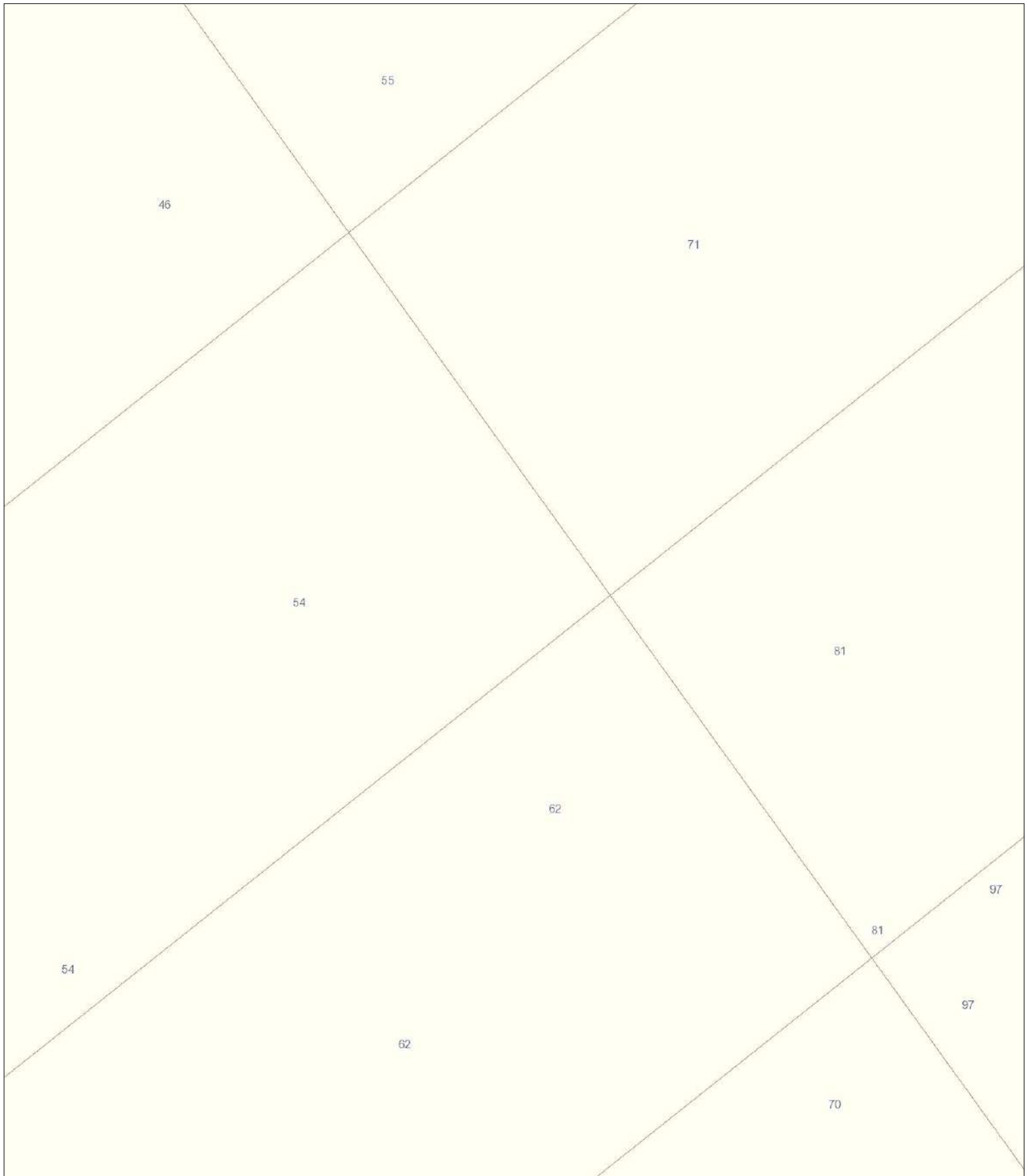


Date: Sep 07, 2020

Sheet 1



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## BCC Stormwater and Cable Networks

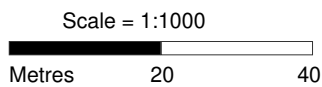
Sequence Number: 101539476

### Disclaimer:

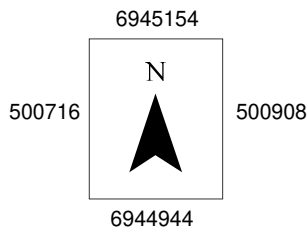
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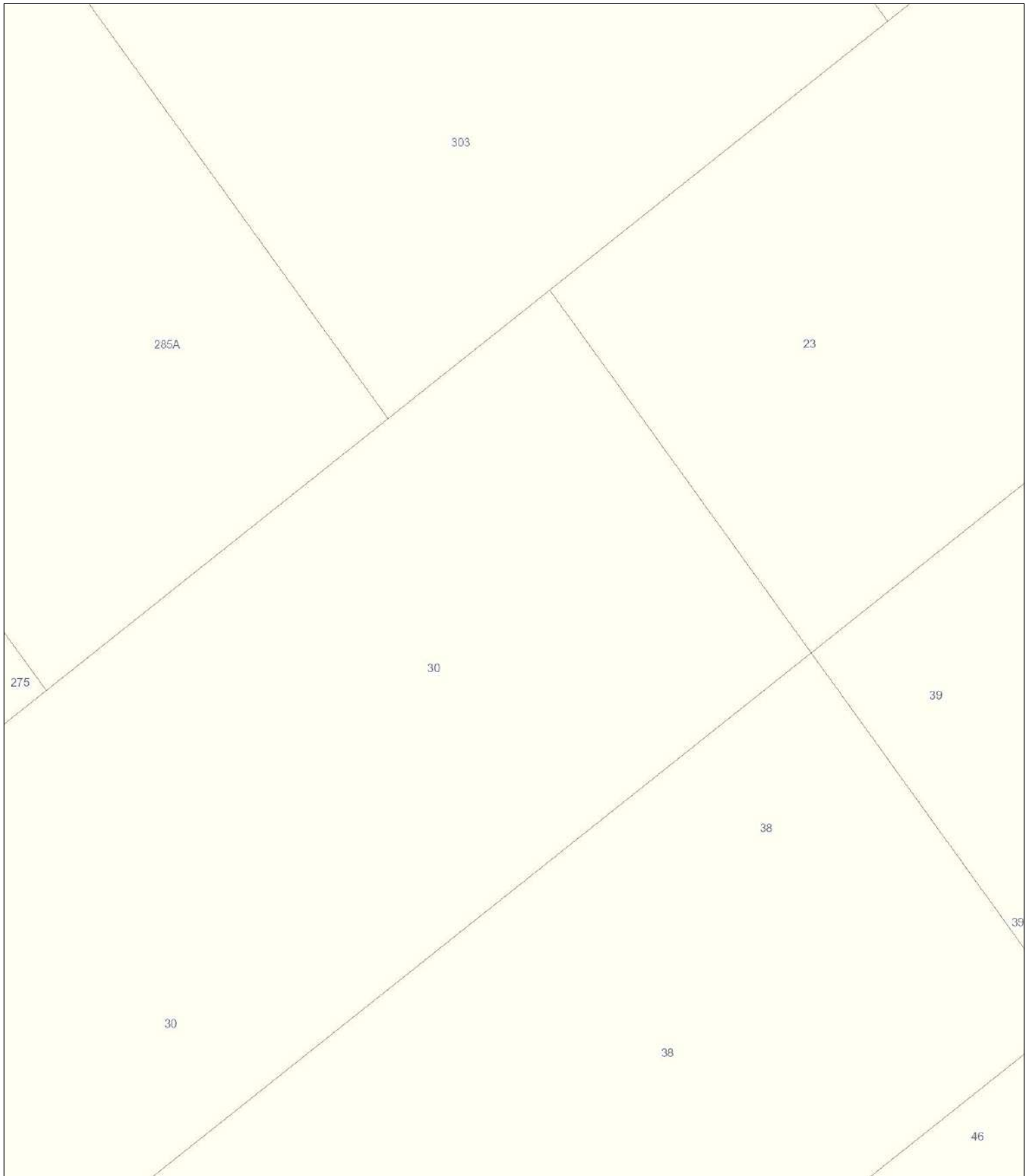


Sheet 2



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Date: Sep 07, 2020



## BCC Stormwater and Cable Networks

Sequence Number: 101539476

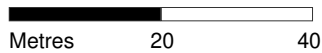
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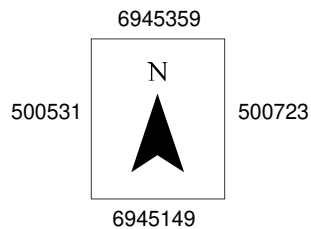
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Scale = 1:1000



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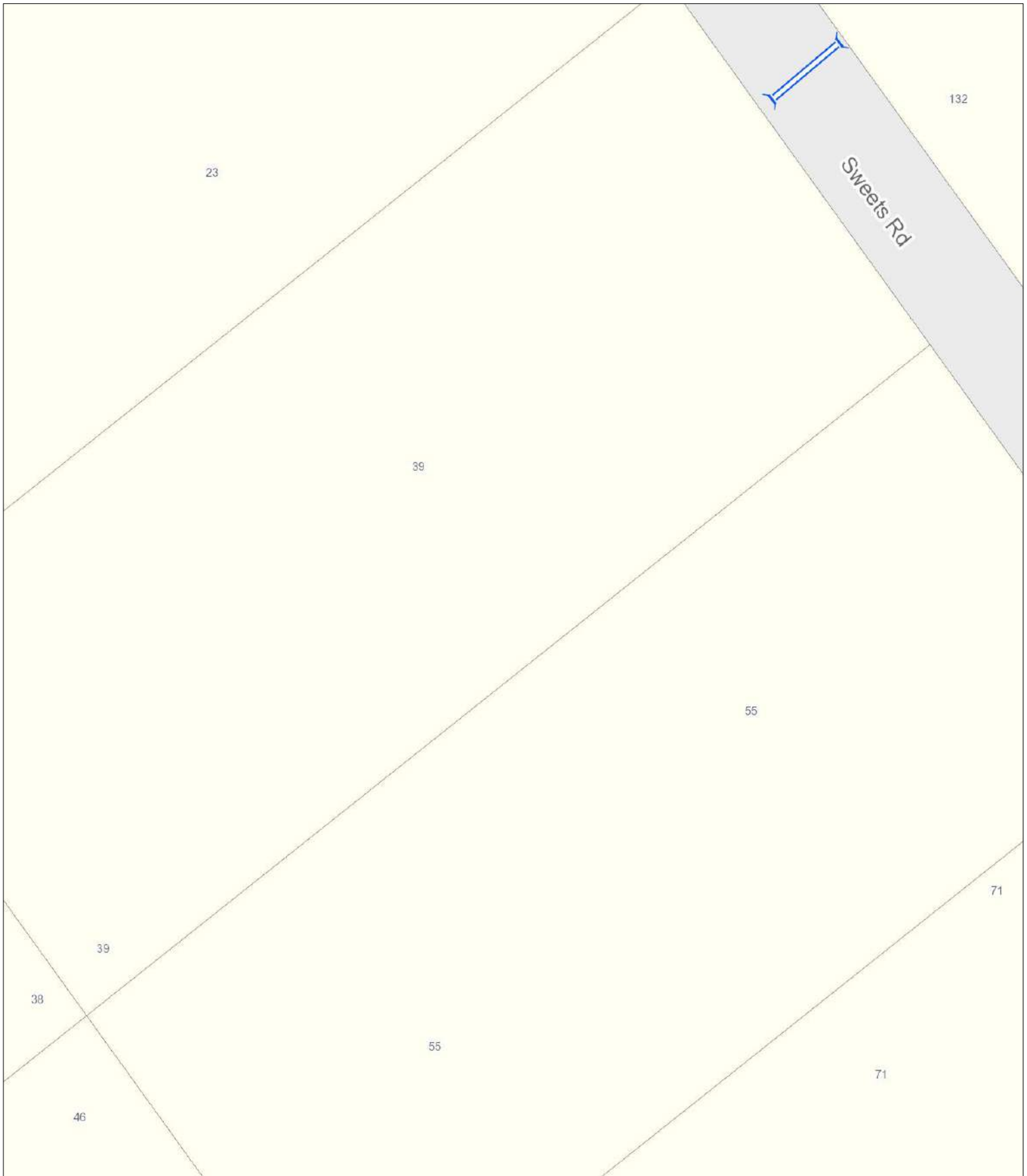


Date: Sep 07, 2020

## Sheet 3



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## BCC Stormwater and Cable Networks

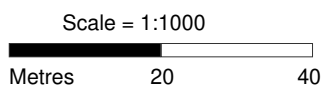
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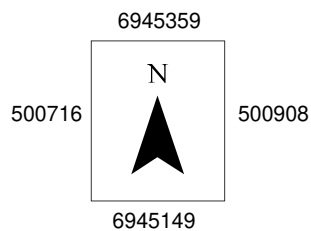
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### Location:



Sheet 4











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Date: Sep 07, 2020

# Legend

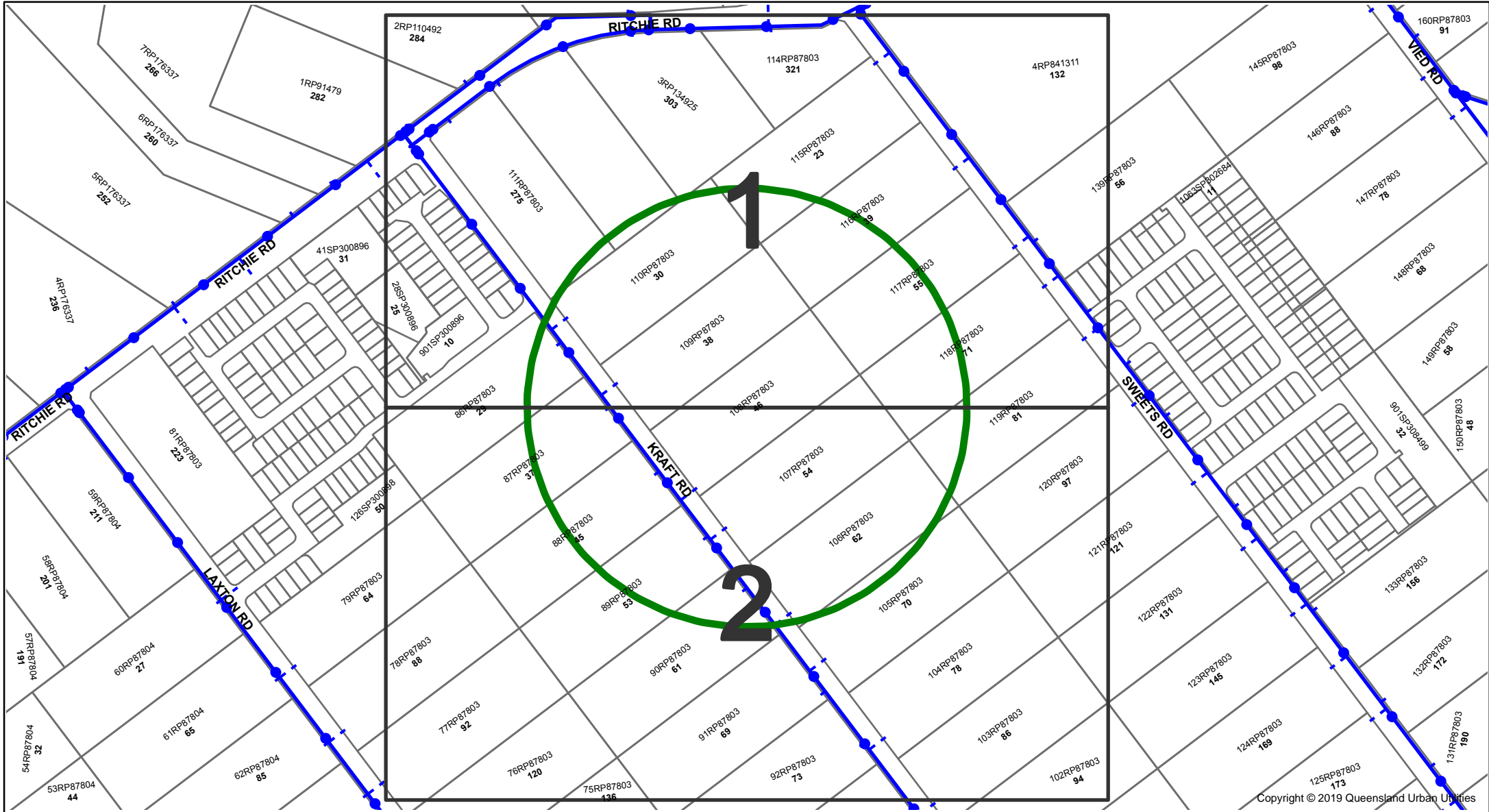
## Stormwater Network

-  Stormwater Drain
-  Stormwater Gully / Roofwater Connection
-  Stormwater Maintenance Hole
-  Stormwater Roofwater Pit
-  Stormwater Gully Pit
-  Stormwater Field Inlet
-  Stormwater Quality Improvement Device
-  Stormwater Culvert



## BCC Cable Network

-  Traffic System Cable
-  Traffic Signal Ducting
-  Traffic Light Conduit
-  Fibre Optic Cable Location
-  Flood Telemetry Conduit
-  Parking Sensor Ducting
-  Fibre Optic Pit Location

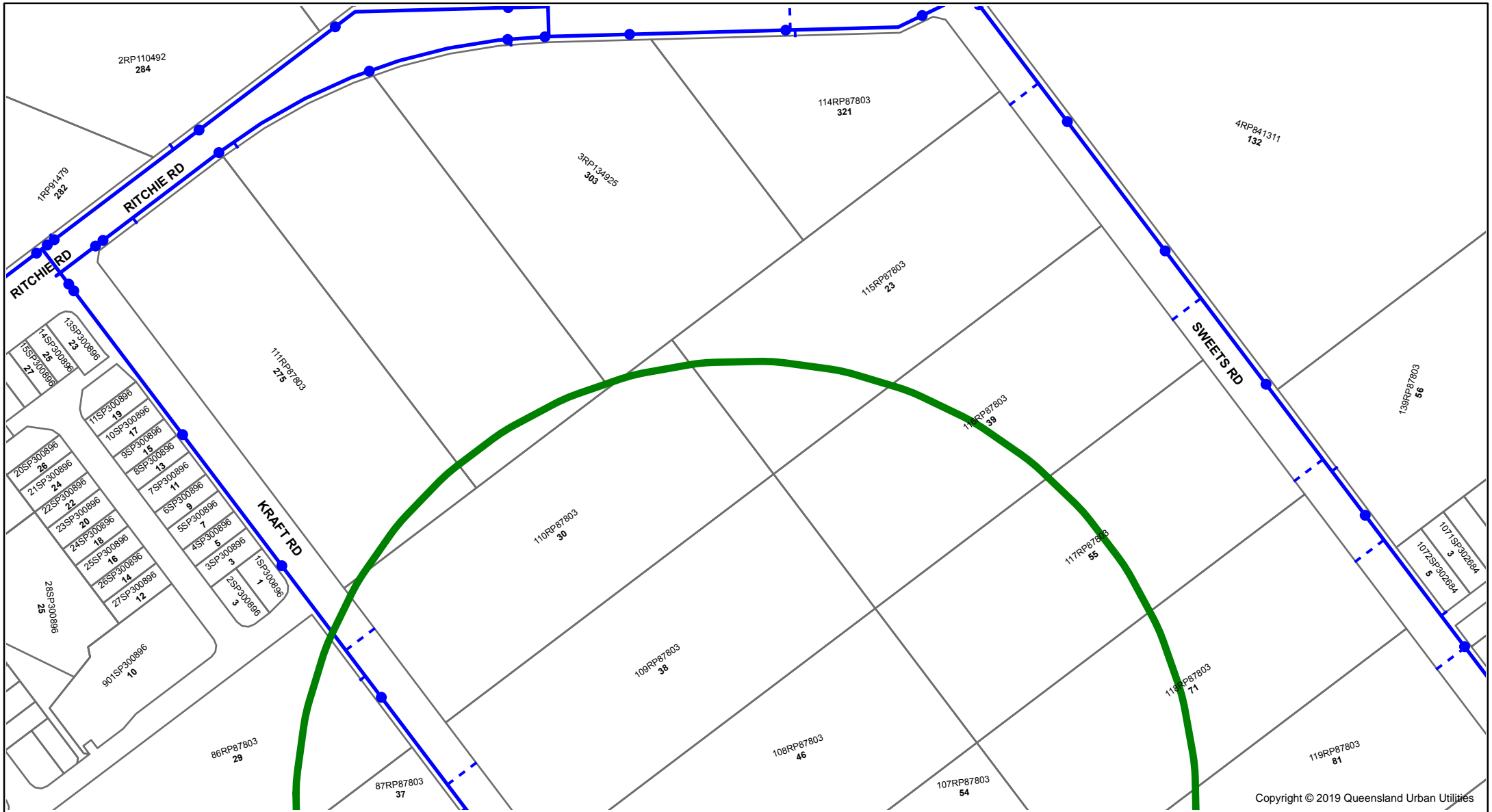
# Queensland Urban Utilities - Water & Sewer Infrastructure



