FLOOD STUDY AND ASSESSMENT REPORT

Wee Hur Regent, 90 - 102 Regent Street, Redfern, NSW 2016

REPORT FOR NSW Department of Planning, Industry and Environment (DPIE)

JHA

CONSULTING ENGINEERS

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1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

JHA has been engaged by The Trust Company (Australia) Limited ATF WH Regent Trust to provide consultancy services such as drainage, stormwater, flood study, and preparation of this report. This flood study and assessment report with the comprehensive flood analysis results forms part of the submission for the Development Application of this project. The stormwater management plans and the report will be submitted in a separate self-sufficient package.

This is the 3rd revision of the flood study and assessment report. This report did not serve the purpose of the comprehensive "Alexandra Canal Floodplain Risk Management Study and Plan" carried out by Cardno for the City of Sydney Council. The purpose of this report is limited only to flooding issues that affect this development.

We refer to Cardno's flood study documents and extracted the relevant data for this report. However, there are several aspects of the flood study that will be excluded from this report, such as historical events and calibration, economic and social impact, evacuation strategy etc. Our first and second flood study report submission was found lacking in certain aspects. Therefore, this 3rd revision of the flood study and assessment report will incorporate the results of the first and second revision but specifically address the shortfall of the previous reports.

The following aspects of the flood study are to be included, as requested by the NSW Department of Planning, Industry and Environment are as follows:

1) Item 14b of the Planning Secretary's Environmental Assessment Requirements; (Drainage and Flooding) – "An assessment of any flood risk in accordance with the guideline contained in the NSW Floodplain Development Manual (DIPNR, 2005) including potential effects of climate change and an increase in rainfall intensity. The sites frontage to William Lane is subject to flooding and as such any proposed access to a basement area needs to be above the probable maximum flood level". The ground floor retail space needs to be at or above the 1% annual exceedance probability flood level". In this report, the flood risk will be assessed in accordance with the NSW Floodplain Development Manual with potential effects of climate change and an increase in rainfall intensity. Floodwater shall not find its way into the basement during the PMF storm event and the appropriate Flood Planning levels for the Architectural ground floors; shall be calculated.

2) Item 35 – "Flood modelling contain issues and errors in the 2nd revision; should not be relied upon". In the 2nd revision report, we proposed that the Extreme Storm Events (1 in 2000 years) may be sufficient in determining the flood risk. This is found to be inadequate. Therefore, in this flood study, the estimation of Probable Maximum Precipitation (PMP) will be based on the Generalised Short-Duration Method (GSDM) provided by the Bureau of Meteorology (BOM) of Australia. The calculation is tabulated in Appendix D04 and the Excel spreadsheet will be provided upon request.

3) Item 36 – "Flood mitigation relies upon the neighbouring site – further discussion and evidence to be provided". In this report, we will discuss and provide evidence that the two downstream properties that will be developed by our client (Wee Hur); may provide flood mitigation. The stormwater design and flood study for the site "180391 - Gibbons Wee Hur Student Village Redfern" at 13-23 Gibbons St, Redfern, NSW were carried out by JHA. The consultancy and development for the site at the now decommissioned BP Station were not started yet. However, we have evidence that there will be a proposed public domain easement for this future project. The easement may provide flood mitigation.

4) Item 37- "Clarification to be provided regarding Flood planning levels and PMF levels. In this report, we will export the flood surface "tin" to 12D models and provide the profiles (longitudinal sections) of both the

topwater levels of 1% AEP and PMF. We will provide clarification and explanation regarding the FPL and PMF levels for the entire site, particularly at those critical locations where stormwater enter the building.

This report will be assessed by the NSW Department of Planning, Industry and Environment (DPIE). The proposed development is classified as State Significant Development as it has a project value of more than $10 million. This stormwater report addresses the site stormwater and flood issues with reference to the following documents.

1) Secretary's Environmental Assessment Requirements (SEARs Application Number SSD 10382 dated 27 November 2019).
2) The city of Sydney Council – Interim Floodplain Management Policy and Sydney Local Environmental Plan 2012 item 7.15 Flood planning.
3) NSW Floodplain Development Manual (DIPNR, 2005).
4) Australia Rainfall and Runoff.

Generally, the purpose of this report is to determine that this development:

(a) is compatible with the flood hazard of the land, and

(b) is not likely to significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and

(c) incorporates appropriate measures to manage risk to life from flood, and

(d) is not likely to significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, and

(e) is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.

This report is prepared by an experienced Chartered Professional Civil Engineer from JHA registered with NER.

1.2 LIMITATIONS OF THIS REPORT

This report only serves the purpose of what it was intended to address the stormwater, flood and drainage issues based on the information that is available at the time of preparing this report. This report is not intended for use as a scope of works for tender or other unrelated purposes. Data extracted from this report shall not be used for any construction work. This report may contain outdated drawings. The layout of the buildings may change in the future, but these changes will not alter the results of this flood study. Therefore, the overlay of these drawings in our flood-maps will not be updated. Please refer to the relevant parties for their latest drawings.

The purpose of this flood study report is not to validate or challenge any data or results from previous flood studies. On the contrary, we adopt most of the input data and results derived from the previous flood studies. This development project is very small in relation to the entire catchment of the Alexandra Canal Catchment. As such, this flood study will not cover in detail all aspect of a standard flood study report such as historical storm events, economic impact, social impact, evacuation strategy, climate change research etc. Instead, we extract relevant information from the previous flood studies, ARR2019, Australia Standards, Council guidelines etc.; and present it in this document for evaluation.

2 THE PREVIOUS FLOOD STUDIES AND FLOODING INFORMATION

The proposed development site is located within the Alexandra Canal catchment for which the City of Sydney Council has conducted several flood studies as follows:

1) Alexandra Canal Catchment Flood Study – Report Final, Project W4785 prepared by Cardno
2) Alexandra Canal Floodplain Risk Management Study and Plan, Project W4948 prepared by Cardno
3) 11 Gibbons Street, Redfern Site Flood Assessment, prepared by WMA water Pty Ltd. This property is situated just west of this proposed development. It is now under construction by Lendlease.
4) City of Sydney Flooding Information.

In this chapter, all flooding information is generally referred to the Cardno's flood reports of item 1 and 2. The terrain's data used in the previous flood analysis was based on the Airborne Light Detection and Ranging (LiDAR) survey (also known as Aerial Laser Scanning (ALS)) of the catchment and its immediate surroundings. As mentioned in their reports; the Council provided aerial laser scanning (ALS) ground levels surveyed in 2007 and 2008 for the entire catchment. However, in this flood study, the pre-development and post-development flood analysis will be based on the latest LiDAR data collected in 2020.

A flood study for the Council usually involved several catchments within the LGA of the City of Sydney Council, which is usually much larger than our flood study report, which only focuses on a smaller catchment related to this proposed development. The Alexandra Canal catchment area is approximately 1,141 ha and includes the suburbs of Alexandria, Rosebery, Erskineville, Beaconsfield, Zetland, Waterloo, Redfern, Newtown, Eveleigh, Surry Hills and Moore Park. The majority of the catchment is fully developed (consist of housing, commercial and industrial areas) with some large open spaces. The trunk drainage system is mostly owned by Sydney Water Corporation, while the smaller feeding drainage systems owned by local councils.

The extent of the flood study with the existing pits and pipe system is shown in Appendix A01 (an extract of Figure 4.3 from the Alexandra Canal Flood Study). Wee Hur Regent site is located near the upstream end of the Alexandra Catchment with Council's existing street underground drainage network of pits and pipes along Regent Street, Marian Street and William Lane. The site elevation is between RL 20.00m to RL 30.00m as shown in Appendix A02.

During the major storm event 1 % AEP (100 years ARI), the flood study results shown in Appendix A03 indicate the site is not inundated. There is flooding at the southern part of William lane. Floodwater is prevented to enter the downstream properties due to the elevated courtyard of the downstream property which is about 700mm higher than the street level of William Lane at approximately RL24.11 (Refer to Appendix B02 Survey drawing). An existing retaining wall at the south end of William Lane will cause stormwater to be ponded and flooding (Refer to photos at Appendix C05). There are two existing kerb lintel pits situated on both sides of William lane near the site's southwest corner with an underground pipe of 225mm diameter. The survey shows these pits diverts part of the trapped floodwater to Regent Street via an underground pipe of 300mm diameter running eastward underneath the BP's Cafe building (now decommissioned). The peak flood depth of this location shown in Appendix A04 is in the region of 0.5m-0.69m (cyan colour). Due to the low velocity, this location is designated as Low Hazard as shown in Appendix A05. There is no sign of flood as shown; along the Regent St, Marian St and William Lane that form the Eastern, Northern and Western boundaries respectively, of this development.

During the probable maximum flood (PMF) storm event, the flood study results in Appendix A06 indicates flood occur along William Lane and Regent St. The peak flood depth generally is in the region of 0.1m-0.3m (orange colour) as shown in Appendix A07. William Lane and part of the BP Station are inundated. Part of the retaining wall at the dead-end of William Lane has collapsed (refer to photo at Appendix C05) and floodwater could flow from William Lane into the compound of the BP Station (refer to photo at Appendix C06). The floodwater depth of the existing pit could reach 0.7-0.99m. However, due to the relatively low velocity of flow, the entire site is designated as Low Hazard as shown in Appendix A08.

The NSW Floodplain Development Manual defines flood-prone land to be one of the following 3 hydraulic categories:

a) Floodway – Areas that convey a significant portion of the flow. These are areas that, even if partially blocked, would cause a significant increase in flood levels or a significant redistribution of flood flows, which may adversely affect other areas.

b) Flood Storage – Areas that are important in the temporary storage of the floodwater during the passage of the flood. If the area is substantially removed by levees or fill, it will result in elevated water levels and/or elevated discharges. Flood storage areas, if completely blocked would cause peak flood levels to increase by 0.1m and/or would cause the peak discharge to increase by more than 10 %.

c) Flood Fringe – Remaining area of flood-prone land after Floodway and Flood Storage areas have been defined. Blockage or filling of this area will not have any significant effect on the flood pattern or flood levels.

The site is not flooded in the 100 years ARI event as shown in Appendix A09. During the PMF event, due to the relatively higher flow velocity of floodwater on the street of Regent St, the flood here is designated as floodway (blue colour as shown in Appendix A10). At the BP station compound; a certain part of this area is designated as flood storage (green colour).

The city of Sydney Council provides information on the flooding condition as shown in Appendix B5, B6, B7 and B8. Appendix B5 and B6 show the flood depth for 1% AEP and PMF respectively. Appendix B7 and B8 show the flood hazard for 1% AEP and PMF respectively. Based on the light blue colour region as shown in the flood maps of Appendix B5 and B6; we found that William Lane is flooded to a depth of 0.4m to 0.8m. The flood hazard at William Lane is low. There is no flood at Regent St and Marian St.

3 CLIMATE CHANGE AND INCREASE IN RAINFALL INTENSITIES

The NSW Office of Environment and Heritage (formerly Department of Environment, Climate Change and Water (DECCW)) guideline, Practical Consideration of Climate Change (2007), provides advice for consideration of climate change in flood investigations. The guideline recommends sensitivity analysis is conducted for:

- Sea level rise – for low, medium, and high level impacts up to 0.9m
- Rainfall intensities – for 10%, 20%, and 30% increase in peak rainfall and storm volume

In the Alexandra report, models were run for 100 years ARI 90 minutes storm for the increased rainfall intensities of 10%, 20% and 30% with an elevated tailwater level of 2.9m AHD to Alexandra Canal. Appendix A11, A12 and A13 indicate the difference in peak water level compared to the base 100 years ARI 90 minutes event of rainfall increment of 10%, 20% and 30% respectively. For the 10% increment, Appendix A11 indicates no rise in flood level. The 20% (A12) and 30% (A13) increment indicate (pink region) an increase of 10mm to 20mm flood level.

With reference to Cardno's flood study on the sea-level rise with the following quote: "The climate change assessment in the Cooks River Flood Study (2009) modelled peak water levels for the case of 20% increase to rainfall intensity and a mid-range sea-level rise of 0.55m for the 100-year ARI. A peak tailwater level of 2.9m AHD was estimated from these climate change scenario results for application to the Alexandra Canal catchment model. Given that the model is generally only sensitive to downstream boundary levels near Alexandra Canal, a single downstream boundary scenario is considered reasonable". In view that this development is situated at the upstream end of the Alexandra Canal catchment; the rise of sea level due to climate change will not impact this property.

With reference to Cardno's flood study on increase in rainfall intensities with the following quote: "Climate change, including an impact of sea-level rise and rainfall intensity increases, has been assessed and the likely increase in peak water levels observed. The analysis demonstrates that the model is generally more sensitive to pit and culvert blockages than to climate change". In this report, the flood study carried out using Hec-Ras 2D modelling is based on the full blockages of all the pits and pipes. The results generated will be more conservative than to implement the effect of increasing rainfall intensities due to climate change.

ARR 2019 proposed the use of a six-step process Decision Tree for incorporating Climate Change in flood design as shown in Figure 1.6.2. of the manual. In Step 2 "Set the flood design standard" with the following quote: "If the design standard is the Probable Maximum Flood (PMF), use an up-to-date estimate of the Probable Maximum Precipitation (PMP) to determine the PMF. This approach has an appropriate degree of conservatism, as PMP estimates are updated by the Bureau of Meteorology (BOM) from time to time. This will ensure that any future climate change signal is captured and thus the PMP should not be further adjusted to take into account potential climate change implications".

Based on ARR2019 chapter 2.7.1.1. Climate Change Impacts on Rainfall; we found the following narration "There have been many studies globally that have found increases in the intensity or frequency of extreme precipitation events (Bates et al., 2008; Westra et al., 2013). It is likely that since the 1970s the frequency of heavy precipitation events has increased over most areas (Bates et al., 2008). From 1950 to 2005, extreme daily rainfall intensity and frequency have increased in north-western and central Australia and over the western tablelands of New South Wales but decreased in the south-east and south-west and along the central east coast (CSIRO and Australian Bureau of Meteorology, 2007). Projections analysed by CSIRO and the Australian Bureau of Meteorology (2007) showed that an increase in daily precipitation intensity is likely under climate change. The study found that the highest 1% of daily rainfalls tends to increase in the north of Australia and decrease in the south, with widespread increases in summer and autumn, but not in the south in winter and spring when there is a strong decrease in mean precipitation (CSIRO and Australian Bureau of Meteorology, 2007)".

Redfern is located along the central east coast of NSW and it is possible to find a decrease in rainfall intensity due to climate change, as mentioned above. We make a comparison between the rainfall data calculated by the DRAINS software based on the procedure of ARR1987 and ARR2019. Appendix D1 shows the rainfall data calculated by DRAINS based on the ARR2019 procedure. We found that ensemble 6 of 10 of the 1% AEP 1 hour duration storm event is the critical ensemble in our 2nd Flood study revision. Appendix D2 shows the rainfall data calculated by DRAINS based on the ARR1987 procedure. Appendix D03 shows the comparison of rainfall data between ARR2019 and ARR1987 procedures. We found that in general, the rainfall data of ARR2019 which incorporate climate change factors are slightly lower than the ARR1987 equivalent.

The above result, is not a one-to-one comparison, as the ARR2019 involved 10 ensembles of storm events, while ARR1987 does not. The result did not prove that rainfall intensities are reduced. The purpose of this comparison is to inform that we had analysed flooding base on the ARR2019 procedure in our second revision; while in this 3rd revision we adopt the rainfall data of the ARR1987 procedure which is found to be conservative. Similarly, we adopt the Generalised Short-Duration Method (GSDM) method to calculate the PMP (probable maximum precipitation) as shown in Appendix D04. These Excel and Drains files will be provided for evaluation upon request.

In this chapter, we described how climate change could cause the rise of the mean sea level. However, the terrain of this development site is generally higher than RL20.00. Therefore, it is not affected by the rise of mean sea level. Previous flood studies have carried out sensitivity test of the various percentage of increase in rainfall intensities due to climate change and found that a 30% increase in rainfall intensities, may increase flood level to about 30mm. Therefore, climate change is not the dominant factor that could affect flooding.

All the previous flood studies including this flood study did not factor in the mitigation effect of existing On-site Detention and Rainwater tanks. We believe these factors could mitigate or reduce the flooding and effectively offset the climate change factors.

As we adopt the more conservative rainfall values in this flood study; we believe climate change issues, has been effectively accounted for. As a conclusion for this chapter, we found that climate change has a negligible effect on our flood analysis results and we are using reliable and conservative rainfall data for our flood analysis.

4 THE PRE-DEVELOPMENT SITE AND FLOOD CONDITION

In this chapter, the predevelopment site is referred to the existing terrain in the year 2020; corresponding to the Lidar dataset capture on 14th Jun 2020. Appendix C01-C06, show site photos were taken in the year 2019 and photos in Appendix C07-C10 shows site photos taken in the year 2021.

4.1 THE OVERLAND CATCHMENT AND DRAINS ANALYSIS

The Drains software (premium version by Watercom) is well accepted as the industry standard software to analyse stormwater particularly with regards to the rainfall data, OSD feature, pits and pipes network. However, the software is not particularly suitable for flood analysis such as the Hec-Ras 2D software. In this chapter the purpose of using Drains is to demonstrate how stormwater generated from their overland catchments, flowing within the underground pits and pipes system, and overflow along the street gutters. In contrast to Hec-Ras, modelling in Drains is relatively easy and Drains can analyse multiple storm events simultaneously to provide the maximum results. The results may provide a rough idea of the efficiency of the underground pits and pipes network in the mitigation of flooding. We extract the rainfall data from Drains into Hec-Ras for further analysis. In addition, this Drains model can be further developed to analyse the OSD tank within the site, to account for the possible submerged condition at connection into the existing kerb inlet pit. However, the OSD and WSUD aspect of stormwater will be analysed and designed in a separate package as described in the Executive Summary chapter above.

Appendix D05 is a QGIS snapshot that shows the layout of the catchments (green colour) and pipes network (blue colour) overlaid with a Google satellite image. The existing pits and pipes network information was provided by the Council. The upstream boundary of the Alexandra Canal catchment is shown in red. Appendix D06 shows a similar layout but the google satellite image is replaced by contours (at 1m interval) of the 2020 Lidar terrain. Appendix D07 show the modelling of the pits and pipes network in 12D models software. The delineation of sub-catchments is based on the contours of the 2020 Lidar terrain initially. We visited the site again and visually investigate the sub-catchments boundary such as the crown of the road and road intersection. We make a minor adjustment to the sub-catchments to reconcile with the latest situation at the site. Information gathered from the site investigation is also used to make several adjustments to the 2020 Lidar terrain dataset, as explained in the next chapter. Appendix D17 shows the layout of the existing underground pits and pipes network that serve this development project. Pit A5 is the pit as shown in the photo of Appendix C08 (lower photo). The proposed OSD tank will be connected to the existing kerb inlet pit at location A6. Pits C2 and C3 are the pits as shown in the lower photo in Appendix C05.

The pits and pipes network and the catchments data designed in 12D are exported to Drain's software for further analysis. Appendix D08 shows the Drains model layout of the drainage network and Appendix D09 shows the Drains model layout with pipe sizes. Appendix D10 shows the "zoom-in" Drains model layout similar to Appendix D17, with a focus on the development project. Appendix D11 shows the corresponding pipe sizes which are less than 450mm. It is a practise to exclude pipe sizes less than 450mm in flood analysis.

As mentioned in the previous chapter, the ARR1987 rainfall data (1 ~ 100 years ARI) was downloaded from the Bureau of Meteorology (BOM) and calculated in Drains. The PMP rainfall data is calculated based on the Generalised Short-Duration Method (GSDM) provided by BOM. The analysis results are shown in Appendix D12 to D16.

Appendix D12 shows the worst-case peak flow during the 1% AEP (100 years ARI) storm event. The peak flow at the pipe C3 is 58 l/s while the overflow from the pit C3 is 290 l/s. Appendix D13 shows the critical duration is 25 minutes. Appendix D14 shows the section of the pipe C3 and the floodwater surface level at pit C3 is at RL24.514.

Appendix D15 shows the worst-case peak flow during the PMF storm event. The peak flow at the pipe C3 is 56 l/s while the overflow from the pit C3 is 861 l/s. This indicates the existing 300mm diameter pipe is already running at full capacity and the capacity could be reduced due to higher HGL at the outlet pit A7 during the PMF. Appendix D18 shows the critical duration is 15 minutes. Appendix D16 shows the section of pipe C3 and the floodwater surface level at pit C3 is at RL24.576.

4.2 PRE-DEVELOPMENT SITE CONDITION AND PREVIOUS FLOOD STUDY RESULTS

The existing development site terrain generally slopes from northeast to southeast, as shown in Appendix B02. The existing site consists of a mixture of two to four-storey brick buildings with the front, facing Regent Street. The northern building is a two-storey residence with a car park at the rear occupied about half of the lot areas (Refer to Appendix C4). This house is still in good condition. In the south, there are 3 two-storey shop-lots which are vacant. The southernmost building is a 4-storey apartment with a basement.

The high end of the site generally at RL27.0 (Refer to Appendix B02) at the intersection of Regent St and Marian St; sloping to the low end of the site at RL24.40 at the southwest corner of the site facing William Lane. Floodwater flowing along the street gutter of Regent St at the north will split into two flood streams flowing along Marian St and Regent St. (Refer to photos in Appendix C02 and C08).

The previous flood study of the Alexandra Canal utilized the SOBEK and TUFLOW software. Aerial laser scanning (ALS) ground levels surveyed in 2007 and 2008 were downloaded from NSW Government websites for this development area and encompassed all the upstream catchment areas. Generally, the accuracy of the ALS data is +/- 0.15m to one standard deviation on hard surfaces. The direct rainfall method (also known as rain-on-grid) was used in these flood studies.

Results derived from the Alexandra Canal Flood study and Flood Assessment Report of 11 Gibbons Street (neighbouring property situated at the west of this development, now under-construction by Lendlease) by WMA indicate that the existing building is not flooded during the major storm event of 1% AEP. Due to the existing retaining wall, the trapped low point of William lane could pond to a depth of about 0.9m in the 1% AEP event. The dead-end lane is drained via a 300mm underground pipe that conveys flows east to join the Regent Street stormwater drainage network. When runoff exceeds the capacity of this pipe, stormwater ponds in William Lane until overflow via the compound of the BP Station toward Margaret Street (Refer Appendix C06). Given the depth of ponding, William Lane is considered subject to "mainstream flooding". The 1% AEP Peak level (mAHD) of this low point of William Lane is estimated at RL24.82 from these reports and PMF at 24.93 as shown below.

Table 1: Peak Flood Levels (from Reference 5)

Location	1% AEP Peak Level (mAHD)	PMF Peak Level (mAHD)
Gibbons Street near Marian St corner	25.35	25.45
William Lane	24.82	24.93

It is understood that the above results are extracted from the Tuflow model of the Alexandra Canal Flood Study. The corresponding floodwater surface level is estimated at RL24.514 (1% AEP), using the Drains models at pit C3. This level is about 306mm lower. This is due to the pit C3 is modelled as unblocked. Pipe sizes smaller than 450mm diameter are generally not included in the flood modelling, as expected in the previous flood studies.

Appendix D19 shows the section of pipe C3 and the floodwater surface level at pit C3 is at RL24.768. The pit C3 is modelled with 100% blockage in Drains. As such the floodwater surface levels calculated by Drains is only 52mm lower than the previous flood study results. It is lower due to the pipe C3 still carry the peak flow of 36 l/s in drains.

The drains modelling and results may match previous flood study results, but the "tin" of the floodwater surface is not available for our determination of flood planning levels. Further analysis using Hec-Ras 2D is necessary. The outcome of this Drain's analysis validates that the input data for flood study such as rainfall data, terrain data are consistence with previous flood study.

4.3 PRE-DEVELOPMENT HEC-RAS 2D FLOOD ANALYSIS AND RESULTS

As mentioned above, the floodwater surface levels derived from previous flood studies or Drains analysis in the previous chapter are insufficient to provide the determination of the flood planning levels (FPL) for this development. As such, flood analysis at a smaller scale, focus on the site pre-development and post-development conditions are carried out with similar modelling methodology and design procedure adopted by previous flood studies. Hec-Ras (Hydrologic Engineering Centre–River Analysis System) has 2D flood analysis capabilities and was used for flood analysis for this development. Similar to many previous flood studies, the Direct rainfall method (also known as rain-on-grid) was used in this flood study. The latest Lidar terrain dataset collected in the year 2020 was downloaded from government websites. The terrain data with contours at 0.1m interval is shown in Appendix E01. The survey lidar points on the buildings' roofs or balconies were clipped off and an interpolated surface was generated based on the hardstand footpath or road levels. The neighbouring property at 11 Gibbons St at the west of this development, was a large concrete pavement possibly used for vehicle parking or storage. It is possible floodwater flow from Gibbons St to William Lane via this pavement. The 2020 lidar terrain display surface levels related to the existing ground at that time. In this chapter, the 2020 lidar terrain was adopted without any modification to represent the pre-development scenario. However, in the next chapter, we modified the terrain dataset with additional new buildings, new footpath, kerbs & gutter and flood mitigation swale to represent the post-development scenario.

A 2D "flow area" or "total catchment area" is drawn, consist of 48,776 cells covering an area slightly bigger than the Drains catchment (green polygons) as shown in Appendix E02. HEC RAS takes a very different approach from other software in 2D flow area modelling. The cells can have 3, 4, and 5 up to 8 sides. Each cell is not a simple plane, but a detailed elevation and volume/area relationship that represents the details of the underlying terrain. Each cell face is a detailed cross-section, which gets processed into detailed elevation versus area, wetted perimeter and roughness. This approached allows the modeller to use a larger cell size and still accurately represent the underlying terrain. As such, Hec Ras "rain-on-grid" will calculate and determine within each small polygon cell, the direction and how floodwater will flow towards its polygon boundaries. Smaller cells will provide more accurate results. Similar to floodwater flowing in physical reality, floodwater can split into several streams or combined into one stream depending on the terrain situation. In other words, the software could figure out the contributing catchment areas draining to a location. This is contrary to Drain's manual catchment delineation which may incur errors for very flat terrain. Drawing the "flow area" bigger than the contours-derived "drains catchment" will not affect the accuracy of the analysis and results. In this flood analysis, some of the downstream "drains catchment'' are excluded in the flow area, as the flooding results at upstream areas will not be affected.

We found in Appendix E01 the contours of RL27.00 in the North-East corner of the site matching the ground level survey contours of RL27.00 as shown in Appendix B02. Contours of RL24.30 at the south-west corner of the site also matching the ground survey point data of RL24.37 with negligible differences. Therefore, the terrain data surface levels are reliable for flood analysis. Appendix E03 shows the roughness map with manning's values implemented in this model.

From our site investigation, the overland floodwater flowing along Regent St from the North will bifurcate or split at the intersection of Marian St and Regent St (Refer to photo at Appendix C08); due to the shape of the existing kerb return. Floodwater flowing along Marian St may overtop the crown of Marian St and flow into William Lane (refer to Appendix C09). The floodwater that continues flowing along Regent St toward the south, will flow relatively fast due to the steepness of the Regent St at this location. Floodwater that reached the dead-end of William lane will be "ponded" or "tank" by the existing retaining wall. The floodwater will be drained gradually by an existing underground drainage pipe 300mm diameter draining eastward, connected to the Regent St drainage network. As shown in Appendix D17, pit C3 connected to pit A7 by this pipe.

Our surveyor had open the lid of pit C3 for investigation in September 2020 as shown in photos of Appendix C11. We notice that the pit is a trap gully pit and found to be partially blocked by rubbish. The pit was eventually cleaned. It is very likely that the pits are fully blocked during the rare event of 1% AEP and PMF. As such, it is a standard practice in flood modelling to exclude pits and pipes system smaller than 450mm in diameter.

The results of the HecRas analysis for the pre-development are shown in flood-maps in Appendix F01-F09. Appendix F01 shows the 1% AEP (100 years ARI) map for floodwater depths. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. The duration of 25minutes is found to be the critical duration. The floodwater depth of each cell for this critical storm event are shown in Appendix F02. The maximum floodwater depth is found to be 0.764m, near the existing pit C3. The difference is 36mm and this value is rounded to 0.8m which is identical to the results of 0.8m depth as shown in the report of "11 Gibbons Street, Redfern Site Flood Assessment, prepared by WMA water Pty Ltd" using Tuflow software. We can conclude that the software provides reliable compatible results, despite that there are minor differences in modelling settings such as terrain dataset and cell sizes.

Appendix F03 shows the 1% AEP (100 years ARI) map for floodwater surface elevation. In this map, we had filtered or clipped off areas that a floodwater depth of less than 50mm. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. The duration of 25minutes is found to be the critical duration. The floodwater surface elevation of each cell for this critical storm event is shown in Appendix F04. The surface levels vary and we found the flood levels of RL24.821, near the existing pit C3. This value matches the RL24.82 as shown in the report of "11 Gibbons Street, Redfern Site Flood Assessment, prepared by WMA water Pty Ltd" using Tuflow software.

Appendix F05 shows the 1% AEP (100 years ARI) map for floodwater velocity. In this map, we had filtered or clipped off areas that a floodwater depth of less than 50mm. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. The duration of 25minutes is found to be the critical duration. The floodwater surface elevation of each cell for this critical storm event is shown in Appendix F06. The velocity varies and we found the maximum velocity is 0.716 m/s mid-point of William Lane.

Appendix F07 shows the PMF map for floodwater depths. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. In this map, we had filtered or clipped off areas that a floodwater depth of less than 100mm. The duration of 15minutes is found to be the critical duration. The floodwater depth of each cell for this critical storm event are shown in Appendix F08. The maximum floodwater depth is found to be 0.846m, near the existing pit C3.

Appendix F09 shows the PMF map for floodwater surface elevation. In this map, we had filtered or clipped off areas that a floodwater depth of less than 100mm. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. The duration of 15minutes is found to be the critical duration. The floodwater surface elevation of each cell for this critical storm event is shown in Appendix F10. The surface levels vary and we found the flood levels of RL24.928, near the existing pit C3. This value matches the RL24.93 as shown in the report of "11 Gibbons Street, Redfern Site Flood Assessment, prepared by WMA water Pty Ltd" using Tuflow software.

Appendix F11 shows the PMF map for floodwater velocity. In this map, we had filtered or clipped off areas that a floodwater depth of less than 100mm. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. The duration of 15minutes is found to be the critical duration. The floodwater surface elevation of each cell for this critical storm event is shown in Appendix F12. The velocity varies and we found the maximum velocity is 1.219 m/s mid-point of William Lane.

The Hec-Ras model analysis results match closely with the results provided by previous flood study reports. Therefore, we can conclude that the Hec-Ras model is now calibrated to previous flood studies and can be further modified to analyse the post-development scenario.

5 THE POST-DEVELOPMENT SITE AND FLOOD CONDITION

5.1 THE POST-DEVELOPMENT SITE SITUATION

The proposed development is to construct a new student accommodation known as Wee Hur Regent, located at 90 - 102 Regent Street, Redfern, Redfern, NSW 2016. The existing site is identified as Lot SP57425, DP184335, and DP3954, with a total area of 1287 m2 (refer to Survey Plan in Appendix B01 to B04). The existing site consists of a mixture of 2 to 4 storey brick residential buildings. Generally, the entire site is paved and impermeable, with small landscaping areas.

The adjacent site at the south of this development is a BP service station (now decommissioned) with its associated café and mini grocery shop. The adjacent site at the west is the former City of Sydney Council depot. The former Council depot is being redeveloped to accommodate affordable rental housing. Across Margaret Street to the south is a five-storey residential flat building fronting Gibbons Street and a church building fronting Regent Street. Further to the west of the site across Gibbons Street is Gibbons Street Reserve. The adjacent site at the north is the future 18 storey student housing under construction. The adjacent site at the east across the Regent St is a mixture of apartment buildings, shops, and car-repair workshops.

The proposed development is a tower of 18 storey high buildings with a roof, reaching RL84.80. Appendix G01, G02 and G03 show the latest Architectural layout of the basement, lower ground and ground floor. The build-up area occupied almost the entire footprint of the lot with an offset for a 2.2m footpath along William Lane. Appendix G04 shows the layout of the public domain footpath with the control line "CTRL KERB TOP"; alignment along the new top of the kerb (barrier kerb). Appendix G05 shows the profile of the alignment "CTRL KERB TOP". Appendix G06 and G07 shows the design cross-section of the new barrier kerbs interface with the existing road surface.

The new version of Hec-Ras 2D V6 enables us to easily modify terrain surfaces such as the creation of trench drain or levee features. As such, trench drains are added to the terrain models, in which the cross-sectional areas (0.16m2) is equivalent to the proposed new barrier kerbs and gutter; as shown in Appendix G08. The invert of the trench drain corresponds to the invert levels of the proposed barrier kerbs and gutter. Appendix G09 shows the profile of the kerb alignment with floodwater levels.

Appendix G10 and G11 show the Landscape Architectural layout of the proposed public domain laneway with a swale for a similar project by our client Wee Hur at 13-23 Gibbons St, Redfern. The site is just located downstream of William Lane. The proposed public domain laneway provides pedestrian and cyclist with a "thru-site" link from William Lane to Margaret St. The existing retaining wall that caused ponding of floodwater will be removed and the swale will allow floodwater to flow through. This project is now at the construction stage. Appendix G12 shows the stormwater and drainage layout, with the swale (D1-B5). Appendix G13 shows the profile of the proposed swale, gradient (1.5%) and invert levels. This swale is modelled as trench drain in our post-development terrain Hec-Ras model. Appendix G14 shows an indication that the future development of BP station (by Wee Hur) will provide a public domain easement. This may further provide flooding mitigation, but we did not take account of it, as this is still at the early planning stage.

The pre-development Hec-Ras model is duplicated for post-development modelling. As such, the rainfall data and other settings are exactly similar. Appendix H13 shows the modified Hec-Ras post-development model with contours at 0.1m interval. The high-rise buildings are modelled as rectangular blocks with the roof several meters higher. Therefore, floodwater could not enter the buildings. In a "rain-on-grid" analysis flood-map, we may see very shallow floodwater on the flat surface of a building block. This may be interpreted as floodwater enter the building. Hence, shallow depth will be filtered or clipped off from the food-map. The swale and "kerb & gutter" drainage features are modelled as equivalent trench drain as explained above.

5.2 THE POST-DEVELOPMENT HEC-RAS ANALYSIS AND RESULTS

Appendix H01 shows the 1% AEP (100 years ARI) map for floodwater depths. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. In this map, we had filtered or clipped off areas that a floodwater depth of less than 50mm. The duration of 25minutes is found to be the critical duration. The floodwater depth of each cell for this critical storm event are shown in Appendix H02. The maximum floodwater depth is found to be 0.342m, near the existing pit C3.

Appendix H03 shows the 1% AEP (100 years ARI) map for floodwater surface elevation. In this map, we had filtered or clipped off areas that a floodwater depth of less than 50mm. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. The duration of 25minutes is found to be the critical duration. The floodwater surface elevation of each cell for this critical storm event is shown in Appendix H04. The surface levels vary and we found the flood levels of RL24.41, near the existing pit C3.

Appendix H05 shows the 1% AEP (100 years ARI) map for floodwater velocity. In this map, we had filtered or clipped off areas that a floodwater depth of less than 50mm. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. The duration of 25minutes is found to be the critical duration. The floodwater surface elevation of each cell for this critical storm event is shown in Appendix H06. The velocity varies and we found the maximum velocity is 0.685 m/s mid-point of William Lane.

Appendix H07 shows the PMF map for floodwater depths. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. In this map, we had filtered or clipped off areas that a floodwater depth of less than 100mm. The duration of 15minutes is found to be the critical duration. The floodwater depth of each cell for this critical storm event are shown in Appendix H08. The maximum floodwater depth is found to be 0.667m, near the existing pit C3.

Appendix H09 shows the PMF map for floodwater surface elevation. In this map, we had filtered or clipped off areas that a floodwater depth of less than 100mm. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. The duration of 15minutes is found to be the critical duration. The floodwater surface elevation of each cell for this critical storm event is shown in Appendix H10. The surface levels vary and we found the flood levels of RL24.738, near the existing pit C3.

Appendix H11 shows the PMF map for floodwater velocity. In this map, we had filtered or clipped off areas that a floodwater depth of less than 100mm. The "layer values tab" displayed values for all storm durations from 15minutes to 180 minutes simultaneously. The duration of 15minutes is found to be the critical duration. The floodwater surface elevation of each cell for this critical storm event is shown in Appendix H12. The velocity varies and we found the maximum velocity is 1.234 m/s mid-point of William Lane.

The above results demonstrate that the new development did not increase flooding to neighbouring properties. The tin "triangulated irregular network" of the floodwater surface for the critical storm events are exported into 12D. The 1% AEP duration 25min and PMF duration 15min floodwater surface are profiled (visualized) along the proposed control line "CTRL KERB TOP" as shown in Appendix G09. The profile shows that there is a "hump" on the natural ground which is corresponding to the location of the "No-Stopping" sign at the North-West corner of the site. Therefore, the floodwater registered a "jump" at this location. In the post-development scenario, the surface here will be part of the proposed new footpath. The floodwater levels at this location will be lower in reality. The corresponding floor levels (entrance to the game room) is 500mm higher than the floodwater at 1% AEP.

We found that the proposed new footpath is generally higher than the 1% AEP floodwater. Therefore, we can conclude floodwater did not enter the building during the 1% AEP storm event. The footpath along Regent St is generally higher than the PMF floodwater. The shop, entrance to lounge and staircase along Regent St, are flood-safe. Along William Lane, the entrances to the basement shall be designed to be above the PMF floodwater levels. We found that the 1% AEP floodwater will not enter the loading bay. During the PMF flood event, floodwater will enter the loading bay. Any entrances (if any) leading to the basement from the loading bay must also be above the PMF floodwater levels.

5.3 MINIMUM FLOOD PLANNING LEVELS

The city of Sydney Council has a responsibility to manage flood-affected properties to ensure that:

- Any new development will not experience undue flood risk; and
- Any existing development (neighbourhood) will not be adversely flood-affected through increased damage or hazard as a result of the proposed new development.

The flood analysis results of the pre-development and post-development scenario in the previous chapters demonstrate that floodwater generally flows along the same path along the road of Regent St, Marian St and William Lane. The introduction of this new development did not divert floodwater to neighbouring properties.

Nevertheless, the development shall comply with the floor level requirements as specified in the "City of Sydney Interim Floodplain Management Policy". The minimum flood planning level refers to the permissible minimum building floor levels. Below-ground basement/parking shall refer to the minimum level at each access point such as staircase, elevator or vehicle entrance as described in item 1 of the "Introduction" chapter.

We proposed the minimum Flood Planning Levels (FPL) as shown in Appendix Z01 based on the current floor layout. The proposed floor planning levels are in line with the City of Sydney council recommendation of 500mm freeboard of the habitable areas such as living room and bedrooms, 300mm freeboard for garage and above floodwater for non-habitable areas. In this development, living rooms and bedrooms are located on the 1st Floor and they are more than 2.5m above any possible flood events. We consider the loading dock as a non-habitable area. The floodwater levels are measured based on the alignment of "CTRL KERB TOP" as shown in Appendix G09; projected perpendicular from the alignment to the building wall, rooms, entrances and staircases. Appendix G15 shows the floodwater levels of 1% AEP and PMF at those critical locations.

At the time of writing this report, the design of the ground floor layout is still an on-going process. In our previous flood study report, we tabulate the proposed Architectural rooms and entrances levels; and validate the proposed FPL. However, the location of rooms and entrances were changed several times. This may results in the "hard-coded" FPL contained errors in relation to the latest Architectural layout. Therefore, we provide profiles of floodwater surface level for the critical 1% AEP and PMF storm events along the entire length of the alignment "CTRL KERB TOP". The exact location (based on chainages) of the relocated rooms and entrances can be identified and the corresponding floodwater surface levels can be read easily from the profiles as shown in Appendix G09 and Appendix G15.

Future changes in the location of entrances and rooms layout may require the FPL as shown in Appendix Z01 (last page) to be updated. However, the floodwater surface levels as shown in Appendix G09 and Appendix G15 shall remain unchanged. In this regard, we seek the approval from the Authorities on the floodwater surface levels only (not the Architectural FPL). The final version of the Architectural layout and FPL shall be submitted in the CC documentation.

6 DISCUSSION AND CONCLUSION

We have analysed the flooding situation for both pre-development and post-development using Hec-Ras 2D V6 software. Terrain data or "DEM" (digital elevation model) collected in the year 2020 is downloaded from NSW government websites. We found that the DEM model matches the survey data ground surface levels. The pre-development Hec-Ras flood analysis results are compared with the previous flood studies and found to be similar, particularly referring to the Flood Assessment Report of 11 Gibbons Street by WMAwater. This report will be provided upon request.

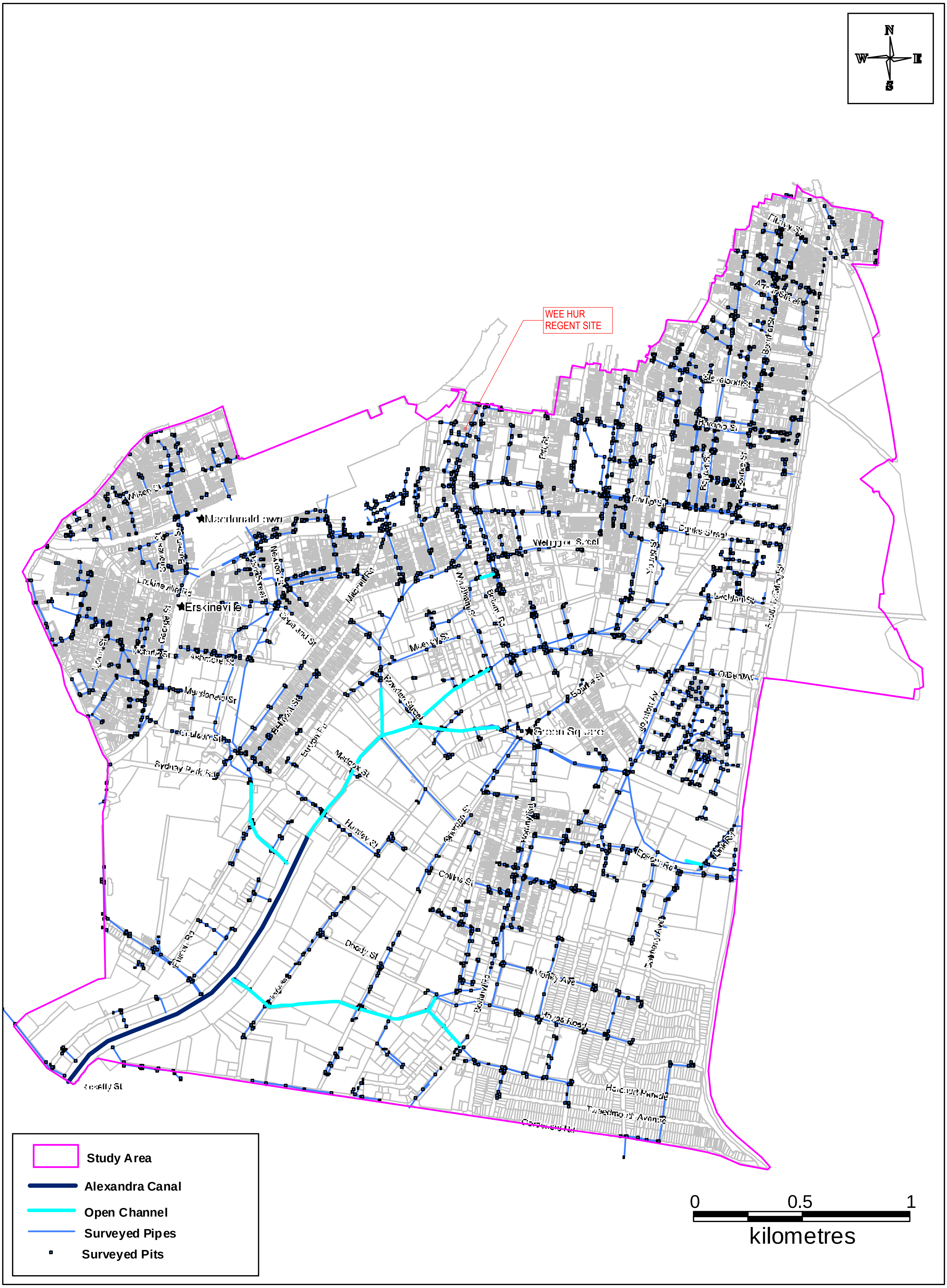
In this 3rd version of the flood study, we adopt rainfall data using the ARR1987 procedure and PMP using the GSDM method. We have conducted a flood study using the ARR2019 procedure with incorporated climate change effect and increased rainfall intensities, in our previous 2nd version of the flood study. We found that the rainfall intensities used in this flood study are generally higher or more conservative than the previous flood study. Climate change is discussed in detail and found to have a negligible impact on this development.

JHA is also involved in the flood study and stormwater design of a Wee Hur project located at 13-23, Gibbons St, Redfern, NSW; a downstream property of William Lane. We design the swale at the public domain laneway that will provide flood mitigation to the post-development flooding. Full-set of drawings is provided upon request. This project is at the stage of construction. Therefore, we have evidence that flooding mitigation will be implemented in the post-development scenario. In addition, the future project of Wee Hur at the now decommissioned BP station will provide a public domain easement. However, this potential flooding mitigation is not taken into account, due to the early stage of development of this project.

This flood study has demonstrated that the proposed development did not divert floodwater to neighbouring properties. The proposed development did not increase the damage or hazard of the existing flooding condition. The proposed minimum flood planning tabulated in the previous chapter complies with the Council and DPIE policies and requirements.

In conclusion, this flood study has demonstrated that flood modelling and flood analysis, using Hec-Ras 2D provide pre-development analysis results identical to the previous Council approved flood studies using Tuflow. We modified this "calibrated" pre-development model with additional drainage feature for the post-development scenario. We found that there is improvement to the flooding condition in the post-development scenario. Both pre-development and post-development analysis demonstrated that this proposed development did not divert floodwater to the neighbouring properties and did not increase the flooding hazard. In this regard, we believe that we have answered all the questions requested by the relevant Authorities with satisfactory results. We have provided to the stakeholders, the required minimum flood planning levels and floodwater surface levels profiles for their reference.