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 <p><b>DBYD - Queensland Urban Utilities</b> <b>Water &amp; Sewer Infrastructure</b></p> <p><b>DBYD Reference No: 101539481</b></p> <p><small>Date DBYD Ref Received: 7/09/2020 4:07:00 PM Date DBYD Job to Commence: 8/09/2020 12:00:00 AM Date DBYD Map Produced: 7/09/2020 This Map is valid for 30 days</small></p> <p><small>Produced By: Queensland Urban Utilities</small></p> 	<p><b>Sewer</b></p> <ul style="list-style-type: none"> <li><span style="color: red;">●</span> Infrastructure</li> <li><span style="color: red;">◆</span> Major Infrastructure</li> <li><span style="color: red;">—</span> Network Pipelines</li> <li><span style="color: red;">—</span> Recycled Water Pipelines</li> <li><span style="border: 1px solid red; display: inline-block; width: 15px; height: 10px;"></span> Network Structures</li> </ul>	<p><b>Water</b></p> <ul style="list-style-type: none"> <li><span style="color: blue;">●</span> Infrastructure</li> <li><span style="color: blue;">◆</span> Major Infrastructure</li> <li><span style="color: blue;">—</span> Network Pipelines</li> <li><span style="color: blue;">- - -</span> Water Service (Indicative only)</li> <li><span style="border: 1px solid blue; display: inline-block; width: 15px; height: 10px;"></span> Network Structures</li> </ul>	<p style="text-align: center;">N ↑ Map Scale <b>1:5125</b></p>	<p><small>The plans are indicative and approximate only and provided without warranties of any kind, express or implied including in relation to accuracy, completeness, correctness, currency or fitness for purpose.</small></p> <p><small>QUU takes no responsibility and accepts no liability for any loss, damage, costs or liability that may be incurred by any person acting in reliance on the information provided on the plans.</small></p> <p><small>This plan should be used as guide only. Any dimensions should be confirmed on site by the relevant authority.</small></p> <p><small>Based on or contains data provided by the State of Queensland (Department of Natural Resources and Mines) [2018]. In consideration of the State permitting the use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, liability or negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws. © State of Queensland Department of Natural Resources and Mines [2018]</small></p> <p><small>For further information, please call Queensland Urban Utilities on 13 26 57 (7am-7pm weekdays). Faults and emergencies 13 23 64 (24/7). www.urbanutilities.com.au ABN 86 673 835 011</small></p>
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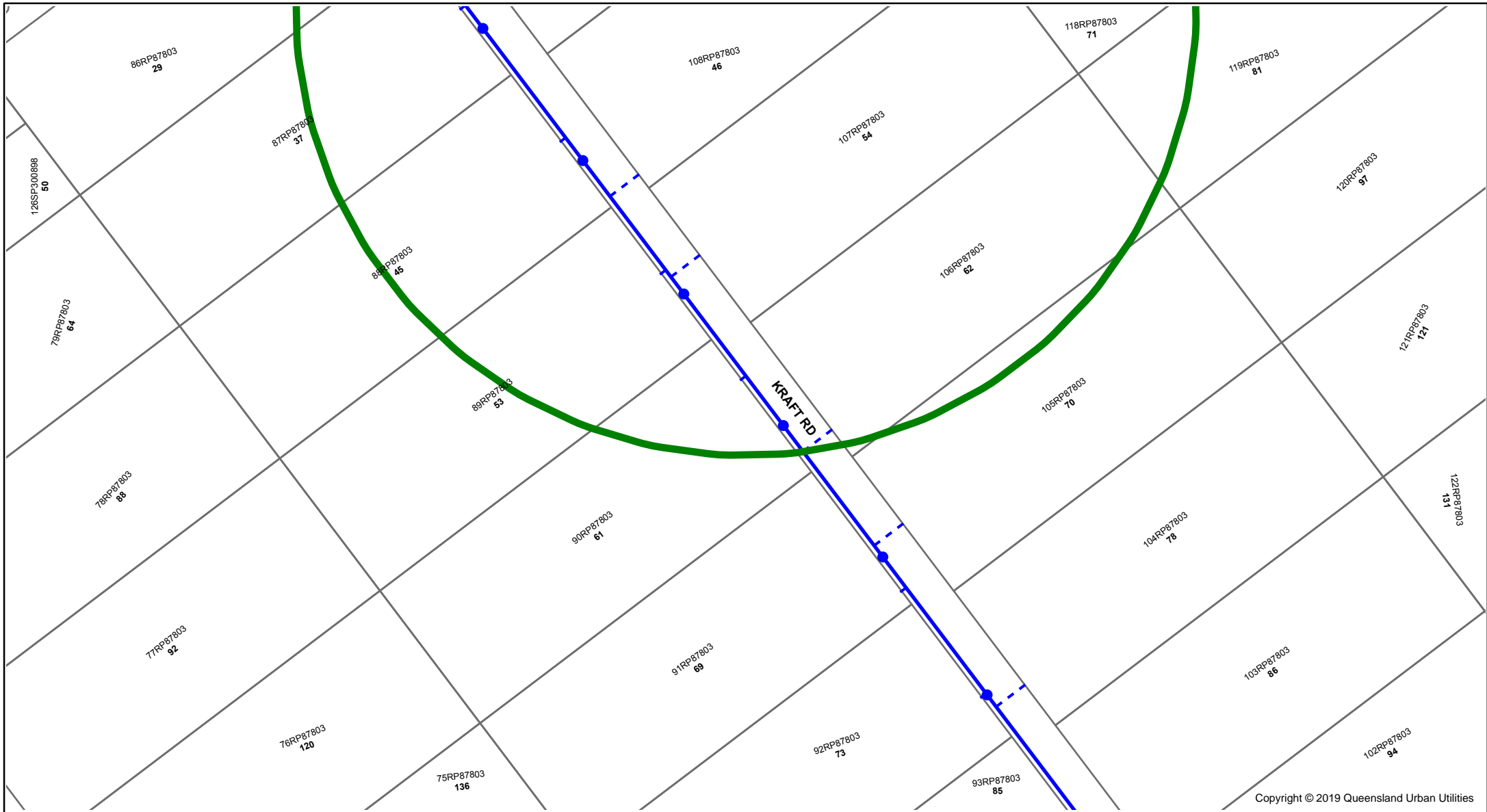
# Queensland Urban Utilities - Water & Sewer Infrastructure





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	<p><b>DBYD - Queensland Urban Utilities</b>  <b>Water &amp; Sewer Infrastructure</b></p> <p><b>DBYD Reference No: 101539481</b></p> <p><small>Date DBYD Ref Received: 7/09/2020 4:07:00 PM                  Date DBYD Job to Commence: 8/09/2020 12:00:00 AM                  Date DBYD Map Produced: 7/09/2020</small></p> <p><small>Produced By: Queensland Urban Utilities</small></p>	<table border="0"> <tr> <td><b>Sewer</b></td> <td><b>Water</b></td> </tr> <tr> <td>● Infrastructure</td> <td>● Infrastructure</td> </tr> <tr> <td>◆ Major Infrastructure</td> <td>◆ Major Infrastructure</td> </tr> <tr> <td>— Network Pipelines</td> <td>— Network Pipelines</td> </tr> <tr> <td>— Recycled Water Pipelines</td> <td>- - - Water Service (Indicative only)</td> </tr> <tr> <td>▭ Network Structures</td> <td>▭ Network Structures</td> </tr> </table>	<b>Sewer</b>	<b>Water</b>	● Infrastructure	● Infrastructure	◆ Major Infrastructure	◆ Major Infrastructure	— Network Pipelines	— Network Pipelines	— Recycled Water Pipelines	- - - Water Service (Indicative only)	▭ Network Structures	▭ Network Structures	<p>N</p> <p><b>Map Scale</b></p> <p>1:2500</p>	<p><small>The plans are indicative and approximate only and provided without warranties of any kind, express or implied including in relation to accuracy, completeness, correctness, currency or fitness for purpose.</small></p> <p><small>QUU takes no responsibility and accepts no liability for any loss, damage, costs or liability that may be incurred by any person acting in reliance on the information provided on the plans.</small></p> <p><small>This plan should be used as guide only. Any dimensions should be confirmed on site by the relevant authority.</small></p> <p><small>Based on or contains data provided by the State of Queensland (Department of Natural Resources and Mines) [2018]. In consideration of the State permitting the use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws. © State of Queensland Department of Natural Resources and Mines [2018]</small></p> <p><small>For further information, please call Queensland Urban Utilities on 13 26 57 (7am-7pm weekdays). Faults and emergencies 13 23 64 (24/7).                  www.urbanutilities.com.au ABN 86 673 835 011</small></p>
<b>Sewer</b>	<b>Water</b>															
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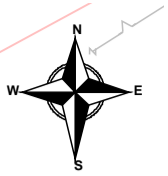
# Queensland Urban Utilities - Water & Sewer Infrastructure



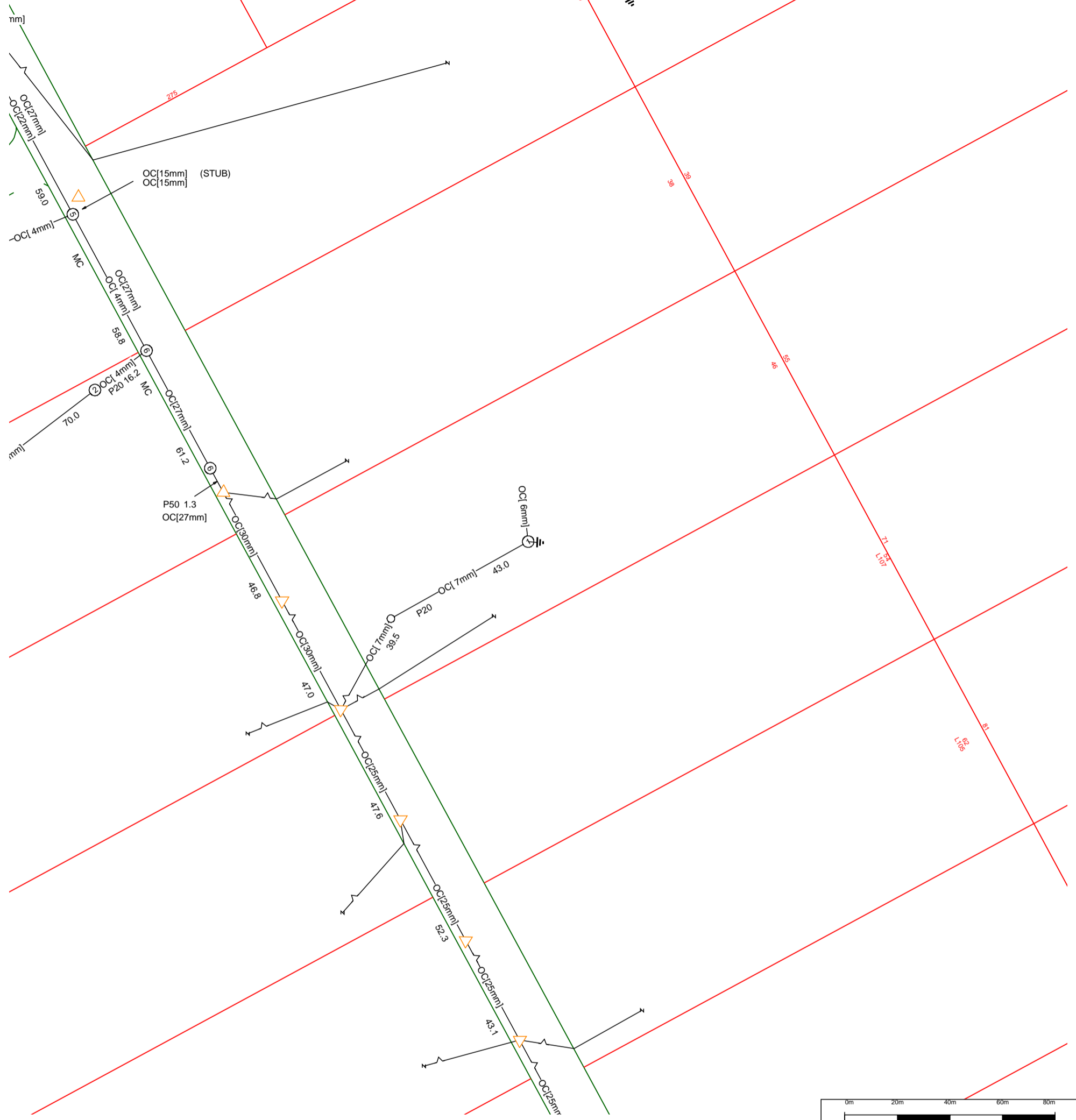
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▨ Network Structures	▨ Network Structures															

# Cable Plan



MC 2.0  
OC[22mm]  
OC[27mm]



For all Telstra DBYD plan enquiries -  
email - Telstra.Plans@team.telstra.com  
For urgent onsite contact only - ph 1800 653 935 (bus hrs)

Sequence Number: 101539477

Please read Duty of Care prior to any excavating

TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

Generated On 07/09/2020 16:16:19

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

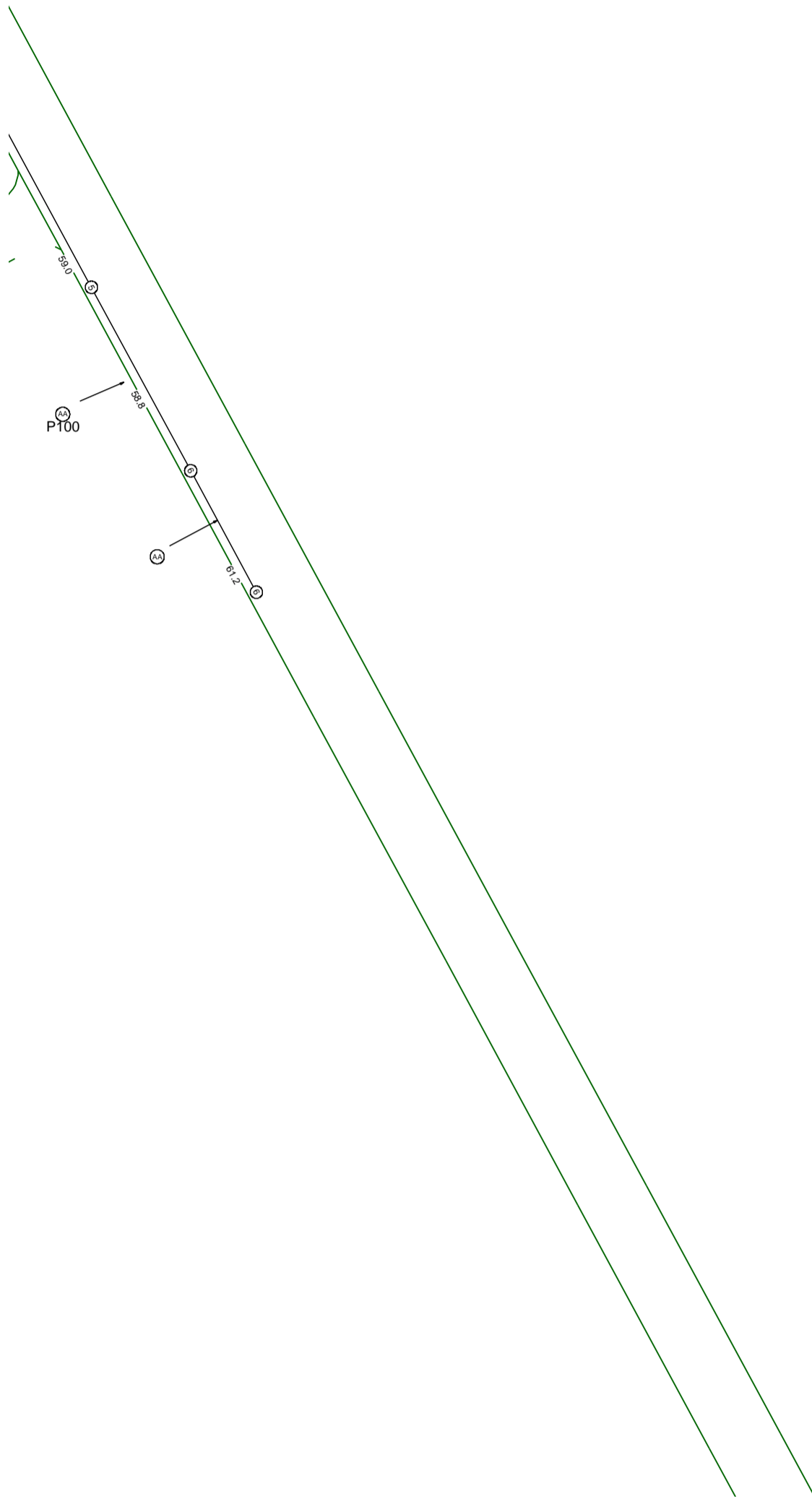
WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

# Mains Cable Plan



For all Telstra DBYD plan enquiries -  
email - [Telstra.Plans@team.telstra.com](mailto:Telstra.Plans@team.telstra.com)  
For urgent onsite contact only - ph 1800 653 935 (bus hrs)

TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

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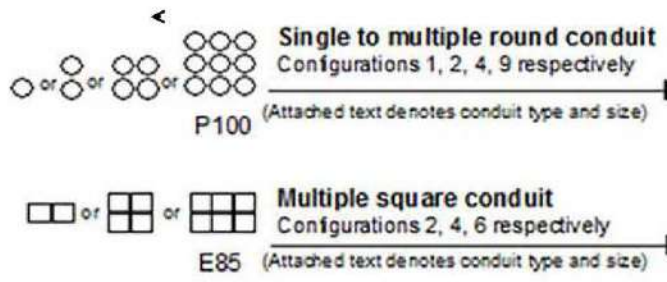
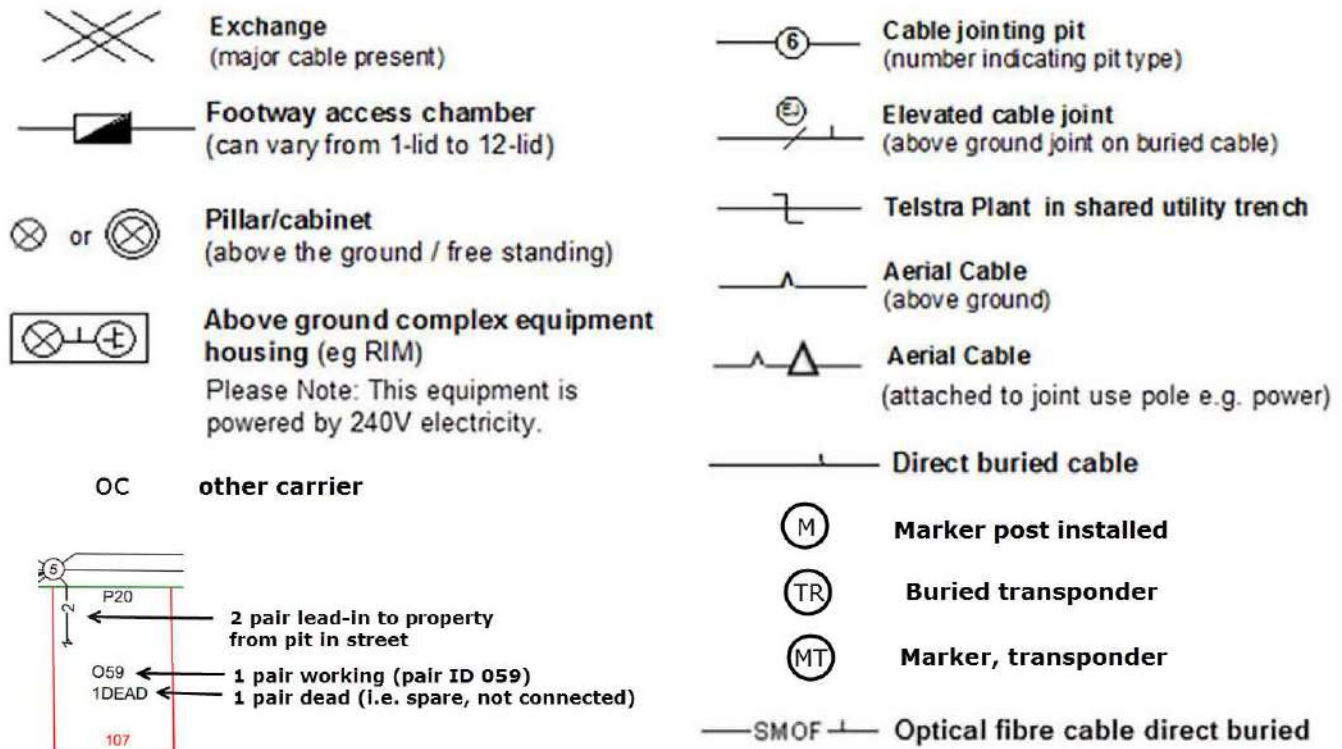
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# LEGEND

IT'S HOW  
WE CONNECT



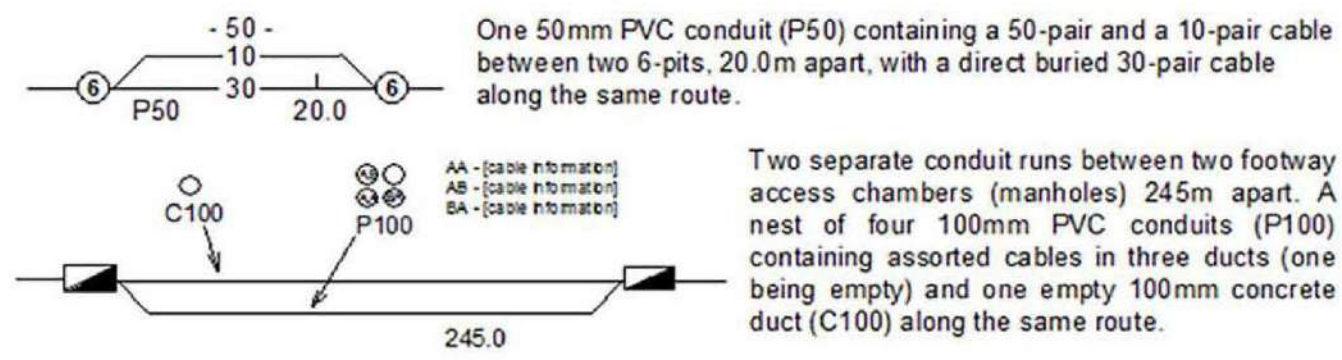
For more info contact a Telstra Accredited Locator or Telstra Plan Services 1800 653 935



**Some examples of conduit type and size:**  
A - Asbestos cement, P - PVC / plastic, C - Concrete, GI - Galvanised iron, E - Earthenware.  
Conduit sizes *nominally* range from 20mm to 100mm.

P50	50mm PVC conduit
P100	100mm PVC conduit
A100	100mm asbestos cement conduit
E 85	85mm square earthenware conduit


## Some examples of how to read Telstra plans:

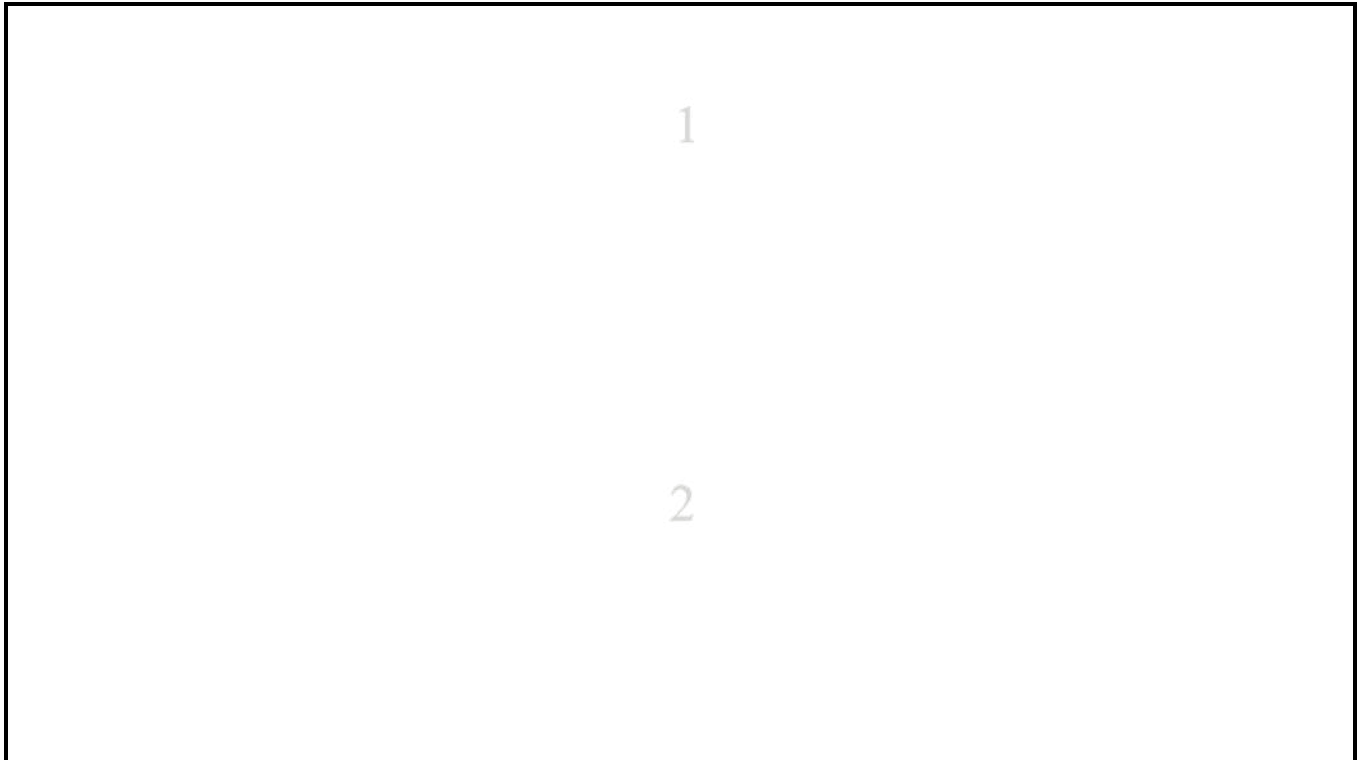


**WARNING:** Telstra plans and location information conform to Quality Level 'D' of the Australian Standard AS 5488 - Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans. **FURTHER ON SITE INVESTIGATION IS REQUIRED TO VALIDATE THE EXACT LOCATION OF TELSTRA PLANT PRIOR TO COMMENCING CONSTRUCTION WORK.** A plant location service is an essential part of the process to validate the exact location of Telstra assets and to ensure the asset is protected during construction works. The exact position of Telstra assets can only be validated by physically exposing it. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.



## Indicative Plans

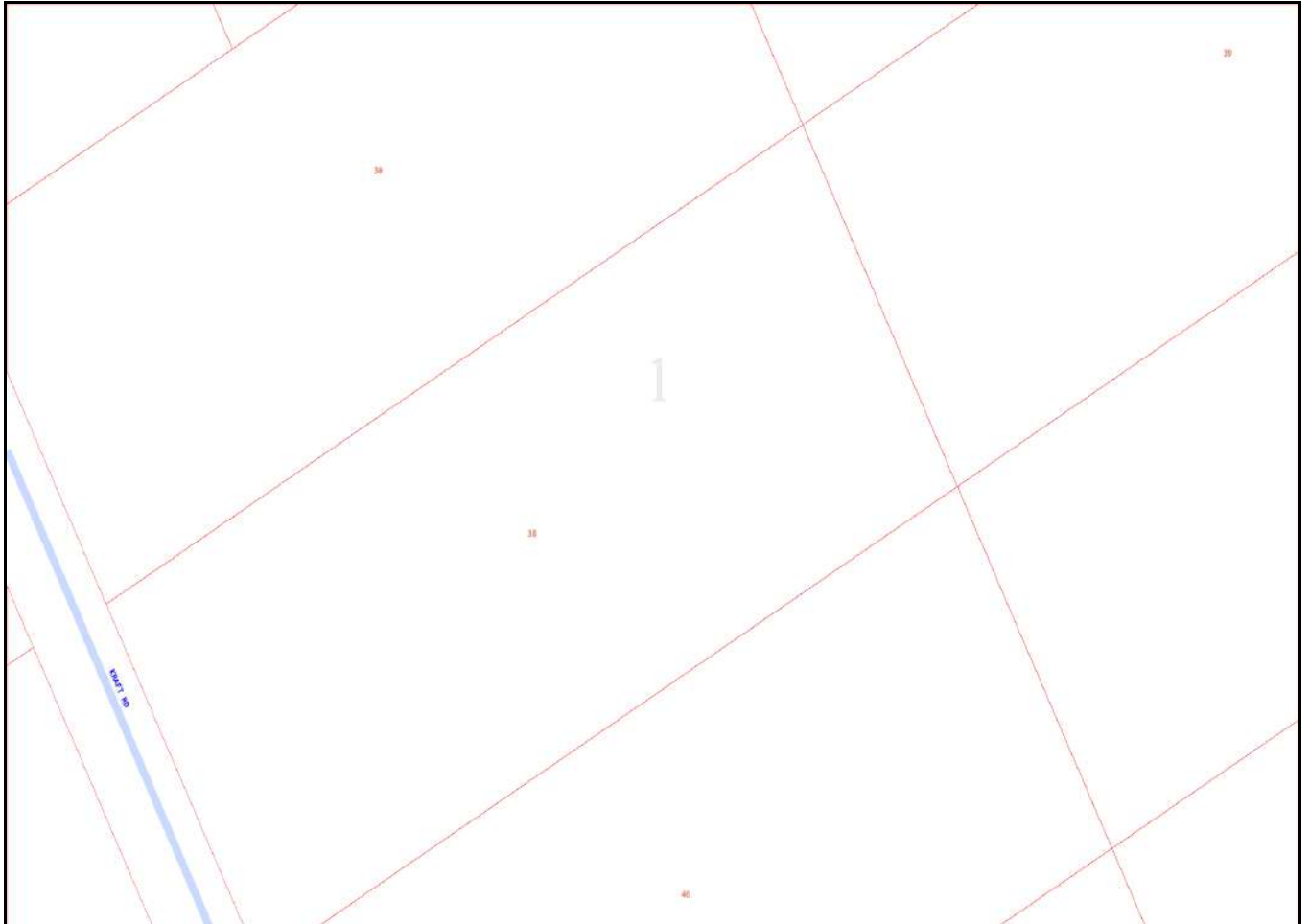
<b>Issue Date:</b>	07/09/2020	 The logo features a red circle with a black border containing a black silhouette of a hand digging. To the right of the circle, the text 'DIAL BEFORE YOU DIG' is written in bold, black, uppercase letters. Below this text, the website address 'www.1100.com.au' is written in a smaller, black, lowercase font.
<b>Location:</b>	46 Kraft Road , Pallara , QLD , 4110	

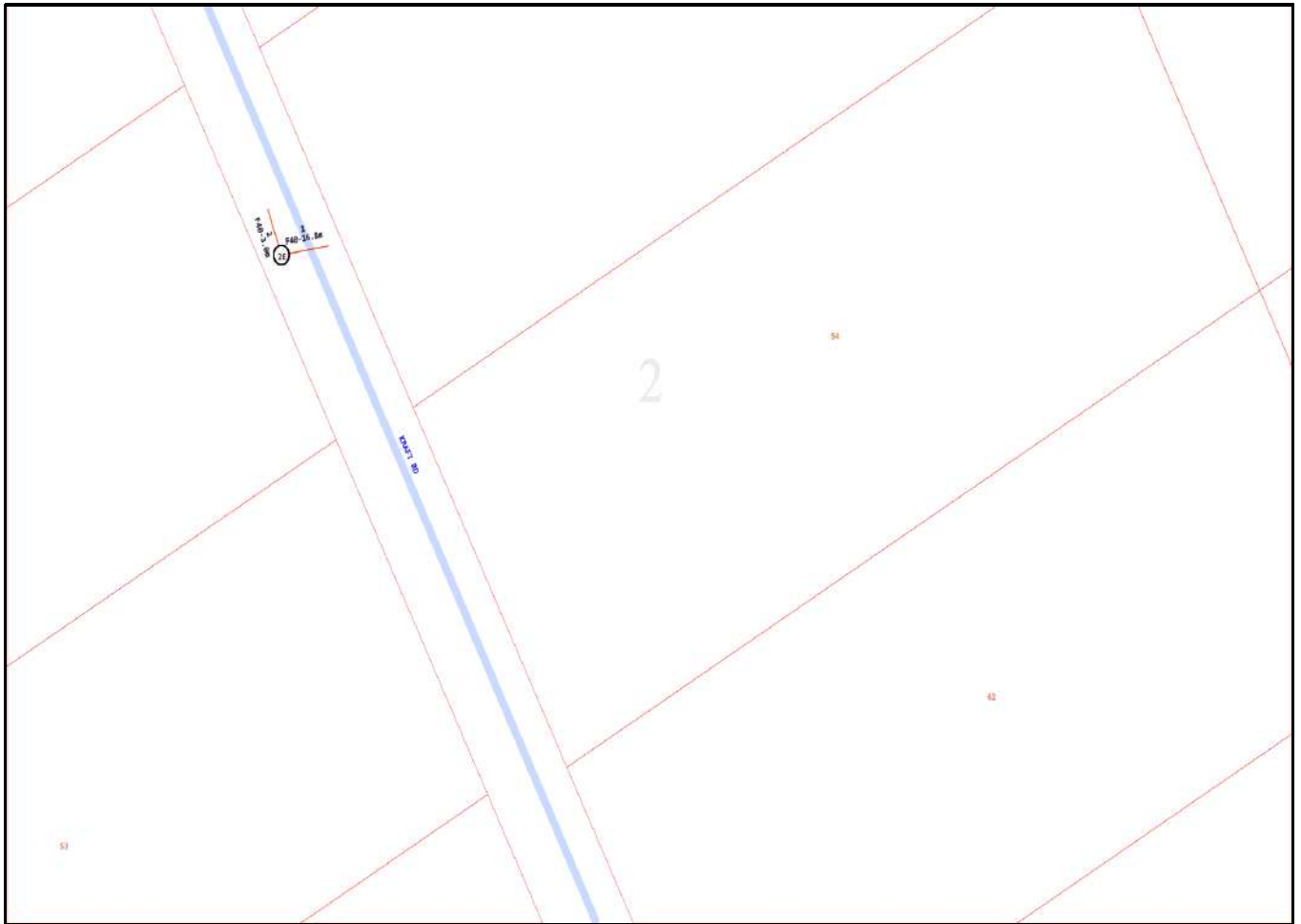




## LEGEND

	Parcel and the location
	Pit with size "5"
	Power Pit with size "2E". Valid PIT Size: e.g. 2E, 5E, 6E, 8E, 9E, E, null.
	Manhole
	Pillar
	Cable count of trench is 2. One "Other size" PVC conduit (PO) owned by Telstra (-T-), between pits of sizes, "5" and "9" are 25.0m apart. One 40mm PVC conduit (P40) owned by NBN, between pits of sizes, "5" and "9" are 20.0m apart.
	2 Direct buried cables between pits of sizes, "5" and "9" are 10.0m apart.
	Trench containing any <b>INSERVICE/CONSTRUCTED</b> (Copper/RF/Fibre) cables.
	Trench containing only <b>DESIGNED/PLANNED</b> (Copper/RF/Fibre/Power) cables.
	Trench containing any <b>INSERVICE/CONSTRUCTED</b> (Power) cables.
	Road and the street name "Broadway ST"
<p>Scale</p>	<p>0 20 40 60 Meters</p> <p>1:2000</p> <p>1 cm equals 20 m</p>

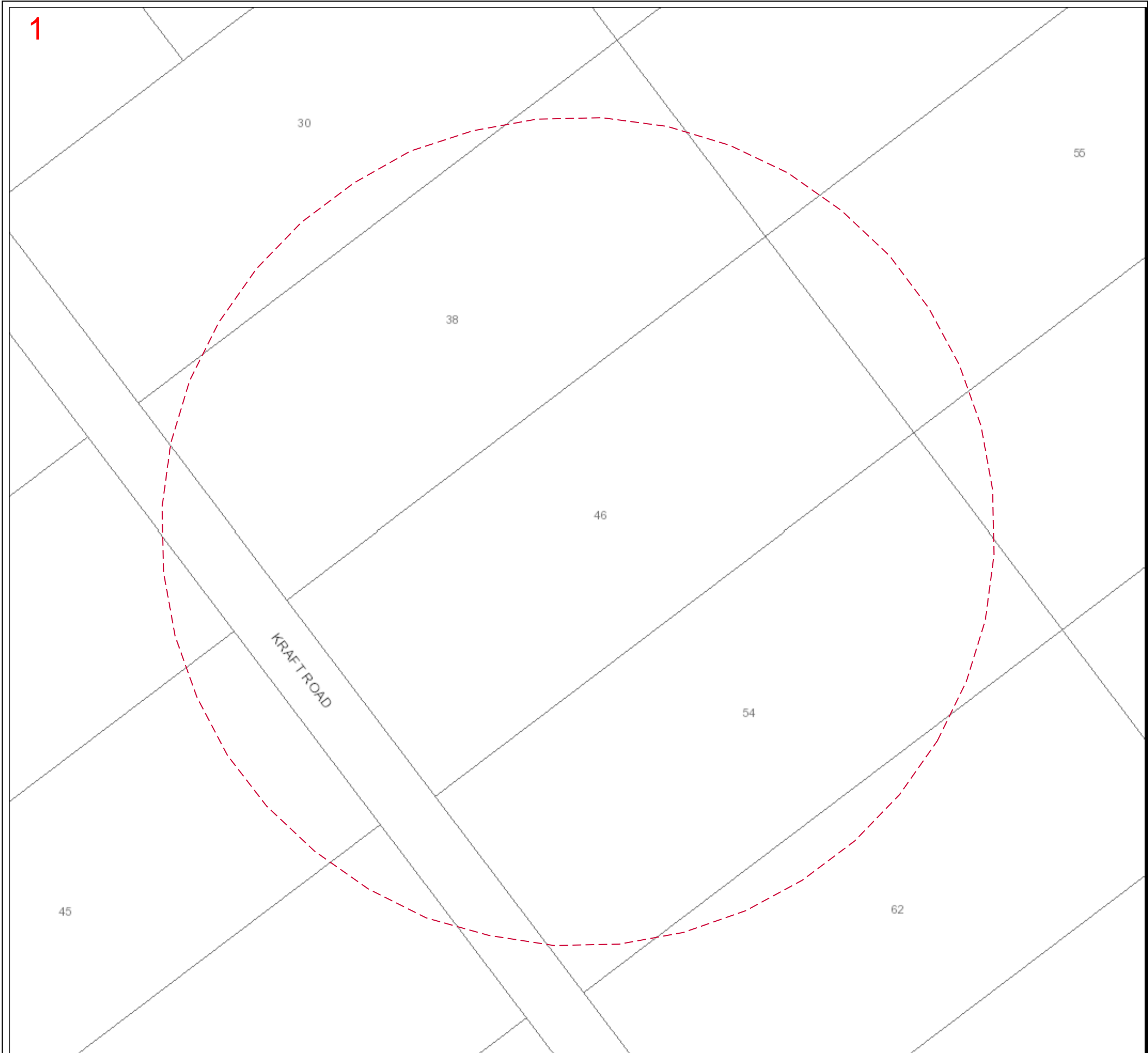




## Emergency Contacts

You must immediately report any damage to **nbn™** network that you are/become aware of. Notification may be by telephone - 1800 626 329.





101539479 Map Sheet: 1

Papersize: A3 Scale: 1:1000

0 0.01km



**Map Key:**

1

**Legend**

**Distribution Main**

- Class 900 Transmission
- Class 600 Transmission
- Class 300 Transmission
- High Pressure Steel
- High Pressure PE Trunk
- High Pressure/ Class 500
- Medium Pressure PE/ Nylon <sup>(1)</sup>
- Medium Pressure (Allgas)
- Low Pressure
- LPG
- TLP
- Proposed/ Under Construction
- Idle Gas Pipe
- Abandoned Gas Pipe
- Sleeve

<sup>(1)</sup> Medium Pressure in AGN/ Nylon in Allgas

**Gas Assets and Fittings**

- Gate Station
- Regulator Station
- Block/ Emergency Valve
- Isolation Valve
- Test Point
- Syphon
- Anode
- Pipeline Marker
- Trace Wire Point
- Reducer
- Pipe Connector/ Tee
- Pipe Connector
- End Cap

**Pipe Materials**

- CI Cast Iron
- CU Copper
- GAL Wrought Galvanised Iron
- PGAL Poly Coated Wrought Galvanised Iron
- ST Steel
- NY/ NY11 Nylon
- PE Polyethylene
- MDPE Medium Density Polyethylene
- HDPE High Density Polyethylene
- DN Nominal Diameter
- OD Outside Diameter

Examples: 40mm Polyethylene in an 80mm (Nominal Diameter) Cast Iron Sleeve  
 63mm Polyethylene inserted in another pipe

Line/ Polygon Request

**Data Source**

Pipeline Data Copyright APA Group, Property Parcels Copyright QLD Government, UBD Imagery - Copyright Sensis, DBYD Dig Location provided by DBYD.

## **APPENDIX G – Catchment Areas**

**Catchment Areas**

- A - 33.8 ha
- B - 38.1 ha
- C - 5.9 ha
- D - 2.5 ha
- E - 7.8 ha
- F - 0.2 ha
- G - 5.0 ha
- H - 1.2 ha
- I - 6.3 ha
- J - 24.3 ha
- K - 1.9 ha
- L - 0.4 ha
- DevS1 - 0.8 ha
- DevS2 - 0.7 ha
- DevS3 - 1.7 ha
- DevS4 - 1.2 ha
- DevS5 - 0.6 ha
- DevS6 - 0.5 ha

Refer to Section 3 of the report for adjusted Catchment Areas for Catchment C and D.



Refer to Figure 2B for site catchment areas



5/541 Old Cleveland Rd, Camp Hill,  
QLD, 4152, Phone (07)3398 4992

Drawn	CDG
Checked	DWR
Date	18/04/19
Scale	1:10,000

55-81 Sweets Road, Pallara

Job No. 15937

Figure 2A  
Developed Catchment Plan



**Catchment Areas**

- A - 33.8 ha
- B - 38.1 ha
- C - 5.9 ha
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- DevS6 - 0.5 ha

Refer to Section 3 of the report for adjusted Catchment Areas for Catchment C and D.

**STORM**  
Water Consulting

5/941 Old Cleveland Rd, Camp Hill,  
QLD, 4152, Phone (07)3398 4992

Drawn	CDG
Checked	DWR
Date	18/04/19
Scale	1:10,000

55-81 Sweets Road, Pallara	
Job No.	15937

Figure 2B  
Developed Catchment Plan (Site close up)

## **APPENDIX H – Hydrographs**

60 MINUTE DURATION

Time (min)	US Boundary 1	US Boundary 2	Inflow 3	Inflow 4	Inflow 5	Inflow 6	Inflow 7	Inflow 8	Inflow EX	Inflow 10	Inflow 11	Inflow 12	Inflow DEVS1	Inflow DEVS2	Inflow DEVS3	Inflow DEVS4	Inflow DEVS5	Inflow DEVS6	INFLOW PR	INFLOW REAR
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.001	0.001	0.001	0.009	0.000	0.001	0.016	0.001	0.000	0.049	0.000
2	0.002	0.003	0.002	0.001	0.000	0.001	0.001	0.001	0.000	0.002	0.002	0.001	0.020	0.000	0.004	0.020	0.002	0.000	0.086	0.000
3	0.004	0.005	0.003	0.002	0.000	0.001	0.002	0.001	0.000	0.003	0.003	0.003	0.033	0.000	0.009	0.038	0.003	0.000	0.114	0.000
4	0.006	0.007	0.004	0.003	0.000	0.001	0.002	0.001	0.000	0.004	0.004	0.002	0.047	0.000	0.016	0.051	0.005	0.000	0.135	0.000
5	0.036	0.051	0.027	0.019	0.016	0.010	0.015	0.006	0.008	0.026	0.026	0.013	0.064	0.002	0.027	0.089	0.008	0.006	0.154	0.001
6	0.099	0.135	0.069	0.054	0.059	0.041	0.023	0.015	0.027	0.068	0.074	0.032	0.090	0.005	0.044	0.126	0.014	0.017	0.204	0.004
7	0.171	0.221	0.108	0.093	0.110	0.031	0.068	0.023	0.049	0.109	0.132	0.047	0.115	0.009	0.065	0.150	0.021	0.026	0.244	0.007
8	0.251	0.307	0.145	0.133	0.165	0.036	0.097	0.030	0.073	0.147	0.200	0.060	0.139	0.012	0.090	0.186	0.028	0.036	0.276	0.010
9	0.338	0.395	0.179	0.175	0.222	0.039	0.179	0.126	0.097	0.277	0.393	0.071	0.159	0.183	0.014	0.277	0.117	0.037	0.301	0.012
10	0.429	0.484	0.213	0.219	0.280	0.041	0.156	0.043	0.120	0.216	0.362	0.080	0.176	0.017	0.147	0.238	0.045	0.054	0.321	0.014
11	0.546	0.602	0.261	0.273	0.359	0.047	0.195	0.052	0.152	0.260	0.468	0.096	0.195	0.021	0.180	0.277	0.056	0.067	0.360	0.017
12	0.669	0.722	0.307	0.330	0.438	0.051	0.235	0.060	0.182	0.301	0.582	0.109	0.211	0.025	0.214	0.292	0.067	0.079	0.391	0.019
13	0.797	0.845	0.354	0.387	0.517	0.053	0.275	0.067	0.211	0.338	0.704	0.120	0.225	0.029	0.248	0.319	0.078	0.090	0.415	0.021
14	0.929	0.970	0.400	0.445	0.594	0.054	0.316	0.073	0.239	0.372	0.831	0.131	0.236	0.032	0.282	0.333	0.090	0.101	0.433	0.022
15	1.065	1.100	0.447	0.502	0.670	0.054	0.357	0.078	0.265	0.403	0.963	0.140	0.245	0.036	0.315	0.349	0.101	0.111	0.448	0.023
16	1.160	1.173	0.465	0.538	0.698	0.044	0.380	0.076	0.269	0.401	1.067	0.135	0.234	0.038	0.339	0.318	0.109	0.112	0.410	0.021
17	1.251	1.252	0.488	0.567	0.724	0.039	0.403	0.075	0.273	0.400	1.166	0.132	0.222	0.040	0.358	0.327	0.116	0.113	0.382	0.019
18	1.340	1.337	0.516	0.597	0.750	0.036	0.425	0.074	0.276	0.399	1.259	0.132	0.206	0.042	0.371	0.299	0.121	0.114	0.360	0.018
19	1.427	1.427	0.546	0.625	0.774	0.034	0.448	0.073	0.279	0.398	1.348	0.132	0.190	0.045	0.379	0.290	0.125	0.114	0.344	0.017
20	1.511	1.521	0.579	0.651	0.797	0.033	0.469	0.072	0.282	0.398	1.432	0.132	0.177	0.048	0.382	0.268	0.128	0.114	0.331	0.017
21	1.678	1.733	0.672	0.717	0.909	0.051	0.525	0.084	0.323	0.453	1.573	0.159	0.197	0.057	0.392	0.330	0.136	0.128	0.411	0.021
22	1.854	1.944	0.756	0.791	1.018	0.062	0.580	0.093	0.361	0.503	1.726	0.179	0.220	0.064	0.404	0.314	0.142	0.139	0.473	0.025
23	2.038	2.154	0.836	0.863	1.124	0.068	0.636	0.100	0.397	0.547	1.888	0.193	0.251	0.072	0.420	0.368	0.149	0.148	0.521	0.027
24	2.229	2.366	0.913	0.937	1.226	0.071	0.692	0.107	0.430	0.588	2.058	0.205	0.281	0.079	0.440	0.384	0.157	0.157	0.557	0.029
25	2.425	2.579	0.987	1.009	1.324	0.073	0.747	0.113	0.460	0.624	2.233	0.215	0.307	0.086	0.464	0.427	0.164	0.165	0.586	0.031
26	2.549	2.688	1.007	1.045	1.330	0.057	0.771	0.107	0.451	0.605	2.357	0.200	0.298	0.089	0.480	0.384	0.167	0.160	0.527	0.027
27	2.668	2.805	1.035	1.070	1.336	0.048	0.794	0.102	0.442	0.590	2.469	0.191	0.442	0.093	0.493	0.412	0.169	0.156	0.482	0.025
28	2.782	2.928	1.067	1.096	1.341	0.043	0.817	0.099	0.435	0.576	2.571	0.186	0.359	0.097	0.500	0.370	0.171	0.154	0.448	0.023
29	2.893	3.055	1.103	1.117	1.346	0.041	0.838	0.096	0.428	0.564	2.664	0.182	0.235	0.101	0.502	0.363	0.171	0.151	0.422	0.021
30	3.002	3.184	1.139	1.138	1.350	0.039	0.858	0.093	0.422	0.553	2.749	0.179	0.215	0.106	0.499	0.329	0.171	0.148	0.402	0.020
31	3.228	3.477	1.260	1.211	1.488	0.063	0.925	0.107	0.472	0.620	2.912	0.212	0.240	0.118	0.506	0.410	0.178	0.164	0.507	0.026
32	3.468	3.762	1.366	1.297	1.621	0.078	0.992	0.118	0.518	0.679	3.092	0.235	0.270	0.128	0.516	0.386	0.185	0.177	0.588	0.031
33	3.718	4.044	1.463	1.379	1.748	0.085	1.059	0.128	0.560	0.732	3.286	0.253	0.312	0.138	0.534	0.458	0.192	0.188	0.650	0.035
34	3.978	4.323	1.555	1.465	1.869	0.090	1.125	0.136	0.599	0.779	3.489	0.267	0.352	0.147	0.557	0.478	0.200	0.199	0.697	0.037
35	4.245	4.601	1.642	1.549	1.984	0.092	1.190	0.143	0.634	0.822	3.699	0.278	0.386	0.155	0.586	0.536	0.209	0.209	0.734	0.039
36	4.451	4.789	1.682	1.602	2.015	0.079	1.229	0.140	0.633	0.818	3.867	0.269	0.387	0.160	0.610	0.511	0.214	0.208	0.696	0.036
37	4.653	4.983	1.728	1.645	2.044	0.072	1.266	0.139	0.633	0.814	4.025	0.264	0.380	0.165	0.633	0.548	0.219	0.208	0.667	0.035
38	4.853	5.181	1.777	1.688	2.071	0.068	1.302	0.137	0.632	0.812	4.174	0.262	0.362	0.170	0.650	0.518	0.224	0.209	0.645	0.033
39	5.051	5.381	1.829	1.726	2.097	0.066	1.337	0.136	0.632	0.809	4.316	0.261	0.344	0.176	0.663	0.517	0.228	0.209	0.628	0.032
40	5.247	5.582	1.881	1.763	2.121	0.065	1.371	0.135	0.631	0.808	4.450	0.261	0.328	0.181	0.670	0.490	0.231	0.209	0.616	0.031
41	5.378	5.696	1.887	1.768	2.069	0.051	1.377	0.126	0.600	0.765	4.534	0.241	0.295	0.182	0.665	0.427	0.228	0.198	0.543	0.027
42	5.501	5.814	1.901	1.764	2.020	0.044	1.383	0.118	0.573	0.729	4.601	0.228	0.266	0.184	0.653	0.409	0.225	0.188	0.488	0.024
43	5.619	5.933	1.918	1.759	1.975	0.039	1.387	0.111	0.548	0.696	4.653	0.217	0.238	0.186	0.633	0.358	0.220	0.179	0.446	0.022
44	5.732	6.051	1.935	1.750	1.933	0.037	1.389	0.105	0.527	0.667	4.694	0.208	0.213	0.188	0.609	0.334	0.213	0.170	0.413	0.020
45	5.842	6.167	1.952	1.741	1.894	0.035	1.391	0.099	0.507	0.641	4.726	0.201	0.195	0.190	0.582	0.301	0.205	0.162	0.389	0.019
46	5.947	6.274	1.965	1.728	1.854	0.034	1.390	0.094	0.489	0.617	4.750	0.193	0.180	0.192	0.553	0.280	0.196	0.153	0.367	0.018
47	6.050	6.377	1.976	1.714	1.817	0.033	1.388	0.090	0.472	0.595	4.767	0.186	0.170	0.193	0.525	0.261	0.188	0.146	0.351	0.017
48	6.152	6.474	1.985	1.700	1.782	0.033	1.386	0.086	0.457	0.575	4.779	0.179	0.164	0.194	0.498	0.248	0.179	0.138	0.338	0.017
49	6.252	6.565	1.991	1.684	1.749	0.033	1.382	0.082	0.444	0.557	4.788	0.173	0.160	0.195	0.472	0.238	0.170	0.132	0.328	0.016
50	6.352	6.650	1.995	1.669	1.719	0.032	1.377	0.079	0.432	0.541	4.793	0.168	0.157	0.195	0.449	0.233	0.162	0.126	0.321	0.016
51	6.444	6.720	1.992	1.651	1.684	0.031	1.370	0.076	0.418	0.524	4.792	0.161	0.154	0.195	0.428	0.224	0.154	0.120	0.310	0.015
52	6.534	6.785	1.988	1.632	1.652	0.031	1.362	0.073	0.406	0.508	4.788	0.156	0.151	0.194	0.409	0.222	0.147	0.115	0.301	0.015
53	6.623	6.844	1.982	1.613	1.622	0.030	1.353	0.071	0.396	0.494	4.782	0.151	0.148	0.193	0.392	0.217	0.141	0.111	0.294	0.015
54	6.709	6.897	1.974	1.594	1.593	0.030	1.344	0.069	0.386	0.481	4.774	0.146	0.146	0.192	0.378	0.215	0.135	0.107	0.289	0.015
55	6.794	6.943	1.965	1.575	1.567	0.030	1.334	0.067	0.377	0.469	4.765	0.143	0.145	0.190	0.365	0.212	0.130	0.104	0.285	0.014
56	6.847	6.946	1.934	1.544	1.512	0.024	1.313	0.062	0.357	0.442	4.735	0.131	0.135	0.187	0.350	0.189	0.124	0.097	0.256	0.013
57	6.89																			