7 APPENDICES



ALEXANDRA CANAL CATCHMENT FLOOD STUDY

Final

Figure 4.3

1D Network

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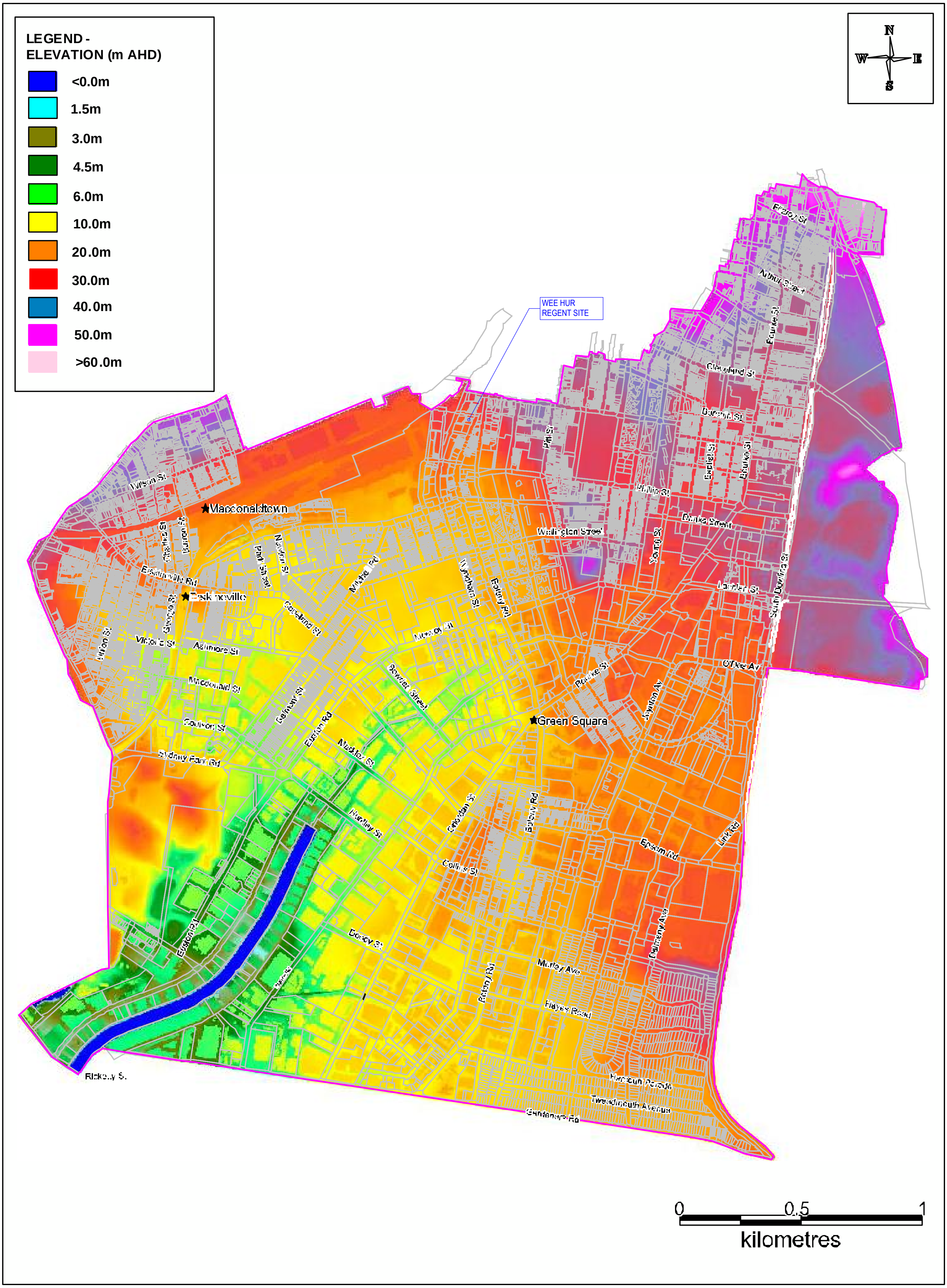
W4785



ALEXANDRA CANAL CATCHMENT FLOOD STUDY

Figure 4.6

2D Elevation Grid

W4785

Final

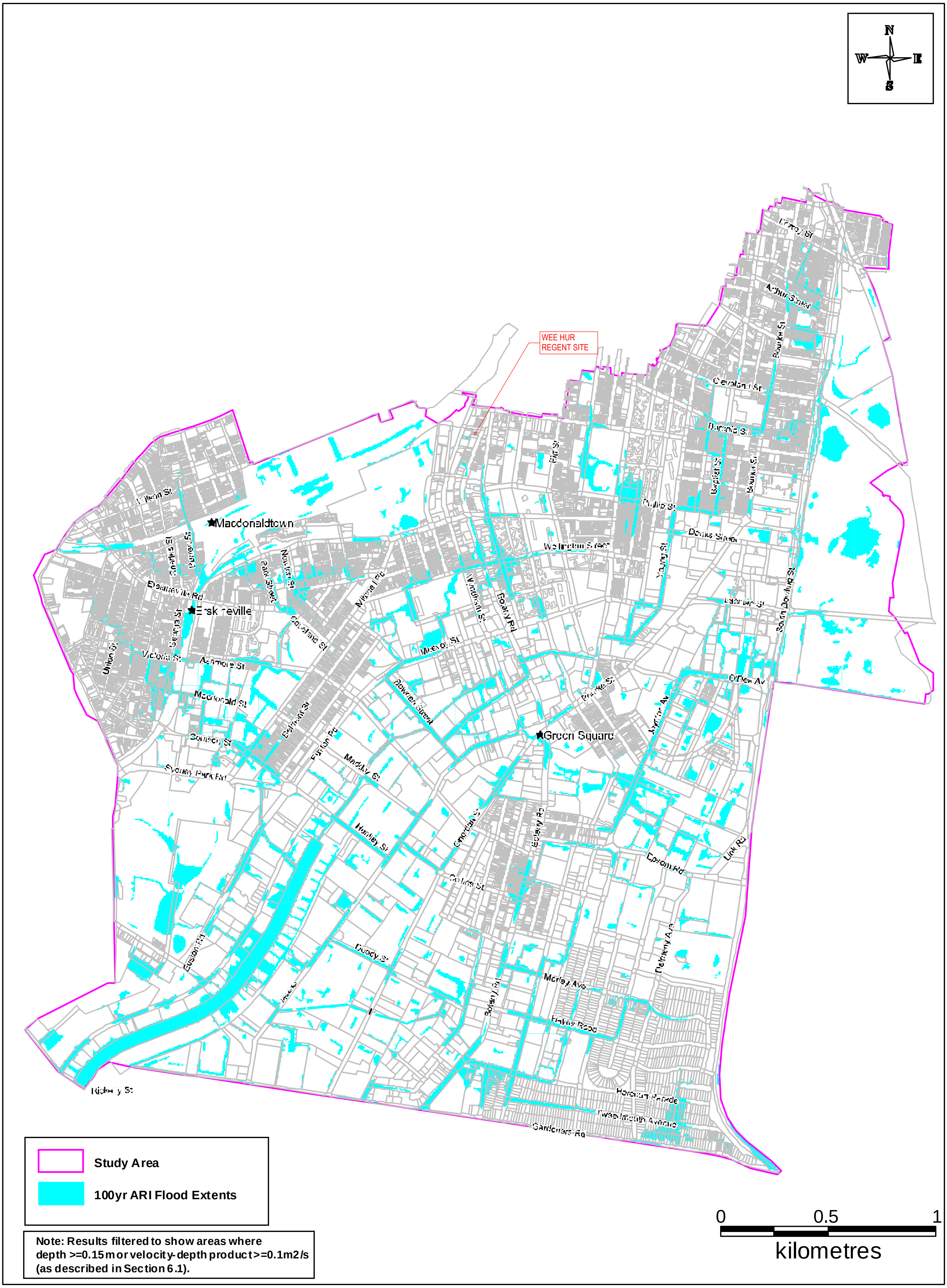


Figure 6.6

ALEXANDRA CANAL CATCHMENT FLOOD STUDY

Flood Extents - 100yr ARI

W4785

Final

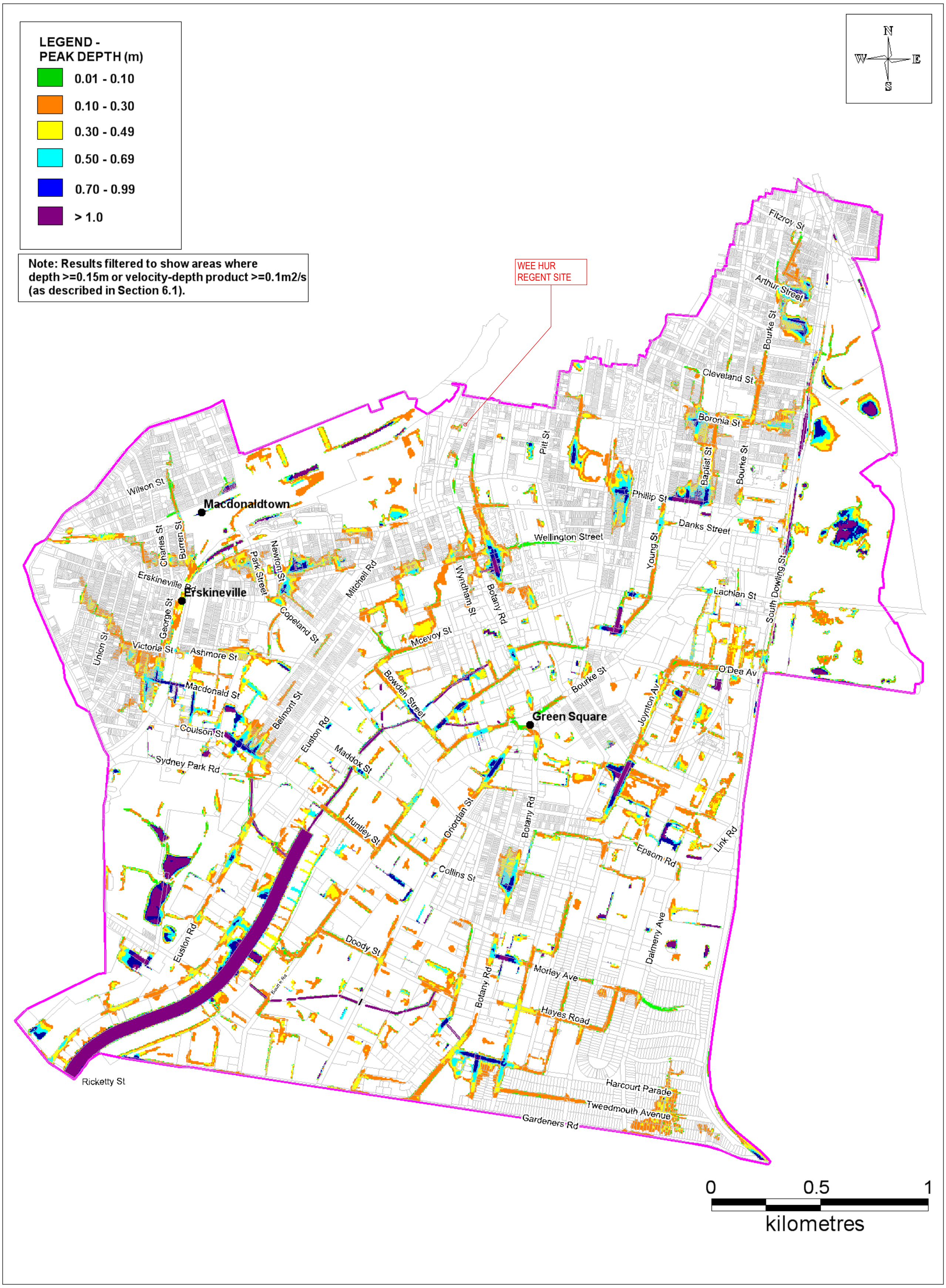


Figure 2-2 100 Year ARI Peak Flood Depths

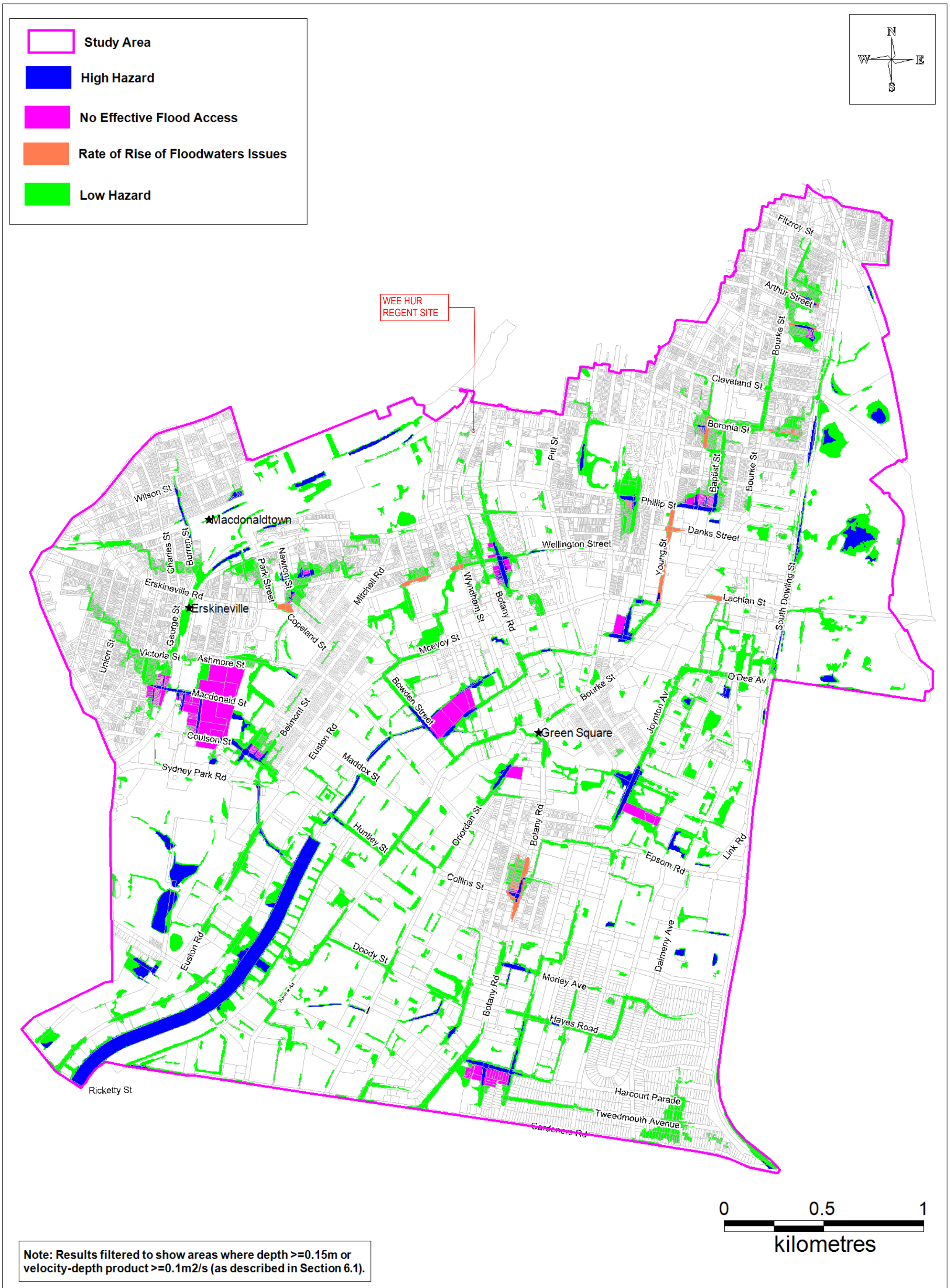
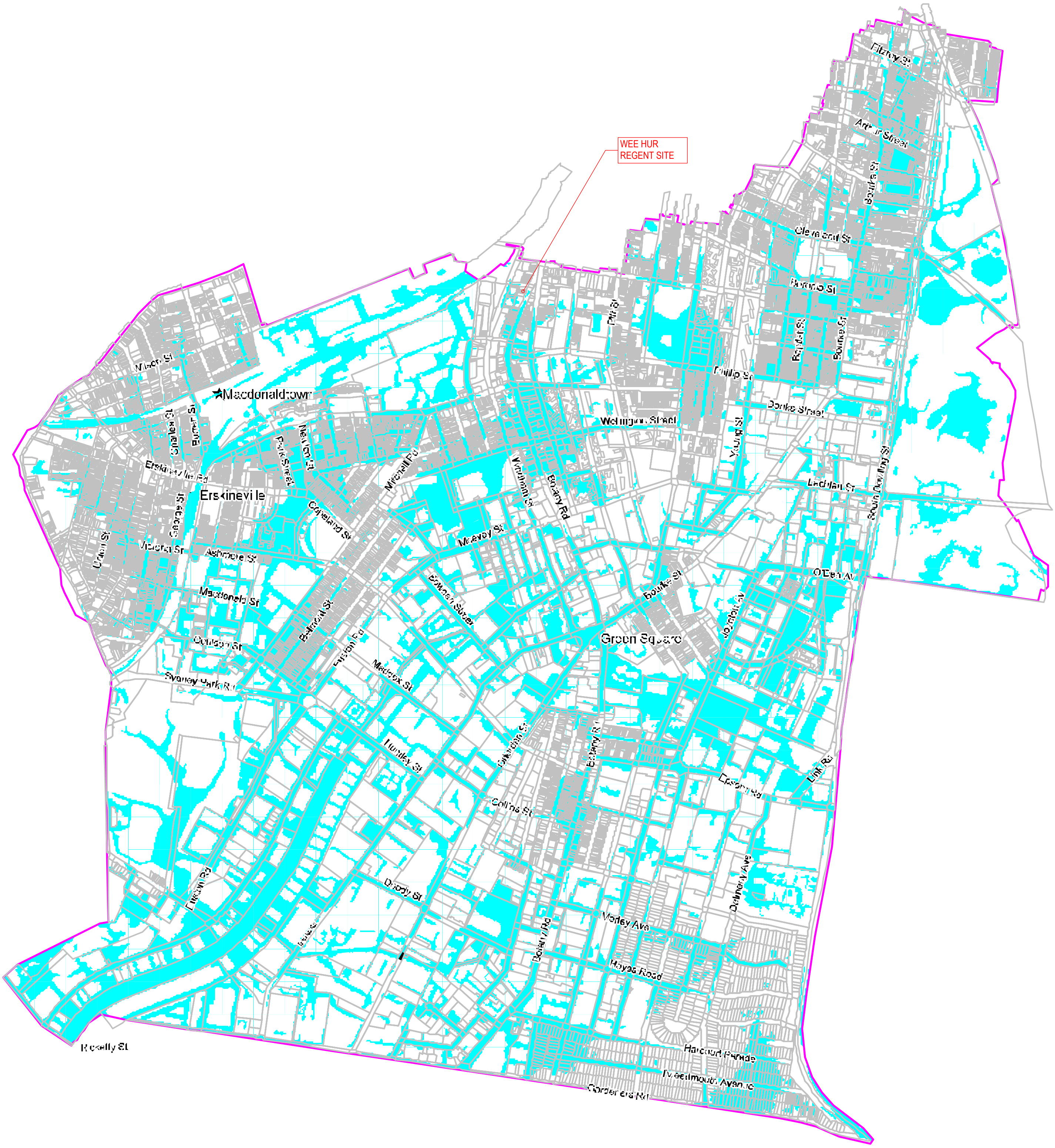


Figure 2-4 100 Year ARI Flood Hazard



Study Area	
PMF Extent	

Note: Results filtered to show areas where depth >=0.15m or velocity-depth product >=0.1m2/s (as described in Section 6.1).

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ALEXANDRA CANAL CATCHMENT FLOOD STUDY

Figure 6.7

Flood Extents - PMF

W4785

Final

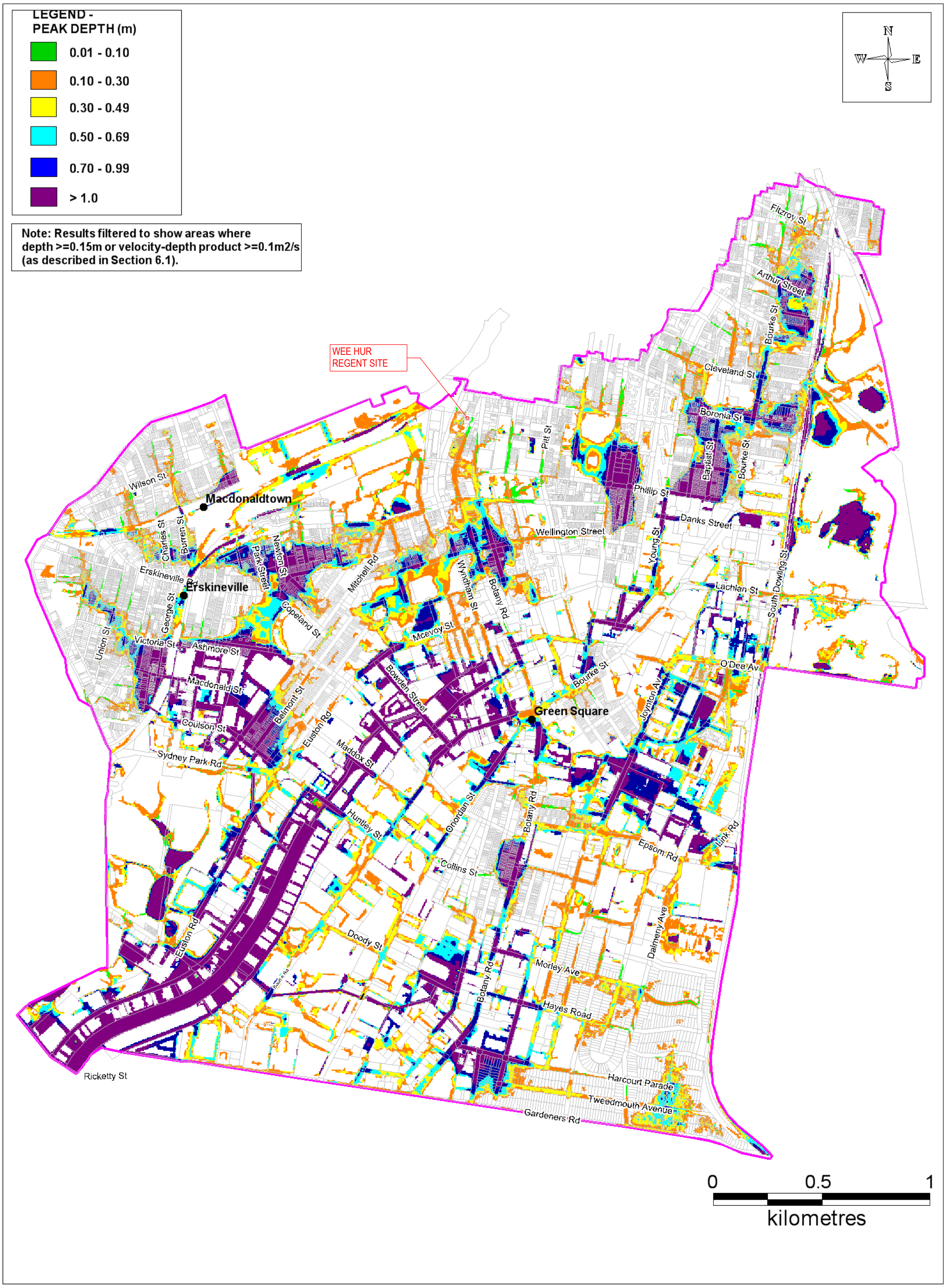


Figure 2-3 PMF Peak Flood Depths

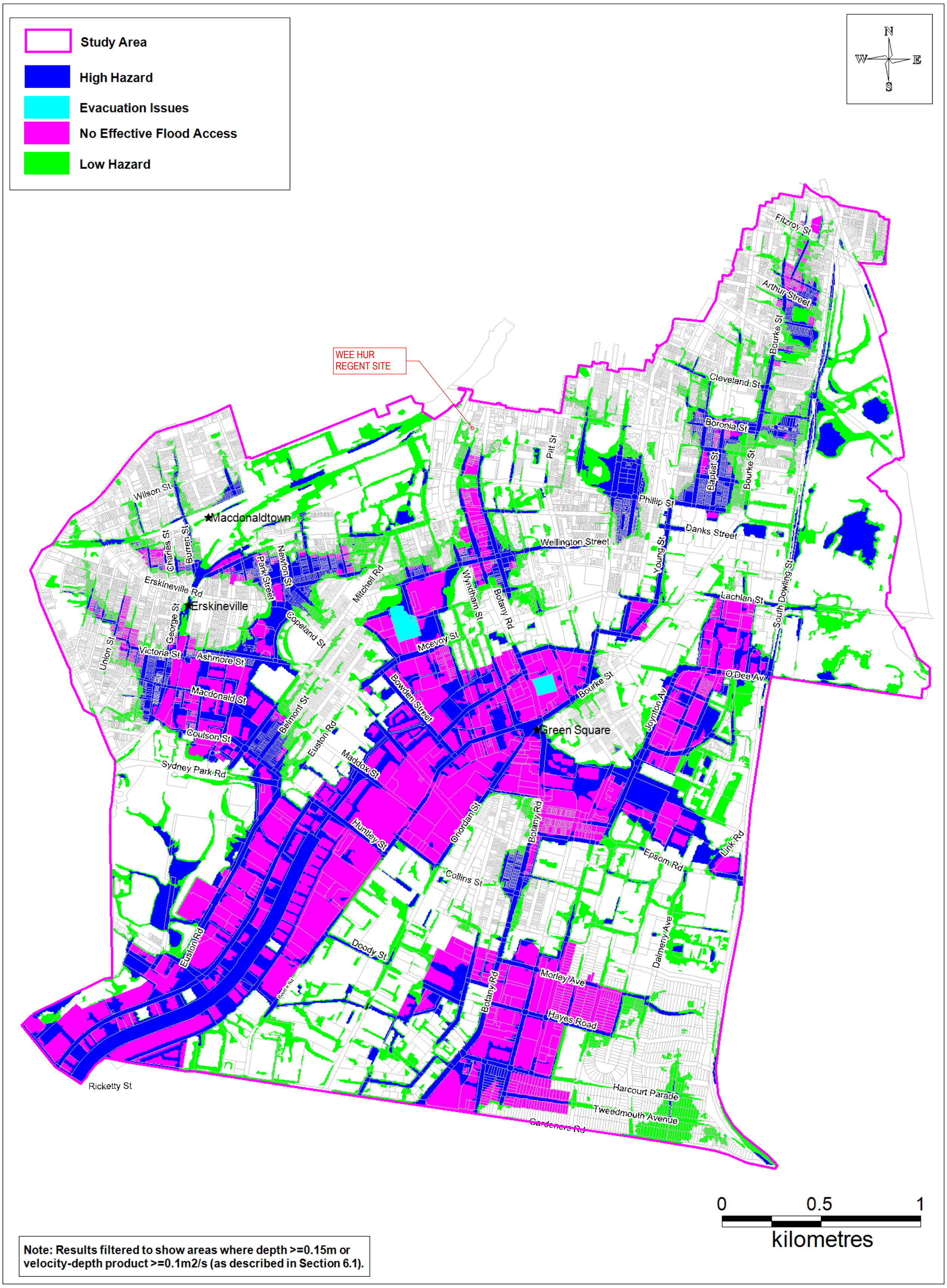


Figure 2-5 PMF Flood Hazard

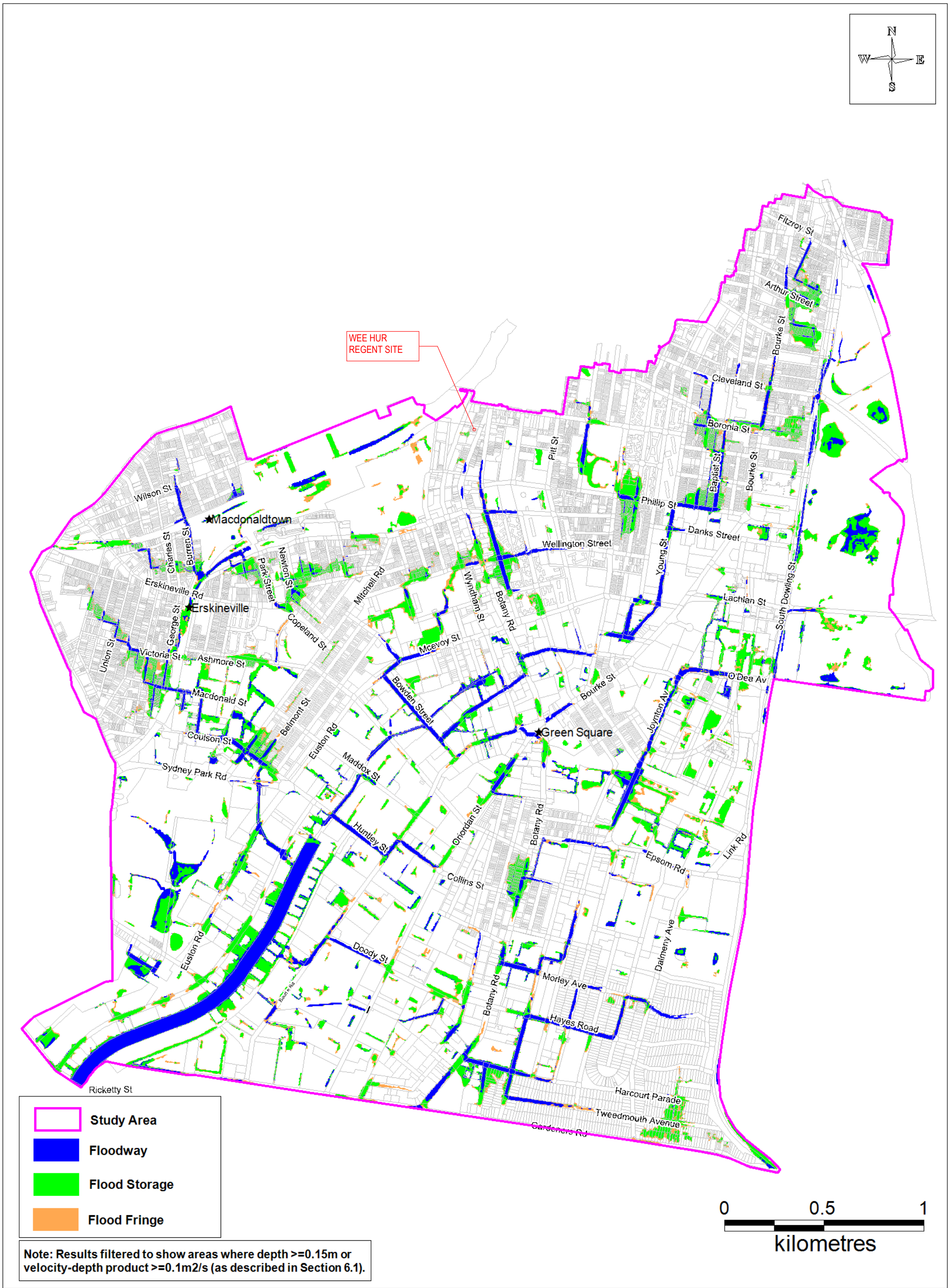


Figure 5-12 Hydraulic Categories – 100 Year ARI

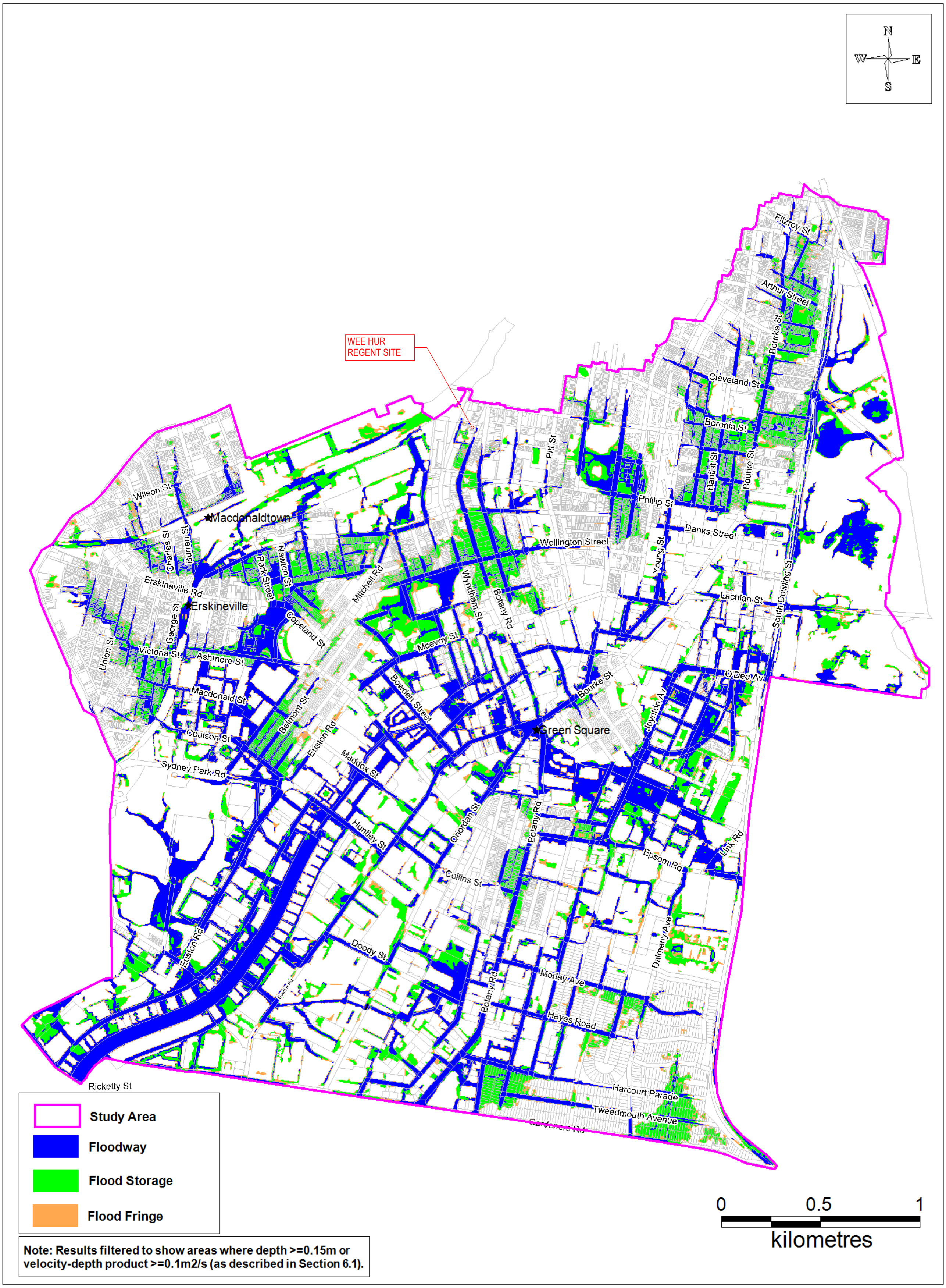
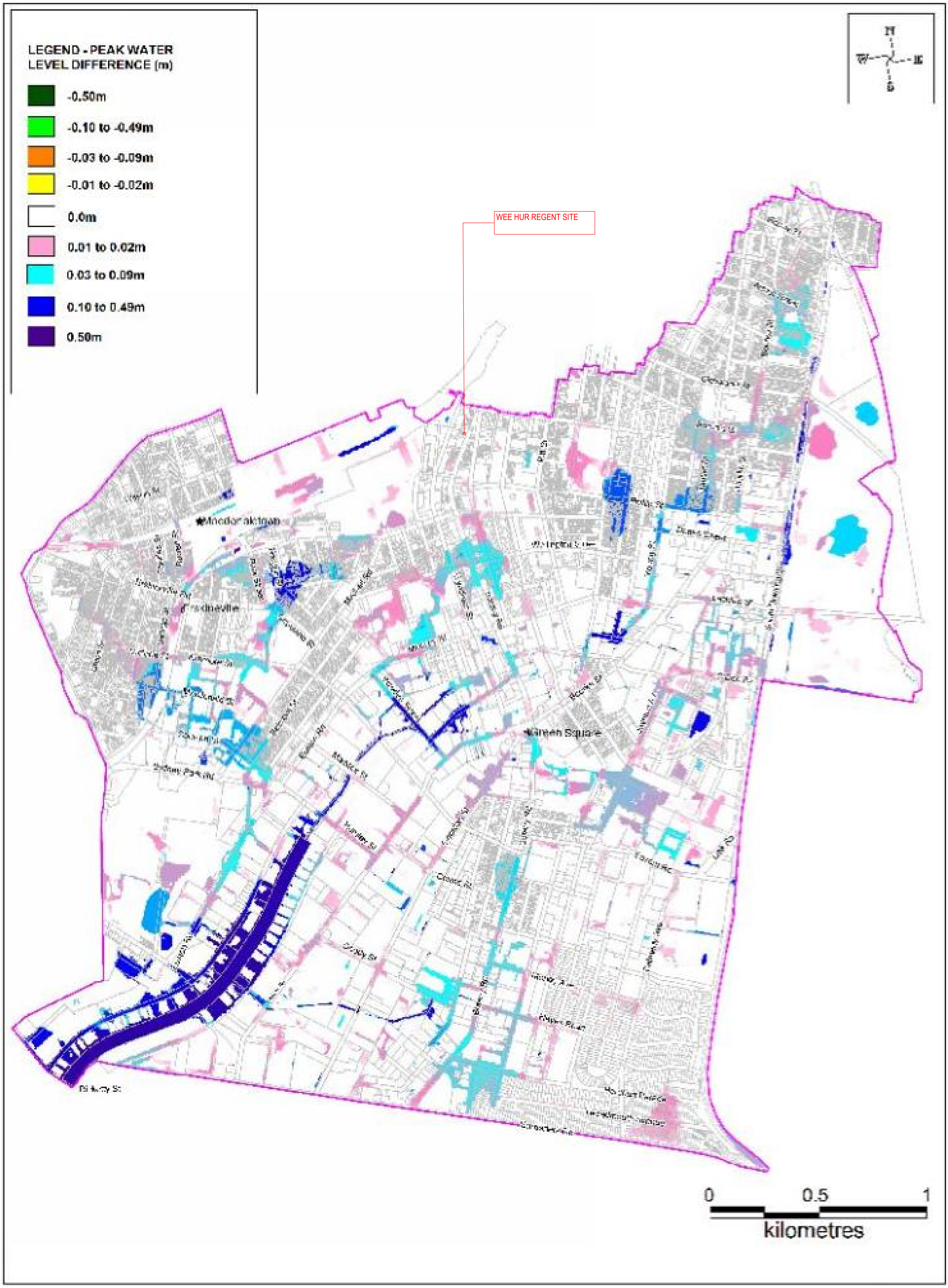


Figure 5-11 Hydraulic Categories – PMF



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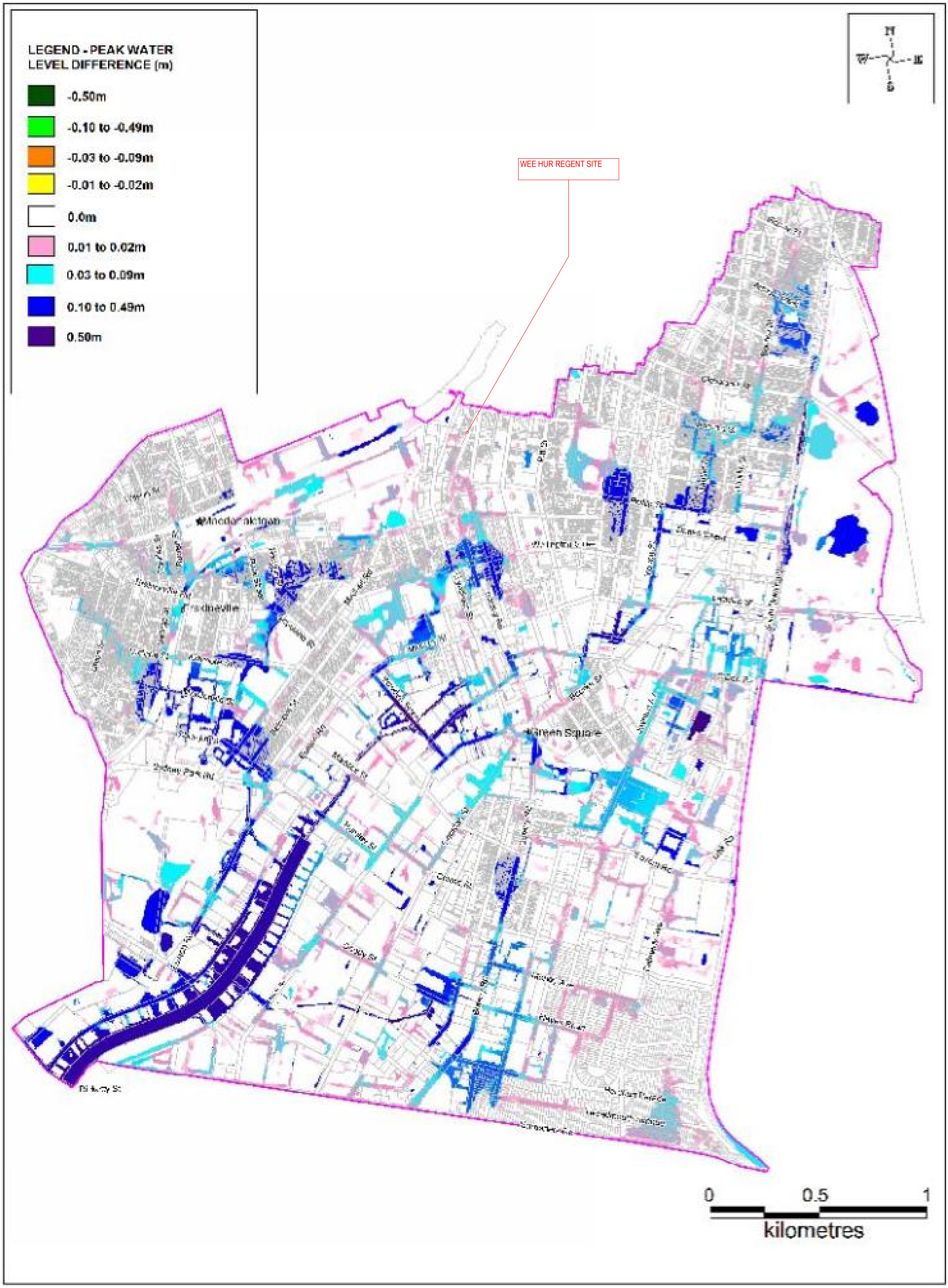
ALEXANDRA CANAL CATCHMENT FLOOD STUDY

Final

Figure 8.1

Climate Change
100yr ARI Rainfall Plus 10%



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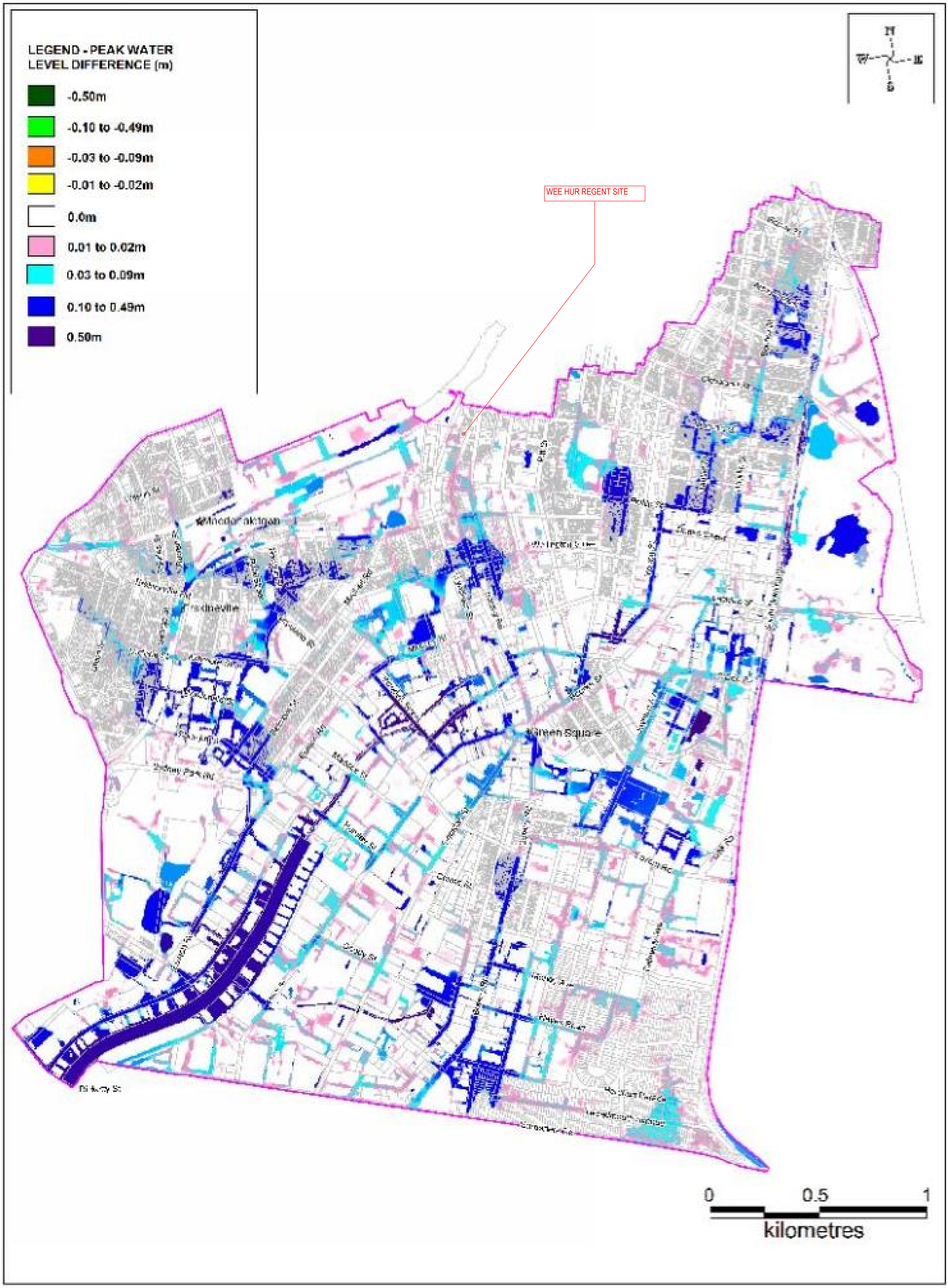
ALEXANDRA CANAL CATCHMENT FLOOD STUDY

Final

Figure 8.2

Climate Change
100yr ARI Rainfall Plus 20%



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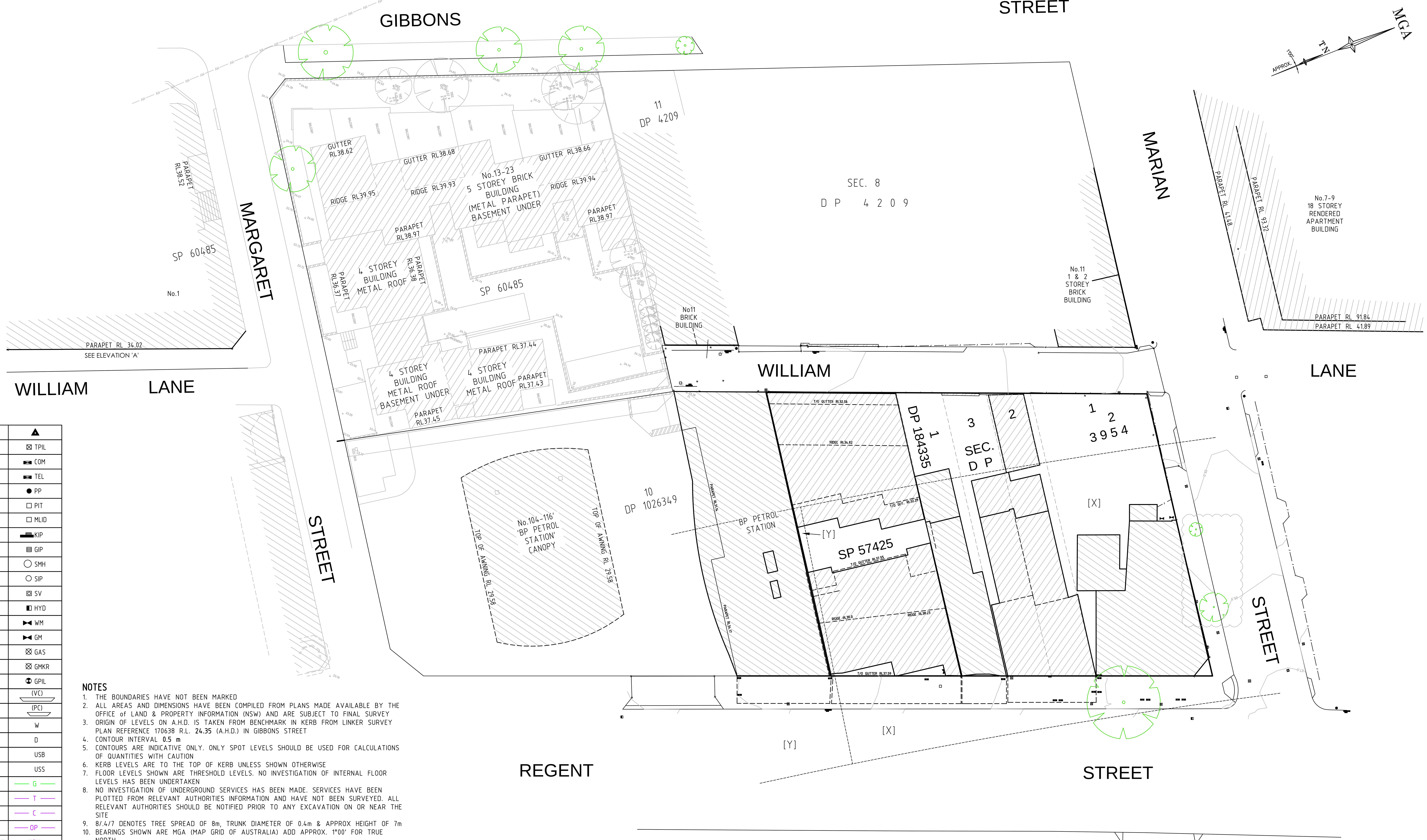
ALEXANDRA CANAL CATCHMENT FLOOD STUDY

Final

Figure 8.3

Climate Change
100yr ARI Rainfall Plus 30%

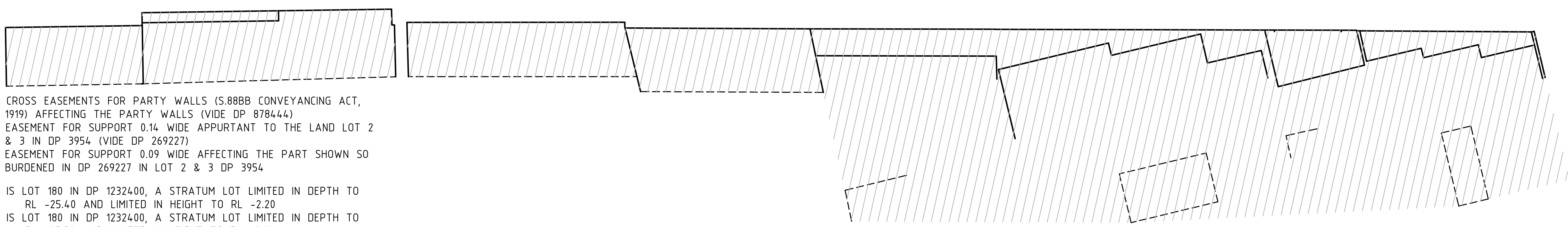


LEGEND

BENCH MARK	▲
TELSTRA PILLAR	TPIL
COMMS PIT	COM
ELECTRICITY PIT	TEL
POWER POLE	PP
SERVICE PIT	PIT
PIT WITH METAL LID	MLID
KERB INLET PIT	KIP
GRATED INLET PIT	GIP
SEWER MANHOLE	SMH
SEWER INSPECTION POINT	SIP
STOP VALVE	SV
HYDRANT	HYD
WATER METER	WM
GAS VALVE	GM
GAS VALVE	GAS
GAS MARKER	GMKR
GAS PILLAR	GPIL
VEHICLE CROSSING	(VC)
PRAM CROSSING	(PC)
WINDOW	W
DOOR	D
UNDERSIDE OF BEAM	USB
UNDERSIDE OF SLABB	USS
GAS (DBYD)	G
TELSTRA (DBYD)	T
COMMUNICATIONS (DBYD)	C
OPTUS (DBYD)	OP
NAT. BROADBAND NETWORK (DBYD)	NBN
WATER (DBYD)	W
STORMWATER (DBYD)	SW
SEWER (DBYD)	S
ELECTRICITY (OVERHEAD)	P
ELECTRICITY (U'GROUND) (DBYD)	E

NOTES

1. THE BOUNDARIES HAVE NOT BEEN MARKED
2. ALL AREAS AND DIMENSIONS HAVE BEEN COMPILED FROM PLANS MADE AVAILABLE BY THE OFFICE OF LAND & PROPERTY INFORMATION (NSW) AND ARE SUBJECT TO FINAL SURVEY
3. ORIGIN OF LEVELS ON A.H.D. IS TAKEN FROM BENCHMARK IN KERB FROM LINKER SURVEY PLAN REFERENCE 170638 R.L. **24.35** (A.H.D.) IN GIBBONS STREET
4. CONTOUR INTERVAL **0.5 m**
5. CONTOURS ARE INDICATIVE ONLY. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
6. KERB LEVELS ARE TO THE TOP OF KERB UNLESS SHOWN OTHERWISE
7. FLOOR LEVELS SHOWN ARE THRESHOLD LEVELS. NO INVESTIGATION OF INTERNAL FLOOR LEVELS HAS BEEN UNDERTAKEN
8. NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. SERVICES HAVE BEEN PLOTTED FROM RELEVANT AUTHORITIES INFORMATION AND HAVE NOT BEEN SURVEYED. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE
9. 8/.4/7 DENOTES TREE SPREAD OF 8m, TRUNK DIAMETER OF 0.4m & APPROX HEIGHT OF 7m
10. BEARINGS SHOWN ARE MGA (MAP GRID OF AUSTRALIA) ADD APPROX. 1°00' FOR TRUE NORTH



(A) CROSS EASEMENTS FOR PARTY WALLS (S.88BB CONVEYANCING ACT, 1919) AFFECTING THE PARTY WALLS (VIDE DP 878444)
(B) EASEMENT FOR SUPPORT 0.14 WIDE APPURTANT TO THE LAND LOT 2 & 3 IN DP 3954 (VIDE DP 269227)
(C) EASEMENT FOR SUPPORT 0.09 WIDE AFFECTING THE PART SHOWN SO BURDENED IN DP 269227 IN LOT 2 & 3 DP 3954