60 MINUTE DURATION

Time (min)	US Boundary 1	US Boundary 2	Inflow 3	Inflow 4	Inflow 5	Inflow 6	Inflow 7	Inflow 8	Inflow EX	Inflow 10	Inflow 11	Inflow 12	Inflow DEVS1	Inflow DEVS2	Inflow DEVS3	Inflow DEVS4	Inflow DEVS5	Inflow DEVS6	INFLOW PR	INFLOW REAR
85	6.798	5.763	1.172	0.850	0.794	0.011	0.772	0.028	0.166	0.195	3.609	0.058	0.059	0.087	0.161	0.088	0.056	0.044	0.116	0.006
86	6.724	5.675	1.142	0.825	0.766	0.009	0.751	0.026	0.158	0.185	3.555	0.054	0.055	0.084	0.154	0.079	0.054	0.041	0.105	0.005
87	6.647	5.587	1.113	0.800	0.741	0.008	0.730	0.024	0.151	0.175	3.500	0.051	0.051	0.082	0.147	0.077	0.051	0.038	0.097	0.005
88	6.569	5.500	1.084	0.776	0.717	0.008	0.710	0.023	0.145	0.145	3.444	0.048	0.047	0.079	0.141	0.070	0.049	0.036	0.091	0.005
89	6.489	5.413	1.057	0.753	0.694	0.007	0.691	0.021	0.139	0.159	3.389	0.046	0.044	0.077	0.134	0.067	0.047	0.034	0.086	0.004
90	6.407	5.326	1.031	0.730	0.672	0.007	0.672	0.020	0.133	0.152	3.334	0.044	0.042	0.075	0.128	0.063	0.045	0.033	0.082	0.004
91	6.310	5.221	0.996	0.703	0.639	0.005	0.649	0.018	0.124	0.138	3.270	0.038	0.035	0.072	0.120	0.049	0.042	0.029	0.064	0.003
92	6.210	5.117	0.963	0.675	0.608	0.003	0.626	0.016	0.115	0.126	3.204	0.034	0.030	0.069	0.112	0.047	0.039	0.026	0.050	0.003
93	6.109	5.014	0.931	0.648	0.579	0.002	0.604	0.014	0.106	0.115	3.137	0.031	0.024	0.066	0.104	0.037	0.036	0.023	0.039	0.002
94	6.007	4.911	0.901	0.621	0.551	0.001	0.582	0.012	0.099	0.105	3.070	0.028	0.019	0.064	0.096	0.032	0.033	0.021	0.031	0.002
95	5.904	4.809	0.872	0.596	0.525	0.001	0.561	0.011	0.092	0.095	3.003	0.025	0.014	0.062	0.087	0.025	0.031	0.019	0.000	0.000
96	5.800	4.708	0.843	0.570	0.501	0.001	0.540	0.009	0.086	0.087	2.936	0.023	0.011	0.059	0.079	0.020	0.028	0.017	0.000	0.000
97	5.696	4.606	0.815	0.546	0.478	0.000	0.520	0.008	0.080	0.080	2.870	0.021	0.008	0.057	0.071	0.015	0.025	0.015	0.000	0.000
98	5.592	4.505	0.788	0.523	0.456	0.000	0.500	0.007	0.075	0.073	2.804	0.019	0.006	0.055	0.064	0.012	0.023	0.013	0.000	0.000
99	5.487	4.405	0.761	0.500	0.436	0.000	0.481	0.006	0.070	0.067	2.740	0.017	0.004	0.053	0.057	0.009	0.021	0.011	0.000	0.000
100	5.383	4.305	0.734	0.478	0.416	0.000	0.463	0.006	0.066	0.061	2.677	0.015	0.003	0.050	0.051	0.007	0.018	0.010	0.000	0.000
101	5.279	4.205	0.708	0.457	0.398	0.000	0.445	0.005	0.061	0.056	2.614	0.014	0.002	0.048	0.045	0.005	0.016	0.009	0.000	0.000
102	5.175	4.106	0.683	0.437	0.380	0.000	0.428	0.004	0.058	0.051	2.553	0.012	0.002	0.046	0.039	0.004	0.014	0.008	0.000	0.000
103	5.071	4.008	0.658	0.417	0.364	0.000	0.411	0.004	0.054	0.047	2.494	0.011	0.001	0.044	0.035	0.003	0.013	0.007	0.000	0.000
104	4.968	3.911	0.634	0.399	0.348	0.000	0.395	0.003	0.051	0.043	2.435	0.010	0.001	0.042	0.031	0.002	0.011	0.006	0.000	0.000
105	4.865	3.815	0.611	0.381	0.334	0.000	0.379	0.003	0.048	0.040	2.378	0.009	0.001	0.040	0.027	0.001	0.010	0.005	0.000	0.000
106	4.763	3.720	0.588	0.364	0.320	0.000	0.364	0.003	0.045	0.037	2.323	0.008	0.000	0.038	0.024	0.001	0.009	0.004	0.000	0.000
107	4.661	3.626	0.565	0.347	0.306	0.000	0.349	0.002	0.042	0.034	2.268	0.007	0.000	0.037	0.021	0.001	0.008	0.004	0.000	0.000
108	4.561	3.533	0.544	0.331	0.294	0.000	0.335	0.002	0.040	0.031	2.215	0.007	0.000	0.035	0.018	0.001	0.007	0.003	0.000	0.000
109	4.461	3.442	0.523	0.316	0.282	0.000	0.321	0.002	0.038	0.029	2.163	0.006	0.000	0.033	0.016	0.000	0.006	0.003	0.000	0.000
110	4.361	3.352	0.502	0.302	0.270	0.000	0.308	0.002	0.036	0.026	2.112	0.005	0.000	0.031	0.014	0.000	0.005	0.002	0.000	0.000
111	4.263	3.263	0.483	0.288	0.259	0.000	0.295	0.001	0.034	0.024	2.063	0.005	0.000	0.030	0.012	0.000	0.004	0.002	0.000	0.000
112	4.166	3.176	0.463	0.275	0.249	0.000	0.283	0.001	0.032	0.022	2.015	0.004	0.000	0.028	0.011	0.000	0.004	0.002	0.000	0.000
113	4.069	3.091	0.445	0.262	0.239	0.000	0.271	0.001	0.030	0.021	1.968	0.004	0.000	0.027	0.009	0.000	0.003	0.002	0.000	0.000
114	3.974	3.007	0.427	0.250	0.230	0.000	0.260	0.001	0.028	0.019	1.922	0.003	0.000	0.025	0.008	0.000	0.003	0.001	0.000	0.000
115	3.880	2.924	0.410	0.238	0.221	0.000	0.249	0.001	0.026	0.018	1.877	0.003	0.000	0.024	0.007	0.000	0.003	0.001	0.000	0.000
116	3.786	2.843	0.393	0.227	0.213	0.000	0.238	0.001	0.024	0.016	1.833	0.003	0.000	0.022	0.006	0.000	0.002	0.001	0.000	0.000
117	3.694	2.764	0.377	0.217	0.205	0.000	0.228	0.001	0.022	0.015	1.791	0.003	0.000	0.021	0.006	0.000	0.002	0.001	0.000	0.000
118	3.604	2.687	0.362	0.207	0.197	0.000	0.218	0.001	0.020	0.014	1.749	0.002	0.000	0.020	0.005	0.000	0.002	0.001	0.000	0.000
119	3.514	2.611	0.347	0.197	0.190	0.000	0.209	0.001	0.019	0.013	1.709	0.002	0.000	0.019	0.004	0.000	0.002	0.001	0.000	0.000
120	3.426	2.537	0.333	0.188	0.183	0.000	0.200	0.000	0.018	0.012	1.669	0.002	0.000	0.017	0.004	0.000	0.001	0.001	0.000	0.000
121	3.339	2.465	0.319	0.179	0.176	0.000	0.191	0.000	0.017	0.011	1.631	0.002	0.000	0.016	0.004	0.000	0.001	0.001	0.000	0.000
122	3.254	2.394	0.306	0.171	0.169	0.000	0.183	0.000	0.016	0.010	1.593	0.002	0.000	0.015	0.003	0.000	0.001	0.000	0.000	0.000
123	3.170	2.325	0.293	0.163	0.163	0.000	0.175	0.000	0.015	0.010	1.556	0.001	0.000	0.014	0.003	0.000	0.001	0.000	0.000	0.000
124	3.087	2.257	0.281	0.155	0.158	0.000	0.167	0.000	0.014	0.009	1.521	0.001	0.000	0.013	0.002	0.000	0.001	0.000	0.000	0.000
125	3.006	2.191	0.269	0.148	0.152	0.000	0.160	0.000	0.013	0.008	1.486	0.001	0.000	0.013	0.002	0.000	0.001	0.000	0.000	0.000
126	2.926	2.127	0.258	0.141	0.147	0.000	0.153	0.000	0.012	0.008	1.452	0.001	0.000	0.012	0.002	0.000	0.001	0.000	0.000	0.000
127	2.848	2.065	0.247	0.134	0.141	0.000	0.146	0.000	0.011	0.007	1.418	0.001	0.000	0.011	0.002	0.000	0.001	0.000	0.000	0.000
128	2.771	2.004	0.237	0.128	0.137	0.000	0.140	0.000	0.010	0.007	1.386	0.001	0.000	0.010	0.002	0.000	0.001	0.000	0.000	0.000
129	2.695	1.944	0.227	0.122	0.132	0.000	0.133	0.000	0.009	0.006	1.355	0.001	0.000	0.010	0.001	0.000	0.000	0.000	0.000	0.000
130	2.622	1.887	0.217	0.116	0.127	0.000	0.128	0.000	0.008	0.006	1.324	0.001	0.000	0.009	0.001	0.000	0.000	0.000	0.000	0.000
131	2.549	1.830	0.208	0.111	0.123	0.000	0.122	0.000	0.007	0.005	1.294	0.001	0.000	0.008	0.001	0.000	0.000	0.000	0.000	0.000
132	2.478	1.775	0.199	0.106	0.119	0.000	0.116	0.000	0.006	0.005	1.264	0.001	0.000	0.008	0.001	0.000	0.000	0.000	0.000	0.000
133	2.409	1.722	0.191	0.101	0.115	0.000	0.111	0.000	0.005	0.005	1.236	0.001	0.000	0.007	0.001	0.000	0.000	0.000	0.000	0.000
134	2.341	1.670	0.183	0.096	0.111	0.000	0.106	0.000	0.004	0.004	1.208	0.001	0.000	0.007	0.001	0.000	0.000	0.000	0.000	0.000
135	2.275	1.620	0.175	0.091	0.108	0.000	0.102	0.000	0.004	0.004	1.180	0.000	0.000	0.006	0.001	0.000	0.000	0.000	0.000	0.000
136	2.210	1.571	0.168	0.087	0.104	0.000	0.097	0.000	0.004	0.004	1.154	0.000	0.000	0.006	0.001	0.000	0.000	0.000	0.000	0.000
137	2.146	1.523	0.161	0.083	0.100	0.000	0.093	0.000	0.003	0.003	1.128	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000
138	2.084	1.477	0.154	0.079	0.099	0.000	0.089	0.000	0.003	0.003	1.103	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000
139	2.024	1.432	0.148	0.075	0.096	0.000	0.085	0.000	0.003	0.003	1.078	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000
140	1.965	1.388	0.141	0.072	0.093	0.000	0.081	0.000	0.003	0.003	1.054	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000
141	1.907	1.345	0.136	0.068	0.090	0.000	0.077	0.000	0.003	0.003	1.030	0.000	0.000	0.004	0.000	0.000	0.00			



90 MINUTE DURATION

Time (min)	US Boundary 1	US Boundary 2	Inflow 3	Inflow 4	Inflow 5	Inflow 6	Inflow 7	Inflow 8	Inflow EX	Inflow 10	Inflow 11	Inflow 12	Inflow DEVS1	Inflow DEVS2	Inflow DEVS3	Inflow DEVS4	Inflow DEVS5	Inflow DEVS6	INFLOW PR	INFLOW REAR
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.001	0.002	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.009	0.000	0.001	0.016	0.001	0.000	0.049	0.000
2	0.002	0.003	0.002	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.020	0.000	0.004	0.020	0.002	0.000	0.086	0.000
3	0.004	0.005	0.003	0.002	0.000	0.001	0.002	0.001	0.000	0.003	0.003	0.001	0.033	0.000	0.009	0.038	0.003	0.000	0.114	0.000
4	0.006	0.007	0.004	0.003	0.000	0.001	0.002	0.001	0.000	0.004	0.004	0.002	0.047	0.000	0.016	0.051	0.005	0.000	0.135	0.000
5	0.036	0.051	0.027	0.019	0.016	0.010	0.015	0.006	0.008	0.026	0.026	0.013	0.064	0.002	0.027	0.089	0.008	0.006	0.154	0.001
6	0.099	0.135	0.069	0.054	0.059	0.041	0.023	0.015	0.027	0.068	0.074	0.032	0.090	0.005	0.044	0.126	0.014	0.017	0.204	0.004
7	0.171	0.221	0.108	0.093	0.110	0.031	0.068	0.023	0.049	0.109	0.132	0.047	0.115	0.009	0.065	0.150	0.021	0.026	0.244	0.007
8	0.251	0.307	0.145	0.133	0.165	0.036	0.097	0.030	0.073	0.147	0.200	0.060	0.139	0.012	0.090	0.186	0.028	0.036	0.276	0.010
9	0.338	0.395	0.179	0.175	0.222	0.039	0.126	0.037	0.097	0.183	0.277	0.071	0.159	0.014	0.117	0.212	0.037	0.045	0.301	0.012
10	0.429	0.484	0.213	0.219	0.280	0.041	0.156	0.043	0.120	0.216	0.362	0.080	0.176	0.017	0.147	0.238	0.045	0.054	0.321	0.014
11	0.546	0.602	0.261	0.273	0.359	0.047	0.195	0.052	0.152	0.260	0.468	0.096	0.195	0.021	0.180	0.277	0.056	0.067	0.360	0.017
12	0.669	0.722	0.307	0.330	0.438	0.051	0.235	0.060	0.182	0.301	0.582	0.109	0.211	0.025	0.214	0.292	0.067	0.079	0.391	0.019
13	0.797	0.845	0.354	0.387	0.517	0.053	0.275	0.067	0.211	0.338	0.704	0.120	0.225	0.029	0.248	0.319	0.078	0.090	0.415	0.021
14	0.929	0.970	0.400	0.445	0.594	0.054	0.316	0.073	0.239	0.372	0.831	0.131	0.236	0.032	0.282	0.333	0.090	0.101	0.433	0.022
15	1.065	1.100	0.447	0.502	0.670	0.054	0.357	0.078	0.265	0.403	0.963	0.140	0.245	0.036	0.315	0.349	0.101	0.111	0.448	0.023
16	1.160	1.173	0.465	0.538	0.698	0.044	0.380	0.076	0.269	0.401	1.067	0.135	0.234	0.038	0.339	0.318	0.109	0.112	0.410	0.021
17	1.251	1.252	0.488	0.567	0.724	0.039	0.403	0.075	0.273	0.400	1.166	0.132	0.222	0.040	0.358	0.327	0.116	0.113	0.382	0.019
18	1.340	1.337	0.516	0.597	0.750	0.036	0.425	0.074	0.276	0.399	1.259	0.132	0.206	0.042	0.371	0.299	0.121	0.114	0.360	0.018
19	1.427	1.427	0.546	0.625	0.774	0.034	0.448	0.073	0.279	0.398	1.348	0.132	0.190	0.045	0.379	0.290	0.125	0.114	0.344	0.017
20	1.511	1.521	0.579	0.651	0.797	0.033	0.469	0.072	0.282	0.398	1.432	0.132	0.177	0.048	0.382	0.268	0.128	0.114	0.331	0.017
21	1.678	1.733	0.672	0.717	0.909	0.051	0.525	0.084	0.323	0.453	1.573	0.159	0.197	0.057	0.392	0.330	0.136	0.128	0.411	0.021
22	1.854	1.944	0.756	0.791	1.018	0.062	0.580	0.093	0.361	0.503	1.726	0.179	0.220	0.064	0.404	0.314	0.142	0.139	0.473	0.025
23	2.038	2.154	0.836	0.863	1.124	0.068	0.636	0.100	0.397	0.547	1.888	0.193	0.251	0.072	0.420	0.368	0.149	0.148	0.521	0.027
24	2.229	2.366	0.913	0.937	1.226	0.071	0.692	0.107	0.430	0.588	2.058	0.205	0.281	0.079	0.440	0.384	0.157	0.157	0.557	0.029
25	2.425	2.579	0.987	1.009	1.324	0.073	0.747	0.113	0.460	0.624	2.233	0.215	0.307	0.086	0.464	0.427	0.164	0.165	0.586	0.031
26	2.549	2.688	1.007	1.045	1.330	0.057	0.771	0.107	0.451	0.605	2.357	0.200	0.298	0.089	0.480	0.384	0.167	0.160	0.527	0.027
27	2.668	2.805	1.035	1.070	1.336	0.048	0.794	0.102	0.442	0.590	2.469	0.191	0.442	0.093	0.493	0.412	0.169	0.156	0.482	0.025
28	2.782	2.928	1.067	1.096	1.341	0.043	0.817	0.099	0.435	0.576	2.571	0.186	0.259	0.097	0.500	0.370	0.171	0.154	0.448	0.023
29	2.893	3.055	1.103	1.117	1.346	0.041	0.838	0.096	0.428	0.564	2.664	0.182	0.235	0.101	0.502	0.363	0.171	0.151	0.422	0.021
30	3.002	3.184	1.139	1.138	1.350	0.039	0.858	0.093	0.422	0.553	2.749	0.179	0.215	0.106	0.499	0.329	0.171	0.148	0.402	0.020
31	3.228	3.477	1.260	1.211	1.488	0.063	0.925	0.107	0.472	0.620	2.912	0.212	0.240	0.118	0.506	0.410	0.178	0.164	0.507	0.026
32	3.468	3.762	1.366	1.297	1.621	0.078	0.992	0.118	0.518	0.679	3.092	0.235	0.270	0.128	0.516	0.386	0.185	0.177	0.588	0.031
33	3.718	4.044	1.463	1.379	1.748	0.085	1.059	0.128	0.560	0.732	3.286	0.253	0.312	0.138	0.534	0.458	0.192	0.188	0.650	0.035
34	3.978	4.323	1.555	1.465	1.869	0.090	1.125	0.136	0.599	0.779	3.489	0.267	0.352	0.147	0.557	0.478	0.200	0.199	0.697	0.037
35	4.245	4.601	1.642	1.549	1.984	0.092	1.190	0.143	0.634	0.822	3.699	0.278	0.386	0.155	0.586	0.536	0.209	0.209	0.734	0.039
36	4.451	4.789	1.682	1.602	2.015	0.079	1.229	0.140	0.633	0.818	3.867	0.269	0.387	0.160	0.610	0.511	0.214	0.208	0.696	0.036
37	4.653	4.983	1.728	1.645	2.044	0.072	1.266	0.139	0.633	0.814	4.025	0.264	0.380	0.165	0.633	0.548	0.219	0.208	0.667	0.035
38	4.853	5.181	1.777	1.688	2.071	0.068	1.302	0.137	0.632	0.812	4.174	0.262	0.362	0.170	0.650	0.518	0.224	0.209	0.645	0.033
39	5.051	5.381	1.829	1.726	2.097	0.066	1.337	0.136	0.632	0.809	4.316	0.261	0.344	0.176	0.663	0.517	0.228	0.209	0.628	0.032
40	5.247	5.582	1.881	1.763	2.121	0.065	1.371	0.135	0.631	0.808	4.450	0.261	0.328	0.181	0.670	0.490	0.231	0.209	0.616	0.031
41	5.378	5.696	1.887	1.768	2.069	0.051	1.377	0.126	0.600	0.765	4.534	0.241	0.295	0.182	0.665	0.427	0.228	0.198	0.543	0.027
42	5.501	5.814	1.901	1.764	2.020	0.044	1.383	0.118	0.573	0.729	4.601	0.228	0.266	0.184	0.653	0.409	0.225	0.188	0.488	0.024
43	5.619	5.933	1.918	1.759	1.975	0.039	1.387	0.111	0.548	0.696	4.653	0.217	0.238	0.186	0.633	0.358	0.220	0.179	0.446	0.022
44	5.732	6.051	1.935	1.750	1.933	0.037	1.389	0.105	0.527	0.667	4.694	0.208	0.213	0.188	0.609	0.334	0.213	0.170	0.413	0.020
45	5.842	6.167	1.952	1.741	1.894	0.035	1.391	0.099	0.507	0.641	4.726	0.201	0.195	0.190	0.582	0.301	0.205	0.162	0.389	0.019
46	5.947	6.274	1.965	1.728	1.854	0.034	1.390	0.094	0.489	0.617	4.750	0.193	0.180	0.192	0.553	0.280	0.196	0.153	0.367	0.018
47	6.050	6.377	1.976	1.714	1.817	0.033	1.388	0.090	0.472	0.595	4.767	0.186	0.170	0.193	0.525	0.261	0.188	0.146	0.351	0.017
48	6.152	6.474	1.985	1.700	1.782	0.033	1.386	0.086	0.457	0.575	4.779	0.179	0.164	0.194	0.498	0.248	0.179	0.138	0.338	0.017
49	6.252	6.565	1.991	1.684	1.749	0.033	1.382	0.082	0.444	0.557	4.788	0.173	0.160	0.195	0.472	0.238	0.170	0.132	0.328	0.016
50	6.352	6.650	1.995	1.669	1.719	0.032	1.377	0.079	0.432	0.541	4.793	0.168	0.157	0.195	0.449	0.233	0.162	0.126	0.321	0.016
51	6.444	6.720	1.992	1.651	1.684	0.031	1.370	0.076	0.418	0.524	4.792	0.161	0.154	0.195	0.428	0.224	0.154	0.120	0.310	0.015
52	6.534	6.785	1.988	1.632	1.652	0.031	1.362	0.073	0.406	0.508	4.788	0.156	0.151	0.194	0.409	0.222	0.147	0.115	0.301	0.015
53	6.623	6.844	1.982	1.613	1.622	0.030	1.353	0.071	0.396	0.494	4.782	0.151	0.148	0.193	0.392	0.217	0.141	0.111	0.294	0.015
54	6.709	6.897	1.974	1.594	1.593	0.030	1.344	0.069	0.386	0.481	4.774	0.146	0.146	0.192	0.378	0.215	0.135	0.107	0.289	0.015
55	6.794	6.943	1.965	1.575	1.567	0.030	1.334	0.067	0.377	0.469	4.765	0.143	0.145	0.190	0.365	0.212	0.130	0.104	0.285	0.014
56	6.847	6.946	1.934	1.544	1.512	0.024	1.313	0.062	0.357	0.442	4.735	0.131	0.135	0.187	0.350	0.189	0.124	0.097	0.256	0.013
57	6.89																			