[X] IS LOT 180 IN DP 1232400, A STRATUM LOT LIMITED IN DEPTH TO RL -25.40 AND LIMITED IN HEIGHT TO RL -2.20
[Y] IS LOT 180 IN DP 1232400, A STRATUM LOT LIMITED IN DEPTH TO RL -23.30 AND LIMITED IN HEIGHT TO RL -0.10

DIAL BEFORE YOU DIG www.1100.com.au
REFER TO NOTES AND LEGEND

SCALE 1:200 @ A1 (0 4 6 8 12 16 20)

Revision	Date	Description	Reference
D	00/00/00	-	00
C	16/09/20	STORMWATER PIPT INVERTS ADDED	50670/005
B	04/07/19	ADDITIONAL TREES ADDED	50670/002
A	29/05/19	ADDITIONAL DETAIL & LEVEL ADDED	50670/002

THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

....
Registered Surveyor NSW

LTS LOCKLEY
Registered Surveyors NSW
www.ltsl.com.au
Suite 1, Level 1
810 Pacific Highway
Gordon NSW 2072
Locked Bag 5
Gordon NSW 2072
P 1300 587 000
F 02 9499 7760

Client THE TRUST COMPANY (AUSTRALIA) LIMITED ATF HW REGENT TRUST

Drawing title
PLAN OF DETAIL AND LEVELS OVER LOTS 1-3 SECTION 2 IN DP 3954, LOT 1 IN DP 184335 AND SP 57425 KNOWN AS No 90-102 REGENT STREET, REDFERN

datum AHD
site Area 1287m²
LGA SYDNEY
reference number 50670 001DT
scale 1:200 @A1
date of survey 23/04/2019
SHEET 1 OF 4

REFER TO NOTES AND LEGEND

SCALE 1:100 @ A1

SEE SHEET 1 FOR NOTES AND LEGEND

Revision	Date	Description	Reference
D	00/00/00	-	00
C	16/09/20	STORMWATER PIPT INVERTS ADDED	50670/005
B	04/07/19	ADDITIONAL TREES ADDED	50670/002
A	29/05/19	ADDITIONAL DETAIL & LEVEL ADDED	50670/002

THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

....
Registered Surveyor NSW

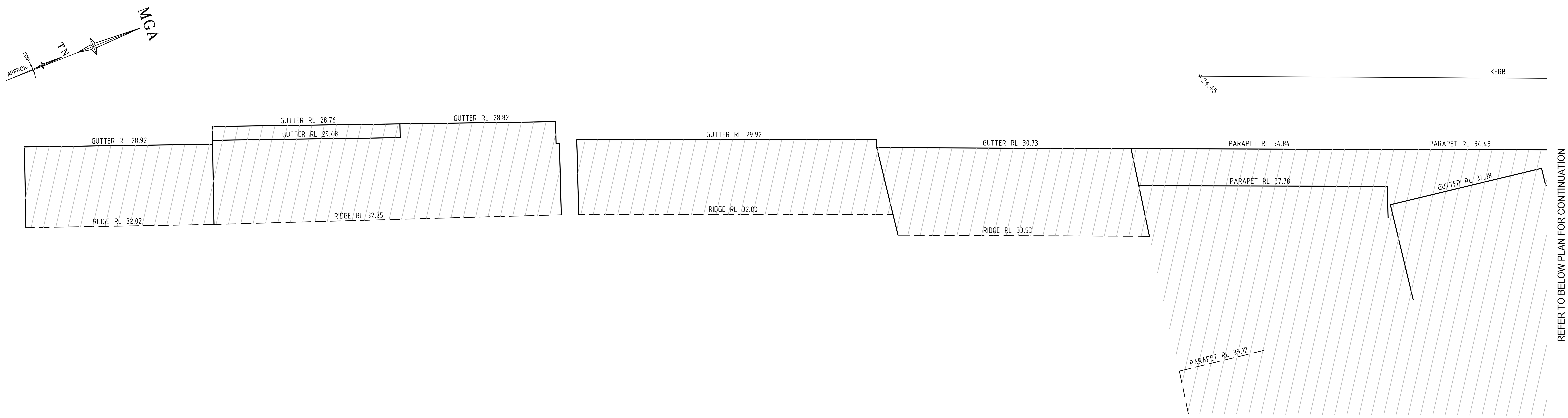
LTS LOCKLEY
Registered Surveyors NSW
www.ltsl.com.au

Suite 1, Level 1
810 Pacific Highway
Gordon NSW 2072
Locked Bag 5
Gordon NSW 2072
P 1300 587 000
F 02 9499 7760

Client THE TRUST COMPANY (AUSTRALIA) LIMITED ATF HW REGENT TRUST

Drawing title
PLAN OF DETAIL AND LEVELS OVER LOTS 1-3 SECTION 2 IN DP 3954, LOT 1 IN DP 184335 AND SP 57425 KNOWN AS No 90-102 REGENT STREET, REDFERN

datum AHD
site Area 1287m²
LGA SYDNEY
reference number 50670 001DT
scale 1:100 @A1
date of survey 23/04/2019
SHEET 2 OF 4



REGENT STREET EASTERN PART PLAN - SOUTH

REGENT STREET

REGENT STREET EASTERN PART PLAN - NORTH

DIAL BEFORE YOU DIG
www.1100.com.au

REFER TO NOTES AND LEGEND

0 2 3 4 6 8 10
SCALE 1:100 @ A1

SEE SHEET 1 FOR NOTES AND LEGEND

Revision	Date	Description	Reference
D	00/00/00	-	00
C	16/09/20	STORMWATER PIPT INVERTS ADDED	50670/005
B	04/07/19	ADDITIONAL TREES ADDED	50670/002
A	29/05/19	ADDITIONAL DETAIL & LEVEL ADDED	50670/002

THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

....
Registered Surveyor NSW

LTS LOCKLEY
Registered Surveyors NSW
www.ltsl.com.au

Suite 1, Level 1
810 Pacific Highway
Gordon NSW 2072
Locked Bag 5
Gordon NSW 2072
P 1300 587 000
F 02 9499 7760

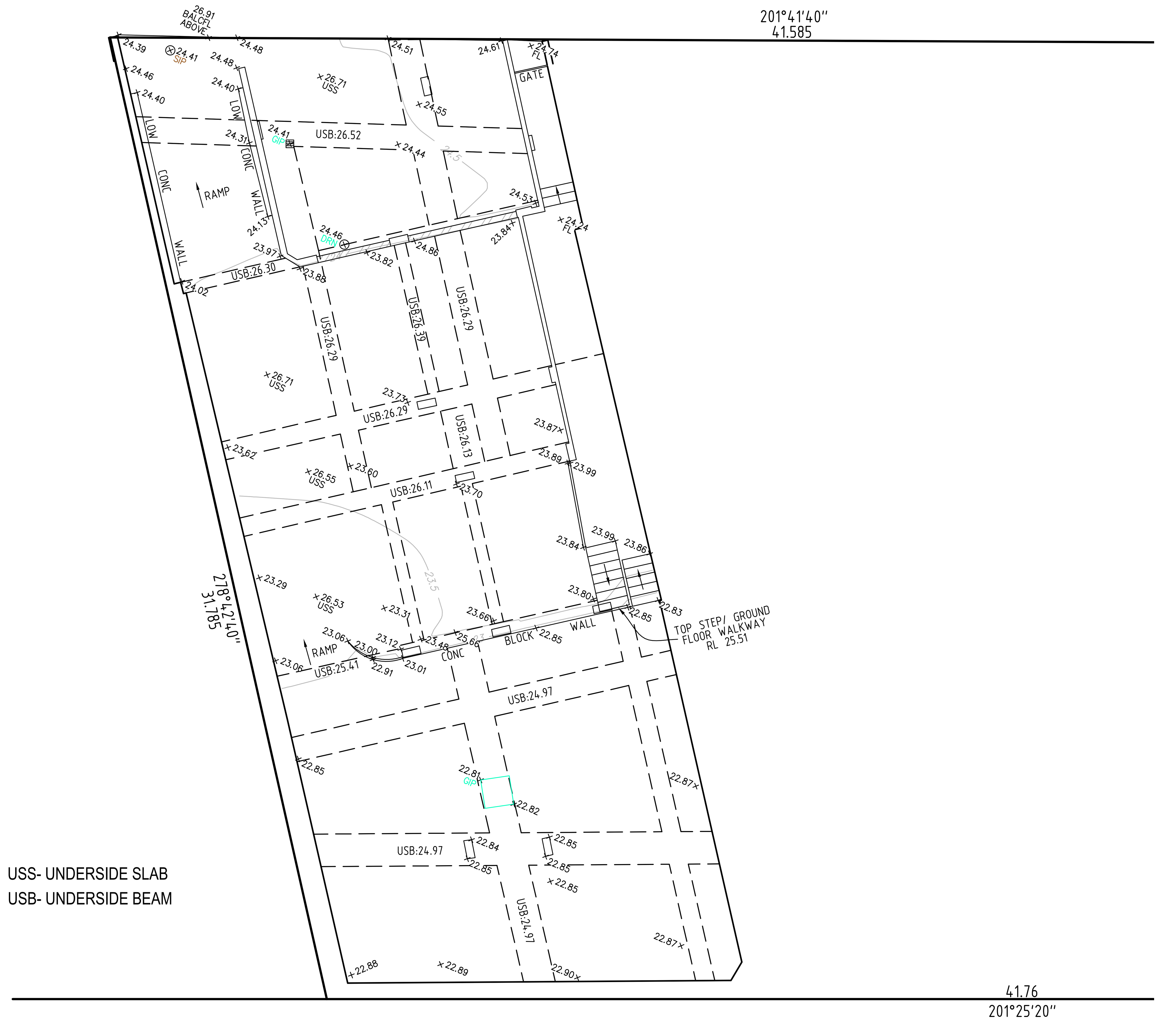
Client THE TRUST COMPANY (AUSTRALIA) LIMITED ATF HW REGENT TRUST

Drawing title
PLAN OF DETAIL AND LEVELS OVER LOTS 1-3 SECTION 2 IN DP 3954, LOT 1 IN DP 184335 AND SP 57425 KNOWN AS No 90-102 REGENT STREET, REDFERN

datum AHD
site Area 1287m²
LGA SYDNEY

reference number 50670 001DT
scale 1:100 @A1
date of survey 23/04/2019
SHEET 3 OF 4

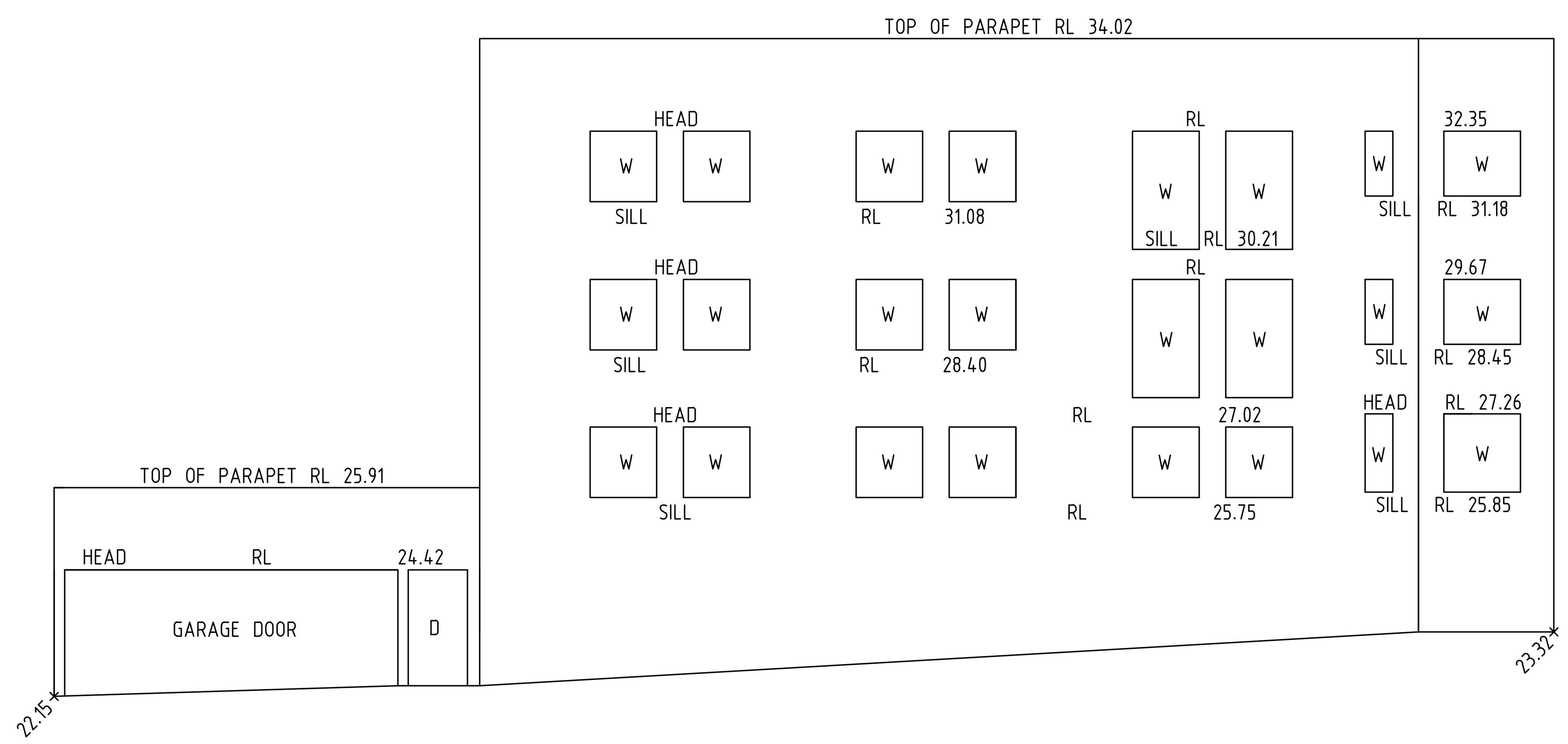
WILLIAM LANE



USS- UNDERSIDE SLAB
USB- UNDERSIDE BEAM

REGENT STREET

BASEMENT PLAN (SP57425)



ELEVATION 'A'
EASTERN ELEVATION OF No1 MARARET STREET

DIAL BEFORE YOU DIG
www.1100.com.au
REFER TO NOTES AND LEGEND

0 2 3 4 6 8 10
SCALE 1:100 @ A1

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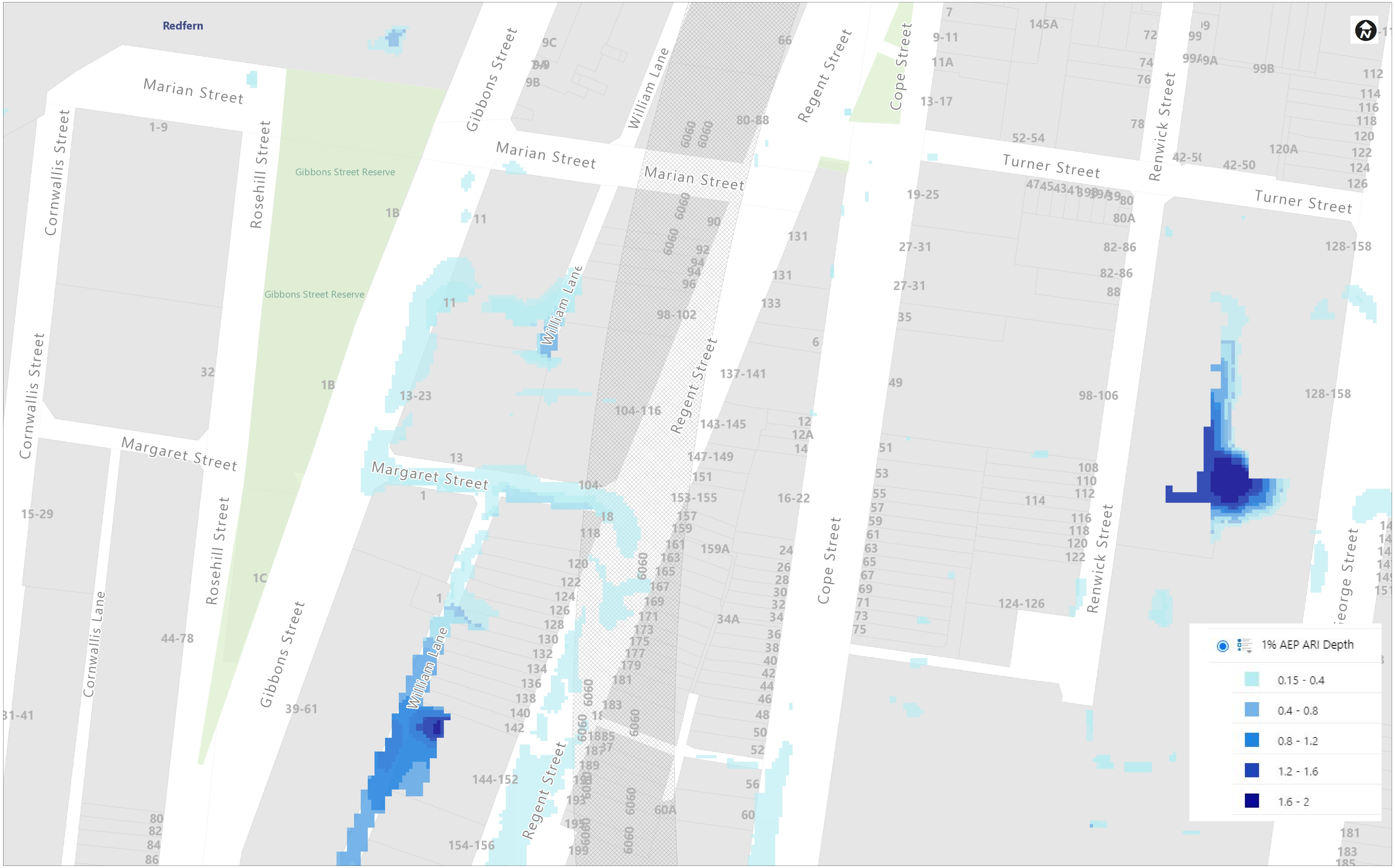
datum AHD
site Area 1287m²
LGA SYDNEY
reference number 50670 001DT
scale 1:100 @A1
date of survey 23/04/2019
SHEET 4 OF 4

0 25 50 100

A3 1: 1,000

Metres

Date: 18-Feb-21



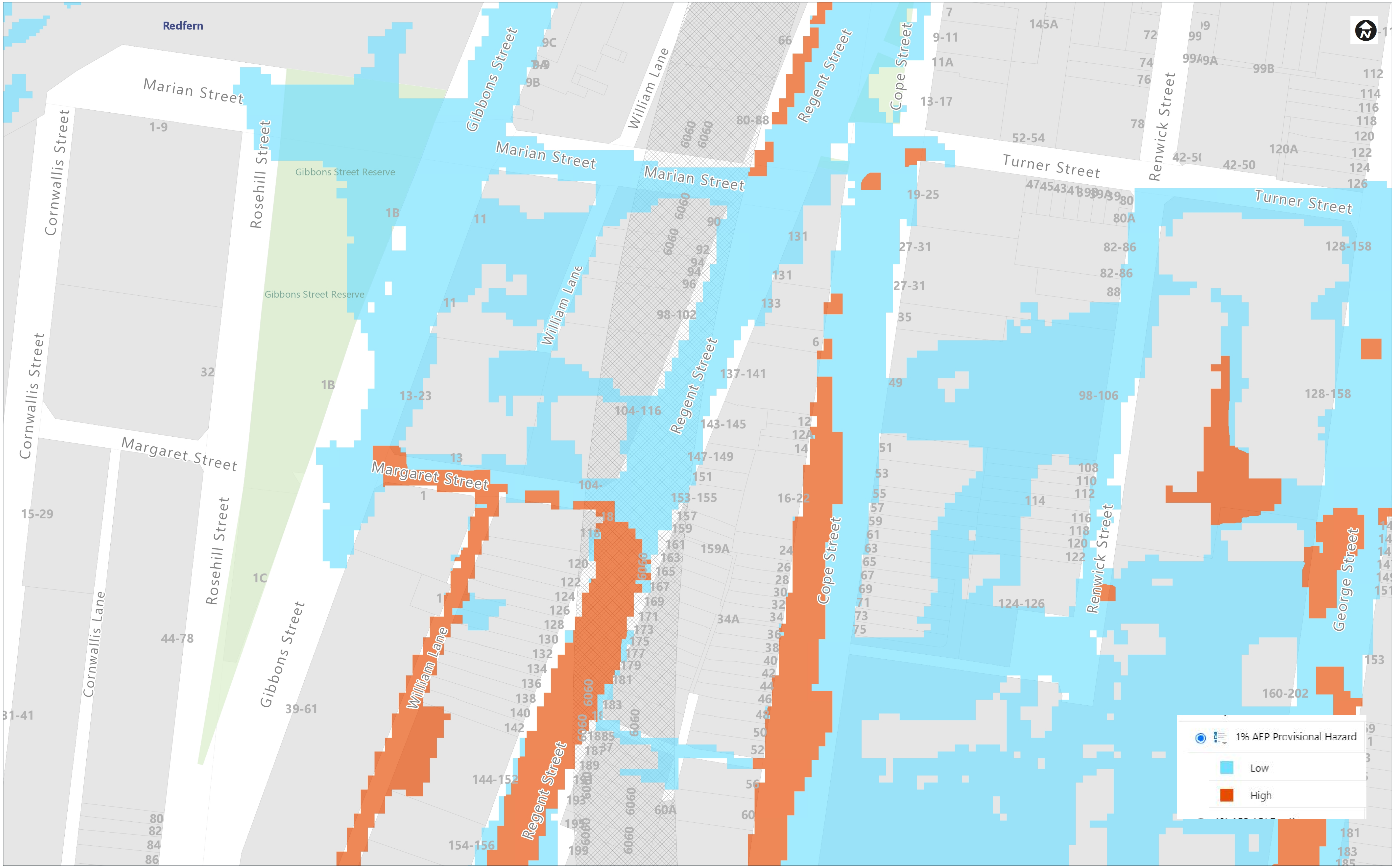
0 25 50 100
A3 1: 1,000 Metres Date: 18-Feb-21

0 25 50 100
Metres
A3 1: 1,000
Date: 18-Feb-21

City of Sydney Flood information

Flood Hazard PMF

CITY OF SYDNEY



0 25 50 100

A3 1: 1,000

Metres

Date: 18-Feb-21

Regent Street Footpath– (looking north)

Regent Street Footpath– (looking South)

Intersection of Regent St and Marian St– (looking South)

Marian St (looking South-West and the motorbike at William Lane)

Marian Street footpath and green Colorbond fencing along boundary of DP3954 – (looking East)

William Lane (looking North)

The interior carpark of DP3954, green Colorbond fencing at boundary (notice that the carpark is partially paved with pavers and bitumen)

The interior driveway of DP184335, looking at the roller shutter (driveway is paved with bricks with a small area for plants at the sides)

William Lane (Looking South).

Photo showing existing courtyard is about 3 steps (700mm) higher than the street level. There is a retaining wall behind the black and white chequered board. The kerb inlet pit at the left connect to Regent St via underground 300mm diameter pipe. During 100 years ARI storm event, flood will happen at this location and could reached 900mm depth at the pit location.

Photo taken at William Lane, at the three steps of the courtyard, showing damaged retaining wall behind the timber board.

Photo showing flood flow path at the BP Station compound, looking south at Margaret St (Retaining wall of William Lane at the foreground is not visible).

Photo taken in 2021, at intersection of Regent St and Redfern St. The crown or centreline of Redfern St generally represent the upstream boundary of the Alexandra Canal Catchment.

Photo taken in 2021 showing the upstream end of the Regent St, looking south.

Regent Street is sloping at about 3% from North to South.

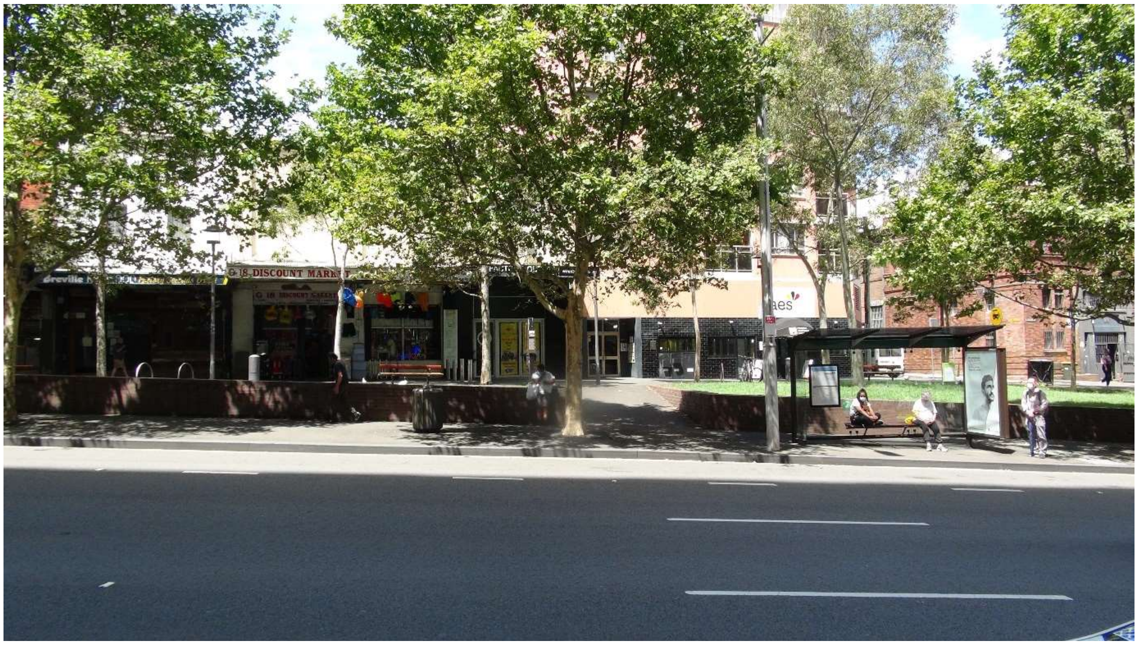


Photo taken in 2021, of Regent St, looking East. Regent St is a two-way cross-fall road. Stormwater generally flow along the kerb and gutter at each side of the road.

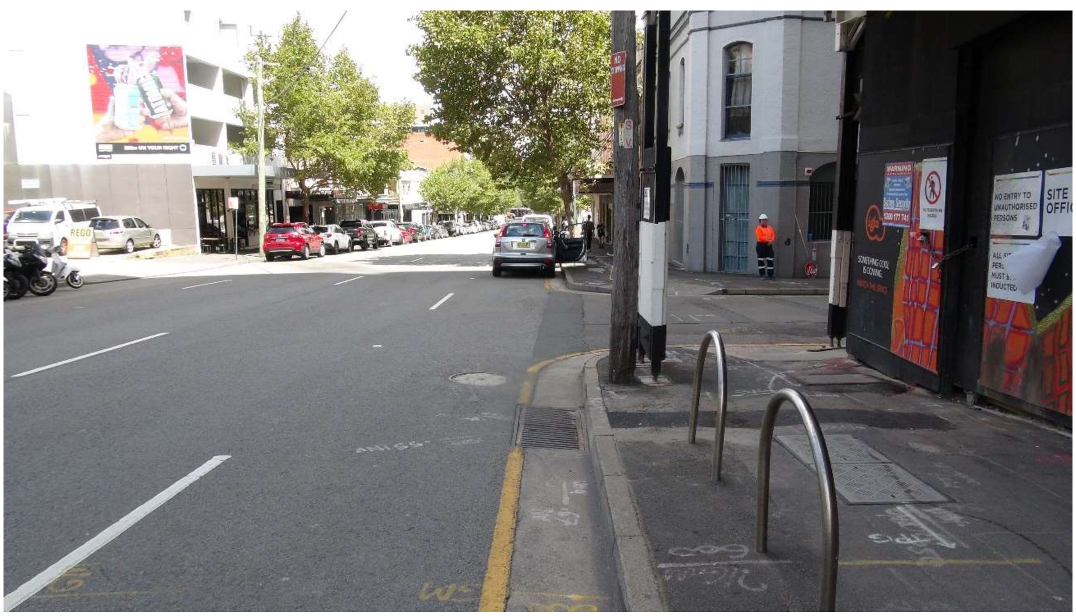


Photo taken in 2021 showing the intersection of Regent St and Marian St. Stormwater would be capture by the existing kerb inlet pit during minor storm. During the major storm, floodwater may split at this junction draining into Marian St.

Photo taken in 2021, of Marian St, looking East. During the major storm event, floodwater flowing along northern kerb's gutter may overtop the road's crown and flow towards William Lane (right).

Photo taken in 2021 showing the barrier kerb and a dish gutter at the entrance to William Lane. During the minor storm event, floodwater will be flowing toward Gibbons St at the background, without entering William Lane. The 2020 Lidar terrain and contours did not display drainage feature of this small dish gutter.

Photo taken in 2021, of the BP petrol station, café and mini grocery shop, looking West. All these facilities were decommissioned and vacant. Construction work has started at the courtyard of Wee Hur development project at 13-23 Gibbons St.

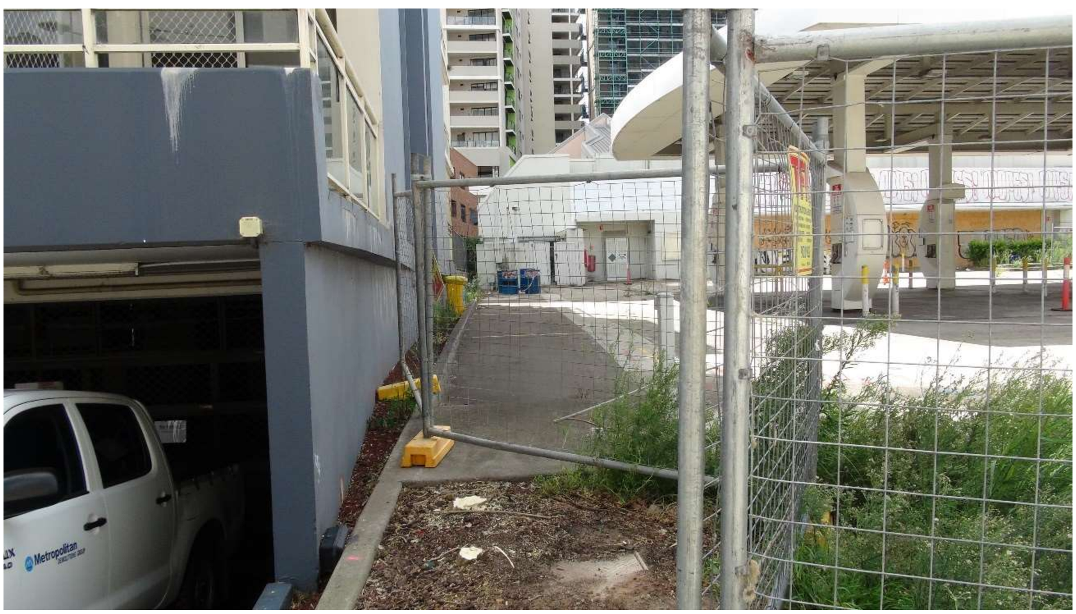


Photo taken in 2021, standing at Margaret St looking north along the common boundary between BP station (Wee Hur future project) and Wee Hur project of 13-23 Gibbons St. This area is proposed to be an easement and could potentially mitigate flooding caused by ponding of floodwater due to the existing retaining wall (see C06) at the North-West corner of this BP station.

INTENSITY CONVERSION FOR VARIOUS DURATION OF 1% AEP STORM

VALUES FROM DRAINS USING ARR2019 PROCEDURE ON CRITICAL ENSEMBLE

	15 min Storm 2		30 min Storm 9		60 min Storm 6		90 min Storm 1		120 min Storm 1	
TIME (MIN)	mm/60min	mm/5min	mm/60min	mm/5min	mm/60min	mm/5min	mm/60min	mm/5min	mm/60min	mm/5min
0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
5	215.487	17.96	100.056	8.34	36.2284	3.02	87.5149	7.29	10.9094	0.91
10	172.37	14.36	62.5606	5.21	57.1057	4.76	23.8399	1.99	7.15932	0.60
15	107.743	8.98	106.339	8.86	62.2812	5.19	35.8618	2.99	47.9561	4.00
20	0	0.00	112.623	9.39	67.4567	5.62	31.8884	2.66	107.958	9.00
25			181.399	15.12	77.8954	6.49	99.5368	8.29	77.1616	6.43
30			112.623	9.39	103.773	8.65	63.675	5.31	118.186	9.85
35			0	0.00	119.387	9.95	75.595	6.30	108.64	9.05
40					114.211	9.52	15.8933	1.32	99.8896	8.32
45					114.211	9.52	11.92	0.99	49.2061	4.10
50					51.9302	4.33	3.97332	0.33	14.7732	1.23
55					46.7548	3.90	47.7817	3.98	47.3879	3.95
60					25.9651	2.16	55.7284	4.64	37.8421	3.15
65					0	0.00	75.595	6.30	29.5464	2.46
70							31.8884	2.66	16.8187	1.40
75							83.5416	6.96	21.8189	1.82
80							55.7284	4.64	75.116	6.26
85							131.323	10.94	43.5241	3.63
90							87.5149	7.29	18.9779	1.58
95							0	0.00	34.092	2.84
100									41.8195	3.48
105									35.342	2.95
110									50.1152	4.18
115									27.2736	2.27
120									14.8868	1.24
125									0	0.00

INTENSITY CONVERSION

RAINFALL DATA FROM BOM USING ARR 1987 PROCEDURE
1% AEP (100 Years ARI)

	15 MIN		20 MIN		25 MIN		30 MIN		45 MIN		60 MIN	
	mm/60min	mm/5min	mm/60min	mm/5min	mm/60min	mm/5min	mm/60min	mm/5min	mm/60min	mm/5min	mm/60min	mm/5min
0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
5	181.17	15.10	129.6	10.80	132.3	11.03	129.6	10.80	53.42	4.45	50.05	4.17
10	258.03	21.50	259.2	21.60	191.1	15.93	194.4	16.20	140.11	11.68	84.97	7.08
15	109.8	9.15	194.4	16.20	257.25	21.44	243	20.25	234.86	19.57	187.4	15.62
20	0	0.00	64.8	5.40	80.85	6.74	81	6.75	178.42	14.87	135.02	11.25
25	0	0.00	0	0.00	73.5	6.13	97.2	8.10	98.78	8.23	252.59	21.05
30	0	0.00	0	0.00	0	0.00	64.8	5.40	117.94	9.83	116.4	9.70
35	0	0.00	0	0.00	0	0.00	0	0.00	79.63	6.64	104.76	8.73
40	0	0.00	0	0.00	0	0.00	0	0.00	65.52	5.46	69.84	5.82
45	0	0.00	0	0.00	0	0.00	0	0.00	39.31	3.28	60.53	5.04
50	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	40.74	3.40
55	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	34.92	2.91
60	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	26.77	2.23
65	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
70	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
75	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
80	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
85	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
90	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
95	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
100	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
105	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
110	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
115	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
120	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

RAINFALL DATA FROM BOM, USING DRAINS SOFTWARE, FOR 1% AEP STORM EVENT

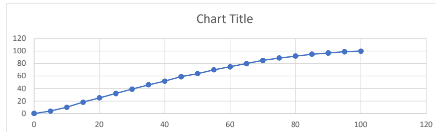
TIME (MIN)	ARR2019 mm/hour	ARR1987 mm/hour
0	0	0
5	36.23	50.05
10	57.11	84.97
15	62.28	187.40
20	67.46	135.02
25	77.90	252.59
30	103.77	116.40
35	119.39	104.76
40	114.21	69.84
45	114.21	60.53
50	51.93	40.74
55	46.75	34.92
60	25.97	26.77
65	0.00	0.00

PMP (GSDM METHOD) RAINFALL DISTRIBUTION CALCULATION TO 5 MIN INTERVAL IN MM/5MIN FOR HECRAS AND MM/HR FOR DRAINS

Table 1: **Design Temporal Distribution of Short Duration PMP**

% OF TIME	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
% OF PMP	0	4	10	18	25	32	39	46	52	59	64	70	75	80	85	89	92	95	97	99	100

DURATION (minutes)	100% PMP (mm)	Average(mm/hr)
15	175	700
30	252	504
45	322	429
60	399	399
90	448	299
120	497	249
150	532	213
180	567	189



FOR HEC RAS 5 MIN DURATION= 15 min, PMP = 175

	%of time	x1	y1	x2	y2	% of PMP	Rain(mm)	mm/hr		
0	0.0					0	0.00	0.00		
5	33.3	30	39	35	46	43.66667	76.42	917.00	0	917.00
10	66.7	65	80	70	85	81.66667	66.50	798.00	5	798.00
15	100.0					100	32.08	385.00	10	385.00
20							0.00	0.00		
						check	175			

FOR HEC RAS 5 MIN DURATION= 30 min, PMP = 252

	%of time	x1	y1	x2	y2	% of PMP	Rain(mm)	mm/hr		
0	0.0					0	0.00	0.00		
5	16.7	15	18	20	25	20.33333	51.24	614.88	0	614.88
10	33.3	30	39	35	46	43.66667	58.80	705.60	5	705.60
15	50.0	50	64	55	70	64	51.24	614.88	10	614.88
20	66.7	65	80	70	85	81.66667	44.52	534.24	15	534.24
25	83.3	80	92	85	95	94	31.08	372.96	20	372.96
30	100.0					100	15.12	181.44	25	181.44
35							0.00	0.00		
						check	252			

FOR HEC RAS 5 MIN DURATION= 45 min, PMP = 322

	%of time	x1	y1	x2	y2	% of PMP	Rain(mm)	mm/hr		
0	0.0					0	0.00	0.00		
5	11.1	10	10	15	18	11.77778	37.92	455.09	0	455.09
10	22.2	20	25	25	32	28.11111	52.59	631.12	5	631.12
15	33.3	30	39	35	46	43.66667	50.09	601.07	10	601.07
20	44.4	40	52	45	59	58.22222	46.87	562.43	15	562.43
25	55.6	55	70	60	75	70.55556	39.71	476.56	20	476.56
30	66.7	65	80	70	85	81.66667	35.78	429.33	25	429.33
35	77.8	75	89	80	92	90.66667	28.98	347.76	30	347.76
40	88.9	85	95	90	97	96.55556	18.96	227.55	35	227.55
45	100.0					100	11.09	133.09	40	133.09
50							0.00	0.00		
						check	322			

FOR HEC RAS 5 MIN DURATION= 60 min, PMP = 399

	%of time	x1	y1	x2	y2	% of PMP	Rain(mm)	mm/hr		
0	0.0					0	0.00	0.00		
5	8.3	5	4	10	10	8	31.92	383.04	0	383.04
10	16.7	15	18	20	25	20.33333	49.21	590.52	5	590.52
15	25.0	25	32	30	39	32	46.55	558.60	10	558.60
20	33.3	30	39	35	46	43.66667	46.55	558.60	15	558.60
25	41.7	40	52	45	59	54.33333	42.56	510.72	20	510.72
30	50.0	50	64	55	70	64	38.57	462.84	25	462.84
35	58.3	55	70	60	75	73.33333	37.24	446.88	30	446.88
40	66.7	65	80	70	85	81.66667	33.25	399.00	35	399.00
45	75.0	75	89	80	92	89	29.26	351.12	40	351.12
50	83.3	80	92	85	95	94	19.95	239.40	45	239.40
55	91.7	90	97	95	99	97.66667	14.63	175.56	50	175.56
60	100.0					100	9.31	111.72	55	111.72
65							0.00	0.00		
						check	399			

FOR HEC RAS 5 MIN DURATION= 90 min, PMP = 448

	%of time	x1	y1	x2	y2	% of PMP	Rain(mm)	mm/hr		
0	0.0					0	0.00	0.00		
5	5.6	5	4	10	10	4.666667	20.91	250.88	0	250.88
10	11.1	10	10	15	18	11.77778	31.86	382.29	5	382.29
15	16.7	15	18	20	25	20.33333	38.33	459.95	10	459.95
20	22.2	20	25	25	32	28.11111	34.84	418.13	15	418.13
25	27.8	25	32	30	39	35.88889	34.84	418.13	20	418.13
30	33.3	30	39	35	46	43.66667	34.84	418.13	25	418.13
35	38.9	35	46	40	52	50.66667	31.36	376.32	30	376.32
40	44.4	40	52	45	59	58.22222	33.85	406.19	35	406.19
45	50.0	50	64	55	70	64	25.88	310.61	40	310.61
50	55.6	55	70	60	75	70.55556	29.37	352.43	45	352.43
55	61.1	60	75	65	80	76.11111	24.89	298.67	50	298.67
60	66.7	65	80	70	85	81.66667	24.89	298.67	55	298.67
65	72.2	70	85	75	89	86.77778	22.90	274.77	60	274.77
70	77.8	75	89	80	92	90.66667	17.42	209.07	65	209.07
75	83.3	80	92	85	95	94	14.93	179.20	70	179.20
80	88.9	85	95	90	97	96.55556	11.45	137.39	75	137.39
85	94.4	90	97	95	99	98.77778	9.96	119.47	80	119.47
90	100.0					100	5.48	65.71	85	65.71
95							0.00	0.00		
100						check	448			

FOR HEC RAS 5 MIN DURATION= 120 min, PMP = 497

	%of time	x1	y1	x2	y2	% of PMP	Rain(mm)	mm/hr		
0	0.0					0	0.00	0.00		
5	4.2	0	0	5	4	3.333333	16.57	198.80	0	198.80
10	8.3	5	4	10	10	8	23.19	278.32	5	278.32
15	12.5	10	10	15	18	14	29.82	357.84	10	357.84
20	16.7	15	18	20	25	20.33333	31.48	377.72	15	377.72
25	20.8	20	25	25	32	26.16667	28.99	347.90	20	347.90
30	25.0	25	32	30	39	32	28.99	347.90	25	347.90
35	29.2	25	32	30	39	37.83333	28.99	347.90	30	347.90
40	33.3	30	39	35	46	43.66667	28.99	347.90	35	347.90
45	37.5	35	46	40	52	49	26.51	318.08	40	318.08
50	41.7	40	52	45	59	54.33333	26.51	318.08	45	318.08
55	45.8	45	59	50	64	59.83333	27.33	328.02	50	328.02
60	50.0	50	64	55	70	64	20.71	248.50	55	248.50
65	54.2	50	64	55	70	69	24.85	298.20	60	298.20
70	58.3	55	70	60	75	73.33333	21.54	258.44	65	258.44
75	62.5	60	75	65	80	77.5	20.71	248.50	70	248.50
80	66.7	65	80	70	85	81.66667	20.71	248.50	75	248.50
85	70.8	70	85	75	89	85.66667	19.88	238.56	80	238.56
90	75.0	75	89	80	92	89	16.57	198.80	85	198.80
95	79.2	75	89	80	92	91.5	12.43	149.10	90	149.10
100	83.3	80	92	85	95	94	12.43	149.10	95	149.10
105	87.5	85	95	90	97	96	9.94	119.28	100	119.28
110	91.7	90	97	95	99	97.66667	8.28	99.40	105	99.40
115	95.8	95	99	100	100	99.16667	7.46	89.46	110	89.46
120	100.0					100	4.14	49.70	115	49.70
125							0.00	0.00		
						check	497			

FOR HEC RAS 5 MIN DURATION= 150 min, PMP = 532

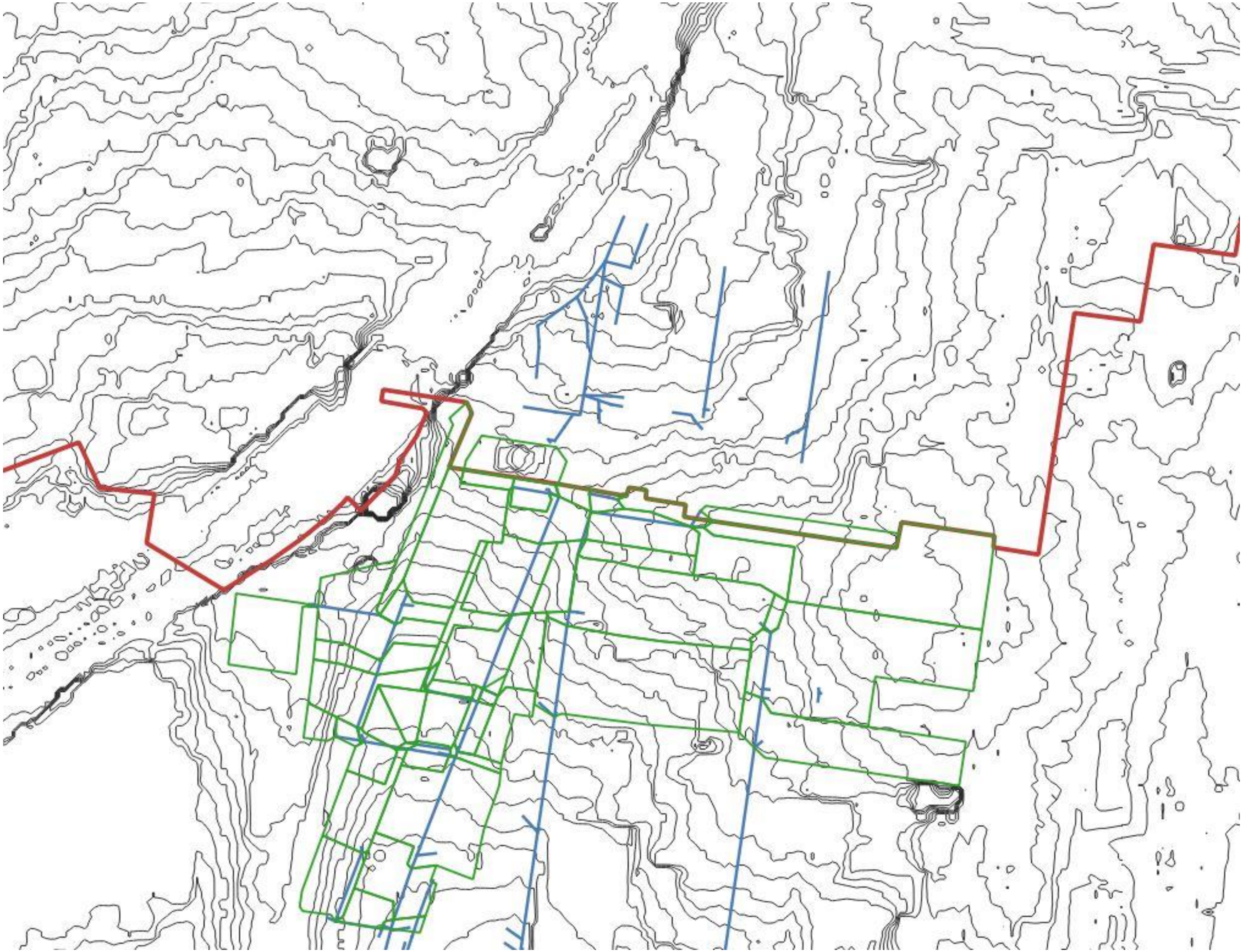
	%of time	x1	y1	x2	y2	% of PMP	Rain(mm)	mm/hr
0	0.0					0	0.00	0.00
5	3.3	0	0	5	4	2.666667	14.19	170.24
10	6.7	5	4	10	10	6	17.73	212.80
15	10.0	10	10	15	18	10	21.28	255.36
20	13.3	10	10	15	18	15.33333	28.37	340.48
25	16.7	15	18	20	25	20.33333	26.60	319.20
30	20.0	20	25	25	32	25	24.83	297.92
35	23.3	20	25	25	32	29.66667	24.83	297.92
40	26.7	25	32	30	39	34.33333	24.83	297.92
45	30.0	30	39	35	46	39	24.83	297.92
50	33.3	30	39	35	46	43.66667	24.83	297.92
55	36.7	35	46	40	52	48	23.05	276.64
60	40.0	40	52	45	59	52	21.28	255.36
65	43.3	40	52	45	59	56.66667	24.83	297.92
70	46.7	45	59	50	64	60.66667	21.28	255.36
75	50.0	50	64	55	70	64	17.73	212.80
80	53.3	50	64	55	70	68	21.28	255.36
85	56.7	55	70	60	75	71.66667	19.51	234.08
90	60.0	60	75	65	80	75	17.73	212.80
95	63.3	60	75	65	80	78.33333	17.73	212.80
100	66.7	65	80	70	85	81.66667	17.73	212.80
105	70.0	70	85	75	89	85	17.73	212.80
110	73.3	70	85	75	89	87.66667	14.19	170.24
115	76.7	75	89	80	92	90	12.41	148.96
120	80.0	80	92	85	95	92	10.64	127.68
125	83.3	80	92	85	95	94	10.64	127.68
130	86.7	85	95	90	97	95.66667	8.87	106.40
135	90.0	90	97	95	99	97	7.09	85.12
140	93.3	90	97	95	99	98.33333	7.09	85.12
145	96.7	95	99	100	100	99.33333	5.32	63.84
150	100.0					100	3.55	42.56
155							0.00	0.00
						check	532	