90 MINUTE DURATION

Time (min)	US Boundary 1	US Boundary 2	Inflow 3	Inflow 4	Inflow 5	Inflow 6	Inflow 7	Inflow 8	Inflow EX	Inflow 10	Inflow 11	Inflow 12	Inflow DEVS1	Inflow DEVS2	Inflow DEVS3	Inflow DEVS4	Inflow DEVS5	Inflow DEVS6	INFLOW PR	INFLOW REAR
85	6.798	5.763	1.172	0.850	0.794	0.011	0.772	0.028	0.166	0.195	3.609	0.058	0.059	0.087	0.161	0.088	0.056	0.044	0.116	0.006
86	6.724	5.675	1.142	0.825	0.766	0.009	0.751	0.026	0.158	0.185	3.555	0.054	0.055	0.084	0.154	0.079	0.054	0.041	0.105	0.005
87	6.647	5.587	1.113	0.800	0.741	0.008	0.730	0.024	0.151	0.175	3.500	0.051	0.051	0.082	0.147	0.077	0.051	0.038	0.097	0.005
88	6.569	5.500	1.084	0.776	0.717	0.008	0.710	0.023	0.145	0.145	3.444	0.048	0.047	0.079	0.141	0.070	0.049	0.036	0.091	0.005
89	6.489	5.413	1.057	0.753	0.694	0.007	0.691	0.021	0.139	0.159	3.389	0.046	0.044	0.077	0.134	0.067	0.047	0.034	0.086	0.004
90	6.407	5.326	1.031	0.730	0.672	0.007	0.672	0.020	0.133	0.152	3.334	0.044	0.042	0.075	0.128	0.063	0.045	0.033	0.082	0.004
91	6.310	5.221	0.996	0.703	0.639	0.005	0.649	0.018	0.124	0.138	3.270	0.038	0.035	0.072	0.120	0.049	0.042	0.029	0.064	0.003
92	6.210	5.117	0.963	0.675	0.608	0.003	0.626	0.016	0.115	0.126	3.204	0.034	0.030	0.069	0.112	0.047	0.039	0.026	0.050	0.003
93	6.109	5.014	0.931	0.648	0.579	0.002	0.604	0.014	0.106	0.115	3.137	0.031	0.024	0.066	0.104	0.037	0.036	0.023	0.039	0.002
94	6.007	4.911	0.901	0.621	0.551	0.001	0.582	0.012	0.099	0.105	3.070	0.028	0.019	0.064	0.096	0.032	0.033	0.021	0.031	0.002
95	5.904	4.809	0.872	0.596	0.525	0.001	0.561	0.011	0.092	0.095	3.003	0.025	0.014	0.062	0.087	0.025	0.031	0.019	0.000	0.000
96	5.800	4.708	0.843	0.570	0.501	0.001	0.540	0.009	0.086	0.087	2.936	0.023	0.011	0.059	0.079	0.020	0.028	0.017	0.000	0.000
97	5.696	4.606	0.815	0.546	0.478	0.000	0.520	0.008	0.080	0.080	2.870	0.021	0.008	0.057	0.071	0.015	0.025	0.015	0.000	0.000
98	5.592	4.505	0.788	0.523	0.456	0.000	0.500	0.007	0.075	0.073	2.804	0.019	0.006	0.055	0.064	0.012	0.023	0.013	0.000	0.000
99	5.487	4.405	0.761	0.500	0.436	0.000	0.481	0.006	0.070	0.067	2.740	0.017	0.004	0.053	0.057	0.009	0.021	0.011	0.000	0.000
100	5.383	4.305	0.734	0.478	0.416	0.000	0.463	0.006	0.066	0.061	2.677	0.015	0.003	0.050	0.051	0.007	0.018	0.010	0.000	0.000
101	5.279	4.205	0.708	0.457	0.398	0.000	0.445	0.005	0.061	0.056	2.614	0.014	0.002	0.048	0.045	0.005	0.016	0.009	0.000	0.000
102	5.175	4.106	0.683	0.437	0.380	0.000	0.428	0.004	0.058	0.051	2.553	0.012	0.002	0.046	0.039	0.004	0.014	0.008	0.000	0.000
103	5.071	4.008	0.658	0.417	0.364	0.000	0.411	0.004	0.054	0.047	2.494	0.011	0.001	0.044	0.035	0.003	0.013	0.007	0.000	0.000
104	4.968	3.911	0.634	0.399	0.348	0.000	0.395	0.003	0.051	0.043	2.435	0.010	0.001	0.042	0.031	0.002	0.011	0.006	0.000	0.000
105	4.865	3.815	0.611	0.381	0.334	0.000	0.379	0.003	0.048	0.040	2.378	0.009	0.001	0.040	0.027	0.001	0.010	0.005	0.000	0.000
106	4.763	3.720	0.588	0.364	0.320	0.000	0.364	0.003	0.045	0.037	2.323	0.008	0.000	0.038	0.024	0.001	0.009	0.004	0.000	0.000
107	4.661	3.626	0.565	0.347	0.306	0.000	0.349	0.002	0.042	0.034	2.268	0.007	0.000	0.037	0.021	0.001	0.008	0.004	0.000	0.000
108	4.561	3.533	0.544	0.331	0.294	0.000	0.335	0.002	0.040	0.031	2.215	0.007	0.000	0.035	0.018	0.001	0.007	0.003	0.000	0.000
109	4.461	3.442	0.523	0.316	0.282	0.000	0.321	0.002	0.038	0.029	2.163	0.006	0.000	0.033	0.016	0.000	0.006	0.003	0.000	0.000
110	4.361	3.352	0.502	0.302	0.270	0.000	0.308	0.002	0.036	0.026	2.112	0.005	0.000	0.031	0.014	0.000	0.005	0.002	0.000	0.000
111	4.263	3.263	0.483	0.288	0.259	0.000	0.295	0.001	0.034	0.024	2.063	0.005	0.000	0.030	0.012	0.000	0.004	0.002	0.000	0.000
112	4.166	3.176	0.463	0.275	0.249	0.000	0.283	0.001	0.032	0.022	2.015	0.004	0.000	0.028	0.011	0.000	0.004	0.002	0.000	0.000
113	4.069	3.091	0.445	0.262	0.239	0.000	0.271	0.001	0.030	0.021	1.968	0.004	0.000	0.027	0.009	0.000	0.003	0.002	0.000	0.000
114	3.974	3.007	0.427	0.250	0.230	0.000	0.260	0.001	0.028	0.019	1.922	0.003	0.000	0.025	0.008	0.000	0.003	0.001	0.000	0.000
115	3.880	2.924	0.410	0.238	0.221	0.000	0.249	0.001	0.026	0.018	1.877	0.003	0.000	0.024	0.007	0.000	0.003	0.001	0.000	0.000
116	3.786	2.843	0.393	0.227	0.213	0.000	0.238	0.001	0.024	0.016	1.833	0.003	0.000	0.022	0.006	0.000	0.002	0.001	0.000	0.000
117	3.694	2.764	0.377	0.217	0.205	0.000	0.228	0.001	0.022	0.015	1.791	0.003	0.000	0.021	0.006	0.000	0.002	0.001	0.000	0.000
118	3.604	2.687	0.362	0.207	0.197	0.000	0.218	0.001	0.020	0.014	1.749	0.002	0.000	0.020	0.005	0.000	0.002	0.001	0.000	0.000
119	3.514	2.611	0.347	0.197	0.190	0.000	0.209	0.001	0.019	0.013	1.709	0.002	0.000	0.019	0.004	0.000	0.002	0.001	0.000	0.000
120	3.426	2.537	0.333	0.188	0.183	0.000	0.200	0.000	0.018	0.012	1.669	0.002	0.000	0.017	0.004	0.000	0.001	0.001	0.000	0.000
121	3.339	2.465	0.319	0.179	0.176	0.000	0.191	0.000	0.017	0.011	1.631	0.002	0.000	0.016	0.004	0.000	0.001	0.001	0.000	0.000
122	3.254	2.394	0.306	0.171	0.169	0.000	0.183	0.000	0.016	0.010	1.593	0.002	0.000	0.015	0.003	0.000	0.001	0.000	0.000	0.000
123	3.170	2.325	0.293	0.163	0.163	0.000	0.175	0.000	0.015	0.010	1.556	0.001	0.000	0.014	0.003	0.000	0.001	0.000	0.000	0.000
124	3.087	2.257	0.281	0.155	0.158	0.000	0.167	0.000	0.014	0.009	1.521	0.001	0.000	0.013	0.002	0.000	0.001	0.000	0.000	0.000
125	3.006	2.191	0.269	0.148	0.152	0.000	0.160	0.000	0.013	0.008	1.486	0.001	0.000	0.013	0.002	0.000	0.001	0.000	0.000	0.000
126	2.926	2.127	0.258	0.141	0.147	0.000	0.153	0.000	0.012	0.008	1.452	0.001	0.000	0.012	0.002	0.000	0.001	0.000	0.000	0.000
127	2.848	2.065	0.247	0.134	0.141	0.000	0.146	0.000	0.011	0.007	1.418	0.001	0.000	0.011	0.002	0.000	0.001	0.000	0.000	0.000
128	2.771	2.004	0.237	0.128	0.137	0.000	0.140	0.000	0.010	0.007	1.386	0.001	0.000	0.010	0.002	0.000	0.001	0.000	0.000	0.000
129	2.695	1.944	0.227	0.122	0.132	0.000	0.133	0.000	0.009	0.006	1.355	0.001	0.000	0.010	0.001	0.000	0.000	0.000	0.000	0.000
130	2.622	1.887	0.217	0.116	0.127	0.000	0.128	0.000	0.008	0.006	1.324	0.001	0.000	0.009	0.001	0.000	0.000	0.000	0.000	0.000
131	2.549	1.830	0.208	0.111	0.123	0.000	0.122	0.000	0.007	0.005	1.294	0.001	0.000	0.008	0.001	0.000	0.000	0.000	0.000	0.000
132	2.478	1.775	0.199	0.106	0.119	0.000	0.116	0.000	0.006	0.005	1.264	0.001	0.000	0.008	0.001	0.000	0.000	0.000	0.000	0.000
133	2.409	1.722	0.191	0.101	0.115	0.000	0.111	0.000	0.005	0.005	1.236	0.001	0.000	0.007	0.001	0.000	0.000	0.000	0.000	0.000
134	2.341	1.670	0.183	0.096	0.111	0.000	0.106	0.000	0.004	0.004	1.208	0.001	0.000	0.007	0.001	0.000	0.000	0.000	0.000	0.000
135	2.275	1.620	0.175	0.091	0.108	0.000	0.102	0.000	0.004	0.004	1.180	0.000	0.000	0.006	0.001	0.000	0.000	0.000	0.000	0.000
136	2.210	1.571	0.168	0.087	0.104	0.000	0.097	0.000	0.004	0.004	1.154	0.000	0.000	0.006	0.001	0.000	0.000	0.000	0.000	0.000
137	2.146	1.523	0.161	0.083	0.100	0.000	0.093	0.000	0.003	0.003	1.128	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000
138	2.084	1.477	0.154	0.079	0.099	0.000	0.089	0.000	0.003	0.003	1.103	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000
139	2.024	1.432	0.148	0.075	0.096	0.000	0.085	0.000	0.003	0.003	1.078	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000
140	1.965	1.388	0.141	0.072	0.093	0.000	0.081	0.000	0.003	0.003	1.054	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000
141	1.907	1.345	0.136	0.068	0.090	0.000	0.077	0.000	0.003	0.003	1.030	0.000	0.000	0.004	0.000	0.000	0.00			



120 MINUTE DURATION

Time (min)	US Boundary 1	US Boundary 2	Inflow 3	Inflow 4	Inflow 5	Inflow 6	Inflow 7	Inflow 8	Inflow EX	Inflow 10	Inflow 11	Inflow 12	Inflow DEVS1	Inflow DEVS2	Inflow DEVS3	Inflow DEVS4	Inflow DEVS5	Inflow DEVS6	INFLOW PR	INFLOW REAR
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.001	0.002	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.009	0.000	0.001	0.016	0.001	0.000	0.035	0.000
2	0.002	0.003	0.002	0.001	0.000	0.001	0.001	0.000	0.000	0.002	0.002	0.001	0.020	0.000	0.004	0.020	0.002	0.000	0.062	0.000
3	0.004	0.005	0.003	0.002	0.000	0.000	0.001	0.002	0.000	0.003	0.003	0.003	0.033	0.000	0.009	0.038	0.003	0.000	0.082	0.000
4	0.006	0.007	0.004	0.003	0.000	0.001	0.002	0.001	0.000	0.004	0.004	0.002	0.047	0.000	0.016	0.051	0.005	0.000	0.098	0.000
5	0.036	0.051	0.027	0.019	0.000	0.010	0.015	0.006	0.000	0.026	0.026	0.013	0.064	0.002	0.027	0.089	0.008	0.006	0.109	0.000
6	0.099	0.135	0.069	0.054	0.009	0.041	0.069	0.041	0.004	0.068	0.074	0.032	0.090	0.005	0.044	0.126	0.014	0.017	0.137	0.001
7	0.171	0.221	0.108	0.093	0.033	0.031	0.068	0.023	0.015	0.109	0.132	0.047	0.115	0.009	0.065	0.150	0.021	0.026	0.160	0.003
8	0.251	0.307	0.145	0.133	0.062	0.036	0.097	0.030	0.028	0.147	0.200	0.060	0.139	0.012	0.090	0.186	0.028	0.036	0.178	0.004
9	0.338	0.395	0.179	0.175	0.092	0.039	0.179	0.037	0.041	0.277	0.183	0.071	0.159	0.183	0.014	0.277	0.117	0.212	0.193	0.006
10	0.429	0.484	0.213	0.219	0.125	0.041	0.156	0.043	0.055	0.216	0.362	0.080	0.176	0.017	0.147	0.238	0.045	0.054	0.205	0.007
11	0.546	0.602	0.261	0.273	0.178	0.047	0.195	0.052	0.078	0.260	0.468	0.096	0.195	0.021	0.180	0.277	0.056	0.067	0.243	0.010
12	0.669	0.722	0.307	0.330	0.234	0.051	0.235	0.060	0.100	0.301	0.582	0.109	0.211	0.301	0.214	0.292	0.067	0.079	0.273	0.012
13	0.797	0.845	0.354	0.387	0.290	0.053	0.275	0.067	0.122	0.338	0.704	0.120	0.225	0.029	0.248	0.319	0.078	0.090	0.296	0.014
14	0.929	0.970	0.400	0.445	0.346	0.054	0.316	0.073	0.144	0.372	0.831	0.131	0.236	0.032	0.282	0.333	0.090	0.101	0.315	0.015
15	1.065	1.100	0.447	0.502	0.402	0.054	0.357	0.078	0.165	0.403	0.963	0.140	0.245	0.036	0.315	0.349	0.101	0.111	0.329	0.016
16	1.160	1.173	0.465	0.538	0.434	0.044	0.380	0.076	0.174	0.401	1.067	0.135	0.234	0.038	0.339	0.318	0.109	0.112	0.314	0.015
17	1.251	1.252	0.488	0.567	0.466	0.039	0.403	0.075	0.183	0.400	1.166	0.132	0.222	0.040	0.358	0.327	0.116	0.113	0.302	0.015
18	1.340	1.337	0.516	0.597	0.496	0.036	0.425	0.074	0.191	0.399	1.259	0.132	0.206	0.042	0.371	0.299	0.121	0.114	0.293	0.015
19	1.427	1.427	0.546	0.625	0.526	0.034	0.448	0.073	0.198	0.398	1.348	0.132	0.190	0.045	0.379	0.290	0.125	0.114	0.287	0.014
20	1.511	1.521	0.579	0.651	0.554	0.033	0.469	0.072	0.205	0.398	1.432	0.132	0.177	0.048	0.382	0.268	0.128	0.114	0.282	0.014
21	1.678	1.733	0.672	0.717	0.663	0.051	0.525	0.084	0.247	0.453	1.573	0.159	0.197	0.057	0.392	0.330	0.136	0.128	0.366	0.019
22	1.854	1.944	0.756	0.791	0.771	0.062	0.580	0.093	0.287	0.503	1.726	0.179	0.220	0.064	0.404	0.314	0.142	0.139	0.431	0.022
23	2.038	2.154	0.836	0.863	0.877	0.068	0.636	0.100	0.325	0.547	1.888	0.193	0.251	0.072	0.420	0.368	0.149	0.148	0.481	0.025
24	2.229	2.366	0.913	0.937	0.979	0.071	0.692	0.107	0.360	0.588	2.058	0.205	0.281	0.079	0.440	0.384	0.157	0.157	0.519	0.027
25	2.425	2.579	0.987	1.009	1.079	0.073	0.747	0.113	0.393	0.624	2.233	0.215	0.307	0.086	0.464	0.427	0.164	0.165	0.549	0.029
26	2.549	2.688	1.007	1.045	1.082	0.057	0.771	0.107	0.383	0.605	2.357	0.200	0.298	0.089	0.480	0.384	0.167	0.160	0.483	0.025
27	2.668	2.805	1.035	1.070	1.084	0.048	0.794	0.102	0.374	0.590	2.469	0.191	0.283	0.093	0.493	0.412	0.169	0.156	0.432	0.022
28	2.782	2.928	1.067	1.096	1.086	0.043	0.817	0.099	0.366	0.576	2.571	0.186	0.259	0.097	0.500	0.370	0.171	0.154	0.393	0.020
29	2.893	3.055	1.103	1.117	1.088	0.041	0.838	0.096	0.358	0.564	2.664	0.182	0.235	0.101	0.502	0.363	0.171	0.151	0.364	0.018
30	3.002	3.184	1.139	1.138	1.090	0.039	0.858	0.093	0.352	0.553	2.749	0.179	0.215	0.106	0.499	0.329	0.171	0.148	0.341	0.017
31	3.228	3.477	1.260	1.211	1.224	0.063	0.925	0.107	0.401	0.620	2.912	0.212	0.240	0.118	0.506	0.410	0.178	0.164	0.448	0.023
32	3.468	3.762	1.366	1.297	1.353	0.078	0.992	0.118	0.446	0.679	3.092	0.235	0.270	0.128	0.516	0.386	0.185	0.177	0.530	0.028
33	3.718	4.044	1.463	1.379	1.477	0.085	1.059	0.128	0.489	0.732	3.286	0.253	0.312	0.138	0.534	0.458	0.192	0.188	0.593	0.032
34	3.978	4.323	1.555	1.465	1.596	0.090	1.125	0.136	0.528	0.779	3.489	0.267	0.352	0.147	0.557	0.478	0.200	0.199	0.642	0.034
35	4.245	4.601	1.642	1.549	1.710	0.092	1.190	0.143	0.563	0.822	3.699	0.278	0.386	0.155	0.586	0.536	0.209	0.209	0.679	0.036
36	4.451	4.789	1.682	1.602	1.746	0.079	1.229	0.140	0.565	0.818	3.867	0.269	0.387	0.160	0.610	0.511	0.214	0.208	0.644	0.034
37	4.653	4.983	1.728	1.645	1.780	0.072	1.266	0.139	0.567	0.814	4.025	0.264	0.380	0.165	0.633	0.548	0.219	0.208	0.618	0.032
38	4.853	5.181	1.777	1.688	1.811	0.068	1.302	0.137	0.568	0.812	4.174	0.262	0.362	0.170	0.650	0.518	0.224	0.209	0.598	0.031
39	5.051	5.381	1.829	1.726	1.841	0.066	1.337	0.136	0.570	0.809	4.316	0.261	0.344	0.176	0.663	0.517	0.228	0.209	0.583	0.030
40	5.247	5.582	1.881	1.763	1.869	0.065	1.371	0.135	0.571	0.808	4.450	0.261	0.328	0.181	0.670	0.490	0.231	0.209	0.571	0.029
41	5.378	5.696	1.887	1.768	1.872	0.051	1.377	0.126	0.562	0.765	4.534	0.241	0.295	0.182	0.665	0.427	0.228	0.198	0.542	0.027
42	5.501	5.814	1.901	1.764	1.874	0.044	1.383	0.118	0.554	0.729	4.601	0.228	0.266	0.184	0.653	0.409	0.225	0.188	0.519	0.026
43	5.619	5.933	1.918	1.759	1.875	0.039	1.387	0.111	0.547	0.696	4.653	0.217	0.238	0.186	0.633	0.358	0.220	0.179	0.501	0.025
44	5.732	6.051	1.935	1.750	1.877	0.037	1.389	0.105	0.541	0.667	4.694	0.208	0.213	0.188	0.609	0.334	0.213	0.170	0.488	0.025
45	5.842	6.167	1.952	1.741	1.879	0.035	1.391	0.099	0.535	0.641	4.726	0.201	0.195	0.190	0.582	0.301	0.205	0.162	0.478	0.024
46	5.947	6.274	1.965	1.728	1.834	0.034	1.390	0.094	0.511	0.617	4.750	0.193	0.180	0.192	0.553	0.280	0.196	0.153	0.430	0.022
47	6.050	6.377	1.976	1.714	1.792	0.033	1.388	0.090	0.490	0.595	4.767	0.186	0.170	0.193	0.525	0.261	0.188	0.146	0.393	0.020
48	6.152	6.474	1.985	1.700	1.753	0.033	1.386	0.086	0.470	0.575	4.779	0.179	0.164	0.194	0.498	0.248	0.179	0.138	0.365	0.018
49	6.252	6.565	1.991	1.684	1.716	0.033	1.382	0.082	0.453	0.557	4.788	0.173	0.160	0.195	0.472	0.238	0.170	0.132	0.344	0.017
50	6.352	6.650	1.995	1.669	1.682	0.032	1.377	0.079	0.438	0.541	4.793	0.168	0.157	0.195	0.449	0.233	0.162	0.126	0.328	0.016
51	6.444	6.720	1.992	1.651	1.651	0.031	1.370	0.076	0.425	0.524	4.792	0.161	0.154	0.195	0.428	0.224	0.154	0.120	0.317	0.016
52	6.534	6.785	1.988	1.632	1.623	0.031	1.362	0.073	0.413	0.508	4.788	0.156	0.151	0.194	0.409	0.222	0.147	0.115	0.308	0.015
53	6.623	6.844	1.982	1.613	1.596	0.030	1.353	0.071	0.402	0.494	4.782	0.151	0.148	0.193	0.392	0.217	0.141	0.111	0.301	0.015
54	6.709	6.897	1.974	1.594	1.572	0.030	1.344	0.069	0.392	0.481	4.774	0.146	0.146	0.192	0.378	0.215	0.135	0.107	0.296	0.015
55	6.794	6.943	1.965	1.575	1.548	0.030	1.334	0.067	0.384	0.469	4.765	0.143	0.145	0.190	0.365	0.212	0.130	0.104	0.292	0.015
56	6.847	6.946	1.934	1.544	1.520	0.024	1.313	0.062	0.373	0.442	4.735	0.131	0.135	0.187	0.350	0.189	0.124	0.097	0.284	0.014
57	6.8																			