FOR HEC RAS 5 MIN DURATION= 180 min, PMP = 567

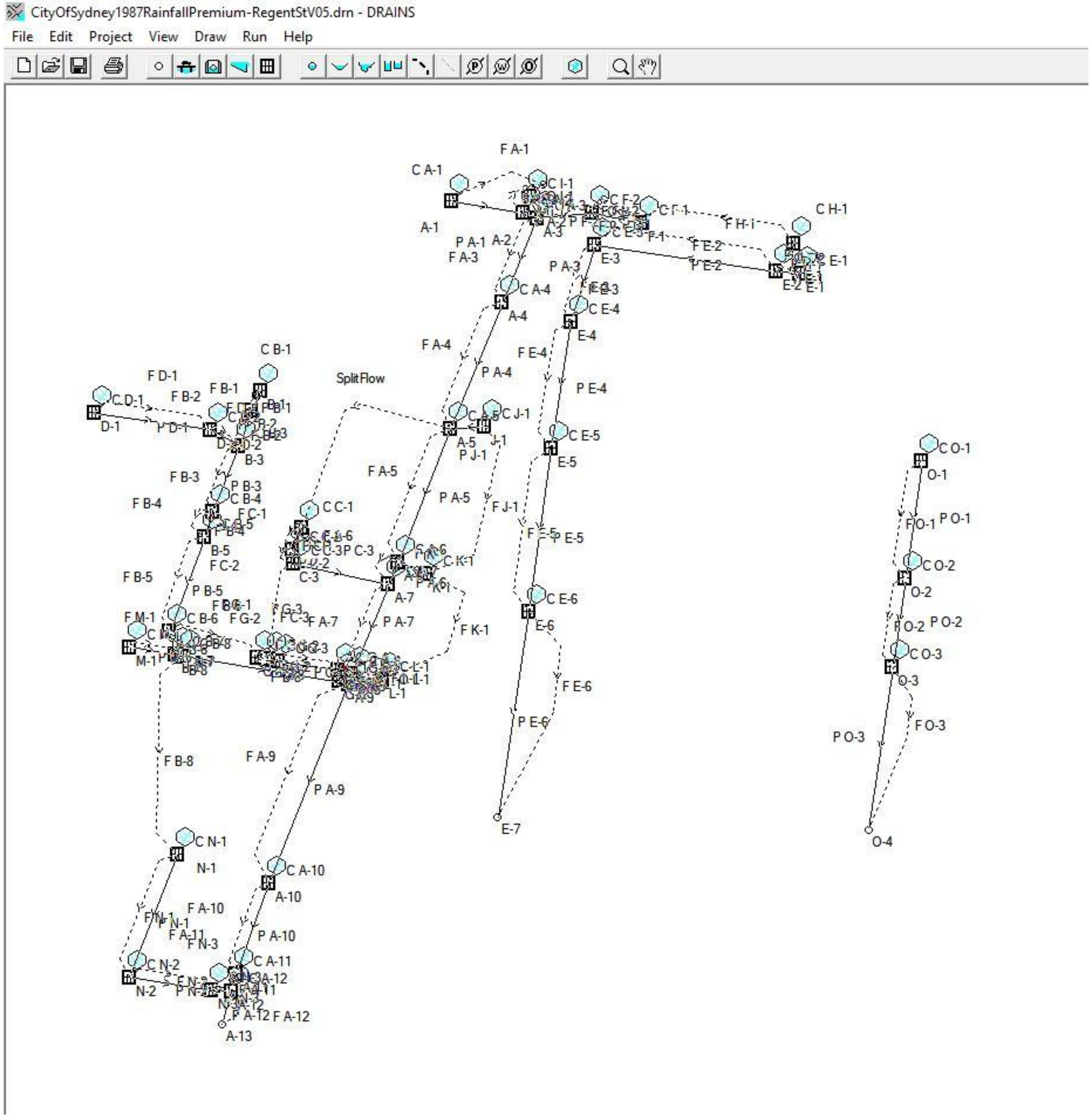
	%of time	x1	y1	x2	y2	% of PMP	Rain(mm)	mm/hr
0	0.0					0	0.00	0.00
5	2.8	0	0	5	4	2.222222	12.60	151.20
10	5.6	5	4	10	10	4.666667	13.86	166.32
15	8.3	5	4	10	10	8	18.90	226.80
20	11.1	10	10	15	18	11.77778	21.42	257.04
25	13.9	10	10	15	18	16.22222	25.20	302.40
30	16.7	15	18	20	25	20.33333	23.31	279.72
35	19.4	15	18	20	25	24.22222	22.05	264.60
40	22.2	20	25	25	32	28.11111	22.05	264.60
45	25.0	25	32	30	39	32	22.05	264.60
50	27.8	25	32	30	39	35.88889	22.05	264.60
55	30.6	30	39	35	46	39.77778	22.05	264.60
60	33.3	30	39	35	46	43.66667	22.05	264.60
65	36.1	35	46	40	52	47.33333	20.79	249.48
70	38.9	35	46	40	52	50.66667	18.90	226.80
75	41.7	40	52	45	59	54.33333	20.79	249.48
80	44.4	40	52	45	59	58.22222	22.05	264.60
85	47.2	45	59	50	64	61.22222	17.01	204.12
90	50.0	50	64	55	70	64	15.75	189.00
95	52.8	50	64	55	70	67.33333	18.90	226.80
100	55.6	55	70	60	75	70.55556	18.27	219.24
105	58.3	55	70	60	75	73.33333	15.75	189.00
110	61.1	60	75	65	80	76.11111	15.75	189.00
115	63.9	60	75	65	80	78.88889	15.75	189.00
120	66.7	65	80	70	85	81.66667	15.75	189.00
125	69.4	65	80	70	85	84.44444	15.75	189.00
130	72.2	70	85	75	89	86.77778	13.23	158.76
135	75.0	75	89	80	92	89	12.60	151.20
140	77.8	75	89	80	92	90.66667	9.45	113.40
145	80.6	80	92	85	95	92.33333	9.45	113.40
150	83.3	80	92	85	95	94	9.45	113.40
155	86.1	85	95	90	97	95.44444	8.19	98.28
160	88.9	85	95	90	97	96.55556	6.30	75.60
165	91.7	90	97	95	99	97.66667	6.30	75.60
170	94.4	90	97	95	99	98.77778	6.30	75.60
175	97.2	95	99	100	100	99.44444	3.78	45.36
180	100.0					100	3.15	37.80
185							0.00	0.00
						check	567	

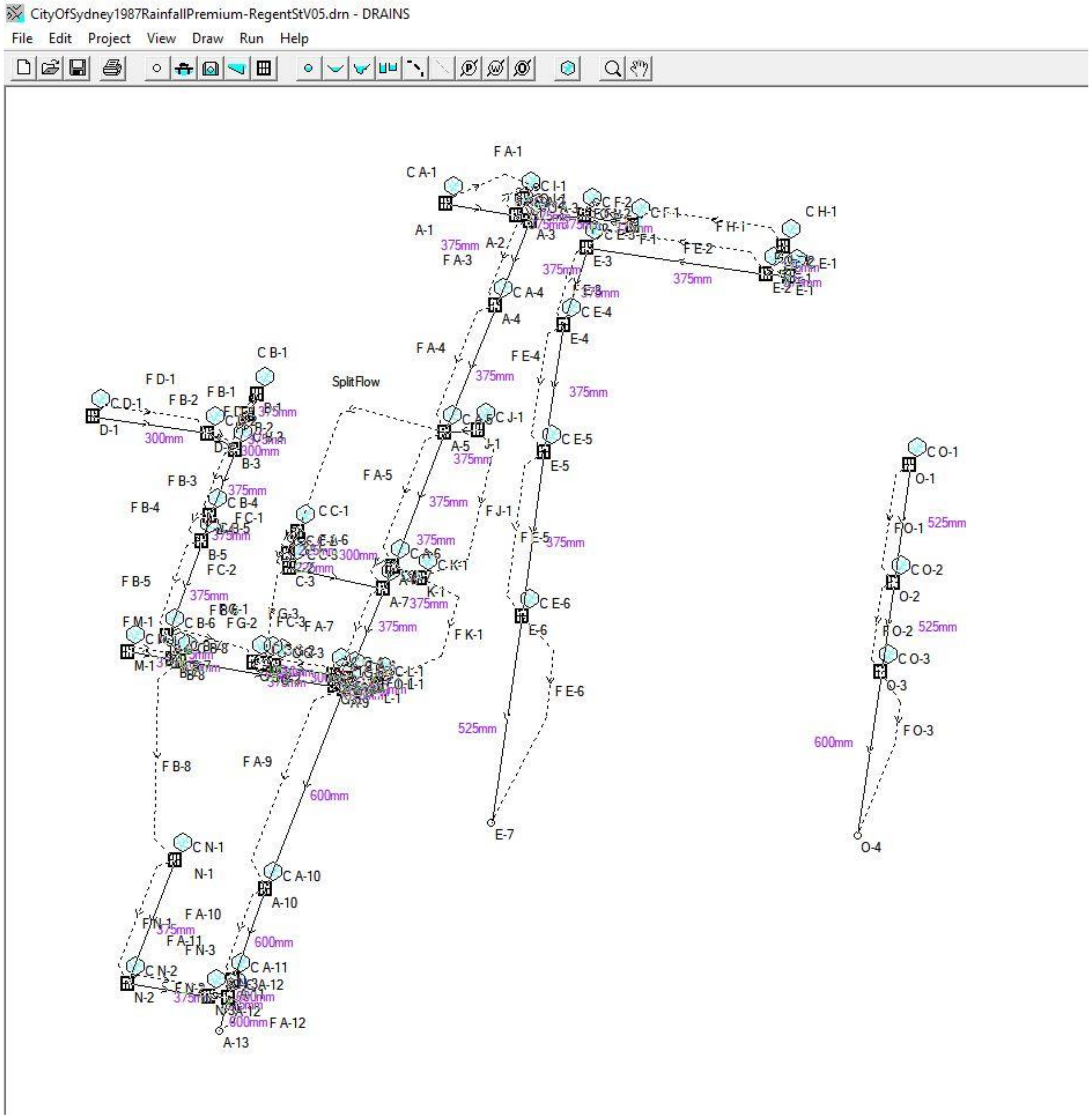
0	170.24
5	212.80
10	255.36
15	340.48
20	319.20
25	297.92
30	297.92
35	297.92
40	297.92
45	297.92
50	276.64
55	255.36
60	297.92
65	255.36
70	212.80
75	255.36
80	234.08
85	212.80
90	212.80
95	212.80
100	212.80
105	170.24
110	148.96
115	127.68
120	127.68
125	106.40
130	85.12
135	85.12
140	63.84
145	42.56

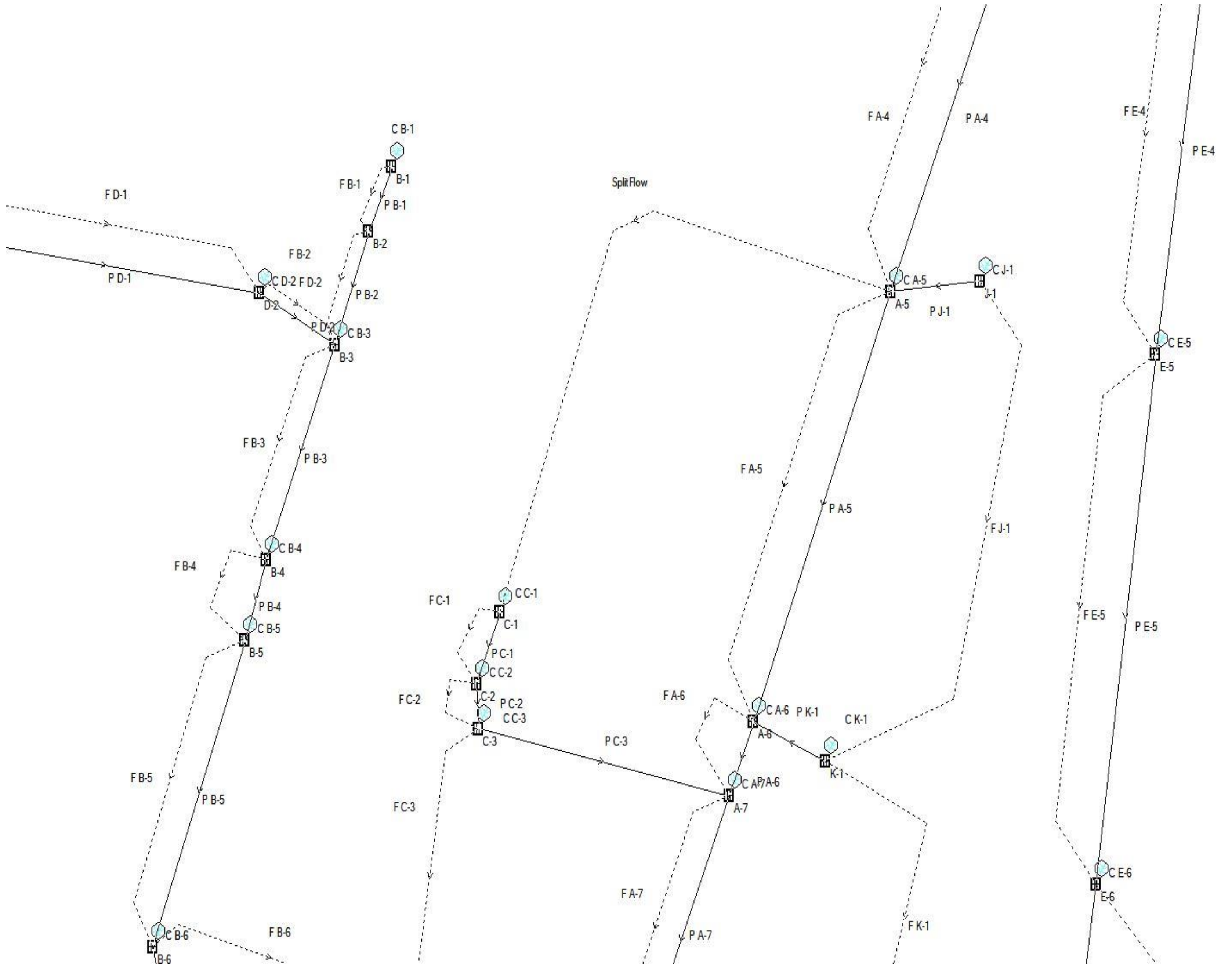
0	151.20
5	166.32
10	226.80
15	257.04
20	302.40
25	279.72
30	264.60
35	264.60
40	264.60
45	264.60
50	264.60
55	264.60
60	249.48
65	226.80
70	249.48
75	264.60
80	204.12
85	189.00
90	226.80
95	219.24
100	189.00
105	189.00
110	189.00
115	189.00
120	189.00
125	158.76
130	151.20
135	113.40
140	113.40
145	113.40
150	98.28
155	75.60
160	75.60
165	75.60
170	45.36
175	37.80



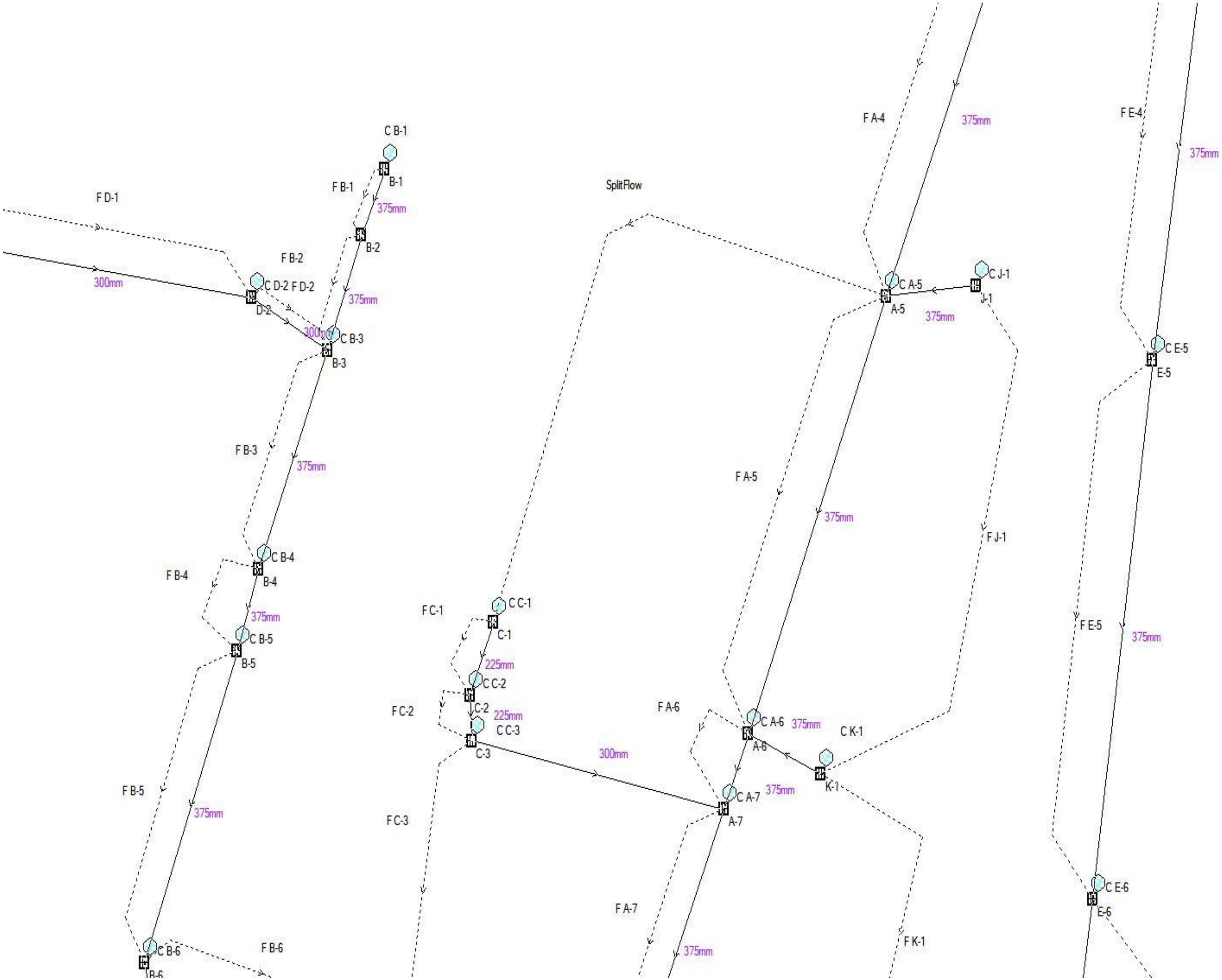
D-1
B-3
E-5
E-6
E-7
D-2
D-3
D-4
N-1
N-2
A-10
A-11
A-13

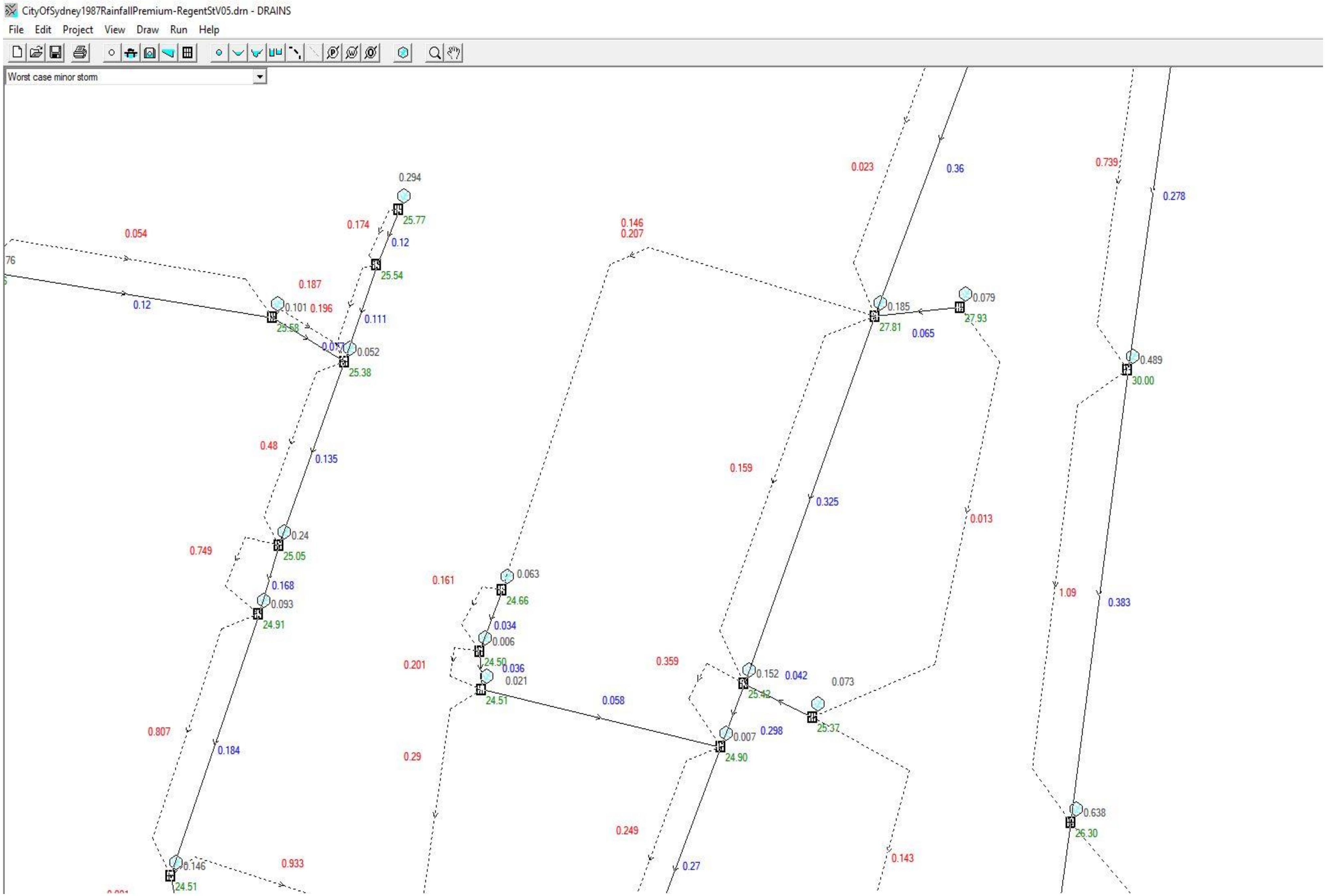

CityOfSydney1987RainfallPremium-RegentStV05.drn - DRAINS
File Edit Project View Draw Run Help
F A-1
C A-1
C H-1
A-1
P A-1
F A-3
E-3
P A-3
C A-4
C E-4
A-4
E-4
F A-4
F E-4
P A-4
P E-4
C B-1
F D-1
F B-2
F B-1
SplitFlow
D-1
P D-1
C J-1
J-1
P J-1
C E-5
E-5
B-3
F B-3
F A-5
P B-3
C B-4
F B-4
C C-1
P A-5
F J-1
F C-1
P E-5
B-5
F C-2
C K-1
F B-5
C-3
P B-5
C E-6
E-6
F M-1
C B-6
F G-2
F A-7
P A-7
F K-1
M-1
L-1
F E-6
P E-6
F B-8
F A-9
P A-9
E-7
C O-1
O-1
P O-1
C O-2
O-2
P O-2
C O-3
O-3
F O-3
P O-3
O-4
C N-1
N-1
C A-10
A-10
F A-10
P A-10
C A-11
C N-2
N-2
F A-12
A-13

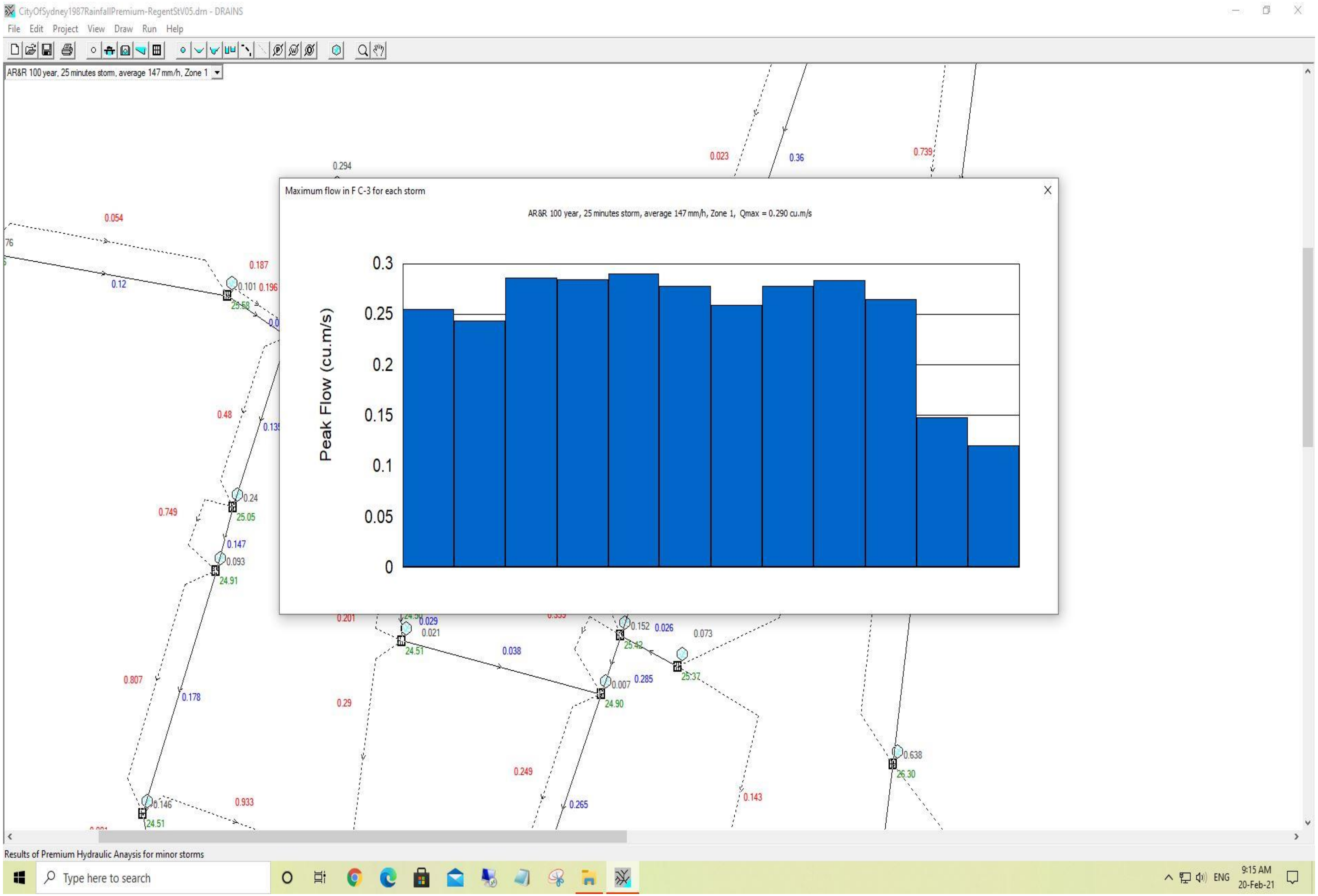

CityOfSydney1987RainfallPremium-RegentStV05.drn - DRAINS
File Edit Project View Draw Run Help
F A-1
C A-1
C H-1
F H-1
A-1
375mm
A-2
F A-3
F E-2
E-3
375mm
C A-4
A-4
C E-4
E-4
F A-4
F E-4
375mm
375mm
C B-1
F D-1
F B-2
F B-1
SplitFlow
C D-1
D-1
300mm
C J-1
C E-5
E-5
B-3
F B-3
F A-5
375mm
F B-4
C B-4
C C-1
F C-1
F J-1
B-5
F C-2
C-3
F B-5
375mm
A-7
F K-1
C E-6
E-6
F M-1
C B-6
F G-2
F A-7
M-1
F E-6
F B-8
F A-9
525mm
600mm
C N-1
N-1
C A-10
A-10
E-7
F A-10
600mm
C N-2
N-2
C A-11
F A-12
A-13
C O-1
O-1
F O-1
525mm
C O-2
O-2
F O-2
525mm
C O-3
O-3
F O-3
600mm
O-4

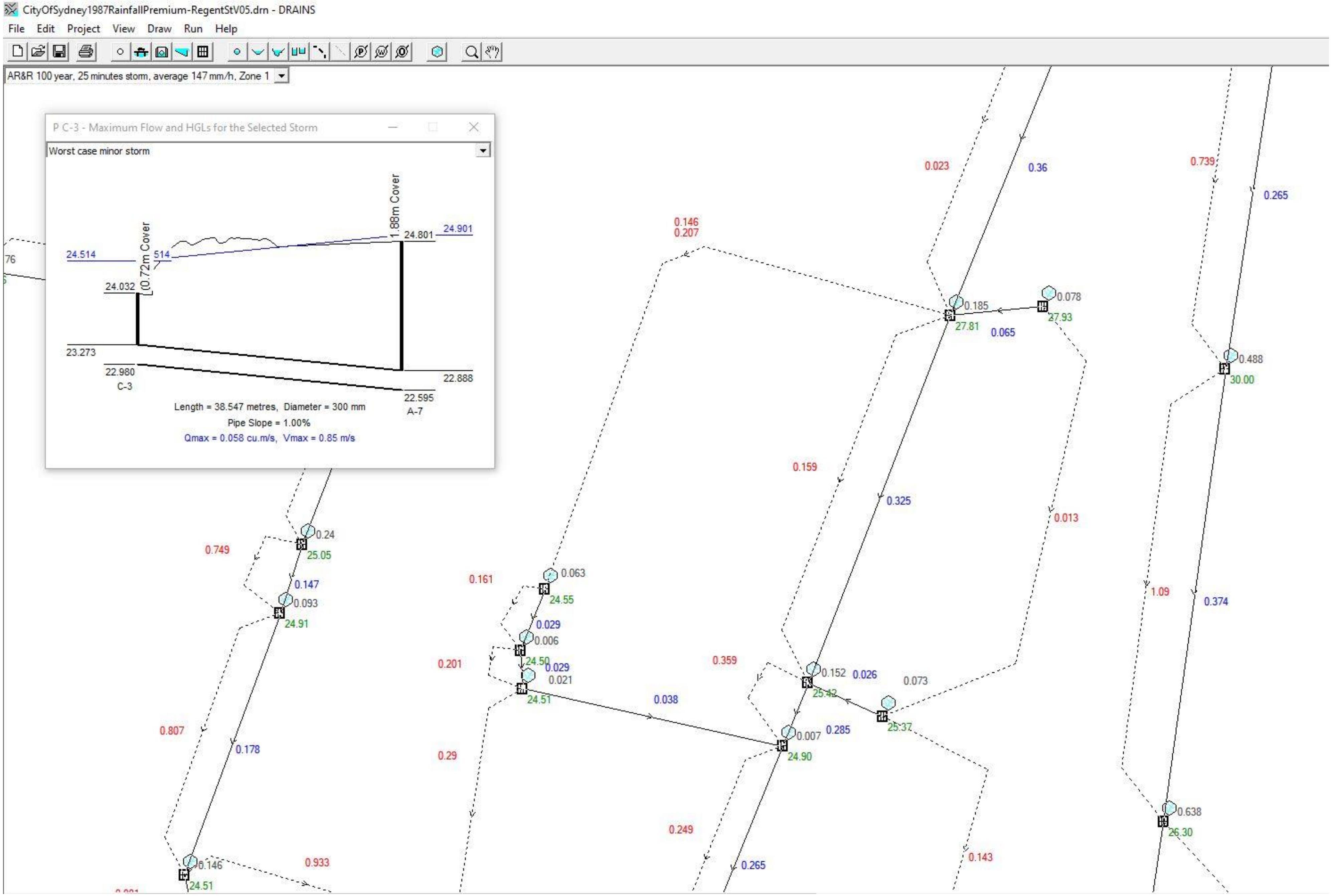


F D-1
P D-1
C D-2
F D-2
D-2
P D-2
C B-1
B-1
F B-1
P B-1
B-2
F B-2
P B-2
C B-3
B-3
F B-3
P B-3
C B-4
B-4
F B-4
P B-4
C B-5
B-5
F B-5
P B-5
C B-6
B-6
F B-6
SplitFlow
C C-1
C-1
F C-1
P C-1
C C-2
C-2
F C-2
P C-2
C C-3
C-3
F C-3
P C-3
F A-4
P A-4
C A-5
A-5
F A-5
P A-5
C J-1
J-1
P J-1
F J-1
F A-6
C A-6
A-6
P K-1
C K-1
K-1
F K-1
C A-7
P A-6
A-7
F A-7
P A-7
F E-4
P E-4
C E-5
E-5
F E-5
P E-5
C E-6
E-6

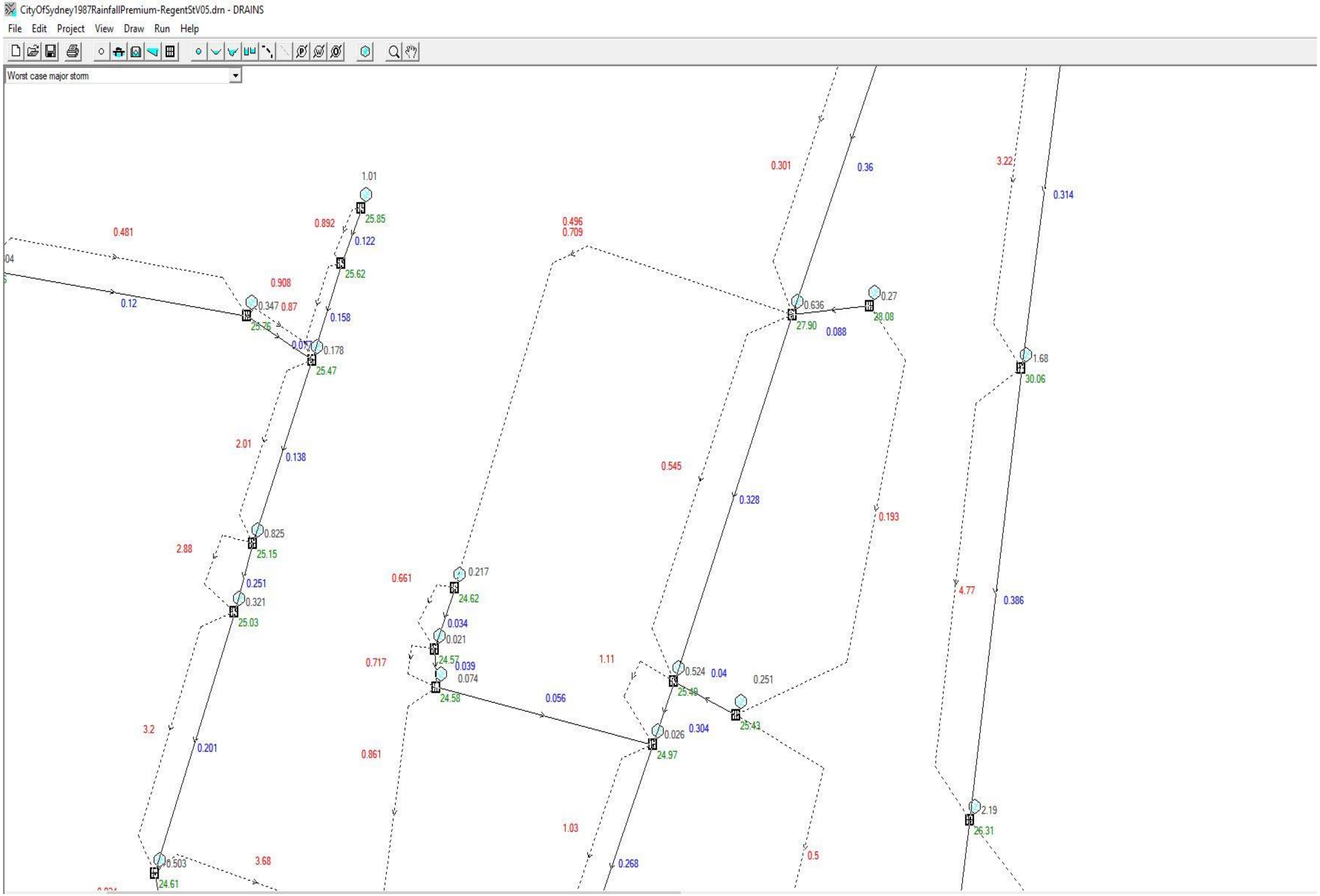

C B-1
B-1
F B-1
375mm
F D-1
B-2
F B-2
300mm
C D-2 F D-2
D-2
375mm
300mm
C B-3
B-3
F B-3
375mm
C B-4
F B-4
B-4
375mm
C B-5
B-5
F B-5
375mm
C B-6
B-6
F B-6
SplitFlow
F A-4
375mm
C A-5
A-5
C J-1
J-1
375mm
F A-5
375mm
F J-1
C C-1
F C-1
C-1
225mm
C C-2
F C-2
C-2
225mm
C C-3
C-3
300mm
F C-3
F A-6
C A-6
375mm
A-6
C K-1
K-1
C A-7
375mm
A-7
F A-7
375mm
F K-1
F E-4
375mm
C E-5
E-5
F E-5
375mm
C E-6
E-6

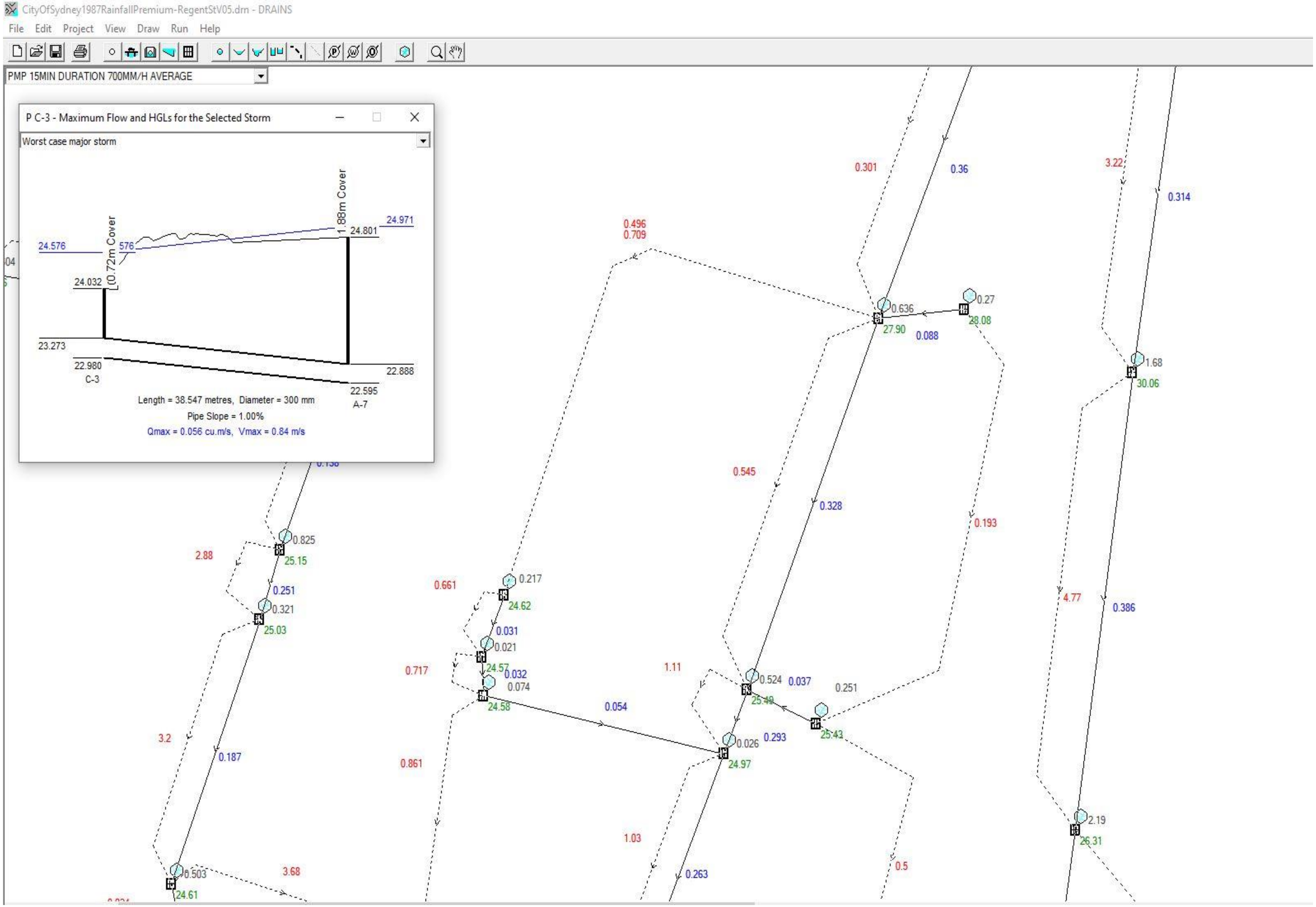

CityOfSydney1987RainfallPremium-RegentStV05.drn - DRAINS
File Edit Project View Draw Run Help
Worst case minor storm
0.294
25.77
0.174
0.12
0.054
25.54
0.187
0.12
0.101
0.196
25.58
0.111
0.052
25.38
0.48
0.135
0.24
25.05
0.749
0.168
0.093
24.91
0.807
0.184
0.146
24.51
0.933
0.146
0.207
0.023
0.36
0.739
0.278
0.185
27.81
0.079
27.93
0.065
0.489
30.00
0.159
0.325
0.013
0.161
0.063
24.66
0.034
0.006
24.50
0.036
0.021
24.51
0.201
0.058
0.359
0.152
0.042
25.42
0.073
25.37
0.007
24.90
0.298
0.29
0.249
0.27
0.143
1.09
0.383
0.638
26.30


CityOfSydney1987RainfallPremium-RegentStV05.drn - DRAINS
File Edit Project View Draw Run Help
AR&R 100 year, 25 minutes storm, average 147 mm/h, Zone 1
Maximum flow in F C-3 for each storm
AR&R 100 year, 25 minutes storm, average 147 mm/h, Zone 1, Qmax = 0.290 cu.m/s
Peak Flow (cu.m/s)
0.3
0.25
0.2
0.15
0.1
0.05
0
Results of Premium Hydraulic Anaysis for minor storms
Type here to search
9:15 AM
20-Feb-21



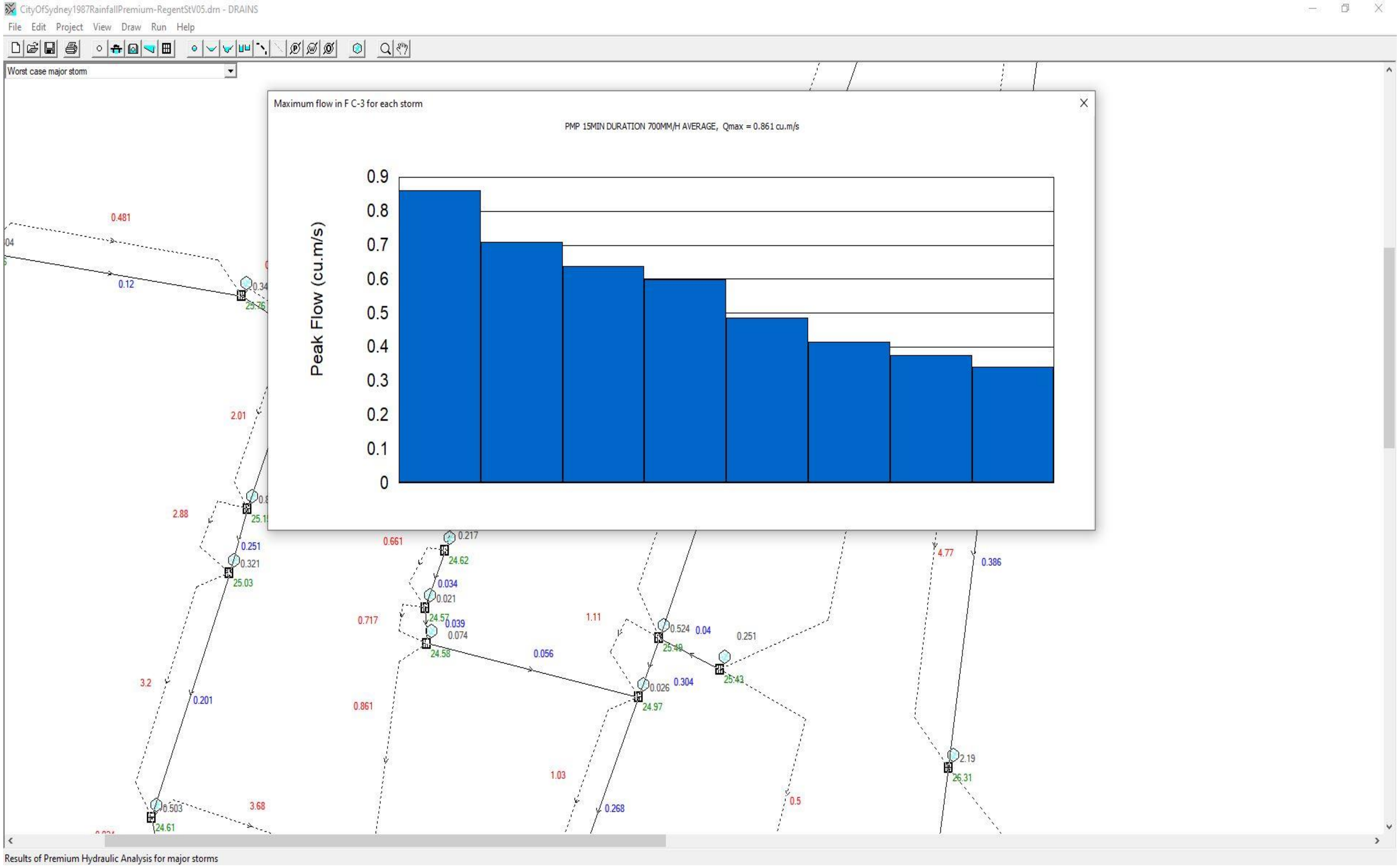
CityOfSydney1987RainfallPremium-RegentStV05.drn - DRAINS
File Edit Project View Draw Run Help
AR&R 100 year, 25 minutes storm, average 147 mm/h, Zone 1
P C-3 - Maximum Flow and HGLs for the Selected Storm
Worst case minor storm
1.88m Cover
0.72m Cover
24.514
24.801
24.901
24.032
23.273
22.980
C-3
22.888
22.595
A-7
Length = 38.547 metres, Diameter = 300 mm
Pipe Slope = 1.00%
Qmax = 0.058 cu.m/s, Vmax = 0.85 m/s
0.023
0.36
0.739
0.265
0.146
0.207
0.185
0.078
27.81
27.93
0.065
0.488
30.00
0.159
0.325
0.013
0.24
25.05
0.749
0.147
0.093
24.91
0.161
0.063
24.55
0.029
0.006
24.50
0.029
0.021
24.51
0.201
0.038
0.359
0.152
0.026
0.073
25.42
25.37
0.007
0.285
24.90
1.09
0.374
0.807
0.178
0.29
0.249
0.143
0.638
26.30
0.146
24.51
0.933
0.265

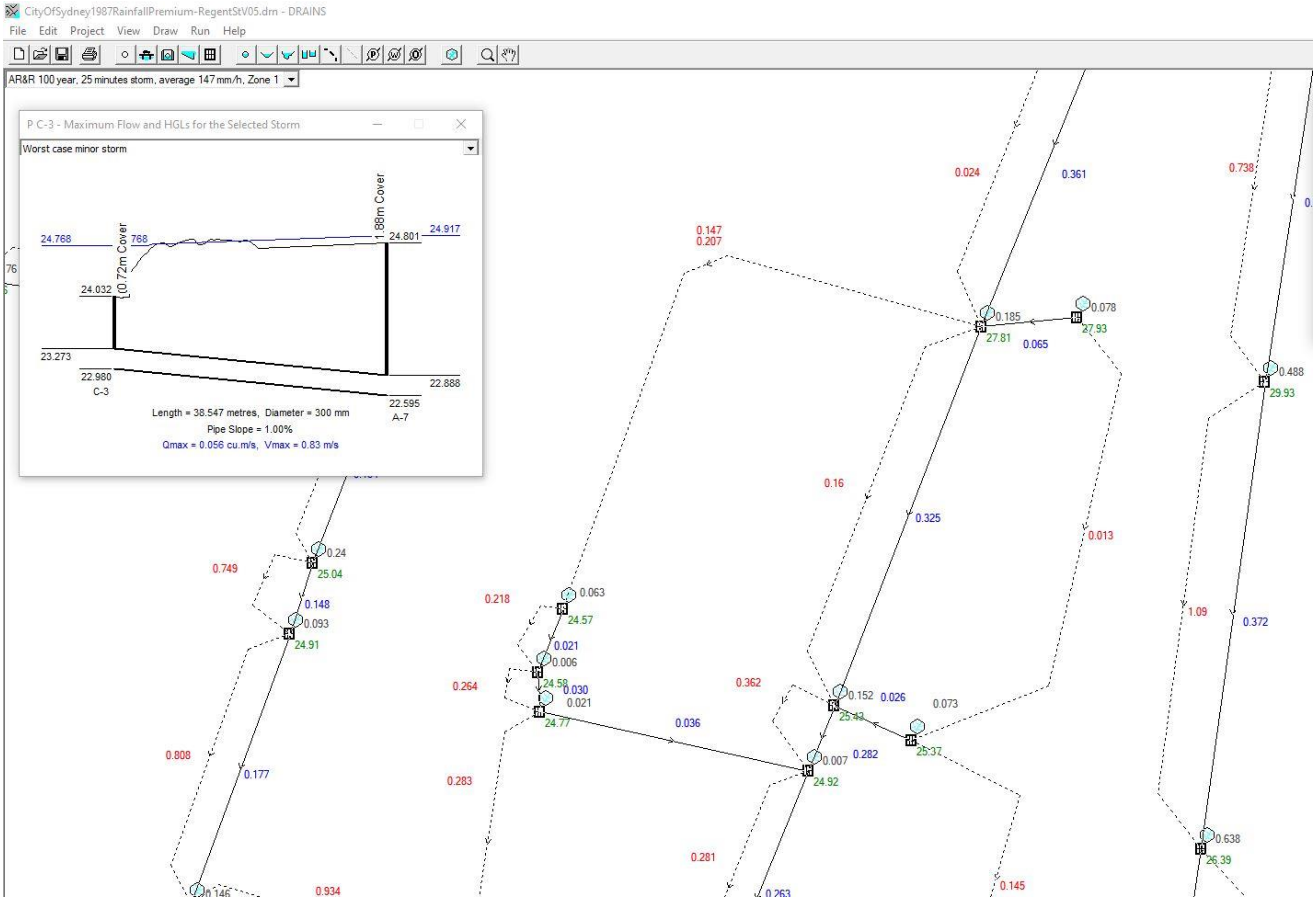

CityOfSydney1987RainfallPremium-RegentStV05.drn - DRAINS
File Edit Project View Draw Run Help
Worst case major storm
1.01
0.892
25.85
0.122
0.481
0.496
0.709
0.301
0.36
3.22
0.314
25.62
0.908
0.12
0.347
0.87
0.158
25.76
0.636
0.27
27.90
28.08
0.088
1.68
30.06
0.178
25.47
2.01
0.138
0.545
0.328
0.193
0.825
25.15
2.88
0.251
0.321
25.03
0.661
0.217
24.62
0.034
0.021
24.57
0.039
0.074
24.58
0.717
4.77
0.386
1.11
0.524
0.04
0.251
25.49
25.43
0.056
0.026
0.304
24.97
3.2
0.201
0.861
2.19
26.31
1.03
0.268
0.5
3.68
0.503
24.61