120 MINUTE DURATION

Time (min)	US Boundary 1	US Boundary 2	Inflow 3	Inflow 4	Inflow 5	Inflow 6	Inflow 7	Inflow 8	Inflow EX	Inflow 10	Inflow 11	Inflow 12	Inflow DEVS1	Inflow DEVS2	Inflow DEVS3	Inflow DEVS4	Inflow DEVS5	Inflow DEVS6	INFLOW PR	INFLOW REAR
85	6.798	5.763	1.172	0.850	0.958	0.011	0.772	0.028	0.218	0.195	3.609	0.058	0.059	0.087	0.161	0.088	0.056	0.044	0.187	0.009
86	6.724	5.675	1.142	0.825	0.946	0.009	0.751	0.026	0.215	0.185	3.555	0.054	0.055	0.084	0.154	0.079	0.054	0.041	0.185	0.009
87	6.647	5.587	1.113	0.800	0.935	0.008	0.730	0.024	0.213	0.175	3.500	0.051	0.051	0.082	0.147	0.077	0.051	0.038	0.183	0.009
88	6.569	5.500	1.084	0.776	0.925	0.008	0.710	0.023	0.211	0.167	3.444	0.048	0.047	0.079	0.141	0.070	0.049	0.036	0.181	0.009
89	6.489	5.413	1.057	0.753	0.915	0.007	0.691	0.021	0.209	0.159	3.389	0.046	0.044	0.077	0.134	0.067	0.047	0.034	0.180	0.009
90	6.407	5.326	1.031	0.730	0.906	0.007	0.672	0.020	0.207	0.152	3.334	0.044	0.042	0.075	0.128	0.063	0.045	0.033	0.180	0.009
91	6.310	5.221	0.996	0.703	0.886	0.005	0.649	0.018	0.202	0.138	3.270	0.038	0.035	0.072	0.120	0.049	0.042	0.029	0.169	0.008
92	6.210	5.117	0.963	0.675	0.868	0.003	0.626	0.016	0.196	0.126	3.204	0.034	0.030	0.069	0.112	0.047	0.039	0.026	0.161	0.008
93	6.109	5.014	0.931	0.648	0.851	0.002	0.604	0.014	0.192	0.115	3.137	0.031	0.024	0.066	0.104	0.037	0.036	0.023	0.154	0.008
94	6.007	4.911	0.901	0.621	0.835	0.001	0.582	0.012	0.187	0.105	3.070	0.028	0.019	0.064	0.096	0.032	0.033	0.021	0.149	0.007
95	5.904	4.809	0.872	0.596	0.819	0.001	0.561	0.011	0.183	0.095	3.003	0.025	0.014	0.062	0.087	0.025	0.031	0.019	0.146	0.007
96	5.800	4.708	0.843	0.570	0.798	0.001	0.540	0.009	0.177	0.087	2.936	0.023	0.011	0.059	0.079	0.020	0.028	0.017	0.135	0.007
97	5.696	4.606	0.815	0.546	0.777	0.000	0.520	0.008	0.171	0.080	2.870	0.021	0.008	0.057	0.071	0.015	0.025	0.015	0.128	0.006
98	5.592	4.505	0.788	0.523	0.758	0.000	0.500	0.007	0.166	0.073	2.804	0.019	0.006	0.055	0.064	0.012	0.023	0.013	0.122	0.006
99	5.487	4.405	0.761	0.500	0.740	0.000	0.481	0.006	0.161	0.067	2.740	0.017	0.004	0.053	0.057	0.009	0.021	0.011	0.117	0.006
100	5.383	4.305	0.734	0.478	0.723	0.000	0.463	0.006	0.156	0.061	2.677	0.015	0.003	0.050	0.051	0.007	0.018	0.010	0.113	0.006
101	5.279	4.205	0.708	0.457	0.712	0.000	0.445	0.005	0.154	0.056	2.614	0.014	0.002	0.048	0.045	0.005	0.016	0.009	0.116	0.006
102	5.175	4.106	0.683	0.437	0.702	0.000	0.428	0.004	0.152	0.051	2.553	0.012	0.002	0.046	0.039	0.004	0.014	0.008	0.119	0.006
103	5.071	4.008	0.658	0.417	0.693	0.000	0.411	0.004	0.151	0.047	2.494	0.011	0.001	0.044	0.035	0.003	0.013	0.007	0.120	0.006
104	4.968	3.911	0.634	0.399	0.684	0.000	0.395	0.003	0.149	0.043	2.435	0.010	0.001	0.042	0.031	0.002	0.011	0.006	0.122	0.006
105	4.865	3.815	0.611	0.381	0.675	0.000	0.379	0.003	0.148	0.040	2.378	0.009	0.001	0.040	0.027	0.001	0.010	0.005	0.123	0.006
106	4.763	3.720	0.588	0.364	0.660	0.000	0.364	0.003	0.144	0.037	2.323	0.008	0.000	0.038	0.024	0.001	0.009	0.004	0.116	0.006
107	4.661	3.626	0.565	0.347	0.646	0.000	0.349	0.002	0.140	0.034	2.268	0.007	0.000	0.037	0.021	0.001	0.008	0.004	0.111	0.005
108	4.561	3.533	0.544	0.331	0.633	0.000	0.335	0.002	0.137	0.031	2.215	0.007	0.000	0.035	0.018	0.001	0.007	0.003	0.107	0.005
109	4.461	3.442	0.523	0.316	0.620	0.000	0.321	0.002	0.133	0.029	2.163	0.006	0.000	0.033	0.016	0.000	0.006	0.003	0.104	0.005
110	4.361	3.352	0.502	0.302	0.608	0.000	0.308	0.002	0.131	0.026	2.112	0.005	0.000	0.031	0.014	0.000	0.005	0.002	0.102	0.005
111	4.263	3.263	0.483	0.288	0.594	0.000	0.295	0.001	0.127	0.024	2.063	0.005	0.000	0.030	0.012	0.000	0.004	0.002	0.098	0.005
112	4.166	3.176	0.463	0.275	0.581	0.000	0.283	0.001	0.124	0.022	2.015	0.004	0.000	0.028	0.011	0.000	0.004	0.002	0.094	0.005
113	4.069	3.091	0.445	0.262	0.568	0.000	0.271	0.001	0.120	0.021	1.968	0.004	0.000	0.027	0.009	0.000	0.003	0.002	0.091	0.004
114	3.974	3.007	0.427	0.250	0.556	0.000	0.260	0.001	0.118	0.019	1.922	0.003	0.000	0.025	0.008	0.000	0.003	0.001	0.089	0.004
115	3.880	2.924	0.410	0.238	0.545	0.000	0.249	0.001	0.115	0.018	1.877	0.003	0.000	0.024	0.007	0.000	0.003	0.001	0.087	0.004
116	3.786	2.843	0.393	0.227	0.527	0.000	0.238	0.001	0.110	0.016	1.833	0.003	0.000	0.022	0.006	0.000	0.002	0.001	0.079	0.004
117	3.694	2.764	0.377	0.217	0.511	0.000	0.228	0.001	0.105	0.015	1.791	0.003	0.000	0.021	0.006	0.000	0.002	0.001	0.073	0.004
118	3.604	2.687	0.362	0.207	0.496	0.000	0.218	0.001	0.101	0.014	1.749	0.002	0.000	0.020	0.005	0.000	0.002	0.001	0.068	0.003
119	3.514	2.611	0.347	0.197	0.481	0.000	0.209	0.001	0.097	0.013	1.709	0.002	0.000	0.019	0.004	0.000	0.002	0.001	0.064	0.003
120	3.426	2.537	0.333	0.188	0.467	0.000	0.200	0.000	0.094	0.012	1.669	0.002	0.000	0.017	0.004	0.000	0.001	0.001	0.061	0.003
121	3.339	2.465	0.319	0.179	0.446	0.000	0.191	0.000	0.087	0.011	1.631	0.002	0.000	0.016	0.004	0.000	0.001	0.001	0.047	0.002
122	3.254	2.394	0.306	0.171	0.426	0.000	0.183	0.000	0.081	0.010	1.593	0.002	0.000	0.015	0.003	0.000	0.001	0.000	0.037	0.002
123	3.170	2.325	0.293	0.163	0.407	0.000	0.175	0.000	0.076	0.010	1.556	0.001	0.000	0.014	0.003	0.000	0.001	0.000	0.029	0.002
124	3.087	2.257	0.281	0.155	0.389	0.000	0.167	0.000	0.071	0.009	1.521	0.001	0.000	0.013	0.002	0.000	0.001	0.000	0.000	0.000
125	3.006	2.191	0.269	0.148	0.372	0.000	0.160	0.000	0.067	0.008	1.486	0.001	0.000	0.013	0.002	0.000	0.001	0.000	0.000	0.000
126	2.926	2.127	0.258	0.141	0.356	0.000	0.153	0.000	0.062	0.008	1.452	0.001	0.000	0.012	0.002	0.000	0.001	0.000	0.000	0.000
127	2.848	2.065	0.247	0.134	0.341	0.000	0.146	0.000	0.059	0.007	1.418	0.001	0.000	0.011	0.002	0.000	0.001	0.000	0.000	0.000
128	2.771	2.004	0.237	0.128	0.327	0.000	0.140	0.000	0.055	0.007	1.386	0.001	0.000	0.010	0.002	0.000	0.001	0.000	0.000	0.000
129	2.695	1.944	0.227	0.122	0.313	0.000	0.133	0.000	0.052	0.006	1.355	0.001	0.000	0.010	0.001	0.000	0.000	0.000	0.000	0.000
130	2.622	1.887	0.217	0.116	0.300	0.000	0.128	0.000	0.049	0.006	1.324	0.001	0.000	0.009	0.001	0.000	0.000	0.000	0.000	0.000
131	2.549	1.830	0.208	0.111	0.288	0.000	0.122	0.000	0.046	0.005	1.294	0.001	0.000	0.008	0.001	0.000	0.000	0.000	0.000	0.000
132	2.478	1.775	0.199	0.106	0.276	0.000	0.116	0.000	0.043	0.005	1.264	0.001	0.000	0.008	0.001	0.000	0.000	0.000	0.000	0.000
133	2.409	1.722	0.191	0.101	0.265	0.000	0.111	0.000	0.041	0.005	1.236	0.001	0.000	0.007	0.001	0.000	0.000	0.000	0.000	0.000
134	2.341	1.670	0.183	0.096	0.254	0.000	0.106	0.000	0.038	0.004	1.208	0.001	0.000	0.007	0.001	0.000	0.000	0.000	0.000	0.000
135	2.275	1.620	0.175	0.091	0.244	0.000	0.102	0.000	0.036	0.004	1.180	0.000	0.000	0.006	0.001	0.000	0.000	0.000	0.000	0.000
136	2.210	1.571	0.168	0.087	0.235	0.000	0.097	0.000	0.034	0.004	1.154	0.000	0.000	0.006	0.001	0.000	0.000	0.000	0.000	0.000
137	2.146	1.523	0.161	0.083	0.226	0.000	0.093	0.000	0.032	0.003	1.128	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000
138	2.084	1.477	0.154	0.079	0.217	0.000	0.089	0.000	0.030	0.003	1.103	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000
139	2.024	1.432	0.148	0.075	0.209	0.000	0.085	0.000	0.030	0.003	1.078	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000
140	1.965	1.388	0.141	0.072	0.201	0.000	0.081	0.000	0.030	0.003	1.054	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000
141	1.907	1.345	0.136	0.068	0.193	0.000	0.077	0.000	0.030	0.003	1.030	0.000	0.000	0.004	0.000	0.000	0.0			



## **APPENDIX I – Flood Overlay Code**

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
<b>Section A—If for self-assessable or assessable development for a <a href="#">dwelling house</a> including any <a href="#">secondary dwelling</a></b> Note—Development for a <a href="#">dwelling house</a> does not require assessment against any other sections of this code.				
<b>PO1</b> Development involving any habitable or non-habitable part of a <a href="#">dwelling house</a> , including any <a href="#">secondary dwelling</a> , is located and designed to: (a) minimise the risk to people from flood hazard; (b) achieve acceptable flood immunity; (c) minimise property impacts from a flood event up to and including the defined flood event; (d) minimise disruption to residents, recovery time and rebuilding or restoration costs after a flood event up to and including the defined flood event.	<b>AO1.1</b> Development for a <a href="#">dwelling house</a> including any <a href="#">secondary dwelling</a> : (a) is not located in the Brisbane River flood planning area 1, 2a or 2b sub-categories or the Creek/waterway flood planning area 1 or 2 sub-categories; or (b) is only located in these sub-categories, if a <a href="#">Registered Professional Engineer Queensland</a> certifies that the <a href="#">dwelling house</a> and any <a href="#">secondary dwelling</a> are structurally designed to be able to resist hydrostatic and hydrodynamic loads associated with flooding up to and including the <a href="#">defined flood event</a> .	N/A	Development is not for dwelling house.	
	<b>AO1.2</b> Development for a dwelling house and any secondary dwelling complies with the minimum flood planning levels in <a href="#">Table 8.2.11.3.B</a> .	N/A	Development is not for dwelling house.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
	Note—If located in an area that has no flood level information available from the Council such as an overland flow path, a <a href="#">Registered Professional Engineer of Queensland</a> with expertise in undertaking flood studies is to certify that the flood level and development levels for the dwelling house and any secondary dwelling achieve the required flood planning levels in <a href="#">Table 8.2.11.3.B</a> .			
	<b>AO1.3</b> Development involving a building undercroft complies with the minimum clearance requirements in <a href="#">Table 8.2.11.3.E</a> . Editor's note—For creek/waterway, storm-tide and river flooding, applicable flood planning information is available from Council's <a href="#">FloodWise Property Report</a> . Note—The <a href="#">Flood planning scheme policy</a> provides guidance on undercroft design.	N/A	Development is not for dwelling house.	
<b>PO2</b> Development within the Creek/waterway flood planning area sub-categories or Overland flow flood planning area sub-category: (a) maintains the conveyance of flood waters to allow them to pass predominantly unimpeded through the site;	<b>AO2</b> Development: (a) is not located within the Creek/waterway flood planning area 1, 2 or 3 sub-categories or the Overland flow flood planning area sub-category; or (b) provides an open undercroft area from natural ground level to habitable floor level for any area inundated by the <a href="#">defined flood event</a> ; or	N/A	Development is not for dwelling house.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
<p>(b) does not concentrate, intensify or divert floodwater onto upstream, downstream or adjacent properties; c) will not result in a material increase in flood levels or flood hazard on upstream, downstream or adjacent properties.</p>	<p>Note—This undercroft area is not suitable for providing non-habitable rooms, secure storage of valuables, or future enclosing for storage or car parking. The clear area may include structural elements such as columns and floor substructure. The <a href="#">Flood planning scheme policy</a> provides guidance on undercroft design. Editor’s note—An open undercroft design may be achieved through a ‘valance’ treatment around the perimeter of an otherwise internally clear undercroft. Editor’s note—For Creek/waterway, storm-tide and river flooding, applicable flood planning information is available from Council’s <a href="#">FloodWise Property Report</a>.</p> <p>C) a report from a <a href="#">Registered Professional Engineer Queensland</a> certifies that the development in the Creek/waterway flood planning area or Overland flow flood planning area sub-categories will not result in a material increase in flood level or flood hazard on upstream, downstream or adjacent properties.</p> <p>Note—Flood studies demonstrate that the development and engineering design methods conform to the principles within the <a href="#">Flood planning scheme policy</a> and the <a href="#">Infrastructure design planning scheme policy</a>.</p>			

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
<b>Section B—If self-assessable or assessable development other than for a <a href="#">dwelling house</a> or reconfiguring a lot</b>				
Note—If self-assessable development complies with the acceptable outcomes of this part, no further assessment against this code is required.				
<b>PO3</b> Development: (a) is compatible with flood hazard in a <a href="#">defined flood event</a> ; (b) minimises the risk to people from flood hazard; (c) does not reduce the ability of evacuation resources including <a href="#">emergency services</a> to access and evacuate the site in a flood emergency, with consideration to the scale of the development; (d) minimises impacts on property from flooding; (e) minimises disruption to residents, business or site operations and recovery time due to flooding;	<b>AO3</b> Development for a material change of use complies with <a href="#">Table 8.2.11.3.C</a> .	N/A	Development is not for material change of use.	

<i>Performance Criteria</i>	<i>Acceptable Solution</i>	<i>Solutions*</i>	<i>Comments</i>	<i>Council Use</i>
<p>(f) minimises the need to rebuild structures after a flood event greater than the defined flood event.</p> <p>Note—Where <a href="#">Table 8.2.11.3.C</a> identifies that a flood risk assessment is required, compliance with this performance outcome can be achieved by submitting a flood risk assessment, which may be included within a flood study, addressing the criteria within this performance solution. Preparing flood risk assessments and flood studies is required to be in accordance with the <a href="#">Flood planning scheme policy</a>.</p> <p>Note—An emergency management plan prepared in accordance with the <a href="#">Flood planning scheme policy</a>, which sets out procedures for evacuation due to flooding may be used to demonstrate compliance with this performance outcome.</p>				
<p><b>PO4</b></p> <p>Development for a <a href="#">park</a> ensures that the design of a park and location of structures and facilities responds to the flood hazard and balances the safety of intended users with:</p> <p>(a) maintaining continuity of operations;</p>	<p><b>AO4.1</b></p> <p>Development involving a building or structure in a <a href="#">park</a> complies with the flood planning levels specified in <a href="#">Table 8.2.11.3.D</a>.</p>	N/A	The development does not involve a building or structure in a park.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
(b) impacts of flooding on asset life and ongoing maintenance costs; (c) efficient recovery after flood events; (d) recreational benefits to the city; (e) availability of suitable land within the <a href="#">park</a> .	<b>AO4.2</b> Development involving a building or structure where <a href="#">Table 8.2.11.3.D</a> does not apply: (a) is not located within the 20% <a href="#">AEP</a> flood extent of any creek/waterway or overland flow path; or (b) is located above the 20% AEP flood level of any creek/waterway or overland flow path.	N/A	The development does not involve a building or structure in a park.	
<b>Section C—If for assessable development other than for a <a href="#">dwelling house</a></b>				
<b>PO5</b> Development is located and designed to: (a) minimise the risk to people from flood hazard on the site; (b) minimise flood damage to the development and contents of buildings up to the <a href="#">defined flood event</a> ; (c) provide suitable amenity;	<b>AO5.1</b> Development complies with the flood planning levels specified in <a href="#">Table 8.2.11.3.D</a> . Note—If located in an area with no Council-derived flood levels such as an overland flow path, a <a href="#">Registered Professional Engineer Queensland</a> with expertise in undertaking flood studies is to derive the applicable flood level and certify that the development meets the required flood planning levels in <a href="#">Table 8.2.11.3.D</a> . The study is to demonstrate that the development and engineering design	N/A	The development is for reconfiguring a lot.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
(d) minimise disruption to residents, recovery time and the need to rebuild structures after a flood event up to and including the defined flood event.	<p>methods conform to the principles within the <a href="#">Flood planning scheme policy</a> and the <a href="#">Infrastructure design planning scheme policy</a>.</p> <p><b>A05.2</b>            Development is:            (a) not located in the:            (i) Brisbane River flood planning area 1, 2a, or 2b sub-categories;            (ii) Creek/waterway flood planning area 1 or 2 sub-categories;            (iii) Overland flow flood planning area sub-category; or            (b) only located in these sub-categories if a <a href="#">Registered Professional Engineer Queensland</a> with expertise in undertaking flood studies certifies that:            (i) the development design, siting and any mitigation measures will ensure the development is structurally adequate to resist hydrostatic, hydrodynamic and debris impact loads associated with flooding up to the defined flood event; and</p>	N/A	The development is for reconfiguring a lot.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
	(ii) the risk to people is managed to an acceptable level.			
<b>PO6</b> Development involving essential electrical services or a <a href="#">basement</a> storage area is suitably located and designed to ensure public safety and minimise flood recovery and economic consequences of damage during a flood.	<b>AO6.1</b> Development ensures that: (a) all areas containing essential electrical services comply with the flood planning levels in <a href="#">Table 8.2.11.3.D</a> ; or (b) if a <a href="#">basement</a> contains essential electrical services or a private basement storage area, the basement is a waterproof structure with walls and floors impermeable to the passage of water with all entry points and services located at or above the relevant flood planning level in <a href="#">Table 8.2.11.3.D</a> . <small>Note—A <a href="#">basement</a> storage area does not include a bike storage room, change room, building maintenance storage and non-critical electrical services.</small>	N/A	The development is for reconfiguring a lot.	
	<b>AO6.2</b> Development involving a <a href="#">basement</a> that relies on a pumping solution to manage floodwater ingress or for dewatering after a flood provides a redundant pump system	N/A	The development is for reconfiguring a lot.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
	with a backup power source for those pumps.			
<b>PO7</b> Development does not directly or indirectly create a material adverse impact on flood behaviour or drainage on properties that are upstream, downstream or adjacent to the development.	<b>A07.1</b> Development: (a) does not block, or divert floodwaters for any area affected by creek/waterway or overland flow flooding, excluding storm-tide flooding and Brisbane River flooding sources; or (b) does not result in a material increase in flood level or hydraulic hazard on upstream, downstream or adjacent properties. Note—Compliance with this acceptable solution can be demonstrated by the submission of a flood study by a <a href="#">Registered Professional Engineer of Queensland</a> with expertise in undertaking flood studies demonstrating that the development and engineering design methods conform to the principles within the <a href="#">Flood planning scheme policy</a> and the <a href="#">Infrastructure design planning scheme policy</a> .	A	The development does not result in an actionable increase in flood level to residential properties on upstream, downstream, or adjacent properties. Refer to the Flood Investigation Report by Civil Works Engineers for details. Increase in flood level as a result of the development are understood to be expected and acceptable by Council.	
	<b>A07.2</b> Development retains existing overland flow paths and does not rely wholly on piped solutions to manage major flows.	A/S	The overland flow path extent within neighbouring properties is largely retained as a result of the proposed development. The development does	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
			not wholly on pipe solutions to manage major flows. Refer to the Flood Investigation Report by Civil Works Engineers for details.	
	<p><b>A07.3</b>            Development which creates a new overland flow path or significantly modifies an existing overland flow path via earthworks does not materially worsen hydraulic hazard on the site from existing conditions.</p> <p>Note—Compliance with this acceptable solution can be demonstrated by the submission of a flood study by a <a href="#">Registered Professional Engineer of Queensland</a> with expertise in undertaking flood studies demonstrating that the development and engineering design methods conform to the principles within the <a href="#">Flood planning scheme policy</a> and the <a href="#">Infrastructure design planning scheme policy</a>.</p>	A/S	It is understood that the development does not materially worsen hydraulic hazards from the existing conditions, and that the increase in flood level is expected and acceptable by Council. Refer to the Flood Investigation Report by Civil Works Engineers for details.	
<p><b>PO8</b>            Development for <a href="#">filling or excavation</a> in an area affected by creek/waterway flooding does not directly, indirectly or cumulatively cause any material increase in flooding or hydraulic hazard or involve</p>	<p><b>A08</b>            Development ensures that no <a href="#">filling or excavation</a> greater than 100mm is located in the Creek/waterway flood planning area 1, 2 or 3 sub-categories if contained in the 5% <a href="#">AEP</a> flood extent of any</p>	N/A	The development is not locating within any creek/waterway flood planning areas.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
<p>significant redistribution of flood storage from high to lower areas in the floodplain.</p> <p>Note—This can be demonstrated by undertaking earthworks in compliance with the <a href="#">Compensatory earthworks planning scheme policy</a>.</p> <p>Note—This part of the code applies to all development other than a <a href="#">dwelling house</a> and any <a href="#">secondary dwelling</a> which involves <a href="#">filling or excavation</a>, whether or not the development application comprises a separate development application for operational work involving filling or excavation.</p>	<p>Creek/waterway flood planning area sub-category for which no waterway corridor has been mapped in the <a href="#">Waterway corridors overlay</a>.</p>			
<p><b>PO9</b></p> <p>Development ensures that the building and site design:</p> <p>(a) maintains the conveyance capacity of existing overland flow paths and creek/waterways;</p> <p>(b) ensures floodwaters and flood debris can pass predominantly unimpeded under a structure or building to minimise property or building damage, including for a flood larger than the <a href="#">defined flood event</a>;</p>	<p><b>A09.1</b></p> <p>Development involving a building undercroft in the Creek/waterway flood planning area sub-categories or the Overland flow flood planning area sub-category:</p> <p>(a) complies with the minimum building undercroft clearance requirements in <a href="#">Table 8.2.11.3.E</a>;</p> <p>(b) not located directly above any part of a waterway corridor as mapped in the Waterway corridors overlay.</p>	N/A	The development is not for dwelling house.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
<p>(c) mitigates flood impacts by ensuring that filling, excavation and location of services are designed to allow for the conveyance of floodwater across the site.</p> <p>Note—The <a href="#">Flood planning scheme policy</a> provides guidance on relevant considerations in determining minimum undercroft clearances and treatment of ground level in undercroft areas where floodwater conveyance is required underneath development.</p>	<p><b>AO9.2</b> Development involving a building undercroft in the Creek/waterway flood planning area sub-categories or the Overland flow flood planning area sub category:</p> <p>(a) has a ground level within the undercroft area is free draining; (b) does not involve excavation below ground level of more than 300mm within the undercroft area.</p>	N/A	The development is not for dwelling house.	
<p><b>PO10</b> Development for <a href="#">vulnerable uses</a>, <a href="#">difficult to evacuate uses</a> or <a href="#">assembly uses</a> optimises vehicular access and efficient evacuation from the development to parts of the road network unaffected by flood hazard, in order to:</p> <p>(a) protect safety of users and <a href="#">emergency services</a> personnel;</p>	<p><b>AO10</b> Development for <a href="#">vulnerable uses</a>, <a href="#">difficult to evacuate uses</a> or <a href="#">assembly uses</a>:</p> <p>(a) is not isolated in any event up to the relevant flood planning level specified in <a href="#">Table 8.2.11.3.L</a>; or (b) has direct vehicle access to a critical route or interim critical route in the <a href="#">Critical infrastructure and movement network overlay</a> for evacuation in a flood; or</p>	N/A	The development is not for vulnerable uses, difficult to evacuate uses, or assembly uses.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
<p>(b) support efficient emergency services access and site evacuation with consideration to the scale of development.</p> <p>Note—A flood risk assessment may be required to address the performance outcomes or acceptable solutions which deal with evacuation and isolation arrangements, and the ability to take refuge. The <a href="#">Flood planning scheme policy</a> provides information for undertaking flood risk assessments.</p>	<p>(c) can achieve vehicular evacuation to a suitable flood-free location.</p> <p>Note—A suitable flood-free location is of a size and nature sufficient to provide for the size and characteristics of the population likely to need evacuation to that area.</p>			
<p><b>PO11</b>            Development has access which, having regard to hydraulic hazard, provides for safe vehicular and pedestrian movement and emergency services access to adjoining roads.</p>	<p><b>AO11.1</b>            Development provides an access or driveway into the site which is:</p> <p>(a) trafficable during the defined flood event;</p> <p>(b) not located in the Creek/waterway flood planning area 1 sub-category;</p> <p>(c) not located in the Overland flow flood planning area sub-category if the hydraulic hazard is unsafe in the <a href="#">defined flood event</a>;</p> <p>(d) the access or driveway is not inundated by a 10% <a href="#">AEP</a> flood.</p>	A/S	Trafficable access during the 2% AEP overland flow flood event is generally achieved for all proposed Lots. Refer to the Flood Investigation Report by Civil Works Engineers for details.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
	<b>AO11.2</b> Development located in the Creek/waterway flood planning area 1, 2, 3 or 4 sub-categories locates any disabled access in the highest part of the site. Note—explanation of hydraulic hazard provided in the <a href="#">Flood planning scheme policy</a> .	N/A	The development is located in creek/waterway flood planning areas.	
<b>PO12</b> Development involving a new road, a bridge or culvert is designed to minimise impacts to flood behaviour, minimise disruption to traffic during a flood and allow for emergency access.	<b>AO12</b> Development involving a new road complies with the flood planning levels in <a href="#">Table 8.2.11.3.F</a> .	A	The new road will comply with the flood planning levels in Table 8.2.11.3.F. The crown of the new road will be at or above the 1% AEP creek/waterway flood level.	
<b>PO13</b> Development for pedestrian and cyclist paths: (a) provides a suitable level of trafficability; (b) manages the impacts of flooding on asset life and ongoing maintenance costs;	<b>AO13.1</b> Development for cyclist and pedestrian facilities other than on public roads, including those traversing through a park and adjacent to a watercourse and overland flow path, are located above the 39% <a href="#">AEP</a> (2 year <a href="#">ARI</a> ) flood immunity from all flooding sources.	N/A	The development does not involve cyclist and pedestrian facilities other than on public roads.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
(c) balances route availability with recreational and transport connectivity benefits to the city.	Note—If the site is subject to more than one type of flooding, the requirement that affords the greatest level of protection will apply.			
	<b>AO13.2</b> All new on-road cyclist and pedestrian facilities comply with the flood planning levels and trafficability standards for the applicable category of road in <a href="#">Table 8.2.11.3.F</a> or <a href="#">Table 8.2.11.3.K</a> .	N/A	The development does not involve new on-road cyclist and pedestrian facilities.	
<b>PO14</b> Development which increases the residential population within the Brisbane River flood planning area sub-categories minimises the risk to people in all flood events with consideration to flood hazard, including warning time.	<b>AO14</b> Development in the Brisbane River flood planning area sub-categories in areas where the <a href="#">residential flood level</a> is greater than 12.8m <a href="#">AHD</a> involving: (a) an increase in the number of residential dwellings; or (b) additional residential lots; or (c) is not subject to an unsafe hydraulic hazard in the 0.2% <a href="#">AEP</a> flood event. Note—Explanation of a hydraulic hazard is provided in the <a href="#">Flood planning scheme policy</a> .	N/A	The development is not within the Brisbane River flood planning areas.	
<b>Additional criteria for <a href="#">essential community infrastructure</a></b>				

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
<p><b>PO15</b> Development involving <a href="#">essential community infrastructure</a>: (a) remains functional to serve community need during and immediately after a flood event, or is part of a network that is able to maintain the function of the essential community infrastructure when parts of the development are unable to function during or after a flood; (b) is designed, sited and operated to avoid adverse impacts on the community or the environment due to the impacts of flooding on infrastructure, facilities or access and egress routes; (c) is able to remain functional or is part of a network which is able to remain functional even when other infrastructure or services (such as electricity supply) may be compromised in a flood event;</p>	<p><b>AO15</b> Development involving <a href="#">essential community infrastructure</a>: (a) is ancillary to and not relied upon for the provision of the essential service during a flood; or (b) is located above the flood planning levels in <a href="#">Table 8.2.11.3.G</a>; (c) has access to or provides the necessary back-up emergency electricity and communications supply in times of flood; (d) is designed and constructed to resist hydrostatic and hydrodynamic forces as a result of inundation by the flood event listed for the development type in <a href="#">Table 8.2.11.3.G</a>; (e) that services a local area: (i) is able to be accessed in times of flood to service local community needs up to the event listed for that development type in <a href="#">Table 8.2.11.3.G</a>; or</p>	N/A	The development is not for essential community infrastructure.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
(d) contains mitigation measures which are not entirely dependent on human activation to respond to a flood event. Note—Protection of function is required up to and including the flood event in <a href="#">Table 8.2.11.3.G</a> .	(ii) has a service continuity plan that demonstrates the continued provision of service during the relevant flood event.			
<b>Additional criteria if development involves the processes in <a href="#">Table 8.2.11.3.H</a></b>				
<b>PO16</b> Development involving the storage and handling of <a href="#">hazardous materials</a> avoids or minimises risks to public health and safety and the environment, by: (a) protecting underground tanks for hazardous materials against the forces of buoyancy, velocity flow and debris impacts; (b) securing above-ground tanks for hazardous materials against flotation and lateral movement; (c) preventing damage to hazardous materials pipework or entry of floodwater into hazardous materials pipework;	<b>AO16</b> (a) Development does not include the storage or handling of hazardous chemicals that are equivalent to or exceed the threshold quantities in <a href="#">Table 8.2.11.3.M</a> . (b) Development involving the processes listed in <a href="#">Table 8.2.11.3.H</a> : (i) where located in the Flood overlay area, occurs only in the Creek/waterway flood planning area 5 sub-category or the Brisbane River flood planning area 5 sub-category; or (ii) is consistent with the standards contained in the <a href="#">Management of hazardous chemicals in flood prone areas planning scheme policy</a> and can operate	N/A	The development does not involve the processes in Table 8.2.11.3.H.	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
<p>(d) preventing damage to or off-site release of packages, drums or containers storing hazardous materials.</p> <p>Note—A chemical hazards flood risk report prepared in accordance with the <a href="#">Management of hazardous chemicals in flood prone areas planning scheme policy</a> can assist in demonstrating achievement of this performance outcome.</p> <p>Note—A pump drainage system is not an acceptable measure to meet the performance outcome.</p>	<p>without risk of environmental harm during a flood event.</p> <p>Note—The <a href="#">Management of hazardous chemicals in flood prone areas planning scheme policy</a> sets out further information and processes including risk assessment for the management of hazardous chemicals in flood planning areas.</p>			
<b>Additional criteria for reconfiguring a lot</b>				
<p><b>PO17</b> Development locates and designs all lots resulting from reconfiguring a lot to:</p> <p>(a) minimise the risk to people from flood hazard;</p> <p>(b) minimise damage to property from flood hazard;</p> <p>(c) facilitate safe and efficient evacuation.</p> <p>Note—</p>	<p><b>AO17.1</b> Development creating new lots is to comply with <a href="#">Table 8.2.11.3.I</a>.</p>	N/A	The development is not located within any creek/waterway flood planning areas or Brisbane River flood planning areas.	
	<p><b>AO17.2</b> Development provides for reconfiguring a lot design that achieves a road and lot layout which:</p> <p>(a) provides trafficable vehicular egress for evacuation during a <a href="#">defined flood event</a>;</p>	A	<p>The development generally provides trafficable access to all Lots.</p> <p>Hazard free movement away from the sources of flood hazard is prioritised.</p>	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
<ul style="list-style-type: none"> <li>Consideration of all floods up to the probably maximum flood is relevant to minimising the risk to people.</li> <li>Flood warning time is not considered sufficient in the Creek/waterway planning area sub-categories or the Overland flow flood planning area sub-category.</li> <li>Filling above the flood planning level for a flood event greater than the defined flood event cannot be assumed to mitigate the flood hazard.</li> </ul>	<p>(b) optimises hazard-free movement away from sources of flood hazard within the development.</p> <p>Note—Further advice on road and lot layout is contained in the <a href="#">Flood planning scheme policy</a>.</p>			
	<p><b>AO17.3</b></p> <p>Development which creates a new residential lot in an area subject to Brisbane River flooding, if the residential flood level is greater than 12.8m AHD is not subject to a hydraulic hazard greater than 0.6m<sup>2</sup>/s DV or 0.6m deep in a 0.2% AEP flood.</p> <p>Note—Refer to the <a href="#">Flood planning scheme policy</a> for further explanation on the 0.2% AEP flood.</p>	N/A	The development is not located within the Brisbane River flood planning area.	
<p><b>PO18</b></p> <p>Development involving reconfiguring a lot:</p> <p>(a) minimises the risk to people from flood hazard;</p> <p>(b) creates safe evacuation routes or avoids isolation of the development</p>	<p><b>AO18.1</b></p> <p>Development involving reconfiguring a lot ensures:</p> <p>(a) all lots comply with the flood planning levels in <a href="#">Table 8.2.11.3.J</a>;</p> <p>(b) a new road complies with the flood planning levels in <a href="#">Table 8.2.11.3.F</a>.</p>	A/S	<p>The development does not wholly comply with Table 8.2.11.3.J. The development is residential in nature and creates more than 6 Lots and a new road.</p> <p>Lots 15 and 16 are proposed to have an overland flow easement over the</p>	

<i>Performance Criteria</i>	<i>Acceptable Solution</i>	<i>Solutions*</i>	<i>Comments</i>	<i>Council Use</i>
<p>during a flood greater than the defined flood event;</p> <p>(c) minimises damage to property and services;</p> <p>(d) provides lots and roads that are not frequently flooded or subject to nuisance ponding or seepage;</p> <p>(e) ensures lots created for park or private open space minimise the risk to people from flood hazard and are fit for purpose;</p> <p>(f) provides a lot that is not substantially burdened by flood mitigation infrastructure.</p>			<p>proposed covenant which will wholly contain the overland flow. The remainder of the site will be located on fill achieving a minimum pad level of 1% AEP Creek/waterway flood level + 300mm. This will minimise damage to property and services, provide a Lot which is not substantially burdened by flood mitigation infrastructure, and minimises the risk to people from flood hazards.</p> <p>The hydraulic hazard as a result of the overland flow path within Lots 15 and 16 is not unsafe. Refer to the Flood Investigation Report prepared by Civil Works Engineers for details.</p> <p>As such, the proposed development achieves majority of the performance criteria of PO18.</p>	

Performance Criteria	Acceptable Solution	Solutions*	Comments	Council Use
			The new road as part of the development will comply with the flood planning levels in Table 8.2.11.3.F. The crown of the new road will be at or above the 1% AEP creek/waterway flood level.	
	<p><b>AO18.2</b>            Development involving reconfiguring a lot creating more than 6 residential lots or a lot for industry ensures the flood planning levels of a dedicated road fronting the development or providing primary access within 200m of the development:</p> <p>(a) complies with <a href="#">Table 8.2.11.3.K</a>; or            (b) has acceptable trafficability in accordance with the requirements in the <a href="#">Flood planning scheme policy</a> and the Queensland Urban Drainage Manual.</p> <p>Note—The <a href="#">Flood planning scheme policy</a> contains supporting information about trafficability on existing roads and serviceability during floods.</p>	A/S	The existing road fronting the site (Kraft Road) is generally trafficable during the 2% AEP overland flow flood event and is understood to generally comply with Table 8.2.11.3.K.	

<i>Performance Criteria</i>	<i>Acceptable Solution</i>	<i>Solutions*</i>	<i>Comments</i>	<i>Council Use</i>
	<b>AO18.3</b> Development protects the conveyance of flood hazard area by providing an easement over the: (a) 2% AEP flood extent for overland flow flooding; (b) 1% AEP flood extent for creek/waterway flooding.	A	A 10m wide easement can be included over the 10m wide covenant at the rear of Lot 15 and 16 for overland flow if strictly required by Council.	