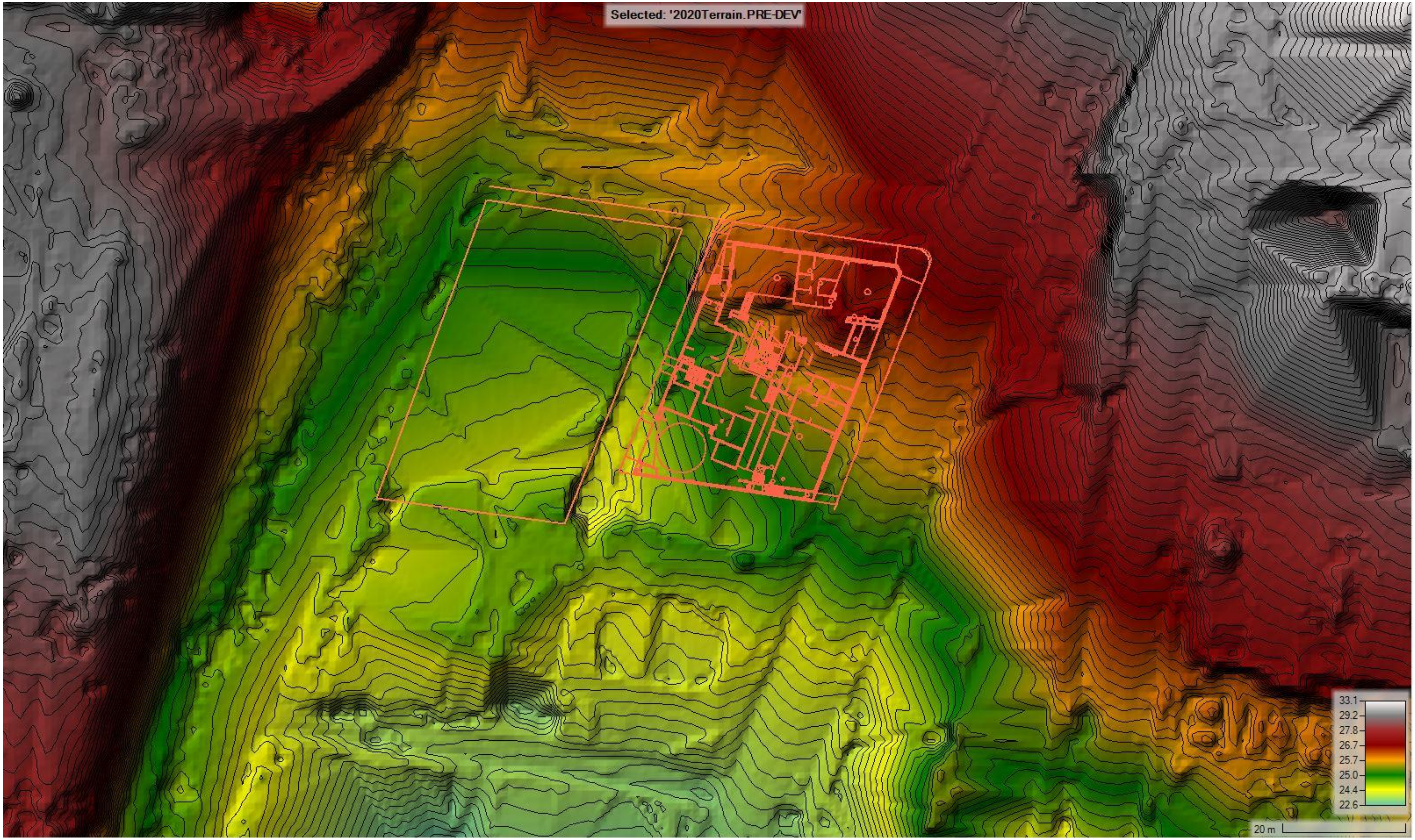


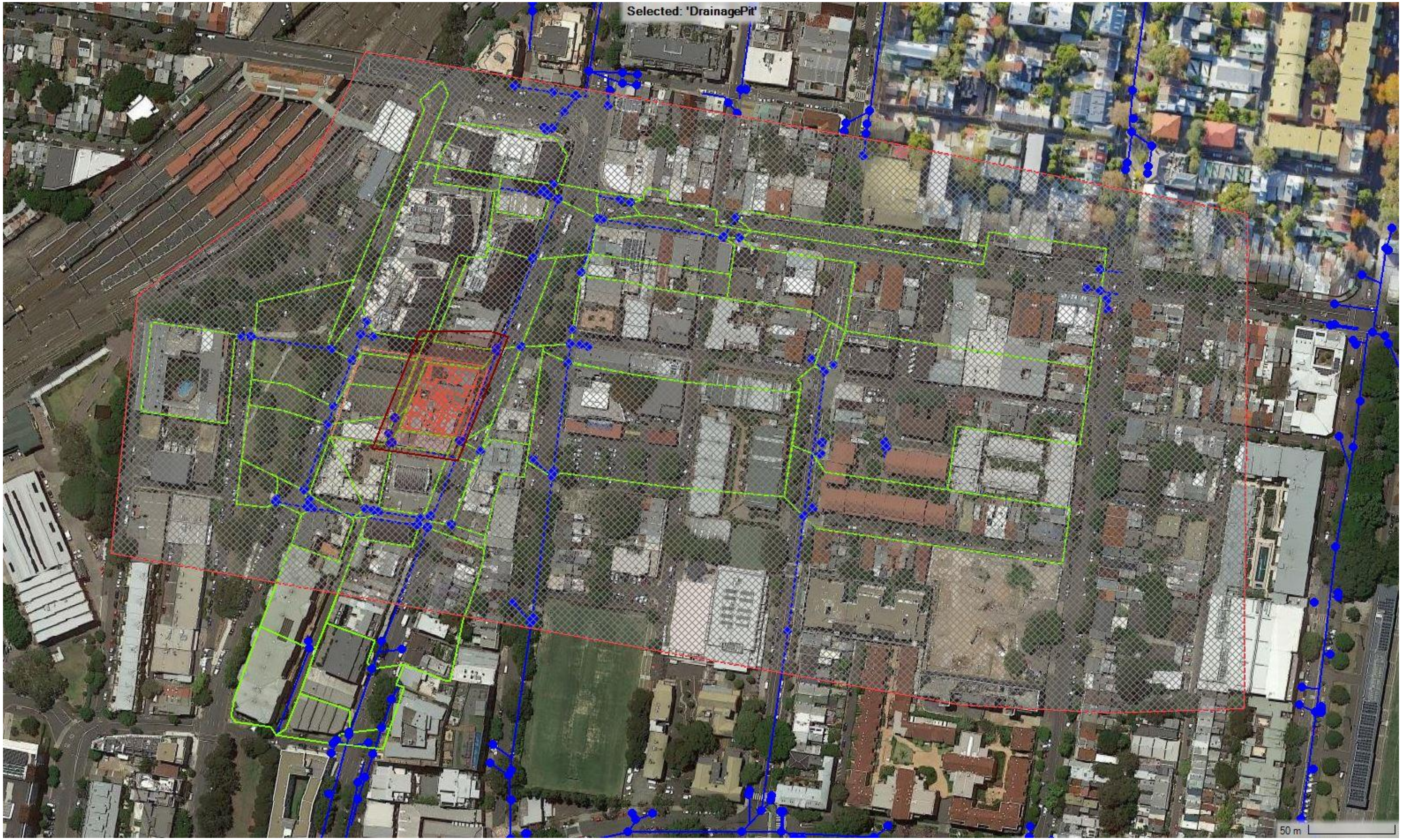
CityOfSydney1987RainfallPremium-RegentStV05.drn - DRAINS
File Edit Project View Draw Run Help
PMP 15MIN DURATION 700MM/H AVERAGE
P C-3 - Maximum Flow and HGLs for the Selected Storm
Worst case major storm
0.72m Cover
1.88m Cover
24.576
24.971
24.801
24.032
23.273
22.980
C-3
22.888
22.595
A-7
Length = 38.547 metres, Diameter = 300 mm
Pipe Slope = 1.00%
Qmax = 0.056 cu.m/s, Vmax = 0.84 m/s

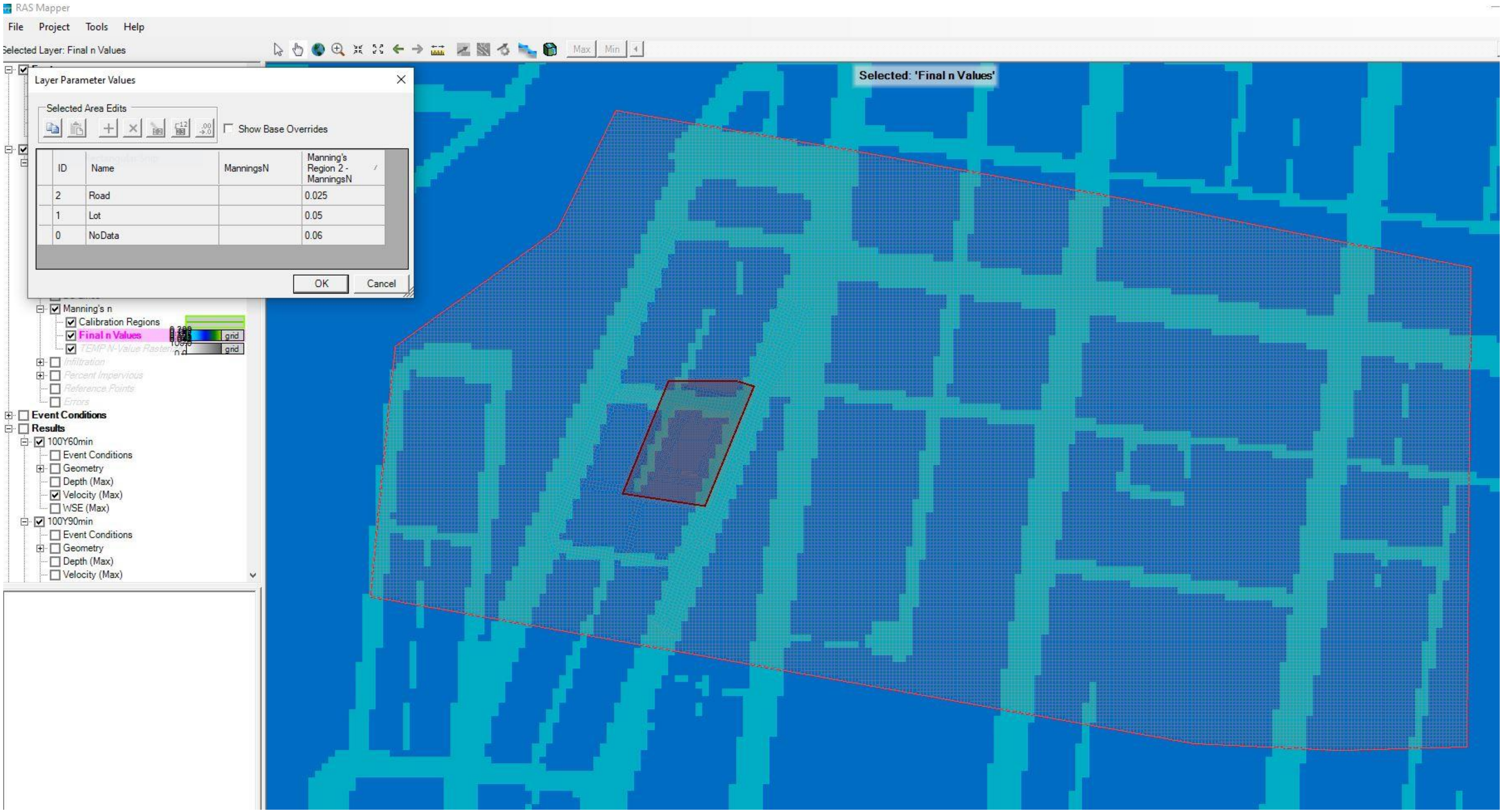
B-1
B-2
D-1
D-2
B-3
A-5
J-1
E-5
B-4
C-1
B-5
C-2
C-3
A-6
K-1
A-7
E-6
B-6
M-1
B-7
B-8
G-1
G-2
G-3
G-4
A-8
L-1
A-9

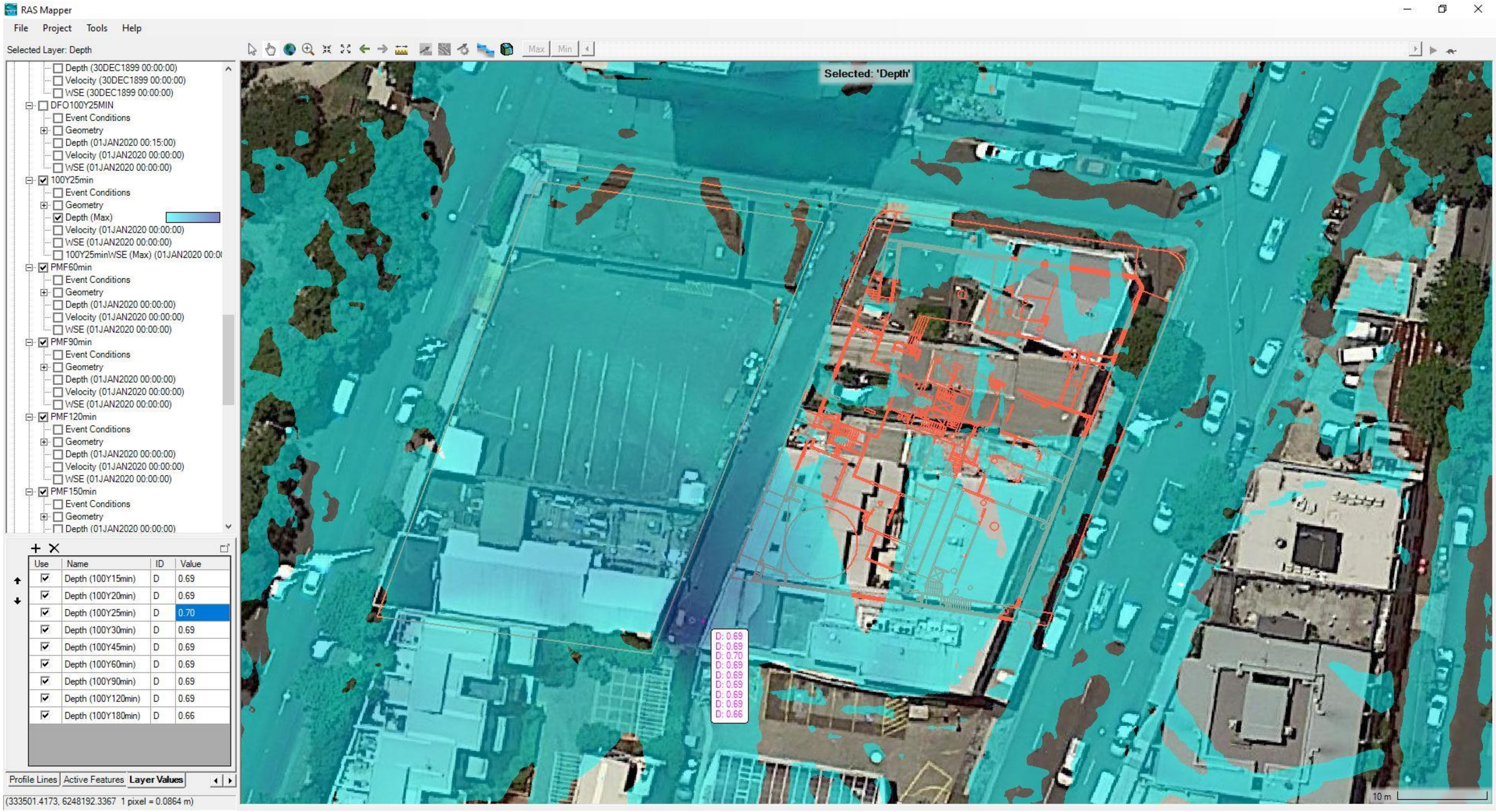

CityOfSydney1987RainfallPremium-RegentStV05.drn - DRAINS
File Edit Project View Draw Run Help
Worst case major storm
Maximum flow in F C-3 for each storm
PMP 15MIN DURATION 700MM/H AVERAGE, Qmax = 0.861 cu.m/s
Peak Flow (cu.m/s)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.481
0.12
2.01
2.88
0.251
0.321
25.03
3.2
0.201
0.503
24.61
3.68
0.661
0.217
24.62
0.034
0.021
24.57
0.039
0.074
24.58
0.717
0.861
0.056
1.11
0.524
0.04
0.251
0.026
0.304
25.43
24.97
1.03
0.268
0.5
4.77
0.386
2.19
26.31
Results of Premium Hydraulic Analysis for major storms

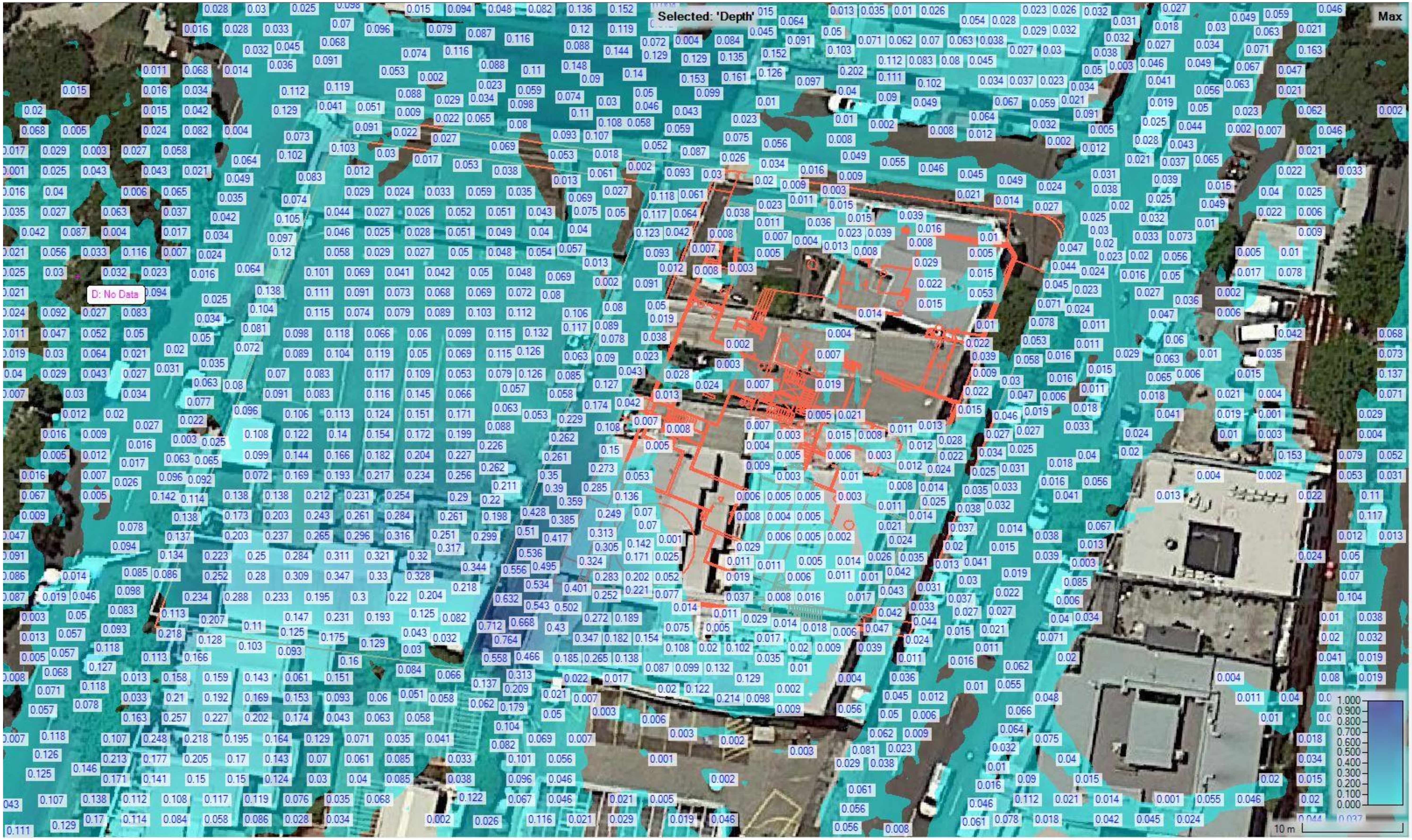

CityOfSydney1987RainfallPremium-RegentStV05.drn - DRAINS
File Edit Project View Draw Run Help
AR&R 100 year, 25 minutes storm, average 147 mm/h, Zone 1
P C-3 - Maximum Flow and HGLs for the Selected Storm
Worst case minor storm
1.88m Cover
0.72m Cover
24.768
24.917
24.801
24.032
23.273
22.980
C-3
22.888
22.595
A-7
Length = 38.547 metres, Diameter = 300 mm
Pipe Slope = 1.00%
Qmax = 0.056 cu.m/s, Vmax = 0.83 m/s
0.024
0.361
0.738
0.147
0.207
0.185
0.078
27.81
27.93
0.065
0.488
29.93
0.16
0.325
0.013
0.24
25.04
0.749
0.148
0.093
24.91
0.218
0.063
24.57
0.021
0.006
0.264
24.58
0.030
0.021
24.77
0.036
0.362
0.152
25.43
0.026
0.073
25.37
0.007
24.92
0.282
1.09
0.372
0.808
0.177
0.283
0.281
0.638
26.39
0.934
0.263
0.145

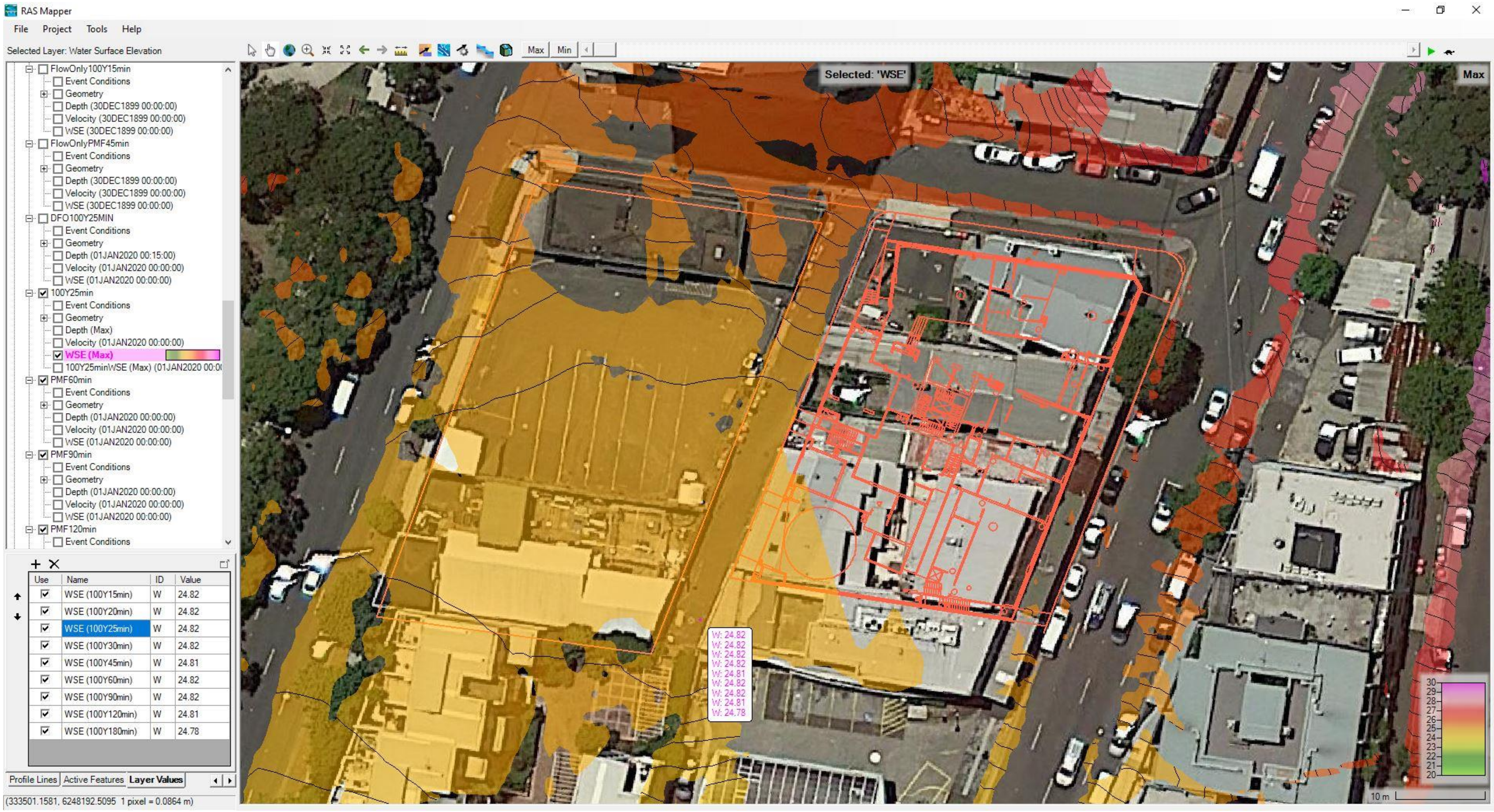

Selected: '2020Terrain.PRE-DEV'
33.1
29.2
27.8
26.7
25.7
25.0
24.4
22.6
20 m

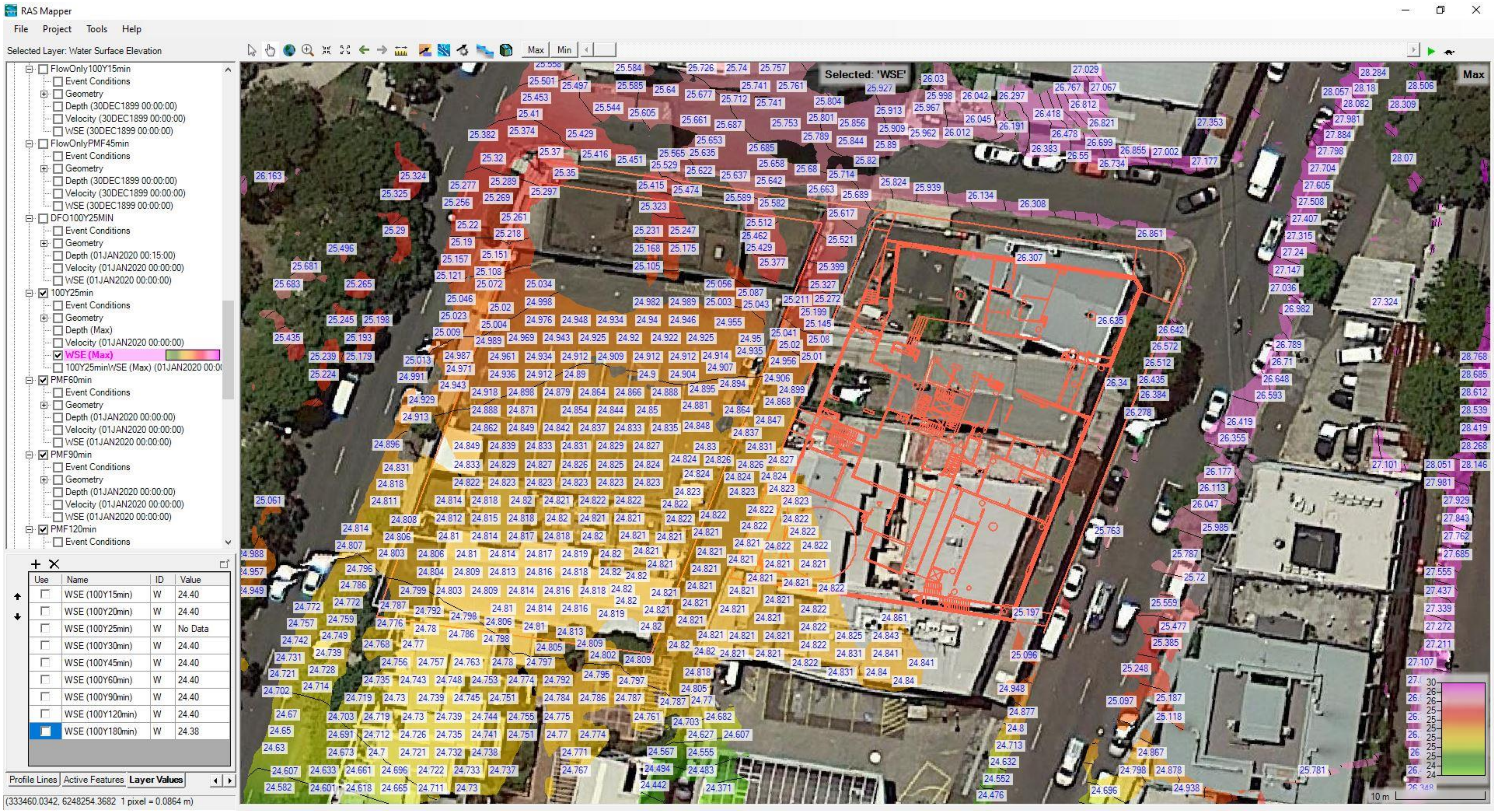

Selected: 'DrainagePit'
50 m

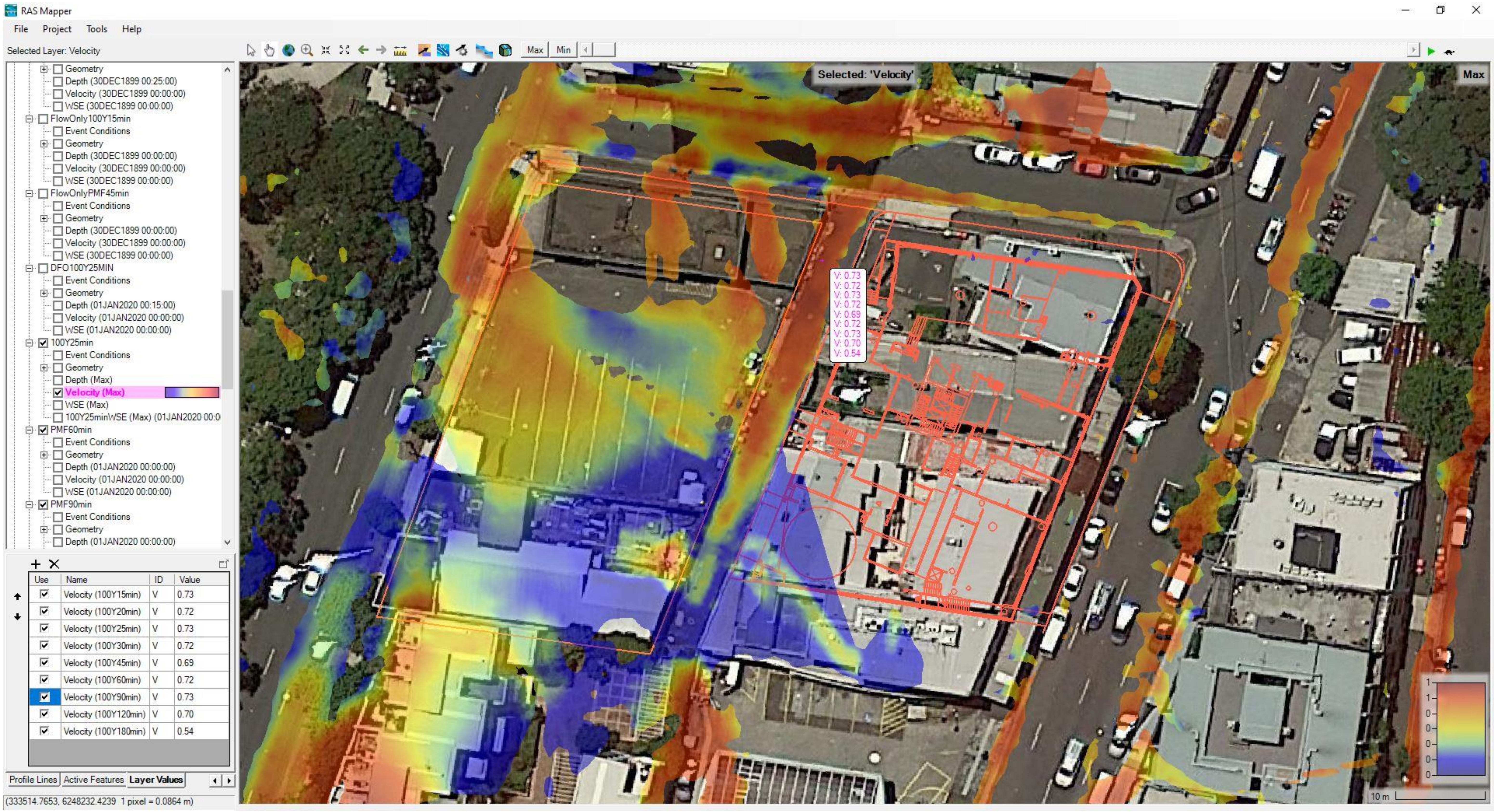

RAS Mapper
File
Project
Tools
Help
Selected Layer: Final n Values
Max
Min
Selected: 'Final n Values'
Layer Parameter Values
Selected Area Edits
Show Base Overrides
ID
Name
ManningsN
Manning's Region 2 - ManningsN
2
Road
0.025
1
Lot
0.05
0
NoData
0.06
OK
Cancel
Manning's n
Calibration Regions
Final n Values
grid
grid
Event Conditions
Results
100Y60min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y90min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)

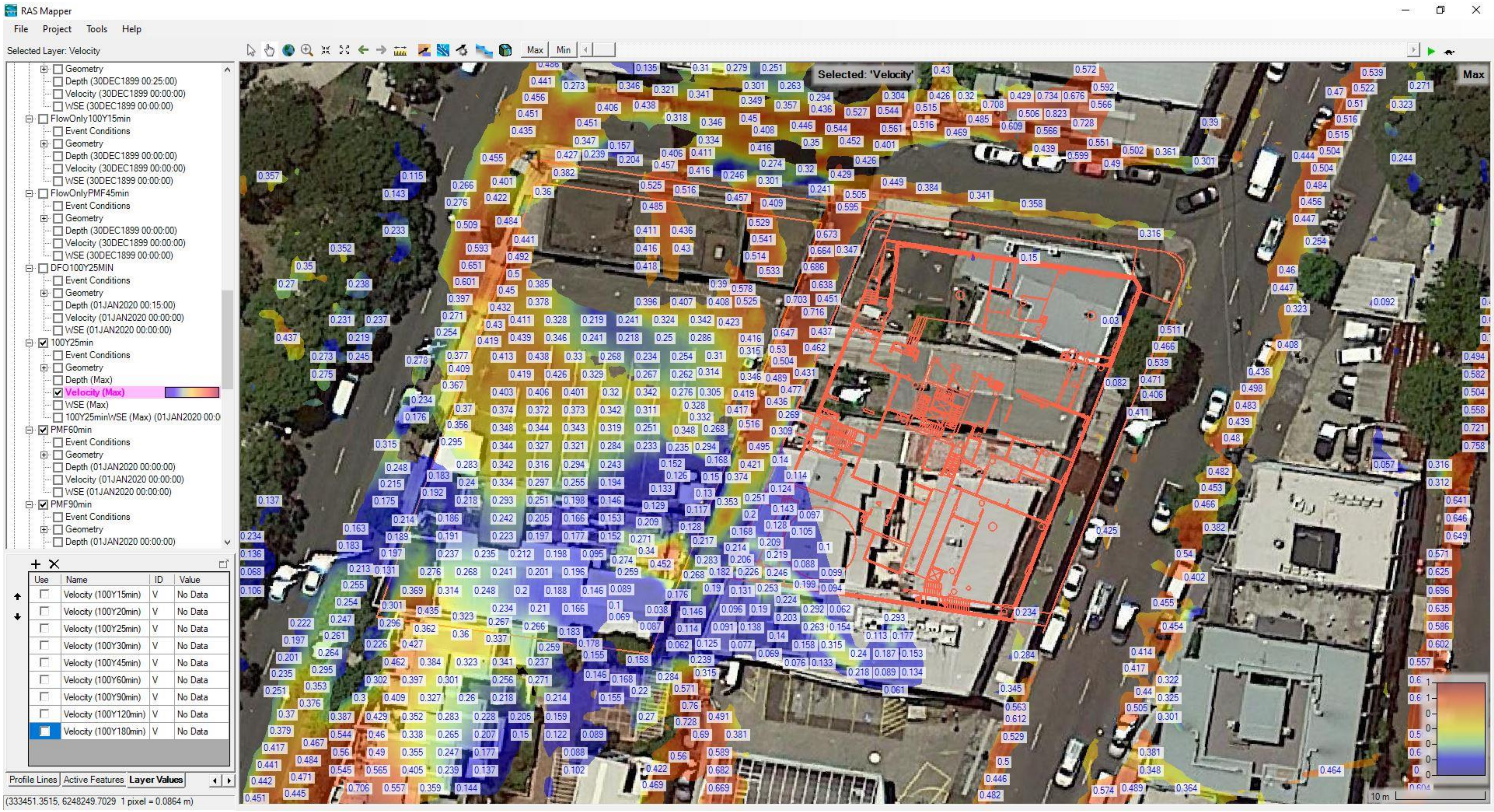

RAS Mapper
File Project Tools Help
Selected Layer: Depth
Max Min
Depth (30DEC1899 00:00:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
DFO100Y25MIN
Event Conditions
Geometry
Depth (01JAN2020 00:15:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y25min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y25minWSE (Max) (01JAN2020 00:0
PMF60min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
PMF90min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
PMF120min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
PMF150min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Use Name ID Value
Depth (100Y15min) D 0.69
Depth (100Y20min) D 0.69
Depth (100Y25min) D 0.70
Depth (100Y30min) D 0.69
Depth (100Y45min) D 0.69
Depth (100Y60min) D 0.69
Depth (100Y90min) D 0.69
Depth (100Y120min) D 0.69
Depth (100Y180min) D 0.66
Profile Lines Active Features Layer Values
(333501.4173, 6248192.3367 1 pixel = 0.0864 m)
Selected: 'Depth'
D: 0.69
D: 0.69
D: 0.70
D: 0.69
D: 0.69
D: 0.69
D: 0.69
D: 0.69
D: 0.66
10 m


Selected: 'Depth'
Max
D: No Data
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
10 m


RAS Mapper
File Project Tools Help
Selected Layer: Water Surface Elevation
Max Min
FlowOnly100Y15min
Event Conditions
Geometry
Depth (30DEC1899 00:00:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
FlowOnlyPMF45min
Event Conditions
Geometry
Depth (30DEC1899 00:00:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
DFO100Y25MIN
Event Conditions
Geometry
Depth (01JAN2020 00:15:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y25min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (Max)
100Y25minWSE (Max) (01JAN2020 00:0
PMF60min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
PMF90min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
PMF120min
Event Conditions
Use Name ID Value
WSE (100Y15min) W 24.82
WSE (100Y20min) W 24.82
WSE (100Y25min) W 24.82
WSE (100Y30min) W 24.82
WSE (100Y45min) W 24.81
WSE (100Y60min) W 24.82
WSE (100Y90min) W 24.82
WSE (100Y120min) W 24.81
WSE (100Y180min) W 24.78
Profile Lines Active Features Layer Values
(333501.1581, 6248192.5095 1 pixel = 0.0864 m)
Selected: 'WSE'
Max
W: 24.82
W: 24.82
W: 24.82
W: 24.82
W: 24.81
W: 24.82
W: 24.82
W: 24.81
W: 24.78
30
29
28
27
26
25
24
23
22
21
20
10 m

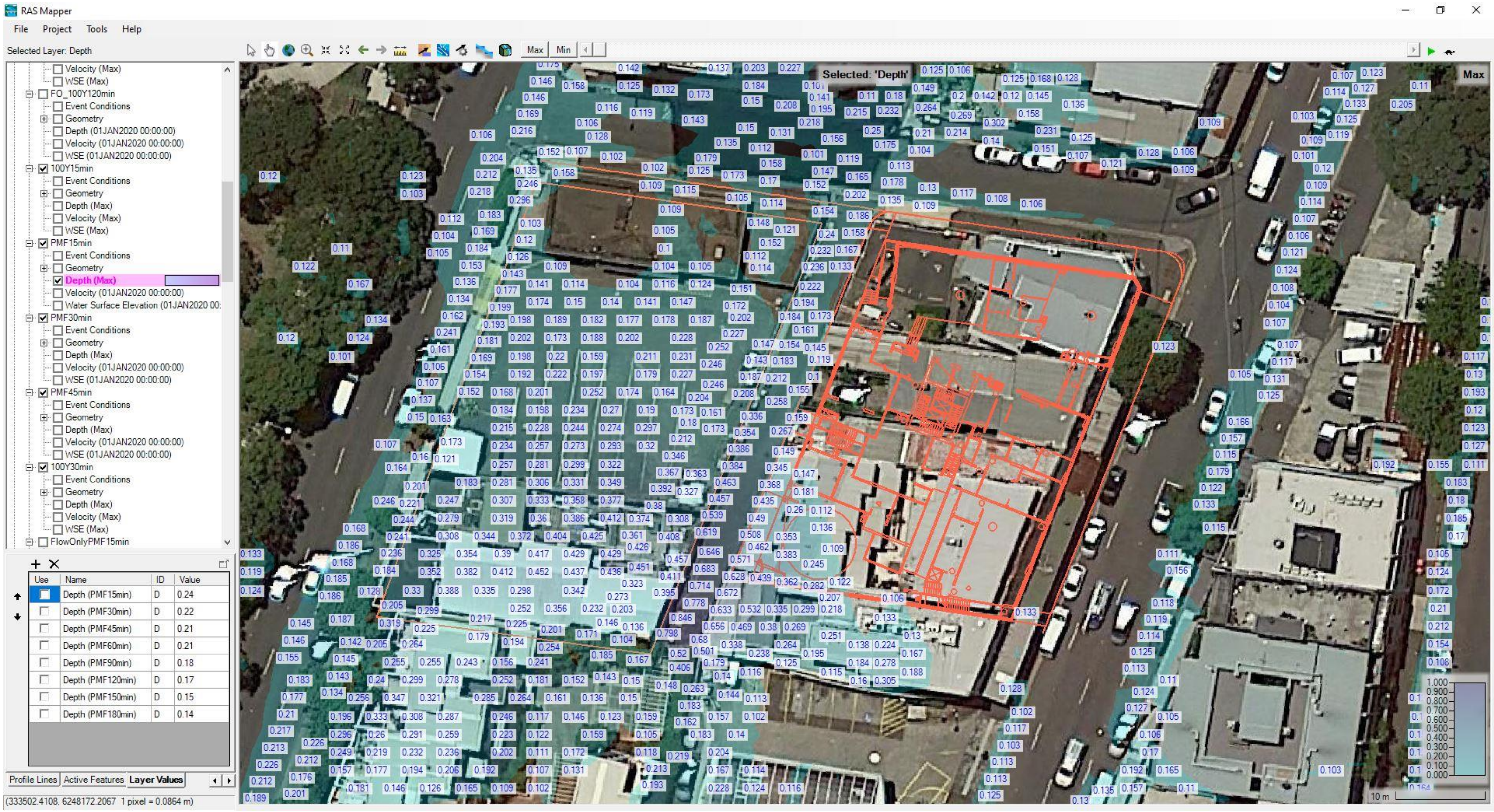

RAS Mapper
File
Project
Tools
Help
Selected Layer: Water Surface Elevation
Max
Min
Selected: 'WSE'
FlowOnly100Y15min
Event Conditions
Geometry
Depth (30DEC1899 00:00:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
FlowOnlyPMF45min
Event Conditions
Geometry
Depth (30DEC1899 00:00:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
DFO100Y25MIN
Event Conditions
Geometry
Depth (01JAN2020 00:15:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y25min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (Max)
100Y25minWSE (Max) (01JAN2020 00:0
PMF60min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
PMF90min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
PMF120min
Event Conditions
Use Name ID Value
WSE (100Y15min) W 24.40
WSE (100Y20min) W 24.40
WSE (100Y25min) W No Data
WSE (100Y30min) W 24.40
WSE (100Y45min) W 24.40
WSE (100Y60min) W 24.40
WSE (100Y90min) W 24.40
WSE (100Y120min) W 24.40
WSE (100Y180min) W 24.38
Profile Lines
Active Features
Layer Values
(333460.0342, 6248254.3682 1 pixel = 0.0864 m)
10 m


RAS Mapper
File Project Tools Help
Selected Layer: Velocity
Max Min
Geometry
Depth (30DEC1899 00:25:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
FlowOnly100Y15min
Event Conditions
Geometry
Depth (30DEC1899 00:00:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
FlowOnlyPMF45min
Event Conditions
Geometry
Depth (30DEC1899 00:00:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
DFO100Y25MIN
Event Conditions
Geometry
Depth (01JAN2020 00:15:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y25min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y25minWSE (Max) (01JAN2020 00:0
PMF60min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
PMF90min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Use Name ID Value
Velocity (100Y15min) V 0.73
Velocity (100Y20min) V 0.72
Velocity (100Y25min) V 0.73
Velocity (100Y30min) V 0.72
Velocity (100Y45min) V 0.69
Velocity (100Y60min) V 0.72
Velocity (100Y90min) V 0.73
Velocity (100Y120min) V 0.70
Velocity (100Y180min) V 0.54
Profile Lines Active Features Layer Values
(333514.7653, 6248232.4239 1 pixel = 0.0864 m)
Selected: 'Velocity'
Max
V: 0.73
V: 0.72
V: 0.73
V: 0.72
V: 0.69
V: 0.72
V: 0.73
V: 0.70
V: 0.54
10 m

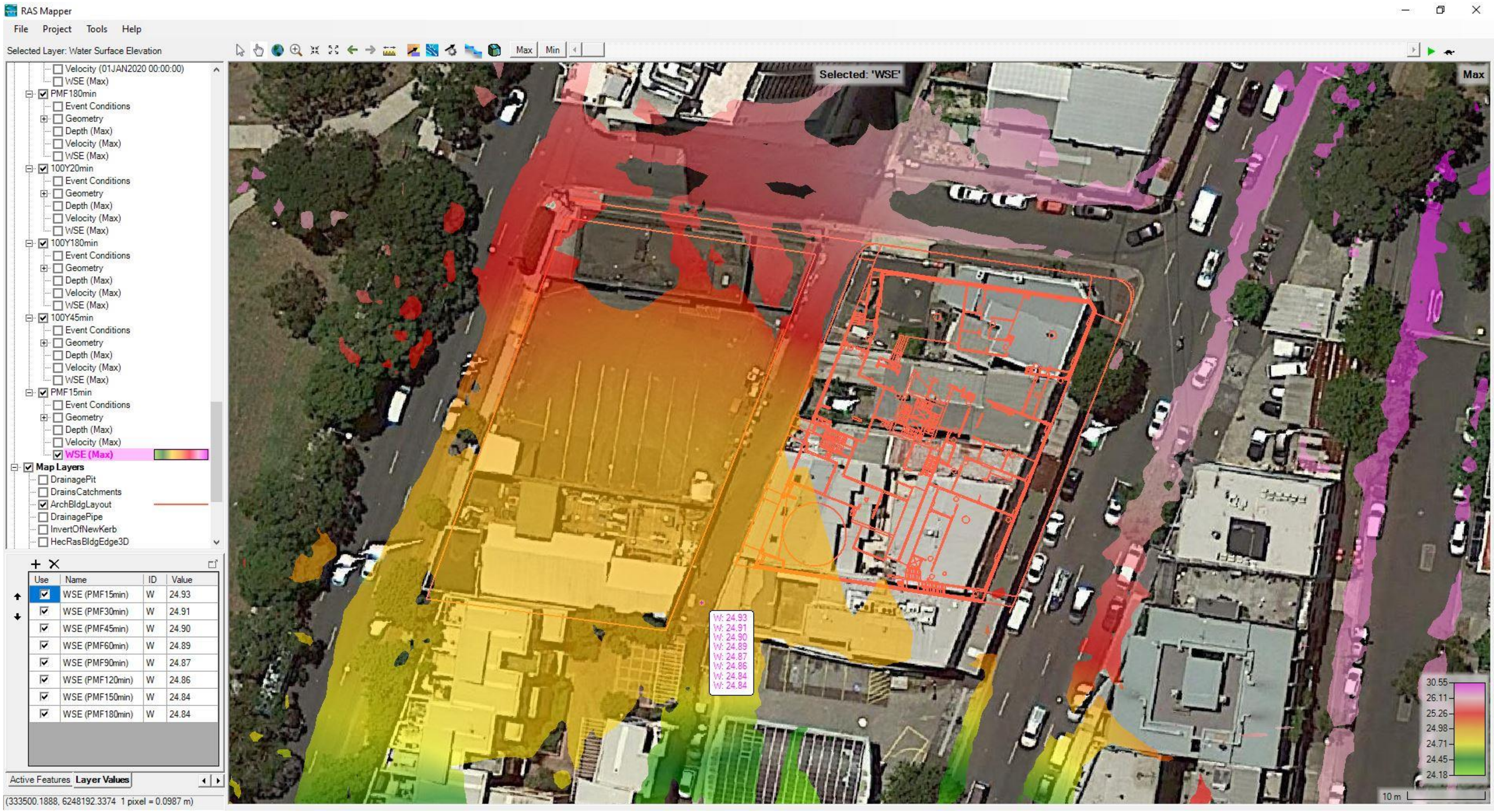


RAS Mapper
File Project Tools Help
Selected Layer: Velocity
Max Min
Geometry
Depth (30DEC1899 00:25:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
FlowOnly100Y15min
Event Conditions
Geometry
Depth (30DEC1899 00:00:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
FlowOnlyPMF45min
Event Conditions
Geometry
Depth (30DEC1899 00:00:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
DFO100Y25MIN
Event Conditions
Geometry
Depth (01JAN2020 00:15:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y25min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y25minWSE (Max) (01JAN2020 00:0
PMF60min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
PMF90min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Use Name ID Value
Velocity (100Y15min) V No Data
Velocity (100Y20min) V No Data
Velocity (100Y25min) V No Data
Velocity (100Y30min) V No Data
Velocity (100Y45min) V No Data
Velocity (100Y60min) V No Data
Velocity (100Y90min) V No Data
Velocity (100Y120min) V No Data
Velocity (100Y180min) V No Data
Profile Lines Active Features Layer Values
(333451.3515, 6248249.7029 1 pixel = 0.0864 m)
Selected: 'Velocity'
Max
10 m

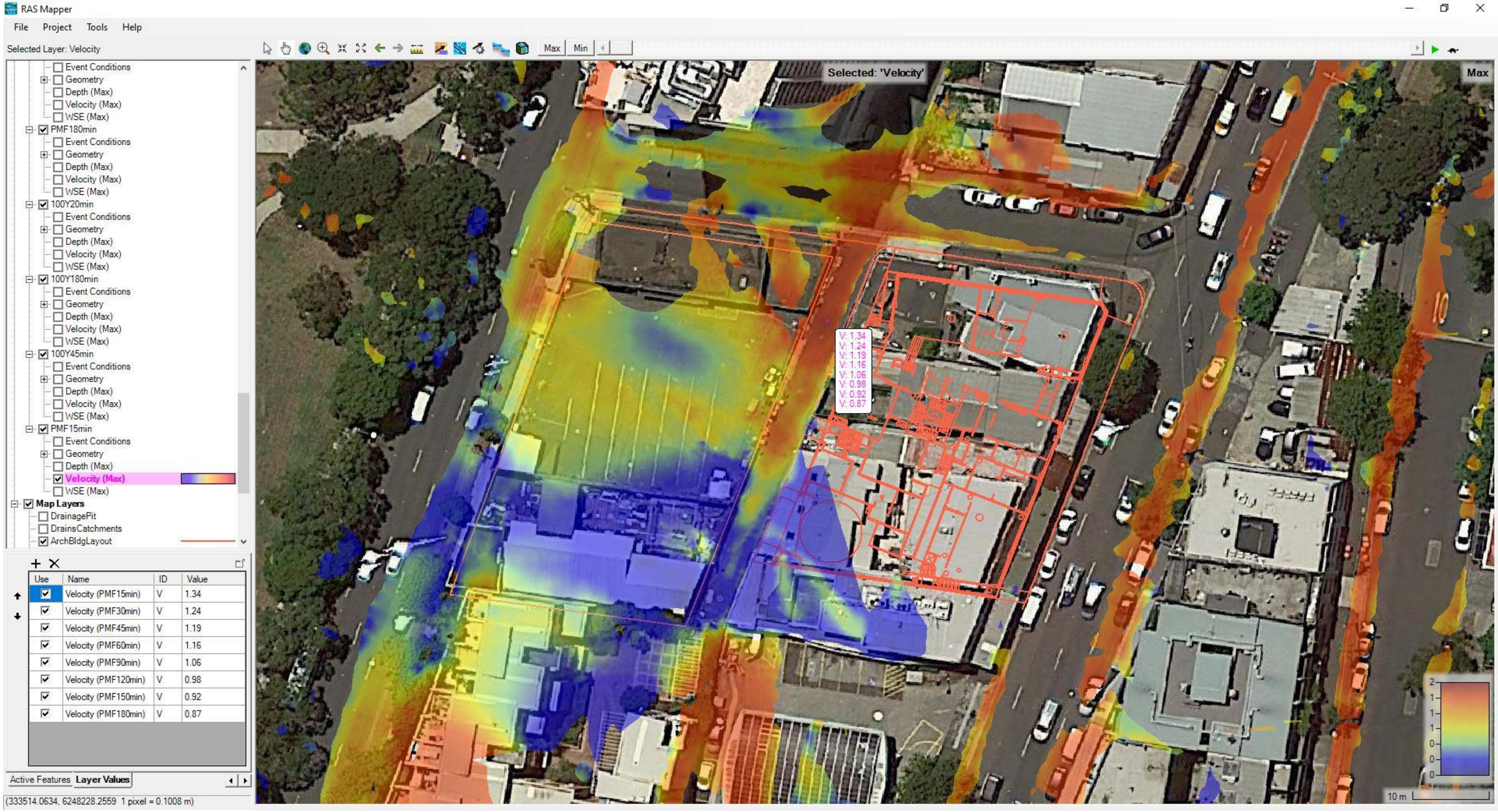

RAS Mapper
File Project Tools Help
Selected Layer: Depth
Velocity (Max)
WSE (Max)
FO_100Y120min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y15min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
PMF15min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
Water Surface Elevation (01JAN2020 00:
PMF30min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
PMF45min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y30min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
FlowOnlyPMF15min
Use Name ID Value
Depth (PMF15min) D 0.86
Depth (PMF30min) D 0.84
Depth (PMF45min) D 0.83
Depth (PMF60min) D 0.82
Depth (PMF90min) D 0.80
Depth (PMF120min) D 0.79
Depth (PMF150min) D 0.78
Depth (PMF180min) D 0.77
Profile Lines Active Features Layer Values
(333500.3374, 6248192.3367 1 pixel = 0.0864 m)
Max Min
Selected: 'Depth'
D: 0.86
D: 0.84
D: 0.83
D: 0.82
D: 0.80
D: 0.79
D: 0.78
D: 0.77
10 m

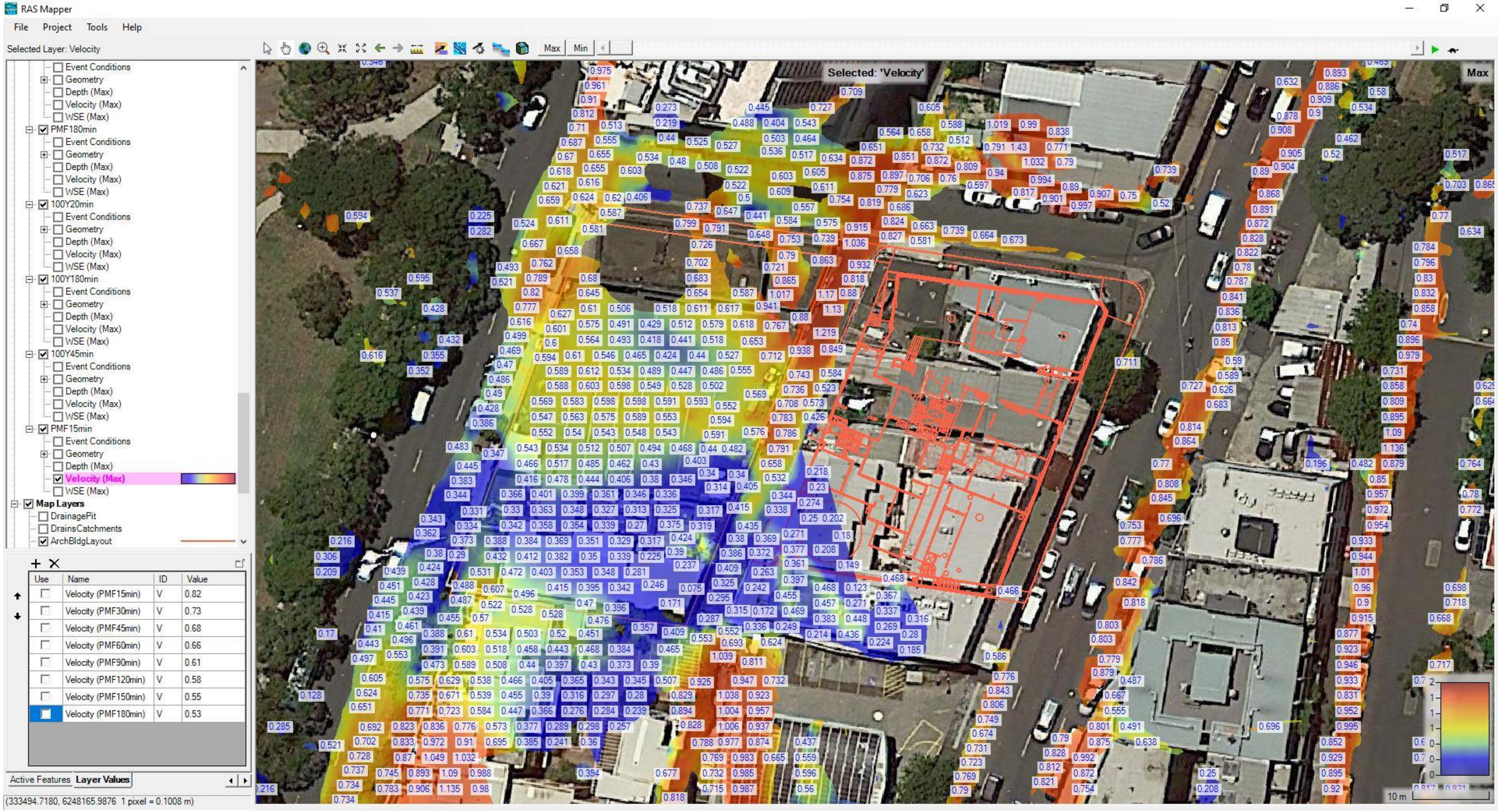


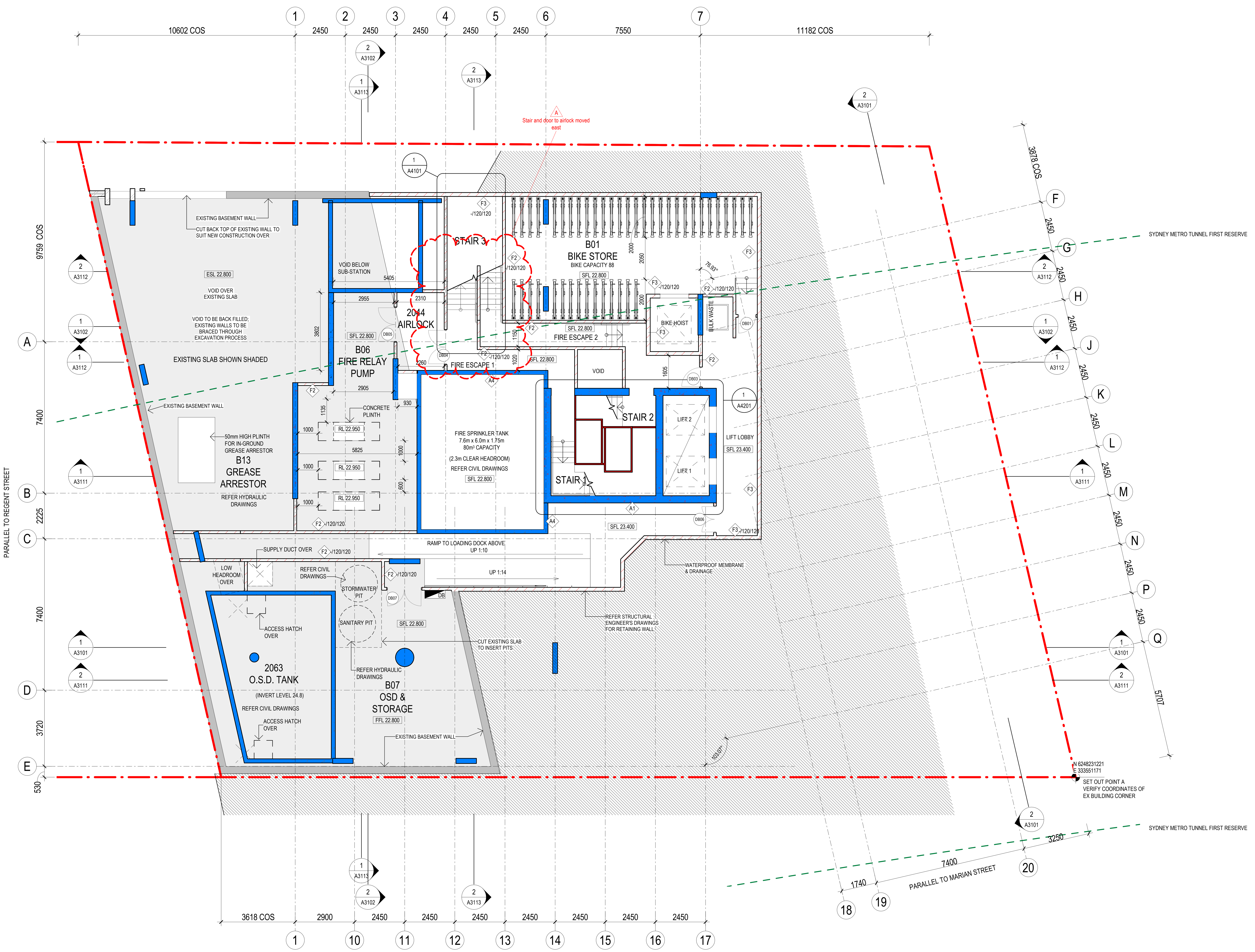
RAS Mapper
File Project Tools Help
Selected Layer: Depth
Max Min
Selected: 'Depth'
Max
Velocity (Max)
WSE (Max)
FO_100Y120min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y15min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
PMF15min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
Water Surface Elevation (01JAN2020 00:
PMF30min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
PMF45min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y30min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
FlowOnlyPMF15min
Use | Name | ID | Value
Depth (PMF15min) | D | 0.24
Depth (PMF30min) | D | 0.22
Depth (PMF45min) | D | 0.21
Depth (PMF60min) | D | 0.21
Depth (PMF90min) | D | 0.18
Depth (PMF120min) | D | 0.17
Depth (PMF150min) | D | 0.15
Depth (PMF180min) | D | 0.14
Profile Lines
Active Features
Layer Values
(333502.4108, 6248172.2067 1 pixel = 0.0864 m)
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
10 m


RAS Mapper
File
Project
Tools
Help
Selected Layer: Water Surface Elevation
Max
Min
Velocity (01JAN2020 00:00:00)
WSE (Max)
PMF180min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y20min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y180min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y45min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
PMF15min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
Map Layers
DrainagePit
DrainsCatchments
ArchBldgLayout
DrainagePipe
InvertOfNewKerb
HecRasBldgEdge3D
Use
Name
ID
Value
WSE (PMF15min) W 24.93
WSE (PMF30min) W 24.91
WSE (PMF45min) W 24.90
WSE (PMF60min) W 24.89
WSE (PMF90min) W 24.87
WSE (PMF120min) W 24.86
WSE (PMF150min) W 24.84
WSE (PMF180min) W 24.84
Active Features
Layer Values
(333500.1888, 6248192.3374 1 pixel = 0.0987 m)
Selected: 'WSE'
Max
W: 24.93
W: 24.91
W: 24.90
W: 24.89
W: 24.87
W: 24.86
W: 24.84
W: 24.84
30.55
26.11
25.26
24.98
24.71
24.45
24.18
10 m


RAS Mapper
File Project Tools Help
Selected Layer: Water Surface Elevation
Max Min
Selected: 'WSE'
Max
Velocity (01JAN2020 00:00:00)
WSE (Max)
PMF180min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y20min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y180min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y45min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
PMF15min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
Map Layers
DrainagePit
DrainsCatchments
ArchBldgLayout
DrainagePipe
InvertOfNewKerb
HecRasBldgEdge3D
Use Name ID Value
WSE (PMF15min) W 24.33
WSE (PMF30min) W 24.32
WSE (PMF45min) W 24.30
WSE (PMF60min) W 24.30
WSE (PMF90min) W No Data
WSE (PMF120min) W No Data
WSE (PMF150min) W No Data
WSE (PMF180min) W No Data
Active Features Layer Values
(333500.7807, 6248167.2801 1 pixel = 0.0987 m)
30.55
26.11
25.26
24.98
24.71
24.45
24.18
10 m


RAS Mapper
File Project Tools Help
Selected Layer: Velocity
Max Min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
PMF180min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y20min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y180min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y45min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
PMF15min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
Map Layers
DrainagePit
DrainsCatchments
ArchBldgLayout
Use Name ID Value
Velocity (PMF15min) V 1.34
Velocity (PMF30min) V 1.24
Velocity (PMF45min) V 1.19
Velocity (PMF60min) V 1.16
Velocity (PMF90min) V 1.06
Velocity (PMF120min) V 0.98
Velocity (PMF150min) V 0.92
Velocity (PMF180min) V 0.87
Active Features Layer Values
(333514.0634, 6248228.2559 1 pixel = 0.1008 m)
Selected: 'Velocity'
Max
V: 1.34
V: 1.24
V: 1.19
V: 1.16
V: 1.06
V: 0.98
V: 0.92
V: 0.87
10 m


RAS Mapper
File Project Tools Help
Selected Layer: Velocity
Max Min
Selected: 'Velocity'
Max
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
PMF180min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y20min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y180min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y45min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
PMF15min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
Map Layers
DrainagePit
DrainsCatchments
ArchBldgLayout
Use Name ID Value
Velocity (PMF15min) V 0.82
Velocity (PMF30min) V 0.73
Velocity (PMF45min) V 0.68
Velocity (PMF60min) V 0.66
Velocity (PMF90min) V 0.61
Velocity (PMF120min) V 0.58
Velocity (PMF150min) V 0.55
Velocity (PMF180min) V 0.53
Active Features Layer Values
(333494.7180, 6248165.9876 1 pixel = 0.1008 m)
10 m



Drawing Status

NOT FOR CONSTRUCTION

WALL LEGEND

CONCRETE WALLS

STRUCTURAL CONCRETE WALL. SEE STRUCTURAL DRAWINGS FOR THICKNESS.

PRECAST CONCRETE WALL. SEE STRUCTURAL DRAWINGS FOR THICKNESS AND LOAD-BEARING.

EXTERNAL FACE BRICK WALLS

SEE ELEVATIONS FOR COURSING TYPE.

FB1	270mm	110 FACE BRICK (DARK) / 50 CAVITY WITH R2.2 THERMAL INSULATION WITH THERMAL BREAKS / 110 INTERNAL BRICK / RENDER
FB2	270mm	110 FACE BRICK (LIGHT) / 50 CAVITY WITH R2.2 THERMAL INSULATION WITH THERMAL BREAKS / 110 INTERNAL BRICK / RENDER

INTERNAL WALLS

E2	140mm	140mm BLOCKWORK - FINISH VARIES
F1	90mm	FIRE RATED BLOCKWORK - FINISH VARIES FRL AS NOTED
F2	140mm	FIRE RATED BLOCKWORK - FINISH VARIES FRL AS NOTED
F3	190mm	FIRE RATED SCORIA BLOCKWORK FRL AS NOTED
J1	80mm	13 PLASTERBOARD / 64 STUD ACOUSTIC RATING Rw + Ctr > 40
J2	90mm	13 PLASTERBOARD / 64 STUD / 13 PLASTERBOARD
J3	105mm	13 PLASTERBOARD / 92 STUD
J4	118mm	13 PLASTERBOARD / 92 STUD / 13 PLASTERBBOARD
IW1	297mm	INTERTENANCY WALL HEBEL1077 FRL -/60/60. ACOUSTIC RATING Rw + Ctr > 50 DISCONTINUOUS CONSTRUCTION
IW2	243mm	INTERTENANCY WALL HEBEL1074 FRL -/60/60. ACOUSTIC RATING RW + CTR 50 DISCONTINUOUS CONSTRUCTION
CW1	90mm	CORRIDOR WALL HEBEL 1212 WITH 20mm CAVITY TO INSULATED POD WALL R VALUE AS PER JV3 REPORT FRL -/90/90 ACOUSTIC RATING RW 50
CW2	144mm	CORRIDOR WALL HEBEL 1171 FRL-/90/90. R VALUE AS PER JV3 REPORT ACOUSTIC RATING RW 50
L1	15mm	13mm PLASTERBOARD DIRECT STICK TO VARIOUS SUBSTRATES.
L2	35mm	13mm PLASTERBOARD ON 16mm FURRING CHANNELS AND PACKERS.
S1	64mm	SPEEDPANEL FRL -/120/120
	70mm	PREFABRICATED BATHROOM POD WALL FORMS PART OF WALL WITH ACOUSTIC RATING Rw + Ctr > 50

No	Date	Description	Chk'd	Appr'd
A	19/03/21	Tender Issue	RP	BM
B	12/04/21	Addendum 3	RP	BM

Revisions

Key

N

Client

Wee Hur

WEE HUR CAPITAL PTE LTD
(Wholly Owned Subsidiary of Wee Hur Holdings Ltd)

Architect

AJ+C
ALLEN JACK+COTTIER

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ABN 53 003 782 250

Project

Wee Hur Regent
90 - 102 Regent Street, Redfern

Proj No. 19026

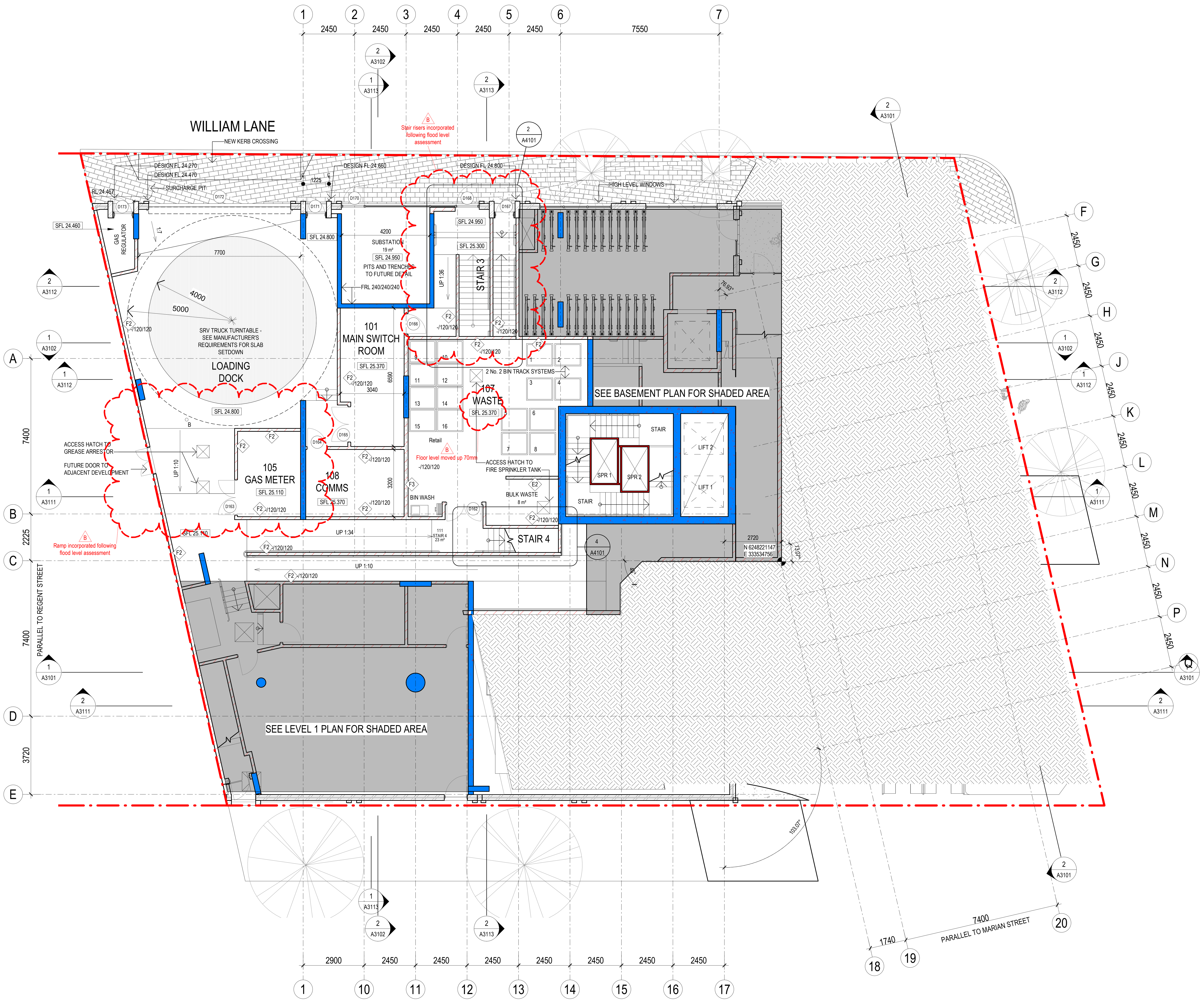
Drawing Title

BASEMENT FLOOR PLAN

Scale	Drawing No.	Issue
1 : 100 @A1	A2100	B

0 1 2 4 8 m

PLOT DATE & TIME: 12/04/2021 2:03:20 PM PLOTTED & CHECKED BY: Author



Drawing Status

NOT FOR CONSTRUCTION

WALL LEGEND

CONCRETE WALLS

STRUCTURAL CONCRETE WALL. SEE STRUCTURAL DRAWINGS FOR THICKNESS.

PRECAST CONCRETE WALL. SEE STRUCTURAL DRAWINGS FOR THICKNESS AND LOAD-BEARING.

EXTERNAL FACE BRICK WALLS

SEE ELEVATIONS FOR COURSING TYPE.

FB1	270mm	110 FACE BRICK (DARK) / 50 CAVITY WITH R2.2 THERMAL INSULATION WITH THERMAL BREAKS / 110 INTERNAL BRICK / RENDER
FB2	270mm	110 FACE BRICK (LIGHT) / 50 CAVITY WITH R2.2 THERMAL INSULATION WITH THERMAL BREAKS / 110 INTERNAL BRICK / RENDER

INTERNAL WALLS

E2	140mm	140mm BLOCKWORK - FINISH VARIES
F1	90mm	FIRE RATED BLOCKWORK - FINISH VARIES FRL AS NOTED
F2	140mm	FIRE RATED BLOCKWORK - FINISH VARIES FRL AS NOTED
F3	190mm	FIRE RATED SCORIA BLOCKWORK FRL AS NOTED
J1	80mm	13 PLASTERBOARD / 64 STUD ACOUSTIC RATING Rw + Ctr > 40
J2	90mm	13 PLASTERBOARD / 64 STUD / 13 PLASTERBOARD
J3	105mm	13 PLASTERBOARD / 92 STUD
J4	118mm	13 PLASTERBOARD / 92 STUD / 13 PLASTERBBOARD
IW1	297mm	INTERTENANCY WALL HEBEL1077 FRL -/60/60. ACOUSTIC RATING Rw + Ctr > 50 DISCONTINUOUS CONSTRUCTION
IW2	243mm	INTERTENANCY WALL HEBEL1074 FRL -/60/60. ACOUSTIC RATING RW + CTR 50 DISCONTINUOUS CONSTRUCTION
CW1	90mm	CORRIDOR WALL HEBEL 1212 WITH 20mm CAVITY TO INSULATED POD WALL R VALUE AS PER JV3 REPORT FRL -/90/90 ACOUSTIC RATING RW 50
CW2	144mm	CORRIDOR WALL HEBEL 1171 FRL-/90/90. R VALUE AS PER JV3 REPORT ACOUSTIC RATING RW 50
L1	15mm	13mm PLASTERBOARD DIRECT STICK TO VARIOUS SUBSTRATES.
L2	35mm	13mm PLASTERBOARD ON 16mm FURRING CHANNELS AND PACKERS.
S1	64mm	SPEEDPANEL FRL -/120/120
	70mm	PREFABRICATED BATHROOM POD WALL FORMS PART OF WALL WITH ACOUSTIC RATING Rw + Ctr > 50

No	Date	Description	Chk'd	Appr'd
A	19/03/21	Tender Issue	RP	BM
B	12/04/21	Addendum 3	RP	BM

Revisions

Key

N

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Architect

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ABN 53 003 782 250

Project

Wee Hur Regent
90 - 102 Regent Street, Redfern

Proj No. 19026

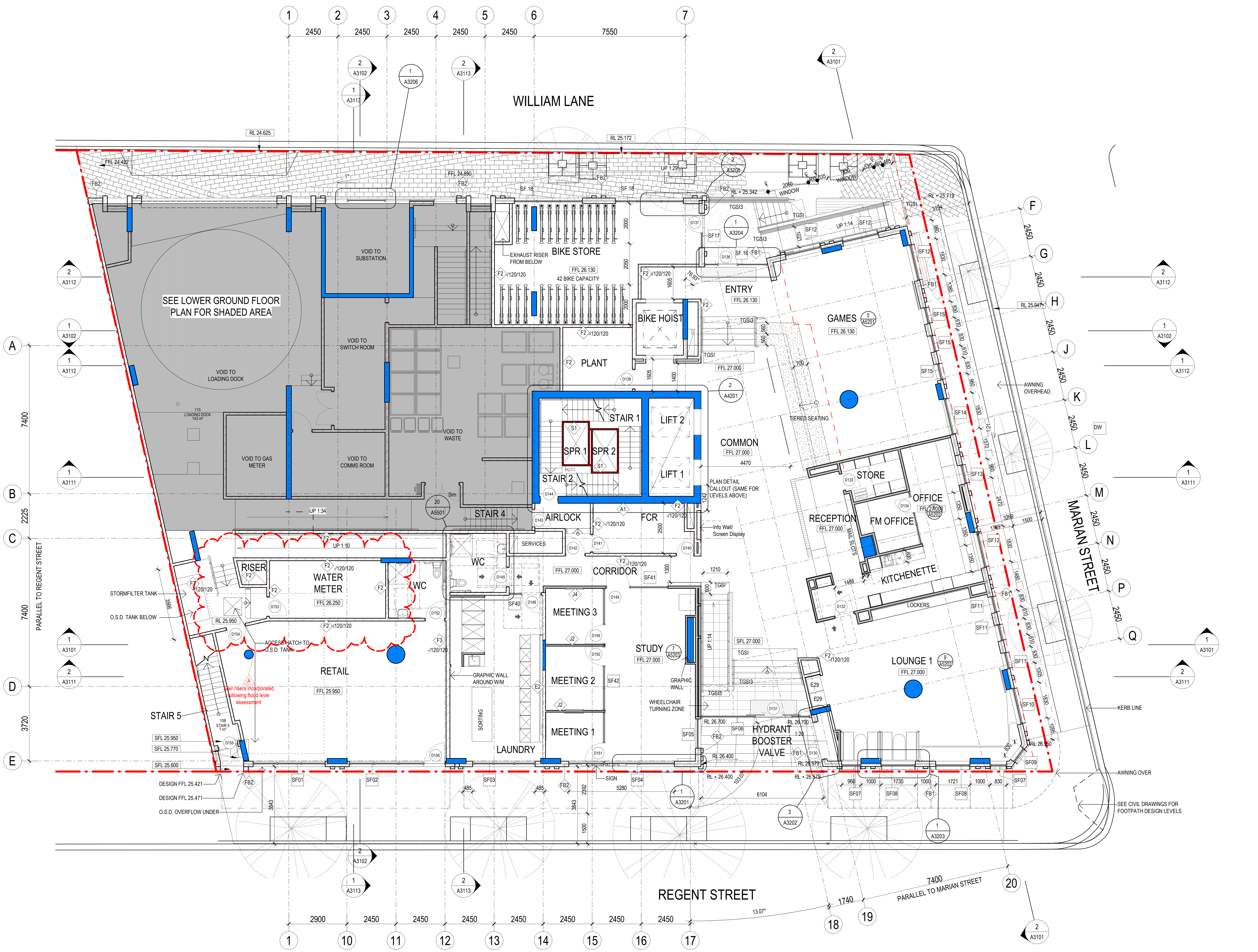
Drawing Title

LOWER GROUND FLOOR PLAN

Scale	Drawing No.	Issue
1 : 100 @A1	A2101	B

0 1 2 4 8 m

PLOT DATE & TIME: 12/04/2021 2:03:37 PM PLOTTED & CHECKED BY: Author



Drawing Status

NOT FOR CONSTRUCTION

WALL LEGEND

CONCRETE WALLS

STRUCTURAL CONCRETE WALL. SEE STRUCTURAL DRAWINGS FOR THICKNESS.

PRECAST CONCRETE WALL. SEE STRUCTURAL DRAWINGS FOR THICKNESS AND LOAD-BEARING.

EXTERNAL FACE BRICK WALLS

SEE ELEVATIONS FOR COURSING TYPE.

FB1	270mm	110 FACE BRICK (DARK) / 50 CAVITY WITH R2.2 THERMAL INSULATION WITH THERMAL BREAKS / 110 INTERNAL BRICK / RENDER
FB2	270mm	110 FACE BRICK (LIGHT) / 50 CAVITY WITH R2.2 THERMAL INSULATION WITH THERMAL BREAKS / 110 INTERNAL BRICK / RENDER

INTERNAL WALLS

E2	140mm	140mm BLOCKWORK - FINISH VARIES
F1	90mm	FIRE RATED BLOCKWORK - FINISH VARIES FRL AS NOTED
F2	140mm	FIRE RATED BLOCKWORK - FINISH VARIES FRL AS NOTED
F3	190mm	FIRE RATED SCORIA BLOCKWORK FRL AS NOTED
J1	80mm	13 PLASTERBOARD / 64 STUD ACOUSTIC RATING Rw + Ctr > 40
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J4	118mm	13 PLASTERBOARD / 92 STUD / 13 PLASTERBBOARD
IW1	297mm	INTERTENANCY WALL HEBEL1077 FRL -/60/60. ACOUSTIC RATING Rw + Ctr > 50 DISCONTINUOUS CONSTRUCTION
IW2	243mm	INTERTENANCY WALL HEBEL1074 FRL -/60/60. ACOUSTIC RATING RW + CTR 50 DISCONTINUOUS CONSTRUCTION
CW1	90mm	CORRIDOR WALL HEBEL 1212 WITH 20mm CAVITY TO INSULATED POD WALL R VALUE AS PER JV3 REPORT FRL -/90/90 ACOUSTIC RATING RW 50
CW2	144mm	CORRIDOR WALL HEBEL 1171 FRL-/90/90. R VALUE AS PER JV3 REPORT ACOUSTIC RATING RW 50
L1	15mm	13mm PLASTERBOARD DIRECT STICK TO VARIOUS SUBSTRATES.
L2	35mm	13mm PLASTERBOARD ON 16mm FURRING CHANNELS AND PACKERS.
S1	64mm	SPEEDPANEL FRL -/120/120
	70mm	PREFABRICATED BATHROOM POD WALL FORMS PART OF WALL WITH ACOUSTIC RATING Rw + Ctr > 50

GENERAL NOTE

SHEET WATERPROOF MEMBRANE TO BE INSTALLED ABOVE ALL HABITABLE SPACES

No	Date	Description	Chk'd	Appr'd
A	19/03/21	Tender Issue	RP	BM
B	12/04/21	Addendum 3	RP	BM

Revisions

Key

N

Client

Wee Hur

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Architect

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ABN 53 003 782 250

Project

Wee Hur Regent
90 - 102 Regent Street, Redfern

Proj No. 19026

Drawing Title

GROUND FLOOR PLAN

Scale	Drawing No.	Issue
1 : 100 @A1	A2102	B

0 1 2 4 8 m

PLOT DATE & TIME: 12/04/2021 2:03:51 PM PLOTTED & CHECKED BY: RP

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
F1	19.01.21	DA ISSUE	J.S.

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified

NORTH

CLIENT
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PROJECT
WEE HUR REGENT
90-102 REGENT STREET,
REDFERN, NSW 2016

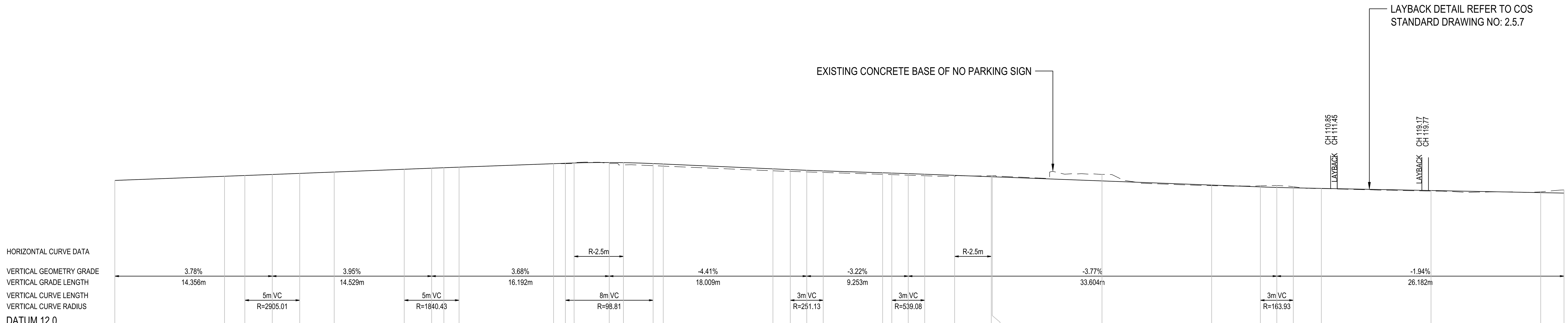
TITLE
CIVIL SERVICES
GROUND LEVEL
FOOTPATH LAYOUT
TOP OF KERB (TOK)
CTRL KERB TOP ALIGNMENT

DA ISSUE
NOT FOR CONSTRUCTION

DRAWN	J.S.	SCALE @ A1
CHECKED	J.S.	1:100
APPROVED	J.S.	
CREATED	01/21	

JOB No.	DRAWING No.	REV
190276	F101	F1

Jan 28, 2021 – 9:05am D:\WORK\190276 Regent Wee Hur 90 102 Redfern\Drawings\Civil\F101.dwg



CHAINAGE	CUT/FILL DEPTH	DESIGN LEVEL	EXISTING LEVEL
0.000	0.000	25.331	25.331
10.000	0.000	25.709	25.709
11.856	0.000	25.779	25.779
14.356	0.001	25.875	25.873
16.856	0.001	25.973	25.972
20.000	0.001	26.097	26.096
26.385	0.000	26.349	26.349
28.885	-0.002	26.447	26.448
30.000	-0.001	26.489	26.490
31.385	0.000	26.540	26.540
40.000	0.003	26.858	26.855
41.077	0.037	26.897	26.860
41.872	0.061	26.923	26.863
45.077	0.096	26.964	26.868
46.371	0.203	26.951	26.748
49.077	0.191	26.868	26.677
50.000	0.190	26.827	26.637
60.000	0.178	26.386	26.208
61.585	0.163	26.316	26.154
63.085	0.148	26.254	26.107
64.585	0.142	26.202	26.060
70.000	0.138	26.027	25.890
70.838	0.140	26.000	25.861
72.338	0.141	25.950	25.809
73.838	0.138	25.896	25.757
76.566	0.091	25.793	25.702
79.910	-0.096	25.666	25.762
80.000	-0.102	25.663	25.765
90.000	-0.597	25.285	25.883
100.000	0.055	24.908	24.853
104.442	-0.103	24.740	24.843
105.942	-0.176	24.691	24.867
107.442	-0.101	24.655	24.756
110.000	0.018	24.605	24.587
120.000	0.051	24.410	24.359
130.000	-0.079	24.216	24.295
132.124	-0.290	24.175	24.464

CTRL KERB TOP

1 : 200-A1   1 : 400-A3

REVISIONS / AMENDMENTS			
Rev	Date	Description	Verified
F1	19.01.21	DA ISSUE	J.S.

REVISIONS / AMENDMENTS			
Rev	Date	Description	Verified

CLIENT
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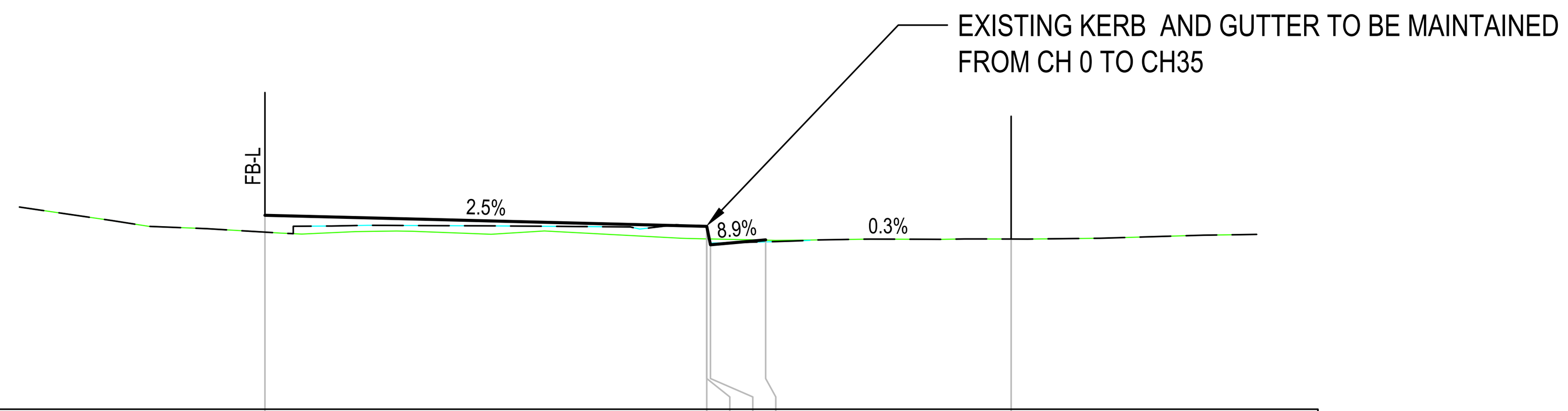
PROJECT
WEE HUR REGENT
90-102 REGENT STREET,
REDFERN, NSW 2016

TITLE
CIVIL SERVICES
FOOTPATH DESIGN
CTRL KERB TOP PROFILE

DA ISSUE
NOT FOR CONSTRUCTION

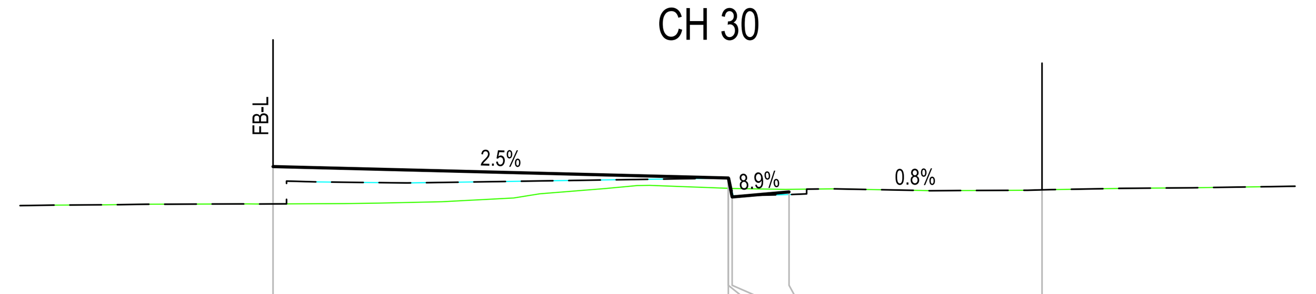
DRAWN	J.S.	SCALE @ A1
CHECKED	J.S.	1:200
APPROVED	J.S.	
CREATED	01/21	
JOB No.	DRAWING No.	REV
190276	F102	F1



DATUM R.L. 25.00

DESIGN SURFACE LEVEL	26.579	26.489	26.489	26.339	26.379	26.386
DEPTH CUT - / FILL +	0.137	-0.001	-0.001	-0.014	0.016	0.000
EXISTING SURFACE LEVEL	26.442	26.490	26.490	26.353	26.363	26.386
OFFSET FROM CENTRELINE	-3.600	0.000	0.000	0.030	0.480	2.480

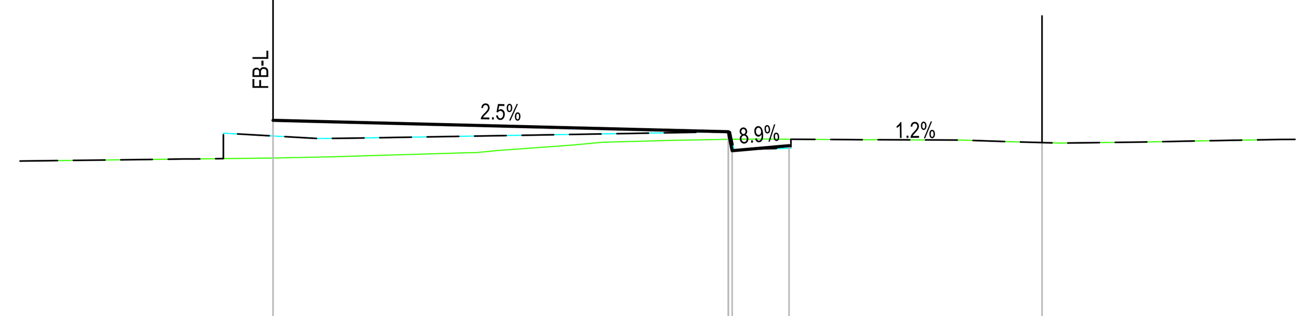
CH 30



DATUM R.L. 25.00

DESIGN SURFACE LEVEL	26.187	26.097	26.097	25.947	25.987	26.003
DEPTH CUT - / FILL +	0.295	0.001	0.001	-0.046	0.021	0.000
EXISTING SURFACE LEVEL	25.892	26.096	26.096	25.993	25.966	26.003
OFFSET FROM CENTRELINE	-3.600	0.000	0.000	0.030	0.480	2.480

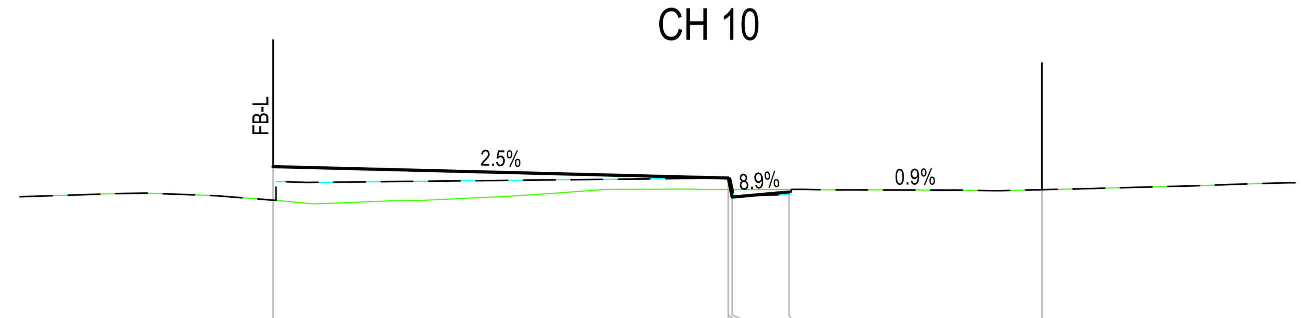
CH 20



DATUM R.L. 24.00

DESIGN SURFACE LEVEL	25.799	25.709	25.709	25.559	25.599	25.623
DEPTH CUT - / FILL +	0.123	0.000	0.000	-0.077	0.020	0.000
EXISTING SURFACE LEVEL	25.676	25.709	25.709	25.636	25.579	25.623
OFFSET FROM CENTRELINE	-3.600	0.000	0.000	0.030	0.480	2.480

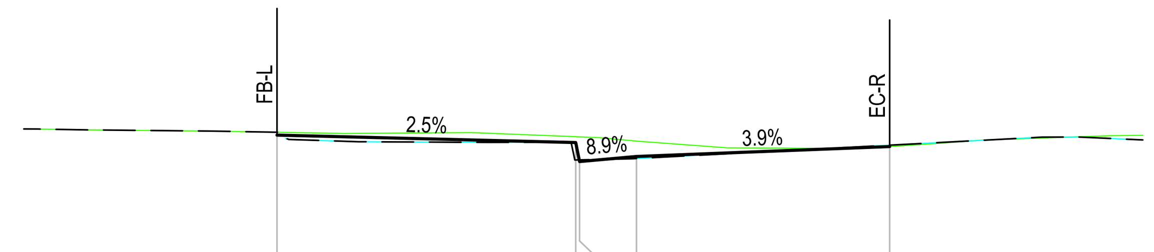
CH 10



DATUM R.L. 24.00

DESIGN SURFACE LEVEL	25.421	25.331	25.331	25.181	25.221	25.239
DEPTH CUT - / FILL +	0.264	0.000	0.000	-0.085	0.021	0.000
EXISTING SURFACE LEVEL	25.156	25.331	25.331	25.266	25.200	25.239
OFFSET FROM CENTRELINE	-3.600	0.000	0.000	0.030	0.480	2.480

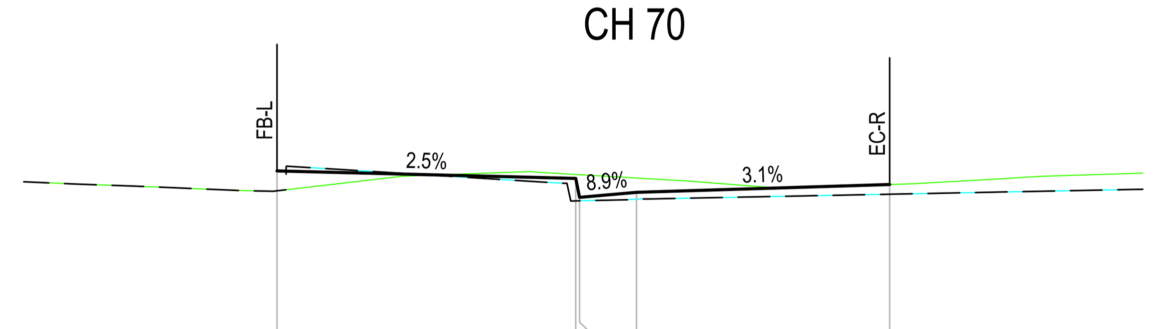
CH 0



DATUM R.L. 25.00

DESIGN SURFACE LEVEL	26.086	26.027	25.877	25.917	25.996
DEPTH CUT - / FILL +	-0.023	0.138	-0.013	0.016	-0.011
EXISTING SURFACE LEVEL	26.109	25.890	25.890	25.901	26.007
OFFSET FROM CENTRELINE	-2.360	0.000	0.030	0.480	2.480

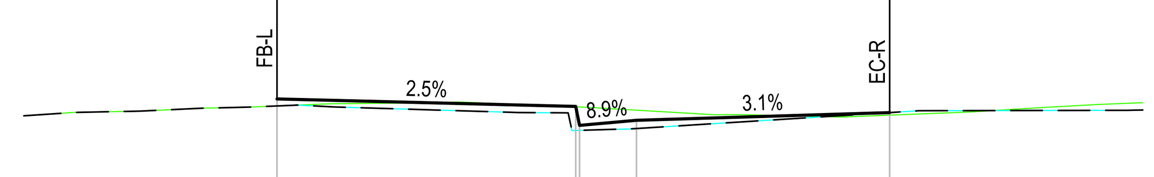
CH 70



DATUM R.L. 25.00

DESIGN SURFACE LEVEL	26.445	26.386	26.236	26.276	26.338
DEPTH CUT - / FILL +	0.157	0.178	0.027	0.054	0.077
EXISTING SURFACE LEVEL	26.288	26.208	26.209	26.222	26.261
OFFSET FROM CENTRELINE	-2.360	0.000	0.030	0.480	2.480

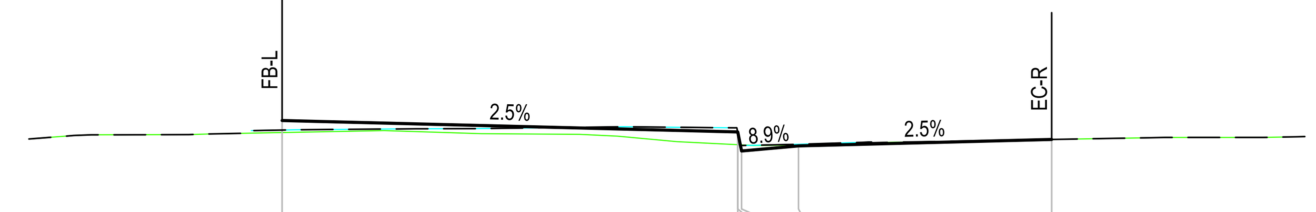
CH 60



DATUM R.L. 26.00

DESIGN SURFACE LEVEL	26.886	26.827	26.677	26.717	26.779
DEPTH CUT - / FILL +	0.055	0.190	0.039	0.065	0.000
EXISTING SURFACE LEVEL	26.831	26.637	26.638	26.653	26.779
OFFSET FROM CENTRELINE	-2.360	0.000	0.030	0.480	2.480

CH 50



DATUM R.L. 26.00

DESIGN SURFACE LEVEL	26.948	26.858	26.858	26.708	26.748	26.798
DEPTH CUT - / FILL +	0.075	0.003	0.003	-0.043	-0.013	0.000
EXISTING SURFACE LEVEL	26.873	26.855	26.855	26.750	26.760	26.798
OFFSET FROM CENTRELINE	-3.600	0.000	0.000	0.030	0.480	2.480

CH 40

NOTE :

1) FB-L DENOTES BACK OF FOOTPATH AT LEFT SIDE OF THE KREBS TOP ALIGNMENT, COINCIDES WITH PROPERTY BOUNDARY ALONG REGENT ST AND MARIAN ST; WHILE REPRESENT THE BUILDING WALL ALONG WILLIAM LANE.
2) EC-R DENOTES EDGES OF SAW CUT AT RIGHT SIDE OF THE KREBS TOP ALIGNMENT.
3) EXISTING KREBS IS MAINTAINED UNTIL CHAINAGE 35 AS SHOWN ON DRAWING F101.
4) GREEN LINE INDICATES EXISTING GROUND DERIVED FROM LIDAR SURVEY, WHILE CYAN LINE INDICATES EXISTING GROUND LEVELS FROM LAND SURVEY.
5) BLACK DOTTED LINE INDICATES THE COMBINED SURFACE OF EXISTING GROUND.

1 0.5 0 1 2 3 4 m

1 : 50-A1 1 : 100-A3

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
F1	19.01.21	DA ISSUE	J.S.

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified

All dimensions to be verified on site/s prior to commencement of on-site work and/ or off-site prefabrication. Figured dimension to be taken in preference to scaled dimensions. This drawing is copyright and remains the property of JHA Consulting Engineers. Reproduction in whole or part of these drawings without written consent constitutes an infringement of copyright.

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ARCHITECT
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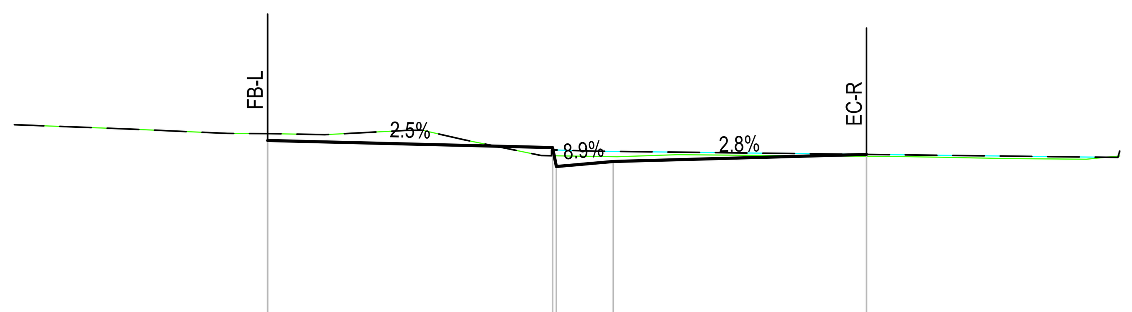
PROJECT
WEE HUR REGENT
90-102 REGENT STREET, REDFERN, NSW 2016

TITLE
CIVIL SERVICES
FOOTPATH DESIGN
CROSS SECTIONS
CH 0 TO CH 70

DA ISSUE
NOT FOR CONSTRUCTION

DRAWN	J.S.	SCALE @ A1
CHECKED	J.S.	
APPROVED	J.S.	1:50
CREATED	01/21	
JOB No.	DRAWING No.	REV
190276	F103	F1

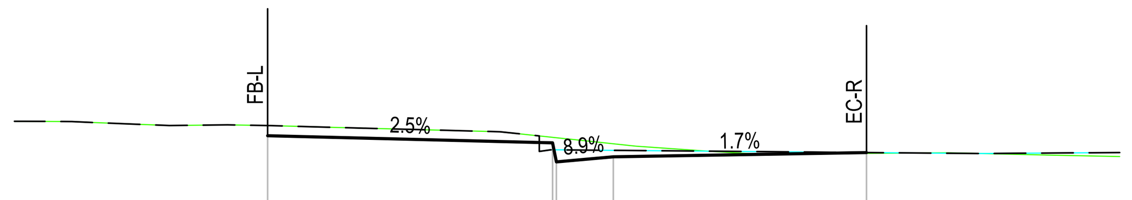
Jan 28, 2021 – 9:21am D:\WORK\190276 Regent Wee Hur 90 102 Redfern\Drawings\Civil\F103.dwg



DATUM R.L. 23.00

	FB-L					EC-R
DESIGN SURFACE LEVEL	24.661	24.605	24.605	24.455	24.495	24.551
DEPTH CUT - / FILL +	-0.054	0.018	0.018	-0.131	-0.080	0.000
EXISTING SURFACE LEVEL	24.715	24.587	24.587	24.586	24.575	24.551
OFFSET FROM CENTRELINE	-2.251	0.000	0.000	0.030	0.480	2.480

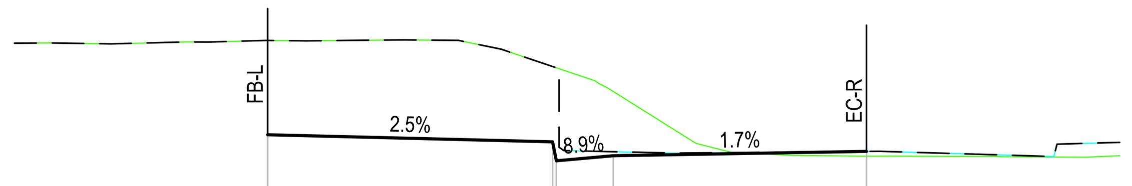
CH 110



DATUM R.L. 24.00

DESIGN SURFACE LEVEL	24.964	24.908	24.908	24.758	24.798	24.832
DEPTH CUT - / FILL +	-0.080	0.055	0.055	-0.095	-0.051	0.000
EXISTING SURFACE LEVEL	25.044	24.853	24.853	24.853	24.849	24.832
OFFSET FROM CENTRELINE	-2.251	0.000	0.000	0.030	0.480	2.480

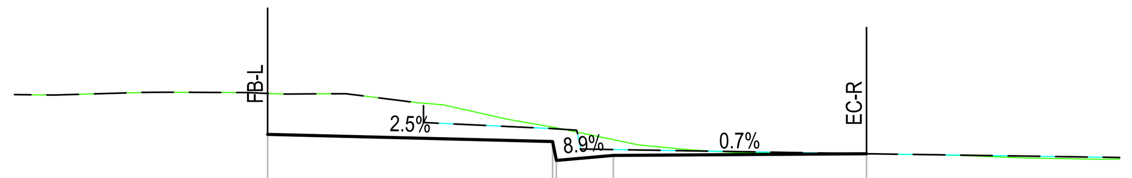
CH 100



DATUM R.L. 24.00

DESIGN SURFACE LEVEL	25.342	25.285	25.285	25.135	25.175	25.210
DEPTH CUT - / FILL +	-0.747	-0.597	-0.597	-0.737	-0.032	0.000
EXISTING SURFACE LEVEL	26.089	25.883	25.883	25.873	25.208	25.210
OFFSET FROM CENTRELINE	-2.251	0.000	0.000	0.030	0.480	2.480

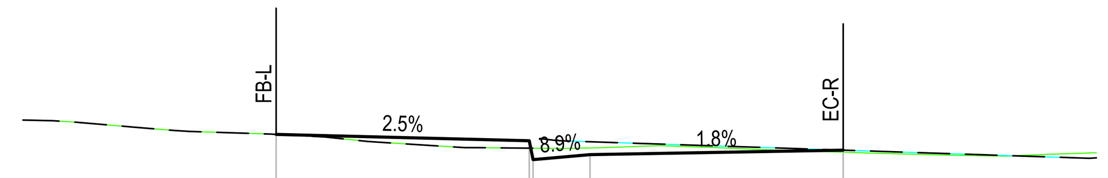
CH 90



DATUM R.L. 25.00

DESIGN SURFACE LEVEL	25.719	25.663	25.663	25.513	25.553	25.566
DEPTH CUT - / FILL +	-0.324	-0.102	-0.102	-0.250	-0.046	0.000
EXISTING SURFACE LEVEL	26.044	25.765	25.765	25.763	25.599	25.566
OFFSET FROM CENTRELINE	-2.251	0.000	0.000	0.030	0.480	2.480

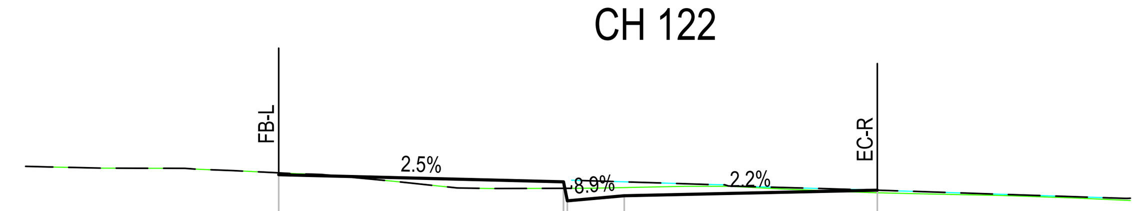
CH 80



DATUM R.L. 23.00

DESIGN SURFACE LEVEL	24.422	24.372	24.222	24.262	24.298
DEPTH CUT - / FILL +	-0.000	0.059	-0.091	-0.102	0.000
EXISTING SURFACE LEVEL	24.423	24.314	24.313	24.364	24.298
OFFSET FROM CENTRELINE	-2.000	0.000	0.030	0.480	2.480

CH 122



DATUM R.L. 23.00

DESIGN SURFACE LEVEL	24.467	24.410	24.410	24.260	24.300	24.345
DEPTH CUT - / FILL +	-0.015	0.051	0.051	-0.099	-0.110	0.000
EXISTING SURFACE LEVEL	24.481	24.359	24.359	24.359	24.410	24.345
OFFSET FROM CENTRELINE	-2.251	0.000	0.000	0.030	0.480	2.480

CH 120

NOTE :

1) FB-L DENOTES BACK OF FOOTPATH AT LEFT SIDE OF THE KREBS TOP ALIGNMENT, COINCIDES WITH PROPERTY BOUNDARY ALONG REGENT ST AND MARIAN ST; WHILE REPRESENT THE BUILDING WALL ALONG WILLIAM LANE.
2) EC-R DENOTES EDGES OF SAW CUT AT RIGHT SIDE OF THE KREBS TOP ALIGNMENT.
3) EXISTING KREBS IS MAINTAINED UNTIL CHAINAGE 35 AS SHOWN ON DRAWING F101.
4) GREEN LINE INDICATES EXISTING GROUND DERIVED FROM LIDAR SURVEY, WHILE CYAN LINE INDICATES EXISTING GROUND LEVELS FROM LAND SURVEY.
5) BLACK DOTTED LINE INDICATES THE COMBINED SURFACE OF EXISTING GROUND.

1 0.5 0 1 2 3 4 m

1 : 50-A1 1 : 100-A3

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
F1	19.01.21	DA ISSUE	J.S.

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified

NORTH

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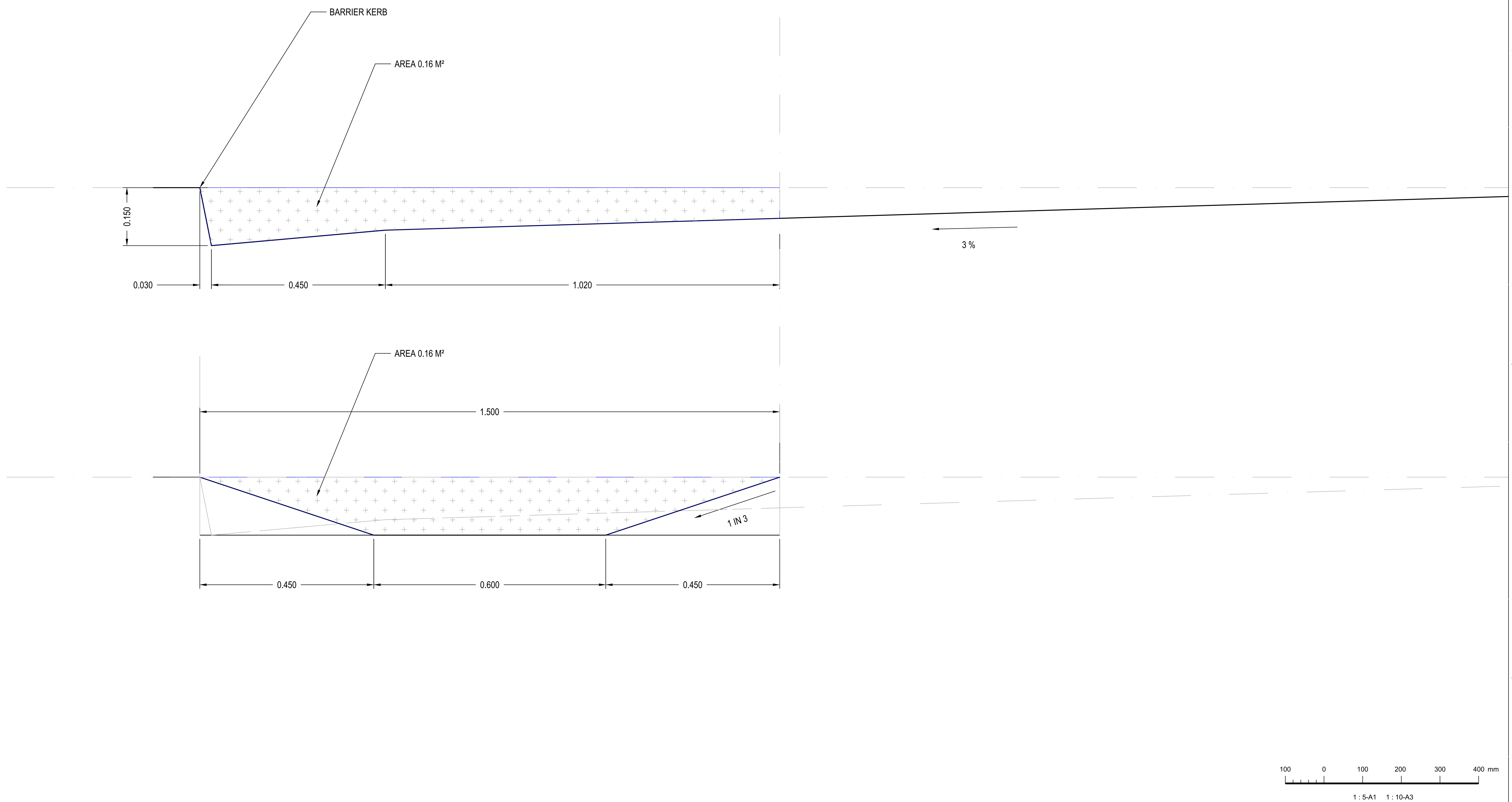
PROJECT
WEE HUR REGENT
90-102 REGENT STREET, REDFERN, NSW 2016

TITLE
CIVIL SERVICES
FOOTPATH DESIGN
CROSS SECTIONS
CH 80 TO CH 122

DA ISSUE
NOT FOR CONSTRUCTION

DRAWN	J.S.	SCALE @ A1
CHECKED	J.S.	
APPROVED	J.S.	1:50
CREATED	01/21	
JOB No.	DRAWING No.	REV
190276	F104	F1



REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
F1	19.01.21	DA ISSUE	J.S.

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified

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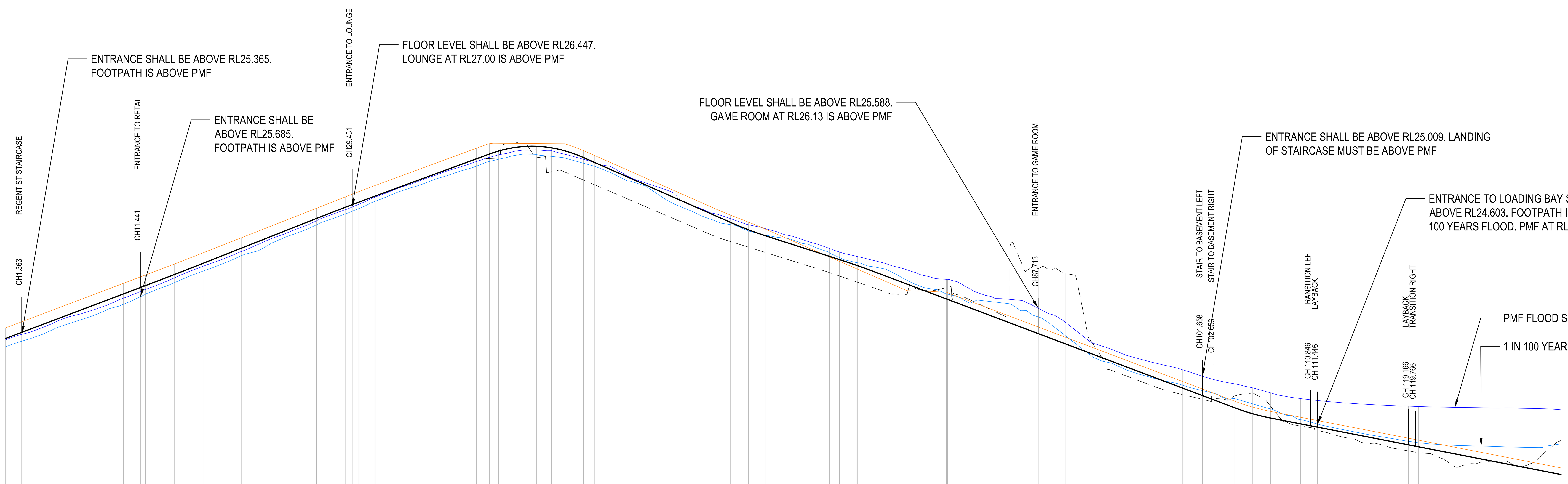
PROJECT
WEE HUR REGENT
90-102 REGENT STREET,
REDFERN, NSW 2016

TITLE
FLOOD STUDY
EQUIVALENT KERB GUTTER
APPLIED IN HEC RAS

DA ISSUE
NOT FOR CONSTRUCTION

DRAWN	J.S.	SCALE @ A1
CHECKED	J.S.	
APPROVED	J.S.	1:5
CREATED	01/21	
JOB No.	DRAWING No.	REV
190276	F901	P1

Jan 31, 2021 – 11:19am D:\WORK\HEC-RAS\EquivalentKerbGutter.dwg



HORIZONTAL CURVE DATA: R-2.5m; R-2.5m

VERTICAL GEOMETRY GRADE / VERTICAL GRADE LENGTH: 3.78% 14.356m; 3.95% 14.529m; 3.68% 16.192m; -4.41% 18.009m; -3.22% 9.253m; -3.77% 33.604m; -1.94% 26.182m

VERTICAL CURVE LENGTH / VERTICAL CURVE RADIUS: 5m VC R=2905.01; 5m VC R=1840.43; 8m VC R=98.81; 3m VC R=251.13; 3m VC R=539.08; 3m VC R=163.93

DATUM 22.0

CHAINAGE	DESIGN LEVEL KERB TOP ALIGNMENT	FOOTPATH LEVEL ALONG BUILDING/BOUNDARY	FLOOD LEVEL PMF 15min	KERB TOP LEVEL VS FLOOD +VE = KERB ABOVE FLOOD	FLOOD LEVEL 100Y 25min	KERB TOP LEVEL VS FLOOD +VE = KERB ABOVE FLOOD	EXISTING LEVEL
0.000	25.331	25.421	25.319	0.011	25.260	0.071	25.331
1.363	25.382	25.472	25.365	0.017	25.307	0.075	25.382
10.000	25.709	25.799	25.673	0.036	25.621	0.088	25.709
11.441	25.763	25.853	25.730	0.034	25.685	0.078	25.763
11.856	25.779	25.869	25.747	0.032	25.705	0.074	25.779
14.356	25.875	25.964	25.847	0.028	25.806	0.069	25.873
16.856	25.973	26.062	25.947	0.025	25.906	0.066	25.972
20.000	26.097	26.185	26.069	0.028	26.034	0.063	26.096
26.385	26.349	26.436	26.330	0.020	26.296	0.054	26.349
28.885	26.447	26.534	26.426	0.021	26.390	0.057	26.448
29.431	26.467	26.556	26.447	0.020	26.412	0.056	26.469
30.000	26.489	26.578	26.471	0.018	26.434	0.055	26.490
31.385	26.540	26.63	26.532	0.009	26.496	0.044	26.540
40.000	26.858	26.948	26.834	0.023	26.795	0.062	26.855
41.077	26.897	26.986	26.869	0.028	26.834	0.063	26.860
41.872	26.923	26.68	26.891	0.032	26.853	0.070	26.863
45.077	26.964	26.88	26.934	0.030	26.894	0.069	26.868
46.371	26.951	26.88	26.926	0.025	26.878	0.073	26.748
49.077	26.868	26.927	26.853	0.015	26.820	0.048	26.677
50.000	26.827	26.887	26.824	0.003	26.794	0.033	26.637
60.000	26.386	26.445	26.395	-0.009	26.340	0.047	26.208
61.585	26.316	26.378	26.348	-0.032	26.297	0.019	26.154
63.085	26.254	26.319	26.297	-0.042	26.245	0.010	26.107
64.585	26.202	26.258	26.263	-0.061	26.208	-0.006	26.060
70.000	26.027	26.022	26.095	-0.067	26.058	-0.030	25.890
70.838	26.000	25.986	26.065	-0.064	26.017	-0.017	25.861
72.338	25.950	25.92	26.027	-0.077	25.974	-0.024	25.809
73.838	25.896	25.855	25.991	-0.095	25.937	-0.041	25.757
76.566	25.793	25.736	25.913	-0.121	25.825	-0.032	25.702
79.910	25.666	25.724	25.833	-0.167	25.709	-0.043	25.762
80.000	25.663	25.72	25.833	-0.170	25.707	-0.044	25.765
87.713	25.372	25.428	25.588	-0.216	25.514	-0.142	25.922
90.000	25.285	25.342	25.470	-0.184	25.356	-0.070	25.883
100.000	24.908	24.964	25.064	-0.156	24.933	-0.025	24.853
101.658	24.845	24.901	25.009	-0.164	24.888	-0.042	24.814
104.442	24.740	24.796	24.944	-0.204	24.818	-0.078	24.843
105.942	24.691	24.747	24.911	-0.220	24.775	-0.084	24.867
107.442	24.655	24.711	24.868	-0.214	24.732	-0.077	24.756
110.000	24.605	24.661	24.820	-0.215	24.640	-0.035	24.587
111.446	24.577	24.633	24.803	-0.226	24.603	-0.026	24.549
119.166	24.427	24.483	24.755	-0.328	24.457	-0.030	24.375
120.000	24.410	24.467	24.752	-0.342	24.444	-0.034	24.359
130.000	24.216	24.272	24.735	-0.519	24.404	-0.188	24.295
132.124	24.175	24.231	24.724	-0.550	24.435	-0.260	24.464

CTRL KERB TOP

10 5 0 10 m
1 : 200-A1 1 : 400-A3

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
F1	19.01.21	DA ISSUE	J.S.

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified

CLIENT
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PROJECT
WEE HUR REGENT
90-102 REGENT STREET, REDFERN, NSW 2016

TITLE
CIVIL SERVICES
TOP OF KERB PROFILE WITH FLOOD LEVELS

DA ISSUE
NOT FOR CONSTRUCTION

DRAWN J.S.
CHECKED J.S.
APPROVED J.S.
CREATED 01/21
SCALE @ A1 H1:200 V1:20
JOB No. 190276
DRAWING No. F201
REV F1

Feb 02, 2021 - 9:38am D:\WORK\190276 Regent Wee Hur 90 102 Redfern\Drawings\Civil\F201.dwg

LANDSCAPE PLAN -GROUND FLOOR -STRUCTURE PLAN

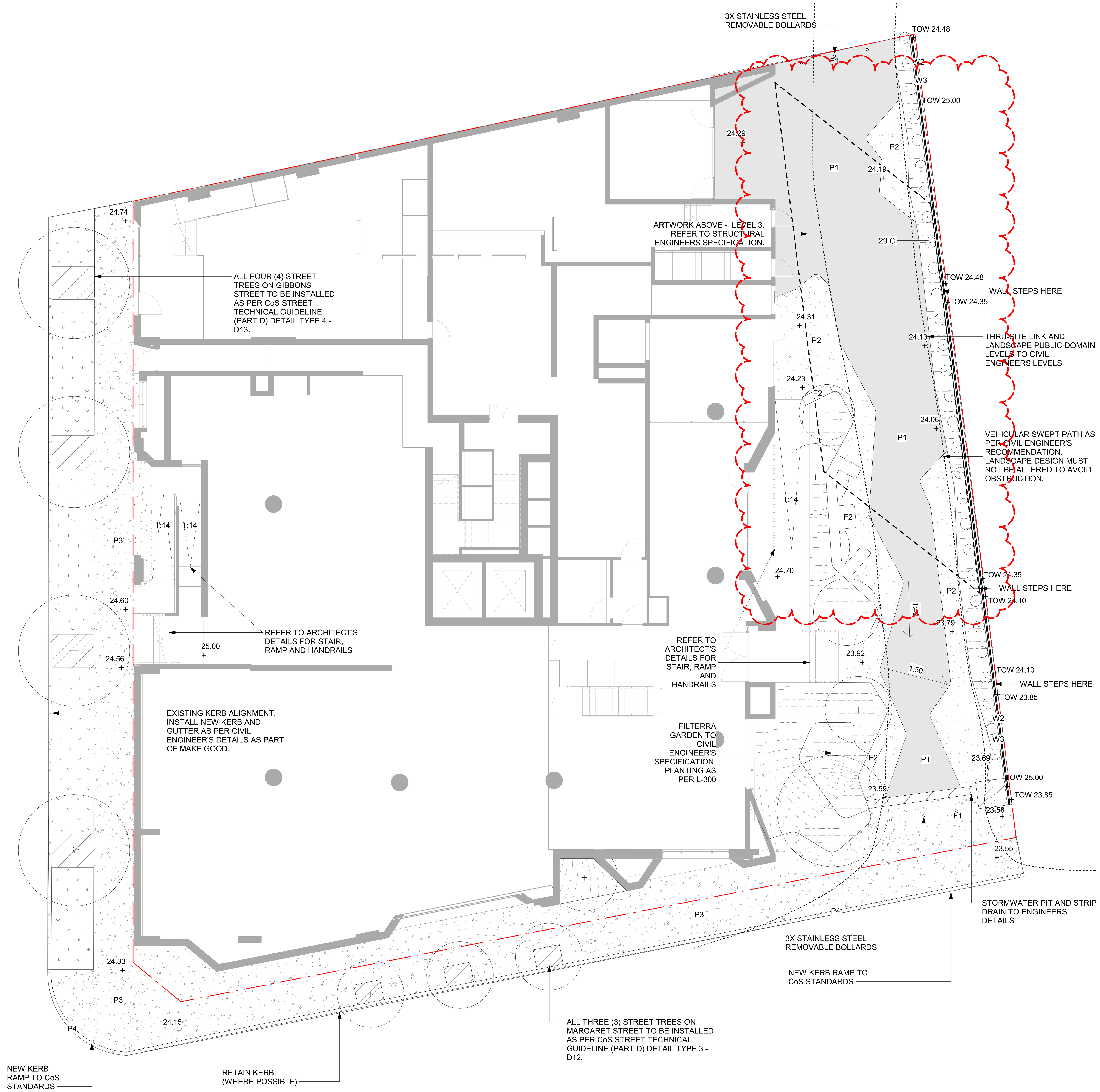
LEGEND

P1	Through site link - HydroSTON permeable pavement
P2	Honed Concrete Special Aggregate
P3	Concrete footpath with broom finish. To be in accordance with Cos Standard.
SF1	Concrete stair flight to match P2. Includes stainless steel handrail, stair nosing and TGSI to AS 1428
AW	Accessible walkway. SS handrail on outer concrete wall hob. Return into stair flight.
Um1	Proposed garden bed - Understory planting Mix 1.
F	Filterra garden bed system - Refer to Civil Engineer drawings
BIO	Bioretention - Refer to Civil Engineer drawings
	Proposed Roadside Verge Lawn
TP	Proposed Tree Pits - to COS Standard.
VS	Swale - Min 700mm wide vegetated swale along entire eastern driveway boundary.
	Proposed Timber Furniture (Seating, benches and tables)
	Indicative of people
+24.05(e)	Existing finish paving levels.
+38.10(P)	Proposed finish paving levels.
1:40	Proposed grades.

Notes:

- Street frontage and footpath within Council's boundary to be upgraded/installed in accordance with Council standards.
- Refer to Civil report for levels and flood provisions

PROJECT. ADDRESS		LANDSCAPE DA REPORT	
Iss.	Amendment	Date	Checked
Draft	LANDSCAPE REPORT	07/12/18	HY
A	LANDSCAPE REPORT	14/12/18	JN
B	LANDSCAPE REPORT	13/11/19	HY
C	LANDSCAPE REPORT	16/04/20	SI
D	LANDSCAPE REPORT	06/07/20	SI



PAVING - GROUND LEVEL

CODE	ITEM	DIMENSION	COLOUR + FINISH	SUPPLIER	SHOP DRAWINGS	SAMPLES	NOTES
P1	Permeable paving	80 x 206 x 136mm (for vehicle traffic) Stretcher Bond, coursing perpendicular to path of travel.	HydroSTON Permeable Pavement H80 Classic - Charcoal - P5 Slip Resistance	HydroSTON +61 (0)2 8303 2423	No	Inspection of completed section prior to installation	-
P2	Honed Concrete - Special Aggregate	150mm thick	P5 Slip Resistance	-	N/a	1m x 1m sample is required for approval prior to installation	-
P3	Concrete Footpath	150mm thick	P5 Slip Resistance	-	N/a	1m x 1m sample is required for approval prior to installation	To CoS Standard
P4	Concrete Kerb	Refer to Civil engineer's specification	P5 Slip Resistance	-	N/a	Not Required	To CoS Standard

WALLS - GROUND LEVEL

CODE	DESCRIPTION	DIMENSIONS	COLOUR + FINISH	MANUFACTURER	SHOP DRAWINGS	SAMPLES	NOTES
W2	Galvanised steel mesh fence	2400mm (h). Mesh openings 50x50mm .	Posts & Frame - powder coated dark grey/black to match artwork support posts. PVC coated mesh colour to match posts	TBA	Required	Yes	Top of fence at consistent height - W4 wall below steps
W3	Rendered blockwork wall	200mm wide, height varies	Grey painted finish. Ensure all exposed surfaces are fully rendered and painted - including 150mm below adjacent mulch level allowing for future soil settlement.	TBA	-	-	Refer to engineer's drawings for reinforcement and structural details.

FURNITURE AND FIXINGS - GROUND LEVEL

CODE	DESCRIPTION	DIMENSION	COLOUR + FINISH	MANUFACTURER	SHOP DRAWINGS	SAMPLES	NOTES
F1	Stainless Steel Bollard	880MM (h) x 165mm dia	Brushed Stainless Steel - Flat Top	Street Furniture Australia (02) 8774 8888	Required	Yes	Removeable surface fixed model. Install to manufacturers recommendation.
F2	Timber Batten Steel Frame Bench Seat	Size varies	All battens to be made from spotted gum timber. Graphite colour powder coat finish to all steel frame and leg elements. Allow for seat backrest to half seat.	Mos Urban +61 2 9188 3459	Required	Yes	Provide clear coat cutex extreme timber protection oil to all timber seating and backrest battens. Timber to be pre-leeched to minimise staining.

DRAFT NOT FOR CONSTRUCTION

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2. THIS DRAWING IS AN UNCONTROLLED COPY UNLESS STAMPED WITH STATUS THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND LEVELS ON SITE AS THIS IS
3. NOT A SHOP DRAWING.
4. THE CONTRACTOR MUST REFER ANY DISCREPANCIES TO THE SUPERINTENDENTS REPRESENTATIVE BEFORE PROCEEDING WITH THE WORK.
5. THE CONTRACTOR MUST NOT SCALE FROM THESE DRAWINGS. USE NOMINATED DIMENSIONS AND LEVELS.
6. THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE TOTAL CONTRACT PACKAGE INCLUDING DRAWINGS AND SPECIFICATIONS OF ALL CONSULTANTS. IF THE CONTRACTOR INTENDS TO UNDERTAKE ANY EXCAVATION WORK, IT IS THE
7. CONTRACTORS RESPONSIBLITY TO CONTACT 1100 - DIAL BEFORE YOU DIG OR WWW.1100.COM.AU

SURVEY INFORMATION

8. TURF DESIGN STUDIO DO NOT WARRANT THE ACCURACY OF SURVEY INFORMATION.

Rev	Date	Description	Drawn	Checked
3	29.10.20	Tender 80%	DR	JN
2	14.10.20	Tender 80%	DR	JN
1	25.09.20	Tender 80%	DR	JN

Author

turf

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Client

WEE HUR

Project

Wee Hur Student Housing

Drawing Title

General Arrangement - Ground Floor

Drawing Status

Tender 80%

N

Scale. 1 : 100 @A1

Plot Date 29/10/2020 2:07:04 PM

Project No. 1820

Drawing No. L-200

Revision 3

C:\Users\Turf\Documents\1820_Wee Hur_13-23 Gibbons Street Redfern_19_sydney@turfdesign.com.nt

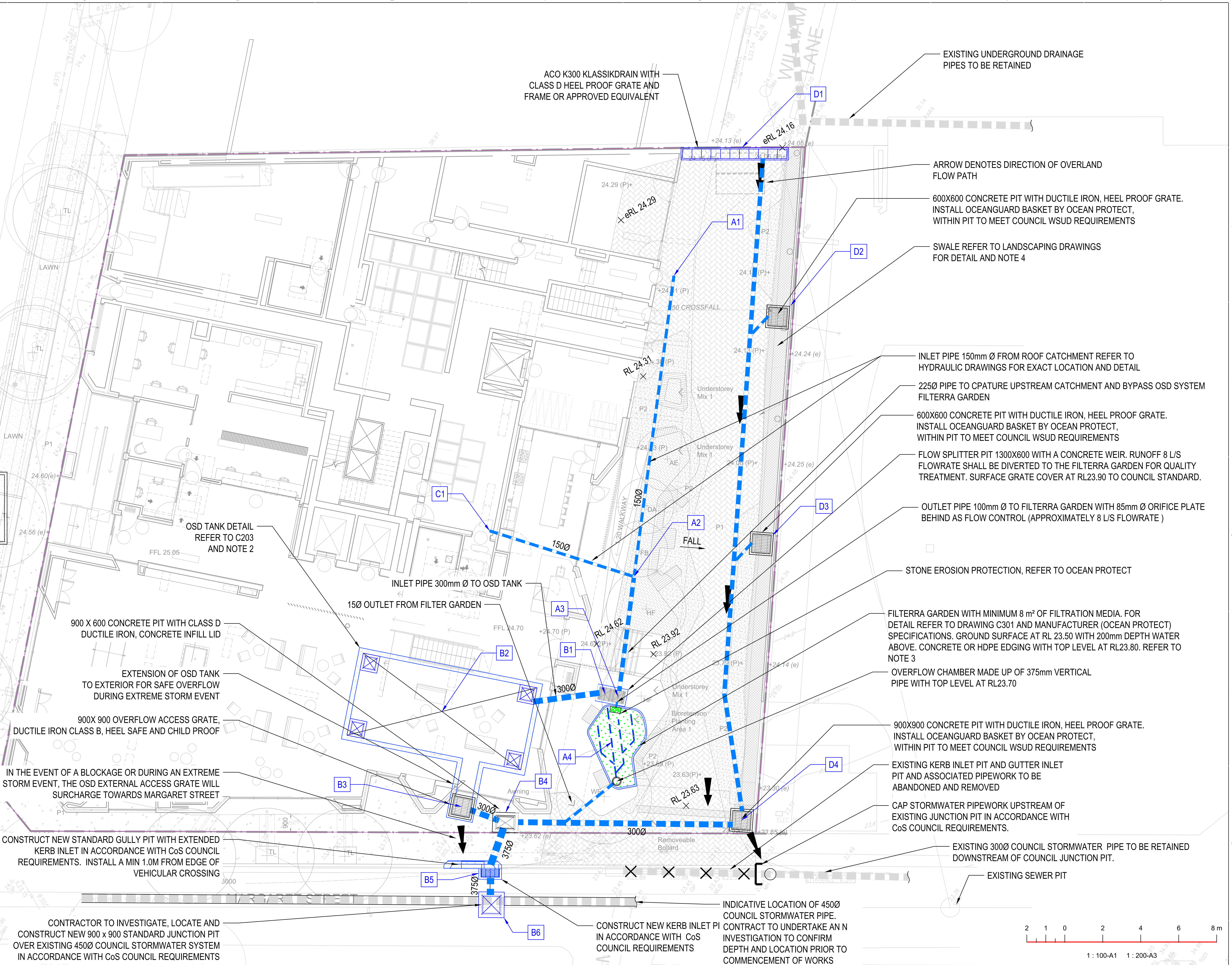
DIRECTION OF OVERLAND FLOW PATH

NOTES

1. ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH AS3500.3 PLUMBING & DRAINAGE PART 3: STORMWATER DRAINAGE, CITY OF SYDNEY STORMWATER DRAINAGE MANUAL AND THE LATEST BASIX REQUIREMENTS.
2. IN ACCORDANCE WITH CITY OF SYDNEY REQUIREMENTS FOR THE PROPOSED DEVELOPMENT, ON-SITE DETENTION (OSD) REQUIRED. SYDNEY WATER HAVE CONFIRMED THE FOLLOWING SITE STORAGE REQUIREMENT AND PERMISSIBLE SITE DISCHARGE REQUIREMENTS:
   MIN OSD SSR = $24.0m^3$
   MIN OSD = 48.0L/s
3. IN ACCORDANCE WITH CITY OF SYDNEY REQUIREMENTS FOR THE PROPOSED DEVELOPMENT, A STORMWATER QUALITY ASSESSMENT HAS BEEN UNDERTAKEN BY A SUITABLE QUALIFIED DRAINAGE ENGINEER DEMONSTRATING HOW THE DEVELOPMENT WILL BE DESIGNED TO ENSURE THAT THE FLOW OF POST-DEVELOPMENT POLLUTANTS FROM THE SITE DUE TO STORMWATER WILL BE REDUCED. REFER TO DRAWING C501 FOR DETAILS.
4. WILLIAM LANE IS SUBJECT TO MAINSTREAM FLOODING. REFER TO THE FLOOD ASSESSMENT AND STORMWATER MANAGEMENT REPORT FOR DEFINED FLOOD LEVELS AND EXTENTS, AS WELL AS MITIGATION MEASURES.
5. AN "APPLICATION FOR APPROVAL OF STORMWATER DRAINAGE CONNECTIONS" SHALL BE SUBMITTED TO COUNCIL WITH THE APPROPRIATE FEE AT THE TIME OF LODGEMENT OF THE PROPOSAL FOR CONNECTION FOR STORMWATER TO COUNCIL'S DRAINAGE SYSTEM

NOTES

ALL GRATES SERVING PITS AND TRENCH DRAINS SHALL BE CLASS D, DUCTILE IRON HEEL SAFE IN ACCORDANCE WITH CoS COUNCIL REQUIREMENTS U.N.O



2 1 0 2 4 6 8 m

1 : 100-A1 1 : 200-A3

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
T1	28.02.20	TENDER ISSUE	J.S.
1	09.02.21	CONSTRUCTION ISSUE	J.S.
2	30.03.21	CONSTRUCTION ISSUE	M.B.

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified

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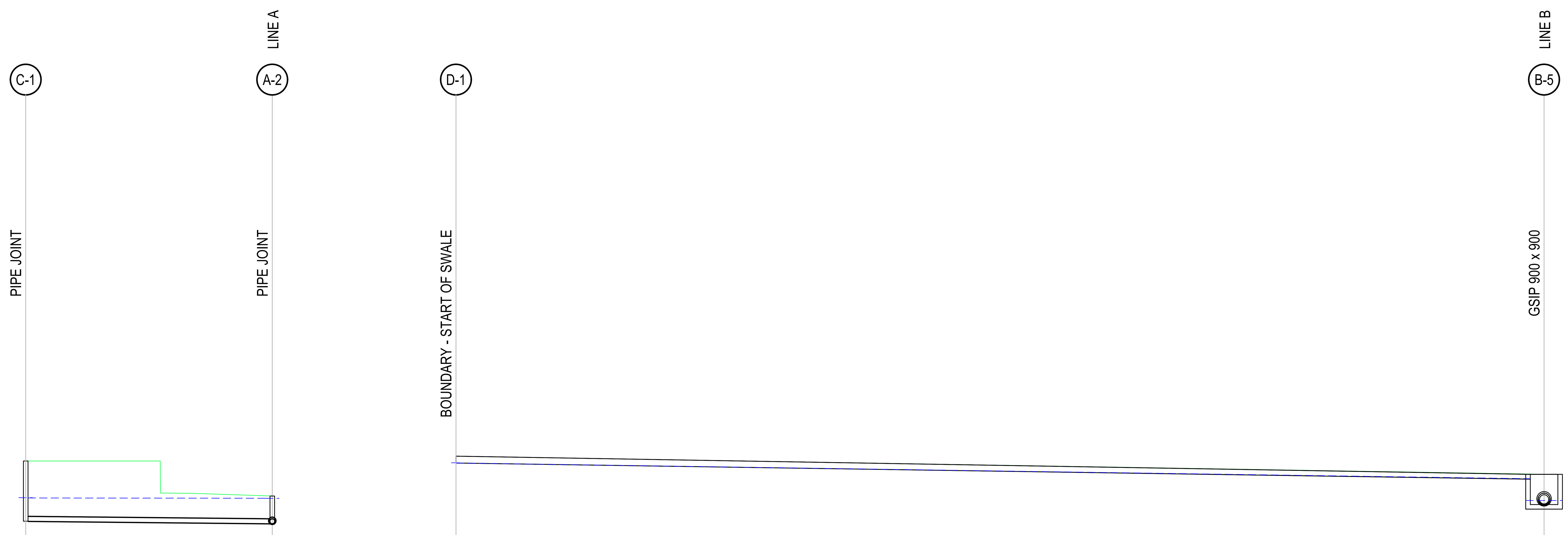
PROJECT
WEE HUR REDFERN STUDENT VILLAGE
13-23 GIBBONS STREET, REDFERN, NSW 2016

TITLE
CIVIL SERVICES
GROUND LEVEL
OSD AND WSUD DESIGN
DRAINAGE LAYOUT

CONSTRUCTION ISSUE

DRAWN	J.S.	SCALE @ A1
CHECKED	J.S.	1:100
APPROVED	J.S.	
CREATED	AUG 19	
JOB No.	DRAWING No.	REV
180391	C201	2



LINE C

DATUM (m)	5.00	
PIPE CLASS	UPVC	
PIPE SIZE (mm)	150	
PIPE COVER MIN (m)	0.74	
PIPE GRADE (%)	1.00	
FULL PIPE VELOCITY (m/s)	0.28	
PEAK FLOW (L/s)	5	
DESIGN SURFACE LEVEL	25.050	23.906
INVERT LEVEL	23.084	23.005 22.985
PIPE CHAINAGE	0.000	8.054

LINE D

DATUM (m)	4.00	
PIPE CLASS	CHNL	
PIPE SIZE (mm)	SWALE 1500B1000x225 REFER TO LANDSCAPING	
PIPE COVER MIN (m)	0.65	
PIPE GRADE (%)	1.50	
FULL PIPE VELOCITY (m/s)	0.32	
PEAK FLOW (L/s)	4	
DESIGN SURFACE LEVEL	24.207	23.614
INVERT LEVEL	23.982	23.456 22.628
PIPE CHAINAGE	0.000	35.540

NOTES:
1) THIS PITS AND PIPES PROFILE ARE GENERATED FROM 12D PLOT. THE STORMWATER ANALYSIS AND HGL LEVELS ARE IMPORTED FROM DRAINS SOFTWARE.
2) THE PURPOSE OF THIS PROFILE IS TO DEMONSTRATE THAT STORMWATER FLOW TOWARD THE OSD TANK AND DISCHARGE INTO EXSITING KERB INLET PITS WITH APPROPRIATE GRADIENTS.
3) THE DRAINS STORMWATER ANALYSIS SHOW THAT NO WATER UPWELLING FROM ANY PITS DURING THE 1 IN 5 YEARS ARI STORM EVENT.
4) REFER TO C203 AND C204 FOR DETAIL OF OSD TANK AND FILTERRA GARDEN.

2 1 0 2 4 6 8 m
1 : 100-A1 1 : 200-A3

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
T1	28.08.20	TENDER ISSUE	J.S.
C1	06.02.21	CONSTRUCTION CERTIFICATE	J.S.

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified

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PROJECT
WEE HUR REDFERN STUDENT VILLAGE
13-23 GIBBONS STREET, REDFERN, NSW 2016

TITLE
STORMWATER SERVICES
PIPE AND PIT PROFILE
HGL AT 1 YEAR ARI

C.C. ISSUE
FOR CONSTRUCTION

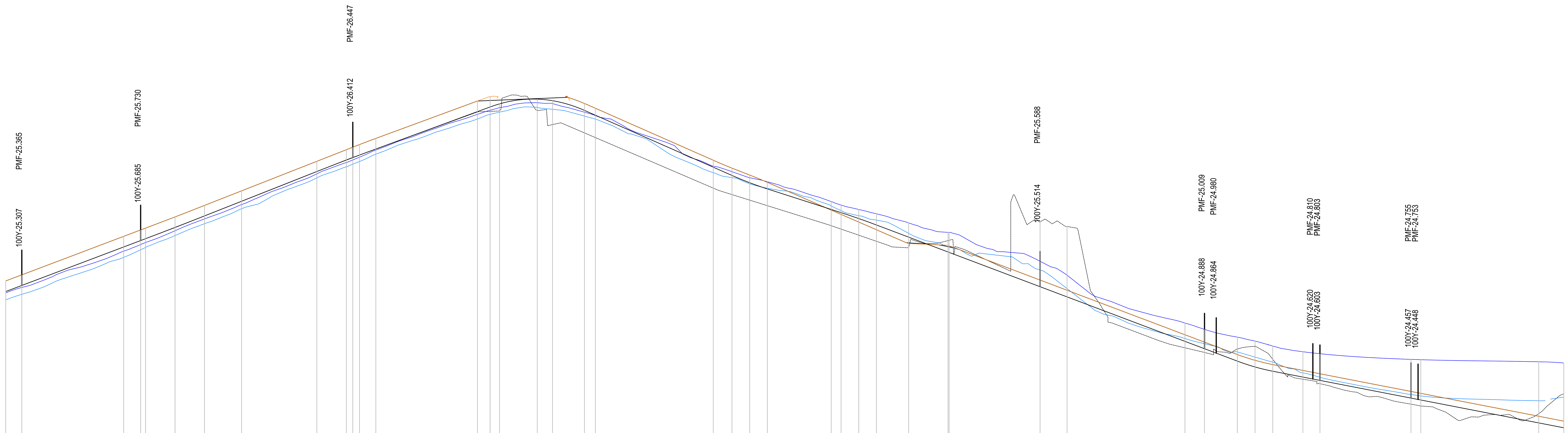
DRAWN	J.S.	SCALE @ A1
CHECKED	M.B.	1:100
APPROVED	M.E.	
CREATED	08/20	
JOB No.	DRAWING No.	REV
180391	C303	C1

ANTONIADES ARCHITECTS

偉合控股有限公司 WEE HUR HOLDINGS LTD

OPTION 1E
LEVEL 1 FLOOR PLAN
SCALE 1:300
20009DA- 104-116 REGENT STREET, REDFERN

10NOV,20



HORIZONTAL CURVE DATA: R-2.5m; R-2.5m

VERTICAL GEOMETRY GRADE / VERTICAL GRADE LENGTH: 3.78% 14.356m; 3.95% 14.529m; 3.68% 16.192m; -4.41% 18.009m; -3.22% 9.253m; -3.77% 33.604m; -1.94% 26.182m

VERTICAL CURVE LENGTH / VERTICAL CURVE RADIUS: 5m VC R=2905.01; 5m VC R=1840.43; 8m VC R=98.81; 3m VC R=251.13; 3m VC R=539.08; 3m VC R=163.93

DATUM 22.0

DESIGN LEVEL KERB TOP ALIGNMENT	25.331	25.382	25.709	25.763	25.779	25.875	25.973	26.097	26.349	26.447	26.467
FOOTPATH LEVEL ALONG BUILDING	25.421	25.472	25.799	25.853	25.869	25.964	26.062	26.185	26.436	26.534	26.556
FLOOD LEVEL PMF 15min	25.319	25.365	25.673	25.730	25.747	25.847	25.947	26.069	26.330	26.426	26.447
KERB TOP LEVEL VS FLOOD +VE = KERB ABOVE FLOOD	0.011	0.017	0.036	0.034	0.032	0.028	0.025	0.028	0.020	0.021	0.020
FLOOD LEVEL 100Y 25min	25.260	25.307	25.621	25.685	25.705	25.806	25.906	26.034	26.296	26.390	26.412
KERB TOP LEVEL VS FLOOD +VE = KERB ABOVE FLOOD	0.071	0.075	0.088	0.078	0.074	0.069	0.066	0.063	0.054	0.057	0.056
EXISTING LEVEL	25.331	25.382	25.709	25.763	25.779	25.873	25.972	26.096	26.349	26.448	26.469
CHAINAGE	0.000	1.363	10.000	11.441	11.856	14.356	16.856	20.000	26.385	28.885	29.431

DESIGN LEVEL KERB TOP ALIGNMENT	26.489	26.540	26.858	26.897	26.923	26.964	26.951	26.868	26.827	26.386	26.316
FOOTPATH LEVEL ALONG BUILDING	26.578	26.63	26.948	26.986		26.88		26.927	26.887	26.445	26.378
FLOOD LEVEL PMF 15min	26.471	26.532	26.834	26.869	26.891	26.934	26.926	26.853	26.824	26.395	26.348
KERB TOP LEVEL VS FLOOD +VE = KERB ABOVE FLOOD	0.018	0.009	0.023	0.028	0.032	0.030	0.025	0.015	0.003	-0.009	-0.032
FLOOD LEVEL 100Y 25min	26.434	26.496	26.795	26.834	26.853	26.894	26.878	26.820	26.794	26.340	26.297
KERB TOP LEVEL VS FLOOD +VE = KERB ABOVE FLOOD	0.055	0.044	0.062	0.063	0.070	0.069	0.073	0.048	0.033	0.047	0.019
EXISTING LEVEL	26.490	26.540	26.855	26.860	26.863	26.868	26.748	26.677	26.637	26.208	26.154
CHAINAGE	30.000	31.385	40.000	41.077	41.872	45.077	46.371	49.077	50.000	60.000	61.585

DESIGN LEVEL KERB TOP ALIGNMENT	26.254	26.202	26.027	26.000	25.950	25.896	25.793	25.666	25.663	25.372	25.285
FOOTPATH LEVEL ALONG BUILDING	26.319	26.258	26.022	25.986	25.92	25.855	25.736	25.724	25.72	25.428	25.342
FLOOD LEVEL PMF 15min	26.297	26.263	26.095	26.065	26.027	25.991	25.913	25.833	25.833	25.588	25.470
KERB TOP LEVEL VS FLOOD +VE = KERB ABOVE FLOOD	-0.042	-0.061	-0.067	-0.064	-0.077	-0.095	-0.121	-0.167	-0.170	-0.216	-0.184
FLOOD LEVEL 100Y 25min	26.245	26.208	26.058	26.017	25.974	25.937	25.825	25.709	25.707	25.514	25.356
KERB TOP LEVEL VS FLOOD +VE = KERB ABOVE FLOOD	0.010	-0.006	-0.030	-0.017	-0.024	-0.041	-0.032	-0.043	-0.044	-0.142	-0.070
EXISTING LEVEL	26.107	26.060	25.890	25.861	25.809	25.757	25.702	25.762	25.765	25.922	25.883
CHAINAGE	63.085	64.585	70.000	70.838	72.338	73.838	76.566	79.910	80.000	87.713	90.000

DESIGN LEVEL KERB TOP ALIGNMENT	24.908	24.845	24.740	24.691	24.655	24.605	24.577	24.427	24.410	24.216	24.175
FOOTPATH LEVEL ALONG BUILDING	24.964	24.901	24.796	24.747	24.711	24.661	24.633	24.483	24.467	24.272	24.231
FLOOD LEVEL PMF 15min	25.064	25.009	24.944	24.911	24.868	24.820	24.803	24.755	24.752	24.735	24.724
KERB TOP LEVEL VS FLOOD +VE = KERB ABOVE FLOOD	-0.156	-0.164	-0.204	-0.220	-0.214	-0.215	-0.226	-0.328	-0.342	-0.519	-0.550
FLOOD LEVEL 100Y 25min	24.933	24.888	24.818	24.775	24.732	24.640	24.603	24.457	24.444	24.404	24.435
KERB TOP LEVEL VS FLOOD +VE = KERB ABOVE FLOOD	-0.025	-0.042	-0.078	-0.084	-0.077	-0.035	-0.026	-0.030	-0.034	-0.188	-0.260
EXISTING LEVEL	24.853	24.814	24.843	24.867	24.756	24.587	24.549	24.375	24.359	24.295	24.464
CHAINAGE	100.000	101.658	104.442	105.942	107.442	110.000	111.446	119.166	120.000	130.000	132.124

CTRL KERB TOP

10 5 0 10 m

1 : 200-A1 1 : 400-A3

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
F1	19.01.21	DA ISSUE	J.S.

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified

NORTH

CLIENT
WEE HUR

ARCHITECT
ALLEN JACK COTTIER

CONSULTANT
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+61 (02) 9437 1000
general@jhaengineers.com.au
www.jhaservices.com

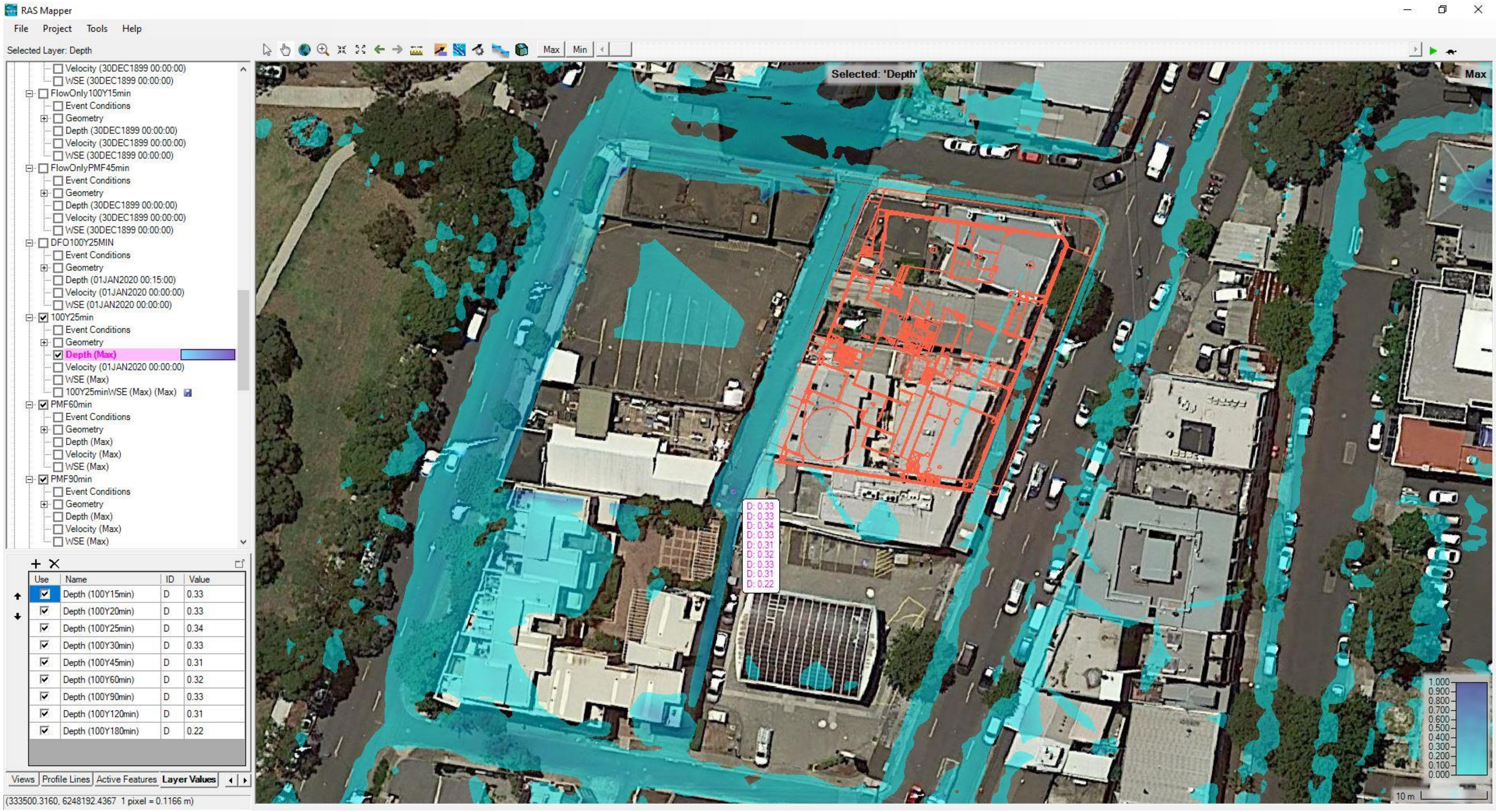
PROJECT
WEE HUR REGENT
90-102 REGENT STREET, REDFERN, NSW 2016

TITLE
CIVIL SERVICES
TOP OF KERB PROFILE WITH FLOOD LEVELS OF 100Y AND PMF

DA ISSUE
NOT FOR CONSTRUCTION

DRAWN	J.S.	SCALE @ A1	
CHECKED	J.S.	H1:200 V1:20	
APPROVED	J.S.		
CREATED	01/21		
JOB No.	DRAWING No.	REV	
190276	F202	F1	

Feb 21, 2021 – 1:14pm D:\WORK\190276 Regent Wee Hur 90 102 Redfern\Drawings\Civil\F202.dwg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Event Conditions
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Geometry
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ID
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Profile Lines
Active Features
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D: 0.22
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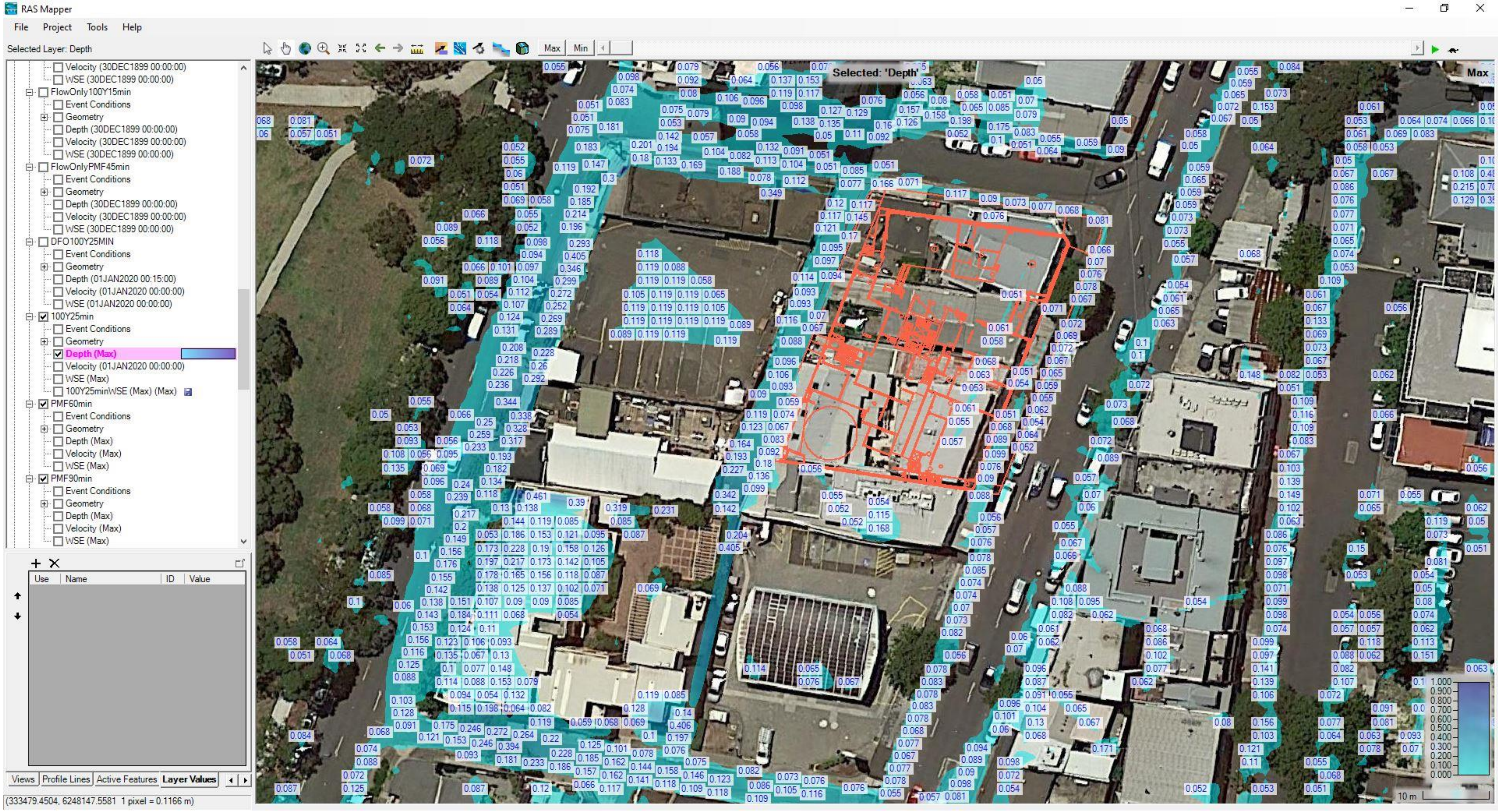
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Velocity (30DEC1899 00:00:00)
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Event Conditions
Geometry
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Velocity (30DEC1899 00:00:00)
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DFO100Y25MIN
Event Conditions
Geometry
Depth (01JAN2020 00:15:00)
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WSE (01JAN2020 00:00:00)
100Y25min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (Max)
100Y25minWSE (Max) (Max)
PMF60min
Event Conditions
Geometry
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Velocity (Max)
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PMF90min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
Use Name ID Value
Views Profile Lines Active Features Layer Values
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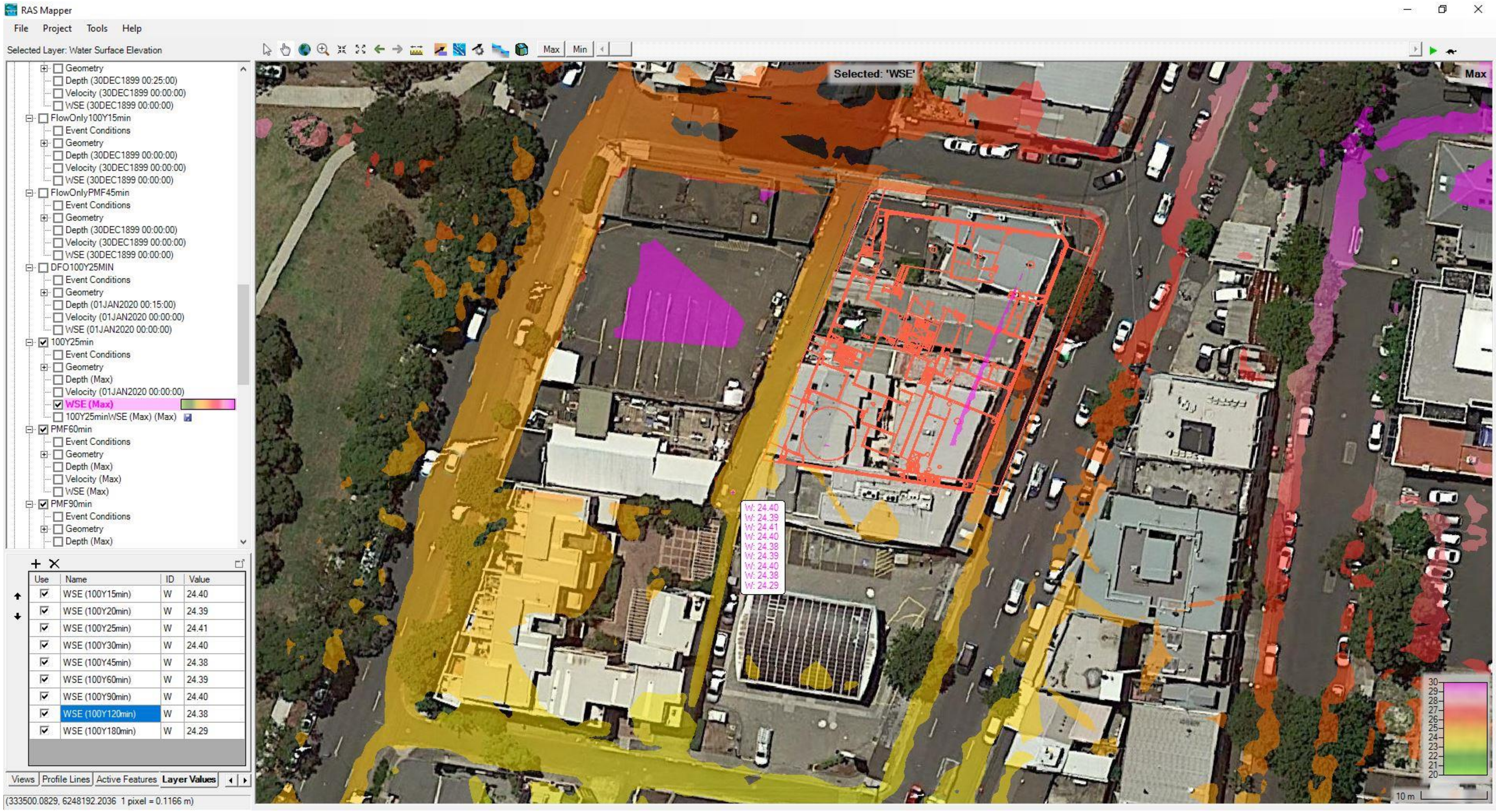

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Event Conditions
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WSE (30DEC1899 00:00:00)
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Event Conditions
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DFO100Y25MIN
Event Conditions
Geometry
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WSE (01JAN2020 00:00:00)
100Y25min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (Max)
100Y25minWSE (Max) (Max)
PMF60min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
PMF90min
Event Conditions
Geometry
Depth (Max)
Use | Name | ID | Value
WSE (100Y15min) | W | 24.40
WSE (100Y20min) | W | 24.39
WSE (100Y25min) | W | 24.41
WSE (100Y30min) | W | 24.40
WSE (100Y45min) | W | 24.38
WSE (100Y60min) | W | 24.39
WSE (100Y90min) | W | 24.40
WSE (100Y120min) | W | 24.38
WSE (100Y180min) | W | 24.29
Views Profile Lines Active Features Layer Values
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W: 24.40
W: 24.39
W: 24.41
W: 24.40
W: 24.38
W: 24.39
W: 24.40
W: 24.38
W: 24.29
30
29
28
27
26
25
24
23
22
21
20
10 m


RAS Mapper
File
Project
Tools
Help
Selected Layer: Water Surface Elevation
Max
Min
Selected: 'WSE'
Geometry
Depth (30DEC1899 00:25:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
FlowOnly100Y15min
Event Conditions
Geometry
Depth (30DEC1899 00:00:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
FlowOnlyPMF45min
Event Conditions
Geometry
Depth (30DEC1899 00:00:00)
Velocity (30DEC1899 00:00:00)
WSE (30DEC1899 00:00:00)
DFO100Y25MIN
Event Conditions
Geometry
Depth (01JAN2020 00:15:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y25min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (Max)
100Y25minWSE (Max) (Max)
PMF60min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
PMF90min
Event Conditions
Geometry
Depth (Max)
Use
Name
ID
Value
Views
Profile Lines
Active Features
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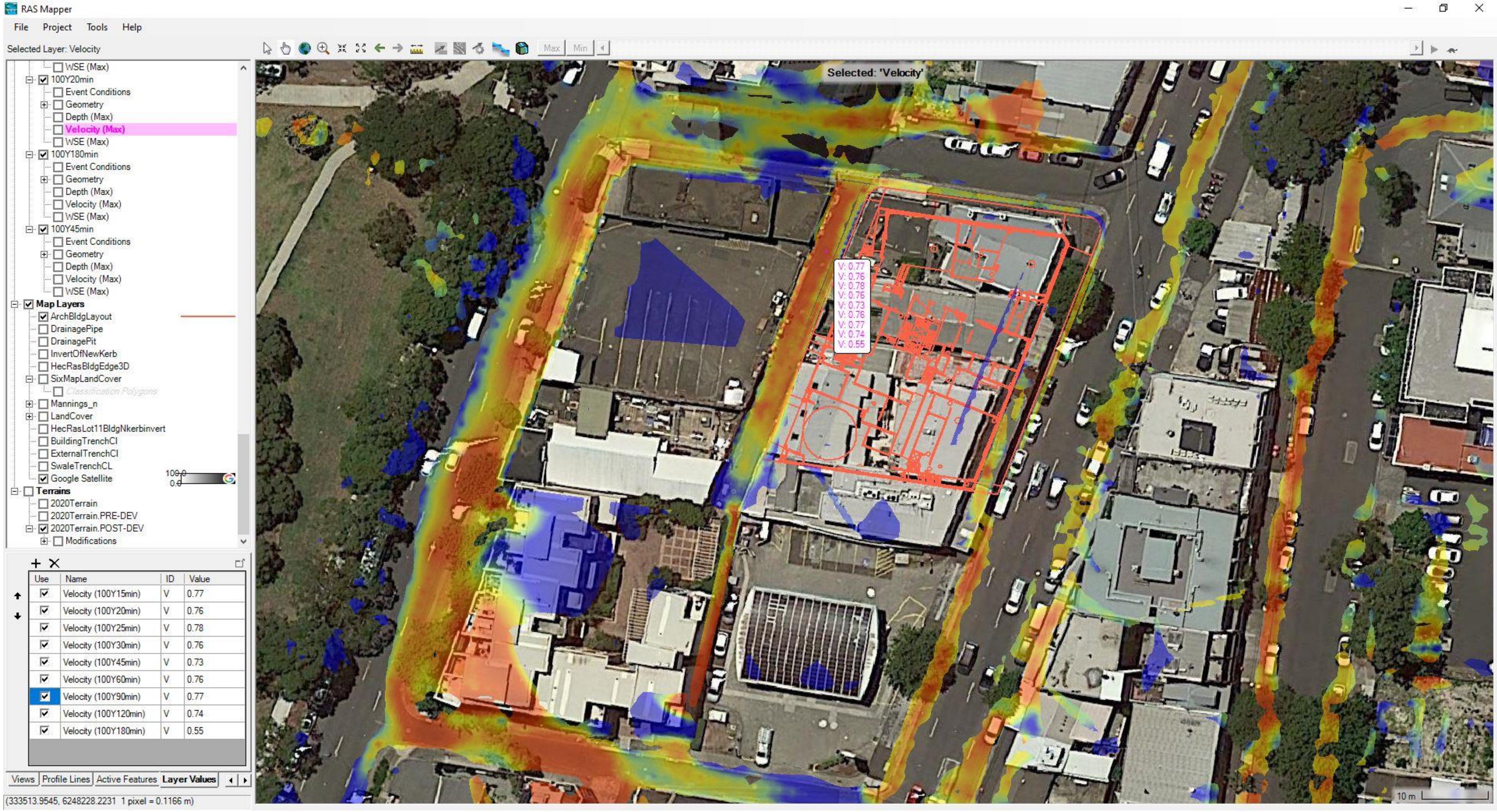
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File Project Tools Help
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Event Conditions
Geometry
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100Y180min
Event Conditions
Geometry
Depth (Max)
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100Y45min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
Map Layers
ArchBldgLayout
DrainagePipe
DrainagePit
InvertOfNewKerb
HecRasBldgEdge3D
SixMapLandCover
Classification Polygons
Mannings_n
LandCover
HecRasLot11BldgNkerbinvert
BuildingTrenchCl
ExternalTrenchCl
SwaleTrenchCL
Google Satellite
100.0
0.0
Terrains
2020Terrain
2020Terrain.PRE-DEV
2020Terrain.POST-DEV
Modifications
V: 0.77
V: 0.76
V: 0.78
V: 0.76
V: 0.73
V: 0.76
V: 0.77
V: 0.74
V: 0.55
Use Name ID Value
Velocity (100Y15min) V 0.77
Velocity (100Y20min) V 0.76
Velocity (100Y25min) V 0.78
Velocity (100Y30min) V 0.76
Velocity (100Y45min) V 0.73
Velocity (100Y60min) V 0.76
Velocity (100Y90min) V 0.77
Velocity (100Y120min) V 0.74
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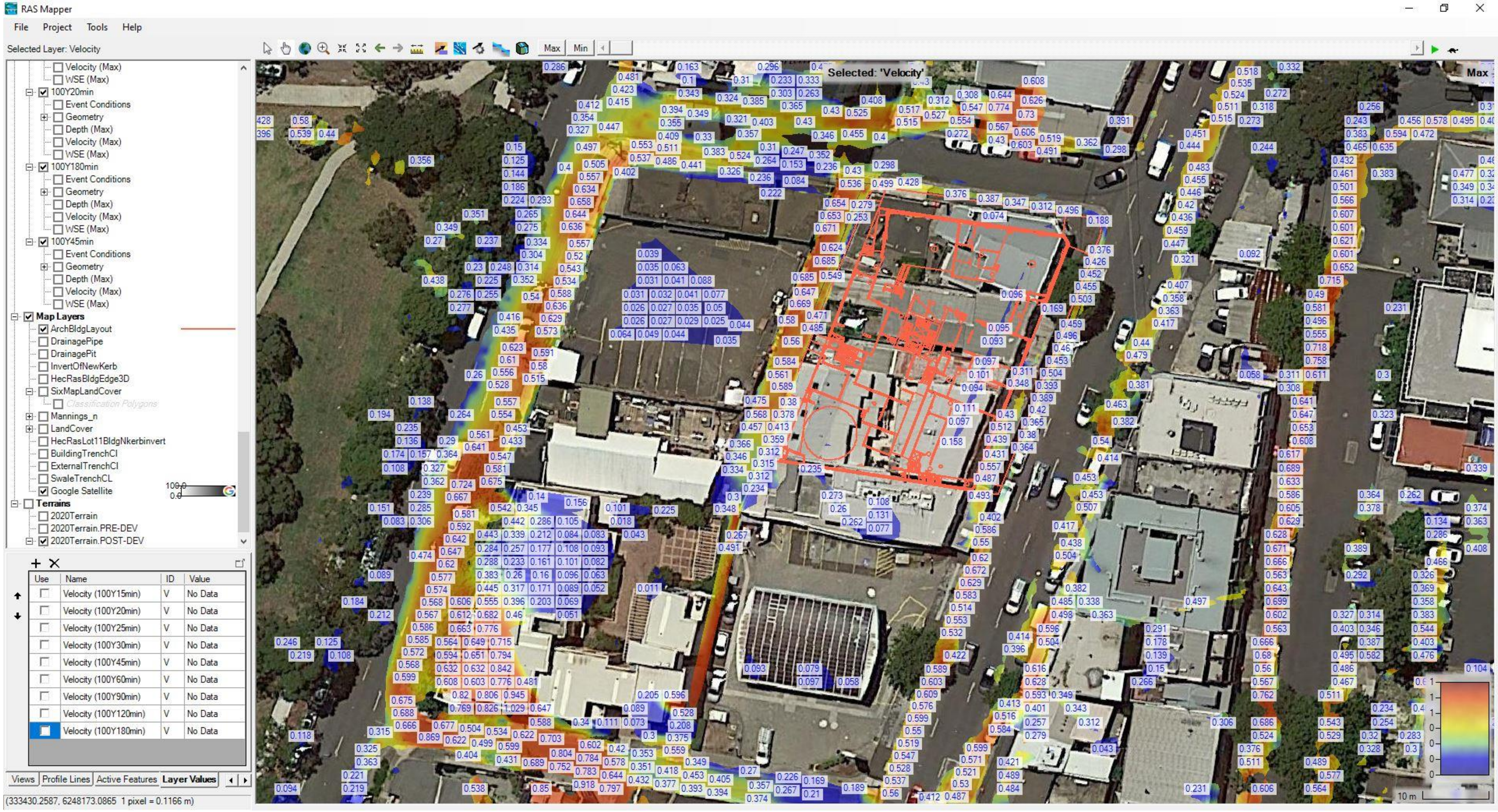
RAS Mapper
File
Project
Tools
Help
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Min
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Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y180min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y45min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
Map Layers
ArchBldgLayout
DrainagePipe
DrainagePit
InvertOfNewKerb
HecRasBldgEdge3D
SixMapLandCover
Classification Polygons
Mannings_n
LandCover
HecRasLot11BldgNkerbinvert
BuildingTrenchCl
ExternalTrenchCl
SwaleTrenchCL
Google Satellite
Terrains
2020Terrain
2020Terrain.PRE-DEV
2020Terrain.POST-DEV
Use
Name
ID
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Velocity (100Y20min) V No Data
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Velocity (100Y30min) V No Data
Velocity (100Y45min) V No Data
Velocity (100Y60min) V No Data
Velocity (100Y90min) V No Data
Velocity (100Y120min) V No Data
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Views
Profile Lines
Active Features
Layer Values
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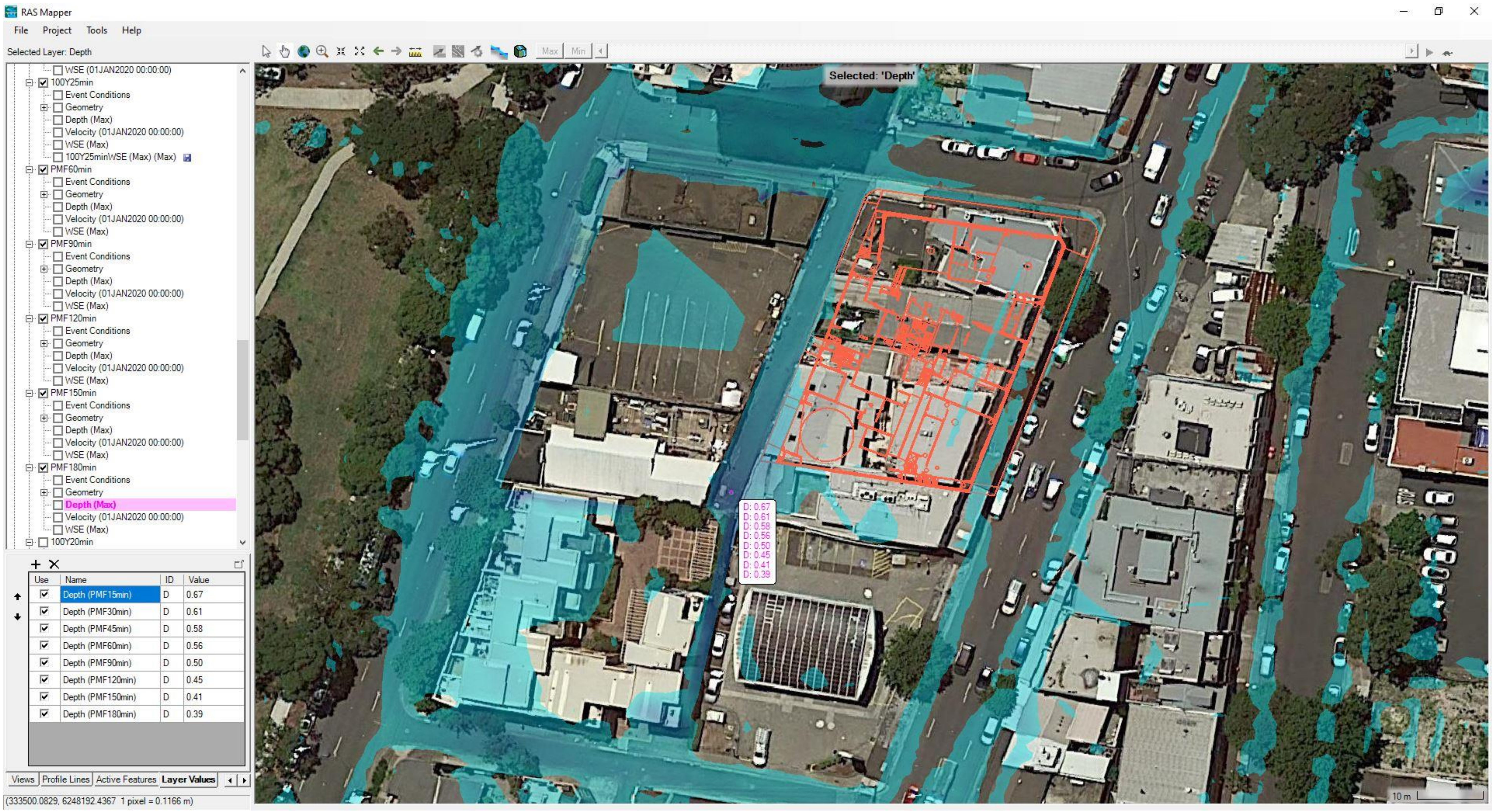
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WSE (Max)
100Y25minWSE (Max) (Max)
PMF60min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
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PMF90min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (Max)
PMF120min
Event Conditions
Geometry
Depth (Max)
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WSE (Max)
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Event Conditions
Geometry
Depth (Max)
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WSE (Max)
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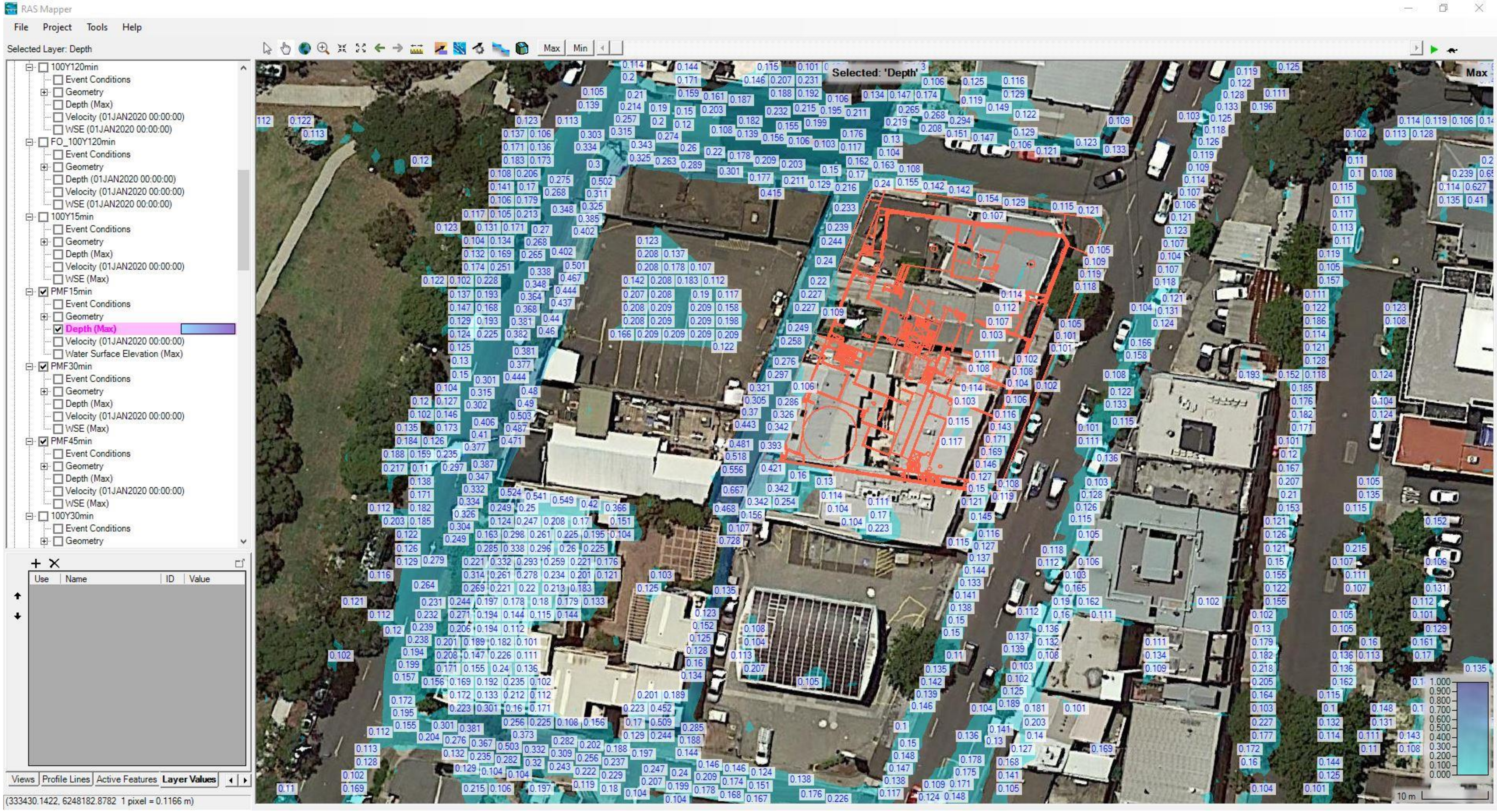
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FO_100Y120min
Event Conditions
Geometry
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100Y15min
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Geometry
Depth (Max)
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PMF15min
Event Conditions
Geometry
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Velocity (01JAN2020 00:00:00)
Water Surface Elevation (Max)
PMF30min
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Geometry
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Geometry
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WSE (Max)
100Y30min
Event Conditions
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Use Name ID Value
Views Profile Lines Active Features Layer Values
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RAS Mapper
File
Project
Tools
Help
Max
Min
Features
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Profile Lines
Active Features
Layer Values
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RAS Mapper
File
Project
Tools
Help
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Min
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Depth (Max)
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PMF15min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
Water Surface Elevation (Max)
PMF30min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (Max)
PMF45min
Event Conditions
Use | Name | ID | Value
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WSE (PMF30min) | W | 24.51
WSE (PMF45min) | W | 24.50
WSE (PMF60min) | W | 24.50
WSE (PMF90min) | W | 24.49
WSE (PMF120min) | W | 24.48
WSE (PMF150min) | W | 24.47
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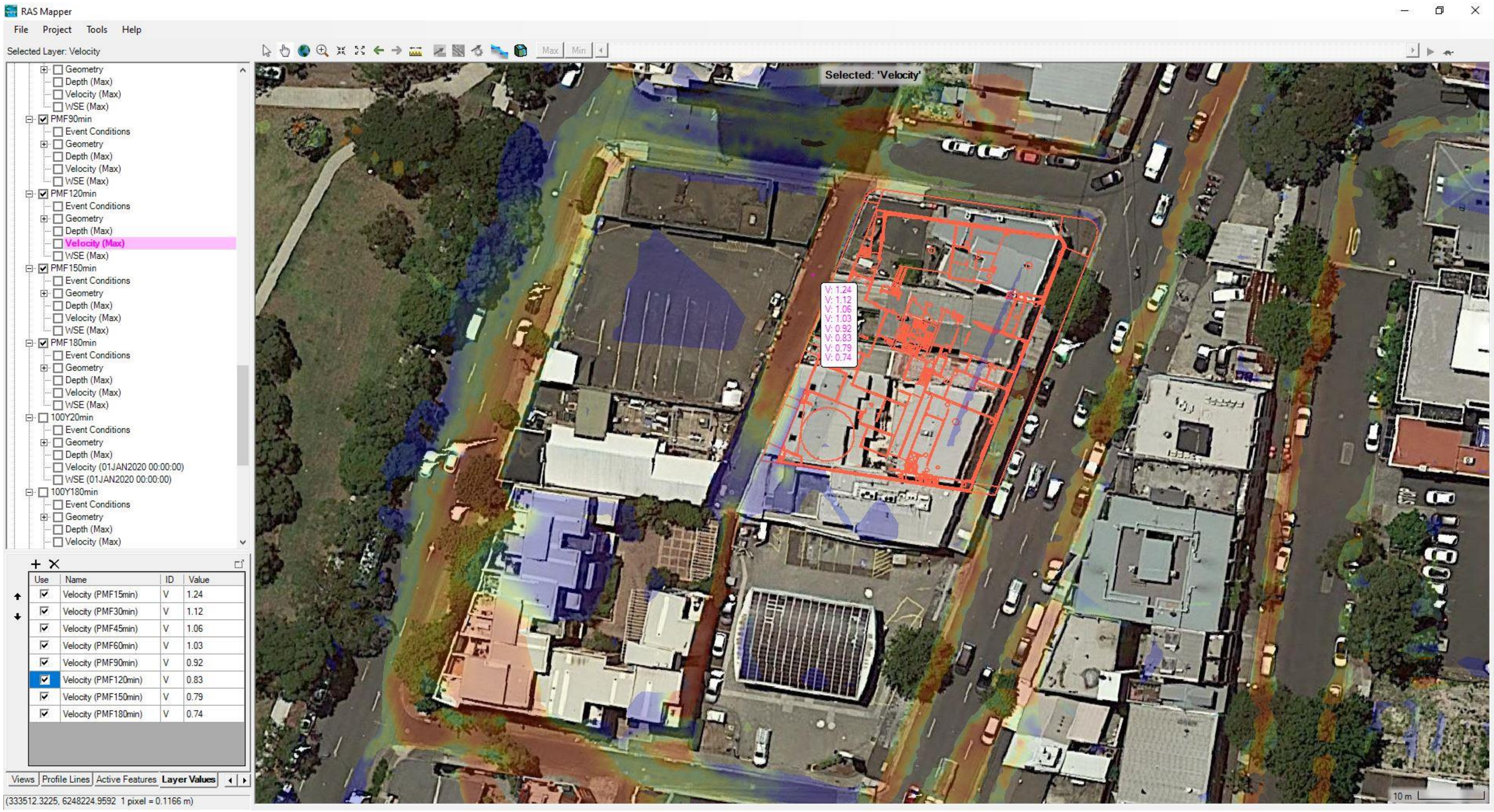
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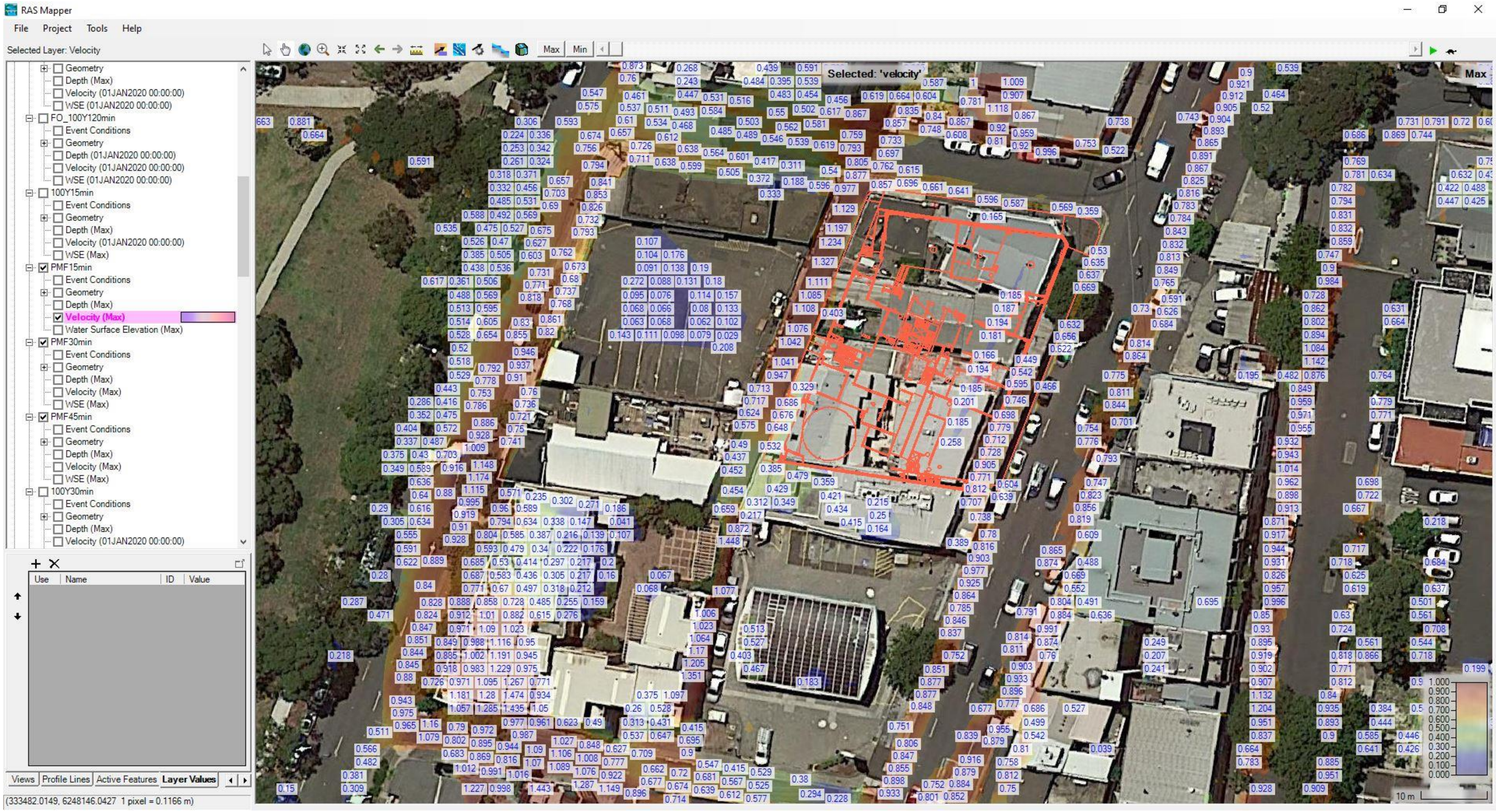
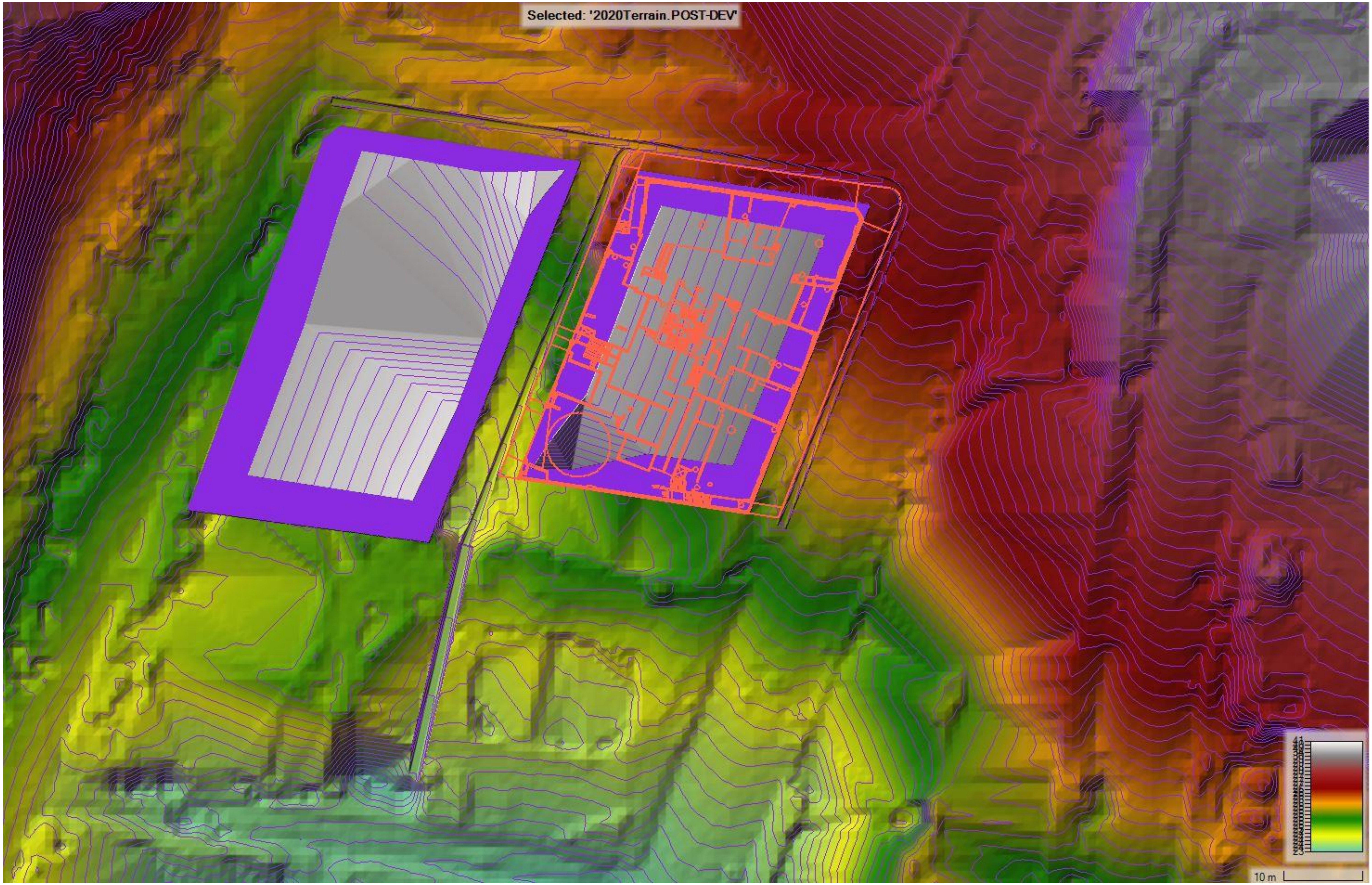
Views
Profile Lines
Active Features
Layer Values
(333512.3225, 6248224.9592 1 pixel = 0.1166 m)
Selected: 'Velocity'
V: 1.24
V: 1.12
V: 1.06
V: 1.03
V: 0.92
V: 0.83
V: 0.79
V: 0.74
10 m



RAS Mapper
File Project Tools Help
Selected Layer: Velocity
Max Min
Selected: 'velocity'
Max
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
FO_100Y120min
Event Conditions
Geometry
Depth (01JAN2020 00:00:00)
Velocity (01JAN2020 00:00:00)
WSE (01JAN2020 00:00:00)
100Y15min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
WSE (Max)
PMF15min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
Water Surface Elevation (Max)
PMF30min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
PMF45min
Event Conditions
Geometry
Depth (Max)
Velocity (Max)
WSE (Max)
100Y30min
Event Conditions
Geometry
Depth (Max)
Velocity (01JAN2020 00:00:00)
Use Name ID Value
Views Profile Lines Active Features Layer Values
(333482.0149, 6248146.0427 1 pixel = 0.1166 m)
10 m
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000


Selected: '2020Terrain.POST-DEV'
10 m

Item	Rooms/Entry Point	Proposed Minimum FPL (m)	PMF Flood Surface Levels (m)	1% AEP Flood Surface Levels (m)	Add 300mm to 1% AEP (m)	Add 500mm to 1% AEP (m)	Comment
1	Regent Street – Stair case entrance	25.607	25.365	25.307	25.607	25.807	Meet 300mm above 1% AEP and PMF*
2	Regent St – Entrance to Retail	25.690	25.730	25.685	25.985	26.185	Meet just above 1% AEP
3	Water Meter-Entrance to Retail	26.200	25.730	25.685	25.985	26.185	Meet 500mm above 1% AEP and PMF
4	Regent St – Entrance to Lounge	26.920	26.447	26.412	26.712	26.912	Meet 500mm above 1% AEP and PMF
5	William Lane–Entrance to Gameroom	26.020	25.588	25.514	25.814	26.014	Meet 500mm above 1% AEP and PMF
6	William Lane–Staircase to Basement (left)	25.190	25.009	24.888	25.188	25.388	Meet 300mm above 1% AEP and PMF*
7	William Lane–Staircase to Basement (right)	25.170	24.980	24.864	25.164	25.364	Meet 300mm above 1% AEP and PMF*
8	Comms Room-Entrance to staircase	25.370	24.980	24.864	25.164	25.364	Meet 500mm above 1% AEP and PMF
9	William Lane-Entrance to Loading Bay	24.610	24.803	24.603	24.903	25.103	Meet just above 1% AEP
10	Truck Turntable	24.800	24.803	24.603	24.903	25.103	Meet just above 1% AEP
11	Gas meter Room-Entrance to Loading Bay	25.103	24.803	24.603	24.903	25.103	Meet 500mm above 1% AEP and PMF
12	Entrance to basement from Loading Bay	24.903	24.803	24.603	24.903	25.103	Meet 300mm above 1% AEP and PMF*

* 300mm freeboard requested due to site not being highlighted as a flood control lot, 1% AEP shallow flow depth (less than 300mm) and restricted access to lift levels from back of footpath to provide accessibility to fire escape locations. In addition all entry levels to basement areas are above the PMF event.